



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

**Report of the  
Comptroller and Auditor General of India  
on  
Implementation of Phase 1 and Phase 2 of  
Bangalore Metro Rail Project  
by Bangalore Metro Rail Corporation Limited**

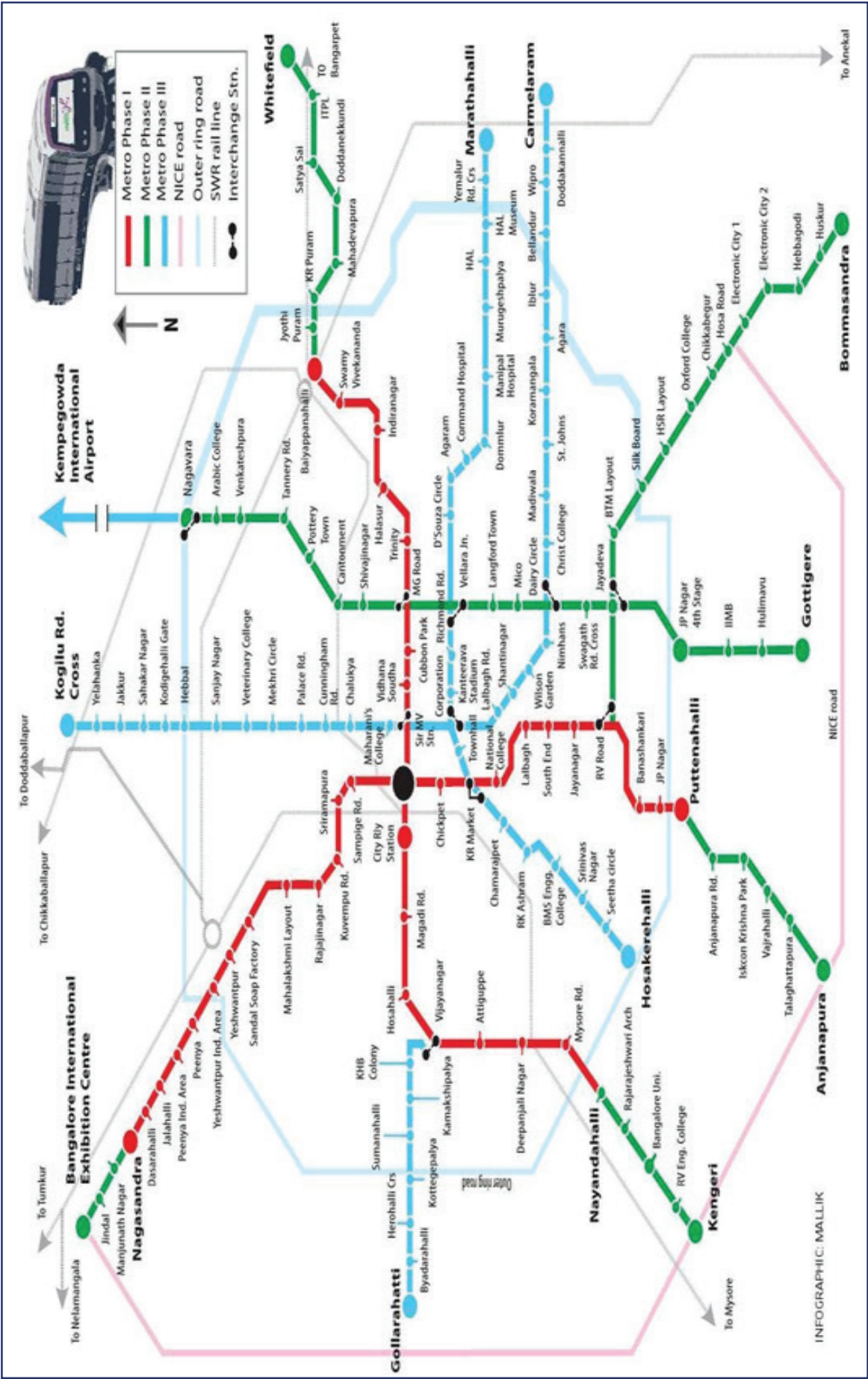
**Union Government  
Ministry of Housing and Urban Affairs  
No. 7 of 2026  
(Performance Audit - Commercial)**



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**Laid on the table of Lok Sabha and Rajya Sabha on .....**





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**Tunnel Boring Machine URJA had break through at Pottery Town Metro Station on 30 June 2022**



## Preface

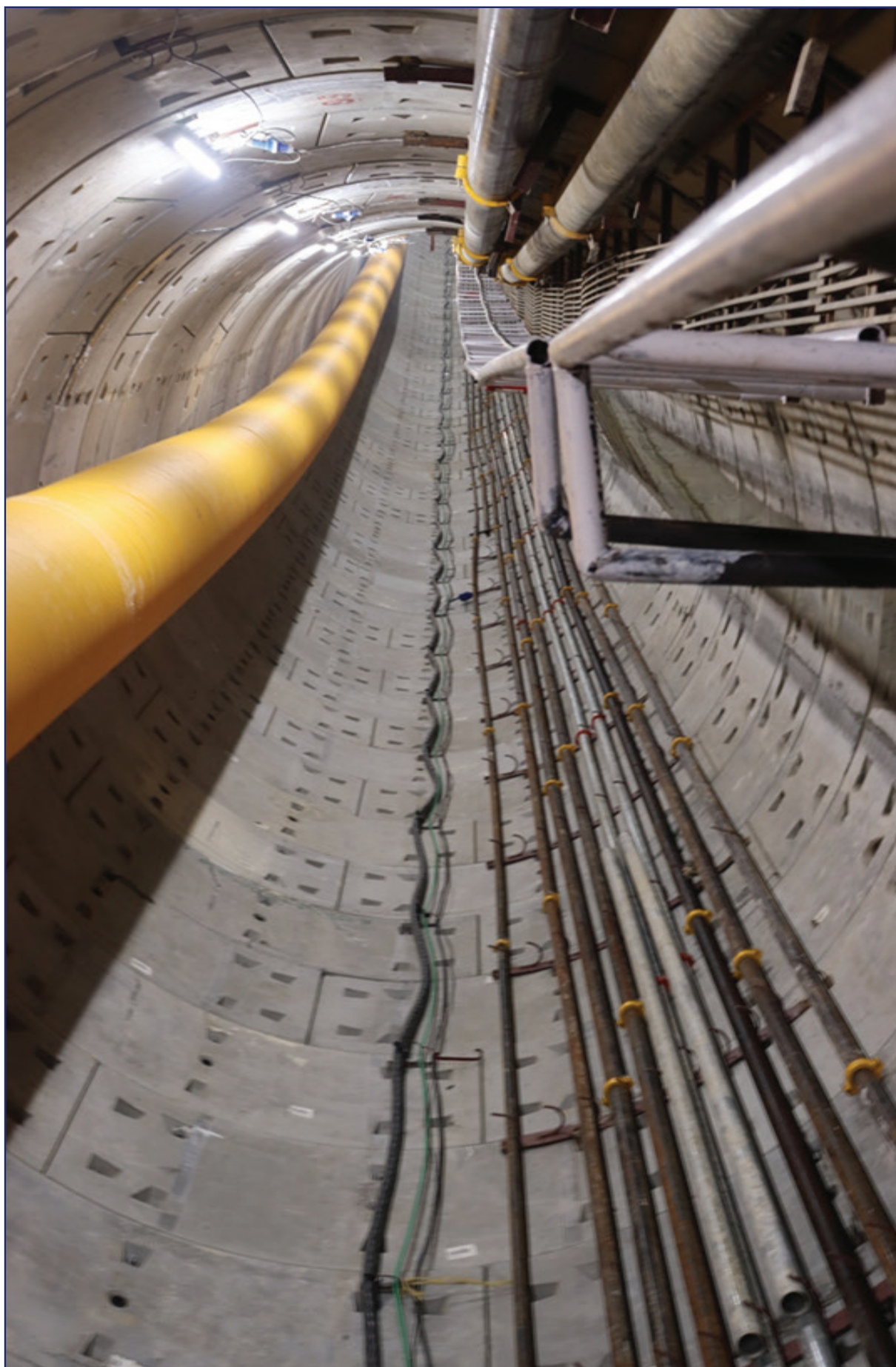
**The Performance Audit Report on ‘Implementation of Phase 1 and Phase 2 of Bangalore Metro Rail Project’ by Bangalore Metro Rail Corporation Limited has been prepared under the provisions of Section 19-A of the Comptroller and Auditor General’s (Duties, Powers and Conditions of Service) Act, 1971 for submission to the Government. 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 since inception of Bangalore Metro Rail Corporation Limited up to 31 March 2021 and the financial figures have been updated up to 31 March 2023. This report examines planning, implementation, monitoring, operation and maintenance of corridors and outcome of the activities of Phase 1 and Phase 2 (excluding 2A and 2B) of the Bangalore Metro Rail project since inception.**

**Audit wishes to acknowledge the assistance provided by the Technical Consultant (Indian Institute of Technology, Delhi) and co-operation extended by the officers and staff of Bangalore Metro Rail Corporation Limited, Ministry of Housing and Urban Affairs and Government of Karnataka for this Performance Audit.**



**Phase 2 Reach 6 Underground Construction by AVNI Tunnel Boring Machine**



## Executive Summary and Recommendations

The Bangalore Mass Rapid Transit Limited (BMRTL) was incorporated (September 1994) for implementation of Mass Rapid Transit System (MRTS) at Bengaluru. As Elevated Light Rail Transit System (ELRTS) under Build Own Operate Transfer model did not materialize, Bangalore Metro Rail Project was initiated in July 2002 in place of ELRTS. BMRTL, renamed (September 2005) as Bangalore Metro Rail Corporation Limited (BMRCL), is a 50:50 Joint Venture of Government of India (GoI) and Government of Karnataka (GoK). BMRCL was entrusted with the responsibility of construction, operation and maintenance of Metro Rail Project in Bengaluru. Detailed Project Report (DPR) of Bangalore Metro Rail Project for Phase 1 was prepared and submitted (May 2003) by Delhi Metro Rail Corporation Limited (DMRCL) for a route length of 33 km. Phase 1 extension DPRs were also prepared and submitted by DMRCL during October 2007 and June 2008 for a route length of 9.30 km. DPRs of Phase 2 were prepared and submitted by DMRCL during May 2011 to September 2011 for a route length of 72.10 km. The commercial operations of Phase 1 commenced in a phased manner from October 2011 and was completely operational in June 2017 for a total length of 42.30 km. The commercial operations of Phase 2 were partly commenced during January 2021 to March 2023 for a length of 27.36 km and balance network length is planned to be completed by December 2026.

The Performance Audit was conducted covering planning, implementation, monitoring and operations of Phase 1 and Phase 2 (excluding 2A and 2B) of Bangalore Metro Rail Project by BMRCL since inception up to March 2021. The physical and financial progress of selected contracts were reviewed up to 31 March 2023. The objectives of the Performance Audit were to assess whether:

- (i) Planning was done in a rational manner to ensure economic viability and selection of the most appropriate technologies;
- (ii) Implementation in terms of project execution and contract management was done with due care, economy and in a timely and transparent manner and adequate mechanism was in existence to monitor the project execution; and
- (iii) Operation and Maintenance (O&M) was efficient and the planned benefits were achieved after commercial operation of completed Reaches in respective Phases.

Audit scrutinized 117 project contracts valuing ₹27,472.85 crore out of 538 contracts valuing ₹30,982.35 crore (covering 89 *per cent* in terms of value and 22 *per cent* in terms of number of contracts) and 75 O&M contracts valuing ₹348.12 crore out of 2,279 contracts valuing of ₹476.83 crore (73 *per cent* in terms of value and 3 *per cent* in terms of number of contracts).

The Indian Institute of Technology, Delhi (IIT Delhi) provided technical consultancy during review of the technical aspects of the Phase 1 and Phase 2 projects.

A summary of main audit findings of performance audit is given below:

### Planning and Selection of Technology

Though National Urban Transport Policy (NUTP), 2006 framed by the Ministry of Housing and Urban Affairs (MoHUA), GoI emphasized preparation of Integrated Land Use and Comprehensive City Transport Plans, DPRs for Phase 2 (May 2011/ July 2011/ September 2011) were prepared in absence of the Comprehensive Mobility Plan (CMP), Transit Oriented Development (TOD)/ Land Use Policy (LUP) for planning, designing and transforming urban areas to make the best use of public transport network. The CMP and TOD Plan for Bengaluru were approved by GoK in September 2020 and November 2022 respectively. Also, as per the norms for selecting mode of transport issued by Working Group on Urban Transport in May 2011, Heavy Metro should be proposed if the Peak Hour Peak Direction Traffic (PHPDT) in 2021 was more than 15,000 for at least 5 km continuous length, else Bus Rapid Transit System should be proposed. Audit noticed that Phase 2 could not be implemented as of 2021 and actual PHPDT achieved in 2021 for Phase 1 was far below the projections (below 15,000) and ranged between 6,429 and 8,852. Despite above, there was no study to show how ridership could be improved to justify investment in Heavy Metro.

**(Para 3.1.1)**

Multi Modal Integration (MMI) is the seamless integration of different modes of transportation into a single, streamlined supply chain which results in greater efficiency, lower costs and faster transit times and requires integration in planning, design, scheduling, fares and operations. MMI has been planned at three operational hubs and is yet to be operational at another eight locations as of March 2023, even after full operationalization of Phase 1 since June 2017. Further, BMRCL has neither implemented formal monitoring process for achieving integration as suggested in DPRs nor conducted infrastructure and operation audits to evaluate the impact of better last mile connectivity.

**(Para 3.1.5.3)**

For Phase 1 and Phase 2, the Financial Internal Rate of Return (FIRR) and Economic Internal Rate of Return (EIRR) were calculated based on ridership figures which appeared to be overestimated as the envisaged ridership could not be achieved. Sensitivity Analysis for different levels of ridership was not conducted. Moreover, no detailed study had been done to understand the reasons for low ridership. Further, the assumptions for estimating EIRR for DPRs of Phase 1 and those of its extensions in Phase 2 were not uniform.

**(Paras 3.2 and 3.3)**

Communication Based Train Control (CBTC) is a railway signalling system that uses telecommunications between train and track equipment for traffic management and infrastructure control and allows a train's position to be known more accurately than with traditional signalling systems. BMRCL adopted Distance to Go (DTG) Signaling & Telecommunication (S&T) system for Phase 1 even though CBTC signaling system was available at the time of finalisation of S&T system works for Phase 1. As a result, BMRCL was forced to continue with the old DTG signaling system instead of CBTC signaling system in extension lines of Phase 1 under Phase 2.

**(Para 3.5.2)**



Platform Screen Doors (PSDs) also known as Platform Edge Doors, used at Metro stations (Elevated/ Underground) to separate the platforms from trains, act as a physical barrier preventing people or objects from falling onto tracks. Mainly in case of Underground (UG) Stations, PSDs also maintain climate control within the station and provide substantial savings in Heating, Ventilation and Air Conditioning (HVAC) costs in UG stations. BMRCL had not considered installing PSDs in Phase 1 UG stations despite projected savings of ₹6.58 crore per annum in the cost of air conditioning and maintenance costs.

**(Para 3.5.3)**

The hardness values of rail should be in the range of 340 – 390 Brinell Hardness Number (BHN) at all the locations where the wheel is supposed to form contact with rail. Rails of relatively low value of hardness (ranged between 260 and 330 BHN in 34 of the 36 locations), as compared to standards (340 – 390 BHN), were procured, which may result in increased maintenance cost as well as increase in noise and vibration as well as increase in energy loss arising due to high friction/traction and decreased life of rails and wheels.

**(Para 3.5.4.1)**

**With reference to Audit findings on Planning and Selection of Technology, Audit recommends that:**

1. *The estimation of ridership should be realistic based on the Comprehensive Mobility Plan (CMP)/ Transit Oriented Development (TOD) Policy of the City and expansion of Heavy/ Medium Metro should be based on Alternative Scenario Analysis. This can include impact of integration of Bangalore Metropolitan Transport Corporation bus routes, fare integration, walking, bicycling infrastructure development, etc.*
2. *As most of the Metros are running with DTG systems, the matters relating to replacement costs, open software, interoperability, etc. need to be discussed and decided by the Ministry as a 'Policy Matter' and necessary guidelines should be issued by the Ministry of Housing and Urban Affairs.*

## Land Management

Land requirement for metro corridors was not properly assessed in DPRs of Phase 1 and Phase 2 metro projects. BMRCL had acquired 62.67 hectares of land for Phase 1 as against projected 45.24 hectares of land. Similarly, for Phase 2, BMRCL acquired 145.16 hectares of land as against projected land requirement of 165.09 hectares (including 55 hectares for property development) in DPRs. Also, 55 hectares of land proposed for property development was not acquired. Further, improper land estimation coupled with delays in acquisition resulted in increase in cost of land acquisition by ₹6,603.39 crore (Phase 1: ₹835.81 crore and Phase 2: ₹5,767.58 crore) as of 31 March 2023.

**(Paras 4.2.1 and 4.2.2)**

BMRCL had not fixed any timelines for pre-notification activities. Delays were noticed at each stage of land acquisition viz., issue of Notifications under Section 28 of Karnataka Industrial Areas Development (KIAD) Act, 1966, conduct of joint measurement, finalization of compensation, etc.

**(Para 4.3)**

Unlike Phase 1, Government of Karnataka did not issue preventive orders when DPRs for Phase 2 Reaches were under submission. As a result, 46 landowners converted their lands from agriculture to non-agriculture lands just before submission of DPR or just after submission of DPR, resulting in BMRCL paying additional compensation. Further, BMRCL did not exercise adequate prudence in determination of land status and adopted either non-agriculture land rates for agriculture land or added certain attributes under Bangalore Development Authority (BDA) guidelines to agriculture lands which were applicable to converted land. This resulted in excess payment of land compensation to landowners to the extent of ₹294.72 crore.

(Para 4.4.2.1)

The High Power Committee (HPC) prescribed 270 days for taking possession of land after issue of Preliminary Notifications. Due to delay in issue of Final Notification for land acquisition beyond the timeline approved by the HPC, BMRCL paid additional compensation at 12 *per cent* of market value as interest to the extent of ₹186.86 crore.

(Para 4.4.2.2)

Government of Karnataka issued guidelines to increase the market value of properties acquired for Phase 2 by up to 5 *per cent* for the properties having frontage, two roads, without drainage/ high tension line, etc. However, BMRCL adopted higher percentage than the percentage prescribed by Government of Karnataka resulting in payment of excess compensation of ₹31.35 crore to the landowners in case of Phase 2.

(Para 4.4.2.3)

**With reference to Audit findings on Land Management, Audit recommends that:**

3. *BMRCL should ensure that the DPR shall contain clear details of land to be acquired along with the ownership details.*
4. *BMRCL should approach GoK to amend the KIAD Act, 1966 duly prescribing the timelines for acquisition of land.*
5. *BMRCL should ensure that the extant rules and guidelines framed for valuation of land parcels are followed scrupulously and responsibilities be fixed for avoidable payments.*

#### **Project Execution and Contract Management**

BMRCL did not have a Procurement Manual due to which there was no uniformity in preparation of cost estimates. There were no established guidelines for deciding project duration, size of Package, time period allowed for sale of tender documents and for regulating release of advances to contractors and fixation of interest rates on advances.

(Paras 5.1, 5.3, 5.4 and 5.5)

BMRCL prepared cost estimates for Phase 2 contracts inclusive of all taxes but instructed the bidders to submit bids exclusive of taxes without revising its cost estimates by excluding the tax components. Audit observed that taxes amounting to ₹1,098.28 crore were included in the cost estimates of nine civil contracts resulting in increase in project cost by ₹1,222.40 crore.

(Para 5.1.2)



BMRCL descope the Property Development works from the Station Designs in case of three stations, viz., Hosa Road, Basapura Road and Chikkabegur Stations of Reach 5 (Package 2) of Phase 2 to save cost and time in constructing the stations without analyzing the revenues foregone due to descope of Property Development, which was one of the key factors for deciding on the financial viability of the Phase 2.

**(Para 5.10.2)**

Despite being aware that availability of land to contractors on time cannot be guaranteed, as experienced during execution of Phase I, during tendering for Phase 2 works, BMRCL amended the tender terms to include payment of damages to the contractor for delays in handing over of land beyond 90 days from the date of signing the contract agreement. Audit noticed delays in handing over the land in 13 contracts which ranged between 12 and 1,305 days (beyond the allowable 90 days). In 5 out of 13 contract, the contractors raised claims to the tune of ₹98.21 crore, out of which ₹12.19 crore has already been paid against one claim.

**(Para 5.12)**

There were delays in shifting of utilities, removal/ translocation of trees, demolition of buildings/ structures, etc. due to which the main civil contract works were delayed, which consequently led to delay in execution of works.

**(Para 5.13)**

BMRCL constructed Metro stations at Nagasandra, Peenya, Peenya Industry, Jalahalli and Dasarahalli of Phase 1 alongside of National Highways without Foot Over Bridge (FOB)/ under pass to access the metro stations. Though FOBs/ under pass in case of Nagasandra, Jalahalli and Dasarahalli could be constructed subsequently, FOBs at Peenya and Peenya Industry were not found feasible due to vertical height clearances.

**(Para 5.14.1)**

**With reference to Audit findings on Project Execution and Contract Management, Audit recommends that:**

6. *BMRCL should adopt a systematic approach while determining project timeframe to ensure time-cost trade-off to derive the most optimum time at which the cost is the lowest.*
8. *BMRCL should ensure that the acquisition of land, removal/ translocation of trees, shifting of utilities and demolition of buildings is completed before the award of civil/ system works to avoid delays in execution of works and payment of damages/ compensation for delays.*
9. *BMRCL should ensure infrastructure for safe crossing of the metro users in case of the metro stations already in operation and/or under construction and should prepare an Action Plan with specific timeline wherever this infrastructure is not available. Further, going forward, BMRCL should integrate crossing of road by metro users in metro station plan itself and accordingly obtain necessary permissions from the road owning Agencies (NHAI/ BBMP) and Traffic Police before executing the metro station works.*

## Financial Management and Innovative Financing

Audit observed that BMRCL has been continuously incurring cash losses for the period from 2013-14 to 2021-22, Hence, the revenue generated by BMRCL is insufficient to meet the External Debt Repayment obligations and BMRCL is completely dependent on GoK to service the debt raised for the project as of 31 March 2023.

**(Para 6.1)**

BMRCL could not realize projected minimum 10 *per cent* Non-Farebox Revenue (Non-FBR) of total FBR as per the DPRs of Phase 1 and Phase 2. The actual Non-FBR on actual Farebox Revenue (FBR) was in the range of 8.85 to 49.54 *per cent* but when compared to projected Non-FBR, BMRCL achieved Non-FBR between 1.39 and 8.62 *per cent* of projected FBR.

**(Para 6.3)**

BMRCL availed loan for payment of GST amount of ₹75.59 crore on mobilisation advances, in deviation to the terms of loan agreement with European Investment Bank and Asian Infrastructure Investment Bank. It also led to additional interest burden on the Metro Rail Project during construction period as well as on the State Government, as the SGST portion is already borne by GoK as per MoU terms.

**(Para 6.5)**

BMRCL projected additional Property Development in Phase 1 and Phase 2. In case of Phase 1, out of the identified eight parcels totaling to 42.60 acres, only one property at Nagasandra (14 acre) was developed. Further, financial viability of corridors under Phase 2 was considered, with income projections of ₹21,282 crore from Property Development in an additional 55 hectare of land during the years from 2016-17 to 2041-42. However, 55 hectare of land is yet to be acquired as of March 2023.

**(Para 6.8)**

BMRCL lost potential revenue to the tune of ₹103.77 crore due to fixation of Minimum Development Premium (MDP) on the lower side while leasing out 14 acres of land for integrated Property Development around Nagasandra Metro station.

**(Para 6.9)**

BMRCL developed built-up area of 2.46 lakh sft in the Metro stations for Property Development, of which only 0.23 lakh sft had been utilised for Property Development/commercial activity, while the remaining 2.23 lakh sft built-up area had been lying vacant for years, thereby losing the opportunity to earn Non-FBR (lease rent) of ₹38.53 crore during the period 2019-22. Further, there was no guiding Asset Management Policy to monetize the empty spaces in stations/ areas identified for Property Development.

**(Para 6.10)**

One of the means for achieving objectives of NUTP, 2006 was raising finances through innovative mechanisms that tap land as a resource, for investments in urban transport infrastructure. BMRCL

entered into six MoUs valuing ₹605 crore for part funding the construction of Metro stations and corridors through Innovative Financing. Out of six, two companies agreed to contribute ₹100 crore and ₹65 crore respectively and BMRCL received ₹103 crore till March 2023 from two companies. However, there was no approved Policy for securing Innovative Financing for the project in a transparent and competitive manner. Further, neither BMRCL nor GoK/ GoI could deploy the principles of Value Capture Financing despite making an investment of about ₹40,000 crore in Phase 1 and 2 as of 31 March 2023.

(Para 6.11, 6.11.1 and 6.11.2)

**With reference to Audit findings on Financial Management and Innovative Financing, Audit recommends that:**

13. *BMRCL should ensure availing loans from Financial Institutions as per the terms of the loan agreement to avoid interest burden and future legal complications for deviations.*
14. *BMRCL should ensure timely availability of land for Property Development, as envisaged in the Detailed Project Reports of Phase 2 at the earliest to make the project financially viable.*
15. *BMRCL should devise a mechanism to adopt 'Value Capture' principle as per the directions of MoHUA, GoI for self-financing the Metro projects out of the revenue generated from value created.*

### Operation and Maintenance

During the period 2016-17 to 2022-23, the actual Farebox Revenue (FBR) earned for both Phase 1 and Phase 2 was ₹1,758.13 crore as against the projected FBR of ₹7,736.70 crore which is 22.72 per cent of the projected FBR.

(Para 7.2)

The enabling local/ street level infrastructure was not properly designed for majority of the Metro stations. There was no documentation or formal protocol available to ensure implementation of universally accessible station environment outside the station, which has consequently affected the ridership. Further, parking facility was not available in 18 of the 51 operational Metro stations.

(Para 7.3)

BMRCL could not achieve the ridership and PHPDT as per DPRs projected against the year 2007 even by the year 2023. This was due to non-integration of Metro with Bengaluru Metropolitan Transport Corporation (BMTC), lack of last mile connectivity, lack of adequate parking facility, etc. Further, despite GoI directions in May 2006, GoK did not make suitable provisions for integrated traffic plan to act as a feeder/ evacuation system of Metro Project.

(Para 7.4)

The feeder modes to Metro were poorly organized and lacked connectivity with interior residential zones. Further, footfall in BMTC buses reduced from 51.30 lakh per day in 2014-15 to 27.49 lakh per day in 2022-23. Even after introduction of Metro, the combined ridership of BMTC buses and Metro

is lesser than the earlier ridership of BMTC buses, which indicates that the Metro has not been able to attract enough private vehicle users that can result in an overall increase in public transport ridership.

(Para 7.6)

A train set with 3-cars can carry 1,000 passengers whereas a train set with 6-cars can carry 2,068 passengers. Despite non-achievement of projected ridership and PHPDT, BMRCL converted all the 3-car trains of Phase 1 into 6-car trains.

(Para 7.8)

The Board Level Committee on Operation & Maintenance was reconstituted in February 2021 but no meetings were held so far.

(Para 7.13)

**With reference to Audit findings on Operation and Maintenance, Audit recommends that:**

- 16. BMRCL should ensure that the Policy on ‘Accessible Stations – Inside and Outside’ is implemented in its entirety.*
- 17. BMRCL should conduct due diligence to ensure that the DPR projections made by the Consultant are based on realistic estimates.*
- 18. Intended benefits can accrue if time to time interventions and modifications in access infrastructure and integration with other modes are implemented. Hence, BMRCL should put in place continuous monitoring mechanisms for achieving integration as suggested in DPRs and subsequent committees, conduct alternate scenario analysis, and conduct infrastructure and operation audits to evaluate the impact of improvement in last mile connectivity and take corrective course of action.*
- 19. The Board Level Committee on Operation & Maintenance needs to meet periodically to monitor the operation and maintenance activities of Metro.*

#### **Positive takeaways from the Performance Audit**

BMRCL has constructively acknowledged the observations in audit and has implemented measures for improvement of their processes and/ or are in the process of implementing the same. Some takeaways from the Performance Audit are enumerated below:

#### **Implemented measures at the instance of Audit**

- (i)** BMRCL has implemented procurement through e-tendering system for all types of contracts/ works of metro. Further, instructions have been issued prescribing that the cost estimates of works, quantity variations in execution of works and non-tendered items to be executed shall be vetted by Finance Department of BMRCL.
- (ii)** A system of proof checking of designs prepared by Detailed Design Consultant has been put in place. These designs are first reviewed by BMRCL Design Team and proof checked by the Indian Institute of Science, Bengaluru.

- (iii) A dedicated team for removal of trees in the way of metro alignment and ensuring compensatory plantation has been formed (Social Environment Monitoring Unit) by BMRCL to coordinate with Forest Department executives and ensuring that these functions are performed timely.
- (iv) BMRCL has constituted a Committee to examine issues that had arisen due to the introduction of the GST Act, 2017 and to finalise/regularise the claims/bills involving application of GST provisions.

#### **Measures under implementation at the instance of Audit**

- (v) BMRCL has drafted a Procurement Manual considering the aspects raised in Audit and is following it up with the Government of Karnataka for approval.
- (vi) BMRCL is in discussions with Karnataka Industrial Areas Development Board to provide revised timelines for various stages of land acquisition.

#### **Assurances**

- (vii) MoHUA stated that Indian Communication Based Train Control (I-CBTC) system is being developed by DMRCL in collaboration with Bharat Electronic Limited and Research Designs and Standards Organisation, which will be deployed by replacing the existing DTG System at the end of the codal life of the deployed systems.
- (viii) BMRCL assured to formulate its “Outdoor Advertisement Policy” based on the policy to be finalised by Bruhat Bengaluru Mahanagara Palike.
- (ix) BMRCL assured to formulate and finalise an Asset Management Policy.
- (x) BMRCL is devising a policy for utilisation and safeguarding of surplus/ surrendered land in its possession.





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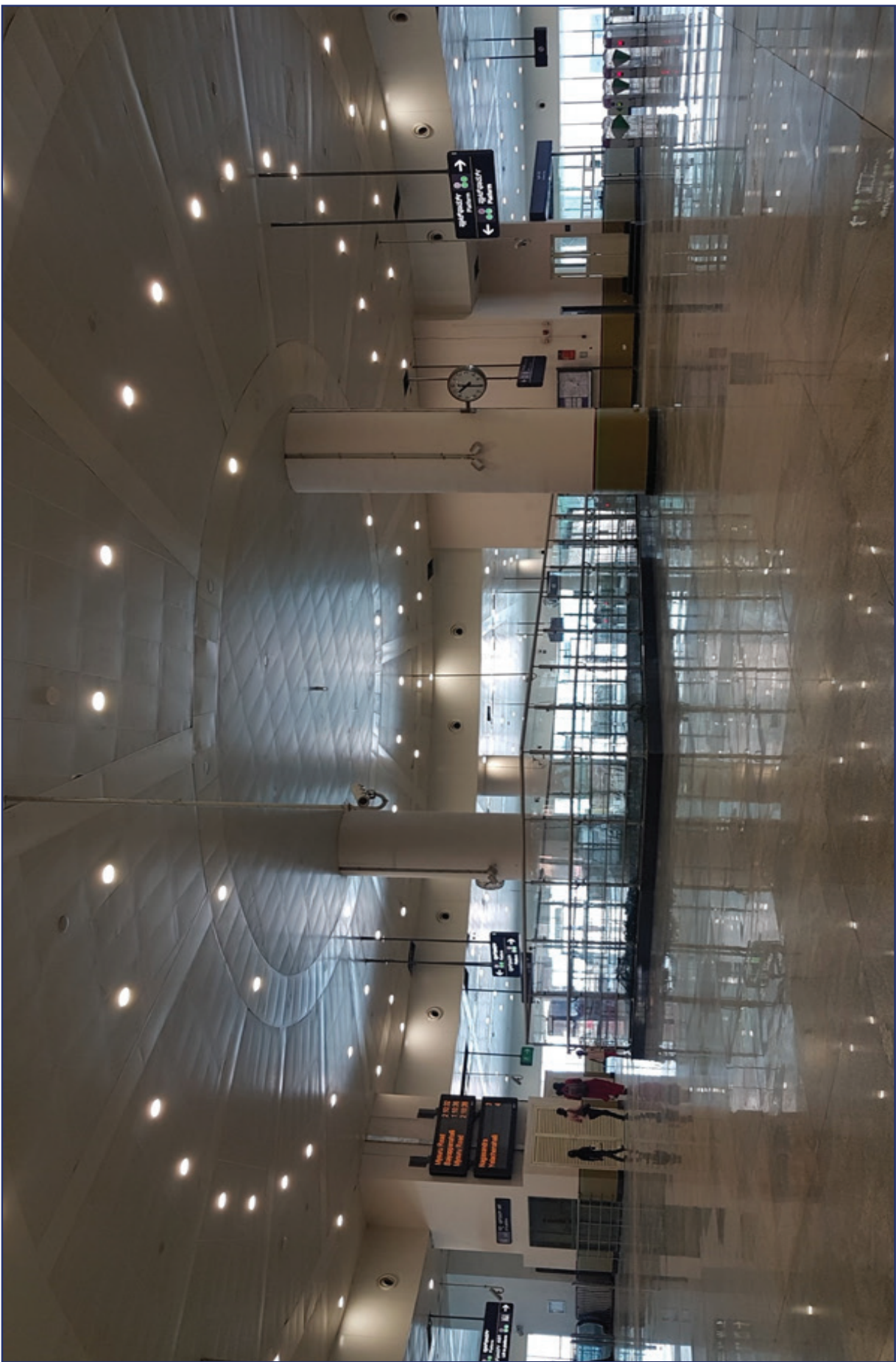
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# Chapter 1: Introduction

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**Nada Prabhu Kempegowda Station, Majestic**



# Chapter 1: Introduction

## 1.1 Background

An official committee nominated by Government of Karnataka (GoK) recommended (1993) Mass Rapid Transport System (MRTS) for Bengaluru city to overcome transport problems and accordingly, Bangalore Mass Rapid Transit Limited (BMRTL) was incorporated (September 1994) by GoK to implement the MRTS.

In line with the Government of India (GoI) Policy for planning rail based urban transport, on the advice (September 2002) of GoK, BMRTL engaged Delhi Metro Rail Corporation Limited (DMRCL) for preparation of Detailed Project Report (DPR) for a Metro System for Bengaluru city. DMRCL submitted (May 2003) DPR for Phase 1 of Bangalore Metro Rail Project recommending two corridors, viz., East-West and North-South, considering estimated traffic demand as of 2007 and future demand for 2011 and 2021 in consultation with Bangalore Development Authority.

BMRTL, renamed (12 September 2005) as Bangalore Metro Rail Corporation Limited (BMRCL) and converted as a 50:50 Joint Venture of GoI and GoK, was entrusted with the responsibility of implementation and operation of Metro Rail Project in Bengaluru city. The Bangalore Metro was christened as “Namma Metro”.

The Management of BMRCL is vested with the Board consisting of 13 Directors as on 31 March 2023. The Secretary, Ministry of Housing and Urban Affairs (MoHUA), GoI is the Chairman of the Board. The full-time Managing Director of BMRCL is a nominee of GoK. There are three Functional Directors, viz., Director (Projects & Planning), Director (Rolling Stock, Electrical, Signalling & Telecommunication) and Director (Finance). In addition, four Directors each are nominated by GoI and GoK.

A ‘High Power Committee (HPC)’ was set up by GoK under the chairmanship of Chief Secretary, consisting of Secretaries of the concerned Departments of GoK, Heads of Civic Bodies, etc., as members, to address and sort out State level issues regarding implementation of the project, particularly with regard to land acquisition, shifting of utilities and structures in the project alignment, rehabilitation of project affected persons, etc. An Empowered Group of Ministers (EGoM) on Mass Rapid Transit Systems was constituted by the Cabinet to take policy decisions at the Central Government level and review the progress of MRTS projects from time to time. The scope of the EGoM was also extended to Bangalore Metro Rail Project by including the Chief Minister, Karnataka as one of its invitees when matters relating to Bangalore Metro Rail Project are considered. These mechanisms were put in place for timely execution of the Bangalore Metro Rail Project.

## 1.2 Bangalore Metro Rail Project

Bangalore Metro Rail Project is being implemented in a phased manner as indicated below –

**Table 1.1 – Table indicating the status of different Phases of Bangalore Metro Rail Project**

| Phase   | Length (in Km) |       |       | Stations (in nos.) |    |       | Sanctioned Cost (₹ in crore) | Status                                                                                                |
|---------|----------------|-------|-------|--------------------|----|-------|------------------------------|-------------------------------------------------------------------------------------------------------|
|         | E              | UG    | Total | E                  | UG | Total |                              |                                                                                                       |
| Phase 1 | 33.51          | 8.79  | 42.30 | 33                 | 7  | 40    | ₹14,133.17                   | Operational in phases from October 2011 and completely operational since June 2017.                   |
| Phase 2 | 58.30          | 13.79 | 72.09 | 49                 | 12 | 61    | ₹30,695.12                   | Partly operational by 31 March 2023. Complete Phase 2 is proposed to be operational by December 2026. |

### *E – Elevated; UG – Underground*

Phase 1 was to commence on 1 January 2007 with scheduled completion by June 2012. However, Phase 1 was operationalised in phased manner from 20 October 2011 and was completely operational by 18 June 2017 with a route length of 42.30 km across North-South (Green line) and East-West (Purple line) corridors.

Similarly, Phase 2 was to commence on 31 December 2014 with scheduled completion by 31 December 2019. However, three out of four extension lines of Phase 1 forming part of Phase 2 (route length - 27.36 km) was commercially operational from 15 January 2021, 30 August 2021 and 26 March 2023 respectively and the balance works were still in progress as of March 2023. Further, Reach 5 and 6 under Phase 2 covering 18.82 km and 21.25 km respectively were under construction. Phase 2 is proposed to be fully operationalised by December 2026.

Reach wise commercial operations of Phase 1 and 2 as of March 2023 is given below:

**Table 1.2 – Table indicating the Reach wise commercial operations of Phase 1 and Phase 2**

| Name of the Reach             | Corridor                                     | Length (in Km) | Stations  | Date of Commercial Operation |
|-------------------------------|----------------------------------------------|----------------|-----------|------------------------------|
| <b>Phase 1</b>                |                                              |                |           |                              |
| Reach 1                       | Baiyappanahalli to M.G. Road                 | 6.70           | 6         | 20.10.2011                   |
| Reach 3, 3A                   | Mantri Square Sampige Road to Peenya         | 10.30          | 10        | 01.03.2014                   |
| Reach 3B                      | Peenya to Nagasandra                         | 2.50           | 3         | 01.05.2015                   |
| Reach 2                       | Magadi Road to Mysore Road                   | 6.40           | 6         | 18.11.2015                   |
| Underground 2                 | M.G. Road to Magadi Road                     | 4.80           | 5         | 30.04.2016                   |
| Reach 4, 4A and Underground 1 | Mantri Square Sampige Road to Yelechenahalli | 11.60          | 10        | 18.06.2017                   |
| <b>Total</b>                  |                                              | <b>42.30</b>   | <b>40</b> |                              |



| Phase 2         |                                  |              |           |            |
|-----------------|----------------------------------|--------------|-----------|------------|
| Reach 4B        | Yelechenahalli to Silk Institute | 6.12         | 5         | 15.01.2021 |
| Reach 2B        | Mysore Road to Kengeri           | 7.53         | 6         | 30.08.2021 |
| Reach 1A and 1B | Krishnarajapura to Whitefield    | 13.71        | 12        | 26.03.2023 |
| <b>Total</b>    |                                  | <b>27.36</b> | <b>23</b> |            |

### 1.2.1 Phase 1 of Bangalore Metro Rail Project

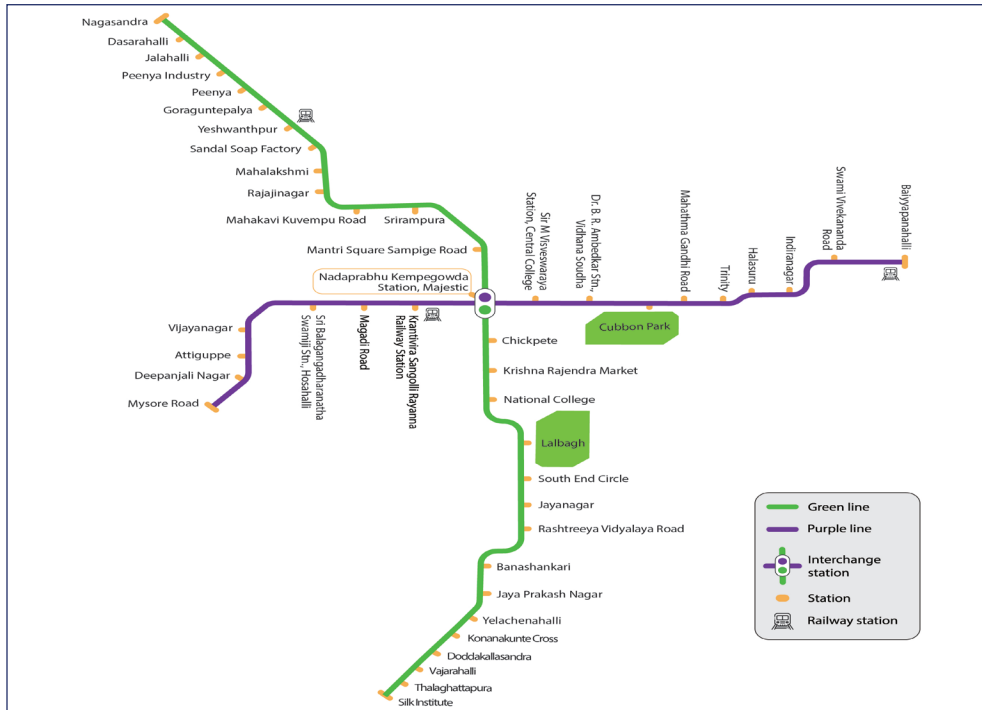
The following DPRs were prepared by DMRCCL for Phase 1:

**Table 1.3 – Table indicating the DPRs prepared for Phase 1**

(₹ in crore)

| Corridor                                                                                                             | Length<br>(in<br>Km) | DPR<br>submission | DPR<br>estimate<br>as per<br>DMRCL | Initial<br>Approved<br>cost by<br>GoI | Date of<br>approval<br>by GoI | DPR<br>estimate<br>as per<br>BMRCL                             | Scheduled<br>Completion |
|----------------------------------------------------------------------------------------------------------------------|----------------------|-------------------|------------------------------------|---------------------------------------|-------------------------------|----------------------------------------------------------------|-------------------------|
| East - West corridor<br>(Baiyappanahalli to<br>Mysore Road) (Purple<br>line)                                         | 18.10                | May 2003          | 4,495                              | 6,395                                 | May<br>2006                   | No separate<br>estimate<br>prepared<br>by BMRCL<br>for Phase 1 | June 2011               |
| North - South corridor<br>(Yeshwanthpur to<br>RV Road Terminal)<br>(Green line)                                      | 14.90                |                   |                                    |                                       |                               |                                                                |                         |
| Extension of North-<br>South corridor<br>further North from<br>Yeshwanthpur to<br>Hesaraghatta Cross<br>(Nagasandra) | 5.60                 | October<br>2007   | 1,082                              | 1,082                                 | January<br>2010               |                                                                | June 2012               |
| Extension of North-<br>South corridor<br>further South from<br>RV Road Terminal to<br>Puttenahalli Cross             | 3.70                 | June 2008         | 681                                | 681                                   |                               |                                                                |                         |
| <b>Total</b>                                                                                                         | <b>42.30</b>         |                   | <b>6,258</b>                       | <b>8,158</b>                          |                               |                                                                |                         |

A tripartite Memorandum of Understanding (MoU) was signed (24 December 2010) between GoI, GoK and BMRCL for execution of Phase 1 (42.30 km in two corridors) at a cost of ₹8,158 crore, which was approved (4 October 2011) by GoI with revised project cost of ₹11,609 crore and with extension of time up to December 2013. Subsequently, the project cost was revised to ₹13,845.01 crore due to increase in land cost, cost of civil works, increased interest amount during construction, etc., which was approved (July 2015) by GoI, along with extension of time up to December 2015. The actual completion cost of ₹14,133.17 crore was approved by GoI on 19 June 2023 without further increase in contribution from GoI.



**Picture 1 – Schematic of the Phase 1 of Bangalore Metro Rail Project**

### 1.2.2 Phase 2 of Bangalore Metro Rail Project

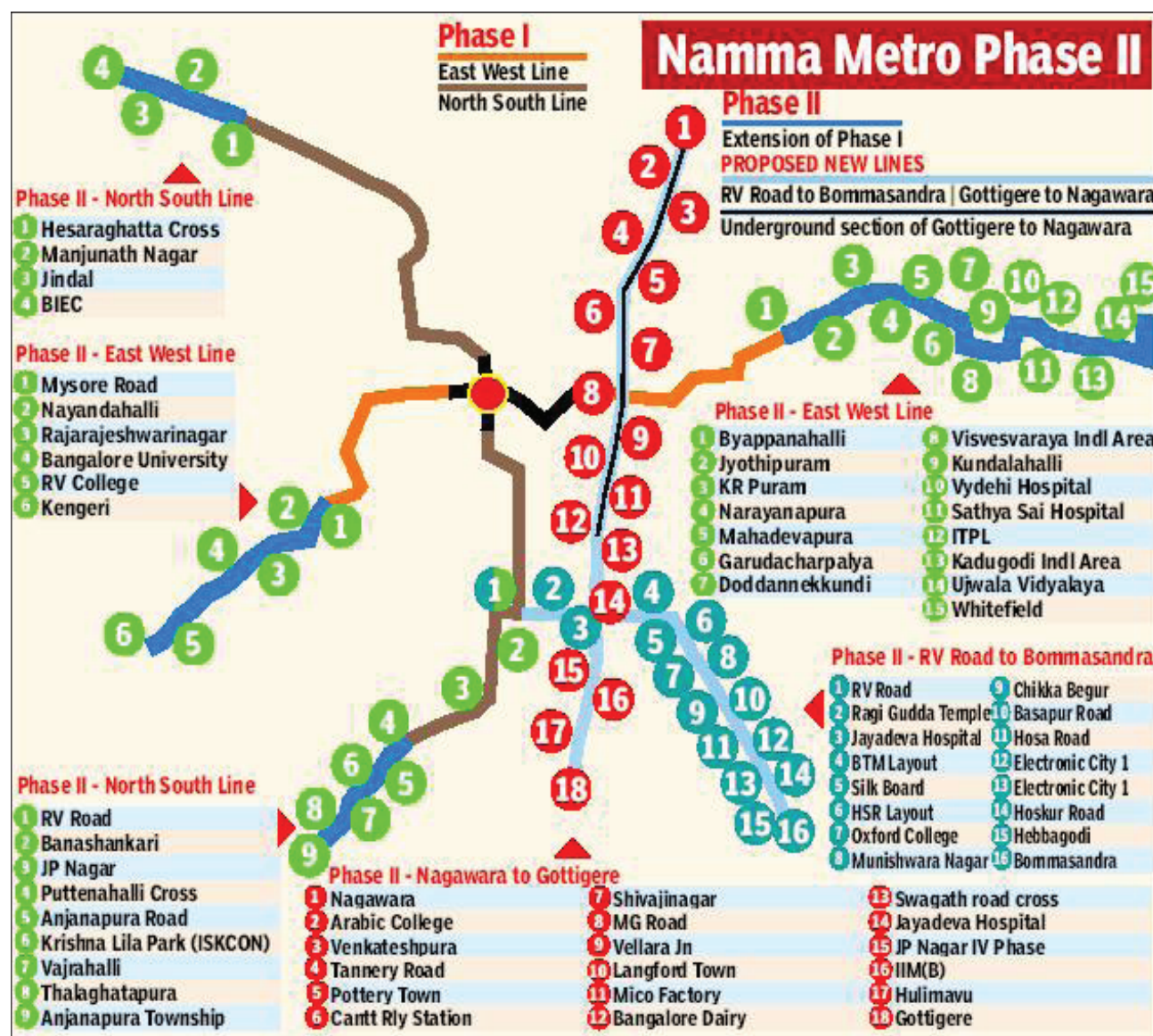
The following DPRs were prepared by DMRCL for Phase 2:

**Table 1.4 – Table indicating the DPRs prepared for Phase 2**

| Corridor                        | Length<br>(in Km) | DPR<br>submission | DPR estimate<br>as per<br>DMRCL | ₹ in crore)                  |                                    |
|---------------------------------|-------------------|-------------------|---------------------------------|------------------------------|------------------------------------|
|                                 |                   |                   |                                 | DPR estimate<br>as per BMRCL | Project<br>duration<br>(in months) |
| RV Road Terminal to Bommasandra | 18.82             | May 2011          | 4,225                           | 5,744                        | 50                                 |
| Four Extensions of Phase 1      | 32.03             | July 2011         | 7,657                           | 9,647                        | 62                                 |
| Gottigere to Nagawara           | 21.25             | September 2011    | 8,188                           | 8,730                        | March 2017                         |
| <b>Total</b>                    | <b>72.10</b>      |                   | <b>20,070</b>                   | <b>24,121</b>                |                                    |

Gol approved (21 February 2014) Phase 2 (72.10 km) at an estimated project completion cost of ₹26,405.14 crore (including escalation of 5 per cent per annum and Central Taxes and excluding State Taxes and Duties). Subsequently, a tripartite MoU was signed (24 February 2017) between GoI, GoK and BMRCL for execution of Phase 2.

Due to enhanced land cost from ₹2,003.18 crore to ₹6,293.16 crore, GoK approved (12 September 2017) the increase in the project cost of Phase 2 to ₹30,695.12 crore. Actual land compensation paid was ₹7,455.09 crore as on 31 March 2023 as against sanctioned cost of ₹6,293.16 crore due to increase in area acquired as well as upward revision in land cost.



Picture 2 – Schematic of the Phase 2 of Bangalore Metro Rail Project (as per DPR)

### 1.3 Project Funding

The project cost and mode of funding for Phase 1 and Phase 2 is given in Table 1.5 –

Table 1.5 – Table indicating the funding of different Phases of Bangalore Metro Rail Project

| (₹ in crore)             |                                |                   |                 |                   |                 |
|--------------------------|--------------------------------|-------------------|-----------------|-------------------|-----------------|
| Name of the Stake Holder | Type of Fund                   | Phase 1           |                 | Phase 2           |                 |
|                          |                                | Amount Sanctioned | Amount Received | Amount Sanctioned | Amount Received |
| Government of India      | Equity                         | 1,983.26          | 1,983.26        | 3,868.35          | 3,868.35        |
|                          | Sub-ordinate Debt <sup>1</sup> | 1,089.94          | 1,089.94        | 1,412.65          | 1,412.65        |
|                          | <b>Sub Total</b>               | <b>3,073.20</b>   | <b>3,073.20</b> | <b>5,281.00</b>   | <b>5,281.00</b> |

<sup>1</sup> Subordinate debt is any type of loan that's paid after all other corporate debts and loans are repaid, in the case of borrower default.

|                                                   |                                                                     |                   |                   |                   |                       |
|---------------------------------------------------|---------------------------------------------------------------------|-------------------|-------------------|-------------------|-----------------------|
| Government of Karnataka                           | Equity                                                              | 1,983.26          | 1,983.26          | 3,868.35          | 3,868.35              |
|                                                   | Sub-ordinate Debt                                                   | 1,634.91          | 1,634.91          | 7,714.73          | 7,714.73 <sup>s</sup> |
|                                                   | Addl. Interest Free Sub-Debt/ Grant                                 | 1,751.84          | 1,312.64          | 1,689.90          | 0.00                  |
|                                                   | <b>Sub Total</b>                                                    | <b>5,370.01</b>   | <b>4,930.81</b>   | <b>13,272.98</b>  | <b>11,583.08</b>      |
| Senior Term Debt <sup>2</sup>                     | Multilateral Agencies and Other Financial Institutions <sup>#</sup> | 5,046.16          | 5,046.16          | 12,141.14         | 7,726.41              |
|                                                   | Govt. of Karnataka                                                  | 130.01            | 130.01            | --                | --                    |
|                                                   | <b>Sub Total</b>                                                    | <b>5,176.17</b>   | <b>5,176.17</b>   | <b>12,141.14</b>  | <b>7,726.41</b>       |
| Property Development (PD)/ Internal Accruals (IA) | Funds generated from PD/ IA                                         | 513.79            | 513.79            | 0.00              | 0.00                  |
|                                                   | <b>Sub Total</b>                                                    | <b>513.79</b>     | <b>513.79</b>     | <b>0.00</b>       | <b>0.00</b>           |
| <b>Grand Total</b>                                |                                                                     | <b>14,133.17</b>  | <b>13,693.97*</b> | <b>30,695.12</b>  | <b>24,590.49*</b>     |
| <b>Expenditure (as of 31 March 2023)</b>          |                                                                     | <b>14,133.17*</b> |                   | <b>25,727.07*</b> |                       |
| <b>Senior Term Debt Repayment (Principal)</b>     |                                                                     | <b>1,230.25</b>   |                   | <b>381.96</b>     |                       |

\$ Subordinate Debt of Phase 2 includes subordinate debt of ₹3,424.75 crore plus enhanced land cost of ₹4,289.98 crore, which was borne by GoK.

# For Phase 1 and 2, BMRCL borrowed loans from Multilateral Agencies namely Japan International Cooperation Agency (JICA), Agence Francaise De Development (AFD), European Investment Bank (EIB) and Asian Infrastructure Investment Bank (AIIB). BMRCL also availed loans from domestic Financial Institutions and raised funds through Namma Metro Bonds.

\* The shortfall (i.e., difference between the fund received and expenditure incurred) under Phase 1 and Phase 2 were ₹439.20 crore and ₹1,136.58 crore respectively.

## 1.4 Financial Performance

The financial performance of BMRCL during the period from 2016-17 to 2022-23 is as mentioned below –

**Table 1.6 – Financial Performance**

(₹ in crore)

| Particulars                           | Financial Year |               |               |               |              |               |               |
|---------------------------------------|----------------|---------------|---------------|---------------|--------------|---------------|---------------|
|                                       | 2016-17        | 2017-18       | 2018-19       | 2019-20       | 2020-21      | 2021-22       | 2022-23       |
| <b>Income</b>                         |                |               |               |               |              |               |               |
| Revenue from Operations               | 130.28         | 325.00        | 402.35        | 419.91        | 73.56        | 191.34        | 460.01        |
| Other Income                          | 14.84          | 12.21         | 17.12         | 13.32         | 8.41         | 37.42         | 134.00        |
| Reimbursement of Cash Losses from GoK | --             | 202.27        | 116.39        | --            | --           | --            | --            |
| <b>Total Income</b>                   | <b>145.12</b>  | <b>539.48</b> | <b>535.86</b> | <b>433.23</b> | <b>81.97</b> | <b>228.76</b> | <b>594.01</b> |

<sup>2</sup> Senior Term Debt is a loan with a priority repayment in case of bankruptcy and typically carries lower interest rates and lower risk. The term can be for several months or years, and the debt may carry a fixed or variable interest rate.

| <b>Expenditure</b>                     |                 |                 |                 |                 |                 |                 |                 |
|----------------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Operating Expenses                     | 104.37          | 170.76          | 220.69          | 226.54          | 169.08          | 206.17          | 289.77          |
| Employee Benefits Expenses             | 60.13           | 79.66           | 100.08          | 134.54          | 115.92          | 126.03          | 159.62          |
| Finance Costs                          | 66.15           | 111.85          | 112.50          | 108.97          | 106.13          | 96.08           | 98.13           |
| Depreciation and Amortisation Expenses | 364.21          | 515.79          | 583.94          | 583.80          | 583.38          | 380.26          | 410.99          |
| Other Expenses                         | 7.82            | 12.52           | 15.20           | 18.05           | 10.00           | 13.40           | 37.22           |
| <b>Total Expenditure</b>               | <b>602.68</b>   | <b>890.58</b>   | <b>1,032.41</b> | <b>1,071.90</b> | <b>984.51</b>   | <b>821.94</b>   | <b>995.73</b>   |
| <b>Profit/ (Loss) Before Tax</b>       | <b>(457.56)</b> | <b>(351.10)</b> | <b>(496.55)</b> | <b>(638.67)</b> | <b>(902.54)</b> | <b>(593.18)</b> | <b>(401.72)</b> |

It may be seen that BMRCL is incurring losses since 2016-17 until 2022-23. Though revenue from operations showed an increasing trend after complete operation of Phase 1 in June 2017, the increase in revenue was not sufficient to cover the rise in operating costs, depreciation/ amortisation expenses, etc. Further, there was a decline (82 *per cent*) in revenue during 2020-21 on account of suspension of Metro operations for a major part of the year on account of COVID 19 lockdown.





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# **Chapter 2:**

# **Scope, Audit Objectives and**

# **Methodology**

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## Chapter 2: Scope, Audit Objectives and Methodology

The Performance Audit Report on ‘Implementation of Phase 1 and Phase 2 of Bangalore 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 December 2021 to October 2022 covering planning, implementation, monitoring and operations of Phase 1 and 2 (excluding 2A and 2B) of Bangalore Metro Rail Project by BMRCL since inception up to 2020-21. The physical and financial progress of selected contracts were reviewed up to 31 March 2023.

In respect of Phases 1 and 2, a total of 538 contracts/ work orders valuing ₹30,982.35 crore relating to project works and 2,279 contracts/ work orders valuing ₹476.83 crore relating to Operation and Maintenance (O&M) were awarded by BMRCL up to 31 March 2021. Audit selected contracts for scrutiny by adopting simple random sampling using following criteria –

**Table 2.1 – Criteria for selection of samples**

| Contracts/ Work Orders for Project Works |              | Contracts/ Work Orders for O&M |              |
|------------------------------------------|--------------|--------------------------------|--------------|
| Group                                    | Sample Size  | Group                          | Sample Size  |
| More than ₹500 crore                     | 100 per cent | More than ₹5 crore             | 100 per cent |
| Between ₹500 crore and ₹100 crore        | 75 per cent  | Between ₹5 crore and ₹5 lakh   | 10 per cent  |
| Between ₹100 crore and ₹50 crore         | 50 per cent  | Below ₹5 lakh                  | 2 per cent   |
| Between ₹50 crore and ₹1 crore           | 15 per cent  |                                |              |
| Below ₹1 crore                           | 10 per cent  |                                |              |

Accordingly, 117 contracts valuing ₹27,472.85 crore out of 538 contracts (covering 89 per cent in terms of value and 22 per cent in terms of number of contracts) and 75 O&M contracts valuing ₹348.12 crore (covering 73 per cent in terms of value and 3 per cent in terms of number of contracts), were scrutinised (details in *Annexure-I*). As can be seen from *Annexure-I*, the sample includes different categories of contracts. Accordingly, the number of contracts reviewed in respect of each of the observations in Chapter 5 vary depending on the nature of the observation and its applicability in respect of the nature of contract.

### 2.2 Audit Objectives

The Audit Objectives of the Performance Audit were to examine and assess whether -

- Planning was done in a rational manner to ensure economic viability and selection of the most appropriate technologies;

- ii) Implementation in terms of project execution and contract management was done with due care, economy, and in a timely and transparent manner and adequate mechanism was in existence to monitor the project execution; and
- iii) Operation and Maintenance was efficient and the planned benefits were achieved after commercial operation of completed Reaches in respective Phases.

### 2.3 Audit Criteria

The Criteria for audit would be derived from the following sources -

- i) Agenda and Minutes of the meetings of Board of Directors, Project Management Committee, Finance & Audit Committee, High Power Committee, Empowered Committee, Empowered Group of Ministers and other Committees;
- ii) Detailed Project Reports of Phase 1 and Phase 2 Projects;
- iii) Metro Railways (Operation and Maintenance) Act, 2002, New Metro Rail Policy, 2017 and Rules thereof;
- iv) Karnataka Transparency in Public Procurement (KTPP) Act, 1999, General Financial Rules and Guidelines of Central Vigilance Commission;
- v) Guidelines/ Directions/ Rules and Regulations issued by Ministry of Housing and Urban Affairs for Metro projects;
- vi) Manuals/ Guidelines/ Directions/ Policies, etc. issued by BMRCL for various activities like contract, safety, quality control, etc. as well as Annual Reports of BMRCL, Schedule of Powers, Management Information System Reports and Monthly Progress Reports; and
- vii) Terms and Conditions of the Tender and Contract Agreements.

### 2.4 Audit Methodology

The Performance Audit commenced with an Entry Conference held on 23 December 2021 with BMRCL wherein Audit Objectives, Scope, Criteria and Methodology were discussed. The Audit Process included issue of audit requisitions and questionnaires, review of records of BMRCL, discussions with the BMRCL's management from time to time, collection of visual evidence, site inspections along with BMRCL's management team, issue of queries, obtaining replies on audit queries and issue of draft report to BMRCL.

Indian Institute of Technology, Delhi (IIT Delhi) was appointed as Technical Consultant (TC) to review the technical aspects of DPRs, civil works, signaling and telecommunication, rolling stock, heating ventilation and air conditioning, electrical works, etc. executed by BMRCL during the implementation of Phase 1 and 2. A tripartite meeting with officials of Audit Team, BMRCL and TC (IIT Delhi) was held on 5 April 2023 to discuss the technical aspects and issues raised in Audit, which was followed by field visits by TC (IIT Delhi). Their observations and suggestions have been suitably incorporated in this Report.



The Draft Report was issued to the Management for their views/ comments on 4 December 2023. After receipt of replies in February 2024, Audit, along with TC (IIT Delhi) held an Exit Conference with the Management of BMRCL on 4 April 2024. This Draft Report was modified duly considering the replies of the Management and remarks of Audit/ TC (IIT Delhi) thereon and was issued to the Ministry of Housing and Urban Affairs (MoHUA/ Ministry), GoI on 19 September 2024 and Government of Karnataka (GoK) on 03 December 2025. MoHUA had forwarded their comments vide letter dated 16 April 2025 and an Exit Conference was held with the Ministry on 16 May 2025. This Report has been finalized considering the replies as well as the discussions held during the Exit Conferences with BMRCL/ MoHUA. Ministry has forwarded the reply of the Management. Wherever the Ministry has offered its remarks, the same has been included in this Report. The reply of GoK is awaited (March 2026)

## 2.5 Structure of the Report

The Audit Findings are discussed in Chapters 3 to 7 with conclusion mentioned at the end of each Chapter.

- Chapter 3 of this Report deals with inefficiencies in planning which, at a later stage, affected the economic viability and selection of appropriate technology.
- Chapter 4 highlights the issues noticed in acquisition of land, more particularly the lapses on the part of BMRCL, which adversely affected the scheduled completion of Project.
- Chapter 5 contains observations on project execution and contract management as also observations on monitoring and internal control lapses.
- Chapter 6 highlights discrepancies in financial management and innovative financing.
- Chapter 7 contains observations related to operation and maintenance of Metro.

Audit Recommendations on key audit findings have also been included at the end of significant findings in each Chapter.

## 2.6 Acknowledgement

The assistance provided by the Technical Consultant (The Indian Institute of Technology, Delhi) and co-operation extended by Bangalore Metro Rail Corporation Limited (BMRCL), Ministry of Housing and Urban Affairs (MoHUA) and Government of Karnataka during the conduct of this Audit are appreciated and acknowledged.



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# **Chapter 3:**

# **Planning and Selection**

# **of Technology**

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Track Level view from Jalahalli Station towards “Y” Junction and Peenya Industry Station



## Chapter 3: Planning and Selection of Technology

### 3.1 Policy Framework and Planning Process

GoK initially (November 1994) decided to implement Elevated Light Rail Transit System (ELRTS), on the recommendation of the consultant appointed by the High Power Committee (HPC) under GoK and the Build Own Operate Transfer (BOOT) concessionaire was selected (1996) for a period of 30 years. However, ELRTS was not implemented due to changes in assumptions, significant portion of financial burden, transfer of risk to GoK and unviable estimated ridership. Subsequently, GoK instructed (July 2002) BMRTL for submission of alternative forms of mass transit proposals such as Sky Bus, Monorail, etc. On approval of GoK, BMRTL placed (September 2002) work order for preparation of Detailed Feasibility Report (DFR) on Heavy Rail Surface-Underground MRTS for Bengaluru City to Delhi Metro Rail Corporation Limited (DMRCL). Subsequently, based on the DFR prepared by DMRCL, GoK went ahead with the proposal for implementation of Heavy Metro Rail for Bengaluru city having designed Peak Hour Peak Direction Traffic (PHPDT)<sup>3</sup> of 15,000 to 41,000.

#### 3.1.1 Preparation of DPR for Phase 2 without ‘Integrated Land Use’ and ‘Comprehensive City Transport Plans’

The Ministry of Housing and Urban Affairs (MoHUA), GoI framed the National Urban Transport Policy (NUTP), 2006 for implementation of sustainable transport solutions in cities of various sizes by encouraging improvements in public transport and facilities for use of non-motorised transport, involving private sector and innovative financing, enhancing efficiency and reducing impact on public budget, by use of cleaner technologies. These guidelines were applicable during preparation of Phase 2 DPR (May/ July/ September 2011). The Comprehensive Mobility Plan (CMP) and Transit Oriented Development (TOD)/ Land Use Policy (LUP) for planning, designing and transforming urban areas to make the best use of public transport network by orienting appropriate land use for the city of Bengaluru were approved by GoK in September 2020 and November 2022 respectively.

In view of the above, Audit observed that NUTP, 2006 emphasized preparation of Integrated Land Use and Comprehensive City Transport Plans, however, this was neither considered by DPR consultant (DMRCL) nor by the Company while preparing Phase 2 DPRs. Also, as per norms for selecting mode of transport issued by Working Group on Urban Transport in May 2011, Heavy Metro should be proposed if the PHPDT in 2021 was more than 15,000 for at least 5 km continuous length, else Bus Rapid Transit System should be proposed. Audit noticed that Phase 2 could not be implemented as of 2021 and actual PHPDT achieved in 2021 for Phase 1 was far below the projections (below 15,000) and ranged between 6,429<sup>4</sup> and 8,852<sup>5</sup>. Despite above, there was no study to show how ridership could be improved to justify investment in Heavy Metro.

<sup>3</sup> *PHPDT - “Peak Hour Peak Direction Traffic” means maximum number of users commuting through the entire length of the busiest section of a route consisting of five successive metro stations on an operational route during a Peak Hour in the direction which is carrying a higher volume of traffic.*

<sup>4</sup> *Yashwanthpura to Nagasandra (7 stations – 5.40 km length)*

<sup>5</sup> *Trinity to Baiyappanahalli (5 stations – 5.99 km length)*



Audit, along with TC (IIT Delhi), observed that DPRs should have considered alternative land use patterns and population growth along with alternate mass transit systems to estimate ridership, benefits and accordingly, should have recommended appropriate technology.

BMRCL stated (February 2024) that the factors such as land use and development, projections, connectivity and integration, time lag in realizing projects, etc. collectively contributed to disparity between estimated ridership figures in DPRs and the actual PHPDT achieved.

TC (IIT Delhi) reiterated that the current methodologies did not capture the uncertainties including estimating ridership, which should be avoided in the future extension of Metro.

***Recommendation # 1 – The estimation of ridership should be realistic based on the Comprehensive Mobility Plan (CMP)/ Transit Oriented Development (TOD) Policy of the City and expansion of Heavy/ Medium Metro should be based on Alternative Scenario Analysis. This can include impact of integration of Bangalore Metropolitan Transport Corporation bus routes, fare integration, walking, bicycling infrastructure development, etc.***

***BMRCL stated (February 2024) that DPRs of Phase 2A and 2B were prepared in line with the Bengaluru CMP and noted (April 2025) the Recommendation of Audit.***

### **3.1.2 Applicability of CVC and DPE Guidelines and KTPP Act, 1999 to BMRCL**

BMRCL was formed as a 50:50 Joint Venture (JV) between GoI and GoK. As per Clause 14.17 of MoU between GoI, GoK and BMRCL, BMRCL shall follow Central Vigilance Commission (CVC) guidelines and Karnataka Transparency in Public Procurement (KTPP) Act, 1999 for tenders and contracts, and Department of Public Enterprises (DPE) guidelines for investments.

Audit noticed that BMRCL has not prepared its own Procurement Manual, in absence of which, discrepancies and inconsistencies were noticed in fixation of qualification criteria for selection of prospective bidders, preparation of cost estimates of civil and system works, fixation of interest rate on advances to contractors, etc.

BMRCL stated (April 2025) that the Draft Procurement Manual, considering the requirements of KTPP Act, 1999, Procurement Guidelines of Funding Agencies as well as General Financial Rules (GFRs), has been finalized and submitted to GoK for its approval.

BMRCL's reply may be viewed in light of the fact that BMRCL is yet to finalise and adopt its own Procurement Manual even after a lapse of 18 years of its establishment, despite the specific advice (August 2017) of the GoK.

### **3.1.3 Absence of Corporate Plan**

Corporate Plan serves as a written guidance for all the officials of the company and promotes a favourable control environment for the achievement of corporate objectives and aids in monitoring the project status.

Audit noticed that BMRCL did not prepare a Corporate Plan and has not been able to properly plan and effectively monitor the project works. It is pertinent to note that considerable delays were noticed at all levels of Project Implementation/ Execution.

BMRCL assured (February 2024) that a Corporate Plan will be prepared by appointing an External Agency.

### **3.1.4 Non-availability of back up documents used for preparation of DPRs of Phase 1 and Phase 2**

DPRs for Phase 1 and 2 containing transport demand forecast, train operation and rolling stock, signalling and telecommunication etc., were only submitted to Audit. However, DPR related reports pertaining to geotechnical surveys, integration with local bus/ train services, along with Metro station layouts, detailed cost estimates for various works/ supplies, supporting documents of estimated daily ridership and Farebox Revenue/ Non-Farebox Revenue<sup>6</sup>, Financial Internal Rate of Return, Economic Internal Rate of Return, were not made available to Audit. As a result, Audit was unable to study and verify the correctness of the figures stated in the DPRs of Phase 1 and 2 with reference to the above cited issues.

BMRCL replied (February 2024) that the old records could not be traced and most of the then employees had left the organisation. However, most of the records had been made available.

The fact remains that BMRCL should have safeguarded the DPRs, along with supporting documentation, as these form the basis and reference points for future projects.

### **3.1.5 Lacunae in Detailed Project Reports**

**3.1.5.1** The costs for Phase 1 were estimated based on DMRCL rates without detailed analysis and comparison with prevailing market rates, which then became the basis for estimating the Phase 2 costs. BMRCL did not follow any protocol to estimate the cost of project scientifically, which would have aided more precise cost estimation.

BMRCL replied (February 2024) that DMRCL, as Consultant for the preparation of Phase 1 DPR, had correctly taken their awarded price to work out the estimated completion cost since such information for Bengaluru city was not available.

BMRCL's reply may be viewed in light of the fact that the cost estimates for civil works was to be prepared based on prevailing Karnataka Public Works Department (KPWD) Schedule of Rates (SoR), prevailing market rates for steel and cement and budgetary offers for machinery, other items and systems contracts. DMRCL, however, estimated the cost based on its awarded cost, which does not necessarily reflect the current procurement cost.

**3.1.5.2** DPRs for Phase 1 and 2 assumed Modal Split<sup>7</sup> in favour of public transport in the presence of Metro to be from 45 to 65 *per cent* in 2011 and 70 *per cent* in 2021.

<sup>6</sup> *Non-farebox Revenue means revenue earned through property development, leasing of parking rights at stations, advertisement on trains and tickets, advertisements within stations and parking lots, advertisements on viaducts, columns and other metro structures, co-branding rights to corporates, film shootings and special events on metro premises.*

<sup>7</sup> *Modal Split indicates percentage of people using public modes of transport such as Bus, Rail, etc.*

Audit, along with TC (IIT Delhi), observed that the assumption of modal split and shift in favour of public transport were not supported with detailed analysis. The DPRs did not have Sensitivity Analysis with alternate assumptions with lesser modal split. Further, decisions on extension and/ or realignment of corridors during execution of Phase 1 and 2 works were not supported by any analysis of impact on ridership.

BMRCL agreed (February 2024) with the audit observation and stated that due diligence will be exercised, henceforth, while extending or realigning the corridor.

**3.1.5.3 Multi Modal Integration (MMI)** is the seamless integration of different modes of transportation into a single, streamlined supply chain which results in greater efficiency, lower costs and faster transit times and requires integration in planning, design, scheduling, fares and operations. DPRs for Phase 1 and 2 provide for integration of facilities with Railway/ Bus Network, which include approach roads to stations, pedestrian ways and adequate parking areas for various modes likely to come to stations including feeder buses/ mini-buses, etc. The tripartite MoU signed between GoI, GoK and BMRCL for Phase 1 and 2 also provided for according high priority for MMI which would act as feeder/ evacuation system to Bangalore Metro with a view to improving ridership.

Audit, along with TC (IIT Delhi), observed that even after full operationalisation of Phase 1 since June 2017, MMI was not planned and studies have not been awarded, even as of March 2023, for corridors completed under Phase 1 and 2. Further, BMRCL has neither implemented formal monitoring processes for achieving integration as suggested in DPRs nor conducted infrastructure and operation audits to evaluate the impact of better last mile connectivity.

BMRCL replied (February 2024) that MMI has been planned through seamless connectivity between different modes of transport at three operational hubs<sup>8</sup> through Foot Over Bridges (Sky Walks), Subways, provision for parking, etc. BMRCL had also signed a MoU with Bengaluru Metropolitan Transport Corporation (BMTCL) for operating feeder buses to ensure last mile connectivity.

BMRCL's reply may be viewed in light of the fact that the Company is still planning first and last mile connectivity even though Metro operations commenced in a phased manner from October 2011. Feeder bus services have been provided at only 32 stations out of 65 metro stations of Phase 1 and 2, which were operational as of 31 March 2023. Further, MMI hubs at another eight locations of Phase 1 and Phase 2 are yet to be operational as of 31 March 2023.

***BMRCL stated (April 2025) that the observation of integration of different modes of transportation is noted, however, it's reply is silent on formal monitoring process for achieving integration of different modes of transport and conducting infrastructure and operation audits. Moreover, the reply is also silent on specific timelines for achievement of MMI, which in the opinion of Audit and TC (IIT Delhi) is of utmost importance.***

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<sup>8</sup> *Nada Prabhu Kempegowda Metro Station with connectivity to Railway Station and Bus Terminal, Bayappanahalli Metro Station with connectivity to Railway Station, and Krantiveera Sangolli Rayanna Metro Station with connectivity to city Railway Station.*

**3.1.5.4 Geological and Geotechnical<sup>9</sup>** investigations mentioned in the DPRs do not contain any details about the rock and rock mass properties, which are essential for foundations, tunnel designs, ramps, support system and excavation methodology including the selection of suitable Tunnel Boring Machine (TBM). Geophysical<sup>10</sup> investigations are essential to identify the variations in the strata condition below the surface up to the required depth. In this regard, Audit, along with TC (IIT Delhi), observed that BMRCL did not submit any documents/ reports to indicate that Geophysical investigations have been conducted. Further, DPRs lacked information related to tunnel details, cut and cover method, tunnelling methods, support system<sup>11</sup>, lining, excavation methods, etc. Following instances, noticed in audit, bring out importance of a proper Geophysical investigation before taking up tunnelling works -

- A.** Hard rock had got dislodged from jointed rock and damaged the cutters of the TBM in UG Section of Phase 1 (Godavari Tunnel Drive) leading to stoppage of work and delay of 18 months with additional cost of ₹91.69 crore. This was caused as structural features like rock joints, foliations<sup>12</sup>, faults, folds, etc., were not provided in the DPR.
- B.** The soil condition at Majestic Station under Phase 1 was weak and depth of excavation for UG station was up to 20 metres, which accentuated the chances of slippage of soil anchors [60 Metric Tonne (MT)], approved as per Good for Construction Drawings<sup>13</sup>. Hence, as suggested by Designer, higher capacity anchors (75 MT and 90 MT) were adopted for stability of soil against collapse, involving additional cost of ₹30.56 crore as the same were executed as non-tendered items, which were paid on par with market rate.

BMRCL replied (February 2024) that Geophysical Surveys were not conducted during the DPR stage for UG works due to huge financial implications involved and were construed superfluous during DPR stage. However, they were employed during the advanced stage of project execution.

In this regard, Audit, along with TC (IIT Delhi), opined that the non-destructive Geophysical Studies provide vital information about the strata up to required depth. Hence, based on those results, DPR should have been prepared. It was also opined that the tests were cost effective.

BMRCL stated (April 2025) that the suggestion of TC (IIT Delhi) is noted.

<sup>9</sup> *Geotechnical investigations primarily focus on obtaining direct information about soil and rock properties through field and laboratory testing.*

<sup>10</sup> *Geophysical investigations focus on indirect measurement of physical properties using methods such as seismic, gravimetric, borehole, etc.*

<sup>11</sup> *Support Systems are systems designed and installed to support the perimeter of an underground opening between the time it is first excavated up to the time that a permanent lining is in place.*

<sup>12</sup> *Foliation refers to repetitive layering in metamorphic rocks.*

<sup>13</sup> *The Good For Construction (GFC) Drawings are finally approved construction documents issued by Company to contractors for the purpose of building a structure. GFC drawings provide detailed information about dimensions, specifications, and other requirements necessary for construction.*

## 3.2 Projection of Financial Internal Rate of Return (FIRR)

### 3.2.1 Projected Phase 1 FIRR

FIRR Sensitivity Analysis for three DPRs prepared for Phase 1 is as indicated below –

**Table 3.1 – Projected FIRR of Phase 1 DPRs**

| Detail                                                                | Phase 1 two corridors                                                                                                                                                                                     | Phase 1 Extension<br>(Yeshwanthpur to Hesaraghatta)                                                                                | Phase 1 Extension<br>(RV Road to Puttenahalli)                                                                                     |
|-----------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| Project Cost and FIRR                                                 | ₹4,495 crore/<br>3.16 per cent                                                                                                                                                                            | ₹1,082 crore/<br>3.59 per cent                                                                                                     | ₹681 crore/<br>5.26 per cent                                                                                                       |
| Effect of increase in project cost and reduction in projected revenue | FIRR would vary between 2.51 to 1.97 per cent for increase in project cost by 5 to 20 per cent. FIRR would vary between 1.37 to (–) 5.37 per cent for decrease in projected revenue by 10 to 40 per cent. | FIRR would be 2.46 per cent with 10 per cent increase in project cost and 1.24 per cent with 20 per cent increase in project cost. | FIRR would be 4.29 per cent with 10 per cent increase in project cost and 3.37 per cent with 20 per cent increase in project cost. |

In this regard, Audit observed that –

- (i) Phase 1 was delayed by more than three years and was completed at a cost of ₹14,133.17 crore, as against initial projected cost of ₹6,258 crore, indicating an increase in project cost by ₹7,875.17 crore (i.e., 126 per cent).
- (ii) Against the envisaged Metro ridership of 19.49 lakh per day, highest actual average Metro ridership per day was only 5.89 lakh (August 2022). The projected revenue was not achieved due to lower actual ridership and inability to achieve Non-Farebox Revenue due to non-development of properties, resulting in cash losses for BMRCL.
- (iii) As the Project Cost had increased by more than 20 per cent and only 56 per cent of the projected revenues could be realized due to the actual ridership being less than 40 per cent of the projected ridership, the Phase 1 project ended up with a negative FIRR.

TC (IIT Delhi) concluded that the FIRR was calculated based on ridership figures which appear to be overestimated. Further, Sensitivity Analysis considering lower ridership and lower Non-Farebox Revenue was not conducted. Moreover, no detailed study had been done to understand the reasons for low ridership.

BMRCL replied (March 2023/ February 2024) that actual completion cost of Phase 1 had increased due to factors beyond its control such as increase in land cost by ₹1,563 crore, civil works by ₹3,950 crore, etc. BMRCL further stated that the ridership will go up as and when the network (Phase 2, 2A and 2B) gets expanded, which will result in cash profit/ break-even to BMRCL. It was added that FIRR was calculated in the DPR for a horizon period of 30 years and therefore, it is not correct to conclude at this stage that the FIRR is negative.



BMRCL's reply may be viewed in light of the fact that Phase 1 works were commenced later than envisaged in DPR due to delays in acquisition of land, delays in awarding and completion of works. Further, ridership was assessed independently for Phase 1 in the DPRs without considering extensions of Metro corridors. The identified land properties were not developed to enhance other income as envisaged in the DPRs. The Ex-post Evaluation Report (July 2020) of Phase 1 by Japan International Cooperation Agency confirms the fact that the FIRR, on completion of Phase 1, was negative [i.e., (-) 4.81 *per cent*] as against the projected FIRR of 3.16 *per cent*. The Report also confirms non-achievement of envisaged ridership after commencement of commercial operation.

Further, TC (IIT Delhi) opined that all assumptions about future growth and expected ridership should be described explicitly for ensuring transparency. During Exit Conference with the Ministry (May 2025), on the plea of the Ministry that the ridership would increase on the completion of the entire network, it was clarified by Audit that the projections in the DPRs were made considering only individual lines.

### 3.2.2 Projected Phase 2 FIRR

FIRR Sensitivity Analysis for three DPRs prepared for Phase 2 is as indicated below—

**Table 3.2 – Projected FIRR of Phase 2 DPRs**

| Detail                                                                                      | Four Phase 1<br>Extension Lines                                                                                 | Reach 5<br>(RV Road to<br>Bommasandra)                                                                        | Reach 6<br>(Gottigere to<br>Nagawara)                                                                                 |
|---------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| Project Cost including running expenses and replacement cost                                | ₹26,538 crore                                                                                                   | ₹17,209 crore                                                                                                 | ₹22,349 crore                                                                                                         |
| Net Cash flows/ FIRR without additional Property Development (PD)                           | (-) ₹2,545 crore/<br>(-) 3.10 <i>per cent</i>                                                                   | Negative cash flow of<br>(-) ₹7,106 crore                                                                     | Negative cash flow of<br>(-) ₹8,053 crore                                                                             |
| Net Cash flows/ FIRR with additional PD                                                     | ₹3,272 crore/ 2.23 <i>per cent</i><br>(assuming residual income of ₹5,818 crore from PD in 15 hectares of land) | ₹626 crore/ 0.83 <i>per cent</i><br>(assuming residual income of ₹7,732 crore from PD in 20 hectares of land) | (-) ₹322 crore/ (-) 0.20 <i>per cent</i><br>(assuming residual income of ₹7,732 crore from PD in 20 hectares of land) |
| FIRR in case of increase (10/ 20 <i>per cent</i> ) in capital cost along with additional PD | 1.60 <i>per cent</i> /<br>1.05 <i>per cent</i>                                                                  | 0.24 <i>per cent</i> /<br>(-) 0.29 <i>per cent</i>                                                            | (-) 0.76 <i>per cent</i> /<br>(-) 1.26 <i>per cent</i>                                                                |

In this regard, Audit observed that –

- (i) BMRCL continued with the proposal to take up Reach 6 despite negative FIRR even with projected revenue from additional Property Development (PD). It was further noticed that FIRR was estimated to be positive, i.e., 0.40 *per cent*, with Depot proposed at Hulimavu. However, BMRCL took up the project with negative FIRR with Depot at Kothanur and not at Hulimavu.

- (ii) For all DPRs of Phase 2, FIRR was positive on the assumption of additional land development and revenue generation thereon. BMRCL, however, is yet to acquire projected additional land for PD, as of 31 March 2023.
- (iii) GoI approved Phase 2 at a cost of ₹26,405.14 crore considering land acquisition cost at ₹2,003.18 crore, which has now been revised to ₹6,293.16 crore, thereby increasing project cost to ₹30,695.12 crore. The increase in project cost further reduced the FIRR making the project unviable.
- (iv) No Sensitivity Analysis of FIRR was done in DPRs for Phase 2 on account of delay on completion of project as was calculated for Phase 1 DPRs.

TC (IIT Delhi) concluded that FIRR was calculated based on ridership, which appears to be overestimated. Further, Sensitivity Analysis considering lower ridership was not conducted.

BMRCL replied (March 2023/ February 2024) that the extant policy (February 2014) did not prescribe a minimum threshold for FIRR. Projects were approved based on the social benefits accruing to society rather than financial benefits. Further, it was stated that BMRCL will explore the possibility of acquiring land for joint development. Further, in future expansions of BMRCL projects, the Consultant shall be advised to work out the sensitivity analysis due to delay in implementation of the project in addition to other parameters.

BMRCL's reply may be viewed in light of the fact that Metro project requires sufficient revenue to meet recurring expenditure and to undertake sustainable operations. Neither GoK has allotted land nor did BMRCL acquire additional land required for PD, as of March 2023, even in cases of stretches, which have been operationalized.

Hence, despite the Projects have social benefits accruing to society, the envisaged financial benefits accruing from the Projects are affected on account of increased project cost, high projections of Non-Farebox Revenue and non-acquisition of additional land for PD. Further, Phase 2 is still under execution and is expected to be completed by December 2026, as against December 2019 implying further increase in project cost as well as delayed starting of ridership and consequential delay in collection of revenues for the entire phase resulting in further reduction of FIRR.

### 3.3 Projection of Economic Internal Rate of Return (EIRR)

The EIRR was calculated considering the socio-economic benefits such as reduction in fuel consumption, vehicle operating cost and travel time of passenger, reduction in accidents, reduction in air pollution, etc. As there has been inordinate delay in execution of both Phases 1 and 2, there has been loss of intended socio-economic benefits as mentioned below –

**Table 3.3 – EIRR of Phase 1 and Phase 2**

| Detail                           | Phase 1                        | Phase 2                        |
|----------------------------------|--------------------------------|--------------------------------|
| EIRR projected                   | 22.30 to 30.85 <i>per cent</i> | 13.20 to 18.10 <i>per cent</i> |
| Socio-economic savings envisaged | ₹1,29,140.04 crore             | ₹1,15,677.70 crore             |
| Period of savings                | April 2007 - March 2044        | April 2016 - March 2047        |
| Scheduled Completion             | June 2012                      | December 2019                  |

| Actual Completion                                | June 2017                                      | December 2026 (expected)                       |
|--------------------------------------------------|------------------------------------------------|------------------------------------------------|
| Ridership projected                              | 19.49 lakh per day                             | 14.18 lakh per day                             |
| Actual ridership achieved                        | 5.89 lakh (August 2022)                        | Under Implementation                           |
| Loss of savings due to delay and lower ridership | ₹62,191.71 crore<br>(April 2007 to March 2023) | ₹18,756.68 crore<br>(April 2016 to March 2023) |

Audit, along with the Technical Consultant (IIT Delhi), observed that –

- (i) EIRR was calculated based on overestimated ridership in the DPR, which could not be realized and resultantly, expected benefits could not be achieved.
- (ii) Estimated savings in fuel consumption, travel time savings, reduction in accidents, etc. were based on expected modal shift to Metro. As the expected modal shift did not occur, the expected benefits could not be achieved.
- (iii) Sensitivity Analysis for different levels of ridership was not undertaken.
- (iv) The assumptions for estimating EIRR for DPRs prepared for Phase 1 and its extensions in Phase 2 were not uniform. For instance, assumption for Phase 1 include savings due to reduction in fuel consumption and emissions, reduction in vehicle operating costs, reduction in accident and road infrastructure expenditure and saving of passenger time, while in Phase 2, the assumptions included only savings from reductions in passenger time and in vehicle operating time.
- (v) Environmental benefit by way of reduction by 30 *per cent* in noise levels, air pollution loads, congestion problems and accidents as projected in DPRs also could not be realized in view of increased noise levels of Rails/ Wheels and private non-transport vehicles, which in turn contributed to increase in congestion and air pollution loads.

BMRCL replied (March 2023/ February 2024) that Phase 1 progress was affected due to factors such as delay in UG civil works caused by hard rocks (30 months), breakdown of a Tunnel Boring Machine (7 months), delay in securing land for construction (27 months), etc. The ridership depends upon extending the Metro Rail network across the city, proper first and last mile connectivity, affordable fare structure, locations of offices near to the Metro Station, etc. and this can impact the envisioned savings and benefits. As soon as ongoing Phase 2, 2A and 2B are completed and commissioned, Bengaluru city will have 175.60 km of Metro Rail network, which will help achieve the projected ridership. Further, with reference to Phase 2, economic benefits cannot be measured while the Project is still under construction stage. However, on quarterly basis, Environmental and Social Monitoring Report is independently prepared through Bangalore University and the same is submitted to the funding agency. It was further added that it may not be correct to conclude that the projected environmental benefits have not been achieved as the traffic on road had decreased but due to Covid-19, people started using their vehicle to commute in view of health issues. Further, though sensitivity analysis for different level of ridership has not been computed but the same has been computed for increase/ decrease in the estimated revenue, which is the product of ridership and fare structure. Further, BMRCL stated that they are adhering to the Appraisal Guidelines for Metro Rail Policy, 2017 issued by MoHUA for Economic Cost Benefit Analysis and added that the basic

assumption for calculation of EIRR could be varying as DPRs are prepared by different consultants for various phases.

BMRCL's reply may be viewed in light of the fact that the first and last mile connectivity has not been ensured for all the metro stations in operation as of 31 March 2023, which impacted the ridership, as mentioned in the Ex-post Evaluation Report of JICA for Phase 1. Further, the possibility of increase in ridership would also be impacted by the changes in the functional protocol of IT companies and personal preference for private transport amongst individuals, post COVID 19. Also, the Management's reply substantiates that the social benefits were not assessed properly. It is also pertinent to note that the Phase 1 and 2 DPRs were prepared by DMRCL but the assumptions for calculation of EIRR were not uniform.

TC (IIT Delhi) opined that BMRCL should accept that the methodology used for EIRR requires modifications. Further, Sensitivity analysis using different ridership numbers are required to highlight the possible range of expected benefits.

*However, BMRCL noted (April 2025) the Audit suggestion that (i) BMRCL may take steps to realise the socio-economic benefits as per expected modal shift to achieve the projected EIRR in DPRs; and (ii) BMRCL may ensure that the assumptions underlying the calculation of EIRR are uniform across all DPRs prepared for the same Phase as change in assumptions in DPRs has direct impact on calculation of EIRR.*

### 3.4 Routes and Alignment

#### 3.4.1 Construction of additional viaduct and additional stations at Kengeri and Challaghatta without prior approval of GoI

Phase 2 DPR (July 2011) provided for additional Depot at Kengeri (in Reach 2 Extension) for stabling and maintaining 37 rakes of 6-Cars, for which 12 hectares of land was identified. Subsequently, the proposal for the Depot was changed to Challaghatta on a private piece of land which was available between the National Highway and railway track of Mysore Bangalore line, which was to be useful in case of future extension towards Bidadi (towards Mysore). The change in the location envisaged extension of the viaduct by 1.90 km and two additional stations, namely, Kengeri Terminal Station<sup>14</sup> and Challaghatta Station. Accordingly, HPC approved to shift the train maintenance Depot from Kengeri to Challaghatta by extending the viaduct by 1.94 km and for construction of two Metro Stations (in Reach 2 Extension Line). GoK accorded approval (24 January 2019) for establishing a new Metro station and multi-level parking facility at Challaghatta at an estimated cost of ₹140 crore.

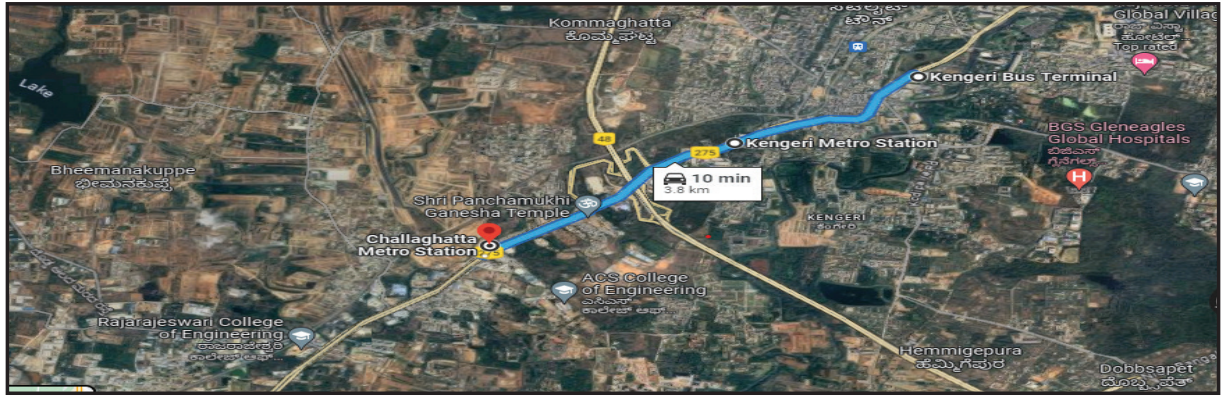
In this regard, Audit noticed that the length of Mysore Road – Kengeri Extension Line was extended to 9.580 km with seven stations from the GoI approved 6.465 km with five stations, involving an additional estimated cost of ₹267.78 crore (i.e., ₹42 crore per station and ₹59 crore per km for 3.115 km<sup>15</sup>) for which no approval was obtained from GoI.

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<sup>14</sup> Kengeri Terminal Station was constructed in lieu of K Narayanapura Station which was envisaged in R1 Extension Line.

<sup>15</sup> Mailasandra Metro Station to Chalaghatta Metro Station (i.e., 9.580 minus 6.465).





**Picture 3 – Aerial view of Challaghatta Metro Station, Kengeri Terminal Metro Station and Mailasandra Metro Station (Kengeri Bus Terminal Station)**

BMRCL replied (March 2023/ February 2024) that six stations were approved in the DPR of Phase 1 Extension and all the changes were made with the approval of HPC. It was stated that while submitting the revised cost proposal, the said change will be included for obtaining GoI approval. Considering the developments taking place in and around the said station, the ridership is expected to increase considerably. Further, since Metro Rail project was being undertaken by taking into account traffic and transportation requirement for next 100 years, it is not appropriate to conclude that the amount spent is an avoidable expenditure in view of creation of the assets for future requirement.

BMRCL's reply may be viewed in light of the fact that Mysore Road – Kengeri extension DPR had envisaged only five stations. Further, while BMRCL accepted that GoI approval has not been sought prior to making changes in route length and establishing additional stations, it is pertinent to note that the decision to establish two new stations was not based on proper feasibility studies (necessity, ridership and non-farebox revenue studies). Moreover, no proper alternative land acquisition studies were conducted for the Depot at Kengeri.

### 3.5 Selection of Technology

#### 3.5.1 Civil Issues – Construction of Pocket Tracks

BMRCL constructed Pocket Tracks<sup>16</sup> at Mahalakshmi Station, Peenya Station and Nagasandra Stations of Reach 3 under Phase 1 for stabling of metro trains and for operation of the partially constructed stretches. However, the Pocket Tracks have no utility after execution of extension lines of Reach 3, thereby rendering the cost of construction infructuous. For instance, cost of construction of Pocket Track at Mahalakshmi Station was ₹12.85 crore, which became infructuous after the Line was extended to Peenya.

In this regard, Audit along with TC (IIT Delhi) observed that BMRCL should avoid construction of Pocket Tracks in short spacing for temporary use, which after completion of entire line remain unutilised. BMRCL may, instead, extend the track further which can be subsequently used during extension of lines. This practice was noticed by Audit in case of Hyderabad Metro.

BMRCL replied (February 2024) that the suggestion is noted for future projects.

<sup>16</sup> Pocket Track refers to a short section of track, often located between the main tracks, which allows trains to be temporarily parked or diverted, without disrupting the main line's operation.



### 3.5.2 Signalling and Telecommunication (S&T) Issues

Two types of signalling systems, viz., Fixed Block Based/ Distance To Go (DTG) Signalling system and Moving Block/ Communication Based Train Control (CBTC) Signalling system were in vogue at the time of invitation of bids (2008) for S&T work under Phase 1. CBTC is a railway signalling system that uses telecommunications between train and track equipment for traffic management and infrastructure control and allows a train's position to be known more accurately than with traditional signalling systems. BMRCL floated tenders for S&T works of Phase 1 in August 2008 based on the specifications mentioned in the DPRs prepared in 2003 and placed the work order (June 2009) for supply of DTG based Urbalis-200 Signalling System, as specified in DPR, at a contract price of ₹574.51 crore.

In this regard, Audit observed that CBTC technology with its relative advantages in terms of increasing track capacity/ reducing headway<sup>17</sup>, was available at the time of issuing tender (2008) and hence, BMRCL could have adopted CBTC technology instead of DTG. Further, due to non-inclusion of suitable clauses (interoperability clause) to upgrade in the future in spite of faster obsolescence of S&T technologies, BMRCL had (2018) to adopt the outdated DTG technology for the four extension lines of Phase 1 under Phase 2, while latest CBTC Signalling System was proposed for Reach 5 and 6 corridors under Phase 2.

TC (IIT Delhi) noted that the precise location of the train is not known in case of DTG system and therefore, the possibility of local sabotage/ tampering of signalling systems with central control/ monitoring station being unaware of the same cannot be ruled out. Hence, TC (IIT Delhi) recommended the usage of a private Radio Frequency band specifically dedicated for Metro services to avoid possibility of cyber-attacks, data hacking, data tampering, etc.

BMRCL justified (March 2023/ February 2024) its action stating that with a view to ensure reliability, safety and smooth integration with other systems such as Rolling Stock, Telecommunication, etc., proven and mature technology (DTG) was used, which facilitated ease for approval from statutory and regulatory authorities. For uniformity in train operation, same signalling system (DTG) was adopted for extension lines of Phase 1 under Phase 2. BMRCL further stated that the usage of private radio band will be explored, as suggested.

BMRCL's reply may be viewed in light of the fact that CBTC system with Driverless Train Operation was operational since 2003 in Singapore's North-East Metro Line. Hence, BMRCL and General Consultant<sup>18</sup> for Phase 1 could have considered CBTC, as it was a proven technology by the time of calling Tenders during the year 2008.

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<sup>17</sup> Headway refers to the distance or duration between two trains in a transit system measured in space or time. Track capacity could be increased by running more number of trains by reducing the headway.

<sup>18</sup> BMRCL appointed a consortium of M/s RITES Limited, India; M/s Pacific Consultants International, Tokyo; M/s Parsons Brinckerhoff International Inc., USA; and M/s Systra SA, France as 'General Consultant' for Phase 1.

***Recommendation # 2 – As most of the Metros are running with DTG systems, the matters relating to replacement costs, open software, interoperability, etc. need to be discussed and decided by the Ministry as a ‘Policy Matter’ and necessary guidelines should be issued by the Ministry of Housing and Urban Affairs.***

***Ministry stated (April 2025) that presently DTG System wherever deployed will work till its codal life. In addition, Indian – Communication Based Train Control (I-CBTC) System is being developed by DMRC in collaboration with Bharat Electronics Limited and Research Designs and Standards Organisation, which will be deployed by replacing the DTG System at appropriate time. During Exit Conference (May 2025), the Ministry further stated that the GoI holds the Intellectual Property Rights of the new System and the same is proposed to be rolled out by December 2026.***

### **3.5.3 Heating, Ventilation and Air Conditioning (HVAC) issues – Provision of Platform Screen Doors**

Platform Screen Doors (PSDs) also known as Platform Edge Doors, used at Metro stations (Elevated/UG) to separate the platforms from trains, act as a physical barrier preventing people or objects from falling onto tracks. Mainly in case of UG stations, PSDs also maintain climate control within the station and provide substantial savings in Heating, Ventilation and Air Conditioning (HVAC) costs in UG stations.

PSDs have been in use since 1963 and Detailed Design Consultant (DDC) intimated (December 2010) the same to BMRC while submitting the designs for Majestic UG Station and also intimated the proposal for use of PSD system at Delhi Metro. The cost of PSD system for each platform was assessed at ₹4.50 crore and increased maintenance cost were estimated to be recouped through savings on the costs of Air Conditioning (AC) alone, which was assessed to be in the range of 10 to 40 per cent of the estimated load of each UG Station. Audit observed that PSD system was not implemented at any UG station of Phase 1.

TC (IIT Delhi) observed that PSDs are capable of reducing peak AC load by improving thermal insulation, enhanced airflow control, minimizing AC loss and reducing heat loads from trains.

BMRC replied (March 2023) that PSD system was not popular in India during execution of Phase 1. Further, PSD provided in Delhi Metro during 2019 at Rajeev Chowk was only for a height of 2 meters to help the crowd management but had no impact on AC load. Hence, installation of PSDs for Phase 1 was not considered.

BMRC's reply may be viewed in light of the fact that it did not consider the recommendations of DDC despite PSDs inherent benefits of passenger safety and cost saving through energy efficiency. Further, implementation of PSDs at all UG stations of Phase 2 substantiates the fact of inherent advantages of PSDs through cost savings estimated at ₹6.58 crore per annum.

***BMRC agreed (February 2024) to consider full height PSDs for subsequent phases of Bangalore Metro Rail Project, as suggested by Audit.***

### 3.5.4 Mechanical issues related to Rail and Rolling Stock

#### 3.5.4.1 Issues in quality of Wheels/ Rails procured

**A.** Audit, along with TC (IIT Delhi), observed that the hardness values of rail should be in the range of 340 – 390 Brinell Hardness Number (BHN)<sup>19</sup> at all the locations where the wheel is supposed to form contact with rail. The measured hardness of the samples provided by BMRCL ranged between 260 and 330 BHN in 34 of the 36 locations. Low values of hardness of critical areas on rail head result in increase in maintenance cost of rolling stock and track by 15 to 20 *per cent*, increase in noise and vibration than permissible value, increase in energy loss arising due to high friction/ traction and decreased life of rails and wheels.

**B.** BMRCL stated that the hardness of rail should be more than wheels as passes of runs, the wear of wheels and rail will take place and thus, replacing the worn rails, is easier, as compared to wheels. But during the onsite visit by TC (IIT Delhi) along with Audit, it was found that the hardness of wheels and rails were almost same. However, in view of the increase in hardness at the contacts due to strain hardening during run, BMRCL should have adopted rail and wheels having equal hardness (or better) in beginning itself for having good performance from running-in periods.

**C.** BMRCL further stated that the turning of wheels and grinding of rails will be done after completion of specific kilometres of wheel runs. However, Audit along with TC (IIT Delhi), are of the view that the decision on grinding/ turning should be based on the limits of noise and vibrations, considering the visual inspection of worn out surfaces and not on set kilometre operation guideline.

**D.** After grinding/ turning, the hardened layer of wheels gets removed due to increased surface roughness. BMRCL, however, does not have any technical means to increase the hardness and improve the surface finish of the wheels and rails. Restoring the hardness on wheel's flanges and rails (after grinding) is of utmost importance as increase in noise and vibration were recorded after turning and grinding of wheels and rails respectively.

BMRCL stated (February 2024) that the rails meeting Technical Standards of Track Structure had been procured and tests had been conducted by internationally reputed testing agencies on the rails before the same were dispatched to the Plant. The test reports indicated BHN in the range of 361 to 384 at all the locations. The wear on the rails, which were in service for the past 11 years, was within the permissible limits. 'Need Based' grinding of rails is being carried out based on visual inspection and measurement profile. Till date, observed vertical wear in BMRCL is less than 3 mm.

TC (IIT Delhi) clarified that rail segments provided by BMRCL were first filed (i.e., machined) to remove thickness of 0.2 mm from the surfaces before measuring Leeb Rebound Hardness Test (using Standard Probe D) and Brinell Hardness. Filing was done to remove increased hardness which got imparted during the laser/ flame cutting of rail segments and oxide formation due to moisture/ chemicals present in environment. The hardness of rail was measured three times and hardness at different locations was

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<sup>19</sup> *Brinell Hardness indicates the ability of a metal to resist permanent indentation deformation. The hardness shows the material's resistance to penetration indenter under standardised conditions.*

lesser (particularly at the rail head which interacts with wheels and their flanges) than the standard values as per DPR. Further, the tests need to be correlated with frequency of grinding of rail heads and wheel flanges for knowing the impact (increased cost of maintenance) of lesser values of hardness of rail head. TC (IIT Delhi) further clarified that the decision on turning and grinding of rail wheel and rail head should be based on detection of deviations in the wheel's geometry by Automatic Wheel Profile Measurement System. It triggers alert for timely corrective actions/ maintenance of profiles.

#### 3.5.4.2 Consequences of low hardness in Rails

The Metro rail's vibration and noise arise from the forces generated at the contact point between train wheel and the rail. Audit, along with the TC (IIT Delhi), observed high values of noise and vibrations in the car (train) at the site/ field.

**A. Noise** – The loudest noise in Metro rail is the rolling noise coming from the interaction of wheel and rail during running condition. Other noises include the traction noise, aerodynamic noise, curve squeal, bridge noise and braking noise. The noise levels inside the running car had to be in the range of 70 to 72 decibels (dB). Audit, along with the TC (IIT Delhi), conducted a physical visit on 2 May 2023 of the stretch from Baiyappanahalli to Kempegowda (to and fro) and observed that the noise levels inside the car were in excess of the norms and ranged up to 80.2 dB on the stretch.

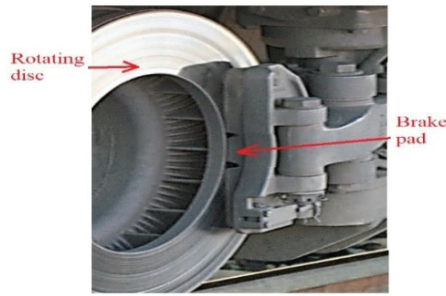
**B. Vibration** – The dynamic impact forces generated during the wheels and rails interaction excite the structures leading to vibrations. The key factor which determines the level of vibrations is track design and the maintenance of wheel and rail. As per norms (ISO 2631), passengers should not be subjected to vibration level more than 0.315 metre per second squared ( $\text{m/s}^2$ ). Audit, along with the TC (IIT Delhi) and officials of BMRCL, conducted a physical visit on 2 May 2023 of the stretch from Baiyappanahalli to Kempegowda (to and fro) and observed vibration in excess of 0.315  $\text{m/s}^2$  throughout the stretch between Baiyappanahalli to Kempegowda and back.

The above noise and vibration levels in excess of the permissible limits indicated that the interface of wheels and rails was not proper and the noise/ vibration absorption system and the suspension system need attention.

BMRCL stated (February 2024) that during initial Type Test, train did not pass noise measurement test. After implementing modifications in the door system, repeat Type Test was conducted and the train passed the criteria of interior noise level of 72 dB at 80 kmph. Similarly, after implementing several modifications in HVAC, repeat Type Test was carried out and the train passed the vibration criteria specified in the Employer's Requirement – Technical Specification.

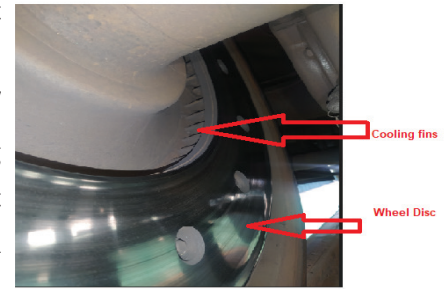
TC (IIT Delhi) clarified that the intensity of noise and vibrations was experienced by them in the cars during the inspection/ physical visit and the recordings were made in the presence of the officials of the Company. As such, TC (IIT Delhi) requested BMRCL to recheck the limiting values of vibration and revisit the data submitted in the TC Report.

### 3.5.4.3 Selection of Braking System



Picture 4A – Schematic view of Disc and Brake Pad

TC (IIT Delhi) observed that rotating surface of the disc brake did not have perforations/ holes for cooling resulting in increase in temperature at the interface of brake pad and counter rotating surface which consequently affected the life and reliability of the braking



Picture 4B – Schematic view of Wheel Mounted Disc Brake

system. The reduction in life is expected to be in the range of 15 to 20 *per cent* resulting in frequent repairs and maintenance, thereby increasing the maintenance cost of braking system.

BMRCL replied (February 2024) that the Brake System supplier had carried out temperature simulation on Phase 1 corridors and accordingly, wheel mounted disc brakes were designed. Cooling fins were provided in Brake Disc, which will create fanning effect during running and heat generated during braking would be dissipated. This is a proven design of wheel mounted disc brake for Metro application.

TC (IIT Delhi) clarified that fins were provided on metallic surface holding the friction material of brake pad to increase the surface area for better cooling. But perforations/ holes provided on rotating disc were more effective and better in comparison to fins based aspect. TC (IIT Delhi) further clarified that they could not notice the perforations/ holes in the wheels of rolling stock of rails on the site shown to them at the time of physical inspection.

## 3.6 Conclusion

The DPRs of Phase 2 were prepared in the absence of the Comprehensive Mobility Plan/ Land Use Policy for Bengaluru city, which resulted in inflated ridership projections, thereby leading to inflated projected revenues resulting in higher FIRR and EIRR. In case of selection of technology, rails of relatively low value of hardness, as compared to standards, were noticed. With reference to adoption of S&T technology, current technologies at the time of procurement were not considered, which resulted in procurement and retention of outdated technologies even in Phase 2. Platform Screen Doors were not installed in Phase 1 despite projected savings in the cost of AC and maintenance costs.



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# **Chapter 4:**

# **Land Management**

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**Aerial view of Phase 2 (Reach 4B) Viaduct**



## Chapter 4: Land Management

In a Metro project, land is required for – (i) Metro structures along the alignment, station building, platforms, entry and exit structures, ventilation shafts, traffic integration facilities, etc.; (ii) Depot/ car (train) shed; (iii) Receiving and Traction Substation; and (iv) Temporary construction/ storage yards/ workers rest areas and work sites.

### 4.1 Land acquisition arrangement at BMRCL

As per Memorandum of Understanding (MoU) between GoI, GoK and BMRCL signed on 24 December 2010 (Phase-1) and 24 February 2017 (Phase-2), Bangalore Metro Rail Project shall be governed by the provisions of the Metro Railway (Construction of Works) Act, 1978 and the Metro Railways (Operation & Maintenance) Act, 2002 as amended through Metro Railways (Amendment) Act, 2009 and Railway Act, 1989 or such legislation made from time to time as may be decided by GoI. However, Land Acquisition by BMRCL was not made under these Act(s), considering that land acquisition process for Phase 1 and 2 were already initiated under Karnataka Industrial Areas Development (KIAD) Act, 1966 since 2005 and 2014 (i.e., prior to signing of the MoU on 24 December 2010 and 24 February 2017 respectively).

BMRCL proposed (January 2005) to proceed with Land Acquisition (LA) under the provisions of KIAD Act, 1966, to expedite land acquisition, as proceedings can swiftly be completed within a period of 60 days as against 3 years under LA Act, 1894. There was also scope for negotiation of land price. Accordingly, BMRCL entered (June 2005) into an agreement with Karnataka Industrial Areas Development Board (KIADB)<sup>20</sup> for carrying out the LA as per Sections 3(1)<sup>21</sup>, 28(1)<sup>22</sup>, 28(4)<sup>23</sup> and 28(8)<sup>24</sup> of KIAD Act, 1966. The process involved in LA, along with role of BMRCL and KIADB is given below:

<sup>20</sup> *KIADB is a statutory body, constituted under Section 5 of Karnataka Industrial Areas Development Act (KIAD) Act, 1966 to promote rapid and orderly establishment and development of industries and for providing industrial infrastructural facilities and other amenities in Industrial areas in the State of Karnataka. KIAD Act, 1966, a special Act, provides for expeditious acquisition of lands for industrial and infrastructure purposes.*

<sup>21</sup> *The State Government may, by notification, declare any area in the State to be an industrial area for the purposes of this Act under Section 3(1) of KIAD Act, 1966 which includes private properties and karab lands, nala, road portion and lake portion, etc. As these lands belong to Government, these will be notified under Section 3(1) of KIAD Act, 1966 for which there will not be any payment or handing over or khata change.*

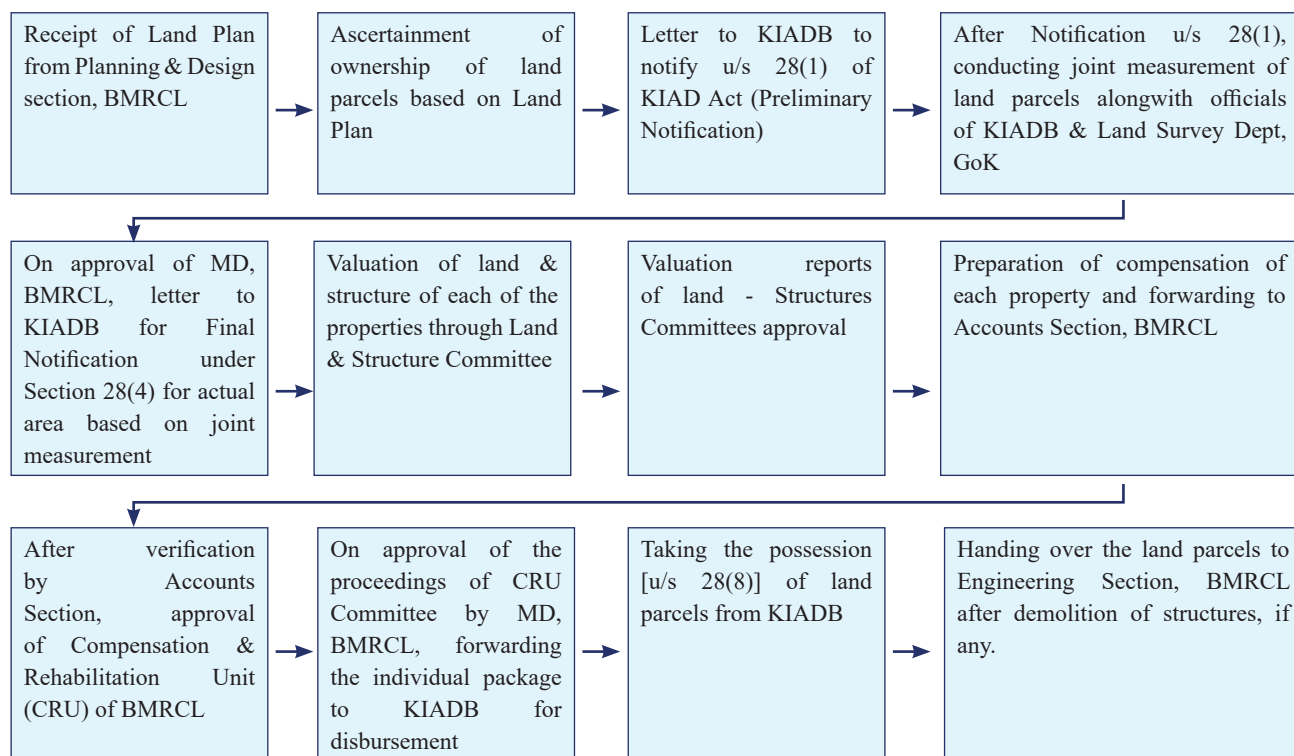
<sup>22</sup> *If at any time, in the opinion of the State Government, any land is required for the purpose of development by the Board, or for any other purpose in furtherance of the objects of this Act, the State Government may by notification, give notice of its intention to acquire such land (Preliminary Notification). Upon issue of notice, the owner of land will be given opportunity to be heard within 30 days.*

<sup>23</sup> *After orders are passed under sub-section (3), where the State Government is satisfied that any land should be acquired for the purpose specified in the notification issued under sub-section (1), a declaration shall, by notification in the official Gazette, be made to that effect (Final Notification). Upon issue of 28(4), the land shall vest absolutely with the State Government free from all encumbrances.*

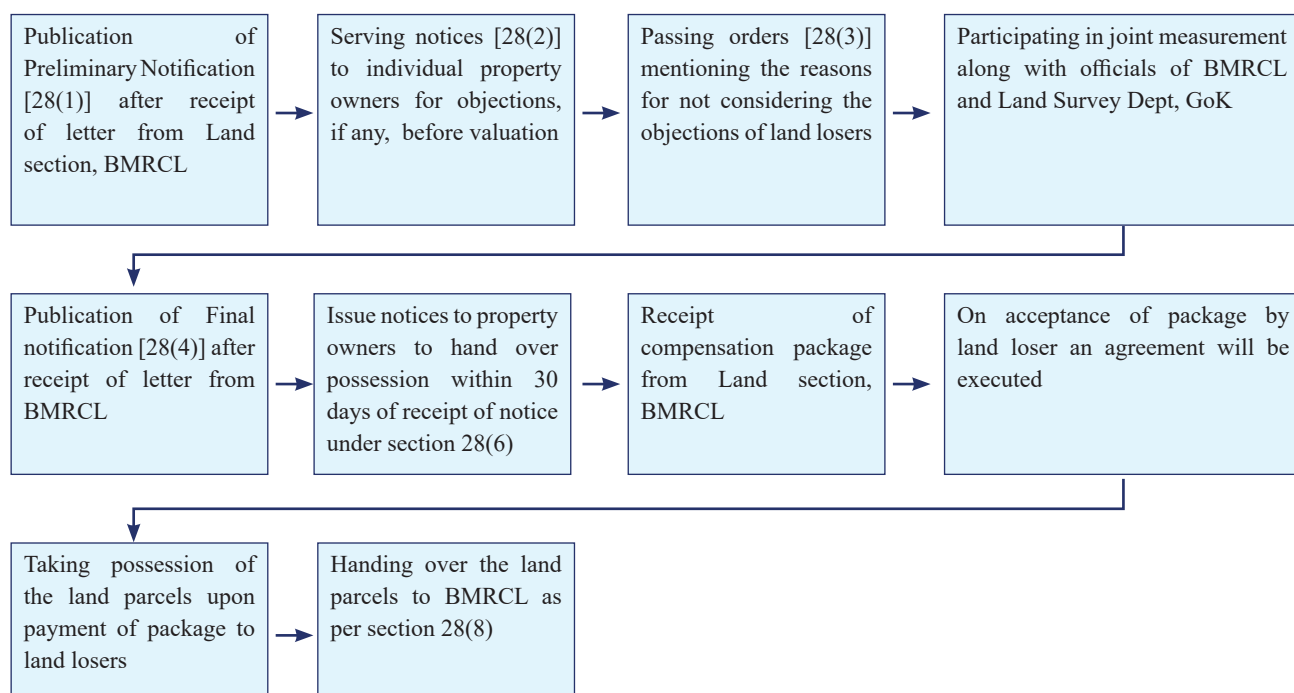
<sup>24</sup> *Where the land has been acquired for the Board, the State Government, after it has taken possession of the land, may transfer the land to the Board for the purpose for which the land has been acquired.*



## Role of BMRCL -



## Role of KIADB –



The observations of Audit relating to land management are discussed in the subsequent paragraphs.

## 4.2 Land Acquisition issues in Detailed Project Reports of Phase 1 and Phase 2

Under Phase 1 and 2, BMRCL acquired 62.67 Hectares and 145.16 Hectares of land at a cost of ₹1,195.81 crore and ₹7,455.09 crore respectively.

### 4.2.1 Land Acquisitions under Phase 1

DMRCL submitted DPR for Phase 1 in May 2003. In addition, BMRCL engaged (October 2003) M/s RITES Ltd (erstwhile Rail India Technical and Economic Service Ltd.) as Interim Consultant for conducting preliminary site activities, geotechnical studies, etc. DPR for Phase 1 estimated the cost of acquiring 45.24 Hectares of land as ₹360 crore, which was revised to ₹600 crore and was approved by the GoK in March 2005 and by GoI in May 2006. As against projection of 45.24 ha of land, BMRCL has acquired 62.67 ha of land, which is as per actual site requirement and transfer of 100 acres of air force land for Peenya Depot as against 30 acres as per DPR. The following table shows the land requirement projected in DPR and actually acquired for the proposed two corridors of Phase-I.

**Table 4.1 - Table indicating the projection of land requirement as per DPR and actual acquisition (in hectares) for phase 1**

| Detail                                          | Private Land | Government Land | Property Development (PD) | Total    |
|-------------------------------------------------|--------------|-----------------|---------------------------|----------|
| <b>DPR Projection</b>                           |              |                 |                           |          |
| Land area (in hectares)                         | 18.85        | 26.39           | -                         | 45.24    |
| Land Cost (₹ in crore)                          |              |                 |                           | 360.00   |
| <b>Actual land acquisition as of March 2023</b> |              |                 |                           |          |
| Land area (in hectares)                         | 16.40        | 46.27           | -                         | 62.67    |
| Land Cost (₹ in crore)                          | 806.73       | 389.08          |                           | 1,195.81 |

- A. DPRs did not have the details of the properties to be acquired. Further, the actual land acquired (62.67 ha) varied with the projection of the DPR consultant (DMRCL) and also with that of the Interim Consultant (M/s RITES). The incorrect estimation of land parcels required, coupled with delay in actual acquisition, resulted in increase in LA cost to ₹1,195.81 crore, an increase by ₹835.81 crore (232.17 *per cent*) as compared to the DPR estimate (₹360.00 crore). Further, when compared to GoI approved (May 2006) cost (₹600 crore), there was an increase of ₹595.81 crore (99 *per cent*). Furthermore, there were delays in acquisition, which hampered the overall execution of Phase 1 works.

BMRCL stated (February 2024) that the increase in cost of LA was partly due to increase in the area of land actually acquired and partly due to upward revision of market value of lands over a period of time by the State Government.

BMRCL's reply substantiates that the projections of land required in DPRs were incorrect leading to increase in actual land area acquired and its cost.



- B.** Though BMRCL had presented (29 January 2005) to its Board of Directors that on comparison of LA Act, 1894 and KIAD Act, 1966 the land acquisition process under LA Act would take 2 years, whereas the same would be completed in 60 days under KIAD Act, 1966, Audit observed that no timeline was spelt out for completion of LA either in the KIAD Act, 1966 or in the agreement signed between BMRCL and KIADB during June 2005. Further, in the implementation schedule presented (July 2006) to its Board of Directors, BMRCL indicated that LA process would be completed by 31 December 2006. Audit, however, noticed that acquisition and takeover of land parcels continued up to March 2014.

BMRCL stated (February 2024) that it is not possible to assess land requirement at the DPR stage itself as minor modifications in the alignment, station locations as per site conditions, etc. necessitate acquisition of additional areas.

BMRCL's reply may be viewed in light of the fact that it took more than 7 years for assessment and completion of LA as against internal target date of 31 December 2006.

#### 4.2.2 Land Acquisitions under Phase 2

BMRCL entrusted (19 July 2008) preparation of DPR for Phase 2 also to DMRCL, who submitted three DPRs for Phase 2. The land proposed for acquisition in DPRs and actual acquisition under Phase 2 for all purposes is as given below –

**Table 4.2 – Table indicating the projection of land requirement as per DPR and actual acquisition for Phase 2**

| Detail                                          | Private Land | Government Land | Property Development (PD) | Total    |
|-------------------------------------------------|--------------|-----------------|---------------------------|----------|
| <b>DPR Projection</b>                           |              |                 |                           |          |
| Land area (in hectares)                         | 94.19        | 15.90           | 55.00                     | 165.09   |
| Land Cost (₹ in crore)                          | 1,608.04     | 79.47           | 138.46                    | 1,825.97 |
| <b>Actual land acquisition as of March 2023</b> |              |                 |                           |          |
| Land area (in hectares)                         | 90.30        | 54.86           | 0.00                      | 145.16   |
| Land Cost (₹ in crore)                          | 7,114.15     | 340.94          | 0.00                      | 7,455.09 |

As per the DPRs, a total area of 165.09 ha which included 55 ha towards Property Development was projected to be acquired at a cost of ₹1,825.97 crore. However, as of 31 March 2023, BMRCL had actually acquired 145.16 ha with 'nil' acquisition towards Property Development, at a cost of ₹7,455.09 crore. Further, the Phase 2 was to be completed by March 2017 as per the DPRs but the LA is still in progress as of 31 March 2023.

- A.** When compared with DPR projections, actual LA ranged between 100 *per cent* (Reach 2E) to 463 *per cent* (Reach 5) in respect of Private Lands and between zero *per cent* (Reach 3C) and 4,32,234 *per cent* (Reach 1E) in respect of Government Lands. The acquisition varied from DPR projections due to factors such as envisaging a new Depot at Kadugodi (Reach 1E), shifting of

Depot from Kenigeri to Challagatta (Reach 2E), improper projection of lands for various stations, depot, viaduct, etc.

- B.** DPR only mentioned the requirement of lands chainage wise but did not provide the exact land parcels with exact area and ownership details, apart from indicating that these are Government or private properties. Therefore, Audit was neither able to ascertain whether the same lands proposed in the DPR were acquired nor express any opinion on adequacy of the land requirement analysis made by DPR consultant.

BMRCL stated (February 2024) that it is not possible to provide exact land parcels, along with ownership details at DPR stage. The exact details of area required and ownership would be identified once LA process is initiated after the sanction of the Project by GoK and GoI.

BMRCL's reply may be viewed in light of the fact that as DPR Consultant could differentiate between Government and Private lands while mentioning the extent of land required in the land projections and the same were considered by GoI and GoK while approving the respective DPRs, the DPR Consultant should have given the details of exact land parcels, along with the extent of land as the same would have reduced the time for LA.

***Recommendation # 3 - BMRCL should ensure that the DPR shall contain clear details of land to be acquired along with the ownership details.***

***BMRCL stated (February 2024) that the Recommendation has been noted.***

## **4.3 Delays in land acquisition**

### **4.3.1 Private Lands for East-West and North-South corridor under Phase 1**

The East-West and North-South corridors are divided into four Reaches and lands were acquired for each Reach. KIADB issued a Preliminary Notification u/s 28(1) of KIAD Act, 1966 for 19.61 ha of private land but finally acquired 16.40 ha through issue of Final Notification u/s 28(4). Audit noticed that first Preliminary Notification was issued on 17 January 2006 and it continued to be issued up to January 2013, which ultimately resulted in delays in LA process. In this regard, Audit noticed that –

- (i) Reasons for delay in acquisition of fewer properties through many Notifications were not documented and indicated lapses in planning.
- (ii) Issue of many individual Notifications with single/ few properties indicated improper assessment of facilities to be created and lack of proper groundwork.
- (iii) Delays were noticed in conduct of joint measurement and appointment of Committee by GoK for determination of land valuation of private properties, thereby delaying the issue of Final Notification. The time taken from issue of Preliminary Notification u/s 28(1) to taking-over of land by KIADB u/s 28(8) of KIAD Act, 1966 across all four reaches ranged from five to 41 months.

BMRCL stated (February 2024) that delay in acquisition of properties through multiple notifications was necessitated mainly due to requirement of additional lands during detailed planning and construction. Many notifications were issued based on request of the Planning and Design Wing of BMRCL. The responsibility for conducting joint measurement of lands proposed for acquisition lies with the Special Land Acquisition Officer, KIADB and depends on availability of Government Surveyors.

BMRCL's reply may be viewed in light of the fact that assessment of land required made by DPR Consultant (DMRCL) and the Interim Consultant (M/s RITES) was deficient necessitating identification of new properties to be acquired at the time of Project implementation. Further, in March 2006, Joint Measurement Groups were established comprising of members of BMRCL, KIADB and Department of Survey, to complete joint measurement within 20 days, but without detailed plans for the same. Further, Land Committee appointed in April 2006 for deciding valuation of private lands submitted its Report in April 2007, which also contributed to overall delay in land acquisition.

#### **4.3.2 Private Lands for extension of corridors under Phase 1**

Phase 1 was extended on both North and South sides for which DMRCL had prepared DPRs in October 2007 and in June 2008 respectively. GoI accorded approval in January 2010 for both the extension lines. Audit noticed that the First Preliminary Notification was issued on 31 January 2009 and subsequently, Preliminary Notifications were continued to be issued up to January 2013, which ultimately resulted in delays in LA process.

In respect of Reaches 3A, 3B and 4A, against the DPR projection of 5.66 ha of private lands, KIADB notified 26.03 ha but acquired 19.19 ha, i.e., around 3.39 times of the area projected in DPR and incurred ₹702.44 crore towards Rehabilitation and Resettlement (R&R) Cost as against ₹59.10 crore projected in the DPR.

Further, in respect of Reach 3B, 99 out of 156 properties notified in First Preliminary Notification, were dropped while issuing Final Notification due to change in land plan. The reasons for delay in identification and acquisition of fewer properties in many notifications were not on record. Issue of many individual Notifications for a single property indicated improper assessment/ proceedings of LA. The reasons for delayed handing over were also not on record. The time taken from Preliminary Notification to handing over of land in the three Reaches ranged from 7 months to 34 months.

BMRCL stated (February 2024) that the notifications u/s 28(1) were issued based on land plans issued by Planning Section of BMRCL and that during Joint Measurement, the exact areas and number of properties required were ascertained. Delays in LA could be due to writ petitions and disputes on ownership of the properties.

BMRCL's reply indicates that it did not learn lessons from the delays occurred in LA in Phase 1 and did not implement corrective measures for Phase 1 extension. Further, DPR Consultant (DMRCL) should have examined the suitability of route alignment and finalise the land plan. As such, this led to overall delay in LA with consequent delay in execution of the Project.

### 4.3.3 Government Lands under Phase 1

For Phase 1, in addition to private lands, BMRCL acquired 46.27 ha from various Government Departments/ Public Sector Undertakings (PSUs) for ₹389.08 crore as against DPR projection of 26.39 ha at ₹173.21 crore, i.e., 2.25 times more. Similarly, in respect of Reaches 3A and 4A<sup>25</sup>, BMRCL acquired 43.31 ha from various Government Departments/ PSUs and paid ₹68.53 crore as against DPR projection of 1.72 ha at ₹23.57 crore.

BMRCL stated (March 2023) that some of the properties were acquired subsequent to issue of First Notification, because of the need for additional properties for stations, viaduct, parking, Property Development and road widening due to site conditions. Further, some other properties were acquired based on additional land required as per actual need, for ramps and for shifting of electrical utilities.

BMRCL's reply substantiates inadequate assessment of land requirement by DPR Consultant. Subsequent land plans prepared by Planning and Design Section of BMRCL in consultation with M/s RITES were also inadequate resulting in time and cost overrun.

BMRCL did not offer further remarks while replying in February 2024/ April 2025.

### 4.3.4 Pre-notification activities for land acquisition for Phase 2

While approving (21 February 2014) Phase 2, GoI, *inter-alia*, laid a condition that GoK would ensure that LA does not become reason for delay in project implementation. In order to overcome undue delay and to streamline the process of LA and acquire land at earliest, HPC agreed to BMRCL's proposal for 450 days timeline from date of issue of Preliminary Notification u/s 28 (1) of KIAD Act, 1966 to the date of handing over to BMRCL by KIADB.

Audit noticed that the time taken from preparation of initial land plans to GoK approval ranged from 10 to 36 months. Further, two to 10 months were taken for issue of the First Preliminary Notification from the preparation of initial land plan. The reasons for the delays were not available on record. Audit also observed that BMRCL had not fixed any timelines for pre-notification activities like preparation of land plans by Planning and Design Section, obtaining approvals for sending notification proposals to KIADB, approval by GoK for issue of Preliminary Notification u/s 28 (1). Audit further noticed that presently, BMRCL is issuing Preliminary Notifications u/s 28(1) after conducting joint measurements and hence, the timelines approved by the HPC was not modified accordingly.

BMRCL stated (March 2023/ February 2024) that LA could not start immediately as the land plans were to be prepared by M/s RITES, which involved carrying out varied activities including topological survey, identification of properties and collecting ownership documents. These activities required sufficient time after which land plans could be finalised by Planning and Design Section of BMRCL. Even after that, issue of notification u/s 28(1) requires time as draft notification will be sent to KIADB and after verification at KIADB, the notification needs to be issued by the State Government only after

<sup>25</sup> BMRCL did not furnish details of Government Lands acquired and cost incurred in respect of Reach 3B.

approval of the Minister concerned. It was also stated that in Metro Rail Projects, it is assumed that the required land will be acquired while construction is in progress to avoid unnecessary cost increase at the DPR stage.

BMRCL's reply reinforces the fact that substantial time is required for pre-notification activities and the same should be appropriately factored in while considering the execution schedule. The reply also brings out the inadequacy of the land requirement identified along the proposed chainage by the DPR Consultant (DMRCL), requiring further work such as identification of precise land area, ownership details, etc. Further, LA during construction to avoid unnecessary cost increase at the DPR stage is not agreeable as such presumption would result in undue delay and cost variance during the execution phase.

#### **4.3.5 Private Lands under Phase 2**

With a view to streamline the process of LA and to get the land for the project as early as possible and also to avoid undue burden on the state exchequer, BMRCL proposed (May 2013) timeline of 450 days from the date of issue of Preliminary Notification u/s 28 (1) of the KIAD Act, 1966 up to handing over to BMRCL by KIADB, which was agreed to by the HPC. Audit noticed delays in completion of the Joint Measurement, Issue of Final Notification and taking possession of the land from the date of each Preliminary Notification. Audit also noticed that the first Preliminary Notification was issued on 02 August 2013 and it continued to be issued up to May 2022. These delays culminated in overall delay of the Project. In this regard, Audit observed that –

- (i) BMRCL issued multiple Notifications ranging from 7 to 26 due to changes in alignment, identification of additional lands during joint measurement, for road-widening and shifting of utilities, provision for access roads to nearby villages, etc., which could have been avoided with proper due diligence in identification of utilities to be shifted across the Metro alignment and estimation of land parcels by the DPR Consultant (DMRCL).
- (ii) Time taken for joint measurement of land parcels after issue of Preliminary Notification u/s 28(1) ranged from 38 to 1,473 days in Phase 2, against HPC approved 120 days. However, no specific reasons for the delays were on record except for Reach 1E and Reach 3C. Delays in Reach 1E were attributed to delay in getting clarification from National Highways Authority of India (NHAI) which had already notified certain lands. Delays in Reach 3C were attributed to a pending court case to decide ownership of certain land parcels which were presumed to be acquired by NHAI.
- (iii) Time taken for issue of Final Notification u/s 28(4) from date of issue of Preliminary Notifications ranged between 57 and 1,696 days, against the HPC approved 180 days. The delays were attributable to the time taken to get approval of Competent Authority in BMRCL for issue of Notification u/s 28(4) and sending proposals to KIADB and the time taken by KIADB to get approval from its Authorities and GoK.
- (iv) HPC laid down that land parcels were to be handed over to BMRCL within 150 days from date of issue of Final Notification u/s 28(4), but the actual time taken ranged between 32 days and 798 days in Phase 2. Audit observed that the delays were attributable to time taken for finalization of



compensation package for each property and getting approval of the Managing Director, BMRCL and sending the package details to KIADB for disbursement. There were further delays on the part of KIADB in offering package and getting possession from the landowners. However, specific time delays attributable to BMRCL and KIADB could not be arrived at, due to involvement of large number of land properties where compensation packages were sent in respect of each package separately.

BMRCL stated (March 2023/ February 2024) that the timeline fixed by HPC for various stages of LA were for internal guidance. The actual time taken to complete the LA process starting from u/s 28(1) to 28(8) varies from case to case depending upon various conditions involved in the LA process. BMRCL further stated that though the clarifications were issued by NHAI in May 2016, there were issues pertaining to joint measurement and Special LAO had to order for fresh identification and measurement of properties. As a result, Final Notification could be published with delays. Though BMRCL is pursuing for expeditious completion of LA, it is not always possible to adhere to the timelines fixed by the HPC.

It is pertinent to note that BMRCL itself proposed (May 2013) the above timelines to HPC for approval in order to overcome undue delay in LA and to streamline the LA process. Further, BMRCL has not offered any remarks on delays in joint measurement in respect of Reach 5 and 6. The above also indicates that the DPR Consultant (DMRCL) had not properly identified/ ascertained the land details at the time of DPR preparation. Further, BMRCL has not produced any documentary evidence as to in how many cases, out of the total land parcels acquired, the award u/s 29(3) was approved by Special LAO or GoK and time taken for such process.

Reach wise dates of Preliminary Notifications, Final Notifications and Handing Over of land parcels by KIADB to BMRCL indicated that against HPC approved timeframe of 330 days from date of issue of Preliminary Notification u/s 28(1) to taking over of lands by BMRCL u/s 28(8), actual time taken for Phase 2 ranged between four and 54 months.

***BMRCL acknowledged (February 2024) the Audit suggestions to ensure that the project execution schedule factors the time required for land acquisition; and to evolve a mechanism to identify the ownership details for the proposed lands to be acquired before issue of Preliminary Notification to negate the delays involved in resolving the issues with organisations like NHAI. BMRCL stated (April 2025) that it has already taken steps to identify the ownership details of the lands proposed for acquisition for Phase 3 before issue of Preliminary Notification.***

## 4.4 Valuation of Private lands

### 4.4.1. Valuation of Private Lands under Phase 1

BMRCL appointed (August 2006) a single man Land Committee, who in turn, appointed an international consultant (Valuer). The valuer submitted (April 2007) Main Valuation Report to Land Committee by bifurcating all the properties into 22 stretches. The Valuer followed Direct Comparison Method<sup>26</sup>

<sup>26</sup> *Comparison of subject land parcel with similar land parcel that have actually been sold in the vicinity.*

and Residual/ Developmental Method<sup>27</sup> and made an average to arrive at the fair market rate. When compared with Guidance Values (GV) prescribed by Stamps and Registration (S&R) Department of GoK, the fair market value arrived by the Valuer was higher by 29 to 206 *per cent*, if stretch wise details are compared. If individual property wise details are considered, the fair market value by Valuer was higher by 19 to 494 *per cent* (*Annexure II*). The Land Committee submitted (April 2007) the Valuation Report to BMRCL based on the Valuation Report of the Valuer and the same was accepted (April 2007) by the Board of Directors of BMRCL. Similarly, in respect of Phase 1 extension, BMRCL constituted (14 November 2008) another one man Expert Committee, which was assisted by a private property valuer firm. The Land Committee followed the same methodology adopted by the earlier Committee and submitted (January/ February 2010) their Land Valuation Reports to BMRCL, which were approved (March 2010) by the Board of Directors of BMRCL.

Audit observed that as per Valuation Report (April 2007), Residual/ Developmental Method was hypothetical method and depended on professional judgement of the valuer with more chances of committing errors. BMRCL, however, approved the values without further verification about the correctness. Hence, in the absence of documentary evidence forming basis for arriving at values under the above mentioned two methods, Audit could not express any opinion on the land valuation methodology. Further, there were no supporting documents for approving the valuation methodology, which was different from GV prescribed by S&R Department of GoK. Total land compensation amount paid by BMRCL based on fair market value was ₹1,195.81 crore as compared to DPR estimates (₹360 crore) and GoI approved costs (₹600 crore).

BMRCL stated (March 2023/ February 2024) that DPR cost estimate was prepared in April 2003 whereas LA was completed in 2010. Further, DPR had not considered the cost towards structures on acquired lands and due to these reasons, LA cost had gone up. The Land Committee adopted the fair market value in order to complete the acquisition through consent u/s 29(2) of KIAD Act. Had GV method been adopted, the compensation amount would have not been accepted and few landowners had approached Court seeking enhancement in compensation, which was agreed to by the Court and those landowners were paid enhanced compensation along with interest.

BMRCL's reply may be viewed in light of the fact that though LA process was extended up to the year 2010, the major reason contributing to increase in LA cost was the adoption of fair market value, which were higher by 19 to 494 *per cent* when compared with the GV of S&R Department. Further, no supporting documents were furnished to Audit as to how these market rates were arrived at. Though GoK adopted payment of compensation based on Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013 for Phase 2, the landowners approached the Courts seeking further higher compensation.

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<sup>27</sup> *Assesses the value that a prospective purchaser could afford to pay for the proposed development.*

#### 4.4.2 Valuation of Private Lands under Phase 2

DPR Consultant (DRMCL) estimated (2011) LA amount for Phase 2 including Rehabilitation and Resettlement (R&R) as ₹1,825.97 crore, which was updated (February 2012) to ₹2,003.18 crore by GoK while according approval. Later, GoK adopted (September 2015) the Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement (RFCTLARR) Act, 2013. Later in September 2017, GoK approved revised land cost of ₹6,293.16 crore including R&R cost due to (a) GV based land cost estimated in DPR, had undergone revision thrice with the rates getting almost doubled; (b) RFCTLARR Act, 2013 fixed the rate of solatium at 100 *per cent* as compared to 30 *per cent* under LA Act, 1894; and (c) notification of revised Master Plan of Bengaluru (2015) wherein most of the lands falling along the Metro alignment were categorized as commercial lands, resulting in enhanced valuation.

BMRCL approved the Valuation Reports of private lands by the Board appointed Land Committee for all the six Reaches in Phase 2 for determination of compensation to land owners, which considered the provisions of RFCTLARR Act, 2013 and other attributes approved (September 2015) by GoK for the purpose of valuation of private land parcels.

Audit observed that when compared to the timelines prescribed in the DPRs for completion of Phase 2 during July 2015 to March 2017, BMRCL could not even acquire land as mentioned in **Paragraph 4.3.5**. The GV rates considered by DPR Consultant had been revised upwards five times during the period from 2013 to 2018. As a result, BMRCL incurred an amount of ₹7,455.09 crore up to March 2023 for LA including R&R cost under Phase 2 as against revised approved land cost of ₹6,293.16 crore and DPR estimated cost of ₹1,825.97 crore. This cost may further increase as the LA is still under progress.

BMRCL attributed (March 2023) the increase in cost of LA to adoption of RFCTLARR Act 2013, periodical revision of GV by State Government and increase in the area of land acquired.

This may be viewed in the light of the fact that the actual cost of acquisition could have been restricted to a lower level if the LA had been completed within a reasonable time.

Audit further noticed the following lapses in valuation of land parcels done by the Land Committee and adopted by BMRCL in respect of LA of Phase 2.

##### 4.4.2.1 Payment of excess compensation of ₹294.72 crore for Phase 2 by treating the agriculture lands as converted lands

Audit scrutiny of 84 number of Valuation Reports available in the Land Committee Reports revealed that 117 vacant land parcels admeasuring more than 505.85 square metres were considered as converted land parcels on the basis of visual inspection and higher compensation was paid. Audit noted that conversion status was not required in respect of 17 number of these properties as they pertained to Bangalore Development Authority (BDA)/ Bruhat Bengaluru Mahanagara Palike (BBMP)/ Nandi Infrastructure Corridor Enterprises, and there were no discrepancies in valuation of land compensation in 37 number of cases. In the balance 63 number of cases, Audit review revealed that –

- (i) Before initiation of LA for Phase 1, GoK issued (28 February 2004) orders that no further developments of any nature shall be taken up along or across the full width of the road along the two routes of North-South and East-West corridors till further notice. However, no such preventive orders were issued when DPRs for Phase 2 Reaches were under submission (May to July 2011) of LA for Phase 2. As a result, 46 landowners converted their lands from agriculture to non-agriculture lands just before submission of DPR or just after submission of DPR, resulting in BMRCL paying additional compensation of ₹197.22 crore (*Annexure III*).
- (ii) In respect of 3 land parcels whose conversion status was not known, compensation of ₹46.40 crore (*Annexure IV*) was paid treating them either as converted lands or towards attributes applicable to converted lands.
- (iii) In case of 14 land parcels, which were categorised as ‘agricultural lands’, compensation of ₹51.10 crore (*Annexure V*) was paid treating them either as converted or towards attributes applicable to converted lands.

These deficiencies in valuation of 63 land parcels were not verified by Land Section, Screening Committee and Accounts Section of BMRCL before finalization of compensation package. This has resulted in excess payment of ₹294.72 crore (i.e., 197.22 plus 46.40 plus 51.10).

***BMRCL noted (February 2024) the Audit suggestion to ensure that GoK issues preventive orders for conversion/ development of lands on the proposed corridor immediately after initiation of DPR to avoid payment of higher land compensation due to conversion subsequent to submission of DPRs. BMRCL added (April 2025) that it has already sent a proposal to Urban Development Department of GoK for necessary action at their end.***

#### **4.4.2.2 Payment of ₹186.86 crore due to delay in issue of Final Notification for acquisition of lands of Phase 2**

As per LA Act, 1894 [Section 23(1-A)]/ Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement (RFCTLARR) Act, 2013 [Section 69(2)], BMRCL had to pay 12 *per cent* per annum additional market value on the land compensation for the period between Preliminary Notification u/s 28(1) of KIAD Act, 1966 and taking possession of lands u/s 28(6). As there was no fixed timeline under KIAD Act, 1966 for notifying u/s 28(1) and 28(6), BMRCL proposed timelines for each activity of LA from the notification u/s 28(1) which were approved (May 2013) by HPC. According to the timelines, a period of 240 days *plus* a grace of 30 days was stipulated for getting possession as per Notification u/s 28(6). BMRCL paid land compensation of ₹7,455.09 crore for land and structure, which included ₹431.33 crore towards 12 *per cent* per annum towards additional market value as interest.

In this regard, Audit observed that the delay in respect of 41 Preliminary Notifications u/s 28(1) was beyond the prescribed timeline of 270 days for taking possession of land after issue of Preliminary Notification, resulting in avoidable payment of ₹186.86 crore towards 12 *per cent* per annum additional market value for period over and above 270 days.

BMRCL stated (March 2023/ February 2024) that unforeseen delays at various stages between the date of issue of notifications u/s 28(1) and 28(6) resulted in payment of additional market value beyond 270 days. Further, the total amount of 12 *per cent* per annum additional market value paid for all properties of Phase 2 was only ₹137 crore. So, the figure of ₹431.33 crore said to have been paid towards 12 *per cent* per annum additional market value appears to be not correct.

BMRCL's reply may be viewed in light of the fact that payment of ₹431.33 crore towards 12 *per cent* per annum additional market value was arrived at based on Property Registers for all the Reaches of Phase 2 as furnished by Land Section of BMRCL. However, Management has not furnished any documents in support of their reply that the additional amount paid was only ₹137 crore.

***Recommendation # 4 - BMRCL should approach GoK to amend the KIAD Act, 1966 duly prescribing the timelines for acquisition of land.***

***During Exit Conference with the Ministry (May 2025), BMRCL acknowledged the Recommendation of Audit.***

#### **4.4.2.3 Payment of excess compensation of ₹31.35 crore for Phase 2 land acquisition by considering higher percentage of attributes**

As per Section 26 of the Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement (RFCTLARR) Act, 2013, the Market Value was to be considered as higher among (a) Market Value as specified in the Indian Stamp Act, 1899; (b) Average Sale Price for similar type of land situated in the nearest village or vicinity area; and (c) consented amount of compensation as agreed upon. GoK issued (September 2015) guidelines to adopt this Act for Phase 2 and also to increase the Market Value of properties determined under this Act by up to 5 *per cent* in terms of these guidelines for properties having attributes such as frontage, two roads, without drainage/ high tension line, etc., to arrive at the base price of the land, on which 100 *per cent* solatium is to be paid.

Audit observed that in respect of 553 land parcels in all the six (6) Reaches, the Land Committee allowed higher Market Value up to 7.5 *per cent*, over and above the escalated rates up to 5 *per cent*. This has resulted in excess payment of ₹31.35 crore (being excess base price: ₹15.67 crore and corresponding solatium @ 100 *per cent*: ₹15.67 crore) (***Annexure VI***).

BMRCL stated (March 2023/ February 2024) that the Land Committee had adopted the individual property attributes, which were approved by the GoK. The Reports of Land Committee were duly verified by the Screening Committee of BMRCL before approval of the same.

BMRCL's reply is general in nature duly explaining the procedure followed. BMRCL has not furnished property wise specific reply against the 553 properties commented by Audit where the individual attribute percentages were more than the percentage prescribed by GoK.



***Recommendation # 5 - BMRCL should ensure that the extant rules and guidelines framed for valuation of land parcels are followed scrupulously and responsibilities be fixed for avoidable payments.***

***BMRCL stated (February 2024) that the Recommendation has been noted.***

#### **4.5 Delay in transfer of title deeds of private properties**

Land acquisition for Phases 1 and 2 was done through KIADB, which took over the possession of land after payment of compensation to landowners and transferred the possession to BMRCL. As titles of land were still not transferred in favour of BMRCL, GoK decided (March 2018) that sale deed can be executed after two (2) years of acquisition of land by BMRCL.

In this regard, Audit observed that BMRCL has acquired 3,881 properties under Phase 1 (1,014 properties) and under Phase 2 (2,867 properties) up to 2014 and March 2023 respectively. However, titles of ownership have not been transferred to BMRCL for the entire land parcels under Phase 1 and 2,853 properties under Phase 2 acquired up to March 2023, which have completed two (2) years and are eligible for registration for transfer of title.

BMRCL replied (February 2024) that Company has been able to get the sale deed in respect of 206 properties of Reach 2 of Phase 1 on 29 December 2023.

The remaining 808 (i.e., 1,014 *minus* 206) properties under phase 1 and 2,853 properties under phase 2 are yet to be registered in the name of the Company.

***BMRCL acknowledged the Audit suggestion to ensure timely transfer of title deeds in its favour as per the directions of the GoK and stated (April 2025) that title deeds in case of lands acquired for Reach 2, 3, 3A and 3B of Phase 1 have been transferred to BMRCL and Draft Sale Deeds in respect of Reach 1, 4, 4A of Phase 1 and Reach 1E, 2E, 3C, 4B and 6 of Phase 2 had been submitted to KIADB.***

#### **4.6 No policy for acquisition/ use of land parcels surrendered by land users**

As per *Annexure A* of the Rehabilitation Package of BMRCL (August 2007), owners losing land and structure partially and willing to surrender the same completely to Project Authority had the option of giving up the remaining part of the property to the Project Authority and compensation and entitlements will be paid as per the Rehabilitation Package. The above option was available for private properties acquired under Phase 1 as well as Phase 2.

In this regard, Audit observed that there is no record of land acquired through surrender by land losers in case of Phase 1. In respect of LAs made for Phase 2, BMRCL acquired 3,619 sq. mtrs. land parcels consisting of 11 properties in four out of six Reaches surrendered by land losers and paid compensation of ₹32.82 crore for nine properties up to March 2023. However, the purpose for which these surrendered lands were being used were not furnished to Audit. Further, no policy has been framed by BMRCL for alternate use of surrendered lands such as property development/ resale, etc.

Also, after acquisition of land parcels, the same were handed over to Project Wing for construction and after completion of construction works, the Assets were handed over to Operation & Maintenance Wing for watch and ward. Audit, however, is unable to express any opinion on the demarcation and safeguard of leftover lands, if any, after completion of construction works and their optimum utilization by BMRCL for other purposes in absence of records.

***BMRCL acknowledged the Audit suggestion and stated (April 2025) that the Policy to utilise and safeguard the surplus/ surrendered lands is under finalization and will be implemented from FY 2025-26.***

#### 4.7 Conclusion

The extent of land to be acquired was not correctly assessed in DPRs resulting in acquisition of additional land. Delays in land acquisition were noticed which were mainly due to delays in land survey, conducting joint measurement, initiation of land notifications without ensuring ownership of lands, and delays in preparation of Land Valuation Reports. These delays resulted in payment of higher compensation to land owners. Further, irregularities in payment of compensation to land owners were noticed with reference to not ensuring status of agriculture lands (whether converted to commercial lands), consideration of higher *percentage* towards certain land attributes and payment of additional market value (interest) due to delay in issuing the Final Notification for land acquisition beyond the timeline approved by the HPC, thus leading to overall increase in the project cost and additional financial burden on GoK exchequer.



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# **Chapter 5:**

# **Project Execution and Contract**

# **Management**

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**Aerial view of 53 metres Composite Steel Girder Erection across NICE Road (Phase 2 (Reach 4B))**





## Chapter 5: Project Execution and Contract Management

As per Clause 14.17 of Tripartite Memorandum of Understanding (MoU) for Phase 1 (December 2010) and Phase 2 (February 2017) between GoI, GoK and BMRCL, the Karnataka Transparency in Public Procurement (KTPP) Act, 1999 and guidelines of Central Vigilance Commission (CVC) are applicable to both the Phases. Further, Schedule of Powers (SoP) of BMRCL are applicable for sanction and authorisation for execution of works, along with all applicable laws relating to operation of Metro rail.

Audit reviewed the selected sample of 117 Civil and System contracts under Phase 1 and 2 awarded up to 31 March 2021 and the financial figures in the Report were updated upto March 2023. The discrepancies noticed on review of these contracts are brought out in the subsequent paragraphs.

### 5.1 Absence of Procurement Manual

Procurement Manual helps in regulating the procurement of goods, services and works systematically to ensure uniformity, regularity and transparency in the procurement process by specifying the methodology of preparing cost estimates (for civil, Systems and Consultancy works), deciding the hierarchy, prescribing effective internal checks, internal controls and effective monitoring in the process. Audit observed that till date (March 2023), BMRCL had not prepared its own Procurement Manual to regulate procurement processes. GoK had also advised (August 2017) BMRCL for preparation of its own Procurement Manual. However, the Manual is yet to be finalised by BMRCL till date (31 March 2023).

Some of the consequences of the non-formulation of the Procurement Manual are indicated in the subsequent paragraphs.

#### 5.1.1 No established guidelines for preparation of cost estimates under Phase 1 and 2

In the absence of the Procurement Manual, there were no Guidelines/ Policy/ Standard Operating Procedure for preparation of cost estimates leading to incongruencies in the preparation of cost estimates by BMRCL.

Audit, along with TC (IIT Delhi), observed that BMRCL considered 75 *per cent* of unit costs for Elevated/ Underground sections in DMRCL project to determine the costs for Phase 1, without any basis. Further, vetting remarks and concurrence of Finance Department on the cost estimates prepared by General Consultant appointed for Phase 1 were not made available to Audit.

Audit, along with TC (IIT Delhi), observed that Phase 2 cost estimates were prepared based on similar works executed during Phase 1. On review of 22 sample contracts under Phase 2 (*Annexure VII*), it was noticed that the cost was determined on the basis of the Last Accepted Rates of completed projects under Phase 1 by adding escalation at 5 *per cent* per annum.

TC (IIT Delhi) noted that starting from 2012, the cost index had marginally changed and in fact, showed a decrease in the building cost index in some of the years and hence, increase by 5 *per cent* per year by BMRCL was not justified. TC also concluded that BMRCL's system to prepare cost estimates was flawed as it did not consider current rates but escalated the price with reference to previously executed contracts.

BMRCL replied (March 2023) that CVC guidelines and stipulations of KTPP Act/ Rules, with due modifications as required keeping in view BMRCL's own experience gained over a period of time, were being followed. BMRCL further added (February 2024) that for Phase 1, DPR was prepared by DMRCL as it was the only metro organisation having experience in the country and thus, costs were adopted based on costings of DMRCL. BMRCL also stated that the reasonability of rates ascertained by Tender Scrutiny Committee in each of these cases clearly brings out that the rates were reasonable with respect to contemporary Last Accepted Rates duly reckoning the aspects of exclusion of taxes by tenderers, applicability of Service Tax besides other site conditions and features.

BMRCL's reply may be viewed in light of the fact that cost estimates of Phase 2 contracts were not prepared based on prevailing market rates as per CVC guidelines, instead it was prepared by increasing 21.55 *per cent* (i.e. at the rate of 5 *per cent* per annum compounded annually) over the previously awarded contract rates of DMRCL and were inclusive of taxes. The Tender Evaluation Committee also did not consider the impact of taxes included in the estimated cost while evaluation of tenders, which is discussed in subsequent paragraphs.

### **5.1.2 Improper inclusion of taxes in estimates for civil works under Phase 2**

BMRCL prepared cost estimates for Phase 2 contracts inclusive of all taxes. However, bidders were instructed to submit bids exclusive of Excise Duty on Steel and Cement, Karnataka VAT and Service Tax, without revising its cost estimates by excluding the tax components. Audit worked out the amount of above tax components and observed that in case of 9 civil contracts<sup>28</sup>, taxes amounting to ₹1,098.28 crore were included in the cost estimates. Further, as the contractors had quoted at premium/ below these cost estimates, the overall increase in contract price was to the extent of ₹1,222.40 crore (₹1,098.28 crore *plus* net premium of ₹124.12 crore). Also, Financial Tender Evaluation Committee did not consider impact of taxes included in the cost estimates and recommended that the prices quoted were reasonable with respect to the estimated cost.

BMRCL replied (March 2023) that the cost put to tender may not be relevant and that tenderers quoted their rates based on their own estimation and that their estimated rates were only for guidance. BMRCL added that the price quoted by tenderer was compared with base price to select the lowest quoted tenderer.

BMRCL's reply that cost put to tender may not be relevant is not acceptable as the estimated cost becomes the basis for fixing of Earnest Money Deposit, fixing of technical and financial qualification criteria and finally, it becomes the basis for arriving at the reasonability of the financial bids submitted

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<sup>28</sup> *Construction of viaduct and Metro station contracts pertaining to Packages 1, 2, 3 of Reach 5, Reach 1B, Elevated Section of Reach 6, and Construction of Tunnel and Underground Stations pertaining to 4 Packages of Reach 6.*

by the tenderers based on which the key decision to award the work is decided. Further, TC (IIT Delhi) also observed that BMRCL was not preparing justified cost estimates and as such, the justifiability of the lowest bidder's price cannot be ensured.

***BMRCL acknowledged the Audit suggestions (i) to formulate a formal Procurement Manual to ensure that the procurement process is done transparently and procedures followed are uniform in award of works so that there is no ambiguity; and (ii) to formulate a Standard Operating Procedure (SOP) as part of Procurement Manual to ensure that the cost estimates are prepared reasonably and reliably based on prevailing market rates instead of adoption of previously awarded rates with escalation.***

## **5.2 Discrepancies in preparation of cost estimates**

### **5.2.1 Cost estimates for Civil Works for Reach 6 under Phase 2 hiked by ₹262.24 crore**

The cost estimates of UG section of Reach 6 (Nagawara to Gottigere) were prepared in May 2017 considering the rates quoted in November 2011 for Majestic Interchange UG station of Phase 1 and other civil works awarded during April 2015 to March 2016. A tender was floated (June 2017) for four Packages of Round Tunnel (RT) works (i.e., RT1 to RT4). The tender was discharged as it was noticed that the bidders had distributed the Packages amongst themselves taking turn to become the lowest bidder and that too at an abnormally high tender premium (67 to 75 per cent) uniformly across all the Packages. BMRCL subsequently floated tenders separately between June 2018 and January 2019.

In this regard, Audit observed that –

- (i) The original tender (June 2017) for RT1 to RT4 included cost of land for Casting Yard and Batching Plant, which was chargeable at a cost of ₹130.83 crore and procurement of 13 Tunnel Boring Machines (TBM) at ₹50 crore each. While retendering (June 2018 to January 2019), it was decided to issue land for Casting Yard and Batching Plant free of cost. However, instead of reducing the estimated cost by ₹130.83 crore, BMRCL increased the TBM cost to ₹80 crore each and reduced the number of machines to nine (9) nos. BMRCL also increased the rates of other items like segment moulds, other machinery and fixed cost of each of the 13,900 rings without any supporting documents.
- (ii) Schedule D rates were increased by ₹131.41 crore by adopting higher of the rates awarded for Majestic Station (November 2011), Reach 2A (April 2015), Reach 2B (March 2016) and Reach 4B of Phase 1 (January 2016) and further escalating the cost by 35 per cent. These rates did not reflect the prevailing market rates.

Overall, the cost estimates for Reach 6 was abnormally increased by ₹262.24 crore.

BMRCL replied (March 2023/ February 2024/ April 2025) that one of the reasons for receiving lesser quote is providing land free of cost for establishing Casting Yard and Batching Plants. As land cost was not part of the estimated cost, reducing the cost in the revised tender was not required. BMRCL further stated that initially ₹50 crore per TBM was considered based on cost of machines used in Phase

1. Afterwards, based on subsequent enquiry from reliable sources, relevant cost of TBM was around ₹80.00 crore. The information received was found correct when the contractor sourced two TBMs in August 2019 at a cost of ₹85.61 crore each.

BMRCL's reply may be viewed in light of the fact that due to non-reduction of the cost of land for Casting Yard and Batching Plant, from the estimates and as the awards were quoted with premium, the project cost was escalated to the extent of premium *plus* cost of land (i.e., ₹130 crore). BMRCL has mistakenly taken the currency mentioned as INR instead of the currency mentioned as US\$ in the *Annexure*, as a result the cost per TBM sourced worked out to only ₹61.50 crore and not ₹85 crore. Further, for the preparation of cost estimates for Systems Contracts, viz., electrification of Third Rail System, 33 KV Distribution System, SCADA System etc., BMRCL considered lowest rates of previously awarded contracts. However, in respect of Civil Contracts, the Company had considered highest rate of the previously awarded works, which indicated the lack of uniformity in the preparation of cost estimates by the Company.

Thus, Reach 6 cost estimates had been over-estimated by at least ₹262.24 crore which had an impact of increase of at least ₹45 crore (i.e., ₹262.24 crore x 17 *per cent*), as the award was given at a premium ranging from 17 to 21 *per cent* over the cost estimates.

#### **5.2.2 Cost estimates for Hebbagodi Depot hiked by ₹8.15 crore due to adoption of incorrect area weightage**

Hebbagodi falls in the limits of Bangalore Metropolitan Region Development Authority (BMRDA) and applicable area weightage was 3 *per cent* only. Audit, however, observed that BMRCL prepared cost estimates by considering area weightage at 6 to 8 *per cent* instead of 3 *per cent*, which resulted in increase of cost estimates by ₹8.15 crore. As the contract was awarded at a discount of 5.84 *per cent* based on the estimate, it resulted in increase in project cost by ₹7.67 crore (i.e., ₹8.15 crore x 94.16 *per cent*).

*BMRCL acknowledged the Audit suggestion to ensure adoption of correct area weightages to arrive at reasonable cost estimates and stated (April 2025) that it is included in the draft procurement manual sent to GoK for approval.*

#### **5.3 No established guidelines for deciding project duration and size of Package**

For Phase 1, duration of the tendered works were proposed and finalised in consultation with the General Consultant keeping in view the scope of work, extent and nature of work, etc. and the experience of DMRCL. For Phase 2 projects, in addition to above, the project duration was decided based on BMRCL's own experience gained in Phase 1. Further, in response to a query on written policy on package size, BMRCL stated that the Company decides the size of a contractual package on judgement basis, depending on time estimate given in the sanctioned DPR, duly keeping in view the agencies available in the market and their capabilities for the respective types of works. The experience of BMRCL officials and that of other Metros is also factored to decide on the size of Package.

In this regard, Audit, along with TC, did not find evidence of conducting any time analysis for different types of contracts. It was noticed that same project duration was fixed for similar works even though there was significant difference in quantum of works. For instance, under Reach 6 of Phase 2, BMRCL fixed 42 months as the project duration for 4.591 km of Metro route with 4 UG stations under Package 4 and the same duration was fixed for 2.884 km of Metro route with 2 UG stations under Package 3. Audit, along with TC (IIT Delhi), also opined that in absence of a policy for deciding on package size, possibility of making a package very large or very small cannot be ruled out, thereby discouraging competition.

BMRCL replied (February 2024) that project duration of various tenders is proposed by field officials based on site conditions, i.e., availability of work front, traffic conditions of roads, etc., which are duly reviewed by very senior experienced officials at the level of Executive Director and Director and finally approved by the Managing Director. The effort is to decide the most optimum time at which the cost is lowest and work of different Reaches get completed simultaneously as far as possible.

BMRCL's reply may be viewed in light of the fact that there is no recorded analysis for fixing the completion period for each contract/ package. Hence, TC (IIT Delhi) opined that BMRCL should conduct trade-off analysis, in order to optimise time, cost, quality, safety and sustainability performance of various projects.

***BMRCL acknowledged the Audit suggestion to frame a policy for deciding the most appropriate package size including the approval process for deviations from the stated policies, if any, and stated (February 2024) that a proper policy shall be included in the Procurement Manual.***

***Recommendation # 6 - BMRCL should adopt a systematic approach while determining the project timeframe to ensure time-cost trade-off to derive the most optimum time at which the cost is the lowest.***

***During the Exit Conference, BMRCL assured (April 2024) that the reasons/ basis of fixation of project duration will be recorded in the noting of Management henceforth.***

## **5.4 No norms for sale period of tender documents**

KTPP Act 1999, prescribed a sale period of 60 days for tender documents and that it should not be less than seven (7) days in case of emergency.

Audit noticed that in nine contracts of the selected sample, the sale period allowed by BMRCL was in the range of 14 to 44 days despite high value and complexity of work, viz., construction of Metro depots, procurement of rails, UG section of Reach 6, etc. (*Annexure VIII*). Thus, sufficient time was not given to the bidders to submit their bids, in order to generate fair and adequate competition. TC (IIT Dehi) also concurred with the views of Audit.

BMRCL stated (April 2025) that KTPP Act has been amended and the minimum period has been reduced to 15 days for tenders valued less than ₹2 crore and 30 days for tenders valued in excess of ₹2 crore.



BMRCL's reply may be viewed in light of the fact that the amendment to KTPP Act was issued in September 2019 by which time most of the cases pointed out by Audit had already been tendered and the extant norms had not been followed.

***BMRCL acknowledged the suggestion to prescribe a policy regarding sale period of tender documents and to follow it scrupulously and stated (February 2024) that the issue will be covered suitably in the Procurement Manual being issued and further added (April 2025) that it will follow provisions of KTPP Act while deciding on the period for tender opening.***

## 5.5 No norms for regulating release of advances to contractors and fixation of interest rates on advances

CVC directions (8 October 1997) stipulate that Mobilisation Advance should be interest bearing so that the contractor does not draw undue benefit. These instructions were modified (10 April 2007) and additional guidelines were issued (17 February 2011) stating that Bank Guarantee (BG) should be at least 110 *per cent* of the advance and Mobilisation Advance should not be paid in less than two instalments except in special circumstances for reasons to be recorded. In this regard, Audit observed discrepancies in release and recovery of Mobilisation Advances as brought out below:

- (i) Audit noticed that though CVC directions do not indicate the quantum of Mobilisation Advance to be given, BMRCL allowed Interest Free Mobilisation Advance at 10 to 40 *per cent* of contract value in 24 contracts of Phase 1 and 2 without any justification on record. Further, BMRCL has not fixed uniform interest rates even for similar nature of works. Details are given in ***Annexure-IX***.
- (ii) BMRCL has not considered the impact of Interest Free Advances and Interest Bearing Advances in the cost estimates.
- (iii) BMRCL released Mobilisation Advance in a single instalment for 42 out of 61 cases in violation of CVC guidelines issued in February 2011 but the timelines for recovery of advances from contractors varied from contract to contract. Audit observed that the recovery of advances till the end of the Scheduled Completion Period/ the Extended Completion Period was not in line with the CVC guidelines and also, not in the financial interest of BMRCL.
- (iv) BMRCL has not collected interest of ₹15.10 crore on outstanding advances provided to various contractors (Rolling Stock 3 of Phase 2, UG 1 of Phase 1 and Pocket Track of Reach 3 of Phase 1) for the period of delay beyond the stipulated period of recovery.

***BMRCL acknowledged the suggestion to formulate a policy for regulating the release of Mobilisation Advance to the contractors and for fixation of interest rates based on prevailing market conditions with periodic revisions; and stated (February 2024) that the Procurement Manual shall cover all the above aspects and will have standardised guidelines by taking into account CVC guidelines, etc.***

## 5.6 Release of Material Advance/ Stage Payments

BMRCL provided material advance and stage payments for procurement of steel and cement as per the terms and conditions of the contract and recovered the Material Advances through the Interim Payment Certificates (IPCs) based on consumption of procured materials. Audit observed that in 11

out of 69 civil contracts of Phase 1 and Phase 2 selected for review, BMRCL released ₹589.94 crore of Material Advances/ Stage Payments, of which ₹375.38 crore was released in five cases, even without enabling clause in the contract (*Annexure-X*). Audit further observed that BMRCL did not charge any interest on above advances.

BMRCL replied (March 2023/ February 2024) that as per conditions of the respective contracts, action was taken whether to charge the interest on material advance or not.

BMRCL's reply may be viewed in the light of the fact that there was no uniform policy on charging interest on material advances given to contractors. BMRCL has not provided any reply on providing material advance/ stage payments without any enabling clause in contract.

***BMRCL acknowledged the suggestion to formulate a policy for regulating the release of Material Advance to the contractors and to ensure that the terms are uniformly made applicable to all the contractors and also to release the interest free Material Advance by keeping in view the financial interests of the Company and stated (February 2024) that suitable policy will be incorporated in the draft Procurement Manual.***

## 5.7 Award of contracts on 'Nomination' basis

Sections 5 and 6 of the KTPP Act, 1999 provide that Goods and Services are to be procured by inviting tenders but in emergency situations, these provisions were not applicable for works valuing up to ₹5 lakh for construction works and ₹2 lakh for service related works. Further, as per Section 4(g) of KTPP Act, GoK has the power to issue specific exemption on case to case basis. The CVC has also directed (July 2007/ July 2018) that awards must normally be granted through Public Auction/ Public Tendering by inviting tenders from eligible persons to ensure transparency in public procurement, to maximise economy and efficiency, to promote competition and to provide for fair and equitable treatment to all bidders.

In this regard, Audit observed that BMRCL has awarded new works of ₹158.04 crore on nomination basis without floating tenders in 17 out of 117 contracts selected for review (*Annexure-XI*).

BMRCL replied (February 2024/ April 2025) that these works were entrusted to ongoing contractors as a variation to their contracts in view of urgency in the interest of early completion of overall project, as award of these contracts through fresh tenders would have taken additional time and thus, caused additional delay. Further, these works were awarded at the accepted rates of the ongoing working contractors, which were evaluated while awarding the original contracts and thus, no financial loss was suffered by BMRCL.

BMRCL's reply may be viewed in light of the fact that BMRCL did not obtain exemption from GoK for deviating from the provisions of KTPP Act, 1999 on procurement through tendering.

## 5.8 Absence of Registered Vendor base

CVC directed (2 July 2004) for encouraging procurement of goods/ services through a system of approved/ registered vendors and contractors, which needs to be updated annually to enable procurement of goods and services of short term nature in a transparent and equitable manner.

In this regard, Audit noticed that BMRCL did not maintain registered/ approved list of vendors/ contractors and awarded works by calling three local quotations from selected vendors or as variation to existing contractors for works valuing less than ₹5 lakh. Audit noticed that this procedure was followed in 11, out of 15 contracts selected for review, valuing ₹44 lakh. Further, as per instructions (10 May 2014) from BMRCL's Finance Department, Finance Concurrence was required at every stage from initiation of proposal to placement of work order. The works, however, were awarded without involvement of the Contract Department and concurrence of the Finance Department.

Though the deviation was noticed in 11 contracts valuing ₹44 lakh which seems to be nominal, BMRCL awarded 2,147 contracts under 'Operation and Maintenance' valuing ₹53.25 crore which were below ₹5 lakh and in most of the cases, the awards have been placed based on quotations from selected vendors.

BMRCL stated (February 2024) that this practice is being followed for award of works below ₹5 lakh.

*BMRCL acknowledged the suggestion to streamline awarding of individual works valuing up to ₹5 lakh by maintaining annually updated list of registered/ empanelled vendors and by floating limited enquiry and stated (February 2024) that empanelment of contractors for Operation and Maintenance works valued up to ₹5 lakh is under process and the same shall be implemented and streamlined.*

## 5.9 Lack of proper due diligence during preparation of Bill of Quantities

Earth Mats<sup>29</sup> are required to be provided below base slab of UG stations or Entry/ Exit Structure, to protect the equipment. BMRCL, however, did not include the component of 'Earth Mat' as part of Bill of Quantities (BOQ) at tender stage for UG Package 2 of Phase 1. Subsequently, this item was executed as a Non Tendered (NT) item at a cost of ₹2.35 crore, which was 30 *per cent* over and above the derived rate agreed for NT items. Similarly, despite the experience of Phase 1, this component was again executed as NT item even for UG Packages of Phase 2 for ₹7.63 crore<sup>30</sup>, which included premium over and above the market/ derived rates agreed for NT items.

***Recommendation # 7 - BMRCL should ensure that basic materials are included during preparation of Bill of Quantities (BOQ) instead of executing the works as 'Non Tendered Items' at a later date which may lead to additional financial implication.***

<sup>29</sup> An Earth Mat is a mesh formed of bare metallic conductors and buried in shallow soil to provide better safety from touch and step potential.

<sup>30</sup> For three Packages of Reach 6 (RT2 to RT4) - ₹7.63 crore. Details not made available for RTI

***BMRCL stated (February 2024) that the suggestion of Audit is noted for implementation in future Civil Underground tenders as a BOQ item, instead of executing this component as ‘non-tendered’ item.***

## **5.10 Descoping of works**

### **5.10.1 Irregular descoping of Underground (UG) Tunnel Package in Phase 1**

Tender Scrutiny Committee (TSC) of BMRCL recommended (June 2009) to award UG2 tender at ₹1,441.30 crore, inclusive of taxes. BMRCL awarded (December 2009) UG2 contract at a total cost of ₹995.20 crore excluding taxes, duties, Ventilation Air Conditioning (VAC) works, Electrical & Mechanical (E&M) works and Architectural works.

Audit observed that UG2 tender was floated (November 2008) to three bidders with contract price inclusive of all taxes, but the contract was awarded (December 2009) by excluding all taxes after descoping VAC, E&M and Architectural works and also providing additional 5 *per cent* of contract value as interest free advance. However, despite above changes in scope and contractual terms, other two bidders were not given equal opportunity to resubmit their financial bids.

BMRCL replied (March 2023/ February 2024) that detailed analysis and reasoning for de-scoping, its benefits, effect on tendering process, etc., were discussed by an Expert Committee and Board Committee and accordingly, final decision to award the work was taken. It was further stated that as the difference in L1 and L2 for initial tender was huge, even if revised quote was obtained from L2, the relative position of bidders would have remained unchanged.

BMRCL’s reply may be viewed in light of the fact that descoping the works after financial evaluation and before awarding resulted in precluding equal opportunity to other bidders, thereby reducing competition. The reply of the Company that there is huge difference in L1 and L2 and would make no difference is made in the hindsight and specific to the case. It is essential that the process is streamlined so that such instances do not recur.

***BMRCL added (April 2025) that observation of Audit will be considered in future contracts.***

### **5.10.2 Descoping of Property Development works in Phase 2**

BMRCL descoped the Property Development (PD) works from the Station Designs in case of three stations of Phase 2, viz., Hosa Road, Basapura Road and Chikkabegur Stations of Reach 5 (Package 2) to save cost and time in constructing the stations. BMRCL did not analyse the revenues foregone due to descoping of PD, which was one of the key factors for deciding the financial viability of the Phase 2.

BMRCL replied (March 2023/ February 2024) that during the project implementation stage, it was realized that by implementing the PD, the expected Non-FBR cannot be generated and with the existing proposal, it was very difficult to implement the project against the targets set out by GoI/ GoK and hence, the PD was excluded.

BMRCL's reply that expected Non-FBR cannot be generated by PD in three metro stations of Phase 2 was not substantiated by any supporting documents, as the decision was made only to reduce cost and adhere to timelines fixed without analysing potentiality of revenue foregone.

BMRCL replied (April 2025) that after commencement of commercial operations in Reach-5, PD activities will be taken up. Spaces have already been identified and joint inspection, along with O&M is carried out. The parking tender has already been floated.

***BMRCL acknowledged the Audit suggestion to ensure that descoping of Property Development is based on proper assessment and cost benefit analysis and stated (May 2025) during Exit Conference with Ministry that the suggestion is noted.***

### 5.11 Issues in Design Drawings

The Detailed Design Consultant (DDC)/ Contractors submitted Good For Construction (GFC) Drawings to BMRCL for approval, which were issued to the contractors for execution of works. Audit observed that in 25 out of 88 contracts selected for review (*Annexure-XII*), there were delays in approval and issue of GFC Drawings ranging from 6 days to 1,172 days due to revisions in Alignment/ General Arrangement due to site constraints, utility issues, etc. resulting in delay in execution.

***BMRCL acknowledged Audit suggestion to ensure timely approval of GFC drawings to enable timely completion of works by the Contractor and stated (April 2025) that, as brought out by Audit, action has been taken to finalise the DDC contract well before award of civil construction contracts to facilitate timely approvals and completion.***

### 5.12 Delay in handing over of land to contractors

As per Clause 2.2 of General Conditions of Contracts under Phase 1, BMRCL shall grant the contractors, right of access to, and possession of, the site progressively for the completion of works. If the contractor suffers any delay from failure on the part of BMRCL to grant right of access to, and possession of the site, the contractor shall be entitled to extension of time. Audit noticed that in 24 out of 26 contracts selected for review (*Annexure-XIII*), BMRCL did not hand over the land as per schedule and made the land available in stages and accordingly, time extension was granted to contractors. Instance of avoidable expenditure due to delays in handing over of work front are discussed under subsequent paragraph.

Audit further observed that despite being aware that availability of land to contractors on time cannot be guaranteed, as experienced during execution of Phase I, during tendering for Phase 2 works, BMRCL amended the tender terms to include payment of damages to the contractor for delays in handing over of land beyond 90 days from the date of signing the contract agreement. Audit noticed delays, beyond the allowable 90 days, in handing over the land in 13 out of 30 contracts selected for review (*Annexure-XIV*) ranged between 12 and 1,305 days. Audit noticed from the records made available that due to delays in handing over of lands, 5 out of 13 contractors<sup>31</sup> raised claims to the tune of ₹98.21

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<sup>31</sup> Claims from contractors under balance 8 contracts were not in the records made available to Audit.



crore, out of which ₹12.19 crore has already been paid against one claim and other four claims are under scrutiny by BMRCL. Further, the contractor under settlement with ₹12.19 crore had claimed interest of ₹7.26 crore for delay in payment of damages. Audit further noticed that BMRCL was not in possession of the required land in any of the above 13 cases by the time of floating the tenders.

BMRCL replied (March 2023) that taking over of land by KIADB was delayed due to various issues like ownership of land, disputes between parties on same piece of land, COVID 19 pandemic, etc. There were delays in handing over of land due to clearing of existing trees in the works area, which was being directly monitored by Hon'ble High Court of Karnataka.

*Though the reply of BMRCL is factual, BMRCL has to put in place a mechanism to monitor land acquisition process and align the same with tendering of works to avoid consequential delays and payment of damages to contractors towards idling of manpower, machinery, etc. This suggestion by Audit was noted (February 2024) by BMRCL.*

#### **5.12.1 Additional cost of ₹6.86 crore due to non-availability of land for Reach 6**

BMRCL awarded (February 2019) Package 2 (RT 02) of Reach 6 but could make available only 6,382 sq. m. of land of the required 11,231 sq. m., due to land acquisition issues at Church area at Vellara Station. Consequently, the designs and station layout had to be changed for which contractor raised (August 2021) additional claim of ₹6.86 crore.

BMRCL replied (March 2023/ February 2024) that Church area for Vellara Station could not be made available due to social reasons. Shortage in the works area caused rearrangement of station layout resulting in additional works towards which the contractor made claims.

BMRCL's reply substantiates the Audit observation that BMRCL allowed the work to commence without possession of land, resulting in delay in execution of work besides additional financial implications.

### **5.13 Delay in shifting of utilities, removal of trees and demolition of buildings**

There were delays in shifting of utilities in 13 contracts<sup>32</sup> out of 56 contracts selected for review, delay in removal and translocation of trees in 10 contracts<sup>33</sup> and in demolition of structures/ buildings along the Right of Way (ROW) in eight contracts<sup>34</sup> due to which the main civil contract works were delayed, which consequently led to delay in execution of works. The delays specific to each of the above activities could not be established in Audit as these were concurrent to non-finalisation of design drawings, and handing over of land.

BMRCL replied (March 2023/ February 2024) that shifting the utilities like waterline, sanitary

<sup>32</sup> *Reach 3B, Underground 2 contract of Phase 1, Reach 3C, Reach 4B, Elevated Section of Reach 6, Reach 1B, 4 Packages of Underground Section of Reach 6 and 3 Packages of Reach 5.*

<sup>33</sup> *Underground 2 contract of Phase 1, Reach 3C, Reach 4B, Elevated Section of Reach 6, Reach 1B, 4 Packages of Underground Section of Reach 6 and Package 3 of Reach 5.*

<sup>34</sup> *Demolition Work at Reach 1A and 1B, Reach 3C, Reach 4B, Elevated Section of Reach 6, Packages 1 and 4 of Underground Section of Reach 6 and Package 1 and 3 of Reach 5.*

line, power and communication cables etc. running within ROW was delayed due to presence of trees in works area, disputes/ litigations in land area and also due to procedural delays from various organizations. Further, the tree cutting was delayed due to time taken for obtaining permission from Forest Department/ Hon'ble High Court of Karnataka. The structures were demolished as and when the same was made available after paying necessary compensation. BMRCL further attributed the delays to changes/ modifications in alignment and acquisition of additional properties during execution of works.

Though the reply of BMRCL is factual, BMRCL has to put in place a mechanism to monitor the shifting of utilities/ demolition of buildings/ structures and align the same with the tendering of works to avoid consequential delays. Further, the pursuance through the HPC may also be made effective as considerable delays have been noticed in shifting of utilities, which consequently are delaying the execution of Metro Rail works.

#### **5.13.1 Additional cost of ₹33.56 crore for shifting of Tunnel Boring Machines (TBMs) at Dairy Circle in Package 1 of Reach 6 of Phase 2**

As per the approved Detailed Work Programme in respect of UG Package 1 of Reach 6, two TBMs were supposed to start from South Shaft to Dairy Circle from 7 September 2020 and 7 October 2020. Both TBMs were lowered and launched on 25 May 2021 and 14 July 2021. The drive from South Shaft to Dairy Circle Station consists of 612 metres. Both TBMs started tunnelling and TBM 1 was likely to reach Dairy Circle by 10 November 2021 by which time, Station in Dairy Circle had to be ready to receive the TBM. The work could not progress as planned due to delay in permission for felling/ transplantation of trees, diversion of existing electrical lines (one overhead line and one 11 KV cable), etc.

The Contractor reworked the route of the TBM and submitted (September 2021) cost estimate of ₹34.99 crore for deviations. Similarly, tree clearance issue at Langford station required additional piling works to facilitate breakthrough of third TBM. The contractor submitted cost estimates for additional piling works at North Shaft of Langford Town station at ₹0.97 crore. BMRCL placed (June 2022) variation order for both the works at ₹31.82 crore for deviation of TBMs at Dairy Circle station and creation of temporary shaft in Langford Town station. The contractor completed the work and was paid (June 2022) ₹33.56 crore. Due to delay in removal of trees and utilities, BMRCL incurred additional cost of ₹33.56 crore.

TC (IIT Delhi) observed that the clearing of trees was being monitored by the Hon'ble High Court of Karnataka and the High Court needed the breakup of the plantation to approve the tree cutting. Had the plantation been planned properly by BMRCL, the delay in tree-cutting could have been avoided.

BMRCL replied (March 2023) that clearing of trees was not under the control of BMRCL and clearing of utility was dependent on clearing of trees which necessitated change in TBM methodology at Dairy Circle Station. BMRCL further stated (February 2024) that the application to clear trees was made as early as in October 2017 but permission was not granted. Shifting of utilities without forming diversion road and without clearing trees was not possible.

BMRCL's reply may be viewed in light of the fact that it should have known at the time of preparing DPRs regarding removal of trees and shifting of utilities wherever trees and utilities were infringing Metro corridor. DPRs were submitted in September 2011 but application for removal of trees was filed in October 2017 and the amount was deposited with Bangalore Water Supply and Sewerage Board in February 2018 for shifting of utilities. Tenders were floated in January 2019, i.e., after eight (8) years, which was sufficient time for planning and realigning, if problems in tree felling and utilities shifting persisted.

*In response to TC's (IIT Delhi) suggestion, BMRCL stated (April 2025) that a dedicated team for removing of trees coming in the way of Metro alignment and compensatory plantation was formed by Social Environment Monitoring Unit, which was closely coordinating with the Forest Department and getting clearances/ approvals and was closely monitoring the translocation and compensatory plantation.*

***Recommendation # 8 - BMRCL should ensure that the acquisition of land, removal/ translocation of trees, shifting of utilities and demolition of buildings is completed before the award of civil/ system works to avoid delays in execution of works and payment of damages/ compensation for delays.***

*BMRCL stated (February 2024/ April 2025) that the Recommendation of Audit is noted.*

## 5.14 Execution of works

### 5.14.1 Delay in construction of Foot Over Bridges for stations under Phase 1

BMRCL commenced operations of Phase 1 Metro at Nagasandra, Peenya, Jalahalli and Dasarahalli between March 2014 and May 2015. In this regard, Audit observed that as the above stations were along the National Highway, foot over bridges/ underpasses had to be constructed for allowing passengers to cross the road and access the station. Presently, the Metro passengers have to go further and take a 'u' turn to access these Metro stations. The foot over bridge at Nagasandra was made operational from January 2021, while the foot over bridge at Dasarahalli and vehicular underpass at Jalahalli are under construction as of March 2023. However, in case of stations at Peenya and Peenya Industry, the construction of foot over bridges was not found feasible due to the vertical height clearances and BMRCL was yet to take corrective course of action for the passengers to have access.

TC (IIT Delhi) also opined that every Metro station has to have a safe crossing facility for pedestrians. In the absence of foot over bridge/ underpass, suitable arrangements have to be made for at grade crossing for access to the Metro station.

Thus, absence of foot over bridges/ underpasses has not only impacted the footfall of Metro ridership but also has impact on the safety of passengers crossing the road.

BMRCL stated (February 2024) that sincere efforts were taken by BMRCL to address the issue of safe road crossing by metro users at respective metro stations. Further, providing foot over bridge for pedestrian crossing was the responsibility of NHAI/ Bruhat Bengaluru Mahanagara Palike (BBMP), the custodian of road. Accordingly, construction of foot over bridges was taken up by BMRCL after it

was denied by BBMP. At Peenya and Peenya Industry, NHAI has provided one pedestrian crossing 85 m away from the station. BMRCL also stated that in Phase 2, provision of crossing of road by metro user has been integrated in metro station plan itself.



Picture 5A – No Footover Bridge at Peenya Station



Picture 5B – Newly constructed Footover Bridge at Nagasandra Station

BMRCL's reply may be viewed in light of the fact that ensuring safe crossing facilities at all metro stations is BMRCL's responsibility and necessary approvals/ clearance need to be obtained by BMRCL, as it was obtained by BMRCL from NHAI for constructing foot over bridge at Nagasandra. TC (IIT Delhi) also endorsed the audit opinion on provisioning of safe crossing for the metro users.

***Recommendation # 9 - BMRCL should ensure infrastructure for safe crossing of the metro users in case of the metro stations already in operation and/ or under construction and should prepare an Action Plan with specific timeline wherever this infrastructure is not available. Further, going forward, BMRCL should integrate crossing of road by metro users in metro station plan itself and accordingly obtain necessary permissions from the road owning Agencies (NHAI/ BBMP) and Traffic Police before executing the metro station works.***

***During the Exit Conference with Ministry, BMRCL agreed (May 2025) to the Recommendation and stated that in three, out of four stations highlighted by audit, foot over bridges have been provided and that provision for foot over bridges are included in all stations being designed now.***

#### **5.14.2 Non recovery of savings towards use of Granulated Ground Blast Furnace Slag in Concrete Design Mix**

The description in Item 1 of Schedule A – Pile Foundations and Open Foundations in civil contracts under Phase 2 provided for M35/ M20 Grade of RCC using Portland Slag Cement (PSC) for Pile and Pile Cap works. The contractors submitted M35 grade concrete mix designs with mix of Ordinary Portland Cement (OPC) *plus* Ground Granulated Blast Furnace Slag (GGBS), which was accepted by BMRCL for Pile and Structural Foundation Works.

In this regard, Audit observed that though the use of PSC vis-à-vis a mix of GGBS and OPC might have different cost implications, in 13 cases<sup>35</sup> out of 30 contracts under Phase 2, the payments were made based on the rate applicable for using PSC and no savings were passed on to BMRCL.

<sup>35</sup> ***Reach 1A, Reach 1B, Reach 3C, Reach 4B, Elevated Section of Reach 6, Four Underground Packages of Reach 6, Packages 1, 2 and 3 of Reach 5, Track Works of Phase 2.***

BMRCL stated (February 2024) that contract conditions clearly allow use of OPC *plus* GGBS and therefore, contractor must have quoted his rates for concrete works considering these conditions and hence, recovery cannot be made for use of GGBS.

BMRCL's reply may be viewed in light of the fact that while approving the contractors' proposals for use of OPC *plus* GGBS in place of PSC, it was mentioned by BMRCL that contractors were to make necessary price adjustments.

TC (IIT Delhi) also observed that the approval by BMRCL for usage of OPC and GGBS in place of PSC without analysing the financial impact was not justified. TC further stated that usage of GGBS could contribute to saving of ₹1,247.40 per cubic metre of M35 grade concrete, leading to a saving of nearly ₹3.57 crore to contractor, which was not passed on to BMRCL.

Furthermore, TC (IIT Delhi) advised using factory-manufactured PSC bags instead of mixing at the site. The uniformity in quality is better achieved in manufactured products at the factory.

***Recommendation # 10 - BMRCL should ensure that the cost estimates reflect the desirable concrete mix design and the contract conditions shall clearly specify the transfer of savings, if any, due to change in concrete mix design to prevent unjust enrichment of the contractor.***

***During Exit Conference with Management, BMRCL accepted (April 2024) the Recommendation.***

#### **5.14.3 Splitting of architectural finishing works of 15 Metro stations of Reach 5 corridor into two separate works to facilitate the meeting of tender qualification criteria**

BMRCL awarded contracts to two contractors during November 2020 and January 2022 for architectural finishing works in respect of 10 Metro stations and 7 Metro stations in Reach 5 under Phase 2 for ₹92.89 crore and ₹93.98 crore respectively.

In this regard, Audit observed that BMRCL had estimated (April 2020) that the architectural finishing works of 15 Metro stations in Reach 5 corridor under Phase 2 would be ₹171.43 crore. In the meantime, the then two contractors in Reach 4 and Reach 2 extension could not meet tender eligibility criteria for architectural finishing works of 16 Metro stations of Reach 1 extension and Reach 3C. Hence, BMRCL split (May 2020) the architectural finishing works into two separate tenders – one for ten Metro stations and second for five Metro stations. BMRCL also removed financial parameter, 'current ratio', from the tender, however, no justification for removing the financial parameter 'current ratio' was on record. As such, by splitting the tender into two, BMRCL extended undue advantage to designated contractors.

BMRCL replied (March 2023) that the entire scope of Reach 5 works was divided into three contract packages taking several aspects into account like Jayadeva Flyover, double decker viaduct, etc. Further, due to several issues, even tenders for structural contracts were also not taken up together and taken up in a phased manner. In respect of architectural finishing works also, though initially it was planned to go for one tender for entire Reach 5 line, however, considering the time lag in completion of station and viaduct works of all Packages of Reach 5, it was decided to consider two separate tenders. This was mainly for better management of architectural finishing works and may not be considered as



splitting of work for two separate tenders. BMRCL further stated (February 2024) that calling for two tenders should not be considered as splitting and this has rather facilitated wider participation of more vendors and speedy implementation/ completion. BMRCL reiterated (April 2025) the same.

BMRCL's reply may be viewed in light of the fact that the architectural finishing work was split specifically citing the reasons that two existing contractors in other Reaches could not qualify in the tender for similar work for 16 metro stations. Moreover, the work of entire 15 stations could have been awarded through one tender with the scope of better and competitive bid.

#### **5.14.4 Execution of non-tendered/ non-scheduled items without prior approval of the Competent Authority**

As per Item No.A.4.10 of Schedule of Powers (SoP) of BMRCL, the Managing Director (MD) has the power to approve and sanction any new item (Non-Tendered/ Non-Scheduled) up to ₹5 crore per item subject to a maximum of 10 *per cent* of the contract value.

Audit observed that in five contracts, non-tendered/ non-scheduled items valuing ₹8.63 crore (*Annexure XV*) were executed without prior approval of the Managing Director, who is the Competent Authority.

BMRCL replied (March 2023) that the execution was necessitated due to requirement of new items as per site conditions, availability of material, etc. and the works were mostly executed with the oral approvals as proper approval before taking up such works could have delayed the commissioning. BMRCL added (February 2024) that post-facto approval of the Competent Authority was obtained.

BMRCL's reply substantiates the Audit observation that approvals were taken only after execution while making payments to the Contractors, which was not an acceptable practice.

#### **5.14.5 Non recovery of special advances**

Audit observed that in 10 out of 69 civil contracts selected for review (*Annexure XVI*), BMRCL released special advance of ₹144.27 crore to contractors without any specific conditions in the contract citing poor financial position of contractors and also in the interest of progress of work. Though BMRCL could recover ₹79.23 crore, along with interest, in respect of eight cases, Company could not recover principal advance amounting to ₹65.04 crore in two cases as mentioned below –

- A. BMRCL placed order (March 2011) on a JV company for construction of UG tunnel and Metro stations under UG Package 1 of Phase 1, and termination notices were issued (April/ May 2014) due to slow progress and failure to meet contractual obligations. As the Bank Guarantees (BG) was not extended by the JV company and considering that the lead partner of the JV was involved in Corporate Debt Restructuring Process on account of weak financial situation, BMRCL encashed (July 2014) the BG amounting to ₹182.41 crore. However, in order to complete the balance works, BMRCL provided unsecured advances to JV company during August 2014 to July 2017 totalling to ₹130.35 crore. After adjustment of surplus amount of ₹85.94 crore (i.e., encashed BG of ₹182.41 crore *minus* ₹96.47 crore adjusted towards outstanding advances), the

JV company was liable to refund ₹44.41 crore (i.e., ₹130.35 crore *minus* ₹85.94 crore) by the time of completion of works. In addition, BMRCL had not recovered ₹81.18 crore from the JV company, towards Central Taxes, risk and cost amount for execution of South Bound Tunnel, rent and lease charges for land, excess payment of price variation and variation in works. The National Company Law Tribunal (NCLT) passed order for winding up the lead partner of the JV company on 06 December 2018.

Thus, BMRCL has not recovered total amount of ₹125.49 crore (i.e., ₹44.41 crore *plus* ₹81.18 crore) from the JV company.

Justifying its decision for release of advances to the JV companies, BMRCL stated (February 2024) that the recovery issue is being dealt along with other claims of the JV company in Conciliation/ Arbitration Proceedings and the final outcome is awaited.

- B.** Similarly, under another contract for construction of UG Majestic Metro station awarded to another JV company, BMRCL had released unsecured advances of ₹20.63 crore and ₹12.01 crore towards lease rent for land and direct payments to vendors at the time of completion of work. NCLT passed order for winding up the lead partner of the JV company on 06 December 2018.

Thus, BMRCL had not recovered a total amount of ₹32.64 crore (i.e., ₹20.63 crore *plus* ₹12.01 crore) from the JV company.

Justifying its decision for release of advances to the JV companies, BMRCL stated (February 2024) that the recovery is possible only if the claims of the contractor and counter claims of BMRCL are settled through Conciliation and Arbitration proceedings.

BMRCL's reply indicates that it did not exercise due diligence while releasing additional financial support without ensuring adequate security, resulting in blocking up of funds to the tune of ₹65.04 crore, recovery of which is very remote. Besides above, BMRCL had not recovered ₹93.49 crore (i.e., ₹81.18 crore *plus* ₹12.01 crore *plus* ₹0.30 crore) from the above two JVs towards various dues as mentioned above.

***BMRCL acknowledged the Audit suggestion to formulate a policy for release and recovery of the special advances given due to the financial incapacity of the contractors so that the same does not result as an undue benefit to the contractors and stated (February 2024) that the issue will be covered suitably in the Procurement Manual.***

#### **5.14.6 Avoidable expenditure towards price variation – ₹54.47 crore**

BMRCL placed order (November 2009) for laying Third Rail System in Phase 1. The contractor quoted contract price in Foreign Currency (US Dollar and EURO) as well as Indian Rupees (INR). As per Special Conditions of Contract (SCC) Clause 20.13, the rates and prices of Power Cables were subject to variation as per Indian Electrical and Electronics Manufacturers Association (IEEMA) formula and that too, for items quoted in INR only. The contractor quoted 33 KV cables and Direct Current (DC) cables in INR but subsequently, the same was allowed by BMRCL to be imported and

the contractor, despite the imports, had billed these in INR and claimed price variation on these items in deviation to the contract conditions.

In this regard, Audit observed that BMRCL paid price variation claims on imported 33 KV cables from May 2011 in deviation to the provisions of the contract. In this regard, while submitting (April 2010) the proposal to MoHUA, the Company excluded the item of 33 KV cables. However, while re-submitting the proposal, along with clarifications in June 2010, the item of 33 KV cables were included by the contractor, which was not diligently verified by BMRCL and was forwarded to the Ministry for approval. As the list approved by the Ministry included this item, the contractor imported the cables and raised claims in INR along with price variation. Despite realising (June 2014) that the payment was not as per contractual conditions, BMRCL continued to pay variation on 33 KV and DC cables by obtaining Bank Guarantee (BG) of ₹41.04 crore. However, by the time of completion of the supplies in December 2014, BMRCL paid a total price variation of ₹54.47 crore (₹52.03 crore towards 33 KV cables *plus* ₹2.44 crore for DC cables) against the BG of ₹41.04 crore. Despite encashing (January 2019) the BG of ₹41.04 crore, an amount of ₹13.43 crore was still recoverable. The Contractor disputed the recovery and went for arbitration.

BMRCL replied (March 2023/ February 2024) that the matter is under arbitration and any comment at this stage could be prejudicial to the interest of the company.

BMRCL's reply may be viewed in light of the fact that Arbitration Award was passed in February 2024 in favour of the contractor for reimbursement of entire PVC claims with 12 *per cent* interest from date of award to realisation and ₹1 crore towards legal and miscellaneous expenses.

Thus, BMRCL did not exercise due diligence in verification of the proposals submitted to the Ministry for seeking permission for concessional rates of customs duty, which has led to claiming price variation and subsequent arbitration.

#### **5.14.7 Non adjustment of pre-Goods and Services Tax (GST) taxes from Contract Prices resulting in excess payment of at least ₹24.60 crore**

Government of India (GoI) implemented GST Act with effect from 1 July 2017. The applicable GST to Metro projects was 18 *per cent*, which was subsequently reduced to 12 *per cent* from 25 January 2018. The then prevailing taxes before implementation of GST were Excise Duty at 12.5 *per cent* on steel and cement, Service Tax at 15 *per cent* and Karnataka Value Added Tax at 14.5 *per cent*. In this regard, Audit observed following:

- (a) In respect of the ongoing contracts, which were tendered/ awarded prior to implementation of GST Act from 1 July 2017, the basis price was arrived at by excluding GST from the contract price without considering the taxes applied prior to implementation of GST Act.
- (b) Considering item wise (Cement, Steel, Diesel, Labour and Fixed Costs) factors included in price variation formula, BMRCL calculated taxes at 18.955 *per cent*. Hence, due to non-adjustment of contract prices, the contractors were enriched on account of old taxes in the range of 0.955 *per cent* (18.955 *per cent* less 18 *per cent*) to 6.955 *per cent* (18.955 *per cent* less 12 *per cent*).

- (c) In this regard, pre-GST taxes were not adjusted in 10 contracts (*Annexure-XVII*) of selected sample valuing ₹3,305.80 crore resulting in excess payment of ₹24.60 crore, in three contracts on account of non-adjustment of pre-GST taxes while in balance contracts, Audit could not quantify as tax structure clause was deleted in the tender documents.
- (d) After implementation of GST Act, DMRCL obtained undertaking from each contractor to ensure that the benefit of reduction in tax rate on supply of goods and services or the benefit of additional Input Tax Credit had to be passed on to DMRCL. BMRCL, however, had not taken any such decision as of March 2023 for adjustment of contract price.

*As such, Audit suggests that the Company may adopt a uniform procedure in allowing/ reimbursing claims pertaining to introduction of GST.*

*BMRCL acknowledged the suggestion to ensure that the financial impact due to introduction of GST is worked out in line with tender conditions before settling the final bills of contractors in case of ongoing contracts and stated during the Exit Conference (April 2024) that the same will be examined by constituting a Committee. BMRCL added (April 2025) that the Committee has already recommended one case for settlement.*

#### 5.14.8 Levy and Recovery of Liquidated Damages

The contract conditions prescribed levy of Liquidated Damages (LD) for the period of delay beyond scheduled completion period for the reasons clearly attributable to contractors. In this regard, Audit observed that in 26 out of 117 contracts (*Annexure XVIII*), the delay in completion of works was in the range of three months to more than five years due to delay in handing over encumbrance free work front, delay in removal of trees, delay in shifting of utilities and insufficient resources deployed by the contractor. The delays were attributable to either parties, i.e., BMRCL as well as the contractor.

For instance, BMRCL placed order (February 2009) on a JV company for construction of two elevated Metro stations at R.V. Road Terminal and Jayanagar in Reach 4 of Phase 1 with scheduled completion by December 2013, which was, however, completed by October 2016 due to delays solely attributable to contractor due to financial problems, insufficient cash flows, delayed mobilisation of material, manpower, etc. The delay was also brought out by the Director (Rolling Stock, S&T and Electrical, O&M), while processing the Extension of Time up to 31 January 2017 for the 10<sup>th</sup> time. As per Clause 8.5 of General Conditions of Contract (GCC), BMRCL could levy 15 *per cent* of the original contract value (₹71.52 crore) as LD amounting to ₹10.73 crore, which was, however, not levied by BMRCL.

BMRCL stated (February 2024) that in the instant case, LD was not levied as balance works as on 31 October 2016 were only snag type and Final Bill was processed and paid as a measure of closure of contract. Imposition of penalty at that stage would have invited litigation/ arbitration which was not desirable.

BMRCL's reply may be viewed in light of the fact that in the instant case, despite having contractual provisions for levy of LD for the delays clearly attributable to the Contractor, BMRCL closed the contract without recovering LD of ₹10.73 crore. As such, BMRCL should not only maintain the data

regarding delays attributable to company as well as contractor but also enforce relevant penalty clauses wherein delays are solely attributable to the Contractor.

***Recommendation # 11 - BMRCL should consider developing a system for analysing the delays and should scrupulously levy Liquidated Damages for delays solely attributable to contractors as per the terms of the contract.***

***BMRCL stated (April 2025) that the Recommendation is noted.***

## 5.15 Design deficiencies

### 5.15.1 Loss of ₹31.73 crore due to design deficiency in execution of Package 3 of Reach 5 corridor under Phase 2

BMRCL placed order (August 2017) on a Contractor for construction of elevated structures (viaduct, stations and road cum rail flyover bridge) and Metro stations under Package 3 of Reach 5 of Phase 2. The designs were prepared by the Detailed Design Consultant (DDC) and approved by the Company and then given to the Contractor for construction. During execution, BMRCL observed (September 2020) that cracks of 0.05 millimetre (mm) to 0.25 mm had developed in the erected span of road level of S1 Road Segment (RS1) due to design deficiency. BMRCL conducted Ultrasonic Pulse Velocity Test costing ₹19.72 lakh to check the cracks and repaired the already erected RS1 segments to strengthen it at a cost of ₹15.04 crore. Further, the segments which were already cast at a cost of ₹3.39 crore<sup>36</sup> but not erected, had to be dismantled and discarded at a cost of ₹41.28 lakh, and new segments were cast with new design at a cost of ₹3.19 crore. Also, during this interim period, the contractor had claimed idle charges of ₹32.35 crore and BMRCL agreed to settle at ₹9.50 crore. On the whole, BMRCL incurred ₹31.73 crore<sup>37</sup> for rectification of cracks in Segments and casting of Segments with new design.

TC (IIT Delhi) observed that IS 456:2000 permits a maximum crack width of 0.30 mm. However, a crack width of up to 0.90 mm was observed from the Ultrasonic Pulse Velocity Test Report. Although the cracks had been repaired, the root cause has not been identified. It further opined that the cracks could appear due to multiple reasons such as improper concrete design mix, inappropriate method of curing, inappropriate handling of precast element, and poor reinforcement detailing. It also mentioned that the original structure cannot be restored by repair.

BMRCL replied (March 2023) that considering importance of the structure, design criteria was subsequently modified for restricting crack width to 0.15 mm. Structure design was rechecked through DDC, who recommended for revised design and strengthening of already cast and erected RS1 Segment to fulfil revised crack width criteria. BMRCL further replied (February 2024) that Expert Committee comprising of Professors from IITs, Indian Institute of Science and Expert Consultants opined that cracks were due to secondary stresses in transverse direction not detrimental to safety and integrity of structure and possibility of cracks opening is remote under normal service conditions.

<sup>36</sup> ₹3.39 crore = (₹4,39,086 x 62 nos. of segments of old design) plus (₹5,14,115 X 13 nos. of segments of new design prototypes)

<sup>37</sup> ₹31.73 crore = 0.20 + 15.04 + 3.39 + 0.41 + 3.19 + 9.5



While the action taken by BMRCL in investigating the reasons for development of cracks in segments and taking corrective action is appreciated, Audit suggests that the detailed designs may be thoroughly verified before finalisation considering the secondary stresses.

***BMRCL, while acknowledging the Audit suggestion to ensure that the designs and drawings are carefully scrutinised for any technical deficiencies before issue to the contractors for implementation so as to avoid time and financial loss to the Company, stated (April 2025) that BMRCL has put in place a system of proof checking of design. The designs prepared by DDC are reviewed by BMRCL design team and proof checked by Indian Institute of Science, Bengaluru.***

### 5.15.2 Changes in design during execution

For Phase 1 works, Designs were prepared by engaging Detailed Design Consultants (DDCs) which were checked and approved by the General Consultant besides approval of BMRCL. For Phase 2 works, the detailed Designs and Drawings submitted by the DDCs were proof checked by Indian Institute of Science, Bengaluru before approval by BMRCL's in-house Planning and Design Cell.

In this regard, Audit, along with TC (IIT Delhi), observed that the retaining wall was partly constructed at Anjanapura Depot. Changes were necessitated in the Design due to land constraints and box-type wall had to be adopted. It was also noticed that the Depot was designed to be constructed over a large filling. Due to large filling, the pile length had also increased significantly. This coupled with cost of filling material which had to be transported from a distance of about 12 km resulted in avoidable extra costs. The filling material was not appropriately compacted as large cracks were visible in different locations of the Depot area. Proper compaction should be ensured by BMRCL to avoid any settlement in the future and any damages to the Depot structure.



Picture 6A



Picture 6B



Picture 6C

Picture 6A – Partly constructed Retaining Wall at Anjanapura Depot

Picture 6B – Box-type Retaining Wall based on the revised design at Depot and huge filling

Picture 6C – Compaction of filling material required at the Depot

BMRCL stated (February 2024) that to expedite the work, earth filling was done leaving 10-12 metres of space from the retaining wall. The cracks were observed in the earthen slopes as it was not compacted at that point of time. While doing earth filling for the balance portion, the loose earth on the slopes will be removed and fresh earth work will be executed in layers duly compacted.

*TC (IIT Delhi) suggested to explore other options, such as constructing a framed structure below the Depot construction and lowering the level of the Depot Area with some cutting to avoid abnormal costs for filling and additional costs towards extra pile lengths in similar cases apart from future quality issues due to improper compaction of filling. BMRCL stated (April 2025) that the suggestion is noted.*

## 5.16 Quality issues

### 5.16.1 Project Quality Management

BMRCL envisaged submission of proper Quality Assurance and Quality Control (QAQC) Plan, as per ISO 9001, by the Contractor which is approved by BMRCL before starting the work. BMRCL's Quality Cell/ Team checks the quality independently on its own or by engaging Independent Quality Monitoring Consultants (IQMC) who are deputed to monitor the quality of works including conducting and witnessing tests and inspection of construction activities at different stages.

In this regard, Audit, along with TC (IIT Delhi), noticed that quality of construction varied in different contracts. Significant variation in the compressive strength of Reinforced Cement Concrete (RCC) was observed from the Rebound Hammer Tests (RHT) conducted ranging from 19 to 33 in corner columns (designed for M35) in Depot Control Room at Kothanur Depot and from 25 to 44 in columns (designed for M50) on the first floor of Central Silk Board Station, indicating that the quality of concrete was non-uniform. Further, in the selected locations reduction in strength by about 15 to 20 per cent from the contractually desired values was noticed.



**Picture 7 – Rebound Hammer testing at Central Silk Board Station**

The quality was largely dependent on the contractor's capacity and the formwork system they adopted.

BMRCL stated (February 2024) that the concrete quality is ascertained based on the cube strength as laid down in the relevant IS codes. In BMRCL, in all the Reaches, cube strengths are higher than the design characteristic strength. RHT gives only approximate indication of the concrete surface. This test cannot be a substitute for the cube test. It was also stated that BMRCL had already established an elaborate four level quality control mechanism. The quality control systems exist at contractor level, BMRCL in-house quality control team, Project Management Consultant and Indian Institute of Science.

TC (IIT Delhi) stated that though RHT may not be a substitute for Cube Test, it is one of the most popular and reliable tests conducted to test the strength of concrete. If BMRCL had rigorously followed Cube Test, then RHT results at selected locations should have been in a close range but the results showed wide

variations, which indicates that proper procedure after construction might not have been followed to retain the strength. TC (IIT Delhi) also stated that the cube strength is checked to ensure quality of the concrete mix. However, quality of the concrete structure depends on other factors as well, such as transportation method, placing, compaction, curing and workmanship. The uniformity of concrete is, thus, checked using non-destructive testing techniques such as RHT. The test result on specific locations (Kothanur Depot Control Room, Central Silk Board Station) showed that concrete quality was not uniform in some structural components. BMRCL, however, did not provide any specific reply on the non-uniformity of the concrete in different structures.

*As per the suggestion of Audit during the Exit Conference with Management (April 2024), BMRCL stated that fresh Cube Tests will be done and results will be shared with Audit.*

### 5.16.2 Selection of proper formwork

Selection of formwork<sup>38</sup> has a vital role in ensuring quality and safety. Absence of proper formwork system is a primary cause of many quality related issues. In this regard, Audit, along with TC (IIT Delhi), noticed that good formwork system was adopted in the sites at Nagawara, MG Road, Jayadeva Hospital and Cantonment Station, whereas poor formwork system was noticed in the sites at Bengaluru International Exhibition Centre (BIEC) station and Kothanur Depot. In most of the sites, make-shift formwork was used which causes serious quality related issues. In certain sites, the approved formwork design was not implemented. It was also noticed that the tie rods after concreting were not grouted.



Picture 8A - Good formwork system at Cantonment station



Picture 8B - Improper base of the formwork system and poor concreting at Kothanur Depot

BMRCL stated (February 2024) that proper staging/ scaffolding arrangement was ensured for all type of formworks like column, roofbeam and slabs. Tie rod holes filling works are being taken up within reasonable period after concreting and de-shuttering.

*BMRCL acknowledged the Audit suggestion to ensure a system of formwork for Reinforced Cement Concrete structures in different contracts irrespective of the selected contractors and stated (February 2024) that the suggestion is noted.*

<sup>38</sup> Formwork is the term used for the process of creating a temporary mould into which concrete is poured and formed under civil construction.



### 5.16.3 Poor quality of civil structure

The Audit team, along with TC (IIT Delhi) and BMRCL officials, visited few ongoing construction sites and reviewed the design and drawing documents, which revealed instances of poor quality of civil structures such as bulging, honey combing and exposed reinforcement indicating consequences of poor formwork system. In the absence of proper formwork system, the quality, safety, and economy of RCC structures cannot be ensured.

#### A. Poor concreting



Picture 9A - Breaking of wall at Dairy Circle



Picture 9B - Poor quality at Kothanur Depot



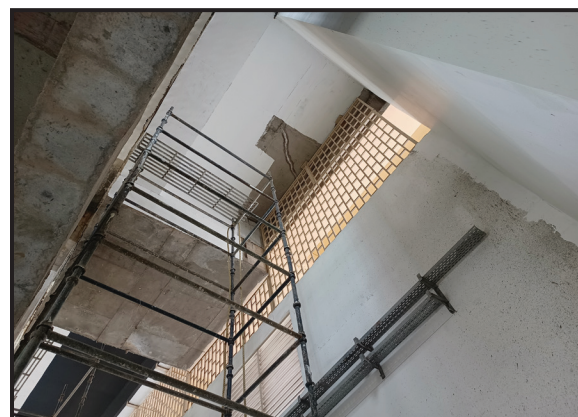
Picture 9C - Cracks on plinth beam below rails at Nagasandra Station



Picture 9D - Poor concreting in RCC wall construction at BIEC station



Picture 9E - Poor concreting in columns at Central Silk Board station



Picture 9F - Cracks and seepage on the slab at Jindal Station

## B. Honeycombs



Picture 10A - Honeycombs and non-uniform concrete surface of retaining wall at BIEC station



Picture 10B - Honeycombs in beams at Central Silk Board station construction

BMRCL stated (February 2024) that the said locations have been visited and rectification of cracks was carried out as per quality laid down procedures. All construction joints were stated to be well grinded for smooth finishing and to disappear. Proper formwork is stated to be ensured for good quality of the structures. Cracks and seepage observed at the Jindal Station were cleaned thoroughly with wire brush and rectified by grouting. BMRCL added (April 2025) that there is a four level quality control system.

*TC (IIT Delhi), however, noted that the repair work will not bring it to the original desired function and is definitely going to impact its durability.*

*BMRCL added (April 2025) that it shall be ensured that works shall be carried out as per the requirements in future.*

### 5.16.4 Poor quality in execution of Package 2 (RT2) of Reach 6 corridor

BMRCL awarded (February 2019) Design and Construction work of UG Structures (Tunnels & Stations) from Vellara Junction to Shivaji Nagar (Package-2) of Reach 6 Corridor. During execution, BMRCL observed cracks, joint steps/ lips in the rings provided for tunnel lining, including water leakage from some of the cracks. Meanwhile, BMRCL withheld an amount of ₹10.10 crore from the bills towards repair of cracks at the rate of ₹5 lakh per ring for 202 rings, which was yet to be adjusted from the Interim Payment Certificates (IPCs) of the contractor.

BMRCL replied (March 2023) that width of the cracks observed were lesser and could be repaired. The amount was withheld as a precaution and will be released after successful repair of cracks. BMRCL further stated (February 2024/ April 2025) that the cracks were inspected by Professor from IIT Madras who opined that the cracks lesser than 0.2 mm can lead to automatic closure due to continued hydration and cracks more than 0.2 mm width were proposed to be filled with grouting.

Though the cracks were being repaired, Audit along with Technical Consultant (IIT Delhi) was of the view that original structures cannot be restored by repairs. Further, IIT Madras had recommended that the Contractor should take concrete steps to ensure avoidance of cracks due to improper arrangement of hydraulic jacks, improper evaluation of reinforcement requirement at the thrusting face, etc.



### 5.16.5 Proper safety measures not followed

The Audit team, along with the TC (IIT Delhi) and BMRCL officials, visited few ongoing construction sites and noticed that proper safety measures were not followed, which may lead to accidents. Side handrails were not provided on the stairs, open spaces were not appropriately covered though the works were ongoing and edges of constructed slabs were not barricaded properly in the Jayadeva Hospital station. Open spaces beside the platform staircase over the roads were not appropriately covered in Nagasandra station.

The Audit Team along with TC (IIT Delhi) noted proper safety measures were taken at Nagavara station.

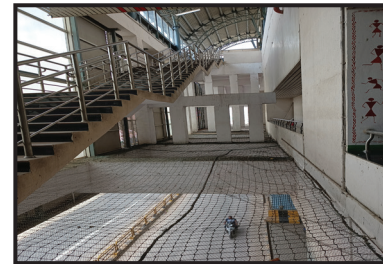
BMRCL stated (February 2024) that the Company ensures proper safety measures with Internal Safety Audit regularly wherein poor housekeeping works are addressed and the same are complied by the Contractor and the Contractors are penalised for lapses/ occurrences so as to discourage repetition in future.

***TC (IIT Delhi) opined that even though the contractor(s) were penalized by BMRCL for not following the safety protocols, the penalty cannot compensate for the loss of life or major incidents due to unsafe work.***

***BMRCL acknowledged the Audit suggestion to ensure proper safety measures are taken by the Contractors during construction at site and stated (February 2024) that the suggestion is noted.***



**Picture 11A – Missing barricade and protection at staircase at Jayadeva Hospital station**



**Picture 11B – Improper covering of open spaces at Nagasandra station over the road**

### 5.17 Role of High Power Committee

As per the GoI Sanction Order (May 2006) for Phase 1 of Bangalore Metro Rail Project, a High Power Committee (HPC) under the chairmanship of Chief Secretary, GoK will be set up and shall meet once in a month to oversee and take expeditious decisions on the problems with regard to land acquisition, diversion of utilities, shifting of structures in the project alignment, rehabilitation of project-affected persons, etc. Further, as per Clause 12.14 of Phase 1 MoU (December 2010) and Clause 12.15 of Phase 2 MoU (February 2017) signed between GoI, GoK and BMRCL, the Committee shall normally meet once in a month or more, if required, to sort out all the above stated issues.

In this regard, Audit observed that HPC conducted first meeting during January 2007 and up to August 2021, total 41 meetings were conducted, as against minimum of 176 meetings to be conducted, as per the MoUs for Phase 1 and 2. Further, HPC meetings held in any year during the period from January 2007 to August 2021 ranged between zero (2014) and seven (2011). It is pertinent to note that Audit noticed huge delays in acquisition of land, diversion of utilities, payment of compensation to the land losers, etc., which led to delay in project completion and increase in project costs of Phase 1 and 2.

BMRCL replied (February 2024) that HPC meets at regular intervals to resolve issues concerning BMRCL project implementation such as land acquisition issues, utility shifting related issues, etc. and necessary directions are issued for early resolution of any issues affecting the progress of works.

The fact remains that HPC meetings were not held even once in a month, as required under the MoUs for Phase 1 and 2.

***Recommendation # 12 - GoK should ensure that the functioning of High Power Committee is effective in resolution of land disputes, early settlement of land compensation, shifting of utilities and availability of clear work fronts.***

***During the Exit Conference with Management, BMRCL stated (April 2024) that the Company will make efforts to arrange for more meetings of the High Power Committee.***

## 5.18 Conclusion

BMRCL did not have a Procurement Manual due to which estimation of costs, size of Packages, fixation of quantum of Mobilisation/ Plant and Machinery Advance, fixation of rate of interest on those Advances, etc. were not uniform in all cases. Further, irregularities in estimation of costs, evaluation of tenders, award of works were noticed. Discrepancies in execution of works were noticed, which resulted in additional/ avoidable costs. The work was split into parts to favor the awarding of work to existing contractors, non-tendered items were executed without prior approval of Competent Authority, and there was lack of proper and efficient monitoring due to insufficient meetings of HPC. Release of interest free Mobilization/ Plant and Machinery Advances was noticed. The works were inordinately delayed due to delays in land acquisition, shifting of utilities, removal/ translocation of trees, demolition of buildings/ structures, etc. Quality issues were noticed, which were a result of adoption of poor formwork and quality of civil structure. Proper safety measures were not followed during construction.



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# **Chapter 6:**

# **Financial Management and Innovative Financing**

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## **Vacant Built-up Area at Peenya Metro Station**



## **Infosys Konappana Agrahara Metro Station funded by M/s Infosys Foundation**





## Chapter 6: Financial Management and Innovative Financing

The Bangalore Metro Rail Project was funded by the GoI and GoK through equity and subordinate debt. In addition, BMRCL had raised funds by issue of Namma Metro Bonds and availed loans from HUDCO, Public/ Private Banks and Karnataka Urban Infrastructure Finance Corporation Limited. BMRCL also availed Senior Term Debt from GoK, loans from International Funding Agencies, viz., Japan International Cooperation Agency (JICA), Agence Francaise De Developpement (AFD), European Investment Bank (EIB), and Asian Infrastructure Investment Bank (AIIB) through GoI without any risk of foreign currency exchange rate fluctuations. The details of the project financing are mentioned in **Table 1.5** *supra*. Further, BMRCL also receives reimbursement of State Taxes and cash losses from GoK.

Audit observations on the financial management in BMRCL are presented below.

### 6.1 Servicing of External Debt for the project

GoI entered into loan agreements with Foreign Financial Institutions for implementation of Phase 1 and 2 and BMRCL received loan as Senior Term Debt from International Funding Agencies through GoI. The details are indicated below –

**Table 6.1 – Details of funds received by BMRCL as Senior Term Debt through Assistance from Government of India**

(₹ in crore)

| Detail                                     | Phase 1  |        |        | Phase 2  |          |          |          | Total     |
|--------------------------------------------|----------|--------|--------|----------|----------|----------|----------|-----------|
|                                            | JICA     | JICA   | AFD    | AFD      | EIB      | AIIB     | JICA     |           |
| Loan Amount                                | 2,221.13 | 986.99 | 873.29 | 1,440.00 | 3,973.40 | 2,330.26 | 1,352.94 | 13,178.01 |
| Senior Term Debt received                  | 2,221.13 | 986.99 | 873.29 | 1,440.00 | 3,967.27 | 2,319.14 | --       | 11,807.82 |
| Tenure including moratorium period (Years) | 30       | 30     | 20     | 20       | 20       | 25       | 30       |           |
| Principal Repayment done as of March 2023  | 812.61   | 97.43  | 320.21 | 360.00   | 21.96    | --       | --       | 1,612.21  |

BMRCL received ₹11,807.82 crore as Senior Term Debt against a sanction of ₹13,178.01 crore through GoI, of which principal loan of ₹1,612.21 crore has been repaid as of March 2023. Audit noticed that BMRCL has been continuously incurring cash losses for the period from 2013-14 to 2021-22 and has been depending on the GoK for debt repayment as provided in the tripartite MoUs signed (December 2010/ July 2013/ February 2017) as shown in the **Table 6.2**:

**Table 6.2 - Year-wise cash losses of BMRCL for the period 2013-14 to 2022-23****(₹ in crore)**

| Particulars                             | 2013-14        | 2014-15        | 2015-16         | 2016-17        | 2017-18        | 2018-19        | 2019-20        | 2020-21         | 2021-22         | 2022-23     |
|-----------------------------------------|----------------|----------------|-----------------|----------------|----------------|----------------|----------------|-----------------|-----------------|-------------|
| Total Income                            | 35.93          | 42.99          | 54.24           | 145.12         | 337.21         | 419.47         | 433.23         | 81.97           | 207.29          | 594.01      |
| Total expenses including debt servicing | 55.05          | 109.74         | 170.64          | 238.47         | 374.79         | 448.47         | 488.09         | 401.14          | 441.68          | 584.74      |
| <b>Cash Loss</b>                        | <b>(19.12)</b> | <b>(66.75)</b> | <b>(116.40)</b> | <b>(93.35)</b> | <b>(37.58)</b> | <b>(29.00)</b> | <b>(54.86)</b> | <b>(319.17)</b> | <b>(234.39)</b> | <b>9.27</b> |

Audit observed that Phase 1 was commercially operationalised in a phased manner from October 2011 to June 2017 and also three Reaches of Phase 2 were commercially operational from January 2021, August 2021 and March 2023 respectively. However, BMRCL incurred cash losses from FY 2013-14 onwards as the projected revenue could not be achieved due to low ridership. Further, BMRCL has not generated sufficient Non-FBR due to non-development of identified land properties/ non-acquisition of land for PD.

BMRCL stated (February 2024) that one of the major Non-FBR i.e., from advertisement (inside and outside metro stations) could not be achieved due to ban on advertisement by GoK. However, for 2022-23, BMRCL was able to meet the finance cost from its own sources.

This may be viewed in light of the fact that during the years 2013-14 to 2021-22, BMRCL has incurred total cash losses of ₹970.62 crore and had a cash surplus of only ₹9.27 crore during the year 2022-23, that too due to change in Accounting Policy and considering income generated on surplus project funds as part of 'Other Income' of the company, which was earlier adjusted against Capital Work In Progress (Project Cost).

## **6.2 Delay in receipt of Operational Cash Losses from GoK**

As per Supplementary MoU signed (July 2013) between GoK, GoI and BMRCL, GoK has to reimburse cash losses within five business days after intimation from BMRCL. In this regard, year-wise cash losses incurred by BMRCL and amounts reimbursed by GoK are given below:

**Table 6.3 – Year wise cash losses incurred by BMRCL and reimbursed by GoK****(₹ in crore)**

| Year    | Cash loss | Date of Reimbursement | Cash loss reimbursed by GoK | Balance Cash loss yet to be received from GoK |
|---------|-----------|-----------------------|-----------------------------|-----------------------------------------------|
| 2013-14 | 19.12     | --                    | --                          | 19.12                                         |
| 2014-15 | 66.75     | --                    | --                          | 85.87                                         |
| 2015-16 | 116.40    | --                    | --                          | 202.27                                        |
| 2016-17 | 93.35     | --                    | --                          | 295.62                                        |
| 2017-18 | 37.58     | 31.03.2018            | 202.27                      | 130.93                                        |
| 2018-19 | 29.00     | 19.03.2019            | 116.39                      | 43.54                                         |
| 2019-20 | 54.86     | 19.03.2020            | 43.00                       | 55.40                                         |
| 2020-21 | 319.17    | 06.01.2021            | 50.00                       | 324.57                                        |

|              |               |                             |               |        |
|--------------|---------------|-----------------------------|---------------|--------|
| 2021-22      | 234.39        | October 2021 & January 2022 | 200.00        | 358.96 |
| 2022-23      | --            | June 2022 and November 2022 | 233.80        | 125.16 |
| <b>Total</b> | <b>970.62</b> |                             | <b>845.46</b> |        |

Audit observed that GoK had not reimbursed cash losses in time as stipulated in supplementary MoU. Cash losses of ₹202.27 crore for the period 2013-14 to 2015-16 were reimbursed in the FY 2017-18 with a delay of up to five years. Subsequently, cash losses for the period 2015-16 to 2021-22 were reimbursed in partial payments until November 2022. An amount of ₹125.16 crore for the year 2021-22 is yet to be received as of March 2023. As a result, BMRCL had to utilize the project funds for the operation and maintenance activities of Metro.

BMRCL replied (March 2023) that loans raised from external sources are as per the approved funding pattern (Senior Debt) and are used for capital expenditure only. BMRCL added (February 2024) that the project funds from the shareholders were never used to meet the operational expenses since BMRCL is able to meet its operational expenditure, i.e., salary, energy and maintenance from its operational revenue.

BMRCL's reply may be viewed in light of the fact that cash losses were reimbursed with a delay of five years and during the interim period, BMRCL was forced to use project funds for operating activities as sufficient FBR and Non-FBR could not be generated. Further, BMRCL had intimated (November 2019) that in view of delay in getting reimbursement of cash losses from the GoK, BMRCL had repaid the loan amount out of Phase 2 funds.

***BMRCL acknowledged the Audit suggestion and stated (February 2024/ April 2025) that MoHUA is monitoring the loan repayment and as per tripartite MoU signed between GoI, GoK and BMRCL, in case BMRCL is not able to repay the loan, GoK is servicing the same.***

### 6.3 Non-Farebox Revenue as per DPRs

The national seminar on 'Urban Mass Transportation' organised by the Institute of Engineers (Karnataka) recommended (November 1994) that, considering the capital intensive nature of Urban Mass Rapid Transit System (UMRTS) projects, these projects require careful evaluation of traffic flows, costs and other parameters to determine the subsidy element<sup>39</sup> and farebox level<sup>40</sup>. Land development, including area over the structures/ facilities, should also be fully planned as it can contribute up to 20 per cent of total capital cost of the project.

DPRs envisaged a minimum Non-Farebox Revenue (Non-FBR) of 10 per cent of total Farebox Revenue (FBR) through Property Development (PD – 5 per cent) and advertisement revenues (5 per cent), after commencement of commercial operations of the corridors. The projected and the actual Non-FBR from 2016-17 to 2022-23 are as follows –

<sup>39</sup> The subsidy element implies quantum of subsidy in the form of taxes offered by State/ Central Government to be considered while finalisation for implementing the metro project.

<sup>40</sup> Farebox level means the quantum of the revenue generated from metro commuters for sustainable running of the metro rail operations.

**Table 6.4 – Projected vis-à-vis Actual Non Farebox Revenue for Phase 1 and Phase 2****(₹ in crore)**

| Detail                                                          | 2016-17 | 2017-18 | 2018-19 | 2019-20  | 2020-21  | 2021-22  | 2022-23  | Total    |
|-----------------------------------------------------------------|---------|---------|---------|----------|----------|----------|----------|----------|
| Projected revenue (FBR) as per DPR for Phase 1 and 2            | 464.83  | 510.20  | 552.15  | 1,560.16 | 1,758.76 | 1,858.19 | 1,987.47 | 8,691.76 |
| Actual revenue earned (FBR)                                     | 110.10  | 281.00  | 355.02  | 376.88   | 49.19    | 163.33   | 422.61   | 1,758.13 |
| Projected revenue (Non-FBR) as per DPR for Phase 1 and 2        | 112.81  | 124.65  | 141.25  | 156.02   | 175.88   | 185.81   | 198.36   | 1,094.78 |
| Actual revenue earned (Non-FBR)                                 | 20.18   | 44.00   | 47.33   | 43.03    | 24.37    | 28.01    | 37.40    | 244.32   |
| Percentage of Actual Non-FBR vis-à-vis Actual FBR earned (%)    | 18.33   | 15.66   | 13.33   | 11.42    | 49.54    | 17.15    | 8.85     | 13.90    |
| Percentage of Actual Non-FBR earned vis-à-vis Projected FBR (%) | 4.34    | 8.62    | 8.57    | 2.76     | 1.39     | 1.51     | 1.88     | 2.81     |

Audit noted that during the last seven (7) years from 2016-17 to 2022-23, though actual Non-FBR as a percentage of actual FBR ranged from 8.85 *per cent* to 49.54 *per cent*, BMRCL could not earn 10 *per cent* Non-FBR with respect to the projected FBR, as envisaged in DPRs and ranged between 1.39 *per cent* (2020-21) and 8.62 *per cent* (2017-18).

Further, other revenue as envisaged through income from advertisements on trains and tickets, within stations and parking lots, on viaducts, columns and other Metro structures, co-branding rights to corporates, film shootings, special events on Metro premises, etc. also could not be realized as BMRCL did not frame any ‘Advertisement Policy’.

BMRCL replied (March 2023/ February 2024) that downfall in Non-FBR was due to COVID 19 effect from 2019-22 and ban on Bruhat Bengaluru Mahanagara Palike (BBMP) ‘Outdoor Signage and Public Messaging Byelaw 2018’ by Hon’ble High Court of Karnataka with a direction to formulate new policy. Till BBMP frames its own policy, BMRCL will not be in a position to make any policy. Also, BMRCL has raised the issue of generating revenue from advertisement before the HPC.

Reply of BMRCL may be viewed in light of the fact that BMRCL did not escalate the matter to Additional Chief Secretary, Urban Development Department and BBMP, despite HPC directions (June 2019) to expedite finalization of bye-laws for allowing BMRCL to take up advertisements on Metro infrastructure.

***BMRCL acknowledged the Audit suggestion to frame the ‘Advertisement Policy’ as per the directions of the Hon’ble High Court of Karnataka to generate Non-FBR as per the projections of DPRs and stated (February 2024/ April 2025) that it shall frame its own policy once BBMP comes out with the outdoor advertisement policy and guidelines.***

#### **6.4 Payment of commitment charges without assessing requirement of assistance**

BMRCL signed (27 March 2012) a Facility Agreement (FA) with Asian Development Bank (ADB) for availing credit facility of US\$ 250 million. As per FA, BMRCL shall pay to ADB

a front-end fee of one *per cent* (US\$ 25,00,000) of the commitment as at the Agreement Date, and accordingly, BMRCL transferred (April 2012) US\$ 12,50,000 (₹6.52 crore) to ADB towards 50 *per cent* of it. Considering that BMRCL did not draw the loan amount within 12 months, as it raised funds from other sources, ADB terminated (October 2015) the FA, by which time BMRCL had incurred ₹8.74 crore towards front-end fee (₹6.52 crore), cost for conducting due diligence (₹1.79 crore) and towards reimbursement of expenses (₹0.43 crore).

In this regard, Audit observed that -

- (i) The loan amount was not disbursed by ADB in view of delay on the part of BMRCL in finalising the Ancillary Loan Documents namely Concession Support Agreement, GoK Support Agreement, etc. Thus, BMRCL's non-compliance with the Conditions Precedent of the FA resulted in unfruitful expenditure of ₹8.74 crore.
- (ii) Meanwhile, BMRCL had sourced funds through Bank of Maharashtra (₹150 crore), Bank of India (₹205 crore), Vijaya Bank (₹150 crore) and initiated (June 2013) proposals for issue of Secured, Non-convertible, Redeemable, Taxable 'Namma Metro Bonds' for ₹300 crore apart from sourcing from AFD as part of the EURO 110 million Sovereign Loan. It is pertinent to mention here that sourcing through above Commercial Banks and through Bonds was at Base Rate (10.20 to 10.25 *per cent*) and 8.79 *per cent* per annum respectively, which was higher than ADB committed interest rate of LIBOR<sup>41</sup> *plus* 1.90 *per cent*.

BMRCL replied (March 2023) that, with a view to have financial closure for an amount of ₹2,481.37 crore, it was scouting for domestic loans through various funding agencies including HUDCO, issue of Bonds, Commercial Banks, etc. Hence, non-sovereign loan from ADB was correctly proposed to be reduced from US\$ 250 million to US\$ 33 million, which was, however, not availed due to additional conditions from ADB, which BMRCL did not agree. BMRCL further stated (February 2024) that since Secured Overnight Financing Rate (SOFR) which replaced LIBOR was increasing every six months, if such interest rate was applicable on ADB loan which had a tenure of 18 years, the rate was more than the domestic interest rates. Hence, sourcing through commercial banks was not costlier as stated by Audit.

BMRCL's reply may be viewed in light of the fact that BMRCL had signed an agreement (December 2011) with HUDCO for availing loan of ₹700 crore before signing of FA with ADB (March 2012). Further, during February 2015, BMRCL had mentioned to its Board that on account of delay in getting the loan disbursement against the FA of US\$ 250 million, BMRCL was constrained to avail certain credit facilities at a substantially higher cost.

***BMRCL agreed (April 2024/ April 2025) to the Audit suggestion to conduct cost benefit analysis based on availability of loans and loan requirements with reference to interest pay out before approaching the Financial Institutions.***

<sup>41</sup> 6 months US\$ LIBOR varied from 0.32 to 5.63 *per cent* in the last 15 years, i.e., from 2004 to 2018.



## 6.5 Loan availed for tax portion in violation of Loan Agreements

As per the terms of Loan Agreements signed (September 2018/ June 2019) with EIB and AIIB for Reach 6 of Phase 2, BMRCL shall avail loan on reimbursement basis in the ratio of 60:34 and balance 6 per cent towards tax amount to be funded by BMRCL. In this regard, Audit observed that though tax amount was to be self funded, BMRCL availed loan for GST amount of ₹75.59 crore on Mobilisation Advances as well as Plant and Machinery Advances paid to the contractors. Hence, availing loan for GST amount was not only violation of terms of the Loan Agreement but also led to additional interest burden on the Metro Rail Project during construction period as well as on the State Government, as the SGST portion is already borne by GoK as per MoU terms.

BMRCL replied (March 2023) that loan amount claimed by it from AIIB/ EIB is exclusive of applicable GST amount. BMRCL further replied (April 2024) that initially the disbursement claims submitted by BMRCL to the Funding Agencies were based on the Mobilisation Advance paid to the contractors. While lodging claims to the Funding Agencies based on Interim Payment Certificates (IPCs) paid by BMRCL for the work done by the contractor, the payment to the contractor is made net of the recovery towards advance paid, TDS and GST paid on work done as per invoice. Hence, no loan has been availed on the tax portion.

BMRCL's reply is factually incorrect in view of the fact that it had availed loan for GST on advances paid to the contractors, which is also corroborated by the reply of BMRCL (April 2024) which stated that the "*disbursement claims were based on Mobilisation Advance paid to contractors*", which is inclusive of GST portion. Further, the reply of BMRCL regarding payment to contractor based on IPCs is not relevant to the aspect of Audit observation on availing loan from EIB/ AIIB. Thus, BMRCL availed loan on taxes of ₹75.59 crore in deviation to the provisions of the agreements with EIB and AIIB and paid interest on taxes.

***Recommendation # 13 - BMRCL should ensure availing loans from Financial Institutions as per the terms of the loan agreement to avoid the interest burden and future legal complications for deviations.***

***BMRCL stated (April 2025) that it is drawing loans strictly in accordance with the terms and conditions of loan agreement.***

## 6.6 Reimbursement of State Taxes and Duties by GoK

The viability of the Phase 1 and 2 was assessed without considering State Government Taxes and Duties. GoK agreed (18 November 2008) for reimbursement of state taxes and duties paid to State Departments during execution of project. Further, Clause 10.4 of MoU (24 December 2010) between GoI, GoK and BMRCL provides that BMRCL would be reimbursed/ exempted from State/ local taxes and duties/ levies. BMRCL has claimed reimbursement of taxes of ₹1,825.29 crore and received ₹1,609.59 crore from the State Government up to March 2023. Details of reimbursement of State taxes and duties by GoK is given in *Annexure XIX*.

*Audit suggests that BMRCL should carryout periodic reconciliation of contract wise tax deducted, deposited with tax authorities and taxes claimed/ reimbursed by GoK.*

## **6.7 Delay in receipt of BDA/ GoK's share of ₹426.47 crore for works taken up on the recommendation of High Power Committee**

HPC recommended (July 2015) for demolition of existing flyover at Jayadeva Hospital Junction and building two levels of metro lines above the flyover for the Gottigere – Nagawara line, and authorised BMRCL to construct road flyover being handled by Bangalore Development Authority (BDA). During Review Meeting (September 2018) chaired by the Chief Secretary, GoK it was decided that GoK should fund part of the cost as BDA was unable to fund it. BMRCL requested (May 2022) GoK to release ₹321.43 crore towards expenditure incurred up to 31 March 2022 against total share of GoK to the tune of ₹426.47 crore. The construction was in progress as on 31 March 2023.

Audit observed that, as on 31 March 2023, BMRCL did not receive GoK's contribution.

BMRCL replied (February 2024/ April 2025) that the fund will be released after obtaining the cabinet approval of GoK and added that in the interest of expediting the work, BMRCL has incurred expenditure including share of other agencies, which is being followed up regularly.

BMRCL's reply may be viewed in light of the fact that delay in reimbursement has resulted in additional burden on BMRCL in the form of interest on funds expended on the fly over work.

## **6.8 Additional Property Development as per DPRs**

### **6.8.1 Additional Property Development in Phase 1**

BMRCL obtained approval of HPC (16 June 2016) and GoK (22 August 2016) for development of eight parcels totalling 42.60 acres of land identified abutting the Metro stations/ depots on long lease basis to generate Non-FBR.

In this regard, Audit observed that BMRCL provided (May 2017) open land at Nagasandra (14 acre) to one private company through tender for development but balance land parcels (28.60 acres) were not developed even as of March 2023. Further, proposal to develop podium slab at Baiyappanahalli Depot for exploitation of air rights over 20 hectare, working out to 3,00,000 sq.m. of built area, was dropped citing requirements for future expansion of the depot.

BMRCL stated (December 2021/ February 2024) that out of 28.60 acres, 13 acres of land was required for expansion of Depot facilities at Baiyappanahalli (8 acres) to cater to Phase 2A and 2B lines and Peenya (5 acres) for Phase 3. It was further stated that the properties were not developed as real estate market conditions were unfavourable.

BMRCL's reply may be viewed in light of the fact that the DPRs envisaged Financial Internal Rate of Return (FIRR) based on FBR and Non-FBR considering PD of 42.60 acres of land in Phase 1. Hence, additional requirement of land for expansion was required to be taken up with GoK. Moreover, balance land of 15.60 acres (i.e., 28.60 acres – 13 acres) is yet to yield any Non-FBR even as of 31

March 2023. Further, in view of the increase in Guidance Value<sup>42</sup> of land around Metro corridors, it is a fact that many real estate projects have developed in and around Metro corridors suggesting that the market conditions were favourable.

Hence, the fact remains that the properties identified have not been developed, despite approval of GoK, even after a lapse of seven years, leading to non-achievement of envisaged Non-FBR from additional PD for Phase 1.

***BMRCL acknowledged the Audit suggestion to take timely decision to utilise the lands/ properties identified for Property Development to generate ‘Other Income’ to sustain the operations of the Metro Project and stated (April 2025) that a tender has been floated for consultancy services aimed at assisting BMRCL in exploring the revenue streams, enhancing asset value, optimising the use and monetisation of assets of BMRCL.***

### **6.8.2 Additional Property Development in Phase 2**

The implementation of Phase 2 was approved based on financial viability of corridors, which took into consideration income projections from PD in an additional 55 hectare of land, with estimated ‘Other Income’ from PD of ₹21,282 crore from 2016-17 to 2041-42, as mentioned in **Para 3.2.2.** supra. However, 55 hectare of land is yet to be acquired as of March 2023.

BMRCL replied (March 2023/ February 2024) that it is generally noticed that Developers will come forward to take the land for PD only after commercial operations of Metro lines are commenced. Hence, BMRCL will take necessary steps to augment Non-FBR as and when Phase 2 lines are completed and commissioned. The commercial operations have not yet commenced and Reach 5 land parcels details will be considered for PD on and after commissioning of the lines. Further, DMRCL, as DPR Consultant, had not identified specific area and land parcels for the said PD and hence, Land Section did not acquire any land.

BMRCL’s reply needs to be seen in light of the fact that Phase 2 commercial operations have commenced from January 2021 in a phased manner. Further BMRCL’s reply indicates lacuna in DPRs as it did not identify the land parcels for real estate development, which were also not considered by BMRCL while evaluating the DPR proposal. This may be viewed in light of the fact that no concrete measures for acquisition of additional 55 hectares of land have been taken, even after a lapse of almost 10 years from the approval of Phase 2 DPR.

***Recommendation # 14 - BMRCL should ensure timely availability of land for Property Development, as envisaged in the Detailed Project Reports of Phase 2 at the earliest to make the project financially viable.***

***BMRCL stated (February 2024) that the Recommendation is noted and added (April 2025) that necessary approvals from GoK and GoI to secure additional funds will be taken for acquiring 55 hectares, as the original estimates in the DPRs were based on land acquisition costs at the time of Project’s approval.***

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<sup>42</sup> Guidance value is the estimated value of property as notified by Central Valuation Committee constituted under Section 45A of the Karnataka Stamp Act, 1957.

## 6.9 Loss of opportunity to earn potential revenue for Nagasandra property

BMRCL appointed consultant for providing advisory services for integrated Property Development (PD) at Nagasandra, submitted (March 2015) 'Financial Analysis Report (FAR)' and arrived at Guidance Value (GV) of ₹320 crore (2014 rate) for total area of 6,05,766 sft (appx. 14 acres) towards commercial development. On the request of BMRCL, the consultant revised (March 2016) the financial analysis and recommended for fixing of land premium in the tender in the range<sup>43</sup> of ₹212.80 crore to ₹304 crore. BMRCL floated (March 2016) Request For Proposal (RFP) for integrated PD around Nagasandra Metro station by fixing Minimum Development Premium of ₹240 crore but cancelled (May 2016) the same for seeking clarity on the issues raised by the bidders during the pre-bid meeting.

Subsequently, consequent to increase in GV, the consultant revised (6 September 2016) land premium to be in the range of ₹232.75 crore to ₹332.50 crore. However, revised RFP was floated (12 September 2016) with same MDP of ₹240 crore and in response, one bidder quoted (November 2016) ₹251.01 crore as Development Premium. BMRCL issued Letter of Award (December 2016) to the bidder and received (May 2017) Development Premium of ₹251.01 crore and entered into an agreement on 31 May 2017. Further, annual charge/ fee of ₹2.51 crore with escalation of 5 *per cent* per annum w.e.f. December 2023 will be collected.

In this regard, Audit observed that -

- (i) There were no reasons/ justifications on record as to why BMRCL requested the consultant in March 2016 to revise its FAR submitted in March 2015 (resulting in reduction in land premium value from ₹320 crore to ₹240 crore) and why no RFP was floated based on the said Report of March 2015.
- (ii) Rules 19 to 22 of the Karnataka Land Grant Rules, 1969 prescribed levy of cost of land granted/ leased at either of Market Value or GV. From June 2015, Market Value was calculated to be the higher of average highest sale value of similar property in each of the preceding 3 years or cost fixed for similar property under Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement (RFCTLARR) Act, 2013. BMRCL, however, did not fix higher GV as Minimum Development Premium in original/ retender RFP.
- (iii) The consultant submitted (March 2015) GV of ₹320 crore considering ₹5,250 per square feet, which was ₹3,750 per sft (₹40,350 per square meters (sqm)) as notified by GoK *plus 40 per cent* premium. The land value was increased from ₹40,350 per sqm to ₹47,400 per sqm by GoK (5 May 2016) and accordingly, the revised land premium should be in the range of ₹248.33 crore to

<sup>43</sup> The consultant had given three parameters – (i) Calculation of NPV considering the borrowing rate of 10.50 per cent over the lease period of 60 years assuming lease rent as 10 per cent of the current Guidance Value on the basis of Rule 22A of Karnataka Land Grant Rules, 1969; (ii) Calculation of NPV considering the borrowing rate of 10.50 per cent over the lease period of 60 years assuming lease rent as 7 per cent of the current Guidance Value on the basis of Department Code issued by the Inspector General of Stamp and Registration; and (iii) Considering sale value at 80 per cent of Guidance Value.

₹354.78 crore. However, MDP was fixed at ₹240 crore, which was lower than the least value as per criteria adopted (₹248.33 crore).

From the above, it can be seen that BMRCL lost potential revenue to the tune of ₹103.77 crore (₹354.78 crore *minus* ₹251.01 crore) due to fixation of MDP on the lower side.

BMRCL replied (March 2023/ February 2024) that MDP of ₹320 crore was recommended by the consultant and revised development premium of ₹304 crore was an overestimate, not based on valuation methodology and norms prescribed by GoK for valuation of properties. The lands at Nagasandra village are non-agricultural and undeveloped land parcels. The Special Land Acquisition Officer (SLAO), KIADB had awarded a compensation of ₹60.94 crore to the landowners in 2013 for 18 acre and 26 guntas of land, of which the land leased to the bidder is a part. Even in the year 2016, when the lease was finalized, the status of the land had remained the same. The highest valuation of ₹304 crore in the valuation range recommended by the consultant was based on treating the land as developed land and then extrapolating the same based on residential site rate. The SLAO had treated the land as undeveloped land only.

BMRCL further stated (March 2023) that due to typographical mistake, the GV of ₹47,400 per sqm (100 *per cent*) was wrongly communicated to the consultant as ₹44,400 per sqm but the 140 *per cent* was correctly communicated. However, the consultant adopted the incorrect GV communicated by it. The calculations as submitted by the consultant were considered by BMRCL instead of getting it corrected. BMRCL also stated that the tender was finalised based on open tender against which only one bidder had participated who offered ₹251.01 crore as upfront money *plus* 1 *per cent* as lease rental *per annum*. BMRCL assured that it will ensure in future that such mistakes will not recur.

BMRCL's reply confirms that GV was incorrectly adopted while making the proposals. Secondly, comparison of the rate fixed for acquisition of land by SLAO for development of essential infrastructural facilities with that of the Project land, which was to be leased for commercial purposes is misleading and not tenable. Further, the Board of Directors was led to approve leasing proposal with incorrect justification that BMRCL will be able to receive upfront lump sum lease rent, which will be virtually equal to sale consideration of the land so that it is protected from any future defaults in payment of annual lease rent, while the fact was that the lump sum lease rent of ₹260.59 crore was less than the revised sale consideration of ₹298.76 crore based on prevailing GV.

***BMRCL acknowledged the Audit suggestion to consider Minimum Development Premium based on the prevailing Guidance Value of the property so as to maximise Non-FBR revenue and to exercise due diligence on the proposals submitted by the Consultant to safeguard its financial interests and stated (April 2025) that the same is noted for future references.***

## **6.10 Absence of Asset Management Policy**

BMRCL developed built-up area of 2.46 lakh sft in the Metro stations for Property Development (PD), of which only 0.23 lakh sft had been utilised for PD/ commercial activity, while the remaining 2.23 lakh sft built-up area had been lying vacant for years. BMRCL identified 45,485 sft in 51 locations of 14



Metro stations with an estimated minimum guarantee revenue of ₹3.11 crore per annum (₹25.95 lakh per month x 12) and floated (June 2018) tenders for selection of licensees for operating retail outlets. The technical bids were opened in August 2018 and 38 bidders were technically qualified for opening their financial bids in 19 locations of the Metro stations, but the financial bids were not opened. In October 2018, the Managing Director stated that there was a need to formulate an ‘Asset Management Policy’ and get the same approved by the Board and accordingly, the tender was discharged.



Picture 12 - 14,702 square feet lying vacant at Peenya Metro Station

Audit observed that BMRCCL had not formulated ‘Asset Management Policy’ even as of March 2023, resulting in 2.23 lakh sft under 43 Metro stations lying unutilised, thereby, losing the opportunity to earn Non-FBR (lease rent) of ₹38.53 crore<sup>44</sup> during the period 2019-22.

BMRCCL replied (April 2025) that tender for allotment for retail space at 220 locations of 56 metro stations has been floated. The expected revenue is ₹25 crore. Further ‘Asset Management Policy’ has been finalised and submitted to Competent Authority for approval.

BMRCCL’s reply may be viewed in light of the fact that the Company could not lease the vacant space available since April 2019.

***BMRCCL acknowledged the Audit suggestion for framing an ‘Asset Management Policy’ for ensuring uniformity and consistency in decision making for leasing out vacant spaces in Metro stations and stated (April 2025) that the Policy has been finalised and submitted to the Competent Authority for approval and in the meanwhile, tender for allotment of retail space at 220 locations in 56 stations had been floated. During Exit Conference with the Ministry, BMRCCL stated (May 2025) that the Asset Management Policy has been finalised and will be placed before the Board shortly. It was further stated that the guidelines for securing innovating financing are also made part of the Asset Management Policy.***

## 6.11 Innovative Financing

One of the means for achieving the objectives of National Urban Transport Policy (NUTP), 2006 was raising finances, through innovative mechanisms that tap land as a resource, for investments in urban transport infrastructure. Further, Innovative Financing is one of the significant sources of Non-FBR for Metro rail projects and a way for making the Metro rail operations viable as per the Metro Rail Policy 2017. Innovative Financing includes station naming rights for specified period, leasing commercial space in Metro stations, providing direct access to the corporate entity premises under Phase 2.

<sup>44</sup> 2.23 lakh sft. X ₹48 per sft. (average licence fee mentioned in tenders) X 36 months.

### 6.11.1 No formal Policy for Innovative Financing

BMRCL approached GoK for entering into Innovative Financing Agreements (IFAs) on case to case basis and accordingly, as per BMRCL Annual Report for the year ended 31 March 2022, BMRCL entered into six MoUs valuing ₹605 crore for part funding the construction of Metro station and Metro corridors through Innovative Financing. Out of six, BMRCL entered into two Definitive/ Grant Agreements during December 2019 and March 2021 whereby, two companies agreed to contribute ₹100 crore and ₹65 crore respectively towards construction of RV Road to Bommasandra metro lines in Reach 5 (Phase 2). Out of committed ₹165 crore, ₹103 crore has been received (i.e., ₹80 crore from one company and ₹23 crore from second company) till March 2023.

Audit observed that BMRCL did not have any policy on ‘Innovative Financing’ and proposals were approved by the Board of Directors on case to case basis. Above two agreements were entered without any Tenders/ Expression of Interest (EoI). This direct approach without tenders and without any policy precludes transparency and competitive price discovery.

*During the Exit Conference with the Ministry, BMRCL stated (May 2025) that policy on ‘Innovative Financing’ for uniform procedure to be followed for finalisation of proposals in a transparent manner has been made part of Asset Management Policy being finalised.*

### 6.11.2 Delay in devising a mechanism to adopt ‘Value Capture Finance’ principle

As per “Value Capture Finance (VCF) Policy Framework” issued (2017) by MoHUA, “Value Capture” is based on the principle that private land and buildings benefit from public investments in infrastructure and policy decisions of governments. Deployment of appropriate VCF tools aids in capturing a part of the increment in value of land and buildings, which, in turn, can be used to fund public projects by the State/ Central Governments and Urban Local Bodies. This generates a virtuous cycle of value creation, value realisation, value capture and reinvestment for project. The principles of VCF should be considered in all phases of projects, i.e., Initiation, Planning, Design & Strategy and Execution & Operation.

In this regard, Audit observed that neither BMRCL nor GoI/ GoK could deploy the principles of VCF despite investing about ₹40,000 crore in Phase 1 and 2 projects as of 31 March 2023.

While concurring with the views of Audit, BMRCL replied (February 2024) that the Company has actively followed up on the amendments and corresponding rules of Karnataka Town and Country Planning Act relating to levy of cess/ surcharge for the purpose of establishing Mass Rapid Transport System and allocation of charges collected for the premium Floor Area Ratio for MRTS Project.

***Recommendation # 15 - BMRCL should devise a mechanism to adopt 'Value Capture' principle as per the directions of MoHUA, GoI for self-financing the Metro projects out of the revenue generated from value created.***

***BMRCL replied (February 2024) that the GoK is yet to issue Government Order to share the revenue generated from various sources to various agencies including BMRCL under the framework of Value Capture Finance so that funds as per the pre-decided formula shall accrue to BMRCL. BMRCL further added (April 2025) that the Urban Transport and Infrastructure Fund is approved by GoK and the same is to be operationalised.***

## 6.12 Conclusion

The revenue generated by BMRCL is insufficient to meet the External Debt repayment obligations and BMRCL is completely dependent on GoK to service the debt raised for the project. Due diligence was not exercised while availing loans, which resulted in avoidable payment of commitment charges. Further, loan was availed for tax portion in deviation to terms of loan agreement. BMRCL also could not realize the projected Non-FBR as per DPRs of Phase 1 and 2. Property Development as envisaged in DPRs was not done. In Phase 1, out of identified eight parcels totaling to 42.60 acres, only one property at Nagasandra (14 acre) was developed as of 31 March 2023. Similarly, 55 hectares projected for Phase 2 is yet to be acquired as of 31 March 2023. There was no guiding Asset Management Policy to monetize the vacant empty spaces in stations/ areas identified for Property Development. There was no approved policy for securing Innovative Financing for the project in a transparent and competitive manner. Neither BMRCL nor the GoK/ GoI could deploy the principles of Value Capture Financing despite making a massive investment of about ₹40,000 crore in Phase 1 and 2 as of 31 March 2023.



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# **Chapter 7:**

# **Operation and Maintenance**

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## Peenya Depot



## Chapter 7: Operation and Maintenance

The Operation and Maintenance (O&M) activities of Bengaluru Metro Rail Project include efficient management/ utilization of Rolling Stock, utilization of stores and spares, repairs and replacements, upgradation of machinery, efficient energy management, proper fare fixation for revenue realization, minimizing operating and other expenditure and ultimately achieving project viability by attaining projected ridership and Peak Hour Peak Direction Traffic (PHPDT) as envisaged in the DPR and also reducing the traffic snarls in Bengaluru city. The deficiencies noticed in this regard are indicated below –

### 7.1 Operational performance

The operational performance of BMRCL during the last seven years is as follows:

**Table 7.1 –Operational Performance of BMRCL from 2016-17 to 2022-23**

|                                                                             | (₹ in crore) |         |         |         |         |         |         |
|-----------------------------------------------------------------------------|--------------|---------|---------|---------|---------|---------|---------|
| Particulars                                                                 | 2016-17      | 2017-18 | 2018-19 | 2019-20 | 2020-21 | 2021-22 | 2022-23 |
| Fare Box Revenue (FBR)                                                      | 110.10       | 281.00  | 355.02  | 376.88  | 49.19   | 163.33  | 422.61  |
| Non-Fare Box Revenue (Non-FBR)                                              | 20.18        | 44.00   | 47.33   | 43.03   | 24.37   | 28.01   | 37.40   |
| Revenue from Operations                                                     | 130.28       | 325.00  | 402.35  | 419.91  | 73.56   | 191.34  | 460.01  |
| Operating Revenue<br>(Revenue from operations + Other income)               | 145.12       | 337.21  | 419.47  | 433.23  | 81.97   | 228.76  | 594.01  |
| Operating Expenses<br>(Operating Expenses + Employee Cost + Other Expenses) | 172.32       | 262.94  | 335.97  | 379.13  | 295.01  | 345.60  | 486.62  |
| Percentage (%) of Operating Revenue over Operating Expenses                 | 84.22        | 128.25  | 124.85  | 114.27  | 27.79   | 66.19   | 122.07  |

During the period 2016-17 to 2022-23, the operating revenue exhibited an increasing trend till 2019-20 and declined thereafter, due to COVID 19 and its after-effects. Operating revenue as a percentage of operating expenditure ranged from 27.79 per cent to 128.25 per cent during this period.

Audit noticed that O&M cost norms were not framed by BMRCL for various systems. Further, station wise revenue generated and O&M cost incurred was not available precluding assessment of station wise profitability and also of the corrective measures, if any, taken by BMRCL for increasing the revenue of the stations and their effectiveness.

BMRCL replied (February 2024) that once BMRCL network is fully implemented, operations are integrated and stabilised, norms for operating costs and performances will be formulated.

BMRCL's reply may be viewed in light of the fact that implementation is an ongoing process with Phases 2A, 2B and 3 still in the pipeline and that more than a decade has passed since commencement of Phase 1 operations. Hence, BMRCL should, at the earliest, make efforts to frame norms for O&M.

***BMRCL acknowledged the Audit suggestion to maintain station-wise record of revenue and expenditure to take corrective measures to increase ridership or non-farebox revenues and stated (April 2025) that earnings/ collections details are maintained station-wise and that the expenses are allocated station-wise presently.***

## 7.2 Non achievement of projected farebox revenues

As per DPR, Phase 1 was to be operationalized in 2007, but was operationalized from October 2011 to June 2017, i.e., after a delay of up to 10 years. Similarly, Phase 2 was projected to be operationalized by March 2017, later revised (February 2017) to December 2019. However, only 3 out of 6 Reaches have been operationalized so far (March 2023). The above delays in operationalisation of Phase 1 and 2 were mostly on account of delays in land acquisition and subsequent construction delays.

Projected vis-à-vis Actual Farebox Revenues for the years 2016-17 to 2022-23 are as follows:-

**Table 7.2 – Projected vis-à-vis Actual Farebox Revenue for Phase 1 and 2**

(₹ in crore)

| Detail                                                      | 2016-17 | 2017-18 | 2018-19 | 2019-20 | 2020-21  | 2021-22  | 2022-23  | Total    |
|-------------------------------------------------------------|---------|---------|---------|---------|----------|----------|----------|----------|
| Projections as per DPRs for Phase 1                         | 464.83  | 510.20  | 552.15  | 605.10  | 656.17   | 720.74   | 763.87   | 4,273.06 |
| Projections as per DPRs for Phase 2                         | --      | --      | --      | --      | 1,102.59 | 1,137.45 | 1,223.60 | 3,463.64 |
| Total Projections for both Phases                           | 464.83  | 510.20  | 552.15  | 605.10  | 1,758.76 | 1,858.19 | 1,987.47 | 7,736.70 |
| Actual Revenue earned                                       | 110.10  | 281.00  | 355.02  | 376.88  | 49.19    | 163.33   | 422.61   | 1,758.13 |
| Actual Revenue (%) w.r.t. Total projections for both phases | 23.69   | 55.08   | 64.30   | 62.28   | 2.80     | 8.79     | 21.26    | 22.72    |

In this regard, Audit further observed that -

- (i) From 2016-17 to 2022-23, BMRCL earned FBR (both Phases) of ₹1,758.13 crore (22.72 *per cent*) as against DPR projection of ₹7,736.70 crore, with actual revenue (both Phases) ranging from 2.8 *per cent* (2020-21) to 64.30 *per cent* (2018-19).
- (ii) FBR of ₹4,273.06 crore was not achieved in Phase 1 due to delay in land acquisition and construction. Further, though ridership was estimated based on the assumed modal split of 65 *per cent* in 2011 and 70 *per cent* in 2021 in favour of public transport, efforts in this direction through integration of Multi Modal Transit systems were not discernible, as discussed in subsequent paragraphs.
- (iii) Similarly, the estimated FBR of ₹3,463.64 crore from Phase 2 could not be realised due to delay in completion of construction works, which were scheduled for completion by December 2019, but are still under execution as of March 2023.

BMRCCL/ MoHUA stated (February 2024/ May 2025) that better comparison can be made only after commissioning of the complete network under Phase 2 Project.

The response of BMRCL/ Ministry may be viewed in light of the fact that the ridership was projected considering only individual lines in DPRs and not with reference to entire network.



### 7.3 Non creation of enabling local/ street level infrastructure

As per BMRCL policy, Metro stations are to be accessible from both inside and outside, to ensure that people with disabilities, as well as elderly people and those with limited mobility, can easily access and use the station facilities. Specific measures to ensure accessibility at the stations include providing ramps or elevators to allow for wheelchair access to platforms and other areas of the station; installation of audio and visual announcements to help people with hearing impairments; providing accessible parking spaces and drop-off zones outside stations; ensuring that sidewalks and pathways leading to the stations are properly maintained and have curb cuts.

TC (IIT Delhi) stated that Global Best Practices recommend at least 500 metres around each station should become pedestrian friendly. In this regard, Audit, along with TC (IIT Delhi), observed the following:

- (i) The enabling local/ street level infrastructure was not properly designed for majority of the Metro stations. No documentation or formal protocol was available to ensure implementation of universally accessible station environment outside the station, which has consequently affected ridership. Further, the impact of accessible streets and walkable streets were not considered by BMRCL.
- (ii) Further, parking facility was not available in 18 of the 51 operational Metro stations<sup>45</sup>.

BMRCL stated (February 2024) that Bangalore City Corporation is developing the pavements, streets in accordance with the Acts and is developing the area around 200 meters of the station for ease of commute. The approach to stations have pavements, road ramps that are necessary for all kinds of commuters. During Exit Conference, BMRCL further stated (April 2024) that parking facility has been provided in 53 out of 65 operational stations and added that provision for accessibility is an ongoing process and will keep on improving.

The reply is silent on documentation/ formal protocol to ensure implementation of universal accessible station environment. TC (IIT Delhi) remarked that BMRCL should ensure proper implementation of accessibility infrastructure on ground and establish formal process of periodical audits. Further, as of May 2025, 40 stations did not have four wheeler parking facility and only eight stations had capacity for parking more than 100 four wheelers. Also, no station had facility to park more than 1,000 two-wheelers.

***Recommendation # 16 - BMRCL should ensure that the Policy on 'Accessible Stations – Inside and Outside' is implemented in its entirety.***

***During the Exit Conference with BMRCL, the Company accepted (April 2024) the Recommendation of Audit.***

<sup>45</sup> 12 stations operational from 26 March 2023 have not been considered.

## 7.4 Non achievement of DPR Projected Ridership and PHPDT under Phase 1

GoI while approving (11 May 2006) to the Phase 1 of Bangalore Metro Rail Project stipulated, among other conditions, that GoK would ensure price based measures to promote and facilitate Metro ridership, integrate traffic rationalization plan for the Bengaluru city with a view to ensure that the projected ridership is realized and integrate various modes of transport, which would act as feeder/evacuation systems to the Metros for improved ridership.

As per DPRs for Phase 1, the projections for Ridership and PHPDT are tabulated as below:

**Table 7.3 – Projections for Ridership and PHPDT as per DPR**

| Year | Ridership (passengers per day) |                | PHPDT (passengers) |                |
|------|--------------------------------|----------------|--------------------|----------------|
|      | DPR 2003                       | Extn. DPR 2008 | DPR 2003           | Extn. DPR 2008 |
| 2007 | 8,20,000                       | --             | 20,000             | --             |
| 2011 | 10,20,000                      | 12,18,000      | 27,000             | 29,279         |
| 2021 | 16,10,000                      | 19,49,000      | 40,000             | 45,684         |

On analysis of the projections for the ridership and PHPDT made in the DPRs as tabulated above vis-a-vis actuals achieved by BMRCL since Phase 1 made fully operational from June 2017 to 31 March 2023, in respect of 40 stations<sup>46</sup> (Phase 1 - 32 stations and extensions of Phase 1 - 8 stations), Audit observed the following -

- (i) The ridership achieved for entire Phase 1 from June 2017 to March 2023 ranged between 3,38,200 (July 2017) to 5,89,082 (August 2022). The highest ridership achieved even by the year 2023, was only about 72 *per cent* of the daily ridership projection for 2007 (8.2 lakh passengers per day) even by the year 2023.
- (ii) Of the 33 stations for which projections were available, the projected ridership of 2007, 2011 and 2021 was achieved in respect of one station, nine stations and four stations respectively. However, 16 stations under North-South and East-West corridors did not achieve even the initial projected ridership as of 2007 and three stations under Extension of Phase 1 did not achieve the projected ridership as of 2011.
- (iii) The details of actual PHPDT achieved are as follows -

**Table 7.4 – Year wise PHPDT details (passengers)**

| Year  | 2017   | 2018   | 2019   | 2020   | 2021   | 2022   |
|-------|--------|--------|--------|--------|--------|--------|
| PHPDT | 17,282 | 18,931 | 20,350 | 22,973 | 10,818 | 17,348 |

BMRCL could achieve the PHPDT projection of the year 2007 during the years 2019 and projections as of 2011 and 2021 were yet to be achieved.

<sup>46</sup> The comparison could not be made in respect of 8 stations, as the locations of the stations were changed from the ones stated in DPRs.



(iv) The projected PHPDT of 2007, 2011 and 2021 was achieved in respect of six stations, nine stations and three stations respectively. However, 13 stations and two stations did not achieve the projected PHPDT as of 2007 and 2011 respectively even by 2023. The details have been mentioned in *Annexure XX*.

BMRCL stated (March 2023) that the ridership depends upon extending the Metro rail network across the city, first and last mile connectivity<sup>47</sup>, affordable fare structure and locations of offices near Metro stations. Further, despite BMRCL's efforts, projected ridership could not be achieved due to various reasons such as increased personal travel pattern, work from home culture of IT industry and technological changes that happened during the last decade. BMRCL further stated (February 2024) that presently it is carrying about 20 per cent (7 lakh passengers) of the BMTC ridership (35 lakh passengers). Once the ongoing Phases 2, 2A and 2B projects are complete and commissioned, the ridership will go up. BMRCL also stated that the Company is working with Directorate of Urban Land Transport<sup>48</sup> (DULT) for working out an integrated approach for Bangalore Transport.

BMRCL's reply may be viewed in light of the fact that lower ridership was due to the lack of last mile connectivity, inadequate parking facility, non-integration with BMTC fare structures, etc., as accepted by BMRCL. Further, despite GoI directions in May 2006, GoK did not make suitable provisions for integrated traffic plan to act as a feeder/ evacuation system of Metro Project. Also, DULT was set up as early as in 2007 on the lines of National Urban Transport Policy (2006) and BMRCL has initiated for working out an integrated approach with DULT only recently after 12 years of commencement of metro operations of Phase 1.

TC (IIT Delhi) opined that BMRCL may prepare an action plan on required interventions to improve ridership. TC (IIT Delhi) further opined that there is no documentation of Expert Opinion or Reference, which formed the basis for such assumptions. A robust and sound methodology is expected to anticipate changes in the Socio/ Economic/ Demographic infrastructure. Sensitivity Analysis shall include these uncertainties.

***BMRCL acknowledged (April 2025) the Audit suggestion to strive to achieve the targeted ridership and PHPDT scrupulously by providing last mile connectivity, proper parking facilities and integration with Bangalore Metropolitan Transport Corporation through planned feeder bus services in order to make the project viable.***

***Recommendation # 17 - BMRCL should conduct due diligence to ensure that the DPR projections made by the Consultant are based on realistic estimates.***

***BMRCL stated (February 2024) that the Recommendation is noted.***

<sup>47</sup> As mentioned in Para 3.7 (i) of Minutes of 62nd Board Meeting, last mile connectivity is the connectivity to the metro rail user in the form of adequate bus services to travel the last 3-4 km from the Metro Stations.

<sup>48</sup> DULT has been set up (2007) by GoK under the Urban Development Department with the objective to coordinate planning and implementation of urban transport projects and programs.

## 7.5 Non-implementation of Sub-Committee Recommendations on Traffic Integration

The Board of Directors of BMRCL constituted (July 2006) a Sub-Committee to suggest integration measures for a hassle free, door to door travel facility to commuters. Audit observed that BMRCL had neither implemented Sub-Committee recommendations (September 2006) on Multi Modal Integration nor conducted any detailed studies for designing stations/ terminals for Phase 1 and 2, even though the commercial operations of Metro services commenced from October 2011. BMRCL signed an MoU with BMTC in May 2020 to run feeder bus services, but the same is yet to become operational (March 2023). In the absence of feeder services, the projected Metro ridership could not be achieved by BMRCL.

BMRCL replied (March 2023/ February 2024/ April 2025) that BMTC is operating shuttle services for Metro commuters. GoK has approved the Transit Oriented Development (TOD) policy, which facilitates commercial activities along station area of the Metro Corridor. Multi Modal Integration studies are being carried out with the help of Expert Consultant with the approval of Urban Development Department/ GoK. Based on their recommendations, station designs are being finalized. This procedure has already been followed in Phases 2A and 2B. An MoU has been entered into with Bangalore Traffic Police in September 2022 to jointly operate pre-paid autorickshaw system at all Metro Stations. Sainikpod, Yulu Bikes, Pedal Port with Bicycles are also operating as feeder services in the Metro stations. Integration with Railways at few Metro stations has been done and it is planned to integrate with K-Ride<sup>49</sup> also at few other stations. In view of unprecedented growth and developments in Bengaluru city, facilities developed through integrated approaches are still wanting. The requirements will keep varying as and when new metro lines get commissioned and BMRCL dynamically considers the facilities required at different times and implements the same.

BMRCL's reply may be viewed in light of the fact that though Metro services commenced in October 2011, BMRCL started acting upon the Sub-Committee recommendations only since 2020. Further, the efforts to engage minibuses for connecting interior residential areas are still to materialise and other efforts are also yet to yield favourable results.

## 7.6 Lack of Collaboration between BMRCL and BMTC

GoI, while approving (May 2006) Phase 1, had directed GoK, to integrate various modes of transport, which would act as feeder or evacuation systems to the Bangalore Metro System for improved ridership. Accordingly, MoU was entered into between GoI, GoK and BMRCL in December 2010, which also accorded high priority for integration of various modes of transport. In this regard, Audit observed the following -

- (i) As bus stops of BMTC were slightly away from the proposed metro stations, BMTC proposed (May 2013) a complete study of the existing bus stops and metro stations to prepare a project

<sup>49</sup> Rail Infrastructure Development (Karnataka) Limited, known as K-Ride is a 51:49 Joint Venture company formed by GoK and Ministry of Railways respectively for implementing Sub-urban Railway project in Bengaluru city.

for complete integration of BMTC bus stops and Metro stations so that commuters can have easy transfer from bus to metro and vice versa. In this regard, despite BMRCL's assurance that the design of all Metro stations provide for location of BMTC bus stops and based on BMTC's requirements, any alterations can be made by BMRCL accordingly, Audit noticed that the feeder modes to Metro were poorly organised and lacked connectivity with interior residential zones.

- (ii) Further, footfall in BMTC buses reduced from 51.30 lakh per day in 2014-15 to 27.49 lakh per day in 2022-23. Even after introduction of Metro, the combined ridership of BMTC buses and Metro is lesser than the earlier ridership of BMTC buses, which indicates that the Metro has not been able to attract enough private vehicle users that can result in an overall increase in public transport ridership.

Audit, along with TC (IIT Delhi), observed that non-integration of public transport services of Metro rail and BMTC's buses has resulted in both arms of public transport incurring significant losses, which is not a desirable situation for any Government.

BMRCL stated (February 2024) that an MoU was entered into with BMTC in May 2020 to operate buses from metro stations and arrangement is also being made for operating minibuses to cover interior residential zones and to operate pre-fixed auto fare booths at six metro stations in collaboration with Bengaluru Traffic Police. Also, pedal port with cycle stand facilities have been provided at 10 metro stations for the convenience of commuters. BMRCL further stated that GoK has approved an authority known as Bangalore Metropolitan Land Transport Authority<sup>50</sup> (BMLTA) for all land transport agencies with a view to have an integrated planning and management of city's urban mobility.

BMRCL's reply may be viewed in light of the fact that the connectivity to interior areas is still being planned through minibuses and do not cover all metro stations. TC (IIT Delhi) opined that the steps taken to improve BMTC and BMRCL operations and formation of BMLTA are in the right direction. TC (IIT Delhi) further opined that BMRCL may provide a plan including timelines, which will ensure proper feeder buses on all stations.

***BMRCL agreed (April 2024) to the suggestion to integrate the Metro and Bus Systems, in consultation with GoK and Bangalore Metropolitan Land Transport Authority (BMLTA), to attract more ridership and reduce on-road non-transport vehicles.***

***Recommendation # 18 - Intended benefits can accrue if time to time interventions and modifications in access infrastructure and integration with other modes are implemented. Hence, BMRCL should put in place continuous monitoring mechanisms for achieving integration as suggested in DPRs and subsequent committees, conduct alternate scenario analysis, and conduct infrastructure and operation audits to evaluate the impact of improvement in last mile connectivity and take corrective course of action.***

<sup>50</sup> BMLTA is an umbrella organization to co-ordinate planning and implementation of urban transport programmes and projects and provide an integrated management structure.

*BMRCL's reply (February 2024) is silent on putting in place a continuous monitoring mechanism for achieving integration as suggested in DPRs and subsequent committees and also on conducting infrastructure and operation audits to evaluate the impact of improvement in last mile connectivity and taking corrective course of action. During the Exit Conference with Management, BMRCL agreed (April 2024) in putting efforts to integrate and introduce Metro-Bus Common Ticketing Facility.*

#### **7.7 Non-constitution of Fare Fixation Committee as per Metro Railways (O&M) Act, 2002**

As per Section 34 of Metro Railways (O&M) Act 2002, the Central Government may, from time to time, constitute a Fare Fixation Committee (FFC) for the purpose of recommending fare for carriage of passengers by metro rail. BMRCL constituted a Board Sub-Committee for initial fixation of fares for Reach 1 under Phase 1, which recommended (December 2010) fares starting from ₹10.00 to ₹34.00 for a distance of 25 km and was approved by Board of Directors for operationalisation of Reach 1 with effect from 20 October 2011. The base fares were revised after completion of entire Phase 1 (June 2017) based on recommendation of the Board Sub-Committee and ranged from ₹10.00 to ₹60.00 for a distance of 25 km.

In the meantime, Ministry of Law and Justice, GoI directed (September 2012) that constitution of FFC is mandatory under the Metro Railways (O&M) Act, 2002. The Board of Directors of BMRCL, however, decided (November 2012) that so long as the project is in construction phase, FFC constituted by the Board may fix the initial fares. On completion of Phase 1 during June 2017, BMRCL approached (February 2020/ June 2021) GoI as well as GoK to constitute the FFC. As the FFC was yet to be constituted, BMRCL did not prescribe any fares for the new stations operated under Reach 4B and 2E of Phase 2 which were operationalized with effect from 15 January 2021 and 30 August 2021 respectively but charged the existing higher fare of ₹60.00 for all these additional stations. No FFC was constituted as yet (March 2023).

In this regard, Audit observed that Phase 1 was made operational in June 2017, however, BMRCL belatedly decided (August 2019) to initiate action for constituting a FFC and accordingly, sent the proposal to MoHUA and GoK only in February 2020. Further, DPR (May 2003) of Phase 1 prescribed that the fare should be 1 ½ times of existing bus fares. However, the higher side fares fixed by BMRCL were always lower than BMTC bus fares. Further, no justification was recorded to fix the same fare of ₹60 for additional stations operated under Phase 2 during September 2020, despite increase in travel length by five km and expected rise in fare from ₹60 to ₹70.

BMRCL stated (February 2024) that the fare structure implemented under construction stage was promotional fare, which was fixed with a conscious decision not to load the entire cost on commuters. Whenever new sections are commissioned, the fares underwent minor adjustment considering the increase in length of metro operations. BMRCL further stated (April 2025) that GoI has constituted FFC in September 2024 and the revised fare structure, as recommended by the FFC have been implemented w.e.f. 09 February 2025.

## 7.8 Conversion of 3-car trains to 6-car trains

The Train Operation Plan of Detailed Project Report (DPR) for Phase 1 projected that train services would be for 19 hours a day with a scheduled speed of 32 to 35 kilo metre per hour (kmph). A train set with 3-cars can carry 1,000 passengers whereas a train set with 6-cars can carry 2,068 passengers. The details of PHPDT and Rolling Stock that has been considered in the DPR are as mentioned below –

**Table 7.5 – Details of PHPDT and Train Cars considered in Phase 1 DPR**

| Line                             |               | Year                         |                              |                              |
|----------------------------------|---------------|------------------------------|------------------------------|------------------------------|
|                                  |               | 2007                         | 2011                         | 2021                         |
| Line 1<br>(East West Corridor)   | PHPDT         | 22,442                       | 27,358                       | 39,838                       |
|                                  | No. of Trains | 21 (3-cars – 4 min. headway) | 21 (6-cars – 4 min. headway) | 6 (6-cars – 3 min. headway)  |
| Line 2<br>(North South Corridor) | PHPDT         | 19,585                       | 22,705                       | 31,694                       |
|                                  | No. of Trains | 18 (3-cars – 4 min. headway) | 18 (3-cars – 4 min. headway) | 18 (6-cars – 4 min. headway) |

The above projection had been revised when a new DPR for North South (NS) corridor extension was made in June 2008 wherein maximum PHPDT of East West (EW) Corridor in the year 2011 and 2021 was estimated at 27,818 and 41,289 respectively. In respect of NS corridor, the PHPDT in the year 2011 and 2021 was revised to 29,279 and 45,684 respectively. Procurement of 62 train sets (27 for EW corridor (21 in 2007 and 6 in 2021) and 35 for NS corridor (18 in 2007 and 17 in 2011)) was proposed under Phase 1 including subsequent lines.

Later, DMRCCL prepared and submitted (July 2011) DPR for Phase 2 of Metro Rail Project, which included extension of both EW and NS corridors and two new lines (Reach 5 and 6). In Phase 2 DPR, PHPDT of 21,803 (EW) and 19,675 (NS) for the year 2016 and 27,593 (EW) and 25,380 (NS) for the year 2021 had been projected. In order to meet the projected PHPDT, Rolling Stock requirement of 16 (5 in 2016 and 11 in 2021) 6-car trains were proposed.

Thus, a total of 78 number of Rolling Stock was proposed for procurement under Phase 1 and 2 including Phase 1 Extension. Accordingly, BMRCCL placed contracts for procurement of Rolling Stock for Phase 1, conversion of existing 3-car trains into 6-car trains for Phase 1 and all 6-car trains for Phase 2.

In this regard, Audit noticed that the DPR Consultant (DMRCCL) in its DPR for NS Extension (June 2008) suggested to convert 3-car trains into 6-car trains based on trend of traffic in the year 2011 so



as to decide how many 3-car trains need to be converted into 6-car trains. This was, however, not considered before floating tenders for conversion and all the 50 existing trains were converted into 6-car trains and commissioned during June 2018 to March 2020 by availing AFD loan of ₹1,440 crore, on which BMRCL incurred interest to the tune of ₹21.02 crore<sup>51</sup> up to March 2022.

Audit further observed that in respect of Phase 1 operation of Bengaluru Metro, for a complete round trip of 37 km, a 3-car train consumes 293 kwh of energy on an average whereas 6-car train consumes 516 kwh of energy, i.e., 76 *per cent* more power is consumed, which consequently led to increased energy cost resulting in higher O&M cost. During the period 2019-23, due to operation of 6-car trains, the extra energy cost (net of regeneration power) incurred by BMRCL was to the tune of ₹28.52 crore.

TC (IIT Delhi) also observed that logic behind conversion of 3-cars to 6-cars was not clear and added that the conversion should be based on documentation of section-wise load factors during peak and non-peak periods. Number of cars in each train and scheduling of long and short trains should be based on detailed understanding of section load factors.

Thus, improper decision of BMRCL to procure 150 intermediate cars led to avoidable capital cost/project cost to the tune of ₹1,440 crore, liability towards interest payment of ₹21.02 crore and higher O&M cost to the tune of ₹28.52 crore during 2019-23 without realization of any additional revenue to the Metro project.

BMRCL stated (March 2023/ February 2024) that after commissioning of EW corridor in June 2016, the ridership as well as PHPDT were continuously showing upward trend. Also, lot of public complaints were received regarding overcrowding of trains during peak hours on EW corridor. In Phase 2 DPR (Four Extensions), for the year 2021, there was also provision to convert existing 50, 3-car train sets procured under Phase 1 to 6-car train sets. As the requirement of Rolling Stock was planned based on PHPDT, in the year 2019, maximum PHPDT achieved on EW corridor was 22,973 against the projected PHPDT of 25,380 in the DPR for the year 2021. Before COVID 19, PHPDT on Phase 1 corridor was in line with DPR projection. It was not possible to meet PHPDT of 22,973 with 3-car train set even with three minutes headway. It was further stated that Phase 2 DPR had factored induced ridership in Phase 2 because of Phase 1. Therefore, 150 cars were included against Rolling Stock of Phase 2 by considering the increase in PHPDT.

The reply of BMRCL may be viewed in light of the fact that at the time of issue of global tender in October 2016, the PHPDT projection of the year 2007 was not achieved and the same was achieved in January 2020 only. Post COVID 19 also, this PHPDT was not achieved again. Further, the suggestion of the DPR Consultant (DMRCL) to convert the 3-car trains into 6-car trains based on the trend of traffic in the year 2011 to decide how many 3-car trains need to be converted to 6-car trains, was not considered before floating tenders for conversion despite non achievement of even 2007 projected PHPDT and total ridership.

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<sup>51</sup> Updated information up to 31 March 2023 has not been provided by BMRCL though requested.

*TC (IIT Delhi) opined that the modelling details with justification were not recorded to have clarity.*

*BMRCL acknowledged (February 2024) the Audit suggestion to ensure cognisance to actual ridership and PHPDT while deciding the upgradation of train sets to avoid infructuous expenditure/unnecessary financial burden on BMRCL without any incremental revenue.*

## 7.9 Maintenance of Heating, Ventilation and Air Conditioning System

BMRCL has a dedicated Department responsible for handling the operations and maintenance of the Heating Ventilation and Air Conditioning (HVAC) system, which follows a comprehensive maintenance schedule including regular checks and maintenance tasks at various intervals. To ensure effective maintenance, Department follows checklists provided by equipment manufacturers.

In this regard, TC (IIT Delhi) suggested that BMRCL may consider certain trigger points for maintenance activities, such as system's failure to maintain specific levels of chiller temperatures, specific psychrometric parameters such as dry bulb temperature, relative humidity and carbon dioxide and oxygen levels and excessive energy consumption, in addition to routine maintenance. BMRCL, however, did not provide specific details about these trigger points and corresponding maintenance activities.

In absence of the information/ record on the trigger points, Audit was unable to comment on the efficiency of the maintenance activity of the HVAC system.

BMRCL stated (February 2024) that maintenance of HVAC system works, particularly in UG Stations, include daily monitoring of hardness of chiller water used in chiller plant, consistent monitoring of condenser inlet and outlet temperatures, controlling of relative humidity by ventilation through air to heat exchanger, etc.

TC (IIT Delhi) stated that BMRCL's Maintenance Department follows a comprehensive schedule for upkeep of HVAC system. Still, absence of specified trigger point values for monitored parameters like chiller temperatures hinders immediate maintenance initiation when safety limits are exceeded. While measures such as condenser monitoring and humidity control are in place, lack of these values limits the system's reliability.

*TC (IIT Delhi) suggested that BMRCL should consider incorporating trigger point details to assess maintenance effectiveness comprehensively. BMRCL noted (April 2024) the suggestions for future guidance.*

## 7.10 Absence of real time performance monitoring and health of Rolling Stock

A. Audit, along with TC (IIT Delhi), observed that BMRCL is not monitoring the real-time performance and health of the Rolling Stock through measuring and monitoring of vibration and noise data of components of Rolling Stock. BMRCL only periodically monitors the status of wheel and rail for arriving on their resurfacing (turning/ grinding) through visual

inspection. Hence, TC (IIT Delhi) suggested that there is urgent need for installing devices for real time monitoring of vibration, noise, temperature, image of rail and wheel surfaces, etc. in rolling stocks. As per Industry 4.0<sup>52</sup>, emerging technologies should essentially be used in maintenance of Rolling Stock.

- B. Health of Rolling Stock** (consisting of wheels, suspension and other binding hardware) decides safety of the Metro train. BMRCL personnel perform the Rolling Stock examination manually, which raise questions on reliability. TC (IIT Delhi) suggested adoption of computer vision algorithms for extraction and localizing the defective working parts of Rolling Stock.

BMRCL replied (February 2024) that the Company's Rolling Stock is provided with state of the art microprocessor based train management system where status of 200 signals per car with different polling cycle are being monitored and are used for analysis with IBM Maximo Asset Management and Maintenance software for maintenance of Rolling Stock. Apart from this, major critical equipment like Variable Voltage Variable Frequency drive, HVAC, Brake System are provided with data logger cards where fault triggered events are recorded. Thus, BMRCL has implemented state of the art microprocessor based monitoring system at train level as well as at equipment level.

TC (IIT Delhi) stated that they are not in agreement with BMRCL's reply as many discrepancies were noticed in the 'Manual' mode during the inspection and the same can be found in the technical files provided to TC (IIT Delhi) by BMRCL.

BMRCL stated (April 2025) that the suggestion of Audit will be explored further, once industrial use proven solutions are available.

### 7.11 Optimisation methods for Life Cycle Cost minimisation

Life Cycle Cost (LCC) is the cumulative costs of items/ equipment procurement, operation and maintenance from the conceptual phase to the disposal phase.

- (A) Rolling Stock** – Rolling Stock design and production are long-term and complex activities involving huge investment costs. As operating and maintenance costs of rolling stock account for about two-third of the LCC, it is necessary to carry out effective prediction, analysis and evaluation of the LCC. BMRCL uses LCC minimisation model, which considers manpower costs, energy, repairs and maintenance costs, overhauling costs and replacement costs over 30 years operation cycle of Rolling Stock. It is, however, assumed that all these factors vary in a linear manner with time, which cannot be considered an accurate model.

TC (IIT Delhi) suggested that there is a need to develop and use a dynamic life cycle assessment integrating LCC minimisation model as per the guidelines of Industry 4.0, which uses emerging

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<sup>52</sup> *Industry 4.0 refers to the Fourth Industrial Revolution which is the integration of digital technologies into manufacturing and industrial processes.*

technologies such as Big Data Analytics, Internet of Things (IoT), Cloud Computing and Virtual Reality, Artificial Intelligence, etc. Through adoption of these advanced technologies, we can increase system reliability, reduce cost and time, increase quality assurance and safety, etc.

*BMRCL stated (February 2024/ April 2025) that Audit suggestion to develop and use a dynamic life cycle assessment integrating LCC minimisation models is noted and shall be referred to the Expert Committee on International Standards.*

- (B) Signalling and Telecommunication (S&T) equipment** - It was noticed that obsolescence forecasting was required for electronic equipment as Metro network is a long term life system, but electronic components are subject to obsolescence and may have shorter life cycle. BMRCL, however, did not have a strategy or practice to maximise the life cycle of these items.

BMRCL stated (February 2024/ April 2025) that equipment life is ensured as part of contract with Original Equipment Manufacturers. Some components/ parts may be required to be replaced as per wear and tear intermediately to ensure that whole system performs smoothly for committed period. The required spare parts availability is ensured as part of contract.

TC (IIT Delhi) stated that from obsolescence forecasting, TC (IIT Delhi) meant all necessary components, chips and electronic equipment are made available from the vendor for the entire projected/ mandated life span of the system. As this is stated to have been ensured in new CBTC systems, however, a similar arrangement must have been done for the previous older technology based Phase 1 system (DTG system) also.

## 7.12 Plantation and maintenance of saplings

BMRCL obtained permission from the Forest Department for removal of trees, which were obstructing the progress of ongoing Bangalore Metro Rail Project works. BMRCL had to plant 10 tall and healthy saplings for each tree removed/ translocated and also ensure proper and effective care and maintenance of trees for a period of three years.

BMRCL undertook compensatory plantation of 21,604 trees in case of Phase 1 through Bruhat Bangalore Mahanagara Palike (BBMP), Bangalore Development Authority (BDA), Non-Government Organisations and other Departments. However, there is no record indicating their maintenance.

BMRCL agreed (February 2024) that there is no record of maintenance of saplings.

BMRCL removed 4,063 trees (felling-3,246 and translocation-817) in Phase 2 and hence, had to plant 40,630 trees. In this regard, Audit noticed that the Company awarded plantation and maintenance works of 1,400 trees at ₹0.40 crore on nomination basis and plantation of 25,500 trees were finalised through local quotations at ₹8.39 crore including GST by taking exemption under Section 4(g) of KTPP Act,

1999, which provides for exemption from tendering process only in case of specific procurements, citing huge gestation periods and emergencies for obtaining exemptions.

In this regard, Audit observed that the justification offered by BMRCL for seeking exemption under Section 4(g) of KTPP Act, 1999 was not justified. Further, there was a fair chance of getting competitive price through open tenders. Finalisation of plantation contracts without floating tenders not only resulted in deviation to CVC guidelines but also resulted in non-competitive price being paid for execution of works.

BMRCL replied (February 2024/ April 2025) that the Company is taking up the plantation job by calling open tenders from February 2024 and eligible contractors are being awarded the work on lowest quoted rates.

### 7.13 Lapses in monitoring of operation and maintenance

The Board of Directors of BMRCL reconstituted (25 February 2021) the Board Level Committee on Operation & Maintenance. However, no agenda and minutes of the Board Level Committee on Operation & Maintenance were furnished to Audit.

BMRCL confirmed (February 2024) that the reconstituted Board Level Committee on Operation & Maintenance had not met so far.

***Recommendation # 19 - The Board Level Committee on Operation & Maintenance needs to meet periodically to monitor the operation and maintenance activities of Metro.***

***During the Exit Conference with Ministry, BMRCL agreed (May 2025) to convene meetings periodically.***

### 7.14 Conclusion

BMRCL could not achieve the projected Ridership and PHPDT as per respective DPRs stated to be achieved against the years 2007 (Phase 1)/ 2011 (Phase1 Extension) even by the year 2022. This was due to non-integration of Metro with Bengaluru Metropolitan Transport Corporation, lack of last mile connectivity, lack of adequate parking facility, etc. Despite non-achievement of projected Ridership and PHPDT, BMRCL converted all 3-car trains of Phase 1 into 6-car trains. No records for maintenance of plantation have been maintained for saplings planted in Phase 1.



*Thus, Performance Audit of “Implementation of Phase 1 and 2 of Bangalore Metro Rail Project” by BMRCL indicated lower ridership and short realization of non-farebox revenue than projected, which may lead to operational losses for BMRCL and extra burden on the Government exchequer even after incurring about ₹40,000 crore up to March 2023.*

*Based on the shortcomings and the implication of such deficiencies in future Phases of implementation of Bangalore Metro Rail Project, 19 Recommendations have been proposed for further strengthening the performance of BMRCL.*



**(Anand Mohan Bajaj)**

**Deputy Comptroller and Auditor General  
and Chairman, Audit Board**

**New Delhi**

**Dated: 10 July 2026**

**Countersigned**



**(K. Sanjay Murthy)**

**Comptroller and Auditor General of India**

**New Delhi**

**Dated: 10 July 2026**



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# Annexures

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**Inauguration of Phase 2 Metro Lines by  
the then Hon'ble Chief Minister of Karnataka**



**Annexure-I****(Referred to in Para No. 2.1)****Statement indicating the details of sample selection****Table A – Phase I Civil Contracts**

| Sl. No. | Group                    | Total No. of Contracts | Total Value of Contracts (₹ in crore) | % of Contracts selected | No. of Contracts selected | Value of the selected Contracts (₹ in crore) |
|---------|--------------------------|------------------------|---------------------------------------|-------------------------|---------------------------|----------------------------------------------|
| 1       | Below ₹1 crore           | 17                     | 6.86                                  | 10                      | 2                         | 1.37                                         |
| 2       | ₹1 crore to ₹50 crore    | 45                     | 467.00                                | 15                      | 7                         | 87.76                                        |
| 3       | ₹50 crore to ₹100 crore  | 4                      | 336.33                                | 50                      | 2                         | 172.68                                       |
| 4       | ₹100 crore to ₹500 crore | 18                     | 3,465.23                              | 75                      | 14                        | 2,807.40                                     |
| 5       | Above ₹ 500 crore        | 3                      | 2,898.89                              | 100                     | 3                         | 2,898.89                                     |
|         | <b>Total</b>             | <b>87</b>              | <b>7,174.31</b>                       |                         | <b>28</b>                 | <b>5,968.10</b>                              |

**Table B – Phase I Systems Contracts**

| Sl. No. | Group                    | Total No. of Contracts | Total Value of Contracts (₹ in crore) | % of Contracts selected | No. of Contracts selected | Value of the selected Contracts (₹ in crore) |
|---------|--------------------------|------------------------|---------------------------------------|-------------------------|---------------------------|----------------------------------------------|
| 1       | Below ₹1 crore           | 14                     | 4.08                                  | 10                      | 2                         | 0.51                                         |
| 2       | ₹1 crore to ₹50 crore    | 18                     | 231.08                                | 15                      | 3                         | 41.40                                        |
| 3       | ₹50 crore to ₹100 crore  | 3                      | 243.84                                | 50                      | 2                         | 143.97                                       |
| 4       | ₹100 crore to ₹500 crore | 3                      | 482.20                                | 75                      | 2                         | 253.94                                       |
| 5       | Above ₹ 500 crore        | 3                      | 2,847.52                              | 100                     | 3                         | 2,847.52                                     |
|         | <b>Total</b>             | <b>41</b>              | <b>3,808.72</b>                       |                         | <b>12</b>                 | <b>3,287.34</b>                              |

**Table C – Phase II Civil Contracts**

| Sl. No. | Group                    | Total No. of Contracts | Total Value of Contracts (₹ in crore) | % of Contracts selected | No. of Contracts selected | Value of the selected Contracts (₹ in crore) |
|---------|--------------------------|------------------------|---------------------------------------|-------------------------|---------------------------|----------------------------------------------|
| 1       | Below ₹ 1 crore          | 102                    | 22.65                                 | 10                      | 11                        | 4.43                                         |
| 2       | ₹1 crore to ₹50 crore    | 64                     | 471.18                                | 15                      | 10                        | 84.25                                        |
| 3       | ₹50 crore to ₹100 crore  | 4                      | 267.39                                | 50                      | 2                         | 154.76                                       |
| 4       | ₹100 crore to ₹500 crore | 9                      | 2,150.04                              | 75                      | 7                         | 1,504.63                                     |
| 5       | Above ₹500 crore         | 11                     | 10,217.22                             | 100                     | 11                        | 10,217.22                                    |
|         | <b>Total</b>             | <b>190</b>             | <b>13,128.48</b>                      |                         | <b>41</b>                 | <b>11,965.29</b>                             |



**Table D – Phase II Systems Contracts**

| Sl. No. | Group                        | Total No. of Contracts | Total Value of Contracts (₹ in crore) | % of Contracts selected | No. of Contracts selected | Value of the selected Contracts (₹ in crore) |
|---------|------------------------------|------------------------|---------------------------------------|-------------------------|---------------------------|----------------------------------------------|
| 1       | Below ₹1 crore               | 139                    | 21.39                                 | 10                      | 14                        | 3.44                                         |
| 2       | ₹1 crore to ₹50 crore        | 68                     | 457.61                                | 15                      | 11                        | 68.12                                        |
| 3       | ₹50 crore to ₹100 crore      | 2                      | 132.86                                | 50                      | 1                         | 69.94                                        |
| 4       | ₹100 crore to ₹500 crore     | 6                      | 1,252.16                              | 75                      | 5                         | 1,103.79                                     |
| 5       | Above ₹500 crore             | 5                      | 5,006.83                              | 100                     | 5                         | 5,006.83                                     |
|         | <b>Total</b>                 | <b>220</b>             | <b>6,870.85</b>                       |                         | <b>36</b>                 | <b>6,252.12</b>                              |
|         | <b>Grand Total (A+B+C+D)</b> | <b>538</b>             | <b>30,982.36</b>                      |                         | <b>117 (22%)</b>          | <b>27,472.85 (89%)</b>                       |

**Table E – Operation & Maintenance Contracts for Phase I and Phase II**

| Sl. No. | Group                 | Total No. of Contracts | Total Value of Contracts (₹ in crore) | % of Contracts selected | No. of Contracts selected | Value of the selected Contracts (₹ in crore) |
|---------|-----------------------|------------------------|---------------------------------------|-------------------------|---------------------------|----------------------------------------------|
| 1       | Below ₹5 lakh         | 2,147                  | 53.25                                 | 2                       | 43                        | 1.20                                         |
| 2       | ₹ 5 lakh to ₹ 5 crore | 111                    | 88.75                                 | 10                      | 11                        | 12.09                                        |
| 3       | Above ₹ 5 crore       | 21                     | 334.83                                | 100                     | 21                        | 334.83                                       |
|         | <b>Total</b>          | <b>2,279</b>           | <b>476.83</b>                         |                         | <b>75 (3%)</b>            | <b>348.12 (73%)</b>                          |

**Annexure-II****(Referred to in Para No. 4.4.1)****Statement indicating the variation of FMV of the Selected Representative Land Parcels with the Prevailing Guideline Values**

| SI. No. | Category                                      | Property ID | Property No. | Area Statement |              | Opinion on the FMV<br>(₹ Per sq.ft.) | Guidance Value<br>(₹ per Sq. Ft.) | Variation of FMV with the Guidance Value |
|---------|-----------------------------------------------|-------------|--------------|----------------|--------------|--------------------------------------|-----------------------------------|------------------------------------------|
|         |                                               |             |              | (in Sq.m)      | (in Sq. ft.) |                                      |                                   |                                          |
| EW-01   | OLD MADRAS ROAD                               |             |              |                |              |                                      |                                   |                                          |
| 1       | A1                                            | EW 17       | 2,3 & 4      | 1,306          | 14,051       | 3,646                                | 1,200                             | 204%                                     |
| 2       | A2                                            | EW 8        | 4/1          | 4,314          | 46,417       | 4,061                                | 1,680                             | 142%                                     |
| 3       | B1                                            | EW 21       | 134          | 610            | 6,558        | 4,028                                | 1,200                             | 236%                                     |
| 4       | B2                                            | EW 9        | 11           | 377            | 4,053        | 4,846                                | 1,680                             | 188%                                     |
| 5       | C11                                           | EW 2        | 92           | 403            | 4,337        | 2,463                                | 1,200                             | 105%                                     |
| 6       | C22                                           | EW 15       | 7(7/8)       | 716            | 7,704        | 4,782                                | 1,680                             | 185%                                     |
| EW-02   | INDIRANAGAR (100-FEET ROAD) TO CMH ROAD CURVE |             |              |                |              |                                      |                                   |                                          |
| 1       | A2                                            | CMH 14      | 14a & 15a    | 424            | 4,564        | 10,656                               | 4,200                             | 154%                                     |
| 2       | B1                                            | CMH 2       | 240          | 225            | 2,425        | 6,635                                | 3,000                             | 121%                                     |
| 3       | B2                                            | CMH 13      | 132          | 221            | 2,379        | 9,081                                | 4,200                             | 116%                                     |
| 4       | C11                                           | CMH 4       | 290          | 233            | 2,506        | 6,341                                | 3,000                             | 111%                                     |
| 5       | C12                                           | CMH 8       | 294          | 374            | 4,025        | 9,457                                | 3,000                             | 215%                                     |
| 6       | C21                                           | CMH 16      | 15           | 132            | 1,422        | 10,068                               | 4,200                             | 140%                                     |
| EW-03   | CMH ROAD TO SV ROAD CURVE                     |             |              |                |              |                                      |                                   |                                          |
| 1       | A2                                            | EW 100      | 58           | 202            | 2,168        | 3,508                                | 2,520                             | 39%                                      |
| 2       | B2                                            | EW 95       | 51/1         | 53             | 566          | 3,557                                | 2,520                             | 41%                                      |
| 3       | C21                                           | EW 108      | 116/3        | 33             | 357          | 3,397                                | 2,520                             | 35%                                      |
| 4       | C22                                           | EW 92A      | 49           | 75             | 807          | 3,648                                | 2,520                             | 45%                                      |
| 5       | C23                                           | EW 97       | 54           | 94             | 1,013        | 3,549                                | 2,520                             | 41%                                      |
| EW-04   | SV ROAD CURVE TO ULSOOR                       |             |              |                |              |                                      |                                   |                                          |
| 1       | A2                                            | EW 140      | 135          | 685            | 7,370        | 3,600                                | 2,800                             | 29%                                      |
| 2       | B1                                            | EW 124      | 121          | 152            | 1,631        | 2,824                                | 2,000                             | 41%                                      |
| 3       | B2                                            | EW 156      | 79-83        | 294            | 3,167        | 3,692                                | 2,800                             | 32%                                      |
| 4       | C21                                           | EW 117      | 103          | 49             | 530          | 3,477                                | 2,800                             | 24%                                      |
| 5       | C22                                           | EW 160      | 74/11        | 202            | 2,177        | 3,412                                | 2,800                             | 22%                                      |
| 6       | C23                                           | EW 148      | 140-141      | 138            | 1,485        | 3,462                                | 2,800                             | 24%                                      |
| EW-05   | TRINITY CIRCLE TO MG ROAD                     |             |              |                |              |                                      |                                   |                                          |
| 1       | A1                                            | EW 185      | 21(41)       | 1,747          | 18,796       | 10,952                               | 5,500                             | 99%                                      |
| 2       | C22                                           | EW 189      | 11           | 2,963          | 31,876       | 12,065                               | 7,700                             | 57%                                      |
| 3       | C23                                           | EW 196      | 71           | 1,534          | 16,502       | 12,698                               | 7,700                             | 65%                                      |
| EW-06   | CITY RAILWAY STATION                          |             |              |                |              |                                      |                                   |                                          |
| 1       | A1                                            | EW 315      | 80           | 69             | 742          | 1,885                                | 600                               | 214%                                     |
| 2       | B1                                            | EW 270      | 35           | 42             | 449          | 1,885                                | 600                               | 214%                                     |
| 3       | C12                                           | EW 325      | 90           | 42             | 449          | 1,785                                | 600                               | 198%                                     |
| 4       | C13                                           | EW 246      | 11           | 37             | 395          | 1,785                                | 600                               | 198%                                     |

| SI. No. | Category                                          | Property ID | Property No. | Area Statement |              | Opinion on the FMV (₹ Per sq.ft.) | Guidance Value (₹ per Sq. Ft.) | Variation of FMV with the Guidance Value |
|---------|---------------------------------------------------|-------------|--------------|----------------|--------------|-----------------------------------|--------------------------------|------------------------------------------|
|         |                                                   |             |              | (in Sq.m)      | (in Sq. ft.) |                                   |                                |                                          |
| EW-07   | MAGADI ROAD                                       |             |              |                |              |                                   |                                |                                          |
| 1       | A2                                                | EW 469      | 99-103       | 392            | 4,214        | 3,780                             | 2,100                          | 80%                                      |
| 2       | B2                                                | EW 376      | 3            | 49             | 532          | 3,918                             | 2,100                          | 87%                                      |
| 3       | C21                                               | EW 480      | 95/1         | 28             | 304          | 3,866                             | 2,100                          | 84%                                      |
| 4       | C22                                               | EW 436      | 51/1         | 81             | 869          | 3,854                             | 2,100                          | 84%                                      |
| 5       | C23                                               | EW 457      | 67/1         | 109            | 1,172        | 3,780                             | 2,100                          | 80%                                      |
| EW-08   | MAGADI ROAD STATION AND CHORD ROAD                |             |              |                |              |                                   |                                |                                          |
| 1       | A2                                                | EW 518      | 76           | 1,243          | 13,371       | 4,854                             | 1,960                          | 148%                                     |
| 2       | B1                                                | EW 529      | 1            | 182            | 1,953        | 3,324                             | 1,400                          | 137%                                     |
| 3       | B2                                                | EW 511      | 78 (1-3)     | 280            | 3,014        | 4,417                             | 1,960                          | 125%                                     |
| 4       | C21                                               | EW 527      | 174G-36      | 58             | 626          | 4,364                             | 1,960                          | 123%                                     |
| EW-09   | VIJAYANAGAR STOCK YARD                            |             |              |                |              |                                   |                                |                                          |
| 1       | C1                                                | EW 536      | 12/1         | 663            | 7,129        | 4,573                             | 770                            | 494%                                     |
| EW-10   | DEEPANJALI NAGAR STATION                          |             |              |                |              |                                   |                                |                                          |
| 1       | A2                                                | EW 560      | KAVIKA       | 3,154          | 33,937       | 3,176                             | 1,120                          | 184%                                     |
| 2       | B1                                                | EW 542      | 15(132)      | 195            | 2,098        | 1,648                             | 800                            | 106%                                     |
| 3       | B2                                                | EW 554      | 1/4          | 191            | 2,052        | 3,097                             | 1,120                          | 177%                                     |
| 4       | C11                                               | EW 543      | 14(131)      | 144            | 1,551        | 1,648                             | 800                            | 106%                                     |
| 5       | C22                                               | EW 551      | 4/2          | 160            | 1,720        | 3,035                             | 1,120                          | 171%                                     |
| EW-11   | MYSORE ROAD                                       |             |              |                |              |                                   |                                |                                          |
| 1       | A2                                                | EW 569      | 326          | 3,688          | 39,677       | 4,114                             | 1,400                          | 194%                                     |
| 2       | B1                                                | EW 591      | 3/A          | 197            | 2,118        | 2,550                             | 1,000                          | 155%                                     |
| 3       | B2                                                | EW 571      | 324          | 999            | 10,752       | 4,418                             | 1,400                          | 216%                                     |
| 4       | C21                                               | EW 577      | 328 & 38/2   | 238            | 2,560        | 3,200                             | 1,400                          | 129%                                     |
| 5       | C23                                               | EW 575      |              | 1,644          | 17,685       | 4,674                             | 1,400                          | 234%                                     |
| NS-01   | MAHALAKSHMI STATION                               |             |              |                |              |                                   |                                |                                          |
| 1       | A2                                                | NS 17B      | 68A          | 537            | 5,777        | 5,196                             | 2,800                          | 86%                                      |
| 2       | B1                                                | NS 23       | 402 (31/2)   | 28             | 299          | 4,768                             | 2,000                          | 138%                                     |
| 3       | B2                                                | NS 7        | 18 (5/1)     | 67             | 717          | 4,683                             | 2,800                          | 67%                                      |
| 4       | C11                                               | NS 21       | 402 (31/1)   | 138            | 1,485        | 4,493                             | 2,100                          | 125%                                     |
| 5       | C23                                               | NS 10A      | 17A          | 283            | 3,049        | 4,368                             | 2,800                          | 56%                                      |
| NS-02   | KUVEMPU ROAD ALIGNMENT (STATION & BEFORE STATION) |             |              |                |              |                                   |                                |                                          |
| 1       | A2                                                | NS 25       | 1761         | 361            | 3,885        | 5,877                             | 2,940                          | 100%                                     |
| 2       | B1                                                | NS 59       | 2926         | 122            | 1,316        | 4,797                             | 2,100                          | 128%                                     |
| 3       | B2                                                | NS 48       | 2941         | 149            | 1,601        | 5,850                             | 2,940                          | 99%                                      |
| 4       | C21                                               | NS 35       | 2956A        | 276            | 2,968        | 5,752                             | 2,940                          | 96%                                      |
| 5       | C22                                               | NS 36       | 2956         | 183            | 1,966        | 5,771                             | 2,940                          | 96%                                      |
| NS-03   | KUVEMPU ROAD ALIGNMENT (AFTER STATION)            |             |              |                |              |                                   |                                |                                          |
| 1       | A2                                                | NS 64       | 1641/56      | 475            | 5,111        | 4,781                             | 2,940                          | 63%                                      |
| 2       | B1                                                | NS 132      | 61           | 982            | 10,569       | 4,455                             | 2,100                          | 112%                                     |
| 3       | B2                                                | NS 126      | 54           | 153            | 1,646        | 4,598                             | 2,940                          | 56%                                      |
| 4       | C21                                               | NS 105      | 2995/B-4     | 81             | 868          | 4,638                             | 2,940                          | 58%                                      |

| SI. No.                                                       | Category | Property ID | Property No.   | Area Statement |              | Opinion on the FMV (₹ Per sq.ft.) | Guidance Value (₹ per Sq. Ft.) | Variation of FMV with the Guidance Value |
|---------------------------------------------------------------|----------|-------------|----------------|----------------|--------------|-----------------------------------|--------------------------------|------------------------------------------|
|                                                               |          |             |                | (in Sq.m)      | (in Sq. ft.) |                                   |                                |                                          |
| 5                                                             | C22      | NS 72       | 1619(16)       | 126            | 1,351        | 4,559                             | 2,940                          | 55%                                      |
| 6                                                             | C23      | NS 116      | 3048(48)       | 96             | 1,030        | 4,639                             | 2,940                          | 58%                                      |
| <b>NS-04 MALLESHWARAM STATION</b>                             |          |             |                |                |              |                                   |                                |                                          |
| 1                                                             | A1       | NS 138-141  | 1613-1616      | 999            | 10,747       | 3,396                             | 2,100                          | 62%                                      |
| 2                                                             | A2       | NS 146-148  | 1613(31)       | 1,167          | 12,554       | 5,782                             | 2,940                          | 97%                                      |
| 3                                                             | B1       | NS 145      | 1588/57 (70/1) | 292            | 3,143        | 3,523                             | 2,100                          | 68%                                      |
| 4                                                             | B2       | NS 143      | 1611/53 (72)   | 170            | 1,826        | 4,374                             | 2,940                          | 49%                                      |
| <b>NS-05 KUVEMPU ROAD RAILWAY CROSSING (SWASTHIK STATION)</b> |          |             |                |                |              |                                   |                                |                                          |
| 1                                                             | A1       | NS 163      | 1356 (56/6)    | 579            | 6,230        | 2,503                             | 2,100                          | 19%                                      |
| 2                                                             | B1       | NS 164      | 1618(37)       | 143            | 1,537        | 3,190                             | 2,100                          | 52%                                      |
| 3                                                             | B2       | NS 151      | 1609/1 (24)    | 291            | 3,128        | 4,096                             | 2,940                          | 39%                                      |
| 4                                                             | C22      | NS 152      | 1608/23        | 278            | 2,994        | 3,999                             | 2,940                          | 36%                                      |
| <b>NS-06 CHICKPET STATION</b>                                 |          |             |                |                |              |                                   |                                |                                          |
| 1                                                             | A2       | NS 169      | 104(109)       | 4,109          | 44,209       | 9,440                             | 3,500                          | 170%                                     |
| 2                                                             | B2       | NS 167      | 90             | 334            | 3,594        | 8,748                             | 3,500                          | 150%                                     |
| 3                                                             | C24      | NS 168      | 108/7 (107)    | 1,080          | 11,622       | 8,829                             | 3,500                          | 152%                                     |
| <b>NS-07 CITY MARKET STATION</b>                              |          |             |                |                |              |                                   |                                |                                          |
| 1                                                             | A2       |             | 39/1           | 475            | 5,109        | 5,108                             | 2,800                          | 82%                                      |
| 2                                                             | B2       |             | 39             | 267            | 2,869        | 4,831                             | 2,800                          | 73%                                      |
| <b>NS-08 RAMP PORTION</b>                                     |          |             |                |                |              |                                   |                                |                                          |
| 1                                                             | B2       | NS 174      | 1089(2)        | 687            | 7,386        | 4,696                             | 2,800                          | 68%                                      |
| <b>NS-09 KR ROAD TO VV ROAD CURVE</b>                         |          |             |                |                |              |                                   |                                |                                          |
| 1                                                             | B1       | NS 184      | 93/2           | 1,215          | 13,073       | 4,641                             | 2,000                          | 132%                                     |
| 2                                                             | B2       | NS 185      | 93             | 139            | 1,493        | 5,345                             | 2,800                          | 91%                                      |
| 3                                                             | C21      | NS 186      | 93/1           | 323            | 3,471        | 5,842                             | 2,800                          | 109%                                     |
| <b>NS-10 LALBAGH STATION</b>                                  |          |             |                |                |              |                                   |                                |                                          |
| 1                                                             | A1       | NS 195      | 94             | 645            | 6,944        | 4,227                             | 2,200                          | 92%                                      |
| 2                                                             | B1       | NS 198      | 92             | 136            | 1,459        | 5,143                             | 2,200                          | 134%                                     |
| 3                                                             | C12      | NS 200      | 89             | 323            | 3,479        | 4,976                             | 2,200                          | 126%                                     |
| 4                                                             | C21      | NS 193      | 96/1           | 264            | 2,839        | 5,945                             | 3,080                          | 93%                                      |
| <b>NS-11 SOUTH END STATION</b>                                |          |             |                |                |              |                                   |                                |                                          |
| 1                                                             | A2       | NS 209      | 200/2          | 2,013          | 21,653       | 6,161                             | 3,080                          | 100%                                     |
| 2                                                             | B2       | NS 207      | 39296          | 205            | 2,209        | 5,043                             | 3,080                          | 64%                                      |
| 3                                                             | C22      | NS 219      | 71/11          | 466            | 5,016        | 5,588                             | 3,080                          | 81%                                      |

**Annexure-III****(Referred to in Para No. 4.4.2.1 (i))****Statement indicating the details of land parcels which were converted due to lack of preventive orders for conversion from GoK**

| Sl. No. | Reach               | Property ID name | Area acquired above 505.85 square metre | Rate in square meter as per agriculture rates (in ₹) | Rate per square metre adopted by BMRCL (in ₹) | Difference in rate per square meter (in ₹) | Excess compensation paid (₹ in Lakh) | Solatium (100% of compensation) Paid (₹ in Lakh) |
|---------|---------------------|------------------|-----------------------------------------|------------------------------------------------------|-----------------------------------------------|--------------------------------------------|--------------------------------------|--------------------------------------------------|
| 1       | Reach 2E Volume - 5 | R2E-139          | 607.55                                  | 5,979.89                                             | 9,281                                         | 3,301.11                                   | 20.06                                | 20.06                                            |
| 2       | Reach 3C Volume - 1 | R3C-14A          | 2,525.00                                | 4,942.05                                             | 15,855                                        | 10,912.95                                  | 275.55                               | 275.55                                           |
| 3       | Reach 5 Volume - 1  | R5-HD-3          | 2,361.00                                | 2,100.37                                             | 7,535                                         | 5,434.63                                   | 128.31                               | 128.31                                           |
| 4       | Reach 5 Volume - 1  | R5-HD-5          | 8,352.00                                | 2,100.37                                             | 7,266                                         | 5,165.63                                   | 431.43                               | 431.43                                           |
| 5       | Reach 5 Volume - 1  | R5-HD-6          | 2,295.00                                | 2,100.37                                             | 7,546                                         | 5,445.63                                   | 124.98                               | 124.98                                           |
| 6       | Reach 5 Volume - 1  | R5-HD-7          | 3,843.00                                | 2,100.37                                             | 7,395                                         | 5,294.63                                   | 203.47                               | 203.47                                           |
| 7       | Reach 5 Volume - 1  | R5-HD-8          | 3,843.00                                | 2,100.37                                             | 7,363                                         | 5,262.63                                   | 202.24                               | 202.24                                           |
| 8       | Reach 5 Volume - 1  | R5-HD-9          | 7,627.00                                | 3,088.78                                             | 7,266                                         | 4,177.22                                   | 318.60                               | 318.60                                           |
| 9       | Reach 5 Volume - 1  | R5-HD-10         | 8,486.96                                | 2,100.37                                             | 7,255                                         | 5,154.63                                   | 437.47                               | 437.47                                           |
| 10      | Reach 5 Volume - 1  | R5-HD-10         | 809.36                                  | 2,100.37                                             | 8,665                                         | 6,564.63                                   | 53.13                                | 53.13                                            |
| 11      | Reach 5 Volume - 1  | R5-HD-11         | 8,267.16                                | 2,100.37                                             | 7,255                                         | 5,154.63                                   | 426.14                               | 426.14                                           |
| 12      | Reach 5 Volume - 1  | R5-HD-11         | 1,542.84                                | 2,100.37                                             | 7,255                                         | 5,154.63                                   | 79.53                                | 79.53                                            |
| 13      | Reach 5 Volume - 1  | R5-HD-12         | 8,854.00                                | 3,088.78                                             | 7,255                                         | 4,166.22                                   | 368.88                               | 368.88                                           |
| 14      | Reach 5 Volume - 1  | R5-HD-13         | 7,983.00                                | 3,088.78                                             | 7,266                                         | 4,177.22                                   | 333.47                               | 333.47                                           |
| 15      | Reach 5 Volume - 1  | R5-HD-14         | 1,808.94                                | 2,100.37                                             | 7,416                                         | 5,315.63                                   | 96.16                                | 96.16                                            |
| 16      | Reach 5 Volume - 1  | R5-HD-14         | 708.19                                  | 2,100.37                                             | 9,096                                         | 6,995.63                                   | 49.54                                | 49.54                                            |
| 17      | Reach 5 Volume - 1  | R5-HD-14         | 708.19                                  | 2,100.37                                             | 9,096                                         | 6,995.63                                   | 49.54                                | 49.54                                            |



| Sl. No. | Reach               | Property ID name | Area acquired above 505.85 square metre | Rate in square meter as per agriculture rates (in ₹) | Rate per square metre adopted by BMRCL (in ₹) | Difference in rate per square meter (in ₹) | Excess compensation paid (₹ in Lakh) | Solatum (100% of compensation) Paid (₹ in Lakh) |
|---------|---------------------|------------------|-----------------------------------------|------------------------------------------------------|-----------------------------------------------|--------------------------------------------|--------------------------------------|-------------------------------------------------|
| 18      | Reach 5 Volume - 1  | R5-HD-15         | 2,434.83                                | 2,100.37                                             | 7,524                                         | 5,423.63                                   | 132.06                               | 132.06                                          |
| 19      | Reach 5 Volume - 1  | R5-HD-16         | 2,357.00                                | 3,088.78                                             | 7,546                                         | 4,457.22                                   | 105.06                               | 105.06                                          |
| 20      | Reach 5 Volume - 1  | R5-HD-17         | 4,733.14                                | 2,100.37                                             | 7,255                                         | 5,154.63                                   | 243.98                               | 243.98                                          |
| 21      | Reach 5 Volume - 1  | R5-HD-17         | 695.37                                  | 2,100.37                                             | 8,686                                         | 6,585.63                                   | 45.79                                | 45.79                                           |
| 22      | Reach 5 Volume - 1  | R5-HD-21         | 4,257.41                                | 2,100.37                                             | 7,266                                         | 5,165.63                                   | 219.92                               | 219.92                                          |
| 23      | Reach 5 Volume - 1  | R5-HD-22         | 1,454.11                                | 2,100.37                                             | 7,599                                         | 5,498.63                                   | 79.96                                | 79.96                                           |
| 24      | Reach 5 Volume - 1  | R5-HD-23         | 908.79                                  | 3,088.78                                             | 9,096                                         | 6,007.22                                   | 54.59                                | 54.59                                           |
| 25      | Reach 5 Volume - 1  | R5-HD-25         | 2,952.09                                | 2,100.37                                             | 7,244                                         | 5,143.63                                   | 151.84                               | 151.84                                          |
| 26      | Reach 5 Volume - 1  | R5-HD-25         | 1,800.38                                | 2,100.37                                             | 7,244                                         | 5,143.63                                   | 92.60                                | 92.60                                           |
| 27      | Reach 5 Volume - 1  | R5-HD-26         | 2,860.60                                | 2,100.37                                             | 7,244                                         | 5,143.63                                   | 147.14                               | 147.14                                          |
| 28      | Reach 5 Volume - 1  | R5-HD-26         | 2,926.07                                | 2,100.37                                             | 7,244                                         | 5,143.63                                   | 150.51                               | 150.51                                          |
| 29      | Reach 5 Volume - 1  | R5-HD-27         | 834.34                                  | 2,100.37                                             | 8,568                                         | 6,467.63                                   | 53.96                                | 53.96                                           |
| 30      | Reach 5 Volume - 1  | R5-HD-27         | 834.34                                  | 2,100.37                                             | 8,568                                         | 6,467.63                                   | 53.96                                | 53.96                                           |
| 31      | Reach 5 Volume - 1  | R5-HD-29         | 4,634.54                                | 2,100.37                                             | 11,593                                        | 9,492.63                                   | 439.94                               | 439.94                                          |
| 32      | Reach 5 Volume - 4  | R5-HD-9          | 668.94                                  | 3,088.78                                             | 8,665                                         | 5,576.22                                   | 37.30                                | 37.30                                           |
| 33      | Reach 5 Volume - 4  | R5-HD-3A         | 516.16                                  | 2,100.37                                             | 8,848                                         | 6,747.63                                   | 34.83                                | 34.83                                           |
| 34      | Reach 5 Volume - 4  | R5-HD-9A         | 1,385.86                                | 2,100.37                                             | 9,709                                         | 7,608.63                                   | 105.44                               | 105.44                                          |
| 35      | Reach 5 Volume - 16 | R5-HD-39         | 2,256.53                                | 2,322.77                                             | 13,608                                        | 11,285.23                                  | 254.65                               | 254.65                                          |
| 36      | Reach 5 Volume - 16 | R5-HD-40         | 1,922.97                                | 2,322.77                                             | 15,674                                        | 13,351.23                                  | 256.74                               | 256.74                                          |

| Sl. No. | Reach               | Property ID name | Area acquired above 505.85 square metre | Rate in square meter as per agriculture rates (in ₹) | Rate per square metre adopted by BMRCL (in ₹) | Difference in rate per square meter (in ₹) | Excess compensation paid (₹ in Lakh) | Solatium (100% of compensation) Paid (₹ in Lakh) |
|---------|---------------------|------------------|-----------------------------------------|------------------------------------------------------|-----------------------------------------------|--------------------------------------------|--------------------------------------|--------------------------------------------------|
| 37      | Reach 5 Volume - 16 | R5-HD-46         | 866.16                                  | 2,322.77                                             | 6,997                                         | 4,674.23                                   | 40.49                                | 40.49                                            |
| 38      | Reach 5 Volume - 16 | R5-HD-47         | 880.34                                  | 2,322.77                                             | 13,608                                        | 11,285.23                                  | 99.35                                | 99.35                                            |
| 39      | Reach 5 Volume - 16 | R5-HD-48         | 575.30                                  | 2,322.77                                             | 15,415                                        | 13,092.23                                  | 75.32                                | 75.32                                            |
| 40      | Reach 5 Volume - 16 | R5-HD-50         | 4,947.23                                | 2,322.77                                             | 20,921                                        | 18,598.23                                  | 920.10                               | 920.10                                           |
| 41      | Reach 5 Volume - 16 | R5-HD-51         | 4,163.43                                | 2,322.77                                             | 17,527                                        | 15,204.23                                  | 633.02                               | 633.02                                           |
| 42      | Reach 5 Volume - 16 | R5-HD-53         | 1,324.20                                | 2,322.77                                             | 15,415                                        | 13,092.23                                  | 173.37                               | 173.37                                           |
| 43      | Reach 5 Volume - 16 | R5-HD-54         | 1,453.20                                | 2,322.77                                             | 15,942                                        | 13,619.23                                  | 197.91                               | 197.91                                           |
| 44      | Reach 6 Volume - 9  | NG-R6-UG-P57     | 1,147.18                                | 13,590.65                                            | 25,754                                        | 12,163.35                                  | 139.54                               | 139.54                                           |
| 45      | Volume - 16         | R5-HD-52         | 7,658.90                                | 2,322.77                                             | 16,345                                        | 14,022.23                                  | 1,073.95                             | 1,073.95                                         |
| 46      | Volume - 16         | R5-HD-55         | 1,204.99                                | 2,322.77                                             | 23,013                                        | 20,690.23                                  | 249.32                               | 249.32                                           |
|         |                     |                  |                                         | <b>Total Paid</b>                                    |                                               |                                            | <b>9,861.14</b>                      | <b>9,861.14</b>                                  |
|         |                     |                  |                                         |                                                      |                                               |                                            |                                      |                                                  |
|         |                     |                  |                                         | <b>Grand Total</b>                                   |                                               |                                            |                                      | <b>₹197.22 crore</b>                             |

**Annexure-IV****(Referred to in Para No. 4.4.2.1 (ii))**

**Statement indicating the details of land parcels whose conversion status is not on record but were paid treating them either as converted lands or towards attributes applicable to converted lands**

| Sl. No. | Reach              | Property ID name  | Area acquired above 505.85 square metre | Rate in square meter as per agriculture rates (in ₹) | Rate per square metre adopted by BMRCL (in ₹) | Difference in rate per square meter (in ₹) | Excess compensation paid (in ₹ Lakh) | Solatium (100% of compensation) paid (in ₹ Lakh) |
|---------|--------------------|-------------------|-----------------------------------------|------------------------------------------------------|-----------------------------------------------|--------------------------------------------|--------------------------------------|--------------------------------------------------|
| 1       | Reach 6 Volume - 2 | DP-1              | 22,514                                  | 7,413.08                                             | 14,521                                        | 7,107.92                                   | 1,600.28                             | 1,600.28                                         |
| 2       | Reach 6 Volume - 2 | DP-1F             | 8,903                                   | 7,413.08                                             | 14,521                                        | 7,107.92                                   | 632.82                               | 632.82                                           |
| 3       | Reach 6 Volume - 8 | DP-1/G and DP-1/H | 1,085                                   | 8,154.39                                             | 16,157                                        | 8,002.61                                   | 86.83                                | 86.83                                            |
|         |                    |                   |                                         | <b>Total Paid</b>                                    |                                               |                                            | <b>2,319.93</b>                      | <b>2,319.93</b>                                  |
|         |                    |                   |                                         |                                                      |                                               |                                            |                                      |                                                  |
|         |                    |                   |                                         | <b>Grand Total</b>                                   |                                               |                                            |                                      | <b>₹46.40 crore</b>                              |

## Annexure-V

(Referred to in Para No. 4.4.2.1 (iii))

**Statement indicating the details of land parcels which were agricultural lands but were paid treating them either as converted lands or towards attributes applicable to converted lands**

| Sl. No. | Reach                  | Property ID name                         | Area acquired above 505.85 square metre | Rate in square meter as per agriculture rates (in ₹) | Rate per square metre adopted by BMRCL (in ₹) | Difference in rate per square meter (in ₹) | Excess compensation paid (in ₹ Lakh) | Solatum (100% of compensation) paid (in ₹ Lakh) |
|---------|------------------------|------------------------------------------|-----------------------------------------|------------------------------------------------------|-----------------------------------------------|--------------------------------------------|--------------------------------------|-------------------------------------------------|
| 1       | Reach 2E               | R2E-123A                                 | 612.00                                  | 7,413.08                                             | 22,259.95                                     | 14,846.87                                  | 90.86                                | 90.86                                           |
| 2       | Volume - 4             | R2E-123A                                 | 527.00                                  | 7,413.08                                             | 21,710.99                                     | 14,297.91                                  | 75.35                                | 75.35                                           |
| 3       |                        | R2E-123                                  | 850.00                                  | 7,413.08                                             | 22,066.20                                     | 14,653.12                                  | 124.55                               | 124.55                                          |
| 4       |                        | R2E-123                                  | 740.00                                  | 7,413.08                                             | 22,066.20                                     | 14,653.12                                  | 108.43                               | 108.43                                          |
| 5       | Volume - 5             | R2E-143                                  | 542.09                                  | 5,979.89                                             | 14,354.00                                     | 8,374.11                                   | 45.40                                | 45.40                                           |
| 6       | Volume - 5             | R2E-129                                  | 978.72                                  | 8,154.39                                             | 14,918.00                                     | 6,763.61                                   | 66.20                                | 66.20                                           |
| 7       | Reach 2E<br>Volume - 4 | R2E-123A                                 | 1,630.50                                | 7,413.08                                             | 13,002.91                                     | 5,589.83                                   | 91.14                                | 91.14                                           |
| 8       | Reach 2E<br>Volume - 4 | R2E-123                                  | 4,260.00                                | 7,413.08                                             | 12,970.62                                     | 5,557.54                                   | 236.75                               | 236.75                                          |
| 9       | Reach 2E<br>Volume - 4 | R2E-124                                  | 7,035.98                                | 7,413.08                                             | 13,002.91                                     | 5,589.83                                   | 393.30                               | 393.30                                          |
| 10      | Reach 2E<br>Volume - 4 | R2E-124                                  | 6,121.02                                | 7,413.08                                             | 13,185.90                                     | 5,772.82                                   | 353.35                               | 353.35                                          |
| 11      | Reach 2E<br>Volume - 4 | R2E-128<br>(Block-1)<br>and<br>(Block-3) | 39,456.30                               | 2,471.03                                             | 4,327.13                                      | 1,856.10                                   | 732.35                               | 732.35                                          |
| 12      | Reach 2E<br>Volume - 5 | R2E-116                                  | 3,449.75                                | 5,979.89                                             | 9,889.00                                      | 3,909.11                                   | 134.85                               | 134.85                                          |
| 13      | Reach 2E<br>Volume - 5 | R2E-139                                  | 4,249.14                                | 5,979.89                                             | 7,911.00                                      | 1,931.11                                   | 82.06                                | 82.06                                           |
| 14      | Reach 2E<br>Volume - 5 | R2E-139                                  | 1,062.28                                | 5,979.89                                             | 7,911.00                                      | 1,931.11                                   | 20.51                                | 20.51                                           |
|         |                        |                                          |                                         | <b>Total Paid</b>                                    |                                               |                                            | <b>2,555.10</b>                      | <b>2,555.10</b>                                 |
|         |                        |                                          |                                         |                                                      |                                               |                                            |                                      |                                                 |
|         |                        |                                          |                                         | <b>Grand Total</b>                                   |                                               |                                            |                                      | <b>₹51.10 crore</b>                             |

**Annexure-VI****(Referred to in Para No. 4.4.2.3)**

**Statement indicating the details of land parcels for which excess compensation was paid by considering higher percentage of attributes than those prescribed by GoK**

**Summary**

| <b>Reach</b>       | <b>No. of cases</b> | <b>Value (₹ in Lakh)</b> |
|--------------------|---------------------|--------------------------|
| 1E                 | 118                 | 218.55                   |
| 2E                 | 16                  | 195.84                   |
| 3C                 | 19                  | 14.81                    |
| 4B                 | 37                  | 41.48                    |
| 5                  | 177                 | 639.67                   |
| 6                  | 186                 | 457.28                   |
| Sub-Total          | 553                 | 1,567.63                 |
|                    | Solatium 100%       | 1,567.63                 |
| <b>Grand Total</b> |                     | <b>3,135.26</b>          |
|                    |                     | <b>₹31.35 crore</b>      |



| SL No.          | V O L U M E | Property ID name | Area in square metre | Excess Amount (₹ in Lakh) | SL No. | V O L U M E | Property ID name    | Area in square metre | Excess Amount (₹ in Lakh) | SL No. | V O L U M E | Property ID name | Area in square metre | Excess Amount (₹ in Lakh) |
|-----------------|-------------|------------------|----------------------|---------------------------|--------|-------------|---------------------|----------------------|---------------------------|--------|-------------|------------------|----------------------|---------------------------|
| <b>Reach 1E</b> |             |                  |                      |                           |        |             |                     |                      |                           |        |             |                  |                      |                           |
| 1               | 1           | R1E-46           | 75.62                | 0.43                      | 16     | 2           | R1E-145             | 11.52                | 0.17                      | 31     | 2           | R1E-193H         | 2.81                 | 0.05                      |
| 2               |             | R1E-51           | 26.14                | 0.04                      | 17     |             | R1E-164             | 140.00               | 1.69                      | 32     |             | R1E-193I         | 17.86                | 0.44                      |
| 3               |             | R1E-106          | 22.87                | 0.16                      | 18     |             | R1E-166 and R1E-167 | 2,471.94             | 5.16                      | 33     |             | R1E-193J         | 73.00                | 0.60                      |
| 4               |             | R1E-114          | 91.82                | 0.69                      | 19     |             | R1E-172             | 226.04               | 2.24                      | 34     |             | R1E-193K         | 6.74                 | 0.02                      |
| 5               |             | R1E-124          | 172.30               | 0.59                      | 20     |             | R1E-174             | 148.54               | 6.12                      | 35     |             | R1E-193N         | 13.76                | 0.47                      |
| 6               |             | R1E-125          | 186.52               | 0.62                      | 21     |             | R1E-175             | 118.00               | 0.06                      | 36     |             | R1E-193O         | 22.19                | 0.24                      |
| 7               | 1           | R1E-125A         | 148.03               | 0.33                      | 22     | 2           | R1E-181,180A        | 342.71               | 7.60                      | 37     | 2           | R1E-193R         | 42.68                | 0.36                      |
| 8               |             | R1E-126          | 160.14               | 0.57                      | 23     |             | R1E-183             | 394.66               | 11.55                     | 38     |             | R1E-193U         | 7.42                 | 0.00                      |
| 9               |             | R1E-126A         | 165.32               | 0.04                      | 24     |             | R1E-184             | 368.26               | 17.97                     | 39     |             | R1E-193W         | 30.56                | 0.07                      |
| 10              |             | R1E-127B         | 103.13               | 0.44                      | 25     |             | R1E-185             | 554.62               | 20.56                     | 40     |             | R1E-225          | 1.72                 | 0.03                      |
| 11              |             | R1E-128          | 80.00                | 0.40                      | 26     |             | R1E-193B            | 34.36                | 1.19                      | 41     |             | R1E-193P         | 13.00                | 0.14                      |
| 12              |             | R1E-128A         | 77.83                | 0.02                      | 27     |             | R1E-193C            | 40.57                | 2.06                      | 42     |             | R1E-203          | 10.93                | 0.14                      |
| 13              | 2           | R1E-128C         | 136.85               | 0.27                      | 28     | 2           | R1E-193D, E         | 19.54                | 0.05                      | 43     | 2           | R1E-208          | 80.73                | 0.33                      |
| 14              |             | R1E-130          | 117.48               | 0.21                      | 29     |             | R1E-193F            | 18.10                | 0.29                      | 44     |             | R1E-209          | 102.00               | 0.60                      |
| 15              |             | R1E-144E         | 6.43                 | 0.08                      | 30     |             | R1E-193G            | 54.03                | 0.03                      | 45     |             | R1E-210A         | 10.80                | 0.12                      |

| Sl. No. | V O L U M E | Property ID name | Area in square metre | Excess Amount (₹ in Lakh) | Sl. No. | V O L U M E | Property ID name | Area in square metre | Excess Amount (₹ in Lakh) | Sl. No. | V O L U M E | Property ID name | Area in square metre | Excess Amount (₹ in Lakh) |
|---------|-------------|------------------|----------------------|---------------------------|---------|-------------|------------------|----------------------|---------------------------|---------|-------------|------------------|----------------------|---------------------------|
| 46      | 2           | R1E-214,215      | 1,737.72             | 10.28                     | 61      | 4           | R1E-193P         | 3.70                 | 0.04                      | 76      | 7           | R1E-156-BU-A     | 6.00                 | 0.00                      |
| 47      |             | R1E-214A         | 636.40               | 7.19                      | 62      |             | R1E-209          | 3.26                 | 0.04                      | 77      |             | R1E-156-BU-A1    | 6.00                 | 0.07                      |
| 48      |             | R1E-216          | 222.06               | 0.86                      | 63      | 5           | R1E-128          | 3.73                 | 0.02                      | 78      |             | R1E-193Q-BU-A    | 8.00                 | 0.14                      |
| 49      |             | R1E-235          | 697.06               | 0.22                      | 64      | 6           | F                | 100.00               | 0.52                      | 79      |             | R1E-257B-BU-A    | 8.00                 | 0.24                      |
| 50      |             | R1E-238          | 36.20                | 0.22                      | 65      |             | I                | 100.00               | 0.21                      | 80      |             | K                | 26.56                | 0.37                      |
| 51      |             | R1E-244          | 2,008.34             | 4.86                      | 66      |             | M                | 100.00               | 1.22                      | 81      |             | R1E-92C          | 133.90               | 1.72                      |
| 52      | 3           | R1E-246          | 1,095.46             | 15.27                     | 67      |             | R1E-50-BU-A      | 6.00                 | 0.09                      | 82      | 9           | R1E-98B          | 12.95                | 0.01                      |
| 53      |             | R1E-246A         | 4.17                 | 0.06                      | 68      |             | R1E-64-BU-A      | 8.00                 | 0.22                      | 83      |             | R1E-101A         | 32.75                | 0.33                      |
| 54      |             | R1E-245B         | 169.83               | 1.89                      | 69      |             | R1E-109-BU-A     | 12.00                | 0.14                      | 84      |             | R1E-239-BU-A     | 16.00                | 0.20                      |
| 55      |             | R1E-251          | 21.49                | 0.56                      | 70      | 7           | R1E-118-BU-A     | 8.00                 | 0.10                      | 85      | 10          | R1E-21D          | 23.67                | 0.19                      |
| 56      |             | R1E-252          | 74.84                | 1.85                      | 71      |             | R1E-127-BU-A     | 12.00                | 0.18                      | 86      |             | R1E-22B          | 44.78                | 0.27                      |
| 57      |             | R1E-263          | 39.66                | 0.55                      | 72      |             | R1E-128C-BU-A    | 8.00                 | 0.11                      | 87      |             | R1E-23A          | 100.22               | 3.29                      |
| 58      |             | R1E-268A         | 832.67               | 7.15                      | 73      |             | R1E-137A-BU-A    | 12.00                | 0.30                      | 88      |             | R1E-25A, 26A     | 75.92                | 0.60                      |
| 59      |             | R1E-278          | 358.12               | 3.18                      | 74      |             | R1E-154-BU-A     | 6.00                 | 0.03                      | 89      |             | R1E-33A          | 27.35                | 0.31                      |
| 60      |             | R1E-193J         | 1.94                 | 0.06                      | 75      |             | R1E-151-BU-A     | 8.00                 | 0.07                      | 90      |             | R1E-13           | 25.72                | 0.24                      |

| Sl. No. | V O L U M E | Property ID name | Area in square metre | Excess Amount (₹ in Lakh) | Sl. No.  | V O L U M E | Property ID name | Area in square metre | Excess Amount (₹ in Lakh) | Sl. No. | V O L U M E | Property ID name | Area in square metre | Excess Amount (₹ in Lakh) |
|---------|-------------|------------------|----------------------|---------------------------|----------|-------------|------------------|----------------------|---------------------------|---------|-------------|------------------|----------------------|---------------------------|
| 91      | 11          | R1E-23           | 195.46               | 3.94                      | 106      | 17          | R1E-5H12,19      | 118.91               | 1.59                      | 2       | 4           | R2E-119A         | 71.66                | 0.68                      |
| 92      |             | R1E-25,26        | 197.79               | 3.39                      | 107      |             | R1E-5H-14        | 27.87                | 0.84                      | 3       |             | R2E-121          | 24.38                | 0.20                      |
| 93      |             | R1E-44           | 29.67                | 0.52                      | 108      |             | R1E-5H-15,16     | 52.43                | 1.51                      | 4       |             | R2E-127A         | 10,724.02            | 151.55                    |
| 94      |             | R1E-47A          | 30.00                | 0.47                      | 109      |             | R1E-5H-17        | 33.44                | 0.02                      | 5       |             | R2E-127B         | 1,214.04             | 17.16                     |
| 95      | 12          | R1E-41           | 35.81                | 0.43                      | 110      | 5           | R1E-5Q           | 605.61               | 1.88                      | 6       | 5           | R2E-116          | 556.43               | 1.93                      |
| 96      | 13          | R1E-25-BU-A      | 18.00                | 0.25                      | 111      |             | R1E-5K           | 115.12               | 3.64                      | 7       |             | R2E-116          | 328.80               | 0.84                      |
| 97      | 14          | R1E-15-D-1       | 8.23                 | 0.12                      | 112      |             | R1E-5L           | 15.08                | 0.09                      | 8       |             | R2E-116          | 328.80               | 0.60                      |
| 98      |             | R1E-41-A-1       | 25.13                | 0.32                      | 113      |             | R1E-8A           | 656.58               | 14.81                     | 9       |             | R2E-116          | 252.92               | 0.94                      |
| 99      | 17          | R1E-5E           | 303.51               | 1.22                      | 114      | 18          | R1E-8B           | 656.58               | 29.20                     | 10      | 6           | R2E-116          | 1,719.89             | 4.16                      |
| 100     |             | R1E-5E           | 303.51               | 1.22                      | 115      |             | R1E-15AD         | 40.80                | 0.60                      | 11      |             | R2E-132B         | 1,609.89             | 6.91                      |
| 101     |             | R1E-5HB          | 4.58                 | 0.08                      | 116      |             | R1E-193P-AD      | 3.90                 | 0.05                      | 12      |             | R2E-142          | 437.41               | 3.71                      |
| 102     | 17          | R1E-5H-1         | 21.32                | 0.27                      | 117      | 19          | R1E-128          | 7.40                 | 0.08                      | 13      | 6           | R2E-144          | 73.27                | 0.36                      |
| 103     |             | R1E-5H-3         | 30.73                | 0.15                      | 118      |             | R1E-133A         | 14.90                | 0.23                      | 14      |             | R2E-128A         | 2,327.00             | 2.56                      |
| 104     |             | R1E-5H-7         | 33.44                | 0.73                      | Reach 2E |             |                  |                      |                           | 15      |             | R2E-128B         | 5,411.00             | 0.12                      |
| 105     |             | R1E-5HC          | 7.56                 | 0.18                      | 1        | 3           | R2E-105          | 34.84                | 0.11                      | 16      |             | R2E-129          | 13,253.00            | 4.00                      |
|         |             |                  |                      |                           |          |             |                  |                      |                           |         |             |                  |                      |                           |

| Sl. No.         | V O L U M E | Property ID name | Area in square metre | Excess Amount (₹ in Lakh) | Sl. No.   | V O L U M E | Property ID name | Area in square metre | Excess Amount (₹ in Lakh) | Sl. No.   | V O L U M E | Property ID name | Area in square metre | Excess Amount (₹ in Lakh) |
|-----------------|-------------|------------------|----------------------|---------------------------|-----------|-------------|------------------|----------------------|---------------------------|-----------|-------------|------------------|----------------------|---------------------------|
| <b>Reach 3C</b> |             |                  |                      |                           |           |             |                  |                      |                           |           |             |                  |                      |                           |
| <b>1</b>        | <b>1</b>    | R3C-12           | 10.00                | 0.07                      | <b>16</b> | <b>7</b>    | R3C-39           | 13.71                | 0.09                      | <b>12</b> | <b>2</b>    | R4B-107          | 48.00                | 1.40                      |
| <b>2</b>        |             | R3C-14           | 468.00               | 3.07                      | <b>17</b> |             | R3C-40           | 13.79                | 0.07                      | <b>13</b> |             | R4B-125          | 109.00               | 1.54                      |
| <b>3</b>        |             | R3C-15           | 380.00               | 3.75                      | <b>18</b> |             | R3C-41A          | 19.19                | 0.20                      | <b>14</b> |             | R4B-112          | 356.00               | 3.95                      |
| <b>4</b>        |             | R3C-17           | 185.00               | 0.53                      | <b>19</b> |             | R3C-J2           | 9.69                 | 0.09                      | <b>15</b> |             | R4B-139A         | 15.00                | 0.31                      |
| <b>5</b>        |             | R3C-28           | 68.00                | 0.20                      | <b>20</b> |             | R4B-51A          | 28.00                | 0.45                      | <b>16</b> |             | R4B-140          | 34.00                | 0.46                      |
| <b>6</b>        | <b>2</b>    | R3C-29           | 60.00                | 0.61                      | <b>21</b> | <b>2</b>    | R4B-53           | 284.00               | 4.71                      | <b>17</b> | <b>2</b>    | R4B-140A         | 23.00                | 0.47                      |
| <b>7</b>        |             | R3C-45           | 25.00                | 0.05                      | <b>22</b> |             | R4B-54           | 37.00                | 0.85                      | <b>18</b> |             | R4B-142          | 89.00                | 1.17                      |
| <b>8</b>        |             | R3C-52           | 582.00               | 2.89                      | <b>23</b> |             | R4B-61           | 16.00                | 0.24                      | <b>19</b> |             | R4B-143          | 36.00                | 0.93                      |
| <b>9</b>        |             | R3C-57B and 57C  | 199.00               | 1.25                      | <b>24</b> |             | R4B-70B & 70C    | 13.00                | 0.16                      | <b>20</b> |             | R4B-145          | 24.00                | 0.23                      |
| <b>10</b>       |             | R3C-60           | 760.00               | 0.59                      | <b>25</b> |             | R4B-62           | 36.00                | 0.94                      | <b>21</b> |             | R4B-152          | 13.00                | 0.11                      |
| <b>11</b>       | <b>3</b>    | R3C-32A1         | 6.00                 | 0.04                      | <b>26</b> | <b>2</b>    | R4B-84           | 171.00               | 6.98                      | <b>22</b> | <b>2</b>    | R4B-152A         | 17.00                | 0.25                      |
| <b>12</b>       | <b>3</b>    | R3C-44A          | 16.27                | 0.00                      | <b>27</b> |             | R4B-103A         | 37.00                | 0.55                      | <b>23</b> |             | R4B-158          | 26.00                | 0.47                      |
| <b>13</b>       |             | R3C-45           | 22.41                | 0.07                      | <b>28</b> |             | R4B-105          | 22.00                | 0.59                      | <b>24</b> |             | R4B-186          | 37.00                | 0.37                      |
| <b>14</b>       |             | R3C-1B           | 92.00                | 0.65                      | <b>29</b> |             | R4B-105A         | 26.00                | 0.99                      | <b>25</b> |             | R4B-187          | 52.00                | 0.89                      |
| <b>15</b>       | <b>5</b>    | R3C-J7           | 71.33                | 0.58                      | <b>30</b> |             | R4B-106          | 63.00                | 1.51                      | <b>26</b> |             | R4B-187A         | 33.00                | 0.42                      |
|                 | <b>11</b>   |                  |                      |                           | <b>31</b> |             |                  |                      |                           | <b>27</b> |             | R4B-199 & 199A   | 215.00               | 2.39                      |

| Sl. No. | VOLUME | Property ID name                            | Area in square metre | Excess Amount (₹ in Lakh) | Sl. No. | VOLUME | Property ID name   | Area in square metre | Excess Amount (₹ in Lakh) | Sl. No. | VOLUME | Property ID name | Area in square metre | Excess Amount (₹ in Lakh) |
|---------|--------|---------------------------------------------|----------------------|---------------------------|---------|--------|--------------------|----------------------|---------------------------|---------|--------|------------------|----------------------|---------------------------|
| 28      | 2      | R4B-215                                     | 204.00               | 2.43                      | 5       | 1      | R5-HD-23           | 908.79               | 1.95                      | 20      |        | R5-216           | 88.6                 | 0.26                      |
| 29      | 3      | R4B-191                                     | 459.00               | 3.51                      | 6       |        | R5-129A            | 14.00                | 0.21                      | 21      |        | R5-232           | 126                  | 1.65                      |
| 30      | 4      | R4B-133H                                    | 21.00                | 0.23                      | 7       |        | R5-136             | 627.56               | 13.30                     | 22      |        | R5-257, R5-258   | 152                  | 2.68                      |
| 31      |        | R4B-3A                                      | 4.00                 | 0.06                      | 8       |        | R5-137B            | 69.68                | 1.87                      | 23      | 2      | R5-264           | 85                   | 0.38                      |
| 32      | 5      | R4B-157A                                    | 36.00                | 0.49                      | 9       |        | R5-142             | 350.99               | 6.04                      | 24      |        | R5-268           | 56                   | 0.54                      |
| 33      |        | TRM-2-P-164<br>R4B-46                       | 6.00                 | 0.10                      | 10      |        | R5-143             | 379.50               | 9.03                      | 25      |        | R5-270A          | 35.48                | 0.12                      |
| 34      |        | TRM-25 R4B-17<br>EP-170                     | 20.25                | 0.69                      | 11      |        | R5-144             | 734.00               | 13.35                     | 26      |        | R5-272           | 49.22                | 1.02                      |
| 35      | 4      | TRM 10 P-214,<br>242 R4B-103B               | 15.00                | 0.36                      | 12      |        | R5-161 &<br>R5-162 | 458.50               | 6.23                      | 27      |        | R5-273           | 57.15                | 0.69                      |
| 36      |        | TRM 33 P-278-<br>279 R4B-167                | 12.25                | 0.04                      | 13      |        | R5-163             | 271.00               | 4.29                      | 28      |        | R5-274           | 91.67                | 2.22                      |
| 37      |        | TRM-21<br>Anjanapura Cross<br>Station R4B-6 | 15.00                | 0.24                      | 14      |        | R5-164             | 105.58               | 1.45                      | 29      | 3      | R5-281           | 181.4                | 3.69                      |
| Reach 5 |        |                                             |                      |                           | 15      |        | R5-165             | 172                  | 4.37                      | 30      |        | R5-322           | 69                   | 1.95                      |
| 1       |        | R5-HD-14                                    | 708.19               | 1.52                      | 16      |        | R5-174             | 51                   | 1.72                      | 31      |        | R5-323           | 67.00                | 1.59                      |
| 2       |        | R5-HD-14                                    | 708.19               | 1.52                      | 17      |        | R5-190             | 98.33                | 1.43                      | 32      |        | R5-343           | 130.00               | 0.87                      |
| 3       | 1      | R5-HD-16                                    | 2,357.00             | 2.85                      | 18      |        | R5-200A &<br>200-B | 60                   | 0.94                      | 33      |        | R5-352           | 164.00               | 2.47                      |
| 4       |        | R5-HD-22                                    | 1,454.11             | 2.53                      | 19      |        | R5-201             | 49.72                | 1.41                      | 34      |        | R-355            | 124.00               | 1.50                      |



| Sl. No. | V O L U M E | Property ID name | Area in square metre | Excess Amount (₹ in Lakh) | SL No. | V O L U M E | Property ID name | Area in square metre | Excess Amount (₹ in Lakh) | SL No. | V O L U M E | Property ID name | Area in square metre | Excess Amount (₹ in Lakh) | SL No. | V O L U M E | Property ID name | Area in square metre | Excess Amount (₹ in Lakh) |
|---------|-------------|------------------|----------------------|---------------------------|--------|-------------|------------------|----------------------|---------------------------|--------|-------------|------------------|----------------------|---------------------------|--------|-------------|------------------|----------------------|---------------------------|
| 35      | 3           | R-356            | 389.10               | 0.50                      | 50     | 3           | R-403J           | 24.00                | 0.63                      | 65     | 3           | R5-440           | 71.00                | 0.78                      | 3      | 3           | R5-440           | 71.00                | 0.78                      |
| 36      |             | R5-371           | 700.20               | 7.91                      | 51     |             | R-403L           | 53.00                | 0.16                      | 66     |             | R5-446A          | 88.00                | 0.79                      |        |             | R5-446A          | 88.00                | 0.79                      |
| 37      |             | R-393A           | 124.00               | 0.96                      | 52     |             | R-403M           | 61.00                | 1.38                      | 67     |             | R5-447           | 31.00                | 12.87                     |        |             | R5-447           | 31.00                | 12.87                     |
| 38      |             | R-393B           | 30.00                | 0.11                      | 53     |             | R-403D           | 5.55                 | 0.01                      | 68     |             | R5-456           | 143.00               | 0.48                      |        |             | R5-456           | 143.00               | 0.48                      |
| 39      |             | R-394            | 200.00               | 1.72                      | 54     |             | R-403Q           | 33.00                | 0.14                      | 69     |             | R-461            | 175.00               | 0.48                      |        |             | R-461            | 175.00               | 0.48                      |
| 40      |             | R-396A           | 98.10                | 0.98                      | 55     |             | R-403N           | 33.84                | 0.84                      | 70     |             | R-468            | 179.34               | 1.13                      |        |             | R-468            | 179.34               | 1.13                      |
| 41      |             | R-397            | 86.40                | 0.72                      | 56     |             | R-403S           | 105.00               | 0.08                      | 71     |             | R-470            | 172.00               | 0.35                      |        |             | R-470            | 172.00               | 0.35                      |
| 42      |             | R-400A           | 104.00               | 1.20                      | 57     |             | R-403R           | 14.00                | 0.06                      | 72     |             | R-473            | 84.00                | 0.37                      |        |             | R-473            | 84.00                | 0.37                      |
| 43      | 3           | R-403            | 24.75                | 0.17                      | 58     | 3           | R-407            | 267.00               | 0.37                      | 73     | 3           | R-474            | 24.00                | 0.16                      | 3      | 3           | R-474            | 24.00                | 0.16                      |
| 44      |             | R-403A           | 24.00                | 0.07                      | 59     |             | R5-407A          | 385.00               | 0.29                      | 74     |             | R-484            | 44.00                | 0.26                      |        |             | R-484            | 44.00                | 0.26                      |
| 45      |             | R-403B           | 23.00                | 0.42                      | 60     |             | R5-420 & 420A    | 1,014.00             | 5.99                      | 75     |             | R-487            | 100.00               | 0.53                      |        |             | R-487            | 100.00               | 0.53                      |
| 46      |             | R-403F           | 78.00                | 2.12                      | 61     |             | R5-433 & 434     | 811.00               | 1.00                      | 76     |             | R-491 & 491A     | 54.00                | 0.38                      |        |             | R-491 & 491A     | 54.00                | 0.38                      |
| 47      |             | R-403E           | 80.00                | 0.19                      | 62     |             | R5-437           | 2,356.00             | 15.40                     | 77     |             | R-492            | 26.00                | 0.08                      |        |             | R-492            | 26.00                | 0.08                      |
| 48      |             | R-403G           | 91.00                | 0.43                      | 63     |             | R5-438           | 133.00               | 1.64                      | 78     |             | R-495            | 75.25                | 0.54                      |        |             | R-495            | 75.25                | 0.54                      |
| 49      |             | R-403H           | 23.00                | 0.07                      | 64     |             | R5-439           | 151.00               | 0.87                      | 79     |             | R-497            | 44.30                | 0.04                      |        |             | R-497            | 44.30                | 0.04                      |

| Sl. No. | V O L U M E | Property ID name | Area in square metre | Excess Amount (₹ in Lakh) | SL No. | V O L U M E | Property ID name                  | Area in square metre | Excess Amount (₹ in Lakh) | SL No. | V O L U M E | Property ID name        | Area in square metre | Excess Amount (₹ in Lakh) | SL No. | V O L U M E | Property ID name        | Area in square metre | Excess Amount (₹ in Lakh) |
|---------|-------------|------------------|----------------------|---------------------------|--------|-------------|-----------------------------------|----------------------|---------------------------|--------|-------------|-------------------------|----------------------|---------------------------|--------|-------------|-------------------------|----------------------|---------------------------|
| 80      | 3           | R-500            | 33.65                | 0.38                      | 95     | 5           | R5-127                            | 29.53                | 0.72                      | 110    | 7           | R5-400A                 | 2.70                 | 0.06                      | 8      | 9           | R5-400A                 | 2.70                 | 0.06                      |
| 81      |             | R-500            | 33.65                | 0.31                      | 96     |             | R5-129A                           | 4.36                 | 0.07                      | 111    |             | R5-403E                 | 19.00                | 0.15                      |        |             | R5-403E                 | 19.00                | 0.15                      |
| 82      |             | R-502            | 13.60                | 0.14                      | 97     |             | R5-144                            | 37.00                | 0.74                      | 112    |             | R5-403H                 | 5.00                 | 0.08                      |        |             | R5-403H                 | 5.00                 | 0.08                      |
| 83      |             | R-505            | 44.00                | 0.26                      | 98     |             | R5-174                            | 14.72                | 0.36                      | 113    |             | R5-431A                 | 7.00                 | 0.09                      |        |             | R5-431A                 | 7.00                 | 0.09                      |
| 84      |             | R-509            | 63.00                | 0.43                      | 99     |             | R5-262 and 263                    | 36.60                | 0.06                      | 114    |             | R5-437                  | 258.00               | 4.28                      |        |             | R5-437                  | 258.00               | 4.28                      |
| 85      | 3           | R-511            | 101.50               | 0.71                      | 100    | 6           | R5-268                            | 5.40                 | 0.09                      | 115    | 8           | R5-461                  | 136.00               | 0.88                      | 9      | 10          | R5-461                  | 136.00               | 0.88                      |
| 86      |             | R-513            | 82.00                | 0.49                      | 101    |             | R5-73                             | 20.00                | 0.47                      | 116    |             | R5-514                  | 6.50                 | 0.06                      |        |             | R5-514                  | 6.50                 | 0.06                      |
| 87      |             | R-514            | 96.00                | 0.64                      | 102    |             | R5-97                             | 106.85               | 5.22                      | 117    |             | R5-532, R5-537 & R5-534 | 19.00                | 0.08                      |        |             | R5-532, R5-537 & R5-534 | 19.00                | 0.08                      |
| 88      | 4           | R-516            | 101.80               | 0.57                      | 103    | 7           | R5-288A, R5-288B, R5-289 & R5-290 | 456.49               | 7.57                      | 118    | 8           | R5-540                  | 6.00                 | 0.04                      | 9      | 10          | R5-540                  | 6.00                 | 0.04                      |
| 89      |             | R-533 R-539      | 23.30                | 0.24                      | 104    |             | R5-342 & R5-343A                  | 77.29                | 1.82                      | 119    |             | R5-N52                  | 3.29                 | 0.09                      |        |             | R5-N52                  | 3.29                 | 0.09                      |
| 90      |             | R5-HD-4          | 42.51                | 0.21                      | 105    |             | R5-343                            | 3.50                 | 0.06                      | 120    |             | R5-N54                  | 4.29                 | 0.01                      |        |             | R5-N54                  | 4.29                 | 0.01                      |
| 91      | 5           | R5-HD-4          | 64.68                | 0.32                      | 106    | 7           | R5-362                            | 47.26                | 0.83                      | 121    | 8           | R5-90A                  | 15.00                | 0.44                      | 9      | 10          | R5-90A                  | 15.00                | 0.44                      |
| 92      |             | R5-HD-10         | 213.66               | 1.04                      | 107    |             | R5-380                            | 14.55                | 0.22                      | 122    |             | R5-99A                  | 15.00                | 0.24                      |        |             | R5-99A                  | 15.00                | 0.24                      |
| 93      |             | R5-HD-3A         | 516.16               | 1.08                      | 108    |             | R5-393A                           | 33.45                | 1.24                      | 123    |             | R5-174A                 | 6.00                 | 0.15                      |        |             | R5-174A                 | 6.00                 | 0.15                      |
| 94      | 5           | R5-126B          | 14.32                | 0.35                      | 109    |             | R5-394                            | 77.50                | 1.24                      | 124    |             | R5-256A                 | 10.00                | 0.17                      |        |             | R5-256A                 | 10.00                | 0.17                      |

| Sl. No. | VOLUME  | Property ID name     | Area in square metre | Excess Amount (₹ in Lakh) | SL No.    | VOLUME  | Property ID name          | Area in square metre | Excess Amount (₹ in Lakh) | SL No.   | VOLUME    | Property ID name    | Area in square metre | Excess Amount (₹ in Lakh) |
|---------|---------|----------------------|----------------------|---------------------------|-----------|---------|---------------------------|----------------------|---------------------------|----------|-----------|---------------------|----------------------|---------------------------|
| 125     | 9       | R5-142A              | 6.00                 | 0.1                       | 140       | 10      | R5-104, R5-105 and R5-106 | 13.00                | 9.45                      | 155      | 14        | R5-227C             | 33.00                | 1.2                       |
| 126     |         | R5-282A              | 6.00                 | 0.13                      | 141       | 11      | R5-124N1                  | 274.00               | 0.28                      | 156      |           | R5-229              | 8.21                 | 0.40                      |
| 127     |         | R5-288A1             | 6.00                 | 0.05                      | 142       |         | R5-124N2                  | 51.00                | 0.80                      | 157      |           | R5-230              | 43.00                | 1.98                      |
| 128     |         | R5-303A              | 14.00                | 0.11                      | 143       |         | R5-124H&N                 | 428.00               | 7.29                      | 158      |           | R5-230A             | 11.94                | 0.87                      |
| 129     |         | R5-459A              | 18.00                | 0.14                      | 144       |         | R5-SW-1                   | 38.02                | 0.61                      | 159      |           | R5-231              | 17.51                | 0.91                      |
| 130     |         | R5-461A              | 8.00                 | 0.05                      | 145       |         | R5-168A                   | 20.56                | 0.73                      | 160      | 15        | R5-328A             | 17.89                | 0.16                      |
| 131     |         | R5-501A              | 6.00                 | 0.03                      | 146       |         | R5-124N10B                | 11.00                | 0.29                      | 161      | 16        | R5-459A             | 416.01               | 3.42                      |
| 132     |         | R5-511A              | 18.00                | 0.23                      | 147       |         | R5-124N11                 | 20.00                | 0.39                      | 162      |           | R5-463A1 & R5-463A2 | 649.37               | 1.24                      |
| 133     | R5-514A | 7.65                 | 0.09                 | 148                       | R5-124N12 |         | 27.00                     | 0.42                 | 163                       | R5-HD-44 |           | 505.85              | 0.87                 |                           |
| 134     | 10      | R5-433A              | 18.00                | 0.14                      | 149       |         | 13                        | R5-124N13            | 28.00                     | 0.87     | 164       | R5-HD-51            | 4,163.43             | 23.75                     |
| 135     |         | R5-439/B             | 16.50                | 0.16                      | 150       |         |                           | R5-124N13A           | 34.00                     | 1.04     | 165       | R5-HD-52            | 7,658.90             | 12.20                     |
| 136     |         | R5-420B              | 6.00                 | 0.04                      | 151       |         |                           | R5-371A              | 55.36                     | 0.97     | 166       | R5-HD-55            | 1,204.99             | 6.30                      |
| 137     | R5-6G   | 405.00               | 317.96               | 152                       | R5-SW-8A  | 31.00   |                           | 0.45                 | 167                       | R5-HD-56 | 566.07    | 16.40               |                      |                           |
| 138     | 11      | R5-124F              | 148.00               | 1.93                      | 153       | R5-463A |                           | 112.00               | 0.77                      | 168      | R5-HD-56C | 226.10              | 4.46                 |                           |
| 139     |         | R-5-103N & R-5 103N1 | 120.00               | 4.69                      | 154       | R5-N41D |                           | 96.76                | 3.19                      | 169      | R5-SW-1   | 12.25               | 0.24                 |                           |

| Sl. No. | V<br>O<br>L<br>U<br>M<br>E | Property ID name | Area in square metre | Excess Amount (₹ in Lakh) | Sl. No. | V<br>O<br>L<br>U<br>M<br>E | Property ID name | Area in square metre | Excess Amount (₹ in Lakh) | Sl. No. | V<br>O<br>L<br>U<br>M<br>E | Property ID name | Area in square metre | Excess Amount (₹ in Lakh) |
|---------|----------------------------|------------------|----------------------|---------------------------|---------|----------------------------|------------------|----------------------|---------------------------|---------|----------------------------|------------------|----------------------|---------------------------|
| 170     | 16                         | R5-420B          | 490.71               | 4.44                      | 7       |                            | R6EL-13          | 43.00                | 1.02                      | 22      |                            | R6EL64           | 9.00                 | 0.22                      |
| 171     | 17                         | R5-224           | 15.00                | 0.20                      | 8       |                            | R6EL-14          | 27.00                | 0.98                      | 23      |                            | R6EL84           | 11.00                | 0.23                      |
| 172     |                            | R5-227C          | 21.99                | 0.57                      | 9       |                            | R6EL-22          | 12.00                | 0.27                      | 24      |                            | R6EL85           | 1.00                 | 0.03                      |
| 173     |                            | R5-229A          | 26.56                | 0.46                      | 10      |                            | R6EL-24          | 15.00                | 0.33                      | 25      |                            | R6EL87A          | 21.00                | 0.43                      |
| 174     | 18                         | R5-230           | 31.94                | 0.29                      | 11      |                            | R6EL-30          | 226.00               | 6.68                      | 26      |                            | R6EL97A          | 312.00               | 6.91                      |
| 175     |                            | R5-120A          | 149.93               | 5.47                      | 12      |                            | R6EL-31          | 238.00               | 5.21                      | 27      |                            | R6EL100          | 4.00                 | 0.08                      |
| 176     |                            | R5-353           | 70.17                | 1.49                      | 13      |                            | R6EL40           | 33.00                | 0.50                      | 28      |                            | R6EL102          | 1.00                 | 0.02                      |
| 177     | 22                         | R5-401A          | 80.77                | 0.94                      | 14      | 1                          | R6EL41           | 38.00                | 0.67                      | 29      | 1                          | R6EL103          | 22.00                | 0.49                      |
| Reach 6 |                            |                  |                      |                           | 15      |                            | R6EL42           | 86.00                | 3.14                      | 30      |                            | R6EL110          | 26.00                | 0.77                      |
|         |                            | R6EL-3C          | 22.00                | 0.06                      | 16      |                            | R6EL43           | 24.00                | 0.61                      | 31      |                            | R6EL111          | 16.00                | 0.48                      |
| 2       | 1                          | R6EL-3G          | 52.00                | 0.08                      | 17      |                            | R6EL47           | 19.00                | 0.36                      | 32      |                            | R6EL114A         | 6.00                 | 0.06                      |
| 3       |                            | R6EL-3H          | 18.00                | 0.11                      | 18      |                            | R6EL54           | 10.00                | 0.25                      | 33      |                            | R6EL114A         | 6.00                 | 0.12                      |
| 4       |                            | R6EL-3H          | 10.00                | 0.06                      | 19      |                            | R6EL57B          | 26.00                | 0.79                      | 34      |                            | R6EL114C         | 13.00                | 0.09                      |
| 5       |                            | R6EL-4           | 2,268.00             | 19.28                     | 20      |                            | R6EL58           | 29.00                | 0.60                      | 35      |                            | R6EL-148B        | 25.50                | 0.08                      |
| 6       |                            | R6EL-8           | 30.00                | 0.12                      | 21      |                            | R6EL63           | 11.00                | 0.23                      | 36      |                            | R6EL-148C        | 105.60               | 0.03                      |

| Sl. No. | V O L U M E | Property ID name          | Area in square metre | Excess Amount (₹ in Lakh) | Sl. No. | V O L U M E | Property ID name  | Area in square metre | Excess Amount (₹ in Lakh) | Sl. No. | V O L U M E | Property ID name              | Area in square metre | Excess Amount (₹ in Lakh) |
|---------|-------------|---------------------------|----------------------|---------------------------|---------|-------------|-------------------|----------------------|---------------------------|---------|-------------|-------------------------------|----------------------|---------------------------|
| 37      | 1           | R6EL-148D                 | 165.00               | 1.76                      | 51      | 1           | R6EL-232          | 20.00                | 0.32                      | 65      | 2           | DP-1/A Plot No.23             | 70.42                | 0.73                      |
| 38      |             | R6EL-149,149A, B, 150-160 | 999.00               | 27.43                     | 52      |             | R6EL-234          | 49.00                | 0.17                      | 66      | 1           | R6EL-249 and R6EL-249A        | 185.00               | 2.52                      |
| 39      |             | R6EL-214                  | 384.00               | 1.15                      | 53      |             | R6EL-202          | 45.00                | 1.30                      | 67      | 3           | R6EL-1A                       | 22.50                | 0.14                      |
| 40      |             | R6EL-217                  | 24.00                | 0.70                      | 54      |             | R6EL-205          | 78.00                | 0.51                      | 68      |             | R6EL-5 DTC 2 Ros 2 RMU        | 31.50                | 0.58                      |
| 41      |             | R6EL-218                  | 24.00                | 0.99                      | 55      |             | R6EL-210D         | 2.00                 | 0.03                      | 69      |             | R6EL-29A                      | 31.50                | 0.72                      |
| 42      |             | R6EL-219                  | 30.00                | 1.19                      | 56      |             | R6EL-212A         | 125.00               | 6.94                      | 70      |             | R6EL 61 GP 91                 | 31.50                | 0.72                      |
| 43      |             | R6EL-220A                 | 10.00                | 0.41                      | 57      |             | R6EL-213          | 103.00               | 3.32                      | 71      |             | R6EL 91 GP 74,75              | 22.50                | 0.51                      |
| 44      |             | R6EL-220                  | 12.00                | 0.49                      | 58      |             | R6EL-205A         | 28.00                | 0.44                      | 72      |             | R6EL 111                      | 9.00                 | 0.41                      |
| 45      |             | R6EL-221                  | 8.00                 | 0.19                      | 59      |             | R6EL-209          | 268.00               | 4.84                      | 73      |             | R6EL 99 GP 107                | 9.00                 | 0.22                      |
| 46      |             | R6EL-222                  | 49.00                | 0.44                      | 60      |             | R6EL-237          | 312.00               | 0.54                      | 74      | 4           | R6EL 99 GP 130/131            | 36.00                | 0.88                      |
| 47      | 1           | R6EL-224                  | 20.00                | 0.22                      | 61      | 2           | R6EL-238          | 306.00               | 4.99                      | 75      |             | R6EL-3 RMU (20D+3VL GP 5 GP6) | 9.00                 | 0.04                      |
| 48      |             | R6EL-227                  | 43.00                | 2.42                      | 62      |             | R6EL-248          | 279.00               | 6.71                      | 76      |             | R6EL-234                      | 36.00                | 0.98                      |
| 49      |             | R6EL-229                  | 45.00                | 1.40                      | 63      |             | R6EL-250          | 440.00               | 13.49                     | 77      |             | DC-R6-UG-P-2                  | 697.43               | 40.07                     |
| 50      |             | R6EL-231                  | 26.00                | 0.53                      | 64      |             | DP-1/A Plot No.22 | 91.09                | 0.08                      | 78      |             | DC-R6-UG-P-3                  | 14.85                | 0.38                      |



| Sl. No. | V<br>O<br>L<br>U<br>M<br>E | Property ID name | Area in square metre | Excess Amount (₹ in Lakh) | Sl. No.        | V<br>O<br>L<br>U<br>M<br>E | Property ID name     | Area in square metre | Excess Amount (₹ in Lakh) | Sl. No. | V<br>O<br>L<br>U<br>M<br>E | Property ID name | Area in square metre | Excess Amount (₹ in Lakh) |
|---------|----------------------------|------------------|----------------------|---------------------------|----------------|----------------------------|----------------------|----------------------|---------------------------|---------|----------------------------|------------------|----------------------|---------------------------|
| 79      | 4                          | MI-R6-UG-P-4     | 416.28               | 22.10                     | 94             | 4                          | MI-R6-UG-P-23        | 338.37               | 1.31                      | 109     | 4                          | SN-R6-UG-P-8     | 47.05                | 1.08                      |
| 80      |                            | MI-R6-UG-P-5     | 242.79               | 10.58                     | 95             |                            | MI-R6-UG-P-24        | 136.24               | 2.41                      | 110     |                            | SN-R6-UG-P-17C   | 17.50                | 0.75                      |
| 81      |                            | DC-R6-UG-P-7     | 300.26               | 14.59                     | 96             |                            | MI-R6-UG-P-31C       | 38.49                | 0.59                      | 111     |                            | SN-R6-UG-P-18A   | 24.36                | 0.57                      |
| 82      |                            | DC-R6-UG-P-8     | 343.21               | 4.25                      | 97             |                            | MI-R6-UG-P-35        | 125.90               | 0.46                      | 112     | 5                          | VR-R6-UG-P-4     | 1,012.00             | 5.31                      |
| 83      |                            | DC-R6-UG-P-9     | 314.42               | 21.09                     | 98             |                            | MI-R6-UG-P-36        | 170.64               | 11.12                     | 113     |                            | R6EL-1A2         | 121.00               | 1.40                      |
| 84      |                            | MI-R6-UG-P-4     | 187.75               | 14.89                     | 99             |                            | MI-R6-UG-P-5A        | 30.82                | 0.78                      | 114     |                            | R6EL-13          | 58.00                | 1.81                      |
| 85      |                            | MI-R6-UG-P-5     | 78.15                | 1.97                      | 100            |                            | MI-R6-UG-P-5A        | 30.19                | 0.79                      | 115     | 6                          | R6EL-14          | 180.00               | 1.56                      |
| 86      |                            | MI-R6-UG-P-7     | 104.94               | 1.95                      | 101            |                            | SN-R6-UG-P-6         | 71.50                | 1.59                      | 116     |                            | R6EL-26A         | 37.00                | 0.26                      |
| 87      |                            | MI-R6-UG-P-9     | 396.87               | 24.58                     | 102            |                            | SN-R6-UG-P-7         | 48.00                | 1.21                      | 117     |                            | R6EL-30          | 7.00                 | 0.27                      |
| 88      |                            | MI-R6-UG-P-10    | 201.80               | 1.37                      | 103            |                            | SN-R6-UG-P-16A & 16B | 45.40                | 1.08                      | 118     | 6                          | R6EL-85A         | 7.00                 | 0.32                      |
| 89      | MI-R6-UG-P-11              | 206.89           | 0.69                 | 104                       | SN-R6-UG-P-9   | 54.76                      | 1.06                 | 119                  | R6EL-196                  | 10.00   |                            | 0.14             |                      |                           |
| 90      | MI-R6-UG-P-12              | 168.35           | 12.08                | 105                       | SN-R6-UG-P-12A | 21.20                      | 0.44                 | 120                  | R6EL-199                  | 17.00   |                            | 0.29             |                      |                           |
| 91      | MI-R6-UG-P-13              | 219.31           | 12.81                | 106                       | MI-R6-UG-P-12B | 11.20                      | 0.21                 | 121                  | R6EL-232                  | 2.00    |                            | 0.07             |                      |                           |
| 92      | MI-R6-UG-P-14              | 230.00           | 15.95                | 107                       | SN-R6-UG-P-13  | 33.70                      | 0.59                 | 122                  | R6EL-202                  | 20.00   |                            | 0.76             |                      |                           |
| 93      | MI-R6-UG-P-22              | 226.26           | 1.60                 | 108                       | SN-R6-UG-P-14  | 70.43                      | 1.43                 | 123                  | R6EL-205                  | 4.00    |                            | 0.32             |                      |                           |

| Sl. No. | V<br>O<br>L<br>U<br>M<br>E | Property ID name | Area in square metre | Excess Amount (₹ in Lakh) | Sl. No.        | V<br>O<br>L<br>U<br>M<br>E | Property ID name | Area in square metre | Excess Amount (₹ in Lakh) | Sl. No.           | V<br>O<br>L<br>U<br>M<br>E | Property ID name | Area in square metre | Excess Amount (₹ in Lakh) |
|---------|----------------------------|------------------|----------------------|---------------------------|----------------|----------------------------|------------------|----------------------|---------------------------|-------------------|----------------------------|------------------|----------------------|---------------------------|
| 124     | 6                          | R6EL-205A        | 3.00                 | 0.26                      | 138            | 7                          | VR-R6-UG-P-6C    | 150.88               | 4.06                      | 152               | 9                          | TN-R6-UG-30A     | 50.16                | 0.09                      |
| 125     |                            | R6EL-237         | 9.00                 | 0.27                      | 139            |                            | SN-R6-UG-P-5A    | 9.48                 | 0.24                      | 153               |                            | TN-R6-UG-P30B    | 50.16                | 0.09                      |
| 126     | DC-R6-UG-P-2               | 6.96             | 0.43                 | 140                       | SN-R6-UG-P-5A  |                            | 9.48             | 0.25                 | 154                       | TN-R6-UG-P38      |                            | 36.23            | 0.07                 |                           |
| 127     | DC-R6-UG-P-4               | 9.69             | 0.85                 | 141                       | SN-R6-UG-P-5B  |                            | 51.00            | 1.17                 | 155                       | TN-R6-UG-P41      |                            | 44.56            | 0.47                 |                           |
| 128     | MI-R6-UG-P-4               | 4.85             | 0.50                 | 142                       | SN-R6-UG-P-8   |                            | 5.15             | 0.12                 | 156                       | AR-R6-UG-P19      |                            | 48.80            | 0.12                 |                           |
| 129     | MI-R6-UG-P-5               | 30.53            | 1.91                 | 143                       | SN-R6-UG-P-9   |                            | 17.54            | 0.34                 | 157                       | VE-R6-UG-P21      |                            | 51.85            | 0.16                 |                           |
| 130     | MI-R6-UG-P-7               | 0.74             | 0.04                 | 144                       | SN-R6-UG-P-12B |                            | 0.40             | 0.01                 | 158                       | VE-R6-UG-P25 & 26 |                            | 36.61            | 0.28                 |                           |
| 131     | 7                          | MI-R6-UG-P-8     | 2.94                 | 0.01                      | 145            | SN-R6-UG-P-14              | 1.67             | 0.03                 | 159                       | VE-R6-UG-P28      |                            | 42.62            | 0.17                 |                           |
| 132     |                            | MI-R6-UG-P-9     | 0.02                 | 0.01                      | 146            | CAN-R6-UG-P4A              | 42.30            | 0.14                 | 160                       | VE-R6-UG-P30      |                            | 58.39            | 0.13                 |                           |
| 133     |                            | MI-R6-UG-P-13    | 48.85                | 3.45                      | 147            | CAN-R6-UG-P4G              | 34.56            | 0.33                 | 161                       | VE-R6-UG-P32      |                            | 54.30            | 1.31                 |                           |
| 134     |                            | MI-R6-UG-P-23    | 11.88                | 0.21                      | 148            | TN-R6-UG-P9A               | 65.60            | 0.06                 | 162                       | VE-R6-UG-P43B     |                            | 19.00            | 0.12                 |                           |
| 135     |                            | MI-R6-UG-P-33    | 19.46                | 0.47                      | 149            | TN-R6-UG-P12               | 208.40           | 4.28                 | 163                       | VE-R6-UG-         |                            | 39.77            | 0.32                 |                           |
| 136     |                            | MI-R6-UG-P-35    | 0.66                 | 0.01                      | 150            | TN-R6-UG-P13, 31, 31A, 31B | 1,038.69         | 11.31                | 164                       | VE-R6-UG-P45      |                            | 131.61           | 1.44                 |                           |
| 137     |                            | DC-R6-UG-P-16    | 9.04                 | 0.28                      | 151            | TN-R6-UG-P15               | 115.06           | 1.43                 | 165                       | VE-R6-UG-P46      |                            | 121.98           | 1.53                 |                           |

| Sl. No. | V<br>O<br>L<br>U<br>M<br>E | Property ID<br>name | Area in<br>square<br>metre | Excess<br>Amount<br>(₹ in<br>Lakh) | Sl. No. | V<br>O<br>L<br>U<br>M<br>E | Property ID<br>name | Area in<br>square<br>metre | Excess<br>Amount<br>(₹ in<br>Lakh) | Sl. No. | V<br>O<br>L<br>U<br>M<br>E | Property ID<br>name | Area in<br>square<br>metre | Excess<br>Amount<br>(₹ in<br>Lakh) | Area in<br>square<br>metre | Excess<br>Amount<br>(₹ in<br>Lakh) |
|---------|----------------------------|---------------------|----------------------------|------------------------------------|---------|----------------------------|---------------------|----------------------------|------------------------------------|---------|----------------------------|---------------------|----------------------------|------------------------------------|----------------------------|------------------------------------|
| 166     |                            | AR-R6-UG-P4         | 244.23                     | 2.53                               | 181     | 9                          | NG-R6-UG-64B        | 55.00                      | 0.62                               |         |                            |                     |                            |                                    |                            |                                    |
| 167     |                            | AR-R6-UG-P6         | 111.24                     | 0.48                               | 182     | 10                         | R6-UG-P8            | 6.00                       | 0.32                               |         |                            |                     |                            |                                    |                            |                                    |
| 168     |                            | AR-R6-UG-P16C       | 15.55                      | 0.10                               | 183     | 12                         | R6EL- 54            | 4.00                       | 0.09                               |         |                            |                     |                            |                                    |                            |                                    |
| 169     |                            | AR-R6-UG-17B        | 16.49                      | 0.03                               | 184     |                            | R6UG-258            | 111.43                     | 4.23                               |         |                            |                     |                            |                                    |                            |                                    |
| 170     |                            | AR-R6-UG-20A        | 23.34                      | 0.08                               | 185     | 13                         | DC-R6-UG-P-17       | 148.80                     | 5.98                               |         |                            |                     |                            |                                    |                            |                                    |
| 171     |                            | AR-R6-UG-20E        | 18.38                      | 0.11                               | 186     | 15                         | R6EL-224A           | 3.00                       | 0.11                               |         |                            |                     |                            |                                    |                            |                                    |
| 172     | 9                          | AR-R6-UG-52A        | 16.19                      | 0.11                               |         |                            |                     |                            |                                    |         |                            |                     |                            |                                    |                            |                                    |
| 173     |                            | AR-R6-UG-P23        | 116.56                     | 1.92                               |         |                            |                     |                            |                                    |         |                            |                     |                            |                                    |                            |                                    |
| 174     |                            | AR-R6-UG-P27        | 185.17                     | 7.50                               |         |                            |                     |                            |                                    |         |                            |                     |                            |                                    |                            |                                    |
| 175     |                            | AR-R6-UG-34A        | 40.99                      | 0.42                               |         |                            |                     |                            |                                    |         |                            |                     |                            |                                    |                            |                                    |
| 176     |                            | AR-R6-UG-39A        | 79.73                      | 0.27                               |         |                            |                     |                            |                                    |         |                            |                     |                            |                                    |                            |                                    |
| 177     |                            | AR-R6-UG- 39B       | 34.10                      | 0.34                               |         |                            |                     |                            |                                    |         |                            |                     |                            |                                    |                            |                                    |
| 178     |                            | NG-R6-UG-19A        | 129.69                     | 4.89                               |         |                            |                     |                            |                                    |         |                            |                     |                            |                                    |                            |                                    |
| 179     |                            | NG-R6-UG-P-35       | 91.32                      | 0.30                               |         |                            |                     |                            |                                    |         |                            |                     |                            |                                    |                            |                                    |
| 180     |                            | NG-R6-UG-64A        | 236.56                     | 4.31                               |         |                            |                     |                            |                                    |         |                            |                     |                            |                                    |                            |                                    |

**Annexure-VII****(Referred to in Para No. 5.1.1)****Statement indicating the contracts awarded wherein cost estimates were prepared by escalating the price of previously awarded works**

| <b>Sl. No.</b> | <b>Particulars of the Contract</b>                                                                                                                           | <b>Contract Value (Revised) ₹ in crore</b> |
|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| 1              | Architectural Finishing Works and Public Health Engineering Works of 5 stations in R4B                                                                       | 42.09                                      |
| 2              | Design Consultancy Services for SES & CFD Analysis and sizing of TVS and Major ECS Equipment for Underground Section of Reach 6                              | 3.40                                       |
| 3              | Design, Fabrication, Supply and Installation of Signages and Graphics for Reach 2 Extension and Reach 4 Extension (12 Nos. of Stations)                      | 4.10                                       |
| 4              | Construction of Metro rail Depot structures at Kothanur in Reach 6                                                                                           | 150.83                                     |
| 5              | Construction of Metro rail Depot structures at Hebbagodi in Reach 5                                                                                          | 170.42                                     |
| 6              | Procurement of HH Rails 1080 Grade for Phase 2 works                                                                                                         | 105.02                                     |
| 7              | Construction of Elevated Structures (3.031 kms) from Hesaraghatta Cross Station (excluding) to BIEC Station and 3 stations in Reach 3C                       | 298.65                                     |
| 8              | Construction of Elevated Structures (6.524 kms) from Puttenahalli Cross Station dead end to Anjanapura Road Cross Station and 5 stations in Reach 4B         | 508.86                                     |
| 9              | Construction of Elevated Structures (6.385 kms) from Hosa Road Station to HSR Layout Station and 6 stations in Reach 5 P2                                    | 511.35                                     |
| 10             | Construction of Elevated Structures (7.50 kms) from Gottigere to Swagath Road Cross and 5 stations in Reach 6 elevated section                               | 578.70                                     |
| 11             | Construction of Elevated Structures (7.218 kms) from Visvesvaraya Industrial Area Station (excl.) to Whitefield Station (incl.) and 7 stations in Reach 1B   | 683.79                                     |
| 12             | Construction of Elevated Structures (6.340 kms) from HSR Layout Station to RV Road Station and 5 stations in Reach 5 P3                                      | 797.29                                     |
| 13             | Design & Construction of Underground structures (Tunnels & Stations) (2.884 Kms) and 2 Nos of UG Metro Stations (RT-03) in Reach 6                           | 1,299.23                                   |
| 14             | Design & Construction of Underground structures (Tunnels & Stations) (2.755 Km) and 3 Nos. of UG Metro Stations (RT-02) in Reach 6                           | 1,329.14                                   |
| 15             | Design & Construction of Underground structures (Tunnels & Stations) (2.755 Km) and UG Metro Stations (RT-01) in Reach 6                                     | 1,526.33                                   |
| 16             | Design & Construction of Underground structures (Tunnels & Stations) (4.591 Km) and 4 Nos of UG Metro Stations (RT-04) in Reach 6                            | 1,771.25                                   |
| 17             | Design, Manufacture, Supply, Installation, Testing and Commissioning of Machine room less, Gearless Elevators for Reach 5 and Reach 6 (Elevated) - 4 ELEV-DM | 24.52                                      |
| 18             | Cable Trough works Reach 2 Extension                                                                                                                         | 5.54                                       |

| Sl. No. | Particulars of the Contract                                                                                                                                                                                                                            | Contract Value (Revised)<br>₹ in crore |
|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|
| 19      | Design, Manufacture, Supply, Installation, Testing and Commissioning of Escalators for the four (04) Extensions (R1, R2, R3 & R4) of Phase 1 - 6 ESCAL - DM contract                                                                                   | 146.65                                 |
| 20      | Engineering, Supply, Erection, Testing and Commissioning of 33kV Distribution, 750V DC Third Rail Traction Electrification including Traction Substations, Auxiliary Substations and SCADA System for Reach 5 & Reach 6 of Phase 2 - EP4 - CC Contract | 528.79                                 |
| 21      | Reach 6 Elevated Balance Works Contract                                                                                                                                                                                                                | 364.88                                 |
| 22      | Construction of Elevated Structures (6.418 kms) from Bommasandra to Hosur Road and 5 stations in Package 1 of Reach 5                                                                                                                                  | 485.52                                 |



**Annexure-VIII****(Referred to in Para No. 5.4)****Statement indicating the works tendered with short duration of sale period**

| <b>Sl. No.</b> | <b>Name of the work</b>                                                                                                                                                                                                             | <b>Estimated Cost of Tender<br/>(₹ in crore)</b> | <b>Sale period of tender documents<br/>(in days)</b> |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|------------------------------------------------------|
| 1              | Line 6 Electric Bogie Tractor for Pulling Cars and Bogies inside workshop (Phase 1)                                                                                                                                                 | 5.22                                             | 24                                                   |
| 2              | Design, Supply, Installation, Testing and Commissioning of Environmental Control System for Underground Stations and Tunnel (Phase 1)                                                                                               | 116.50                                           | 14                                                   |
| 3              | Dismantling and Demolition works in Reach 2 and Reach 4B Extension (Phase 2)                                                                                                                                                        | 0.85                                             | 16                                                   |
| 4              | Design Consultancy Services for Subway Environmental Simulation, Computational Fluid Dynamics and sizing of Tunnel Ventilation System and major Environmental Control System Equipment for Underground Section of Reach 6 (Phase 2) | 3.80                                             | 26                                                   |
| 5              | Construction of Metro Rail Depot Structures at Kothanur Depot (Phase 2)                                                                                                                                                             | 160.83                                           | 42                                                   |
| 6              | Procurement of Head Hardened Rails 1080 Grade (Phase 2)                                                                                                                                                                             | 173.00                                           | 31                                                   |
| 7              | Design and Construction of Underground Structures (Tunnels and Stations) (2.884 kms) and 2 Nos. Underground Metro Stations (RT-03) in Reach 6 (Phase 2)                                                                             | 1,105.42                                         | 43                                                   |
| 8              | Design and Construction of Underground Structures (Tunnels and Stations) (2.755 kms) and 3 Nos. Underground Metro Stations (RT-02) in Reach 6 (Phase 2)                                                                             | 1,130.61                                         | 44                                                   |
| 9              | Supply of Standard Gauge Metro Cars 126 Nos. (DTG Signalling) and 90 Nos. (CBTC Signalling) including Design, Manufacture, Testing, Commissioning and Training of Personnel (Phase 2)                                               | 1,578.58                                         | 21                                                   |

**Annexure-IX****(Referred to in Para No. 5.5 (i))****Details of contracts wherein Interest Free Mobilisation Advance was Paid**

| Sl. No. | Particulars of the Contract                                                                                                                                                                 | Contract Value (Revised) (₹ in crore) | Percentage of Mobilisation Advance |
|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|------------------------------------|
| 1       | Reach 2, Extn. Phase 2                                                                                                                                                                      | 3.07                                  | 40%                                |
| 2       | Misc. Road Work incl. other Consultancy in Reach 3                                                                                                                                          | 18.00                                 | 40%                                |
| 3       | Additional work of construction of South Tunnel between North Ramp & Majestic North Shaft in NS Corridor                                                                                    | 80.95                                 | 15%                                |
| 4       | Construction contract of Underground Majestic station (Interchange station) Phase 1                                                                                                         | 446.28                                | 10%                                |
| 5       | Track Works (including Extension Reach 3A, 3B and 4A) in Phase 1                                                                                                                            | 309.15                                | 10%                                |
| 6       | Design & contract of Underground Stations and Tunnels along North-South Corridor (Excluding Majestic station)                                                                               | 939.98                                | 10%                                |
| 7       | Construction of Underground Stations and Tunnels along East-West corridor                                                                                                                   | 1,436.07                              | 15%                                |
| 8       | Design, Supply, Installation, Testing and Commissioning of Tunnel Ventilation System (TVS) for UG Stations & Tunnels                                                                        | 89.38                                 | 10%                                |
| 9       | Design, Supply, Installation, Testing and Commissioning of Environmental Control System (ECS) for UG Stations & Tunnels                                                                     | 111.98                                | 10%                                |
| 10      | Design, Supply, Installation and Commissioning for Escalators - 2 ESCAL-DM Contract                                                                                                         | 141.96                                | 10%                                |
| 11      | Design, Manufacture, Supply, Installation Testing and Commissioning of S&T Control and Communication - 2 S&T-DM                                                                             | 726.30                                | 10%                                |
| 12      | Restoration of Road, Footpath and Drain between Raja Rajeshwari Nagar and Jnana Bharathi in Reach 2A                                                                                        | 0.89                                  | 40%                                |
| 13      | Providing and Construction of SSM compound wall of BWSSB for an approximate length of 195 m on Mysore Road near Rajarajeshwari Nagar Arch for Property No R2E21 and R2E27 acquired by BMRCL | 0.38                                  | 40%                                |
| 14      | Shifting of Traffic Signal Poles, Blinkers and Surveillance Cameras infringing in Reach 5                                                                                                   | 0.99                                  | 40%                                |
| 15      | Design, Manufacture, Supply, Installation, Testing and Commissioning of Machine Room Less, Gearless Elevators for Reach 5 and Reach 6 (Elevated) - 4 ELEV-DM                                | 24.52                                 | 10%                                |

| Sl. No. | Particulars of the Contract                                                                                                                                                                                                                                                                    | Contract Value (Revised) (₹ in crore) | Percentage of Mobilisation Advance |
|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|------------------------------------|
| 16      | Releasing of existing streetlights/ providing new streetlights and shifting of Highmast lighting structures in Reach 4A                                                                                                                                                                        | 3.67                                  | 40%                                |
| 17      | Electrical and Mechanical (E&M) works for 11 nos. of elevated stations in Reach 2 & Reach 4 Extension of Phase 1 - E&M-1 contract                                                                                                                                                              | 69.94                                 | 10%                                |
| 18      | Electrical and Mechanical (E&M) works for 32 Nos of Elevated stations at Reach 1 Extension, Reach 3 Extension and Reach 5 New Line - E&M-3 contract                                                                                                                                            | 171.57                                | 10%                                |
| 19      | Design, Manufacture, Supply, Installation, Testing and Commissioning of Signalling and Train Control Systems for Four Extensions of Phase 1 - 4 S&T - DM contract                                                                                                                              | 405.90                                | 10%                                |
| 20      | Design, Manufacture, Supply, Installation, Testing and Commissioning of Communication Systems for Four Extensions of Phase 1 - 5 S&T - DM contract                                                                                                                                             | 131.95                                | 10%                                |
| 21      | Design, Manufacture, Supply, Installation, Testing & Commissioning of Signalling & Train Control and Communication Systems for Reach 5 of Phase 2 - 8 S&T -DM contract                                                                                                                         | 247.72                                | 10%                                |
| 22      | Engineering, Supply, Erection, Testing and Commissioning of 33kV Distribution, 750V DC Third Rail Traction Electrification including Traction Substations, Auxiliary Substations and SCADA System for Reach 5 & Reach 6 - EP4 - CC Contract                                                    | 528.79                                | 10%                                |
| 23      | Engineering, Supply, Erection, Testing and Commissioning of 220/33kV GIS and 66/33kV AIS with 220kV & 66kV incoming Cabling from Grid Sub-Station for Phase-II - EP3 - CC contract                                                                                                             | 530.07                                | 10%                                |
| 24      | Engineering, Supply, Erection, Testing and Commissioning of 33kV Distribution, 750V DC Third Rail Traction Electrification including Traction Substations, Auxiliary Substations and SCADA systems for Four Extensions and Integration with the existing system of Phase 1 - EP2 - CC contract | 582.56                                | 10%                                |

**Annexure-X**  
**(Referred to in Para No. 5.6)**  
**Details of Material Advance Paid**

| Sl. No.                                                            | Particulars of the Contract                                                                                                            | Contract Value (Revised) (₹ in crore) | Amount of Material Advance (₹ in crore) |
|--------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|-----------------------------------------|
| <b>A. Cases with interest free advance with enabling clause</b>    |                                                                                                                                        |                                       |                                         |
| 1                                                                  | Construction of two Elevated Structures (Viaduct) from RV Road to Puttenhalli Cross in Reach 4A                                        | 305.23                                | 14.39                                   |
| 2                                                                  | Construction of Underground Majestic Station                                                                                           | 446.28                                | 55.34                                   |
| 3                                                                  | Construction of Elevated Structures from Magadi Road to Mysore Road Terminal under Reach 2 Package 1A                                  | 243.24                                | 51.36                                   |
| 4                                                                  | Construction of Viaduct and Stations in Reach 3B                                                                                       | 229.82                                | 15.78                                   |
| 5                                                                  | Construction of Elevated Structures (Viaduct) from Puttenhalli Cross to Anjanapura Road Cross station and five stations under Reach 4B | 508.86                                | 74.32                                   |
| 6                                                                  | Construction of viaducts between Baiyappanahalli to Cricket Stadium in Reach 1                                                         | 138.55                                | 3.37                                    |
| <b>A.</b>                                                          |                                                                                                                                        |                                       | <b>214.56</b>                           |
| <b>B. Cases with interest free advance without enabling clause</b> |                                                                                                                                        |                                       |                                         |
| 7                                                                  | Package 1 of Reach 5                                                                                                                   | 485.52                                | 103.69                                  |
| 8                                                                  | Package 2 of Reach 5                                                                                                                   | 511.36                                | 99.12                                   |
| 9                                                                  | Package 3 of Reach 5                                                                                                                   | 797.29                                | 167.91                                  |
| 10                                                                 | Construction of Kottunur Depot at Reach 6                                                                                              | 150.83                                | 4.18                                    |
| 11                                                                 | Construction of Anjanapura Depot at Reach 4B                                                                                           | 58.87                                 | 0.48                                    |
| <b>B.</b>                                                          |                                                                                                                                        |                                       | <b>375.38</b>                           |
| <b>Grand Total (A + B)</b>                                         |                                                                                                                                        |                                       | <b>589.94</b>                           |

**Annexure-XI****(Referred to in Para No. 5.7)****Statement indicating the new works awarded on nomination basis**

| <b>Sl. No.</b> | <b>Nature of Work</b>                                                                                                                                                | <b>Value of Work (₹in crore)</b> |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| 1              | Construction of 16 Piles near Swastik Station (Phase 1)                                                                                                              | 1.04                             |
| 2              | Architectural Finishing works at Majestic Station (Phase 1)                                                                                                          | 40.24                            |
| 3              | Architectural Finishing works of Underground Station (except Majestic Station) (Phase 1)                                                                             | 20.14                            |
| 4              | Consultancy work for Subway Environmental Simulation Study and Computational Fluid Dynamics Analysis of Underground Stations and Tunnels of Phase 1                  | 2.89                             |
| 5              | Work of construction of Foot Over Bridge and Subway at City Railway Station (Phase 1)                                                                                | 9.24                             |
| 6              | Security Fencing to High Court premises work (Phase 1)                                                                                                               | 0.53                             |
| 7              | Work of construction of additional structure in City Railway Station (Phase 1)                                                                                       | 2.69                             |
| 8              | Work of construction of additional piers and extension of via duct including lay bye line of Reach 3B of Phase 1 and balance consultancy works                       | 9.66                             |
| 9              | Proof Checking of Drawings for Phase 2 works                                                                                                                         | 2.51                             |
| 10             | Architectural Interior works of Administrative Building of BMRCL (Phase 2)                                                                                           | 5.48                             |
| 11             | Work of construction of Police Station and Quarters at Hebbagodi (Phase 2)                                                                                           | 7.85                             |
| 12             | Strengthening and raising of existing reinforced earth wall as well as fixing of PVC pipes at Baiyappanahalli Depot (Phase 2)                                        | 3.38                             |
| 13             | Work of existing 220 KV – Hoody – Somanahalli Line, Sarakki – Jayadeva DC Lines, Somanahalli – Malur DC Line and Electronics City – Naganathapura DC Lines (Phase 2) | 3.48                             |
| 14             | Shifting of BESCOM utilities (Phase 2)                                                                                                                               | 0.69                             |
| 15             | Architectural Finishing works of Reach 3C (Phase 2)                                                                                                                  | 17.81                            |
| 16             | Interim Design Consultancy Works for Four Extensions of Phase 1 under Phase 2 along with two new lines                                                               | 11.14                            |
| 17             | Road Works, Footpath Restoration, Utility Shifting Works under Phase 1 and Phase 2 (11 works)                                                                        | 19.27                            |
| <b>Total</b>   |                                                                                                                                                                      | <b>158.04</b>                    |



**Annexure-XII****(Referred to in Para No. 5.11)****Statement indicating the delays in Design Drawings**

| Sl. No. | Particulars of the Contract                                                                                                                                                                                                                 | Delay in issue of Design Drawings |
|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|
| 1       | Detailed Design Consultancy work for Reach 4A                                                                                                                                                                                               | 22 months                         |
| 2       | Detailed Design Consultancy work for Majestic Station                                                                                                                                                                                       | 3 months                          |
| 3       | Detailed Design Consultancy work for Baiyappanahalli Depot                                                                                                                                                                                  | 9 months                          |
| 4       | Construction of Underground Stations and Tunnels along East-West Corridor                                                                                                                                                                   | 6 months                          |
| 5       | L-7 Battery Powered Electric Loco                                                                                                                                                                                                           | 11 months                         |
| 6       | Supply of Imported Turnout (for Main Line & Depot) CIF Chennai Port                                                                                                                                                                         | 5 months                          |
| 7       | Architectural Finishing Works and Public Health Engineering Works of 5 stations in Reach 4B                                                                                                                                                 | 9 months                          |
| 8       | Construction of Road, Drain and Footpath Development works from JD Mara Junction to Jayadeva Junction including JP Nagar IV Phase station and at Gottigere, Hulimavu Stations along Bannerghatta Road in Reach 6 (Elevated) Section         | 45 days                           |
| 9       | Construction of Elevated Structures (7.218 kms) from Visvesvaraya Industrial Area Station (excl.) to Whitefield Station (incl.) and 7 stations in Reach 1B                                                                                  | 157 to 256 days                   |
| 10      | Design & Construction of Underground Structures (Tunnels & Stations) (2.884 Kms) and 2 Nos. of UG Metro Stations in Package 3 of Reach 6                                                                                                    | 22 to 1,172 days                  |
| 11      | Design & Construction of Underground structures (Tunnels & Stations) (2.755 Km) and 3 Nos. of UG Metro Stations in Package 2 of Reach 6                                                                                                     | 6 months                          |
| 12      | Design & Construction of Underground Structures (Tunnels & Stations) (2.755 Km) and UG Metro Stations in Package 1 of Reach 6                                                                                                               | 6 to 224 days                     |
| 13      | Engineering, Supply, Erection, Testing and Commissioning of 33kV Distribution, 750V DC Third Rail Traction Electrification including Traction Substations, Auxiliary Substations and SCADA System for Reach 5 & Reach 6 - EP4 - CC Contract | 12 months                         |
| 14      | Package 1 of Reach 5                                                                                                                                                                                                                        | 9 to 160 days                     |
|         | <b>Exact no. of days could not be established in the following contracts -</b>                                                                                                                                                              |                                   |
| 15      | Construction of Boundary Wall, Roads, Drains and Earth Filling including External Electrification work at Peenya Depot                                                                                                                      |                                   |
| 16      | Construction of three stations, viz., Yeshwanthpur, Soap Factory, Mahalaxmi in Package 1 of Reach 3                                                                                                                                         |                                   |

| Sl. No. | Particulars of the Contract                                                                                                              | Delay in issue of Design Drawings |
|---------|------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|
| 17      | Construction of 3 stations, viz., Rajaji Nagar, Kuvempu, Malleswaram in Package 2 of Reach 3                                             |                                   |
| 18      | Construction of Metro Train Depot Structures (Package 2) at Byappanahalli in Reach 1                                                     |                                   |
| 19      | Construction of Viaduct & Stations in Reach 3B                                                                                           |                                   |
| 20      | Design, Manufacture, Supply, Installation, Testing and Commissioning of S&T Control and Communication - 2 S&T-DM                         |                                   |
| 21      | Architectural Finishing Works 10 stations of Package 1 and Package 2 of Reach5                                                           |                                   |
| 22      | Construction of Elevated Structures from Hesaraghatta Cross Station (excl.) to BIEC Station (incl.) and 3 stations in Reach 3C           |                                   |
| 23      | Construction of Elevated Structures from Puttenahalli Cross Station Dead End to Anjanapura Road Cross Station and 5 stations in Reach 4B |                                   |
| 24      | Construction of Elevated Structures (7.50 kms) from Gottigere to Swagath Road Cross and 5 stations in Reach 6 Elevated Section           |                                   |
| 25      | Construction of Elevated Structures (6.340 kms) from HSR Layout Station to RV Road Station and 5 stations in Package 3 of Reach 5        |                                   |

**Annexure-XIII****(Referred to in Para No. 5.12)**

**Statement indicating the contracts delayed due to delay in handing over of land where only  
Extension of Time is prescribed without any monetary compensation**

| <b>Sl. No.</b> | <b>Particulars of the Contract</b>                                                                                                                       |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1              | Construction of Pocket Track work in Reach 3                                                                                                             |
| 2              | Construction of Boundary wall, Roads, Drains and Earth Filling including external Electrification work at Peenya Depot                                   |
| 3              | Construction of Two Elevated Metro Stations, viz, RV Road Terminal and Jayanagar Station in Package 1 of Reach 4                                         |
| 4              | Construction of three Elevated Stations Viz, Tolgate, Hosahalli and Vijayanagar in Package 1 of Reach 2                                                  |
| 5              | Construction of Viaduct & Stations in Reach 3A                                                                                                           |
| 6              | 458 Piles, 420 Piles, Construction of Balance Works Viaduct in Package 1 of Reach 3                                                                      |
| 7              | Construction of three stations viz., Yeshwanthpur, Soap Factory, Mahalaxmi in Package 1 of Reach 3                                                       |
| 8              | Construction of two stations MG Road/ Trinity Stations in Package 3 of Reach 1                                                                           |
| 9              | Construction of Elevated Structures (viaduct) from RV Road station to Puttenahalli cross in Reach 4A                                                     |
| 10             | Construction contract of Underground Majestic Station (Interchange station) Phase 1                                                                      |
| 11             | Construction of 3 stations, viz., Rajaji Nagar, Kuvempu, Malleswaram in Package 2 of Reach 3                                                             |
| 12             | Construction of stations viz., CHM Road, Bayappanahalli Terminal in Package 2 of Reach 1                                                                 |
| 13             | Construction of Metro Train Depot cum Workshop at Peenya                                                                                                 |
| 14             | Construction of Metro Train Depot Structures (Package 2) at Byappanahalli in Reach 1                                                                     |
| 15             | Construction of Viaducts between Byappanahalli to Cricket Stadium in Reach 1                                                                             |
| 16             | Construction of Elevated Structures (Viaduct) between Magadi Road to Mysore Road Terminal under Package 1A of Reach 2                                    |
| 17             | Design & Construction of Underground Stations and Tunnels along North-South Corridor (excl. Majestic Station)                                            |
| 18             | Construction of Underground Stations and Tunnels along East-West Corridor                                                                                |
| 19             | Construction of Viaduct & Stations in Reach 3B                                                                                                           |
| 20             | Construction of Karnataka State Reserve Police (KSRP) Bhavan, Near Central Silk Board Junction in Bangalore                                              |
| 21             | Construction of Elevated Structures (3.945 km) from Mysore Road Station Dead End to Pattangere Station and 4 nos. of Elevated Metro Stations in Reach 2A |
| 22             | Construction of Elevated Structures (4.869 Kms) from Pattanagere station (excl.) to Challagatta Depot and 2 Nos. of Elevated Metro Stations in Reach 2B  |
| 23             | Construction of Elevated Structures (3.031 kms) from Hesaraghatta Cross Station (excl.) to BIEC Station and 3 stations in Reach 3C                       |
| 24             | Construction of Elevated Structures (6.524 kms) from Puttenahalli Cross Station Dead End to Anjanapura Road Cross Station and 5 stations in Reach 4B     |

**Annexure-XIV****(Referred to in Para No. 5.12)****Statement indicating the contracts in which damages claimed for delay in handing over of land**

| Sl. No. | Particulars of the Contract                  | Date of Contract | 90 days from Date of Contract | Delay in Handing over of land                                              | Damages claimed due to delay in handing over of land (₹ in crore) |
|---------|----------------------------------------------|------------------|-------------------------------|----------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1       | Underground Package 1 of Reach 6             | 12.12.2019       | 10.03.2020                    | 109 to 446 days                                                            | 22.95                                                             |
| 2       | Underground Package 2 of Reach 6             | 08.03.2019       | 05.06.2019                    | 12 to 785 days                                                             | 19.09                                                             |
| 3       | Underground Package 3 of Reach 6             | 08.03.2019       | 05.06.2019                    | Land handed over up to 30.09.2021                                          | 26.74                                                             |
| 4       | Package 3 of Reach 5                         | 31.08.2017       | 30.11.2017                    | 207 to 1,096 days                                                          | 11.93                                                             |
| 5       | Elevated Section of Reach 6                  | 26.10.2017       | 23.01.2018                    | 30 to 640 days                                                             | 17.50                                                             |
| 6       | Underground Package 4 of Reach 6             | 13.12.2019       | 12.03.2020                    | Land handed over up to November 2021                                       | Damages are yet to be finalised by BMRCL                          |
| 7       | Reach 1B                                     | 09.06.2017       | 06.09.2017                    | 1,305 days                                                                 |                                                                   |
| 8       | Package 1 of Reach 5                         | 09.06.2017       | 06.09.2017                    | Land handed over up to 03.06.2021                                          |                                                                   |
| 9       | Package 2 of Reach 5                         | 09.06.2017       | 06.09.2017                    | Specific dates could not be established as works are under execution still |                                                                   |
| 10      | Reach 1A                                     | 23.05.2017       | 20.08.2017                    |                                                                            |                                                                   |
| 11      | Construction of Hebbagodi Depot in Reach 5   | 12.09.2019       | 10.12.2019                    |                                                                            |                                                                   |
| 12      | Construction of Kothnur Depot in Reach 6     | 20.08.2020       | 17.11.2020                    |                                                                            |                                                                   |
| 13      | Construction of Anjanapura Depot in Reach 4B | 09.08.2021       | 06.11.2021                    |                                                                            |                                                                   |

**Annexure-XV****(Referred to in Para No. 5.14.4)****Statement indicating the details of non-tendered items executed without the prior approval of Competent Authority**

| <b>Sl. No.</b> | <b>Particulars of the Contracts</b>                                                                                     | <b>Contract Value (Revised)<br/>(₹ in crore)</b> | <b>Value of Non Tendered Items executed without prior approval<br/>(₹ in crore)</b> |
|----------------|-------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|-------------------------------------------------------------------------------------|
| 1              | Detailed Design Consultancy Services for Reach 2 Extension and Reach 4 Extension (Phase 2)                              | 5.94                                             | 1.14                                                                                |
| 2              | Construction of stations viz., CHM Road/ Byappanahalli Terminal in Reach 1 Package 2 (Phase 1)                          | 103.77                                           | 1.04                                                                                |
| 3              | Construction of Metro Train Depot Structures (Package 2) at Byappanahalli in Reach 1 (Phase 1)                          | 152.66                                           | 2.54                                                                                |
| 4              | Design & Contract of Underground Stations and Tunnels along North-South Corridor (Excluding Majestic Station) (Phase 1) | 939.98                                           | 1.56                                                                                |
| 5              | Construction of Underground Stations and Tunnels along East-West Corridor (Phase 1)                                     | 1,436.07                                         | 2.35                                                                                |
| <b>Total</b>   |                                                                                                                         |                                                  | <b>8.63</b>                                                                         |



**Annexure-XVI****(Referred to in Para No. 5.14.5)****Statement indicating the contracts wherein Special Advance was released without any provision in the Contract/ Agreement**

| <b>Sl. No.</b> | <b>Particulars of the Contract</b>                                                                                             | <b>Contract Value (Revised) (₹ in crore)</b> | <b>Amount of Special Advance released (₹ in crore)</b> |
|----------------|--------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|--------------------------------------------------------|
| 1              | Construction of three elevated stations, viz., Tollgate, Hosahalli and Vijayanagar in Reach 2 of Phase 1                       | 133.39                                       | 19.90                                                  |
| 2              | Construction contract of underground Majestic station (Interchange station) Phase 1                                            | 446.28                                       | 20.63                                                  |
| 3              | Track Works (including Extension Reach 3A, Reach 3B and Reach 4A) in Phase 1                                                   | 309.15                                       | 2.00                                                   |
| 4              | Construction of 3 stations - Rajaji Nagar/ Kuvempu/ Malleswaram in Reach 3 P2                                                  | 118.60                                       | 8.50                                                   |
| 5              | Design and construction of underground stations and tunnels along North South Corridor (Excluding Majestic Station)            | 939.98                                       | 44.41                                                  |
| 6              | Construction of underground stations and tunnels along East West corridor                                                      | 1,436.07                                     | 23.00                                                  |
| 7              | Construction of Viaduct & Stations in Reach 3B                                                                                 | 229.82                                       | 5.00                                                   |
| 8              | Construction of Metro Train Depot cum workshop at Peenya                                                                       | 117.00                                       | 6.96                                                   |
| 9              | Construction of Two elevated Metro stations viz, R.V Road Terminal and Jayanagar station in Reach-4 P1                         | 91.73                                        | 4.12                                                   |
| 10             | Construction of Elevated Structures (viaduct) of length 3.91 km approx. from RV Road station to Puttenahalli Cross in Reach 4A | 305.23                                       | 9.75                                                   |
| <b>Total</b>   |                                                                                                                                |                                              | <b>144.27</b>                                          |

## Annexure-XVII

(Referred to in Para No. 5.14.7)

**Statement indicating the contracts wherein GST was not adjusted in contracts which were tendered/ awarded prior to introduction of GST Act, 2017**

| Sl. No.      | Particulars of the Contract                                                                                                                                                                                                                   | Contract Value (Revised) (₹ in crore) | Amount of excess payment due to non-adjustment of GST component (₹ in crore) |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|------------------------------------------------------------------------------|
| 1            | Work of Partial and Full Demolition/ Dismantling of Buildings/ Structures located between Swagath Road Cross and Nagawara of Reach 6                                                                                                          | 1.15                                  |                                                                              |
| 2            | Construction of Elevated Structures from Mysore Road Station Dead End to Pattangere Station and 4 nos. of Elevated Metro Stations in Reach 2A                                                                                                 | 326.99                                |                                                                              |
| 3            | Construction of Elevated Structures from Pattanagere Station (excl.) to of Challagatta Depot and 2 nos. of Elevated Metro Stations in Reach 2B                                                                                                | 332.94                                |                                                                              |
| 4            | Construction of Elevated Structures from Hesaraghatta Cross Station (excl.) to BIEC Station and 3 stations in Reach 3C                                                                                                                        | 298.65                                | 18.43                                                                        |
| 5            | Construction of Elevated Structures from Puttenahalli Cross Station Dead End to Anjanapura Road Cross Station and 5 stations in Reach 4B                                                                                                      | 508.86                                |                                                                              |
| 6            | Shifting of Electrical Lines Ring Main Units/ DTC/ Structure/ Cables from Jayadeva circle limits to Dairy Circle Grade Separator in Reach 6                                                                                                   | 9.72                                  | 0.44                                                                         |
| 7            | Modification of Existing 220/ 66kv Line Towers with suitable 220kv/ 66kv Narrow Based/ Normal Towers                                                                                                                                          | 9.44                                  |                                                                              |
| 8            | Design, Manufacture, Supply, Testing and Commissioning of 150 nos. of standard gauge intermediate cars compatible with and suitable for integration with existing trains of Phase 1 procured under Contract No. 2 RS-DM” - 3 RS - DM contract | 1,794.60                              | 5.73                                                                         |
| 9            | Reach 3C Utilities Shifting work                                                                                                                                                                                                              | 6.28                                  |                                                                              |
| 10           | Reach 6 Utilities Shifting Work                                                                                                                                                                                                               | 17.17                                 |                                                                              |
| <b>Total</b> |                                                                                                                                                                                                                                               | <b>3,305.80</b>                       | <b>24.60</b>                                                                 |

**Annexure-XVIII****(Referred to in Para No. 5.14.8)****Statement indicating the contracts which were delayed in execution**

| <b>Sl. No.</b> | <b>Particulars of the Contract</b>                                                                                     | <b>Delay Period</b>       |
|----------------|------------------------------------------------------------------------------------------------------------------------|---------------------------|
| 1              | Staircase work in KVP station off-loaded from M/s. Punj Lloyd in Phase 1                                               | 3 months 14 days          |
| 2              | Construction of Pocket Track work in Reach 3                                                                           | 12 months 14 days         |
| 3              | Construction of Boundary Wall, Roads, Drains and Earth Filling including External Electrification work at Peenya Depot | 4 months 26 days          |
| 4              | Construction of two Elevated Metro Stations viz, R.V Road Terminal and Jayanagar station in Reach 4                    | 5 years 10 months 7 days  |
| 5              | Construction of three Elevated Stations, viz., Tollgate, Hosahalli and Vijayanagar in Reach 2                          | 4 years 7 months 11 days  |
| 6              | Construction of Viaduct & Stations in Reach 3A                                                                         | 3 years 3 months 15 days  |
| 7              | Balance Works (458 Piles, 420 Piles, Construction of Balance Works of Viaduct) in Reach 3 Package 1                    | 2 years 1 months 13 days  |
| 8              | Construction of three stations, viz., Yeshwanthpur, Soap Factory, Mahalaxmi in Reach 3 Package 1                       | 3 years 8 months          |
| 9              | Construction of two stations, viz., MG Road and Trinity Stations in Reach 1 Package 3                                  | 4 years 18 days           |
| 10             | Construction of Elevated Structures (viaduct) from RV Road station to Puttenahalli cross in Reach 4A                   | 4 years 11 months 25 days |
| 11             | Construction of Underground Majestic station (Interchange Station)                                                     | 3 years 1 month 25 days   |
| 12             | Track Works (including Extension of Reach 3A, Reach 3B and Reach 4A)                                                   | 4 years 7 months 16 days  |
| 13             | Construction of 3 stations, viz., Rajaji Nagar, Kuvempu, Malleswaram in Reach 3 Package 2                              | 3 years 5 months 6 days   |
| 14             | Construction of stations, viz., CHM Road, Bayappanahalli Terminal in Reach 1 Package 2                                 | 4 years 2 months 8 days   |
| 15             | Construction of Metro Train Depot cum Workshop at Peenya                                                               | 2 years 1 month 5 days    |
| 16             | Design & Construction of Underground Stations and Tunnels along North-South Corridor (Excluding Majestic Station)      | 3 years 9 months 3days    |

| Sl. No. | Particulars of the Contract                                                                                                        | Delay Period             |
|---------|------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| 17      | Construction of Viaduct & Stations in Reach 3B                                                                                     | 1 year 5 months 11 days  |
| 18      | L-7 Battery Powered Electric Loco                                                                                                  | 1 year 7 months 16 days  |
| 19      | Design, Supply, Installation, Testing and Commissioning of Tunnel Ventilation System (TVS) for UG Stations & Tunnels in Phase 1    | 3 years 6 months 7 days  |
| 20      | Design, Supply, Installation, Testing and Commissioning of Environmental Control System (ECS) for UG Stations & Tunnels in Phase 1 | 3 years 9 months 28 days |
| 21      | Design, Manufacture Supply, Installation Testing and Commissioning of S&T Control and Communication - 2 S&T-DM                     | 5 years 14 days          |
| 22      | Dismantling and Demolition Work in Reach 2 and Reach 4B Extension                                                                  | 2 years 7 months 4 days  |
| 23      | Detailed Design Consultancy for Reach 2 Extension and Reach 4 Extension                                                            | 4 years 23 days          |
| 24      | Design Consultancy Services for SES & CFD Analysis and sizing of TVS and Major ECS Equipment for Underground Section of Reach 6    | 3 years 7 months 8 days  |
| 25      | Shifting of BESCO Utilities infringing Metro Corridor alignment at Huskur Gate and Hebbagodi Depot Area in Reach 5                 | 9 months                 |
| 26      | Reach 6 Utilities Shifting                                                                                                         | 9 months 8 days          |

## Annexure-XIX

(Referred to in Para No. 6.6)

## Statement indicating the details of reimbursement of State taxes and duties from GoK

| Date of claim application to GoK | Claim amount requested (₹ in crore) | GoK sanction date for reimbursement of taxes | Reimbursed by GoK (₹ in crore) | Delay in receipt of claim amount (in days) |
|----------------------------------|-------------------------------------|----------------------------------------------|--------------------------------|--------------------------------------------|
| 25.03.2010                       | 26.75                               | 21.07.2011                                   | 50.00                          | 483                                        |
| 30.04.2011                       | 66.45                               |                                              |                                | 82                                         |
| 28.07.2011                       | 11.04                               | 29.03.2012                                   | 50.00                          | 245                                        |
| 09.11.2011                       | 13.00                               |                                              |                                | 141                                        |
| 28.01.2012                       | 28.46                               |                                              |                                | 61                                         |
| 30.05.2012                       | 28.36                               | 12.09.2012                                   | 74.06                          | 105                                        |
| 06.11.2012                       | 51.12                               | 27.12.2012                                   | 51.11                          | 51                                         |
| 19.12.2012                       | 31.38                               | 16.03.2013                                   | 31.38                          | 87                                         |
| 16.03.2013                       | 23.53                               | 30.03.2013                                   | 31.30                          | 14                                         |
| 27.03.2013                       | 7.76                                |                                              |                                | 3                                          |
| 11.10.2013                       | 32.56                               | 07.12.2013                                   | 32.56                          | 57                                         |
| 08.02.2014                       | 32.17                               | 10.03.2014                                   | 32.17                          | 30                                         |
| 21.03.2014                       | 21.38                               | 28.03.2014                                   | 21.38                          | 7                                          |
| 22.07.2014                       | 15.18                               | 16.10.2014                                   | 15.19                          | 86                                         |
| 20.01.2015                       | 36.84                               | 19.03.2015                                   | 36.83                          | 58                                         |
|                                  | 13.63                               | 18.08.2015                                   | 13.63                          | 210                                        |
| 07.08.2015                       | 22.84                               | 26.02.2016                                   | 22.84                          | 203                                        |
| 23.02.2016                       | 25.42                               | 31.08.2016                                   | 100.00                         | 190                                        |
| 12.07.2016                       | 88.58                               |                                              |                                | 50                                         |
| 23.02.2017                       | 21.62                               | 25.07.2017                                   | 35.63                          | 152                                        |
| 26.10.2017                       | 41.57                               | 26.03.2018                                   | 41.57                          | 151                                        |
| 10.12.2018                       | 24.59                               | 21.03.2019                                   | 100.00                         | 101                                        |
| 28.02.2019                       | 84.86                               |                                              |                                | 21                                         |
| 21.10.2019                       | 60.90                               | 28.02.2020                                   | 70.35                          | 130                                        |
| 04.09.2020                       | 134.27                              | 27.11.2020                                   | 134.27                         | 85                                         |
| 05.12.2020                       | 14.46                               | 16.03.2021                                   | 14.46                          | 101                                        |
| 20.07.2021                       | 31.62                               | 01.10.2021                                   | 69.08                          | 73                                         |
| 02.08.2021                       | 37.47                               |                                              |                                | 60                                         |
| 04.10.2021                       | 81.93                               | 10.01.2022                                   | 81.78                          | 98                                         |
| 31.05.2022                       | 254.37                              | 28.07.2022                                   | 252.99                         | 58                                         |
| 19.07.2022                       | 48.07                               | 18.10.2022                                   | 47.01                          | 91                                         |
| 23.01.2023                       | 106.81                              | 24.03.2023                                   | 200.00                         | 60                                         |
| 09.03.2023                       | 199.90                              |                                              |                                | 15                                         |
| 04.05.2023                       | 106.40                              | --                                           | --                             | --                                         |
| <b>Total</b>                     | <b>1,825.29</b>                     |                                              | <b>1,609.59</b>                |                                            |



**Annexure-XX**  
(Referred to in Para No. 7.4 (iv))

**A. Statement indicating projected as well as actual ridership of Phase 1**

| Sl. No. | Station Name         | Projected Ridership as per DPR |        |        | Actual Highest Ridership achieved | Year of achievement | Projected ridership of DPR achieved for the year |
|---------|----------------------|--------------------------------|--------|--------|-----------------------------------|---------------------|--------------------------------------------------|
|         |                      | 2007                           | 2011   | 2021   |                                   |                     |                                                  |
| 1       | Mysore Road Terminal | 8,364                          | 10,712 | 14,240 | 18,860                            | 2019                | 2021 projections achieved                        |
| 2       | Deepanjali Nagar     | 20,001                         | 24,740 | 34,838 | 7,375                             | 2019                | Not achieved even 2007 projections               |
| 3       | Vijaya Nagar         | 32,505                         | 39,009 | 69,050 | 14,786                            | 2019                | Not achieved even 2007 projections               |
| 4       | Hosahalli            | 62,171                         | 70,287 | 92,010 | 10,368                            | 2019                | Not achieved even 2007 projections               |
| 5       | Tollgate             | 24,264                         | 28,776 | 44,284 | *                                 |                     |                                                  |
| 6       | Magadi Road          | 23,721                         | 25,700 | 62,151 | 7,626                             | 2017                | Not achieved even 2007 projections               |
| 7       | City Railway station | 28,000                         | 38,300 | 63,979 | 12,083                            | 2022                | Not achieved even 2007 projections               |
| 8       | Majestic             | 30,408                         | 38,700 | 75,938 | 55,692                            | 2018                | 2011 projections achieved                        |
| 9       | Central college      | 15,864                         | 18,400 | 27,533 | 15,245                            | 2019                | Not achieved even 2007 projections               |
| 10      | Vidhan soudha        | 17,843                         | 21,780 | 42,820 | 23,785                            | 2022                | 2011 projections achieved                        |
| 11      | Cricket stadium      | 15,000                         | 18,000 | 24,000 | 22,639                            | 2018                | 2011 projections achieved                        |
| 12      | MG Road              | 25,781                         | 33,561 | 37,531 | 43,997                            | 2018                | 2021 projections achieved                        |
| 13      | Trinity Circle       | 12,580                         | 17,260 | 22,521 | 14,186                            | 2020                | 2007 projections achieved                        |
| 14      | Ulsoor               | 10,902                         | 15,337 | 21,841 | 7,384                             | 2019                | Not achieved even 2007 projections               |
| 15      | CMH Road             | 17,000                         | 24,603 | 36,990 | *                                 |                     |                                                  |
| 16      | Indira Nagar         | 18,083                         | 18,365 | 27,825 | 22,548                            | 2020                | 2011 projections achieved                        |
| 17      | Old Madras Road      | 12,995                         | 16,997 | 32,129 | 10,144                            | 2020                | Not achieved even 2007 projections               |
| 18      | Baiyyappanahalli     | 15,949                         | 28,350 | 45,400 | 43,776                            | 2022                | 2011 projections achieved                        |

| Sl. No. | Station Name     | Projected Ridership as per DPR |        |        | Actual Highest Ridership achieved | Year of achievement | Projected ridership of DPR achieved for the year |
|---------|------------------|--------------------------------|--------|--------|-----------------------------------|---------------------|--------------------------------------------------|
|         |                  | 2007                           | 2011   | 2021   |                                   |                     |                                                  |
| 19      | Yeshwantpur      | 37,691                         | 45,000 | 61,500 | 21,977                            | 2022                | Not achieved even 2007 projections               |
| 20      | Mahalaxmi        | 16,651                         | 18,600 | 28,800 | 16,253                            | 2018                |                                                  |
| 21      | Rajaji Nagar     | 23,306                         | 32,785 | 65,507 | 12,604                            | 2019                |                                                  |
| 22      | Kuvempu          | 36,285                         | 45,600 | 68,400 | 5,793                             | 2020                |                                                  |
| 23      | Malleswaram      | 44,486                         | 54,983 | 75,906 | *                                 |                     |                                                  |
| 24      | Swastik          | 43,982                         | 52,800 | 74,177 | *                                 |                     |                                                  |
| 25      | Majestic         | 46,542                         | 57,246 | 89,799 | *                                 |                     |                                                  |
| 26      | Chikpete         | 22,977                         | 26,200 | 47,200 | 15,978                            | 2019                | Not achieved even 2007 projections               |
| 27      | City Market      | 17,683                         | 21,979 | 36,054 | 39,811                            | 2022                | 2021 projections achieved                        |
| 28      | KR Road          | 9,326                          | 14,900 | 29,682 | *                                 |                     |                                                  |
| 29      | Lalbagh          | 19,900                         | 24,924 | 35,386 | 61,410                            | 2018                | 2021 projections achieved                        |
| 30      | South end circle | 12,870                         | 15,500 | 3,832  | 9,070                             | 2022                | Not achieved even 2007 projections               |
| 31      | Jayanagar        | 32,805                         | 40,900 | 6,546  | 14,405                            | 2022                |                                                  |
| 32      | RV Road Terminal | 64,074                         | 79,729 | 11,869 | 29,654                            | 2019                |                                                  |

\* Data in respect of 6 stations could not be compared as the location of station was changed.

**B. Statement indicating projected as well as actual ridership of Phase 1 Extension**

| Sl. No. | Station Name           | Projected Ridership as per DPR |        | Actual Highest Ridership achieved | Year of achievement | Projected ridership of DPR achieved for the year |
|---------|------------------------|--------------------------------|--------|-----------------------------------|---------------------|--------------------------------------------------|
|         |                        | 2011                           | 2021   |                                   |                     |                                                  |
| 1       | Hesargatta Cross       | 4,100                          | 12,300 | *                                 |                     |                                                  |
| 2       | Dasarahalli            | 1,900                          | 15,000 | 13,023                            | 2022                | 2011 projections achieved                        |
| 3       | Jalahalli Circle       | 10,520                         | 19,089 | 13,948                            | 2022                | 2011 projections achieved                        |
| 4       | Peenya Village         | 18,330                         | 24,825 | 5,465                             | 2017                | Not achieved even 2011 projections               |
| 5       | Peenya Industrial Area | 11,398                         | 21,178 | 16,848                            | 2014                | 2011 projections achieved                        |
| 6       | Outer Ring Road        | 11,499                         | 20,352 | *                                 |                     |                                                  |
| 7       | Banashankari           | 20,500                         | 34,500 | 17,569                            | 2020                | Not achieved even 2011 projections               |
| 8       | JP Nagar               | 29,800                         | 43,500 | 10,696                            | 2020                | Not achieved even 2011 projections               |
| 9       | Puttenahalli Cross     | 21,000                         | 36,000 | 23,738                            | 2020                | 2011 projections achieved                        |

\* Data for 2 stations could not be compared as the location of station is changed

## C. Statement indicating projected as well as actual PHPDT of Phase 1 (East - West Corridor)

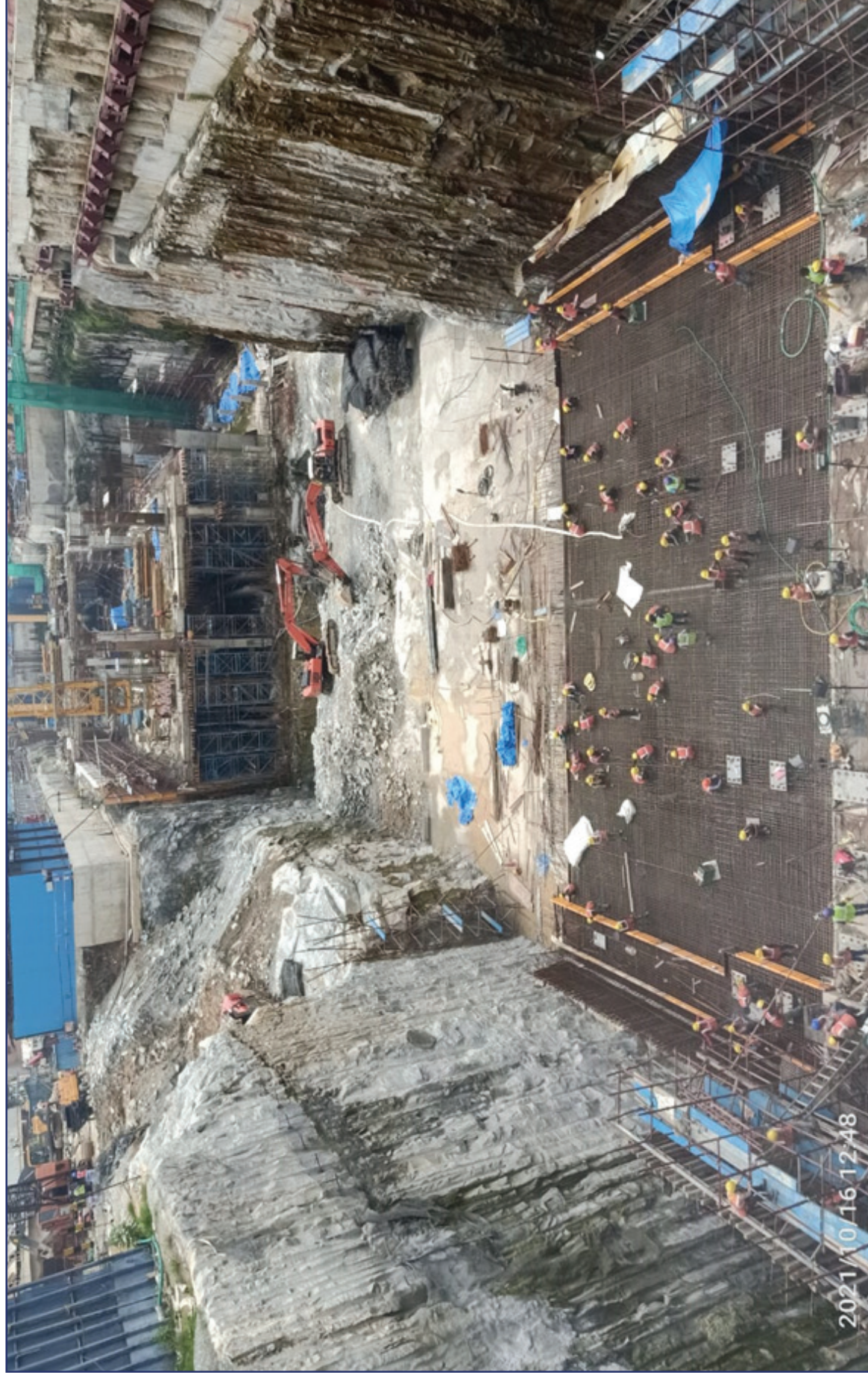
| Sl. No. | Name of the Station                           | Projected PHPDT as per DPR |        |        | Actual PHPDT achieved |        |        |        |        |        | Whether achieved the PHPDT target |
|---------|-----------------------------------------------|----------------------------|--------|--------|-----------------------|--------|--------|--------|--------|--------|-----------------------------------|
|         |                                               | 2007                       | 2011   | 2021   | 2017                  | 2018   | 2019   | 2020   | 2021   | 2022   |                                   |
| 1       | Mysore Road                                   | 1,104                      | 1,414  | 1,709  | 2,899                 | 3,180  | 3,414  | 3,816  | 2,791  | 4,445  | Achieved 2021                     |
| 2       | Deepanjali Nagar                              | 3,704                      | 4,794  | 6,364  | 3,759                 | 4,123  | 4,423  | 4,963  | 3,198  | 5,073  | Achieved 2011                     |
| 3       | Attiguppe                                     | --                         | --     | --     | 5,537                 | 6,075  | 6,521  | 7,304  | 4,188  | 5,716  | New station not envisaged in DPR  |
| 4       | Vijayanagar                                   | 8,091                      | 10,317 | 15,011 | 7,825                 | 8,581  | 9,211  | 10,171 | 5,655  | 6,813  | Approx. achieved 2011             |
| 5       | Hosahalli                                     | 20,059                     | 24,431 | 31,714 | 9,841                 | 10,795 | 11,588 | 12,707 | 6,763  | 8,994  | Not achieved 2007                 |
| 6       | Magadi Road                                   | 22,442                     | 27,398 | 39,838 | 11,010                | 12,078 | 12,965 | 14,044 | 7,508  | 10,311 | Not achieved 2007                 |
| 7       | Krantivira Sangolli Rayanna (KSR)             | 17,379                     | 21,236 | 33,593 | 11,853                | 13,001 | 13,958 | 15,444 | 8,266  | 11,160 | Not achieved 2007                 |
| 8       | Nadaprabhu Kempegowda Station, Majestic       | 14,796                     | 19,560 | 29,510 | 17,282                | 18,931 | 20,350 | 22,973 | 10,818 | 12,654 | Achieved 2011                     |
| 9       | Sir M. Visveshwaraya Station, Central College | 14,595                     | 19,359 | 29,746 | 14,781                | 16,190 | 17,406 | 19,931 | 8,961  | 17,348 | Achieved 2011                     |
| 10      | Dr. B.R. Ambedkar Station, Vidhana Soudha     | 12,497                     | 16,866 | 26,162 | 12,227                | 13,391 | 14,397 | 16,610 | 7,477  | 13,599 | Approx. achieved 2011             |
| 11      | Cubbon Park                                   | 11,961                     | 16,279 | 25,387 | 10,510                | 11,511 | 12,376 | 14,916 | 6,321  | 10,713 | Achieved 2007                     |
| 12      | Mahatma Gandhi (MG) Road                      | 9,850                      | 13,532 | 21,894 | 8,684                 | 9,516  | 10,228 | 12,424 | 4,842  | 9,057  | Achieved 2007                     |
| 13      | Trinity                                       | 8,470                      | 11,789 | 19,919 | 6,319                 | 6,923  | 7,440  | 9,354  | 3,231  | 7,276  | Achieved 2007                     |
| 14      | Halasuru                                      | 7,182                      | 10,049 | 17,646 | 6,030                 | 6,605  | 7,101  | 9,033  | 2,997  | 6,318  | Achieved 2007                     |
| 15      | Indiranagar                                   | 3,076                      | 5,382  | 10,707 | 3,538                 | 3,874  | 4,166  | 5,556  | 1,517  | 5,362  | Achieved 2011                     |
| 16      | Swami Vivekananda Road                        | 2,851                      | 5,021  | 9,948  | 2,561                 | 2,805  | 3,016  | 4,082  | 1,071  | 4,205  | Achieved 2007                     |
| 17      | Baiyappanahalli                               | --                         | --     | --     | 4                     | 5      | 5      | 3      | 36     | 2,779  | No projection in DPR              |

**D. Statement indicating projected as well as actual PHPDT of Phase 1 (North – South Corridor)**

| Sl. No. | Name of the Station                     | Projected PHPDT as per DPR |        |        | Actual PHPDT achieved |       |       |       |       |        | Whether achieved the PHPDT target |  |
|---------|-----------------------------------------|----------------------------|--------|--------|-----------------------|-------|-------|-------|-------|--------|-----------------------------------|--|
|         |                                         | 2007                       | 2011   | 2021   | 2017                  | 2018  | 2019  | 2020  | 2021  | 2022   |                                   |  |
| 1       | Puttenahalli                            | --                         | 6,706  | 9,540  | 3,146                 | 3,450 | 3,707 | 3,968 | 3,249 | 3,182  | Not achieved 2011                 |  |
| 2       | J.P. Nagar                              | --                         | 10,204 | 15,000 | 4,297                 | 4,709 | 5,063 | 5,306 | 3,983 | 4,251  | Not achieved 2011                 |  |
| 3       | Banashankari                            | --                         | --     | --     | 5,327                 | 5,836 | 6,334 | 6,648 | 4,470 | 5,227  | No projections in DPR             |  |
| 4       | Rashtriya Vidyalyaya Road (RV Road)     | --                         | --     | --     | 5,923                 | 6,487 | 6,996 | 7,270 | 4,652 | 6,505  | No projections in DPR             |  |
| 5       | Jayanagar                               | 9,227                      | 10,524 | 14,244 | 6,261                 | 6,854 | 7,489 | 7,808 | 4,635 | 7,004  | Not achieved 2007                 |  |
| 6       | South End Circle                        | 14,478                     | 16,351 | 21,500 | 6,359                 | 6,963 | 7,611 | 7,946 | 4,399 | 7,941  | Not achieved 2007                 |  |
| 7       | Lalbagh                                 | 15,200                     | 17,323 | 23,657 | 6,365                 | 6,972 | 7,600 | 7,947 | 4,339 | 8,072  | Not achieved 2007                 |  |
| 8       | National College                        | --                         | --     | --     | 6,806                 | 7,457 | 8,093 | 8,526 | 4,434 | 9,269  | No projections in DPR             |  |
| 9       | Krishna Rajendra (KR) Market            | 18,300                     | 21,208 | 29,274 | 6,682                 | 7,324 | 7,913 | 8,405 | 4,318 | 10,104 | Not achieved 2007                 |  |
| 10      | Chickpete                               | 19,585                     | 22,705 | 31,694 | 6,501                 | 7,127 | 7,759 | 8,213 | 4,188 | 11,363 | Not achieved 2007                 |  |
| 11      | Nadaprabhu Kempegowda Station, Majestic | 19,259                     | 22,292 | 31,132 | 3,701                 | 4,065 | 4,911 | 5,248 | 3,394 | 13,202 | Not achieved 2007                 |  |
| 12      | Sampige Road (Mantri Square)            | 16,377                     | 18,833 | 26,550 | 2,655                 | 2,923 | 3,974 | 4,238 | 2,632 | 12,446 | Not achieved 2007                 |  |
| 13      | Srirampura                              | 19,146                     | 22,082 | 31,199 | 2,559                 | 2,816 | 3,882 | 4,098 | 2,530 | 11,875 | Not achieved 2007                 |  |
| 14      | Kuvempu Road                            | 14,803                     | 17,073 | 23,965 | 2,509                 | 2,760 | 3,829 | 4,051 | 2,483 | 11,235 | Not achieved 2007                 |  |
| 15      | Rajajinagar                             | 11,253                     | 13,080 | 18,143 | 2,317                 | 2,546 | 3,634 | 3,919 | 2,333 | 10,138 | Not achieved 2007                 |  |
| 16      | Mahalakshmi                             | 7,514                      | 8,387  | 11,113 | 2,180                 | 2,399 | 3,488 | 3,796 | 2,294 | 8,719  | Achieved 2011                     |  |
| 17      | Sandal Soap Factory                     | --                         | --     | --     | 1,701                 | 1,877 | 2,996 | 2,968 | 1,954 | 8,333  | Station location changed          |  |
| 18      | Yeshwanthpur                            | 6,773                      | 7,534  | 9,772  | 1,397                 | 1,544 | 2,717 | 2,623 | 1,743 | 6,952  | Achieved 2007                     |  |
| 19      | Yeshwanthpur Industry                   | --                         | --     | --     | 1,112                 | 1,230 | 2,481 | 2,185 | 1,430 | 6,567  | Station location changed          |  |
| 20      | Peenya                                  | --                         | 2,612  | 5,998  | 940                   | 1,040 | 2,271 | 1,950 | 1,275 | 6,197  | Achieved 2021                     |  |
| 21      | Peenya Industry                         | --                         | 5,856  | 10,339 | 806                   | 889   | 2,014 | 1,678 | 1,080 | 6,000  | Achieved 2011                     |  |
| 22      | Jalahalli                               | --                         | 2,305  | 5,419  | 502                   | 557   | 1,508 | 1,027 | 570   | 4,844  | Achieved 2011                     |  |
| 23      | Dasarahalli                             | --                         | 792    | 3,277  | 300                   | 331   | 1,246 | 673   | 331   | 4,133  | Achieved 2021                     |  |
| 24      | Nagasandra                              | --                         | --     | --     | 0                     | 0     | 3     | 6     | 0     | 2,621  | Station location changed          |  |



## Reach 6 Underground Construction Works at Cantonment Station of Phase 2







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