13

STANDING COMMITTEE ON
HOUSING AND URBAN AFFAIRS
(2021-22)

SEVENTEENTH LOK SABHA

MINISTRY OF HOUSING AND URBAN AFFAIRS

Implementation of Metro Rail Projects - An Appraisal

THIRTEENTH REPORT

LOK SABHA SECRETARIAT
NEW DELHI

April, 2022/Chaitra, 1944 (Saka)

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Implementation of Metro Rail Projects - An Appraisal

Presented to Lok Sabha on 19.07.2022

Laid in Rajya Sabha on 07.04.2022

Presented to Speaker on 09.05.2022

LOK SABHA SECRETARIAT
NEW DELHI

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HOUSING AND URBAN AFFAIRS (2021-22)

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.SECRETARIAT

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4.	**Shri Mukesh Kumar**	-	**Asstt. Executive Officer**

INTRODUCTION

I, the Chairperson of the Standing Committee on Housing and Urban Affairs (2021-22) having been authorized by the Committee, present the Thirteenth Report (17th Lok Sabha) on the Subject 'Implementation of Metro Rail Projects - An Appraisal.'

2. The Committee were briefed by the representatives of Ministry of Housing and Urban Affairs along with DMRC and MMRCL on 27.06.2016. Further the Committee took oral evidence of the representatives of the Ministry along with DMRC and BMRC on 27.10.2017. The Committee further heard the views of the Ministry besides DMRC, MMRCL, KMRL, UPMRCL and PMRCL on 09.07.2021. The Committee also took oral evidence of the Ministry along with MPMRCL, GPMRCL, RITES and PMRCL on 03.08.2021. In addition to above, the Committee have also taken the oral evidence of the Ministry along with JMRL, CMRL, BMRC and MMRC on 08.09.2021.

3. The Committee wish to express their gratitude to the officials of the Ministry of Housing and Urban Affairs, various Metro Rail Corporations and RITES for appearing before them and furnishing the information that they desired in connection with the examination of the subject.

4. The Committee would also like to place on record their deep sense of appreciation for the invaluable assistance rendered to them by the Officials of Lok Sabha Secretariat attached to the Committee.

5. The Committee considered and adopted Draft Report at their Sitting held on 4 April, 2022.

6. For facility of reference, the observations/recommendations of the Committee have been printed in bold letters in the body of the Report.

JAGDAMBIKA PAL,
Chairperson,
Standing Committee on
Housing and Urban Affairs

New Delhi;
4 April, 2022
Chaitra, 1944 (Saka)

PART-I

INTRODUCTORY

1.1 Indian Cities are expanding at a rapid pace, both in terms of size and number. From 35 million plus and 5161 towns in 2001, it has grown to 53 million plus and 7933 towns in 2011. As per 2011 census, 31.2% (i.e. 377 million) of India's population lived in urban areas and by 2050 more than 50% of the country's population will be urban. Urban centres offer opportunities and act as magnets thereby attracting people, capital and technology towards itself. With rapid influx of population, the cities swell with people leading to dense and compact settlements in urban areas. This leads to heavy traffic congestion, environmental pollution, increasing Green House Gas emissions from the transport sector, increasing road accidents, an exploding growth in the number of private vehicles, lack of space, parking space problems, crowding, housing shortage, slums, etc. Therefore, it becomes imminent to develop efficient Mass Transportation Systems in cities viz. Bus, Metro, Railway network, etc. to cater to rapidly increasing urban population.

1.2 Urban Transport is a crucial component of urban infrastructure. It provides access to opportunities, supports urban economic activities and facilitates social interactions. A good public transport system and an efficient Mass Urban Transport System make significant contributions to improve the efficiency of a city and its environs. The extent to which the Indian cities can maximize economic performance and reduce poverty will be closely linked to how efficiently their transport system moves people and goods upon which their socio-economic activities depend.

1.3 Since 1986 Ministry of Housing and Urban Affairs (Erstwhile Ministry of Urban Development) is the nodal ministry for planning and coordination of urban transport matters at the central level. However, the primary responsibility for urban transport infrastructure and service delivery rests with State Governments and local bodies as urban transport, being an integral part of urban development, is a state subject.

1.4 The Ministry of Housing and Urban Affairs has been playing an active role in financing Metro Rail projects which transform the urban transport radically by providing a very comfortable, accessible and environment-friendly means of public transport. Metro Rail

projects provide a network which carries the maximum number of riders in any city in minimum time and on schedule. Metro networks can play an important role in decongesting our cities particularly mega cities and metropolitan cities.

2 Benefits of Mass Rapid Transit Systems

1.5 Mass Rapid Transit Systems especially Metro projects have multiplier effects on transportation, environment, economy, health and society. It reduces road traffic congestion, travel time, environmental pollution, diseases and boosts economic growth. The Ministry in a written reply submitted as under regarding benefits of metro projects:

> "Mass Rapid Transit Systems in urban areas not only facilitate easy and quick movement of people but also have a positive impact on the economic growth and quality of life. This results in increased income and various benefits to the society like reduced external cost due to reduction in traffic congestion, road and parking cost, transport cost and per-capita traffic accidents. Mass Rapid Transit Systems tend to reduce per capita vehicle ownership and usage and encourage more compact & walkable development pattern which provide developmental benefits to the society. Reduction in cost and time of travel lowers the cost of production of goods and services which significantly improves city's competitiveness. One of the significant contributions is substantial reduction in per capita pollution emission bringing down various chronic diseases; hence, results in huge public health benefits."

3. Options of Mass Rapid Transit Systems(MRTS)

1.6 Regarding various types of MRTS, the Ministry have submitted the following information:

> "(i) The mass transit systems in cities/ urban agglomeration can be broadly classified into the following 5 categories:
>
> a. Busways and Bus Rapid Transit System (BRTS): Busways are physically demarcated bus lanes along the main carriageway with a segregated corridor for movement of buses only. At the intersections, the buses may be given priority over other modes through a signalling system. BRTS, is an enhanced form of a busway which incorporates features such as facilities for pedestrians, Non-Motorised Vehicles (NMV) and many other associated infrastructures including operations and control mechanism.
>
> b. Light Rail Transit (LRT): LRT is generally at-grade rail based mass transit system, which is generally segregated from the main carriageway.
>
> c. Tramways: These are at-grade rail based system that are not segregated and often move in mixed traffic conditions.
>
> d. Metro Rail: Metro rail is a fully segregated rail based mass transit system, which could be at grade, elevated or underground. Due to its physical segregation and system

technology, metro rail can have a very high capacity of 40,000 – 80,000 passengers per hour per direction (PPHPD). Metro systems also include monorails, which, however, has lower capacities and higher maintenance cost.

e. Regional Rail: Regional rail caters to passenger services within a larger urban agglomerate or metropolitan area connecting the outskirts to the center of the city. The services have greater number of halts at smaller distances compared to long distance railways but fewer halts and higher speeds compared to metro rail. Regional rail are common in large metropolitan cities and help in decongesting the city center by providing safe, and speedy access to the city center for commuters residing in less congested suburbs.

ii. Choice of Metro Rail as a Mode of Mass Transit: The choice of a particular MRTS will depend on a variety of factors like demand, capacity, cost and ease of implementation. A BRT or LRT systems at grade may require linear pathway to be carved out of existing land if additional space cannot be made available on the sideways and will reduce the space for other traffic depending on the width of existing roads. LRTs and Tramways without horizontal separation will have reduced speed and hence reduced capacity. The capacity of MRTS is generally denoted by passengers per hour per direction (PPHPD). A BRTS typically has a capacity of 10,000-15,000 PPHPD on a single lane but can be enhanced with additional lanes. Comparatively metro rail systems are able to carry much higher passenger volumes of 60,000 PPHPD and can go up to 80,000. Such rail based systems also generally provide rapid service, a higher quality ride and service regularity due to grade separation.

iii. It is pertinent to observe that the above mentioned capacities of different systems can be at best, a guidance parameter and choice of mode will depend on the overall feasibility of the transport system."

1.7 At present, about 742 km of metro rail lines are operational in 19 cities. Further, about 1037 km, including 82 km Delhi-Meerut Regional Rapid Transit System (RRTS) Corridor is under construction in 27 cities. A total of 291 km of RRTS project Delhi - Panipat (111 km) Delhi- Alwar (180 km) is under planning stage. Metro project proposals of several cities such as Delhi Phase-IV (balance 3 corridors), Kochi Phase-II, Chennai Metro Phase II, Bangalore Metro Phase-2A and 2B,Nashik, Nagpur Metro Phase-II, Thane, Pune Metro Extension, Jammu, Srinagar, Kochi Phase IA, Noida Metro Aqualine extension, etc are under consideration. Many more cities like Varanasi, Thiruvananthapuram, Kozhikode, Guwahati, Chandigarh etc. are aspiring to have metro rail system.

II. LEGISLATIVE FRAMEWORK

2.1 While the subject of planning and coordination of all urban transport systems including rail-based systems (Metro Railway) came to MoHUA in 1986, technical planning of Metro Railways is with the MoR and safety certification with the Commissioner of Metro Rail Safety (CMRS) under Ministry of Civil Aviation.

4. Metro Rail Act(s)

2.2 The Metro Rail Projects are governed by the Central Metro Acts viz. Metro Railways (Construction of Works) Act, 1978 and Metro Railways (Operation and Maintenance) Act, 2002.

2.3 Metro Railways (Construction of Works) Act, 1978 provide for the construction of works relating to metro railways in the metropolitan cities and for matters connected therewith. The Act applied in the first instance to the metropolitan city of Calcutta; and the Central Government could, by notification in the Official Gazette, declare that this Act shall also apply to the National Capital Region, such metropolitan city or metropolitan area, accordingly.

2.4 The Metro Railways (Operation and Maintenance) Act, 2002 (the Metro Act) states that it extends in the first instance to the National Capital Region and the Central Government may, by notification, after consultation with the State Government, extend this Act to such other metropolitan area and metropolitan city, except the metropolitan city of Calcutta, and with effect from such date as may be specified in that notification and thereupon the provisions of this Act shall apply to that metropolitan area or metropolitan city accordingly.

2.5 Thus, the Act of 1978 applied in the first instance to Calcutta but 2002 Act could not be extended to Calcutta. However, both the Acts could be extended to National Capital Region, any metropolitan city or metropolitan area.

Need to have a single and comprehensive Metro Act

2.6 Both the Acts *viz.*the Metro Railways (Construction of Works) Act, 1978 and the Metro Railway (Operations and Maintenance) Act, 2002 seems to have the same objective *i.e.* construction of works, maintenance relating to metro railways in metropolitan areas in the country and operations.

2.7 In response to a query whether MoHUA ,keeping in view same objective of both the above mentioned Acts, feel the need for merging both the Acts to make it a single Act , replied as under:

> "The Metro Railways (Construction of Works) Act, 1978 primarily governs the construction of works relating to metro railways and the Metro Railway (Operations and Maintenance) Act, 2002 governs the operation of metro rail system. The Ministry of Housing and Urban Affairs (MoHUA) is under process of drafting the Metro Rail (Construction, Operation, Maintenance and Administration) Bill, 2021 which upon enactment, will replace the three existing Metro Acts namely, the Metro Railways (Construction of Works) Act, 1978, the Metro Railways (Operation and Maintenance) Act, 2002 and the Calcutta Metro Railways (Operation and Maintenance) Temporary Provisions Act, 1985."

2.8 While discussing the Viability Gap Funding (VGF) issue of the Hyderabad Metro, the representative of Metro made the following submission regarding the legal status of the project:

> "….originally this project was started under AP Tramways Act. Later, to get uniformity for all the Metros, Hyderabad Metro was also brought under the Central Metro Act."

2.9 The Secretary, MoHUA , appearing before the Committee on 21.12.2021 , speaking on the issue of VGF in PPP projects, submitted to the Committee that the Ministry is going to introduce a 'new Metro Act'. Elaborating further, the Secretray submitted as follows:

> "….मेट्रो एक्ट पी पी पी को सपोर्ट नहीं करता है इसलिए हमारे देश में दो पी पी पी के प्रोजेक्ट लिए गए पहला मुम्बई मेट्रो लाइन-1, रिलायंस ग्रुप को मिला दूसरा हैदराबाद मेट्रो प्रोजेक्ट जो कि एल एंड टी ग्रुप को मिला। आज की डेट में हमने मेट्रो एक्ट को एक नया मेट्रो लॉ लेकर आ रहे हैं और बहुत जल्दी संसद में आएगा। हमने फैसिलिटेट कर दिया है कि आगे आनेवाले समय में नए मेट्रो लॉ में पी पी पी प्रोजेक्ट को बिड कर सकते हैं।"

2.10 Further, speaking on the issue PPP and VGF issue of Hyderabad, at the sitting held on 21.12.2021, the Secretary, MoHUA *inter alia* stated about the need of a much more robust Act, as under:

> "सर, उसके बारे में मैं बताना चाहूंगा कि वह ट्राम-वे एक्ट था। हर राज्य का स्टेट ट्राम-वे एक्ट है। पहले ट्राम-वे चला करती थीं। ब्रिटिश पीरियड के पहले का वर्ष मुझे याद नहीं है, लेकिन वर्ष-1947 से पहले का एक एक्ट है। वह काफी छोटा–सा एक्ट है। उसमें मुश्किल से 20-25 सैक्शन्स ही हैं। वह बहुत ही बेसिक फैसिलिटीज देता है। कलकत्ता, बॉम्बे और यहां तक कि कानपुर में भी ट्राम-वे किसी जमाने में चला करती

थीं। पहले यह फैसिलिटेट करने के लिए होता था, लेकिन जो हमारा मेट्रो सिस्टम है, उसमें टेक्निकली बहुत सारी चीजें आ गई हैं। इसके लिए नया मेट्रो एक्ट बनाया गया है।

जब दिल्ली मेट्रो एक्ट आया तो उसके बाद वही सभी पर एक्सटेंड कर दिया गया।वर्ष-2014 में तो केवल 5 शहरों में मेट्रो चलती थी, लेकिन आज हम 18 शहरों में मेट्रो चलाते हैं और 27 शहरों में हम मेट्रो का काम कर रहे हैं। Therefore, we need a much more robust Act. हमारा वह एक्ट बन चुका है और वह बहुत एडवान्स्डस्टेज पर है। मैं समझता हूं कि पार्लियामेंट के अगले सेशन में वह एक्ट आजाएगा। उससे ये सारे जो विवाद हैं, उनसे राहत मिलेगी।"

Application of Metro Act to all the Cities having Metro Rail connectivity

2.11 When asked to explain whether the Central Government has extended the Act to the Metropolitan areas or cities where in the metro rail projects are currently operational or are under construction, it was submitted as under:

"The list of Metropolitan Areas / Cities to which the relevant provisions of The Metro Railways (Operation and Maintenance) Act, 2002 have been extended is as under:

Sl. No	Name of State	Name of City (s)	Date of notification
1	Andhra Pradesh	Vijayawada	05.07.2017
		Vishakhapatnam	10.08.2018
2	Bihar	Patna	17.02.2022
	Gujarat	Ahmedabad	13.05.2014
		Gandhinagar	13.05.2014
		Surat	19.08.2020
4	Karnataka	Bangalore	16.10.2009
5	Kerala	Kochi	14.08.2013
6	Madhya Pradesh	Indore	12.12.2020
		Bhopal	12.12.2020
7	Maharashtra	Mumbai	16.10.2009
		Nagpur	18.09.2014
		Pune	20.10.2014
		Navi Mumbai	16.10.2009
8	Rajasthan	Jaipur	14.01.2011
9	Tamil Nadu	Chennai	16.10.2009
10	Telangana	Hyderabad	24.01.2012
11	Uttar Pradesh	Lucknow	05.09.2013
		Kanpur	13.05.2016
		Varanasi	13.05.2016
		Agra	24.04.2018

		Meerut	24.04.2018
		Gorakhpur	23.12.2021

Laying of Annual Reports before Parliament

2.12 Section 13 of the Metro Railways (Operation and Maintenance) Act, 2002 stipulates that the Central Government shall cause the annual report of the Chief Commissioner of Railway Safety to be laid after its receipt before each House of the Parliament. In written reply to a query whether the annual reports of all the operational and under construction metro projects are laid before each house of the Parliament, the Ministry of Housing and Urban Affairs stated as under:

> "Ministry of Civil aviation has informed that the annual report of Commissioner of Railway Safety upto 2020-21 has been laid in both the houses of Parliament.
>
> Also the annual reports of various operational and under construction metro rail projects are laid periodically before each House of the Parliament as mentioned below**:**

S. N	**Metro Rail Company**	**FY**	**Date of laying of Annual Report**	
			In Lok Sabha	**In Rajya Sabha**
1.	Delhi Metro Rail Corporation Ltd. (DMRC)	2019-20	11-2-2021	10-3-2021
		2020-21	10-2-2022	10-2-2022
2.	Bangalore Metro Rail Corporation Limited (BMRCL)	2019-20	11-2-2021	10-3-2021
		2020-21	10-2-2022	10-2-2022
3.	Mumbai Metro Rail Corporation Limited (MMRCL)	2019-20	11-2-2021	10-3-2021
		2020-21	3-2-2022	20-12-2021
4.	Uttar Pradesh Metro Rail Corporation (UPMRC)	2019-20	18-3-2021	17-3-2021
		2020-21	10-2-2022	Will be laid in Rajya Sabha in the next Parliament Session.
5.	Chennai Metro Rail Limited (CMRL)	2019-20	18-3-2021	19-3-2021
		2020-21	Approved by Hon'ble MoS. Will be laid in the next Parliament Session.	
6.	Kochi Metro Rail Limited (KMRL)	2019-20	18-3-2021	17-3-2021
		2020-21	Approved by Hon'ble MoS.Will be laid in the next Parliament Session.	
7.	Maha Metro	2019-20	11-2-2021	10-3-2021
		2020-21	9-12-2021	13-12-2021
8.	National Capital Region Transport Corporation (NCRTC)	2019-20	18-3-2021	17-3-2021
		2020-21	Approved by Hon'ble MoS. Will be laid in the next Parliament Session.	
9.	Gujarat Metro Rail Corporation Limited	2019-20	18-3-2021	19-3-2021
		2020-21	23-12-2021	23-12-2021
10.	Madhya Pradesh Metro Rail	2020-21	The first meeting of Joint Venture Board	

	Corporation Limited (MPMRC)		of Government of India and Government of Madhya Pradesh held on 29.12.2020. Subsequently, Annual Financial Statement for the Financial Year 2020-21 have been approved by Board of Directors in its meeting held on 29.11.2021. Accordingly, the First Annual Report 2021-22 required to be presented, however supplementary Audit for Annual Financial Statement for the Financial Year 2020-21 is yet to be carried out by CAG. Therefore, the First Annual Report 2021-22 will be submitted after the audit of CAG. It may also be noted that the Ministry of Corporate Affairs extended the date of Annual General Meeting from 30 September, 2021 to 30 November, 2021.
11.	Patna Metro Rail Corporation Limited (PMRCL)	2020-21	As per the provision of section 394 of the Companies Act 2013, the Annual Report has to be presented within three months from the Annual General Meeting. But due to non-availability of CAG report in the Annual General Meeting of PMRCL, it has been postponed. As soon as the above CAG reports, which are under process, are received, the Annual General Meeting will be held and copies of the Annual Report of PMRCL will be made available after AGM for necessary action.

III POLICY FRAMEWORK

5. National Urban Transport Policy (NUTP), 2006

3.1 In order to deal with the emerging problems, the Government of India formulated a National Urban Transport Policy in April, 2006. The objective of the policy is to ensure accessible, safe, affordable, quick, comfortable, reliable and sustainable mobility for all. The policy seeks to promote integrated land use and transport planning, greater use of public transport and non-motorized modes of travel and use of cleaner technologies. It offers Central Government's financial support for investments in public transport. It encourages capacity building at institutional and individual levels, innovative financing mechanisms, institutional coordination, association of the private sector and need for public awareness and cooperation.

3.2 Explaining the Urban Transport Policy Framework , the Secretary , MoUD appearing before the the Committee on 27.06.2016, stated as as follows ::

> "...It is pertinent and appropriate to recall that urban transport being a subset of the larger issue or urban development is a State subject….Of course, the Ministry of Urban Development does provide support to the States and the city administrations in terms of policy framework. MoUD has formulated the National Urban Transport Policy in 2006 which lays emphasis on public transport and seeks to discourage individual modes of conveyance and also non-motorised transport. MoUD also, in order to encourage public transport, supports the State Governments by funding Metro Rail projects."

6. Salient features of Metro Rail Policy, 2017

3.3 Submitting the details of the Metro Rail Policy - 2017, the Secretary, MoHUA appearing before the Committee on 27.10.2017, stated as under:

> "Very recently, the Cabinet has approved a new Metro Policy, which basically lays down an eco-system that will help using the Public Private Partnership; using the innovative financing; creating a structure for last mile and first mile connectivity; creating commitments of the State Governments; and also the Urban Metropolitan Transport Authority (UMTA). So, there is some kind of a synergy between different kinds of transporters who are operating within the city limits. So, this kind of an eco-system will help in proliferating Metros in different cities across the country.

We expect it because cities are aspiring to have Metros. Hence, we must make sure that in such cities where there are various alternative modes of urban transport, that is, apart from Metro, there is a Light Rapid Transport, BRT system, etc. The cities should not just move to the Metro right away whatever may be the requirement. So, there is an alternative analysis and a comprehensive mobility plan. All these things have been laid down in the policy, and all future Metro Projects like we had various projects that are lying in the Government of India and which we have sent to the States asking them to kindly re-submit their proposal within the framework of the new Metro Policy."

3.4 In August, 2017, the Government has approved Metro Rail Policy, 2017. Salient features of which as submitted by Ministry are as under:

"i. Comprehensive Mobility Plan (CMP) is mandatory prerequisite for planning the Metro Rail in city.

ii. For integrated approach in planning and management of urban transport, setting up of Unified Metropolitan Transport Authority (UMTA) mandatory for States.

iii. Alternative analysis of modes of transport with a horizon of 30 years is a requirement for metro rail project in a city.

iv. Options for availing Central assistance through grant or equity sharing model.
v. Private participation either for complete project or for some unbundled components.

vi.Innovative Financing through Value Capture Finance (VCF).

vii. Mandates Transit Oriented Development (TOD) to promote compact and dense urban development along metro corridors.

viii. Multimodal integration and provision of last mile connectivity through feeder services and non-motorized transport infrastructure.

ix. Requirement of Economic Rate of Return of at least 14 %."

(i) <u>Setting up of Unified Metropolitan Transport Authority (UMTA)</u>

3.5 The Metro Rail Policy, 2017 states that "for integrated approach in planning and management of urban transport, State Governments should constitute Unified Metropolitan Transport Authority (UMTA) as a statutory body. This Authority would prepare Comprehensive Mobility Plan for the city, organize investments in urban transport infrastructure, establish effective coordination among various urban transport agencies, manage the Urban Transport Fund (UTF) etc." It further states that "for all metro rail projects taken up with central assistance

it will be mandatory for the State Governments to give commitment to set up and operationalise UMTA in the city within a year. Further, cities, where metro projects are under implementation, may consider setting up of UMTA within a year."

3.6 The status regarding formation of Unified Metropolitan Transport Authority (UMTA) by various State Governments is given at **Annexure I**. It can be seen that Kochi, Pune, Chennai, Hyderabad, Lucknow, Kanpur, Agra and Mumbai metros have informed about establishment of UMTA in these cities. On the other hand, UMTA for Patna, Bhopal, Indore and Nagpur metros are under process. However, Delhi Metro which began first operations in 2002, has informed that action is awaited on the part of GNCTD for setting up of UMTA.In Surat, Indore and Jaipur UMTA are still to be constituted by respective State Governments. Further, Bengaluru was one of the first cities to constitute UMTA in 2007, however, it lacked statutory powers thus new Bangalore Metropolitan Land Transport Authority (BMLTA) Bill was prepared which has not been approved yet.

3.7 In response to a query why despite a lapse of more than 4 years, out of 12 states where Metro rail network either has commenced or is under construction, six states such as NCT of Delhi, Karnataka, Gujarat, Madhya Pradesh, Maharashtra (in r/o Mumbai only) and Rajasthan are yet to constitute UMTA and the specific steps taken to ensure that UMTA is set up by these states without further delay, the MoHUA in a written reply submitted as under:

> "National Urban Transport Policy (NUTP), 2006 has envisaged setting up of Unified Metropolitan Transport Authority (UMTA) in all million plus cities with view to facilitate coordinated planning, implementation of Urban Transport programs & projects and integrated management of the Urban Transport systems.
> In the Metro Rail Policy, 2017 issued by Govt. of India, it has been made mandatory for the State Governments seeking central assistance for metro rail projects to give commitment to set up and operationalize UMTA in the city within a year. Further, cities, where metro projects are under implementation, may consider setting up of UMTA within a year.
> The current status of setting up of UMTA in states viz. NCT of Delhi, Karnataka, Gujarat, Madhya Pradesh, Maharashtra (in r/o Mumbai only) and Rajasthan is as under:

S. No.	Name of Metro Rail Company	Current status/ Action Taken for setting up of UMTA
1	NCT of Delhi	Process of setting up of UMTA has been initiated in September, 2021. The proposal is under consideration of GNCTD for taking necessary action.
2	Karnataka	Bengaluru Metropolitan Land Transport Authority

		(BMLTA) Bill has been submitted to Govt. of Karnataka for approval.
3	Gujarat	Pending
4	Madhya Pradesh	Operations documents for UMTA and UTF for Bhopal have been prepared.
5	Maharashtra (in r/o Mumbai only)	"Unified Mumbai Metropolitan Transport Authority" (UMMTA) has been established.
6	Rajasthan	The draft UMTA Bill is under consideration.

(ii)Comprehensive Mobility Plan (CMP)

3.8 As per Metro Rail Policy of 2017, Comprehensive Mobility Plan is a mandatory prerequisite for planning the metro rail in any city. Cities having a population of two million and more may start planning for mass transit systems including metro rail based on the CMP.

3.9 When asked whether in cities where UMTA has been constituted, the Comprehensive Mobility Plan (CMP) has been prepared and details about the status of implementation (city wise), the Ministry submitted as under:

"The status of preparation of CMP in cities where metro rail system is operational or under construction and UMTA has been constituted, is as below:

Name of cities	**Status of preparation of CMP**
Hyderabad	Prepared
Chennai	Prepared
Kochi	Prepared
Lucknow	Prepared
Kanpur	Prepared
Agra	Prepared
Meerut	Prepared
Gurugram	Prepared
Mumbai	Prepared
Pune	Prepared

Apart from above, CMP have also been prepared in Gorakhpur, Varanasi, Prayagraj, Thane, Jalandhar, Ludhiana, Patiala, Amritsar, Bathinda, Pathankot, Nagpur, Bhopal, Indore, Jaipur, Ahmedabad, Surat and Bengaluru."

(iii)Need for implementation of National Policy on Transit Oriented Development (ToD)

3.10 MoHUA, GoI has issued National TOD policy on 01.05.2017, which aims to promote planned and sustainable urban centres with high density, mixed land-use development within an influence zone of 500-800 meters of mass transit stations. The policy aims to enable transformation of cities from private vehicle dependent development to public transport-oriented development. TOD increases the accessibility of the transit stations by creating pedestrian and Non-Motorised Transport (NMT) friendly infrastructure like footpaths and cycle tracks that benefit large number of people, thereby increasing the ridership of the transit facility and improving the economic and financial viability of the system. Many cities have strengthened their public transport by developing MRTS such as metro rails and BRTS. The National TOD policy will help these cities to formulate city specific policies to efficiently use these systems.

3.11 In written reply to a query on the number of states which have come out with Policy/ State Legislation on TOD and a list of Metro Projects/MRTS along which Transit Oriented Development has actually taken place/are being developed, MoHUA submitted as under:

"The Status of TOD Policy in States/cities where metro rail system is operational or under construction is as below:

State	**City**	**Status of notification of TOD Policy**
Delhi	Delhi	Notified
Uttar Pradesh	For entire State	Notified
Karnataka	Bengaluru	Pending
Telangana	Hyderabad	Notified
West Bengal	Kolkata	Notified
Tamil Nadu	Chennai	Pending
Rajasthan	Jaipur	Notified
Kerala	Kochi	Notified
Maharashtra	Nagpur	Notified
	Pune	Notified
	Mumbai	Pending

Bihar	Patna	Pending
Madhya Pradesh	For entire State	Notified
Gujarat	For entire State	Pending

3.12 Furnishing further details in this regard, MoHUA furnished a List of Metro Projects/MRTS along which Transit Oriented Development actually taken place/are being developed as under:

DMRC	12 TOD nodes have been identified by the Government to be taken up in the first phase. As per this, TOD benefits are likely to be available only at two stations of DMRC viz. Dwarka Sector-21 and Majlis Park.
HMRL	Up to 300 meters from the Metro Rail and other mass transit corridors is notified as TOD influence zone with mixed land use development and other incentives to encourage Transit Oriented Development.
CMRL	In order to enhance and utilize the airspace along the transit corridors, Government of Tamil Nadu has increased the Floor Space Index (FSI) along the transit corridors and also adopted special provisions such as additional FSI, 50% discount on premium FSI charges, etc.
Maha Metro	Under the TOD policy for Nagpur, the Nagpur metro rail corridor includes the area falling within the 500 metres distance on either side of Nagpur metro rail measured from its center line and also includes the area falling within 500 metres distance from the longitudinal end of the last metro stations. Under this policy, on metro rail corridor, on payment of additional premium, the plot owners can avail the benefit of additional floor space index (FSI) subject to the plot area and the width of road the plot is abutting. The maximum FSI permissible under TOD policy is 4.0. The total premium received by the Planning Authority while sanctioning buildings with additional FSI shall be shared equally by Maha Metro and the Planning Authority who sanctions the plans. Further, as on date Maha Metro, under the said policy, has received an amount of Rs.76.78 Crore under Nagpur Metro Rail Project.

(iv) Capital-Intensive nature of Metro Projects

3.13 Metro projects are capital intensive in nature. It involves huge capital expenditure. For instance, total cost incurred on Phase I, II, III, IIIA and IV of Delhi Metro was Rs.10891 crore, Rs.21143.46 crore, Rs.36702 crore, Rs.11863.12 crore, Rs.24948.65 crore, respectively. Cost estimates for Phase I & II of Bengaluru metro are Rs.14405.01 crore&Rs.30695.12 crore, respectively and for Hyderabad metro it wasRs.18411 crore. While estimated revised cost for Patna metro corridor I & II are Rs.7120.4 &Rs.6805.1 crore, respectively. Metro projects are so costly that it accounted for about 43.1 percent of total BE for the FY 2021-22 of Ministry of Housing and Urban Affairs. The Year-wise expenses incurred on Metro Projects & MRTS by

Ministry of Housing and Urban Affairs (MoHUA) as percentage of total budget of Ministry ranged from 31.20 to 43.10 in last four years, as given below.

The year-wise Budget Estimate of MoHUA dedicated for Metro Projects are as under:

Financial Year	Total Budget provided for Metro projects by MoHUA	Percentage of total BE of MoHUA dedicated for Metro Projects
2019-20	Rs.19,152 crore	39.87 %
2020-21	Rs.20,000 crore	39.97 %
2021-22	Rs.23,500 crore	43.10 %
2022-23	Rs.23,875 crore	31.20 %

(v) Alternatives Available - New and Cost Effective Transit Modes

3.14 Emphsising the importance of comparative anlaysis of alternat modes of transport d due to high capital intensive nature of the metro rail, the Metro Policy, 2017 states inter- alia as follows:

> "…. the metrorail systems are best suited for cities with teeming population and favorable future growth prospects. Further, they should be decided upon with due care and after a systematic and unbiased analysis of different alternatives. In this context, the spatial pattern of a city is important. Cities with a well spread out spatial pattern, even if they have a high population, may not have sufficient number of corridors with adequate density to justify investments in a metro. Yet cities with a linear spatial pattern may justify a metro even at lower population levels as they have fewer corridors and each would have a high traffic density. A comparative analysis of alternate modes should be an essential requirement for the transit mode selection."

3.15 MetroLite and MetroNeo have come up as alternatives to conventional metro rail.

MetroLite

3.16 About standards of MetroLite, cost involved and its salient features, the Ministry have submitted as under:

> "Standards for Light Urban Rail Transit system called "MetroLite" have been issued by the Ministry in July, 2019. This is suitable for cities with lower projection of ridership that are aspiring for rail-based mass transit system. This system can also be used as feeder to high capacity metro rail system. State Governments have been requested to adopt MetroLite as a prime mode of mass transit in smaller cities. Cost of its construction is about 40% of high capacity metro system. This system is more viable and sustainable due to less capital, operation and maintenance costs.

MetroLite is a low-cost solution to the requirement of mass transit in smaller cities, which are suffering from congestion. In addition to providing solution to congestion, it will also help in transforming the smaller cities and enhancing ease of living. This will help in bringing 50 cities on metro network."

3.17 Uttar Pradesh metro rail has informed about proposed Gorakhpur MetroLite project. And Delhi Metro has informed about following two MetroLite corridors for which DPR has been submitted:

Metro Lite Corridor	Length in km	Stations
Rithala to Narela	22.915	19
Kirti Nagar to Bamnoli Village (near ECC Dwarka)	19.094	21
Total	42.009	40

MetroNeo

3.18 Regarding features, cost involved, passenger capacity, etc. of Metro Neo the Ministry have submitted as under:

"MetroNeo is rubber-tyred electric coach powered by overhead traction system running on a road slab with an exclusive right of way, standard specification of which has been issued in November 2020.

It will provide a similar experience and ease of travel in terms of comfort, convenience, safety, punctuality, reliability, & environment-friendliness as that of a conventional metro system.

This is suitable for tier-2 cities with PHPDT upto 8,000 and can be developed at a cost of about 25% of conventional metro system.

Low capital cost of MetroNeo is attributed to much lighter civil structure due to lesser axle load (10 ton), absence of track and CBTC signaling, open and simple station structure, requirement of low power rated electrical equipments, etc. Like MetroLite, this system can also be developed either At-Grade or elevated with low curve radius thus avoiding the need for underground construction."

3.19 32 Km long Nashik Metro Neo Project having two corridors has got PIB approval in March, 2021 and is expected to be completed in four years.

3.20 A comparison chart of Metro with MetroLite and MetroNeo with the conventional metro train is as under:

	Metro Train	MetroLite	Metro Neo

Peak Hour Peak Direction Traffic (PHPDT)	Upto 72000	15000	8000
Alignment	Underground/At-grade/elevated	At-Grade/ elevated	At-Grade/ elevated
Cost of construction per Km	Elevated- 37.04 to 220 cr Under ground-100 to1126 cr At Grade- 84 to 122 cr	40 % of metro train	25 % of metro train

Difference between Metro Lite and Metro Neo

3.21 At the Sitting of the Committee held on 09.07.2021, the representatives from MoHUA explained the difference between Metro Neo and MetroLite as under:

> "..Metro Neo has a tyred-based system. This is just like a trolleybus. It is having a lesser axle load. It carries lesser passenger as compared to Metro Lite. It can carry up to 15,000 peak hour peak direction traffic, but Metro Neo can carry 8,000 peak hour peak direction traffic. It is articulated, it can be 12 metre long trolleybus kind of thing and it can be increased to 18 metres and up to 24 metres. Metro Neo's first project is coming up in Nasik. It has a network of 32 km costing around Rs. 2,92 crore. It has 30 stations. Now, the proposal is sent for Cabinet approval."
>
> …Sir, Metrolite is similar to Tram, and the trolley buses that are running in Europe are similar to Metro….सर, मेट्रोलाइटमेंआर्टिक्युलेटिडबोगीहोगी।दोकोचोंकेबीचमेंएककॉमनबोगीहोगी।उसमेंवीलबेसकॉमनहोताहै। Metro Neo is more like an articulated bus."

<u>Water Metro</u>

3.22 Informing about unique Water Metro coming up in Kochi, the Ministry submitted as under:

> "A unique urban mass transit system with same experience and ease of travel in terms of comfort, convenience, safety, punctuality, reliability, & environment friendliness as that of conventional metro system. Country's first Water Metro is under development in Kochi. This system will have 78 km of waterway network with multi modal seamless connectivity with the metro system and other transport modes. The transit system apart from being eco-friendly energy efficient will also help reduce road congestions"

3.23 Kochi Water Metro is a unique project to connect island villages around Kochi through battery operated boats. It is also expected to boost ridership of Kochi metro.When asked whether Kochi Metro Rail Ltd. had obtained concurrence of Central Govt. for implementation of

a different type of project i.e. Kochi water metro and whether it necessitated any change in MoU, the Ministry submitted as under:

> "Kochi Metro Project is executed by KMRL as a state sector project. KMRL is only an executing agency. Since there is no change in the shareholding pattern of KMRL, no change in MoU was necessitated."

Need for coverage of Kochi Water Metro under FAME II

3.24 Responding to a query whether it is possible to include battery operated boats being made by Cochin Shipyard for Kochi Water Metro Project under Faster Adoption and Manufacturing of Hybrid and Electric vehicle (FAME) II subsidy scheme i.e. National Mission on Electric Mobility, the Ministry in a written reply submitted as under:

> "Kochi Water Metro being an Urban Electric Transport System, which perfectly align with the objectives of FAME scheme, and inland watercrafts are classified under vehicles for various requirement such as insurance, inclusion in FAME scheme which will expedite the adaption of electric mobility in the sector. FAME II subsidy can be extended to Water Metro boats as well as the charger infrastructure and it can be integrated for the use of electric vehicles as part of FAME II policy"

3.25 When asked about any suggestion of Kochi water metro that authority liked to place beforethe Committee for their consideration, it was submitted as below:

> "Inclusion of Water Crafts in the FAME scheme. Adaption of electric water transport as part of an integrated transportation system in cities with waterways connectivity."

3.26 Replying to a query regarding inclusion of the proposed electric-hybrid-propulsion type of boats to be used the Kochi Water Metro, under the FAME scheme of the Central Government which is limited to land based vehicles, a representative of MoHUA appearing before the Committee Ministry responded as below:

> "Sir, Fame Scheme is dealt by the Department of Heavy Industries. This Ministry is different."

3.27 In response to a further query whether Kochi Water Metro has applied to the Ministry concerned for subsidy under FAME scheme and if applied whether it was approved, the Ministry stated as under:

"Kochi Metro Rail Ltd. (KMRL) has informed that they had submitted the application for inclusion of Kochi Water Metro Transport in FAME-II Scheme to Department of Heavy Industries and Ministry of Heavy Industries & Public Enterprises. The same is not yet approved."

Need for setting up of Water Metro Networks in Cities with Waterways Connectivity

3.28 In response to a a query MOHUA had taken up to promote water metro in cities having waterway connectivity on the lines of Kochi Water Metro, the Ministry in a written reply stated as under:

"Urban transport, which is an integral part of urban development, is a state subject. Hence, respective state governments are responsible for initiating, developing and funding urban transport infrastructure like metro rail, water metro, etc. Kochi water metro is a state sector project which is implemented by the State Government of Kerala."

IV. PHYSICAL FEATURES

4.1 Metro Rail started in the early 1970s and the first Metro Rail stretch was commissioned in the Kolkata city in 1984 between Esplanade and Bhowanipur, covering a distance of 3.40 km with five stations under Metro Railway, Kolkata. At Present, 27 cities have either Operational or Under Construction Network.

At present, about 742 km of metro rail lines are operational in 19 cities and about 1037 km, including 82 km Delhi-Meerut Regional Rapid Transit System (RRTS) Corridor is under construction in 27 cities New Metro/RRTS projects approved by GoI since June, 2014.

4.2 The information regarding number of stations (elevated, underground, at grade), route length, capacity in terms of Passenger per hour per direction (PPHPD) & Peak Hour Peak Direction Traffic (PHPDT), Cost per Km, Project Type and DPR prepared by, is mentioned at Table about data on physical features of Metro rail projects at **Annexure (V)**.

4.3 The list of various Metros along with their status whether operational or under construction is given as under:

S.No.	Name of Metro	Operational	Under construction
1.	Delhi Metro	Phase I to III	Phase IV
2.	Mumbai Metro	Phase I	Phase II to IX
3.	Nagpur Metro	Parts of Corridor 1	Corridor 2
4.	Pune Metro	None	Phase I
5.	Bangalore metro	Phase I	Phase II, II A, II B
6.	Hyderabad metro	69 kms operational	
7.	Chennai metro	Phase I & I Extn.	Phase II
8.	Ahmedabad metro	none	Phase I & II
9.	Surat metro	none	Corridor I & II
10.	Bhopal metro	none	Purple and Red Line
11.	Indore metro	none	Yellow lLine
12.	Patna metro	none	Corridor 1
13.	Kochi metro	Phase I	Ph. 1 A, 1 B, water metro
14.	Lucknow metro	Ph. 1A	
15.	Kanpur metro	none	Corridor 1 & 2
16.	Agra metro	none	Corridor 1 & 2
17.	Jaipur metro	Phase 1A & 1B	Phase 2A & 2B
18.	Kolkata metro	Line 1 &2	Line 3 -6

7. DESIGN OF DEPOTS

4.4 The management of L&T Metro, Hyderabad, stated that depots are designed in such a way that it involves minimal movement and optimization of land use –up to 30% for commercial exploitation. In this context, when asked to state whether it was feasible and practicable to follow such design of depots by all other metros which are under construction, the MoHUA in a written reply stated as under:

> "Depot designs are unique depending upon availability of land and site suitability. However, it is feasible and practicable to design depots in such a way to optimize the land use and commercial exploitation so that their development potential may be captured. Based on the quantum of land available, design and layout of depot facilities and the scope of commercial development, different approaches are taken. There are several examples in Delhi MRTS network where provisions have been made for property development within depots for example Khyber Pass depot, Mundka depot, Vinod Nagar depot, Dwarka depot and Mukundpur depot. At some places multi storey structures have been planned above stabling line, while at other locations independent parcels of land have been carved out for future property development.
>
> Optimization has been done in design of Mandale depot at Mumbai. The optimization of Mandale depot has been carried out by combining of structures. The land of 6081 sqm area is made available for future development for commercial utilization. The Nagpur Metro Phase I depot size has been optimized by more than 40%. The balance land now available with Maha-Metro will be utilized for commercial exploitation in future.
>
> Optimization of land for Commercial exploitation has also been provisioned in depots at various other metro rail projects like Pune metro, Kolkata Metro, Patna metro, UP metro, Bhopal Metro, Indore Metro, Chennai Metro, etc.
>
> Chennai Metro Rail Ltd. (CMRL) in this regard has informed that in Chennai Metro Phase-1-Extension, CMRL depot at WIMCO Nagar is designed as elevated depot with optimized land area for Depots. The area below and above this depot is allotted and designed for commercial development. Further, in phase-2, the land requirements at both Poonamallee and Madhavaram depots are optimized by linear stacking of Rolling Stocks in Stabling yard. The area saved by optimization of Depot layout is proposed for commercial development."

8. DESIGN OF STATIONS

4.5 Open and energy efficient stations having natural ventilation and no requirement of AC resulting in lower operating costs is followed by L&T Hyderabad metro. In this context, when asked to state whether any instruction / direction / mandate were given to the metro projects under implementation for following the same, the Ministry replied as under:

> "The provisions for ventilation and Air Conditioning Systems have been made part of the Appraisal Guidelines of MoHUA, project proposals and Detailed Project Reports

(DPRs). Metro rails companies are adopting for open and energy efficient stations having natural ventilation as per technical feasibility."

9. IoT BASED ASSET MANAGEMENT

4.6 The management of L&T Metro, Hyderabad submitted that IoT based asset management system has reduced the operational expenditure. In written reply to a query whether the other operational metros have adopted the same, the MoHUA stated as under:

Metro Rail Company	**Remarks**
DMRC	IoT based Asset Management System is part of Super SCADA System which is being jointly developed by DMRC and BEL for Automatic Fare Collection (AFC), Lift & Escalator and Wheel wear and Axle box monitoring systems on pilot basis. It will be operational in stages starting from 1st week of April, 2022.
CMRL	Started using IoT based asset management system for Rolling stock to plan trouble shooting/maintenance. The reduction in operational expenditure is yet to be ascertained.
BMRCL	A. BMRCL has implanted Asset Management System (AMS) based on IBM 'MAXIMO' for Rolling Stock application for ease of maintainability, serviceability and high reliability. Date of implementation is 01.11.2015. B. Since, BMRCL is in the process of full-scale implementation of the above system, as such the extent of savings is yet to be ascertained at this stage.
Kolkata	Not adopted.
Nagpur	Not adopted. Digital asset management system is maintained.
Kochi	IT based asset management has been exclusively in KMRL. "Maximo" based asset management system has been implemented.
Lucknow	To be adopted
MMOPL	Not adopted
JMRC	Not adopted
GMRCL	Not adopted

V. OPERATIONAL PERFORMANCE

10. Average Daily Ridership:

5.1 The information regarding Average Daily Ridership required for Breakeven and Actual Average Daily Ridership (AADR) of different metros, is available at **Annexure II** and the same is also explained below:

(i) Delhi Metro: Actual Average Daily Ridership (AADR) of Delhi Metro was 26.14, 28.00, 25.86, 25.93 and 50.65 lakhs in 2015-16, 2016-17, 2017-18, 2018-19 and 2019-20, respectively, against Average Daily Ridership required for Breakeven of 16.07, 18.59, 16.26, 17.03 and 38.24 lakhs, respectively, in the same years. Thus, the Actual Average Daily Passengers, Delhi metro, has been much more than the passenger traffic required for achieving Breakeven.

(ii) Bengaluru Metro: Actual Average Daily Ridership (AADR) of Bengaluru metro was 1.48, 3.40, 4.52, 4.89 and 0.96 lakhs only in 2016-17, 2017-18, 2018-19, 2019-20 and 2020-21, respectively, against Average Daily Ridership required for Breakeven of 7.65, 10.09, 12.32, 13.19 and 18.54 lakhs, respectively, in the same years. Thus, Bengaluru metro has been constantly witnessing very low ridership than required for Breakeven.

(iii) Hyderabad Metro: Actual Average Daily Ridership (AADR) of Hyderabad metro was 0.67, 1.26, 2.76, and 0.65 lakhs in 2017-18, 2018-19, 2019-20 and 2020-21, respectively, against Average Daily Ridership required for Breakeven of 19.00 lakhs for all these years.

(iv) Lucknow Metro: Actual Average Daily Ridership (AADR) of Lucknow metro was 0.537, and 0.258 lakhs only in 2019-20 and 2020-21, respectively, against Average Daily Ridership required for Breakeven of 0.943 lakhs for all these years. Thus Lucknow metro also does not have sufficient ridership for breakeven.

(v) Chennai Metro: Actual Average Daily Ridership (AADR) of Chennai metro was 10,923, 23,301, 50,312, 92,000 and 45,393 in 2016-17, 2017-18, 2018-19, 2019-20 and 2020-21, respectively against Average Daily Ridership required for Breakeven is 92209, 108694, 204903, 253989 and 433644 for all these years.

(vi) Kolkata Metro had Actual Average Daily Ridership of 5.40 to 5.84 lakhs only in Pre Covid times against 15 lakhs required for Breakeven. Thus, actual ridership is merely one-third (approx) of the ridership required for breakeven.

(vii) Kochi Metro: Actual Average Daily Ridership (AADR) of Kochi metro was 0.35, 0.35, 0.51 and 0.19 lakhs in 2017-18, 2018-19, 2019-20 and 2020-21, respectively, against Average Daily Ridership required for Breakeven of 0.59, 0.40, 0.64, and 1 lakh, respectively, in the same years.

(viii) Ahmedabad Metro: For operational network of 6.15 km (so far) the Actual Average Daily Ridership (AADR) is 415. It has not provided year-wise data.

(ix) Jaipur metro: Actual Average Daily Ridership Jaipur metro was 27214, 19789, 16891, 19671, 19292 and 9375 in 2015-16, 2016-17, 2017-18, 2018-19, 2019-20 and 2020-21, respectively, against Average Daily Ridership required for Breakeven of 90049, 90032, 76906, 95336, 84008 and 103287, respectively, in the same years. Thus, Jaipur metro has not been getting even one-third ridership required for breakeven in all these years.

(x) Mumbai Line-1 had Actual Average Daily Ridership of 2.86 lakh to 3.67 lakh in last five years against the Average Daily Ridership required for Breakeven of 1.75 lakh, barring the covid year. Thus, it has been getting more no. of ridership than required for breakeven.

11. Passenger Per Hour Per Direction (PPHPD)

5.2 The data for Passenger Per Hour Per Direction for 6 car train is provided at **Table V** in Annexure. It can be seen from table that PPHPD for different phases of Delhi metro ranges from 6600 to 58600, 67000 for Patna Metro, 17863 to 27593 for different phases of Bengaluru metro, 38187 to 53943 for different phases of Kochi Metro, 40000 for Bhopal Metro, 27480 for Pune metro, 17592 to 72144 for different phases of Mumbai metro, 15312 for Chennai metro, 35000 & 50000 in three lines of Hyderabad metro, 44408 in Lucknow metro, 20800 & 27900 in two phases of Kanpur metro, 19400 & 23300 in two phases of Agra metro, 7420 to 34200 in different phases of Kolkata metro, 1326 to 19251 in different phases of Ahmedabad metro, 12573 to 20856 in two corridors of Surat metro, 13060 to 25526 in Ring Line of Indore Metro, 5695 To 15743 across several corridors in two phases of Nagpur metro, 2800 to 10800 across two corridors off Nashik metro and 11264 to 27750 for Jaipur metro.

12. Peak Hour Peak Direction Traffic (PHPDT)

5.3 The information regarding Peak Hour Peak Direction Traffic (PHPDT) is annexed at **Table V** on PHPDT of Annexure. Patna metro has proposed PHPDT of 14516, while

Ahmedabad metro has PHPDT of 1326 to 19251 for different phases, Surat metro's PHPDT ranges from 12573 to 20856, for Kochi metro its between 13681 to 23621, 40000 in Bhopal metro, Nagpur metro has PHPDT ranging from 5213 to 16889, for Nashik metro the figure ranges from 2800 to 10800 for different phases across years, for Mumbai it is 72000, for Kolkata metro it ranges from 15000 to 42750 for different lines, for Indore metro Ring line it ranges from 13060 to 25526 for different years and for Pune metro PHPDT ranges from 8519 to 20035 across two corridors. However, PHPDT data for Delhi, Bengaluru, Hyderabad, Agra, Kanpur and Lucknow metros have not been provided.

13. Data and Details on Accidents

5.4 When asked whether there are any accidents in various cities where metro rail is operational involving loss of lives and if it was so, to please furnish the details incorporating inter alia the no such accidents, their nature, reasons, lives lost, the corrective action taken, etc., during the last 10 years (year wise and metro rail wise), the Ministry submitted as under:

> "Delhi Metro, Nagpur Metro, Noida Metro, Jaipur Metro, Lucknow Metro, Kanpur Metro, Bangalore Metro, Kochi Metro, Chennai Metro and Gujarat Metro have informed that there are no accidents where loss of lives is involved."
>
> Kolkata metro has informed about one case each of derailment in 2017-18, Fire in 2018-19, SPAD in 2019-20 and two cases of unusual incident in 2018-19 and 2019-20. While Mumbai metro has informed about a few cases of people falling unconscious and one attempted suicide case over last few years."

14. Status of Last Mile Connectivity

5.5 The Metro Rail Policy, 2017 stipulates that "Every proposal for Metro Rail should necessarily include proposals for feeder systems that help to enlarge the catchment area of each metro station at least to 5 kms. Last mile connectivity through pedestrian pathways, Non-Motorized Transport (NMT) infrastructure, and induction of facilities for para transit modes will be essential requirements for availing any central assistance for the proposed metro rail projects. State governments will be required to commit provisioning of feeder systems for the metro rail proposed for availing central financing assistance."

5.6 The information regarding status of First and Last Mile Connectivity in different Metro Projects as provided by the Ministry is at **Annexure VI**. The data regarding Pedestrian

Walkways, Non-motorized transport infrastructure, facilities for para transit modes, public bike sharing at station, infrastructure for feeder buses and parking space for personal vehicles are available in the table at Annexure and the same is discussed below:

(i) Infrastructure for Feeder Buses: Feeder bus systems running on CNG & electricity not only increase catchment area for metro but also reduce traffic congestion and environmental pollution by reducing no. of personal vehicles on road. However, Lucknow metro does not have feeder bus system. Other metros either already have infrastructure for feeder buses or have planned to operationalise it.

(ii) Non-Motorised Transport Infrastructure: It involves movement to and from station by non-motorized transport means such as walking, bicycle, e-rickshaws, etc. Cycling is in vogue world over, as it has overall environmental and health benefits. Patna and Ahmedabad metrosdo not have facility of Non-motorised transport infrastructure. All other metros either already have or have planned for non-motorised transport infrastructure.

(iii) Facilities for Para Transit Modes: It includes facilities for access by car pools, chartered & shuttle buses, shared taxis, etc. *viz.* bus stops, kerb cuts, drop off points, ramped access, signage, lighting, etc. Patna metro has not proposed facilities for para transit modes. All other metros either already have or have planned for these facilities.

(iv) Stations for Public Bike Sharing: Kochi, Patna, Ahmedabad and Kolkata metros do not have/ planned public bike sharing facilities such as e-cycle, e-bike, etc. Pune and Surat metros have not provided a clear reply on it. All other metros either already have or have planned for Public Bike sharing.

(v) Parking space for personal vehicles: Availability of Parking space at metro stations not only reduces vehicles on road but also increase ridership of the metros by preventing people from commuting to their office in personal vehicles. Nagpur and Jaipur phase 1A metros have parking space at all stations. While Patna metro has not made provision for parking space at any station (barring one station in corridor II). Other metros have either provided or have planned parking space at some stations but not all the stations.

5.7 Regarding Last Mile Connectivity Patna Metro has informed that Multi Modal Integration (MMI) and drop off facility is planned in Patna Metro Rail Project**,** Surat metro has informed that Gujarat Metro rail Corporation Ltd. has informed that Consultant has been appointed for

the comprehensive feasibility study and multi modal integration proposals for all 38 stations of Surat Metro Rail Project while Chennai metro has informed that it has Bi-cycle, smart Bikes, E bikes, howdy buses, Feeder buses and Para transit modes.

15. FORMATION OF FARE FIXATION COMMITTEE

5.8 When asked about Fare Mechanism in Metro Rail Corporations, the Ministry in a written reply submitted as under:

> "Fare Mechanism in Metro Companies covered by the Central Metro Acts: The fare fixation of Delhi Metro is governed by Sections 33-37 of Metro Railways (Operation & Maintenance) Act, 2002 which stipulate that, but for the initial fare, the fares have to be fixed by the Fare Fixation Committee (FFC) to be appointed by Government of India (GoI) and comprising a Judge as chair and one member each to be nominated by the State and Central Government. The recommendations made by the FFC are binding. Sections 33 to 37 of the Act are reproduced below:
>
> 33. Fixation of fare for carriage of passengers.-The metro railway administration shall, from time to time, on the recommendations made to it by the Fare Fixation Committee constituted under sub-section (I) of section 34, fix, for the carriage of passengers, fare for travelling from one station to another of the metro railway. Provided that the metro railway administration may fix the fare under this section without recommendations of the Fare Fixation Committee on the initial opening of the metro railway.
>
> 34. Constitution of Fare Fixation Committee.-(1) The Central Government may, from time to time, constitute a Fare Fixation Committee for the purpose of recommending fare for the carriage of passengers by the metro railway.
>
> (2) The Fare Fixation Committee shall consist of a Chairperson and two other members.
>
> (3) A person shall not be qualified for appointment as the Chairperson unless he is or has been a Judge of a High Court.
>
> 1 [(4) The Central Government and the State Government shall nominate one member each to the Fare Fixation Committee: Provided that a person who is or has been an Additional Secretary to the Government of India or holds or has held an equivalent post in the Central Government or the State Government shall be qualified to be nominated as a member.]
>
> (5) A sitting Judge of a High Court shall be appointed after consultation with the Chief Justice of that High Court.
>
> 35. Other terms and conditions and procedure to be followed.-(]) The other terms and conditions of the Fare Fixation Committee, and the procedure to be followed by that committee shall be such as may be prescribed. (2) The metro railway administration shall provide to the Fare Fixation Committee all reasonable facility for the discharge of its duties under this Act.

36. Period for making recommendations.-The Fare Fixation Committee shall submit its report along with recommendations to the metro railway administration within such period, not exceeding three months, as may be specified by order made by the Central Government.

37. Recommendations to be binding on metro railway administration.-The recommendations made by the Fare Fixation Committee shall be binding on the metro railway administration."

5.9 In written reply to a query whether FFCs have been constituted in all the operational metro rail projects by following due process and whether all the positions in FFCs have been filled up, the MoHUA submitted as as under:

"Section 33 of the Metro Railway (Operations and Maintenance) Act, 2002 states that "the Metro Railway Administration may fix the fare under this section without recommendations of the Fare Fixation Committee on the initial opening of the metro railway." The Central Government takes necessary action for constitution of Fare Fixation Committee (FFC) after receipt of request from concerned State Govt/Metro Rail Companies.

Metro Rail Company	**Current status regarding FFCs**
Delhi Metro	Constitution of: 1st FFC - December 2003 2nd FFC - October 2005 3rd FFC - June 2009 4th FFC - May 2016
Nagpur Metro	Initial fare is applicable
Jaipur Metro	Initial fare is applicable
Lucknow Metro	Initial fare is applicable
Bangalore Metro	MoHUA was requested to constitute an FFC for Bangalore Metro. Subsequently, on reference from GOI, the Government of Karnataka (GoK) has sought a few clarifications on the formation of FFC and nomination of GoK member. Bangalore Metro has submitted clarification to GOK and further it is being processed.
Chennai Metro	Initial fare is applicable
Ahmedabad Metro Ph-1	Initial fare is applicable
Hyderabad Metro	Initial fare is applicable. Process for appointing an FFC for future revision of the fares has been initiated.
Kochi Metro	Initial fare is applicable

Mumbai Metro Line 1	Constitution of: 1st FFC – April, 2015 2nd FFC – November, 2018

16. FARE INTEGRATION – PAYMENT THROUGH SINGLE CARD ACROSS METROS: NATIONAL COMMON MOBILITY CARD (NCMC)

5.10 Hassel free and seamless movement of people across different modes of public transportation through single card across cities can do wonders in attracting people towards mass transportation systems.

5.11 About National Common Mobility Card the MoHUA in a written reply submitted as under:

> "Hon'ble Prime Minister, on 4th March 2019, launched the indigenously developed and internationally accredited National Common Mobility Card (NCMC) and Automatatic Fare Collection (AFC) Gate -SWAGAT. NCMC was developed to enable seamless travel by metro rail and other transport systems across the country. It is an Open Loop Card, which means a customer may use the same card for travel across the country through different modes and also use it for retail purchases. Department of Financial Services (DFS) has directed banks to issue all new Debit Cards compliant to NCMC standards. This is expected to allow fast deployment of digital payments due to standardized implementation process and will enable rapid digital penetration. Implementation of NCMC on Delhi Metro Airport Express Line was inaugurated by Hon'ble Prime Minister on 28.12.2020 through Video Link."

5.12 Responding to queries (i)about the features of the NCMC; and (ii) whether NCMC can be used in all the operational metros, MoHUA submitted as under:

> "
>
> ….Features of NCMC are as under:

- The complete NCMC eco-system consisting of Automatic Fare Collection (AFC) system software, Validation Terminal, Metro Gate, Common Mobility Card and interfacing with banking system was developed indigenously.
- The system has been designed under the aegis of MoHUA by C-DAC in collaboration with Bharat Electronics Ltd (BEL) and NPCI and tested for international standards by EMVco accreditation agency in France.
- Interface specifications for NCMC ecosystem and QR specifications have been released in May 2020 and April 2021 respectively for all state governments, UT administrations and public transport operators for adoption.

- All Rupay debit cards issued by banks are NCMC compliant.
- It can be used for transit throughout the country if transit operators have NCMC compliant system.
- NCMC can be used in all metros if Automatic Fare Collection system (AFC) of that metro is NCMC compliant.
- It is E-Wallet based card.
- Same card can be used at ATMs, Merchant shops and for online payments."

About acceptance of the Card the Ministry further informed as under:

"Yes, NCMC cards can be accepted in all operational metros by providing NCMC compliant hardware. Instructions have been issued to Metro Corporations to take steps for transition to full interoperability on existing metro lines and to ensure full interoperability of NCMC in metro lines that are yet to be made operational from the day of commencement of operations itself.

Discussions with STQC/CDAC/NPCI for concretizing the certification process are being held.

Till October, 2021, 25 banks along with 26 credit card/PPIs issuing agencies are live, with issuance volume of 49.26 million cards in Debit Card segment with year wise break-up as:

Financial Year	**Issuance of NCMC compliant cards (in millions)**
2020-2021	24.70 million
2021-2022(upto October,2021)	24.56 million.

Information in respect of various metro rail projects regarding NCMC is as under:

Delhi Metro	NCMC service for Delhi Metro's Airport Express Line (New Delhi to Dwarka Sector 21) was launched by the Prime Minister on December 28, 2020.
Mumbai	MMRDA has appointed M/s SBI as Banking partner for integrated ticketing system for ML 2A & 7. Also, M/s Amnex has been appointed as ITS Mobile App technology partner for ML 2A & 7.
Nagpur Metro	Maha Metro has launched an NCMC based common mobility smart card viz."Maha Card" in Nagpur Metro on 31.08.2019. Common mobility card will provide seamless, integrated payment facility for travel to commuters of Nagpur as well as provide an alternate option for payment needs. At present PPP model is implemented in Nagpur Metro Rail. The system installed at Nagpur Metro Rail stations is NCMC compliant. As per MoHUA guidelines, Maha Metro is working with SBI Consortium (AFC Contractor) to make it interoperable. Till date 16,858 Maha Cards are sold.
Pune Metro	Maha Metro is implementing NCMC card in Pune Metro

<table>
<tr><td>Kolkata</td><td>Action plan has been initiated for introduction of Common Mobility Card in East-West corridor of Metro Railway, Kolkata.</td></tr>
<tr><td>Jaipur</td><td>under process for tie up with interested vendor.</td></tr>
<tr><td>Lucknow Metro</td><td>presently, closed loop AFC System is being used in Lucknow Metro. Therefore, no NCMC cards are being used as of now.</td></tr>
<tr><td>Kanpur Metro</td><td>Recently, in Kanpur Metro AFC system is operational with QR codes since 29.12.2021 and open loop NCMC card will be provisioned at a later stage.</td></tr>
<tr><td>Bangalore Metro</td><td>work related to implementation of NCMC including phase-1 stations is completed and launching is in pipeline.</td></tr>
<tr><td>Chennai Metro</td><td>NCMC is likely to be commissioned in Chennai Metro by end of February 2022.</td></tr>
<tr><td>Gujarat Metro</td><td>Targeted to be implemented by Dec 2022.</td></tr>
<tr><td>Kochi Metro</td><td>Details of NCMC cards issued (Year wise)
<table>
<tr><th>YEAR</th><th>Total EMV Issuance</th></tr>
<tr><td>2017</td><td>8890</td></tr>
<tr><td>2018</td><td>15001</td></tr>
<tr><td>2019</td><td>49684</td></tr>
<tr><td>2020</td><td>16813</td></tr>
<tr><td>2021</td><td>24061</td></tr>
<tr><td>2022</td><td>1430</td></tr>
<tr><td>TOTAL</td><td>115879</td></tr>
</table></td></tr>
</table>

5.13 When asked whether all the metro rail networks have put in place the tech infrastructure for enabling purchase of tickets through Mobiles and QR code, the Ministry stated as under:

Metro Rail Company	**Whether enabled purchase of tickets through Mobile and QR code**
DMRC	Mobile /QR ticketing is implemented on Airport Line of DMRC. Work is awarded for Implementation of Mobile ticketing and QR ticketing on other lines of DMRC.
Nagpur Metro	Nagpur Metro mobile app was launched on 31.08.2019. Following payment modes are available in the app: a) Cash b) Credit/ Debit card c) BHIM UPI d) Internet Banking.

Pune Metro	Purchase of QR code tickets is implemented using the following means of payment: - a) Cash b) Credit/ Debit Card c) BHIM UPI
CMRL	Purchase of QR tickets & Trip tickets is done through CMRL mobile application.
BMRCL	Action is on hand to implement Mobile based QR ticketing. Static QR Code ticketing has been implemented. It enables the passengers to buy the tokens/ Metro travel Cards and also to recharge the Travel Cards.
Kolkata	QR code based mobile ticketing system has been introduced in East – West corridor and work is in progress for introducing in North-South corridor.
Kochi	QR code ticketing is available in Kochi Metro. Further, QR code ticket can also be purchased from mobile.
UPMRCL	QR code has been implemented in Kanpur Metro and is being explored in Lucknow Metro also.
MMOPL	Mumbai Metro Line 1 has launched QR based ticketing through mobile.
JMRC	Adopted digital transaction related payment methodology for paying/purchase of tickets through- 1.POS terminal payment. 2.QR Code based payment.
GMRCL	Mobile app is under development and comprises the facility of Card Top-Up. QR issuance is not part of scope of work for Phase1 implementation in Ahmedabad but will be implemented in Surat.
HMRL	Established the necessary infrastructure for enabling purchase of tickets through Mobiles & QR code. 'T-Savari' App for journey planning is also added for passenger convenience.
MMRDA	Planned Mobile App for all lines of Mumbai. Provision for interface of Line 3 AFC system with Common Mobile App of MMRDA is planned.
MPMRCL	Bhopal Metro Rail Project and Indore Metro Rail Project are being planned for National Common Mobility Card (NCMC).
NCRTC	Automatic Fare Collection system is proposed to be adopted to facilitate integrated ticketing and seamless travel across all modes of public transport and different operators (both Government and Private) in the National Capital Region (NCR). In line with NCMC, the proposed AFC system shall support open loop ticketing and QR code based printed tickets / Contactless smart Card type will be provided.

31. **Integration of Metro CCTV with Command & Control Centre of Metro and City Police Wings:**

5.14 When asked whether all the operating metro projects have integrated metro CCTV with Command and control centre of Metro and city police wings and details of such metro rail projects and the plans to ensure that such integration takes place in all the metro projects, the Ministry submitted as under:

"Information in respect of various metro rail projects w.r.t. CCTV integration is as under:

Metro Rail	**Command & Control Centre**	**City Police Wings**	**Remarks**
Maha Metro (Nagpur Metro & Pune Metro)	Integrated	Not integrated	
Kolkata East West Metro	Integrated	Not integrated	Integration with City police HQ is ready and being done by City police
Kolkata North South Corridor	Integrated	Integrated	
Jaipur Metro	-	-	Command and control center of CCTV is operational and manned by Rajasthan Police, (Govt. of Rajasthan). It is not integrated with city Police CCTV Command and Control Centre.
Lucknow Metro	Integrated	Integrated	
Kanpur Metro	Integrated	Integrated	
Bangalore Metro	Integrated	Not integrated	Presently no such proposal on hand to integrate the system with the Police wing.
Chennai Metro	Integrated	Not integrated	There is a proposal to connect with State intelligence.
Delhi Metro	-	Not integrated	DMRC has informed that so far no proposal for integration has been received by DMRC from City Police. In future, if any such proposal is received, it will be examined in order to enhance the overall security of metro system.
Gujarat Metro	-	-	Gujarat Metro has informed that for the purpose of CCTV monitoring of entire metro reach, it is being supervised 24x7 by State Reserve Police Force (SRPF) from the Metro Control Centre itself.
Hyderabad Metro	Integrated	Integrated	

Kochi Metro	Integrated	Not Integrated	
Mumbai Metro Line 1	-	Not Integrated	CCTV integration with command and control center of Police and MMOPL is not implemented. However, on request of Police authorities, access to CCTV system is provided for investigation and monitoring purposes.

17. Benchmarking:

5.15 In response to queries (i) whether Keolis, leading Public Transport solutions provider operating in 16 countries or any other agency has rated any Indian metro rail projects in operation apart from L&T Hyderabad Metro; (ii) if it was so to furnish the details; and (iii) if not, whether the authorities felt that it was desirable to have some benchmarking / ranking of Metro projects to improve passenger services, the Ministry stated as below:

> "No, Keolis has not rated any Indian Metro rail Project except Hyderabad Metro.
>
> The Indian Metro Rail Organizations' Society "I-Metro" aims to provide common platform to all Metro Rail Companies, Regional Rapid Transit System (RRTS), Mono rail organization, etc. of India for sharing of knowledge, best practices, innovations etc. Currently there are 15 metros in the I-Metro society.
>
> One of the key objectives of I-Metro Society is to prepare benchmarking reports (KPI) of members so that constructive comparison can be done and learning from these reports can help them grow.
>
> In addition to the above, the DMRC is associated with the 'Community of Metros' which benchmarks worldwide urban railway performance. The Community of metros is managed by the Transport Strategy Centre (TSC), at Imperial College London. Delhi Metro has been a part of community of Metros since 2006. Currently, the Community of Metros consists of 43 metros located in 40 cities around the world.
>
> The community of metros works through a framework of confidentiality to ensure open and honest information exchange among the member metros. Sharing of knowledge and identify best practices, measures performances, support operational and strategic goals and Priorities and Support Decision Making for management are some of the important objectives of community of metros."

18. Awards and Recognitions:

5.16 When asked to furnish the details of various awards and recognitions- national and international won by metro rail projects (metro rail city wise) during the last five years (year-wise), the Ministry has submitted a list of various national and international awards and

recognitions won by Nagpur, Jaipur, UPMRCL, Bengaluru, Chennai, Delhi, Kochi, Mumbai and Hyderabad metros.

VI. FINANCIAL PERFORMANCE OF VARIOUS METRO RAIL PROJECTS

20. Various Models of Financing Metro Rail Projects in India

6.1 Most of the metro rail projects have been financed by the central government in partnership with the state governments, while some have been funded by the state governments either on their own or with private partnership. The Secretary, MoHUA at the Committee Sitting held on 27.10.2017 elaborated the funding pattern under the New Metro Policy, 2017 as given:

> "Sir, under the new policy we have come out with various kinds of financial and administrative models. As was mentioned in the presentation, currently we only have 50:50 equity share model or 100 per cent Central Government or 100 per cent State Government and also public-private partnership under various kinds of modes, different kinds of ways of public-private partnership. A new thing has been added. The State Government can take up on its own and 10 per cent grant can be given by the Central Government. This is a new thing which has been added.
>
> The second things is, earlier the whole thing was coming as public-private partnership. Now this can be unbundled into different parts. Just operation and maintenance can be given; just fare collection can be given; maybe only telecom system can be given; different parts can be unbundled and that can be given for public-private partnership. So, the new policy is only creating an ecosystem of making this Metro possible in many cities. That is the objective."

6.2 The prevalent broad models of financing metro rail in India, as given in the Metro Rail Policy, 2017, are mentioned as under:

a) 50:50 Central-State Government Ownership: The existing 50:50 Joint Venture model that is predominantly the major model available for the financing and organization structure was started with Delhi MetroRail Corporation and later followed in other metros like Mumbai Line-3, Chennai,Bangalore, Nagpur, Lucknow, Kochi, Ahmedabad, Bhopal, Indore metro, etc.Govt. of India (GoI) provides support through equity, subordinate debt (SD) and pass through assistance (PTA) and the State Government also provides support through equity and subordinate debt.

The Secretary, MoHUA explained this prevalent Central and State equity sharing model to the Committee in its Sitting held on 08.09.2021 as under:

“सर, इसबारेमेंमैंबतादेताहूं।फिफ्टी-फिफ्टीकामतलबयहनहींहैकिपचासपरसेंटहमशेयरकरेंगेऔरपचासपरसेंटवेशेयरकरेंगे।फिफ्टी-फिफ्टीकामतलबईक्वलशेयरहोताहै।नॉर्मलीमेट्रोकेकंस्ट्रक्शनपर 60 परसेंटया 55 परसेंटकेआस-पासलोनआताहै।पांचपरसेंटवहांकीलोकलबॉडीजयाकिसीऔरसोर्ससेआताहै, तोवह 60 परसेंटहोजाताहै। 40 परसेंटमें 20-20 परसेंटसेंट्रलगवर्नमेंटऔरस्टेटगवर्नमेंटबियरकरतीहैं। 20 परसेंटकेभीदोपार्टहैं।एकइक्विटीपार्टमेंहोताहैऔरदूसरासब-ऑर्डिनेटडेब्टकेपार्टमेंहोताहै।नॉर्मली 15-16 परसेंटइक्विटीपार्टहोताहैऔर 3-4 परसेंटसब-ऑर्डिनेटडेब्टहोताहै।बेसिकली, सब-ऑर्डिनेटडेब्टपेमेंटऑफदटैक्सेजकेलिएहोताहै।भारतसरकारकाजोटैक्सहै, उसकाफिफ्टीपरसेंटभारतसरकारखुदबियरकरतीहै।बाकी, स्टेटगवर्नमेंटसेकरातीहै।यहसबनॉर्मलस्ट्रक्चरहै।“

b) 100% Central Government ownership: The second model is that of full funding by the central government through equity, SD and PTA. Examples of this model are the first metro in the city of Calcutta (now Kolkata) by Indian Railways, followed by East-West corridor in Kolkata being implemented on a74:26 equity sharing between Ministry of Railways and Ministry of Urban Development respectively.

c) 100% State Government ownership: The third model is that of complete funding by state government through equity, SD and loans raised by the State Government. Jaipur Metro Phase-1A is an example. MoH&UA has supported for external assistance from ADB.

d) Public Private Partnership (PPP) models:

The other model is the Public Private Partnership (PPP).

(i) Delhi Airport Express Line was taken up on PPP model with the capital cost of civil construction provided by the GoI and State Government and systems, rolling stock and O&M given to a concessionaire (Delhi Airport Metro Express Private Limited). This concession was for 30 years. However, DMRC took over this line fully with effect from 1st of July, 2013.

(ii) Mumbai Metro Line-1 project has been taken up as a joint venture between the State Government and concessionaire (Mumbai Metro One Private Limited) on Build Operate Transfer (BOT) format. Viability gap funding (VGF) of Rs 471 Cr has been provided by GoI. This concession is for 35 years.

(iii) Hyderabad Metro Rail project is being implemented on PPP model by M/s L&T

Metro Rail (Hyderabad) Limited (concessionaire) in which viability gap funding (VGF) of Rs 1458 Cr has been provided by GoI.

Private Sector Mode: Rapid Metro Rail Gurgaon has been taken up as a completely private initiative with no funding support from the State Government or Government of India. The cost of land and utility shifting is also borne by the concessionaire (Rapid Metro Rail Gurgaon). The concession is for 99 years. The project has since been taken over by DMRC.

21. Delhi Metro Rail Project

6.3 The Delhi metro Phase I and Phase II became fully operational w.e.f. 11.11.2006 and 27.08.2011 respectively. In Phase III, 157.94 km route network has been commissioned in stages w.e.f. 26.06.2014. Presently, 389.37 km of metro network having 285 stations is operational.

Funding pattern of DMRC

6.4 The Delhi Metro Rail Corporation has adopted the first model of funding as mentioned above. The pattern of funding of Delhi Metro is given in tabular format at Annexure IV. It may be seen from the table that inDelhi Metro Phase I, the GoI and State Govt. equity share is 13.4%, in Phase II, the equity share stands at 14.56%, in Phase III it is 8.65% and in Phase IV it is 10.68%. The major share of funding in Phase I comes from JICA loan (untied) through Pass through Assistance (PTA) from GOI amounting to 58.36% of the total funding. In Phase II, this funding stands at 48.39% and in Phase III, it is 41.74% funding from JICA (including IDC of Rs.617 crore) and in Phase IV (3 Priority corridor), the share of JICA funding stands at 51.83%.

6.5 It may also be seen from the table that in Delhi Metro, the share of funds generated through property development stands at 7.19%, 7.04%, 7.78% and 0.12% for Phase I, Phase II, Phase III and Phase IV respectively. Further, in case of Airport Express Line, the funding from Private Companies stands at 40.67%.

Average Daily Earnings required for breakeven

6.6 The average daily earnings required for breakeven and actual average daily earnings in respect of DMRC, as provided by MoHUA, is given under:

(Rs. in Crore)

Actual Average Daily earnings	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
	2.57	3.50	4.17	4.51	4.99	5.57	5.97	8.29	9.82	10.95*
Average daily earnings Required for Break even ^	1.39	1.71	2.35	2.71	3.35	3.86	4.39	5.72	7.00	8.58

** Due to Covid-19 pandemic, the operation of Delhi Metro was closed on account of nationwide lockdown declared by Government w.e.f. 22nd March 2020*

^ The break even covers the operating expenses (Energy, Salaries &wages and Maintenance & other cost) and excludes JICA Payment (Interest & Repayment of loan) and depreciation & amortization expenses.

It can be inferred from the table above that in the last decade there has been a constant increase in the 'actual average daily earnings' of DMRC and the actual earnings average daily earnings have constantly remained higher than the 'average daily earnings required for break even'.

6.7 As regards the fare-box and non-fare box revenue collection in respect of Delhi MRTS operational projects (Phase I, II & III), it can be perused from the table at Annexure XII that there has been a constant increase in both fare box revenue and non-fare box revenue collection over the last decade.

6.8 Also, in response to written questionnaire, MoHUA has submitted that Delhi Metro has been servicing the JICA Loan repayment as per the schedule mentioned in the loan agreement from its operational revenue. The detail is tabulated as under:

Rs./Crore

FY	Repayment of Loan	Interest payment	Total
2006-2007	13.69	153.79	167.48
2007-2008	27.38	104.02	131.40
2008-2009	27.38	98.95	126.33
2009-2010	27.38	114.97	142.35
2010-2011	33.72	225.04	258.76
2011-2012	67.69	213.48	281.17
2012-2013	129.04	231.90	360.94
2013-2014	218.28	239.05	457.33

2014-2015	291.60	249.19	540.79
2015-2016	322.63	300.33	622.96
2016-2017	348.31	332.95	681.26
2017-2018	442.66	355.18	797.84
2018-2019	622.71	440.92	1,063.63
2019-2020	764.77	429.96	1,194.73
2020-2021	808.69	433.85	1,242.54
Total	4,145.93	3,923.58	8,069.51

6.9 The Profit Before Tax (PBT) and Profit After Tax (PAT) of Delhi Metro Rail Corporations from 2010-11 to 2019-20, as given by MoHUA, are as under.

Year	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2017-18**	**2018-19**	**2019-20**
Profit/Loss Before Tax (PBT)	(-) 12.70	(-) 68.10	(-)7.94	(-)60.74	(-)275.46	(-) 470.74	(-) 348.15	(-) 144.98	(-) 764.32	(-)626.24
Profit/Loss After Tax (PAT)	(-) 413.86	(-) 185.15	(-) 90.91	(-) 99.80	(-) 104.79	(-) 296.77	(-) 229.35	(-) 94.99	(-) 464.04	(-) 468.27

6.10 It can be seen from the table above that DMRC is continuously incurring net losses despite (i) average daily earnings higher than the average daily earnings required for break even, (ii) increase in average daily ridership in all the phases operational since 2011-12 to 2019-20 as mentioned at Annexure II, (iii) continuous increase in fare Box collections since 2002-03 (Annexure XII), (iv) concessional finance received from Japanese international Cooperation Agency (JICA).On being asked the specific reasons for the same and the steps taken to make it profitable in defined time limits, MoHUA made the following submission:

"DMRC has informed that the operating profit is ascertained after deducting operating expenses from operating revenue. Profit Before Tax (PBT) on the face of Balance Sheet is not considered operating profit or loss as it includes depreciation and finance cost. From that

standpoint, till 2019-20 DMRC has been in operational profit. Last 10 years data of operating profit is given in the following table**:**

(Rs./Cr.)

Number	Year	Operating Revenue ±	Operating Expenses≠	Operating Profit/Loss	Operating Ratio (%)
1	2	3	4	5 (3-4)	6 (4/3)
1	2010-11	938.65	508.11	430.54	54.13%
2	2011-12	1,281.57	755.41	526.16	58.94%
3	2012-13	1,523.74	857.58	666.16	56.28%
4	2013-14	1,645.40	986.84	658.56	59.98%
5	2014-15	1,820.32	1,226.76	593.56	67.39%
6	2015-16	2,037.43	1,406.60	630.83	69.04%
7	2016-17	2,179.00	1,572.54	606.46	72.17%
8	2017-18	3,027.26	2,091.20	936.06	69.08%
9	2018-19	3,582.80	2,558.56	1024.24	71.41%
10	2019-20	3,897.29	3,033.50	863.79	77.84%

± Includes earning from Passengers and Property Business activities.
≠ Includes expenses on Staff, Energy and Maintenance & other expenses.

Even though, DMRC is making operating profit at operational level as shown above, at Profit After Tax (PAT) level, the Company makes loss.

The factors responsible for this are as under:

1. Metros are highly capital-intensive projects. As on 31.03.2020, the Gross Block of the Company was at Rs.77,000 Crores. For such a high value of Capital assets, provision for Depreciation & Amortisation Expenses consumes major chunk of income to arrive PAT. In the year 2019-20, a sum of Rs.2,383 Crore was provided for on this account.
2. Payment of interest on JICA loan also reduces the PAT. Though the loan comes at a concessional rate, yet in the year 2019-20 it accounted for Rs.430 Crore of outgo.
3. The principal repayment of loan, though does not directly affect P&L, yet it does dent the cash-flow of the Company. In the year 2019-20, a sum of Rs.765 Crore was paid on this account.

Steps taken to make it profitable:

Metro projects are sanctioned and operated on social consideration rather than on economic considerations. However, to make it profitable at PAT level, the only option is to increase the

fare(s) to such an extent so that it can absorb all expenses including Depreciation and finance cost and leave margin for surplus and simultaneously augmenting non-fare box revenue.

The fare increase option has its own limitations. Fares are fixed by a Fare Fixation Committee, which keeps the affordability factor in consideration apart from the financial sustainability of the Company. Moreover, abnormally high fares may prove counterproductive as it affects the ridership directly.

On non-fare box front, DMRC is actively taking various measures to augment it through co-branding of station names, advertising, trains wrapping, property business activities etc. However, non-fare box revenue depends on the prevalent market conditions and overall economic condition of the country."

About the data on Economic Internal Rate of Return (EIRR), it was further submitted:

> "DMRC has informed that EIRR is worked for horizon of 30 years. No metro line of DMRC has completed 30 years."

22. Bangalore Metro Rail Project

6.11 Bangalore Metro Rail Project Phase I, approved at the cost of Rs.13,845.01 crore is fully operational from June, 2017. The Project is implemented by Bangalore Metro Rail Corporation Limited, as a 50:50 joint venture of GoI and Government of Karnataka.

6.12 The sources of financing the Bengaluru Metro Project, as informed by MoHUA are provided below:

Equity (in absolute amounts as well as %of total cost)		Debt (in absolute amounts as well as percentage of total cost)				Grants from Central/ State Govt / others	Funds through Property Devp	Funds from private companies	Details of the debt
GoI	State Govt.	Domestic Sources		External Sources					
		Details of the source	Amount in absolute & % of total debt	Details of the source	Amount in absolute & % of total debt				

1,983.26	1,983.26	SD	₹ 1,089.94	Through PTA	₹ 4,081.41 Cr (AFD – ₹ 873.29 Cr & JICA – ₹ 3,208.12 Cr)	--	--	--	--

6.13 The table at Annexure X shows the 'average daily earnings' of Bengaluru Metro Phase I since 2016-17 vis-à-vis the 'average daily earnings required for break even'. It can be seen from the data provided by the Metro Rail Corporation that even though there has been a continuous yearly increase in the average daily earnings, barring 2020-21 which was a Covid year, the 'average daily earnings' could not even reach 50% of the 'average daily earnings required for break even'.

6.14 Consequently, it can be seen from table given at Annexure VII that Bengaluru Metro Phase I is incurring mounting losses since 2016-17. On being asked whether such losses are envisaged in the DPR, the Ministry has replied as under:

> "Such losses are not envisaged in the DPR."

6.15 Further, about the reasons for such continuous mounting losses and steps taken to address them, the Ministry has made the following written submission:

> "BMRCL has informed that continuous losses have been incurred because of Covid-19 Pandemic. The measures taken to increase the ridership are as under:
>
> 1. Measures have been taken to improve the Last mile connectivity by providing feeder buses
> 2. parking area for the convenience of commuters.
> 3. Hassle free ticketing system
> 4. Concessions (5% discount on actual fare) on Travel, Group tickets"

6.16 On being asked whether the metro network is able to service the debt as per schedule, the following information has been received from the Ministry:

"Yes, the details are enclosed at Annexure-XV."

23. Kochi Metro Rail Project

6.17 Kochi Metro Phase I became operational w.e.f 03.10.2017 in a phased manner and by 07.09.2020 it was fully operational. The funding pattern of Kochi Metro Rail Projects is given at Annexure IV. It may be seen from the table that in Kochi Metro Phase I, the GoI and GoK. equity share is 12%. Further, internally, loans have been raised from Canara Bank, the Kerala State Cooperative Bank and HUDCO at the rate of interest 9.20% and 9.75% respectively. Besides, the Phase I project has also received Pass Through Assistance (PTA) funding from AfD, France to the tune of 50% of the total debt. It may also be seen from the table that in Kochi Metro Phase I, no funds have been generated through property development.

6.18 On being asked the reasons for opting for loans at commercial rate of interest from banks/ NBFCs/ refinancing institutions *vis-a-vis* other metro networks which availed primarily loans from foreign development and investments banks such as in the form of Pass Thorough Assistance (PTA) from KfW (Germany) AfD (France), JICA(Japan),etc., MoH&UA replied as under:

> "The Govt of India vide letter No. K-14011/37/2005-MRTS-IV dated 12.07.2012 as amended by letter dated 18.7.2012, sanctioned Kochi Metro rail project at a total cost of Rs 5181.79 crore. Out of this cost, an amount of Rs 2170 crore was proposed to be funded through external debt.
>
> DMRC was appointed as the Project execution agency in 2013 and the execution of the project commenced started in 2013 itself. Majority of the civil contracts were awarded by DMRC prior to the finalization of the funding Agency. The expenses have been funded by equity contributions and subordinate debt provided by the Union Government and the State Government; as provided for in the sanction order. However, given the pace of project implementation, there was an urgent need to tie up long-term debt funding for the project.
>
> JICA and AFD were approached for the external debt of Rs.2170 crore as Pass Through Assistance (PTA). In the meantime, AFD completed their appraisal missions in KMRL and accorded in principle sanction for financial assistance to the tune of 180 million Euro only in July 2013.

The AFD offered loan with low interest rate (6months EURIBOR+ 155 basis point) similar to JICA and for longer tenure up to 25 years including 5 years grace period. The PTA was approved from AFD and Project agreement was signed on 8.2.2014 and Credit Facility Agreement was signed on 7.2.2014 for 180 million Euros. The equivalent INR of 180 million Euros was estimated to Rs.1000 crore.

Since there was a gap in the total external funding requirement even after availing AFD loan, the Company had approached several domestic funding institutions for a long-term loan of Rs. 1170 crore with pari-passu charge on project assets and without Government guarantee. Loan proposals were sent to nearly 20 commercial banks and financial institutions. Finally, loan agreement was signed with Canara bank for Rs 1170 crore on 20.7.2014."

6.19 As regards the daily average earnings vis-à-vis daily average earnings required for break even, the data is given as under:

"Data for revenue earnings required for breakeven and the actual revenue earnings is tabulated below:

	2020-21	***2019-20***	***2018-19***	***2017-18***
Revenue earnings required for Breakeven (Rs)	***34,02,824***	***20,02,963***	***12,88,884***	***18,74,960***
Actual Revenue earnings (Rs)	***6,26,165***	***15,94,699***	***11,24,351***	***11,24,912***

6.20 The table at Annexure VIII shows the net profit/loss of Kochi Metro. It can be seen from the said table that Kochi Metro has been incurring continuous and increasing losses since 2017-18. On being asked whether such losses in the initial years are envisaged in the DPR and if so, the reasons for and the concrete initiatives taken to reduce these losses, MoH&UA has replied as under:

"KMRL has informed that the ridership projected in DPR of Kochi Metro was 3.8 lakhs in the beginning with full reach from Aluva to Petta. KMRL has started operations reach wise – Reach 1 – Aluva – Palarivattom in June 2017, Palarivattom - Maharajas in October 2017, Maharajas – Thykoodam in Sep 2019, Thykoodam – Petta in Sep 2020. The full stretch from Aluva to Petta was operational in the midst of pandemic Covid 19 and hence the ridership is not comparable with the DPR in the initial year of operations.

The number of passengers during peak hours increased steadily after the inauguration of the Maharaja's – Thykoodam stretch. The average ridership was 60,000 passengers per day on weekdays and 65,000 passengers per day on weekends in pre covid era.

The initiatives taken to reduce the losses:

1) Attract more passengers to the system by introducing flexi fare with 50% discount in non-peak hours – 6 AM to 8 AM and 8PM to 10 PM, student passes etc.
2) Improving last mile connectivity through feeder services from Airport to Aluva auto rickshaws etc.

3) Promoting non-motorized transports which will in turn help in First and last mile connectivity, by inducting 1000 bicycles sharing system
4) Extensive promotion of Kochi One Card
5) VCF Proposals are being followed up with state Govt for approval.

KMRL is further working on the below strategies to increase the ridership-

1. Ensuring First mile-last mile connectivity- E-Autos, E-bikes, E-Van

2. Feeder services to commercial enterprises like Infopark etc
3. Encouraging schools and colleges to use metro as the main mode of transport by ensuring pick up and drop to nearest metro stations

KMRL is working on the following strategies to increase non-fare box revenue –

1. Semi-naming of (co-branding) Metro stations – As of now 2 metro stations have been cobranded (Aluva Station by Federal Bank, Kaloor Station by South Indian Bank. Efforts are being made for branding additional station.
2. Property development of the Commercial Land adjacent to Kaloor, Kalamassery, CUSAT, Edapally & Aluva Metro Station through PPP model.
3. Leasing commercial and retail spaces inside stations. (Already leased 105611 sqft and leasing of 72140 sqft area is under due process).
4. Licensing of advertising rights of piers, medians and portals
5. Licensing of advertising rights inside the trains and inside and outside the metro stations
6. Sponsorship from brands for events, short term leasing for product/vehicle displays, short-term marketing activities etc".

6.21 As per the repayments of loans taken for construction of Kochi Metro project, the MoHUA in the replies stated as follows:

"Such repayments are not made from operational revenues of the metro projects. The required fund for the debt servicing is released as per the terms of GoK as per the terms and conditions of MoU between GoI, GoK and KMRL…"

6.22 To the point whether the repayment of the loan is reflected the accounts of the KMRL and whether such repayment of loan by GoK is taken into consideration for arriving at Profit and loss, MoH&UA has replied as given:

"Repayment of Loan is reflected in the Accounts of KMRL. The interest on PTA from AFD and term loan from Canara Bank is charged to P&L account. The interest during construction (IDC) was added to Project Cost as per the prevailing accounting policy."

24. Mumbai Metro Rail Project

6.23 As per the replies given by MoH&UA, only Line 1, i.e., Versova-Andheri-Ghatkopar, of Mumbai Metro is operational since 08.06.2014 and is running in loss.

6.24 On being asked whether the Mumbai Metro Rail is servicing the debts as per schedule (in r/o loan taken for Lines 1-12 except Line 3 which is under implementation, the Ministry has furnished the following answer:

> "For Line-1, MMOPL has informed that due to financial stress, MMOPL is unable to service its debt in timely manner. Currently, MMOPL's account is NPA (Non-performing Asset).
>
> For Lines 2A, 2B, 7, 4, 4A, 5, 6, 10, 11 & 12, MMRDA has furnished information regarding funding from external Agencies as **Annexure IV**."

6.25 Metro Line-1 – Versova-Andheri-Ghatkopar has been implemented on BOOT (Build Own Operate Transfer)/ PPP (Public Private Partnership) basis through Mumbai Metro One Private Limited (MMOPL).

6.26 The details of final cost of Mumbai Line-1 and VGF extended by central government to the project, as provided by the Ministry are:

> "MMOPL has informed that the project completion cost was estimated in 2012 at Rs.4,321 Crore (including additional rolling stocks). However, the actual project completion cost in 2014 was Rs.4,026 Crore (excluding additional rolling stocks).
>
> VGF extended by central govt to the project;
>
> DEA has informed that Mumbai Metro-1 has not been provided VGF under the VGF Scheme of DEA. The project has been given Additional Central Assistance (ACA) of Rs. 471 Crore by Dept. of Expenditure under 'Other Projects (Grant Component)' for the State's Annual Plan."

6.27 Responding to a query whether the MMOPL abided by all the terms and conditions of VGF by the Central Govt and if there was any non-adherence, the nature of action taken, MoH&UA replied as follows::

> "Question does not arise since the ACA provided to Govt. of Maharashtra for Mumbai Metro Line-1 is not under the VGF scheme of Govt. of India."

25. <u>Chennai Metro Project</u>

6.28 Chennai Metro Phase I with extension was inaugurated stage wise from 2015 onwards and the last stretch was inaugurated on 14th Feb 2021. At present, entire Phase I network with

extension (54 km) is fully operational. Chennai Metro Rail Limited (CMRL) is a company jointly owned by Government of India and Government of Tamil Nadu to execute the Chennai Metro Rail Project.

6.29 The funding pattern of Chennai Phase I and Phase I with extension is given in tabular form at Annexure IV. In the Phase I, GoI and GoTN equity share is 17% each and in the extension Phase, it is 13% each. The major source of funding is JICA loan which stands at 47% and 57% for Phase I and Extension Phase, respectively.

6.30 As regards, debt servicing by Chennai Metro Rail Limited (CMRL), the following was submitted by the Ministry:

> "CMRL has cash deficit and hence it is not able to service both interest and loan repayment. Until Mar'21, their principal repayment commitment for CMRL is Rs. 658.36 crores of which Rs.32.07 crores have been paid. In the cumulative interest liability of Rs.811.51 crores, an amount of Rs.252.83 crores (which was out of project funds received for Interest and Expenses During Construction (IEDC) have been paid. As per MoU, when CMRL is not in a position to service the loan, state government has to meet out the same."

6.31 To the query whether so far, CMRL has defaulted in repayment of loan either loan taken from external/internal sources, the Ministry replied as under:

> "CMRL has informed that there is no default in repayment of loan taken by CMRL from either external or internal funding agency."

6.32 As regards the daily average earnings vis-à-vis daily average earnings required for break even, the data is given as under:

Year	Average Daily Ridership for Breakeven -Nos	Average Daily Earnings for Breakeven- Rs
2016-17	92,209	30,39,012
2017-18	1,08,694	35,64,387
2018-19	2,04,903	69,11,217
2019-20	2,53,989	90,00,146
2020-21	4,33,644	1,39,44,757

6.33 It can be seen from the table below that that there has been a continuous increase both in the fare and non-fare box collection of Chennai Metro, as provided by MoH&UA:

Name of the metro	**Fare Box Revenue**		**Non Fare Box Revenue**				
	Fare/ ticket sales		**Property development & advertisement**		**Any others**		**Comments ,if any**
Chennai Metro Rail Limited.	Amount In Cr.	% of total revenue	Amount In Cr.	% of total revenue	Amount	% of total revenue	
FY 2015-16	10.70	81.6 %	2.41	18.4%			
FY 2016-17	13.81	65%	7.44	35%			
FY 2017-18	29.73	42%	41.01	58%			
FY 2018-19	66.62	77.3%	19.60	22.7%			
FY 2019-20	127.97	74.4%	37.29	22.6%			
FY 2020-21	To be approved.						

6.34 The profit of the metro project is given at Annexure VII. The data shows that CMRL has been incurring continuously increasing losses since 2015-16. On being asked whether such losses are envisaged in the initial years of commencement of the operations in DPR, the Ministry replied as under:

> "The Operating Income and Expenses envisaged in the DPR are as below. However, due to various reasons as stated in below para, the actual Fare Box and PD Revenue was much lesser than the projected revenue in the DPR and on account of which CMRL has incurred operational losses in the respective financial years as against the projected Operational Profit on a yearly basis.

Profit/Loss account - DPR Vs Actual - Rs in Crore		
Financial Year	**Net - Surplus/(Deficit) as in DPR****	**Net - Surplus/(Deficit) actual**
2016-17	162.21	(97.78)
2017_18	325.72	(102.21)
2018_19	358.46	(190.32)

2019_20	411.75	(209.26)
2020_21	436.40	(257.19)

*** Figures excluding Capital cost for Phase I and Phase I Extension"*

6.35 The Ministry has furnished the following reasons for continuous losses of Chennai metro and steps taken to become profitable:

"CMRL has started its operation from June'2015. However, the commissioning of different stretches took place in various time period and the final stage was commissioned in Feb'2019 for Phase I and Feb'2021 for Phase I Extension. The reasons for such losses viz., lower ridership, delay in project completion, shortfall in expected non farebox collections, Interest on JICA loan. CMRL continues to put its best effort to augment its revenue and reduce the costs wherever possible to close this deficit.

Efforts taken by CMRL to increase ridership

1. Introduced various options of Last mile & First mile Connective solutions.
2. Free hiring bicycle provided for last mile connectivity --- CMRL bicycle and Smart bikes
3. Free shuttle service Introduced at Vadapalani metro station to commute to nearest Mall at approx. 300 meters, at Chennai Central Hub & Airport Metro etc. to facilitate commuters.
4. Creating adequate parking space for Metro commuters and introduced payment of parking fee through metro card.
5. Introduced various fare products to attract commuters
6. Introduced special discount of 50% on all Sundays & Holidays to attract moving public on weekends from 27.10.2019 to 25.4.2021
7. Implemented more options in Cashless transactions to facilitate passengers.
   - **(i)** POS machines of more than 1 bank network
   - **(ii)** Paytm payments and SBI UPI
   - **(iii)** Web top up / online top up
   - **(iv)** Smart Parking ticketing machines which also accepts cashless / smartcard payments
8. Introduced mobile based QR ticketing from Sep.2020. and paper QR tickets implemented at Airport station from Dec.2021
9. Fare discount has been implemented on 22.02.2021
10. Store value card discount has been revised from 10% to 20% from 22.02.2021
11. Selling of Travel cards at Retail outlets
12. Selling of Metro travel cards are carried at nearest residential area
13. The promotion activities are being done by issuing of pamphlets at Nehru Park, Kilpauk, Pachiyappa's and Shenoy Nagar metro station
14. Extension of Train service had provided to facilitate the passengers travelling out of the city during continuous festival holidays.

15. Introduced Five Feeder service routes w.e.f 30.11.2021 in close co-ordination with MTC"

26. Lucknow Metro Rail Project

6.36 The Lucknow Metro Phase-1A project is implemented by Uttar Pradesh Metro Rail Corporation Ltd. (UPMRCL) which is a 50:50 joint venture of Government of India and Government of Uttar Pradesh (GoUP). The project is fully operational from 8th March, 2019.

6.37 The Ministry has also submitted that the Project was commissioned 36 days ahead of schedule and there were no cost overrun in execution of project.

6.38 In the written replies provided by MoHUA, the 'average daily ridership required for break even (in lakhs)' in respect of Lucknow Metro Phase 1A is given as 0.943 Lacs whereas, in the Sitting of the Committee held on 09.07.2021, the representatives from MoH&UA submitted that in order to achieve 'breakeven point' the ridership forecast was 1.25 lakhs; however, in order to repay the loans, the need is to achieve atleast 2 lakh ridership in the said corridor. On being asked to comment on the contradictory data provided in respect of ridership required for breakeven of Lucknow Metro and also furnish the final ridership data required for breakeven of the project, MoH&UA replied as under:

> "UPMRCL has informed that considering the actual total operational expenses, ridership forecast of 1.25 lakhs (average daily ridership) has been taken into consideration for breakeven point of Lucknow Metro. The same ridership data may be put on record for reference. However, average ridership of 2 lakh shall be required for repayment of external loan including operational expenses."

6.39 The average daily earnings of Lucknow Metro are 14.99 lakhs and 4.36 lakhs for the years 2019-20 and 2020-21 respectively. However, as per the Ministry's submission, the average daily earnings required for breakeven is 35.89 lakhs.

6.40 The revenue generated through fare and non-fare box by Lucknow metro, as submitted by the Ministry, is given at Annexure XII.

6.41 The information regarding net profit/loss is given at table placed in Annexure VII. The data shows that the Metro has been running into losses. On being asked about the status of 'debt servicing' by the Metro Corporation, the following reply has been received:

> "Finance Contract between Republic of India and European Investment Bank for Tranche A EURO 200 Million was signed on 30.03.2016 and Finance Contract for Tranche B of EURO 250 Million was also signed on 31st March, 2017 for Lucknow Metro Project . As per the Disbursement Notification dated 19/01/2017 first repayment of installment was due on 29.01.2021 and second installment was due on 30.07.2021 of Lucknow Metro Rail Project.
>
> As you are aware that, the Covid-19 is poised to become one of most severe and public health and economic crisis the world has faced in 21st century. Along with sweeping loss of human lives, the virus has left an impact on many sectors including transport. Operation of Lucknow metro has been severely affected due to Covid-19 pandemic since March 2020. Also second wave of Covid-19 was more severe and badly affected the operation of Lucknow metro. Due to the above, we are finding it difficult to meet out our financial obligations."

27. Hyderabad Metro

6.42 The Hyderabad Metro project was undertaken by the Government of Telengana under the Public Private Partnership (PPP) model of funding through Viability Gap Funding (VGF) scheme of Government of India. The project cost as approved by Lenders (a consortium of 10 Indian banks led by SBI) is Rs.14,132 cr (Rs.1,458 cr VGF and Rs. 12,674 cr by the Concessionaire L&TMRHL). However, the actual project cost is Rs.18,411 cr (Rs.1,204 cr VGF released by GoI and Rs.17,207 cr by L%TMRHL). State Government spent Rs. 2,880 cr on land acquisition, R&R, shifting of utilities, etc is not considered as a part of Project Cost as per the VGF guidelines of GoI.

6.43 The funding pattern of Hyderabad Metro in tabular form is given at Annexure IV. It may be seen that no government funding except for land acquisition or funding from external agencies is received in this project. In the brief material provided to the Committee, it is submitted that this is the world's largest Metro Rail project in Public Private Partnership (PPP)

mode and around 90% of the project cost has been financed by the private sector - first time for a Metro project of this magnitude in the world.

6.44 The Ministry in their written replies to the points raised by the Committee has submitted the revenue earned by Hyderabad Metro Rail Corporation since commencement of operations from both fare and non-fare box as under:

Name of the metro	Fare/ ticket sales		Property development		Advertisements		Any others	
	Amount (in Rs. Cr.)	% of total revenue	Amount (in Rs. Cr.)	% of total revenue	Amount (in Rs. Cr.)	% of total revenue	Amount (in Rs. Cr.)	% of total revenue
FY 2017 - 18	28.6	41%	4.62	7%	16.33	23%	19.98	29%
FY 2018 - 19	166.41	52%	92.21	29%	29.56	9%	30.28	10%
FY 2019-20	370.04	62%	135.83	23%	53.68	9%	38.65	6%
FY 2020-21	83.98	37%	60.12	26%	21.38	9%	62.47	27%

It can be seen from the table above that both fare and non-fare box revenue collection of Hyderabad Metro Rail Corporation was rising since inception until FY 2020-21 when it plummeted due to Covid pandemic.

6.45 However, it can also be seen from the table at Annexure II that the actual average daily ridership has remained very low as 2.76 in 2019-20 vis-à-vis 'average daily ridership required for breakeven' which stands at 19 lakhs.

6.46 Similarly, since the Hyderabad Metro became operational, it has been incurring loss as given at Annexure VII. On being asked whether the operations of Hyderabad Metro have achieved break even, the representatives of Hyderabad Metro Rail Project made the following submission:

"No Sir. The project suffered a loss of Rs. 1,767 crore in FY 2020-21 and a cumulative loss of Rs. 3,279 crore so far. Huge debt of Rs. 13,252 crore and a high interest burden of 9.1% (as against -2% for Government projects) are mainly contributing to the losses. The interest burden is coming to about Rs.1,200 crore per annum. Further, closure of the Metro rail system for about 6 months due to Covid-19 pandemic and drastic fall in the daily passenger traffic from over 4 lakh passengers to about 2 lakh passengers in the post-Pandemic period are also adding to the losses."

6.47 It can be seen from the information provided at Annexure IV that out of the total VGF sanctioned grant of Rs.1,458 crores, the VGF received is Rs.1204 crore. On being asked the reasons for non-release of Rs 254 cr VGF amount by Department of Economic Affairs, the Department replied as under:

"The entire VGF has not been released to the concessionaire as it has violated the VGF Guidelines, provisions of the Concession Agreement as well as the provisions of the Tripartite Agreement between the Concessionaire, Lead Financial Institution and DEA for charging pre-determined tariff as user charges…. As per the conditions of eligibility under the VGF Scheme [Rule 3(iii)], a PPP project is eligible for VGF if the said project is to provide a service against payment of a pre-determined tariff or user charge."

6.48 Regarding the reasons for not disbursing the rest of the VGF amount even after a lapse of four years of commencement of the operations, the Ministry of Housing and Urban Affairs submitted as under:

"DEA has informed that the entire VGF has not been released to the concessionaire as it has violated the VGF Guidelines, provisions of the Concession Agreement as well as the provisions of the Tripartite Agreement between the Concessionaire, Lead Financial Institution and DEA for charging pre-determined tariff as user charges.

Hyderabad Metro has informed that DEA, Ministry of Finance has sought certain clarifications from the Concessionaire and also asked Government of Telangana to commission an independent study to assess the revised viability parameters. The required details including independent assessment by IIM, Bangalore, have been submitted to DEA which are under examination."

6.49 When asked about Hyderabad metro's VGF issue, the representatives of Hyderabad Metro submitted as under:

"……We have formed a special SPV, Hyderabad Metro Rail Project. On behalf of the Government of Telangana, we have done all the coordination. The concessionaire is the L&T group, that is, L&T Metro Rail Hyderabad Limited. The concession period is 35 years initially, which can be extended by another 25 years. So, in total it is 60 years. The project cost is about Rs. 14,132 crore. As already our Secretary had mentioned, in

a transparent bidding process, whoever asks for the least grant after technically getting qualified, that grant will be sanctioned. In this case, out of Rs. 14,132 crore, they have asked for 10 per cent, that is Rs. 1458 crore. The entire amount of Rs. 1458 crore was given by the Government of India as VGF grant, that is Viability Gap Funding grant. As regards the remaining amount of Rs. 12674 crore, L&T was to invest on its own…"

6.50 On the issue of non-disbursement of entire VGF amount, representative of MoHUA submitted their position as given:

"सर, वायबिलिटी गैप फंडिंग डी.ई.ए. की स्कीम है, जिसके तहत पीपीपी मोड में जोप्रोजेक्ट्स चल रहे हैं तथाऐसेप्रोजेक्ट्सजोइकोनॉमिकलीडिजाइरेबलहैं, लेकिनकमर्शियलीवायबलनहींहै, उनप्रोजेक्ट्सकोवायबलकरनेकेलिएभारतसरकारकीतरफसेऔरजोकन्सर्न्डस्टेटगवर्नमेंटयाप्रोजेक्टअथॉरिटीहोतीहै, उनकीतरफ सेवायबिलिटीगैपफंडिंगकीजातीहै। इसकेतहतइसमेंइन्फ्रास्ट्रक्चरकेतमामसेक्टर्सशामिलहैं और जोइकोनॉमिकइन्फ्रास्ट्रक्चरकेसेक्टर्सहैं, उनमेंप्रोजेक्टकेटोटलकोस्टका 40 प्रतिशततकवायबिलिटीगैपफंडिंगदीजातीहै।…. हमारेमंत्रालयकाइसपरसीधाकोईनियंत्रणनहींहै।यहपूरापब्लिकप्राइवेटपार्टनरशिपऔरस्टेट्ससेजुड़ाहुआहै औरडी.ई.ए.उसेफंडिंगकरताहै। "

6.51 About measures considered for resolution of this VGF issue, the representatives of Dept. of Economic Affairs (DEA), MoF submitted as under:

"जैसाकिऑलरेडीकहाजाचुकाहैकियहप्रोजेक्टवीजीएफफंडिंगकेतहतकियागयाथा।यहराज्यसरकारकाप्रोजेक्टथा।इसमेंइकोनॉमिकवायबिलिटीलानेकेलिएभारतसरकारनेवीजीएफकीस्वीकृतिदीथी।टोटल 1,458 करोड़रुपएवीजीएफकीस्वीकृतिदीगईथी, जिसकेतहत 1,204 करोड़रुपएअभीतकरिलीजकियाचुकाहैऔर 254 करोड़रुपएकावीजीएफपेंडिंगहै।पूर्वनिर्धारितकिरायादरकेवायलेशनसेसंबंधितकुछमसलेसामनेआएथे, इसवजहसेबैलेंसवीजीएफपेंडिंगहै।कंसेसनेयरनेहमेंकुछप्रोजेक्टरिपोर्टऔरअपनीसबमिशनदीहै, जोअंडरकंसिड्रेशनहै।"

6.52 On the issue of violation of the VGF guidelines, the representatives of Hyderabad metro submitted before the Committee as under:

"… originally this project was started under AP Tramways Act. Later, to get uniformity for all the Metros, Hyderabad Metro was also brought under the Central Metro Act. Originally, there was a formula as per which the tariff was Rs.10 and the maximum fare was Rs. 35, with a provision for yearly escalation. Inflation up to 50 per cent was allowed to be adjusted. But when the new Act came into force, then L&T Metrorail

Hyderabad Limited, as the Metrorail authority, has got the power and responsibility to fix the fares as per the Central Metro Act. So, that is the explanation submitted to the Ministry of Finance. The Department of Economic Affairs is examining this issue.

As far as the losses are concerned, the Government Metros get foreign funding from institutions, like the JICA at an interest rate of two per cent. But what is happening here is that, they have to borrow from Indian banks. In Indian banks, at that time the interest rate was 10.10 per cent at 200 basis points, which has now come down to 9.10 per cent. As a result, what is happening is that, on Rs. 13,000 crore which they have taken as loan, every year about Rs. 1,200 is the interest burden, which they have to bear. That is the main problem. Operationally, before COVID-19 pandemic, it was breaking even. The interest burden is adding about Rs 1,200 crore. Last year, traffic was also stopped for about six months because of which it incurred Rs. 1,700 crore loss. In all, in the last four years, it has incurred a loss of Rs. 3,279 crore.

They have also made a representation to the Government of Telangana to somehow help them. This is also under examination of the Government of Telangana as to how to help them."

28. Kolkata Metro

6.53 On being asked whether the Kolkata Metro rail is servicing the debts taken for metro projects which have commenced operations and started generating revenue, the Ministry of Housing and Urban Affairs replied as under:

"Ministry of Railways has informed that Kolkata Metro Rail Corporations Limited (KMRCL) is the executing agency for construction of the 16.55 Km. East-West Metro Corridor Project, Kolkata and Metro Railway Kolkata, a Zonal Railway under Ministry of Railways is entrusted with the operation of the East-West Metro along with the existing North-South Metro.

As per the Revised Cost estimate sanctioned by the Union Govt. of India, the total estimated project cost of Rs.8574.98 crores include JICA loan of Rs.4158.40 crores.

So far, three tranches of JICA loan have been disbursed. The fourth and final tranche of the JICA loan has been effectuated and is likely to be disbursed by March'2022.

The loan agreement for all the tranches has been signed by Ministry of Finance as the borrower of the loan with KMRCL being the executing agency.

The disbursement of the three tranches of the JICA loan has been effected by JICA as reimbursement to the Ministry of Finance against fund provided by the Ministry of Railways and Ministry of Housing and Urban affairs for financing the project as Pass Through Assistance.

Validity for each tranche of loan is 5 years from the date of effectuation and repayment period is 20 years. Repayment is done by MoF.

CAAA (Controller of Aid Accounts and Audit) under Deptt. of Economic Affairs/Ministry of Finance is the nodal authority for repayment of the loan (both the Principal and the Interest component)."

29. Economic and Financial Rate of Return

6.54 The Financial Rate of Return (FIRR) and Economic Rate of Return (ERR) in respect of all the operational metros is mentioned at **Annexure IX**.

6.55 Metro Policy, 2017 requires Metro Rail projects to have atleast 14% Economic Rate of Return (ERR). To the question how ERR is calculated in respect of metro rail projects, the Ministry has explained as given:

"The Appraisal guidelines of Metro Rail projects issued by Ministry of Housing & Urban Affairs (MoHUA), Govt. of India with Metro Rail Policy, 2017 describes the detailed process of undertaking economic appraisal of Metro Projects (Section 4.4, Annexure IV, Framework for Economic Cost Benefit Analysis).

The economic appraisal of the project is carried out within the broad framework of Social Cost – Benefit Analysis Technique. It is based on the incremental costs and benefits and involves comparison of project costs and benefits in economic terms under the "with" and "without" project scenario. In the analysis, the cost and benefit streams arising under the above project scenarios are estimated in terms of market prices and economic values are computed by converting the former using appropriate shadow prices."

6.56 Further about the number and names of operating metro rail projects which have achieved 14 % ERR and the actual ERR achieved by various operating metro rail projects (project wise) since commencement of operations (city wise), the Ministry stated as under:

"EIRR is worked for horizon of 30 years."

6.57 When it was asked how the Govt proposed to help the metro rail projects to achieve the stipulated ERR, the Ministry explained as below:

"EIRR is calculated based on Framework for Economic Analysis; "Appraisal Guidelines for Metro Rail Project Proposals, Ministry of Housing and Urban Affairs GoI" based on following parameters:

a) Savings in fuel consumption,
b) Vehicle operating costs,
c) Travel time,
d) Reduction in road accidents and
e) Air pollution etc.

Concerned State Governments have been advised to take action on above parameters to improve EIRR."

6.58 The actual ERR achieved by various operating metro rail projects since commencement of operations is given at Annexure IX.

30. FARE AND NON-FARE BOX REVENUE

6.59 Fare Box Revenue is generated from sale of tickets by metros. Non-Fare Box Revenue on the other hand are generated from sources such as advertisements, property development, naming rights, feeder buses, consultancy works, external projects, etc. The data regarding Fare and Non-Fare Box revenue of different metro projects are available at **Table XII &XIII** at annexure.

Percentage of total revenue generated by Delhi Metro Phase I, II and III from Fare Box ranged from 44.16 % in 2002-03 to 56.95% in 2019-20,Kochi metro generated 78.14% of its revenues from fares in 2017-18 which reduced to 60.38% in 2019-20, Gujarat metro generated 97 to 100 percent of its revenues from Fare Box in last three years but only 6.5 km stretch is operational so far, Chennai metro raised 74.4 to 81.6% from fares, revenues from fares component for Hyderabad metro rose from 41% in 2017-18 to 62% in 2019-20 while Lucknow metro generated about 73% from fares barring the COVID year and Mumbai Metro Line 1 generated 86-89% of its revenues since 2014-15 (barring COVID year), which is quite high. Bengaluru metro and Jaipur metro have, however, not provided data regarding fare box collections.

Under Non-Fare Box, Delhi metro generated about revenues from property development, advertisements, naming rights, property business, feeder buses, consultancy works and external projects.

VII. IMPACT OF THE METRO RAIL NETWORK

31. **Impact on Environment:**

7.1 Metro projects can reduce environmental pollution both directly and indirectly. By installing solar panels, better station design to reduce energy consumption, etc. it can directly lessen environmental pollution. Indirectly metro projects reduce vehicles on road thereby impacting environment positively.

7.2 Several Metro networks have adopted energy conservation measures and developed green sources of power such as solar energy. Table III at Annexure provide details about Sources of Power and Energy Conservation Measures by Metro Rail Networks. It can be deduced from table that:

(a) Nagpur metro has planned to meet 65% of its total operational energy requirements from solar energy. A DPR for installation of 14 MW of solar PV systems has been prepared. It has planned to develop solar energy on RESCO model.

(b) Kochi metro has adopted Energy Management policy and Solar energy policy to use the renewable power to the maximum viz. 40 percent of its energy requirements. It has installed 7.28 MW of Solar energy on roof tops of metro station & depot buildings. This solar project was implemented on RESCO model.

(c) Chennai metro has so far commissioned 5.7 MW of Solar Power at Koyambedu depot roof top and at ground level, elevated metro station roofs, underground metro station roofs, ancillary buildings, etc. It is also using energy efficient equipments & methods (LED lights, energy efficient compressors, etc.) Air Cooled Chillers in HVAC which is more energy efficient, Vertical Fan for Tunnel Ventilation System, etc. for reducing power consumption.

(d) Hyderabad metro has 8 MW of captive solar installed and operational and approx. 10 percent of captive power consumption is from installed solar power plant.

(e) Lucknow metro has installed 1.38 MW of solar rooftop power source so far.

(f) Delhi Metro has informed that its Renewable energy consumption is 22,53,04,,300 kwh i.e. 34.22 % of total power consumption. Nearly 45 MW solar power is generated on roof tops in

various locations, 99 MW from offsite solar plant at Rewa and 1MW waste to energy at Ghazipur, Delhi.

(g) Ahmedabad and Surat metros have not informed about total Renewable energy consumption. However, they have stated about 606 kw of Solar Rooftop plants at different locations.

(h) Kolkata metro has informed that solar power is being installed and it has installed capacity of 1.24 MVA at present at present.

(i) Pune metro has proposed that 60% of energy requirements at Pune Metro stations will be obtained through solar panels.

(j) Mumbai metro has not provided specific reply w.r.t. Line 1 to 12. It has only stated that approximately 2.3 MW of renewable power is installed or proposed to be installed in different office buildings/depots of Metro Line 3 which appears too less for size and magnitude of 12 lines of Mumbai metro.

(k) Bhopal & Indore metros have informed that they have planned for generation of Solar power at stations and depot.

(l) Bengaluru, Kanpur and Agra metros have not provided information about renewable energy consumption and generation.

(m) Patna metro has not provided any information regarding renewable energy saying that metro is not operational yet. However, information about planned solar infra could have been provided to the Committee.

32. Solar Power generation through RESCO model by metro projects:

7.3 The RESCO model is a zero-investment model in which the consumer pays only for the electricity generated, while the solar plant is owned by the RESCO developer. You can enjoy the electricity that is generated without worrying about any of the associated operations and maintenance issues. In return, all you need to do is pay a pre-decided monthly tariff which is lower than prevailing grid electricity tariff.

7.4 Kochi and Nagpur metro is also implementing Solar projects on RESCO model. Nagpur metro in a written brief has submitted as under:

"The Greenest Metro by Integration of Rooftop Solar Energy right from inception stage to meet 65% of energy requirements under RESCO PPP MODEL by turning an adversity into opportunity and 100% Water Recycling, Zero Effluent to Sewage System & 100% Rainwater Harvesting.."

7.5 In a response to Committee's query whether any studies have been carried out by the agencies independent of the metro network and MoHUA to assess the impact of Metro rail projects on reducing pollution in those cities having operating metro network, the Ministry stated as under:

"DMRC has informed that a study was conducted in 2018-19 by M/s. The Energy and Resources Institute (TERI) to identify the economic, social and environmental benefits on account of Delhi Metro up to commissioning of Phase-III. As per the study carried out by TERI, the quantified annual benefits for the period 2019 is tabulated below:

Descriptor	Quantified Benefits 2019
No. of vehicles off the road daily	4,74,134 nos.
Annual time saved by passengers	246 million hours
Annual reduction in fuel consumption	2,33,000 tons
Annual reduction in pollution	7,11,396 tons

UPMRCL has informed that for "Assessment of Ambient Air Quality of Lucknow City", in the Pre-Monsoon 2019 Survey conducted by CSIR- Indian Institute of Toxicology Research, following observations were made:

a.Currently, some portion of Lucknow city was begun with convenient metro system which has significant impact on city air pollution positively by avoided road transportation.

b.Overall results indicate that all the parameters monitored showed slightly decreasing trend which might due to full-fledged operation of metro rails, cleanliness of roadside areas

Bangalore Metro has informed that they have appointed Bangalore University to prepare Environmental Monitoring report every Quarter to assess the impact of Eco-friendly Metro rail project on reducing pollution."

33. Carbon Credits:

7.6 A carbon credit is a tradable permit or certificate that provides the holder of the credit the right to emit one ton of carbon dioxide or an equivalent of another greenhouse gas – it's essentially an offset for producers of such gases. The main goal for the creation of carbon

credits is the reduction of emissions of carbon dioxide and other greenhouse gases from industrial activities to reduce the effects of global warming. Several metro projects have registered/applied for Green House Gas (GHG) emission under two platforms viz. Clean Development Mechanism (CDM) under UNFCCC and the Gold Standard Registry (GS) to demonstrate emission reduction. Table II at Annexure provides details about Carbon Credits earned by different Metro Rail Networks and the same is explained below:

(i) Delhi metro has earned 4.4 million carbon credits from CDM and GS projects. Under both platforms it has registered 4 projects.Chennai metrophase I & II have also registered for CDM under UNFCCC.

(ii) Kochi & Lucknow metro have stated that their registration for Carbon Credits is under process while Nagpur metro will apply for it after commissioning of the project. Bhopal and Indore metros on the other hand have informed that their stations and depot are being planned/designed for IGBC Platinum Rating leading to Carbon Credits in due course.

(iii) Hyderabad, Kanpur and Agra metros have not registered for Carbon Credits.

(iv) Ahmedabad, Surat, Patna, Bengaluru, Jaipur and Kolkata metros have not provided any information regarding carbon credits. Pune and Mumbai metros have informed merely that their project is under implementation..

7.7 When asked that data and details furnished by the Ministry shows that many metro rail networks in India are either using or planning to use renewable energy to a considerable extent to meet their requirements and in view of this, was it not desirable to ensure that those rail networks are registered for carbon credits, the Ministry stated as under:

> "It is desirable in metro projects where significant carbon credit is achieved."

34. **Effect on Traffic and Road Accidents:**

7.8 When the Ministry was asked to state whether any studies have been carried out by the agencies independent of the metro network and MoHUA to assess the impact of Metro rail projects on and traffic congestion in the metro areas and furnish the main findings of such studies especially achievement or otherwise of the projections given in the DPR in this regard (metro rail City wise), MoHUA submitted as under:

"DMRC has informed that benefits of Metro study carried out by The Energy and Resources Institute has established that Delhi Metro helps in taking the load of 4,74,134 vehicles off the roads daily. This in-turn reduces traffic congestion, pollution, savings in travel time etc. A comparison of data between TERI report and DPR for the year 2019 is tabulated below:

Descriptor	TERI report2019(Phase-I, II & III)	DMRC Ph-III DPRF or 2019 (Phase-III)
No. of vehicles off the road daily, no.	4,74,134	1,20,680
Annual reduction in fuel consumption, tons	2,33,000	1,09,080
Annual reduction in pollution, tons	7,11,396	2,42,540

35. **Impact Assessment by Independent Agencies:**

7.9 When asked whether any studies have been carried out by the agencies independent of the metro network and MoHUA to assess the impact of Metro rail projects on and traffic congestion in the metro areas and to furnish the main findings of such studies especially achievement or otherwise of the projections given in the DPR in this regard (metro rail City wise), the Ministry stated as under:

"DMRC has informed that a study was conducted in 2018-19 by M/s. The Energy and Resources Institute (TERI) to identify the economic, social and environmental benefits on account of Delhi Metro up to commissioning of Phase-III. As per the study carried out by TERI, the quantified annual benefits for the period 2019 is tabulated below:

Descriptor	Quantified Benefits 2019
No. of vehicles off the road daily	**4,74,134 nos.**
Annual time saved by passengers	**246 million hours**
Annual reduction in fuel consumption	**2,33,000 tons**
Annual reduction in pollution	**7,11,396 tons**

UPMRCL has informed that for "Assessment of Ambient Air Quality of Lucknow City", in the Pre-Monsoon 2019 Survey conducted by CSIR- Indian Institute of Toxicology Research, following observations were made:

a. Currently, some portion of Lucknow city was begun with convenient metro system which has significant impact on city air pollution positively by avoided road transportation.

b. Overall results indicate that all the parameters monitored showed slightly decreasing trend which might due to full-fledged operation of metro rails, cleanliness of roadside areas

Bangalore Metro has informed that they have appointed Bangalore University to prepare Environmental Monitoring report every Quarter to assess the impact of Eco-friendly Metro rail project on reducing pollution."

VIII. HUMAN RESOURCE ISSUES

36. **Employment of Transgenders:**

8.1 When asked to state the number of transgenders employed in the total employees of all operational metro projects (Metro Project wise), the Ministry submitted as under:

Metro Rail Project	No. of transgenders employed
Noida Metro	6 (through outsourcing agency)
Chennai Metro	8 (through outsourcing agency)
Kochi Metro	10

No transgenders are employed in the remaining operational metro rail projects."

IX. OTHERS

37. **Sources of Power and Energy Conservation Measures:**

9.1 Sources of Power and Energy Conservation Measures adopted by various Metro projects is mentioned in **Table III** at Annexure.

9.2 Bangalore Metro has informed the following about source of power and Energy Conservation efforts as under:

> **"**Bangalore Metro has informed that the source of power is from Government of Karnataka utility M/s Bengaluru Electricity Supply Company (BESCOM) [99% Appr] and Roof Top Solar Generation (Internal) –1% [Approx.] LED Luminous Lightings are used in metro cars and same is resulting in 50 to 55% saving in energy consumption."

38. Regenerative Braking System:

9.3 Regenerative braking systems (RBSs) are a type of kinetic energy recovery system that transfers the kinetic energy of an object in motion into potential or stored energy to slow the vehicle down, and as a result increases fuel efficiency. It is an energy recovery mechanism that slows down a moving vehicle or object by converting its kinetic energy into a form that can be either used immediately or stored until needed. In this mechanism, the electric traction motor uses the vehicle's momentum to recover energy that would otherwise be lost to the brake discs as heat. Adoption of Regenerative braking systems (RBS) by metros projects are resulting in power saving and reutilization.

9.4 Regenerative Braking system adopted by L&T Metro Hyderabad is stated to be resulting in 35 % power regeneration and reutilization. Similarly setting up of solar panels on stations and depots and open station design without need for air conditioning are also stated to have led to considerable power savings.

9.5 In this context, information was sought whether all other metro projects are also following the above mentioned / systems which are leading to considerable reduction in power consumption/ savings in expenditure on power and if so, it was asked to furnish the details including the number of metro projects which have adopted the same; and, if not, asked to state the reasons there for and also the steps taken to ensure that other metro projects follow

the same in view of the potential savings in operating expenditure, the Ministry stated as under:

> **"**Yes, all the metro rail projects are following the systems like regenerative braking and setting up of solar panels which are leading to considerable reduction in power consumption and savings in expenditure on power."

9.6 Further when the Ministry was asked whether the upcoming metro networks are planning regenerative Braking system which helps in regeneration and feeding the energy back into the system and whether it was compulsory to adopt this tech in all metro rail systems, the Ministry submitted as under:

> "Yes, various operational and under construction metro rail projects have adopted the regenerative braking system in rolling stocks viz. Delhi Metro, Nagpur Metro, Pune Metro, Metro Railway Kolkata, Jaipur Metro, Patna Metro, Lucknow Metro, Kanpur Metro, Chennai Metro, Ahmedabad Metro, Surat Metro, Kochi Metro, Mumbai Metro Line-1, Mumbai Metro Line-3, Bhopal Metro, Indore Metro, NCRTC, etc."

39. **Ratings from India Green Building Council (IGBC)**

9.7 When asked to state the data on number of total stations and the stations of various metro rail projects (city wise) which got 'PLATINUM' rating from Indian Green Building Council (IGBC), the Ministry stated as below:

Metro Rail Project	**No. of stations**
DMRC (Ph-III)	103
Nagpur Metro	15
Lucknow Metro	21
Kanpur Metro	9
Chennai Metro	38
Hyderabad Metro	57
Kochi Metro	22

9.8 Further when enquired whether it was mandatory that all the stations are required to be designed in such a way to make them eligible to get the certification in view of the advantages associated with it, the Ministry submitted as under:

> "No, it is not mandatory but desirable for the sake of conserving our environment that all stations are designed in a manner to make them eligible to get the certification. Metro rail companies are aspiring to design and construct their stations as per Green Building requirements to reduce the impact on environment."

40. **Need for a platform for sharing ideas and experiences:**

9.9 When asked whether there was any centralized institutional mechanism / system to share the experiences and to exchange ideas in implementation and operations of the Metro rail projects in India and the details of its composition, number of times it met, etc. and if not, didn't MoHUA think it was desirable to have such a platform for exchange of ideas and discussing the problems and arriving at solutions, the Ministry stated as below:

> "Yes, there is a centralized institution mechanism / system named 'Indian Metro Rail Organizations Society' (i Metro), headquartered at New Delhi in place to provide a common platform for all Metro Rail Companies, Regional Rapid Transit System (RRTS) /Mono Rail Organization, etc. in India in terms of sharing knowledge, experience, information, best practices, innovations in all aspects of urban rail transport and learn from one another in order to improve performance of members. At present I Metro governing body constituted of 15 members of various Metro Rail Organization and under the President ship of Secretary (HUA), Ministry of Housing and Urban Affairs, New Delhi (Plg-1)
>
> Following are the Membership Composition of I Metro
> 1. Delhi Metro Rail Corporation Limited
> 2. National Capital Region Corporation
> 3. Maharashtra Metro Rail Corporation Limited
> 4. Bangalore Metro Rail Corporation Limited
> 5. Chennai Metro Rail Limited
> 6. Kochi Metro Rail Limited
> 7. Uttar Pradesh Metro Rail Corporation
> 8. Gujarat Metro Rail Corporation Limited
> 9. Mumbai Metro Rail Corporation Limited
> 10. L & T Metro Rail (Hyderabad)
> 11. Jaipur Metro Rail Corporation
> 12. Maha Mumbai Metro Operation Corporation
> 13. Noida Metro Rail Corporation Limited
> 14. Mumbai Metro One Private Limited
> 15. Madhya Pradesh Metro Rail Corporation Limited
>
> Regular meetings for exchange of Metro related information / progress / innovations are being held since its inception. So far, three General body meetings dated 31 July 2020, 15 Oct 2020 & 03 Sept 2021 and three governing body meetings dated 11 Oct 2019, 15 Oct 2020 and 03 Sept 2021 are held to discuss various issues. Apart from above online workshops / training are also conducted by the I Metro."

41. Requirement of a Central Database for Metro Projects

9.10 The Ministry of Housing and Urban Affairs provides substantial funds for funding Metro projects every year. For instance, 43.1 per cent of the Budget Estimates in 2021-22 and 31.2

per cent this year has been earmarked for Metro projects. However, it is apparent that the Ministry does not seem to have a Central database of various metro projects funded by it. In this context, when it was enquired whether the Ministry did not feel that a Centralized database containing data on various facets of functioning of the Metrorail networks was imperative from the policy making perspective, it was stated as under:

"सर**,** जहां तक मेट्रो का सम्बन्ध है**,** हम जी आई जेड फण्डिंग से एक वेबसाइट बना रहे हैं। अभी तक हमारा फोकस प्रोग्रेस पर था**,** लेकिन क्वेश्चनायर आने के बाद हम इसको इनक्लूड कर रहे हैं। **...**

सर, मेट्रो के केस में आपकी बात बिल्कुल सही है। हमें डेटाबेस मेनटेन करना चाहिए। जितने भी एस्पेक्ट्स हैं कि डीपीआर में कितनी राइडरशिप थी, कितनी प्रोजेक्टेड थी, प्रोजेक्ट की कितनी प्रोग्रेस है आदि के बारे में हम थोड़ा पुराने तरीके से डेटाबेस मैनेजमेंट करते हैं। लेकिनजिसतरहसेअन्यमिशंसमेंहोरहाहै, उससेप्रेरणालेकर, जैसाकिआपनेबताया, एक प्रॉपर ऑनलाइन डेटाबेस हम इसमें बना लेंगे।"

PART-II

Recommendations/Observations

Recommendation Srl. No. 1

Need to have a single and comprehensive Metro Act

The Committee observe that presently Metro Rail Projects are governed by three Central Acts *viz.* (i) Metro Railways (Construction of Works) Act, 1978; (ii) the Calcutta Metro Railways (Operation and Maintenance) Temporary Provisions Act, 1985; and, (iii) Metro Railways (Operation and Maintenance) Act, 2002 whose objective is to (i) provide for the construction of works relating to metro railways in the metropolitan cities and for matters connected therewith (ii) make temporary provisions for the operation and maintenance of Calcutta metro railway and for matters connected there with pending the making of regular arrangements for such operations and maintenance and (iii) operation and maintenance and to regulate the working of the metro railway in the national capital region, metropolitan city and Metropolitan area, respectively.

The Metro Railways (Operation and Maintenance) Act, 2002 (the Metro Act) states that it extends in the first instance to the National Capital Region and the Central Government may, by notification, after consultation with the State Government, extend this Act to such other metropolitan area and metropolitan city, except the metropolitan city of Kolkata.

MoHUA have apprised the Committee that each state has separate Tramway Act and some of them actually started metro works under those Acts. For instance, Hyderabad metro was originally started under AP Tramways Act. Later, to get uniformity for all the Metros, Hyderabad Metro was also brought under the Central Metro Act, i.e., the Metro Railways (Operation and Maintenance) Act, 2002.

The Committee have further been informed that the Ministry of Housing and Urban Affairs (MoHUA) are in the process of drafting the Metro Rail (Construction, Operation, Maintenance and Administration) Bill, 2021 which upon enactment, will replace the three existing Metro Acts namely, the Metro Railways (Construction of Works) Act, 1978, the Metro Railways (Operation and Maintenance) Act, 2002 and the

Calcutta Metro Railways (Operation and Maintenance) Temporary Provisions Act, 1985. Further, the Metro Act does not support PPP projects.

As many metro projects are under planning, development and operating phases in different cities under different models – exclusive ownership of State Govts, JV with Central Govt, PPP basis, private ownership, etc. and many more cities are expected to take up the different kinds of metro projects- MRTS, LRTS MetroLite, MetroNeo, etc, as part of addressing urban transport issues, the Committee feel that there is a requirement of a comprehensive legislation. The Committee while welcoming the MoHUA's initiative to enact a single legislation in place of existing three Metro Acts, hope that such comprehensive legislation aid and enable the smooth setting up and functioning of metro rail networks at the earliest.

Recommendation Srl. No. 2

Laying of Annual Reports before the Parliament

The Committee note that Section 13 of the Metro Railways (Operation and Maintenance) Act, 2002 stipulates that the Central Government shall cause the annual report of the Chief Commissioner of Railway Safety to be laid after its receipt before each House of the Parliament. The Committee note that barring Kolkata metro, Hyderabad metro and Jaipur metro, the annual reports of various operational and under construction metro projects are being laid before each house of the Parliament or are under preparation for laying. The Committee desire that as per present practice the annual report of all the operational and under construction metros, funded by the central government, must be laid in both the Houses of Parliament in a timely manner without fail.

Recommendation No. 3

Setting of Unified Metropolitan Transport Authority (UMTA)

The Committee note that the Metro Rail Policy, 2017 provide for an integrated approach in planning and management of urban transport wherein the State Governments are required to constitute Unified Metropolitan Transport Authority (UMTA) as a statutory body which would be responsible for preparation of Comprehensive Mobility Plan for the city, organize investments in urban transport

infrastructure, establish effective coordination among various urban transport agencies, manage the Urban Transport Fund (UTF), etc. The Committee further note that for all metro rail projects taken up with central assistance it will be mandatory for the State Governments to give commitment to set up and operationalise UMTA in the city within a year and the cities where metro projects are already under implementation, UMTA should be constituted within a year.

The Committee have been apprised that UMTA has been constituted in Bengaluru, Kochi, Pune, Chennai, Hyderabad, Lucknow, Kanpur and Agra cities. On the other hand, UMTA for Patna, Bhopal, Indore and Nagpur metros are under process. However, it is disheartening to note that Delhi metro, which began its operations in 2002 has not yet constituted UMTA. Gujarat (Surat, Indore metros), Mumbai, Jaipur and Gurugram (Rapid metro) have also not constituted UMTA so far. The Committee are dismayed to note that despite a lapse of more than 4 years, out of 12 states where Metro rail net work has either commenced or is under construction, six states are yet to constitute UMTA, *viz.,* NCT of Delhi, Karnataka, Gujarat, Madhya Pradesh, Maharashtra (in r/o Mumbai only) and Rajasthan.

The Committee, therefore, recommend the Ministry to take up and encourage setting up of UMTA in the states where its supported metro networks are, either operational or under construction, without any further delay.

Recommendation No. 4

Need for implementation of National Policy on Transit Oriented Development

The Committee are glad to note that Ministry of Housing and Urban Affairs, GoI has issued National TOD policy on 01.05.2017, which aims to promote planned and sustainable urban centres with high density, mixed land-use development within an influence zone of 500-800 meters of mass transit stations. This policy aims to enable transformation of cities from private vehicle dependent development to public transport-oriented development. The Committee note that Transit Oriented Development increases the accessibility of the transit stations by creating pedestrian and Non-Motorised Transport (NMT) friendly infrastructure like footpaths and cycle tracks that benefit large number of people, thereby increasing the ridership of the transit facility and improving the economic and financial viability of the system. Many cities have

strengthened their public transport by developing MRTS such as metro rails and BRTS. The Committee feel that National TOD policy will help these cities to formulate city specific policies to efficiently use these systems. Transit Oriented Development will not only increase ridership of metro projects, it will also reduce traffic congestion, pollution, travelling time of commuters and overall health benefits to city dwellers.

The Committee, however are disappointed to note that (i) states/ cities namely Karnataka, Tamil Nadu, Bihar, Gujarat and Mumbai are yet to formulate TOD policy; (ii) Delhi, Uttar Pradesh, Telangana, West Bengal, Rajasthan, Kerala, Maharashtra, Nagpur and Pune have only notified TOD and none has developed TOD so far; and, (iii) Actual Transit Oriented Development has not happened along any metro until now. The Committee, therefore, recommend the Ministry to exhort, persuade and prod the state governments to implement Transit Oriented Development along metro stations in respective states. The Committee further recommend the Ministry to persuade every metro project to implement TOD along atleast one metro station on pilot basis and thereafter build upon the gains.

Recommendation No. 5

Adoption of Less Capital intensive MetroLite and MetroNeo networks

The Committee note that metro projects are capital intensive in nature involving huge investment on the part of Ministry accounting for about 43 percent of total BE in 2021-22 of Ministry of Housing and Urban Affairs. The Committee have been further apprised that per kilometre cost of construction of metro projects range from Rs. 37 cr to Rs. 220 crores for elevated metro, Rs. 100 crores to Rs.1126 crores for underground metro and Rs. 84 to Rs. 122 crores for At Grade metros. On the other hand, MetroLite can be constructed at 40% cost of Metro train while MetroNeo (tyred metro) can be constructed at 25% of the cost of metro. The standards for MetroLite and MetroNeo have also been issued by the Ministry in July 2019 and November, 2020, respectively. They will provide a similar experience and ease of travel in terms of comfort, convenience, safety, punctuality, reliability, & environment-friendliness as that of a conventional metro system. Both are suitable for smaller cities with lower ridership that are aspiring for rail-based mass transit system and can also be used as feeder to high capacity metro rail systems. They are more viable and sustainable due to their very less

capital, operation and maintenance costs. Apart from decongesting smaller cities, they will also reduce pollution.

The Committee, therefore, recommend the Ministry to promote and incentivize MetroLite and MetroNeo in smaller cities aspiring for rail-based mass transit system and also as feeder to high capacity metro systems, wherever possible. The Committee also desire to be informed of the specific measures taken to persuade/ incentivize adoption of MetroLite and MetroNeo systems.

Recommendation No. 6

Need for coverage of Kochi water metro under FAME II

The Committee are aware that Kochi metro is constructing Kochi water metro to connect islands around Kochi and increase ridership of Kochi metro, for which it is purchasing battery operated boats. Kochi Water Metro being an urban electric transport system, which perfectly align with the objectives of FAME scheme being operated by Ministry of Heavy Industries, and inland watercrafts are classified under vehicles for various requirements such as insurance, inclusion in FAME scheme which will expedite the adoption of electric mobility in the sector.

The Committee feel that benefits of FAME II scheme subsidy can be extended to battery operated boats and charging infrastructure of Kochi Water Metro as it is an urban electric transport system, which perfectly align with the objectives of FAME scheme. The Committee are of the opinion that Extension of benefits of FAME II scheme to electric vehicles operating in water can act as a catalyst for adoption of e-boats and thereby reduce dependence on polluting diesel vessels. The Committee have also been apprised that Kochi Metro Rail Ltd. had submitted the application for inclusion of Kochi Water Metro Transport in FAME-II Scheme to Department of Heavy Industries and Ministry of Heavy Industries & Public Enterprises and the same is not yet approved.

The Committee, in view of the advantages of water metro in enlarging the catchment area for Kochi metro and also a pollution free mode of transport, strongly recommend the Ministry to take up inclusion of battery operated boats and charging infrastructure of Kochi Water Metro under FAME II scheme with Ministry of Heavy Industries immediately. .

Recommendation Srl. No. 7

Need for setting up of Water Metro Networks in Cities with Waterways Connectivity

The Committee note that Kochi Water Metro is a unique project envisaged for developing modern water transport infrastructure, connecting 10 island villages by constructing 38 Jetties, in the Greater Kochi region. The water metro network covering a route length of 76 km having 38 terminals with 78 Nos. of battery-operated boats provide inter-modal connectivity between Jetties, Bus terminals and Metro networks. The Committee observe that apart from connecting island villages around Kochi, it is also expected to increase ridership of metro and have environmental benefits. The Committee are of the view that such water metro like that of Kochi has potential to connect coastal zones and areas having inland water bodies with mass transportation systems, thereby boosting economic activity as well ensuring social welfare. The Committee, therefore, suggest MoHUA to explore possibility and encourage building such water metros in areas having water networks *viz.* Rivers, Canals, etc. and impress upon states which have such water bodies to build them.

Recommendation Srl. No. 8

Low Actual Average Daily Ridership *vis. a. vis.* Actual Average Daily Ridership required for Breakeven: Need for increase of Ridership

It is disheartening for the Committee to observe that barring Delhi and Mumbai Line 1, most of the operational metros viz. Bengaluru metro, Hyderabad metro, Lucknow metro, Chennai metro, Kolkata metro and Kochi metro has low ridership. Bengaluru Metro had Actual Average Daily Ridership (AADR) of 1.48, 3.40, 4.52, 4.89 and 0.96 lakhs only in 2016-17, 2017-18, 2018-19, 2019-20 and 2020-21, respectively, against Average Daily Ridership required for Breakeven of 7.65, 10.09, 12.32, 13.19 and 18.54 lakhs, respectively, in the same years. Thus, Bengaluru metro has been constantly witnessing low ridership than it is required for Breakeven. Similarly, Hyderabad Metro has very low Actual Average Daily Ridership (AADR) i.e. 0.67, 1.26, 2.76, and 0.65 lakhs only in 2017-18, 2018-19, 2019-20 and 2020-21, respectively, against Average Daily Ridership required for Breakeven of 19.00 lakhs for all these years. Lucknow Metro also had Actual Average Daily Ridership (AADR) of 0.537 and 0.258 lakhs only in 2019-20 and

2020-21, respectively, against Average Daily Ridership required for Breakeven of 0.943 lakhs for all these years. Thus, Lucknow metro also does not have sufficient ridership for breakeven. The Committee further note that Kolkata Metro had Actual Average Daily Ridership (AADR) of 5.40 to 5.84 lakhs only in Pre Covid times against 15 lakhs required for Breakeven. Thus, actual ridership is merely one-third (approx) of the ridership required for breakeven. Kochi Metro too had Actual Average Daily Ridership (AADR) of 0.35, 0.35, 0.51 and 0.19 lakhs only in 2017-18, 2018-19, 2019-20 and 2020-21, respectively, against Average Daily Ridership required for Breakeven of 0.59, 0.40, 0.64, and 1 lakh, respectively, in the same years. Jaipur metro also had dismally low Average Daily Ridership than it is required for breakeven. And Chennai Metro had Actual Average Daily Ridership (AADR) of 10,923, 23,301, 50,312, 92,000 and 45,393 only in 2017-18, 2018-19, 2019-20 and 2020-21, respectively against Average Daily Ridership required for Breakeven of 92209, 108694, 204903, 253989 and 433644 for all these years.

The dismal performance of the majority of the metro rail networks in terms of carrying passengers enough to breakeven even after six to seven years of continuous operations shows that (i) faulty DPRs, (ii) lack of proper planning to provide first and last mile connectivity, (iii) provision of parking at metro rail stations , (iv) need for increasing catchment area, etc. The Committee are of the view that if metro rail projects are to be made as mass transportation medium in true sense and operate them on sustainable basis the commuters are to be weaned away from using private vehicles, a compelling proposition should be made available to them in terms of comfort, convenience, quality, affordability and reliability, etc. The Committee, therefore, recommend the Ministry to:

i. **deliberate upon the reasons for low ridership vis-à-vis the projected ridership for all the above-mentioned metros;**
ii. **take concrete steps to increase ridership of all metro projects and update the Committee of the steps taken in this regard to increase ridership; and**
iii. **to ensure that ridership estimation which forms the basis for selection of type of metro (conventional or metrolite or metroneo) must be accurate and be realistic to the extent possible.**

Recommendation Srl. No. 9

Robust First and Last Mile Connectivity will increase Ridership of Metros

The Committee note that Metro Rail Policy, 2017 stipulates that every proposal for Metro Rail should necessarily include proposals for feeder systems that help to enlarge the catchment area of each metro station at least to 5 kms. The Committee has been apprised that Last mile connectivity through pedestrian pathways, Non-Motorized Transport (NMT) infrastructure, and induction of facilities for para transit modes will be essential requirements for availing any central assistance for the proposed metro rail projects. State governments are required to commit provisioning of feeder systems for the metro rail proposed for availing central financing assistance.

The Committee, however, express concern that all metro networks do not have all these First and Last Mile Connectivity facilities. The Committee are disappointed to note that (i) Lucknow metro does not have infrastructure for Feeder Bus System; (ii) Patna and Ahmedabad Metro do not have facility of Non-motorised transport infrastructure while Surat metro have not provided information about it; (iii) Patna and Ahmedabad metros do not have facility for para transit modes; (iv) Kochi, Patna, Ahmedabad and Kolkata metros do not have or planned public bike sharing stations while Pune and Surat metros have not provided a clear reply; and, (v) Lucknow, Ahmedabad and Kolkata metros do not have infrastructure for Feeder Buses while Pune metro has not provided specific reply on this aspect .

It is heartening to note that Nagpur and Jaipur phase 1A metros have parking space at all stations but the Committee is also disappointed to note that Patna metro has not made provision for parking space at any station (barring one station in corridor II). No specific reasons are provided for not providing this basic provison at metro stations in corridor I and II (except in one station) which may lead to many commuters not opting metro.

The Committee are of the opinion that presence of First and Last Mile Connectivity is something that makes metro networks 'Mass Transportation Systems' in true sense and it should be made mandatory for all the metro stations. Further, the ridership is directly proportional to presence of First and Last Mile connectivity. In the absence of First and Last Mile Connectivity, the projected ridership cannot be achieved. It is, therefore, recommended that the Ministry may make it mandatory for all the metro

stations to make provision for First and Last Mile Connectivity – wherever possible for operational metros and necessary for upcoming ones. The Committee further recommend that for upcoming metro stations no approval should be given until the DPR has a provision for First and Last Mile Connectivity.

Recommendation Srl. No. 10

Formation of Fare Fixation Committee

The Committee note that Fare of Metro Rail Corporations is fixed as per Sections 33 to 37 of Metro Railways (Operation & Maintenance) Act, 2002. The initial fare is fixed by metro project itself, thereafter, the fares are fixed by a Fare Fixation Committee (FFC) comprising of a Chairperson who is has been a judge of a High Court and two other Members who are nominees of Central govt. & State govt. The recommendations of FFC are binding on metro railway administration. The Committee have been apprised that the Central Government takes necessary action for constitution of Fare Fixation Committee (FFC) after receipt of request from concerned State Govt/Metro Rail Companies. So far four FFCs have been constituted for Delhi metro (the last being in 2016) and two for Mumbai metro line 1 (last in 2018) while FFC for Bangalore metro is under process. For all other metros, initial fare is applicable. In view of the foregoing, the Committee suggest/ recommend that:

(i) FFCs should be constituted at intervals as specified in the act or the regulations made thereunder; and,

(ii) all the relevant factors that goes into the cost of running metro may be taken into consideration in fixing fares while keeping in view of the affordability factor also. Otherwise, the Committee believe that many commuters may opt for other modes of transport defeating the very purpose of setting up of metro rail networks.

Recommendation Srl. No. 11

Payment of Fares through Single Card across Metro networks and other Mass Rapid Transit Systems throughout country

The Committee appreciate that on 4 March 2019, Hon'ble Prime Minister, launched the indigenously developed and internationally accredited 'One Nation One Card'

National Common Mobility Card (NCMC) and Automatatic Fare Collection (AFC) Gate-SWAGAT. The Committee are aware that NCMC has been developed to enable seamless travel by metro rail and other transport systems across the country. The Committee has been apprised that it is an Open Loop Card, which means a customer may use the same card for travel across the country through different modes and also use it for retail purchases. The Committee have also been informed that Department of Financial Services (DFS) have directed banks to issue all new Debit Cards compliant to NCMC standards which is expected to allow fast deployment of digital payments due to standardized implementation process and enable rapid digital penetration.

The Committee are glad to note that the complete NCMC eco-system consisting of Automatic Fare Collection (AFC) system software, Validation Terminal, Metro Gate, Common Mobility Card and interfacing with banking system was developed indigenously under the aegis of MoHUA by C-DAC in collaboration with Bharat Electronics Ltd (BEL) and NPCI and tested for international standards by EMVco accreditation agency in France and that it can be used for transit throughout the country if transit operators have NCMC compliant system. The Committee have further been apprised that these NCMC cards can be accepted in all operational metros by providing NCMC compliant hardware and instructions have been issued to Metro Corporations to take steps for transition to full interoperability on existing metro lines and to ensure full interoperability of NCMC in metro lines that are yet to be made operational from the day of commencement of operations itself.

The Committee are of the opinion that payment through single card will enable hassle free and seamless movement of people across different modes of public transportation in various cities and it can do wonders in attracting people towards mass transportation systems. Besides increasing ridership of metro networks, it will also reduce traffic congestion and air pollution.

The Committee, however, are disappointed to note that despite its launch about two years ago, the NCMC compliant systems have not been installed by Kolkata, Jaipur, Lucknow, Kanpur, Chennai and Gujarat metros so far. Moving at this pace, operationalising NCMC fully across entire country's metro and other mass transit networks seems a far-fetched dream. The Committee also apprehend that without involving Ministry of Roads, Transport and Highways and State Governments, the

operationalisation of NCMC across all transit networks throughout country may not be possible. The Committee, therefore, recommend that the Ministry of Housing and Urban Affairs may take up suitable steps in coordination with other stake holders for operationalisation of National Common Mobility Card across all transit networks throughout the country at the earliest and across all metro networks immediately.

Recommendation Srl. No. 12

Delhi Metro: Need to augur non-fare-box revenue

The Committee note that Delhi Metro Rail Project is presently operating around 390 kms of metro network having 285 stations with Actual Average Daily Ridership (AADR) of 26.14, 28.00, 25.86, 25.93 and 50.65 lakhs in 2015-16, 2016-17, 2017-18, 2018-19 and 2019-20, respectively, against Average Daily Ridership required for Breakeven of 16.07, 18.59, 16.26, 17.03 and 38.24 lakhs, respectively, in the same years. Thus, Delhi metro have been getting more no. of Actual Average Daily Passengers than is required for achieving Breakeven. The Committee further note that Actual Average Daily earnings of Delhi Metro for the years 2010-11, 2011-12, 2012-13, 2013-14, 2014-15, 2015-16, 2016-17, 2017-18, 2018-19 and 2019-20 have been Rs. 2.57, 3.50, 4.17, 4.51, 4.99, 5.57, 5.97, 8.29, 9.82 and 10.95 crore against Average daily earnings Required for Breakeven of Rs. 1.39, 1.71, 2.35, 2.71, 3.35, 3.86, 4.39, 5.72, 7.00 and 8.58 Crores for the same years respectively. The Committee also note that Delhi metro has been repaying its loans taken from JICA, timely from its operational revenues. The Committee note that though, DMRC is making profits at operating level, It is yet to make net profits. The Committee while appreciating the operational performance of DMRC which has improved considerably, they are concerned to note that DMRC is continuously incurring net losses despite (i) average daily earnings being higher than the average daily earnings required for breakeven, (ii) increase in average daily ridership in all the phases operational since 2011-12 to 2019-20, (iii) continuous increase in Fare Box collections since 2002-03 (iv) timely repayment of loans to JICA. The Company claimed that it has been making losses because of high Depreciation & Amortisation expenses which consumes major chunk of income, interest and principal repayments on loans.

The Committee while agreeing with the view that performance of the metro projects may not be assessed purely on economic considerations given the benefits that such infrastructure projects brings to the Society as a whole such as reducing traffic congestion, pollution, providing reliable, comfortable, convenient and affordable transport solutions to the millions in cities. Therefore, the Committee are of the opinion that there is a need to enhance non fare box revenues *viz.* commercial development of land and advertising revenues, etc. in the long run to make itself sustaining and profitable and accordingly recommend that all possible avenues of Non-Fare-Box revenue generation should be explored to increase profitability of Delhi metro.

Recommendation Srl. No. 13

Lucknow Metro- Timely completion of project

The Committee desire to bring on record their appreciation for the UPMRC for completion of Lucknow Metro Rail Project 36 days before the deadline, a rare feat in completion of the projects in urban transport infrastructure sector and thereby, avoiding any cost overrun. This is particularly praiseworthy when most of the metro projects are delayed and have extended deadlines. The Committee, thus, suggest that MoHUA should project Lucknow Project as a 'role model' for all under construction projects and the learnings from this project may be shared with other metro corporations which are executing the projects.

Recommendation Srl. No. 14

Viability Gap Funding issue in Hyderabad Metro

The Committee have been apprised that Hyderabad Metro is the world's largest Metro Rail project in Public Private Partnership (PPP) mode and around 90% of the project cost has been financed by the private sector - first time for a Metro project of this magnitude in the world. This project was undertaken by the Government of Telangana under the Public Private Partnership (PPP) model of funding through Viability Gap Funding (VGF) scheme of Government of India. The actual project cost was Rs.18,411 crore (Rs.1,204 crore VGF released by GoI and Rs. 17,207 crore by

L&TMRHL). The Committee note that fare and non-fare box revenue collection of Hyderabad Metro Rail Corporation was rising since inception until FY 2020-21 when it plummeted due to Covid pandemic. The Committee further note that the actual average daily ridership has remained very low, for instance, Rs.2.76 lakhs in 2019-20 vis-à-vis 'average daily ridership required for breakeven' which stands at 19 lakhs.

The Committee also note that Hyderabad metro has suffered a loss of Rs. 1,767 crore in FY 2020-21 and a cumulative loss of Rs. 3,279 crore so far. Huge debt of Rs. 13,252 crore and a high interest burden of 9.1% (as against -2% for Government projects) are mainly contributing to the losses. The interest burden is coming to about Rs.1,200 crore per annum.

The Committee has also been apprised that out of the total VGF sanctioned grant of Rs.1,458 crore, only Rs.1204 crore has been released to Hyderabad metro and Rs 254 crore VGF has been withheld by Dept. of Economic Affairs, Ministry of Finance. In this context, the Committee has been apprised by DEA, MoF that balance amount has not been released owing to violation of the VGF Guidelines by Hyderabad metro, i.e., revision of fares. However, the Committee has been apprised that Hyderabad metro initially began under the AP Tramways Act and later on, it came under the Central Metro Act which permitted revision of fares. Accordingly, Hyderabad metro revised its fares. Hyderabad metro has submitted a request to DEA, MoF for release of balance Rs. 254 crore which is under consideration. Looking to the huge loss that Hyderabad metro is incurring, the Committee desire that VGF issue is resolved at the earliest by DEA, MoF.

Recommendation Srl. No. 15
Maximization of Non-Fare Box Revenues

The Committee are aware that Non-Fare Box Revenues are generated from sources such as advertisements, property development, naming rights, co-naming rights, feeder buses, consultancy works, external projects, etc. The Committee have been apprised that the percentage of total revenues generated by Delhi Metro Phase I, II and III from Fare Box ranged from 24.16% in 2005-06 to 56.95% in 2019-20, Kochi metro generated 78.14% of its revenues from fares in 2017-18 which reduced to 60.38% in 2019-20, Gujarat metro generated 97 to 100 percent of its revenues from Fare Box in last

three years though only 6.5 km stretch is operational so far, Chennai metro raised 74.4 to 81.6% from fares, revenues from fares component for Hyderabad metro rose from 41% in 2017-18 to 62% in 2019-20 while Lucknow metro generated about 73% from fares barring the COVID year and Mumbai Metro Line 1 generated 86-89% of its revenues since 2014-15 (barring COVID year), which is quite high. The Committee have further been informed that under Non-Fare Box, Delhi metro generated revenues from property development, advertisements, naming rights, property business, feeder buses, consultancy works and external projects. The Committee note with dismay that percentage of revenues generated from fare collection is quite high for most of the metros and there is a need to increase revenues from Non-Fare Box.

The Committee are of the opinion that maximization of revenue from Fare Box collections may negatively impact ridership and it may prevent metro projects from becoming a true mass transportation system and thus defeat the entire objective of developing metro projects. Therefore, the Committee recommend the Ministry to persuade and impress upon metro projects to explore all possible avenues of maximization of revenues from Non-Fare Box. The Committee also desire that information about various sources Non-Fare Box revenue generation is also made available on I-metros platform of the Ministry so that there is cross board learning. They also would like to be apprised of the experience of raising Non Fare Box revenues by the major metros of the world including the share of such revenues in the total revenues of these metros.

Recommendation Srl. No. 16

Green Energy initiatives by metro projects

The Committee note that several Metro networks viz. Nagpur, Chennai, Hyderabad, Delhi, Lucknow, Ahmedabad, Surat, Kolkata, Pune, Bhopal and Indore are adopting energy conservation measures and development of green sources of power such as solar energy. It is heartening to note that Nagpur metro has planned to meet 65% of its total operational energy requirements through solar power, while Kochi and Pune metros have planned to meet 60% of their total operational energy requirements through solar power. The Committee are, disappointed to observe that Patna, Bengaluru, Kanpur and Agra metros have not provided information about solar power generation in their networks. Similarly, Mumbai Metro has not provided specific reply

w.r.t. Line 1 to 12. It has merely stated that approximately 2.3 MW of renewable power is installed or proposed to be installed in different office buildings/depots of Metro Line 3 which appears too less for size and magnitude of 12 lines of Mumbai metro.

The Committee, therefore, recommend that the Ministry should encourage mandatory sourcing of power from renewables especially solar, by the metro rail networks to the maximum extent that the technology permits. The Committee also suggest that green energy measures *viz.* solar power be compulsorily be made part of DPR of metro projects and the Ministry before approving any metro may examine whether it has green energy provisions or not. The Committee also desire to be apprised of the steps taken in this regard.

Recommendation Srl. No. 17

Development of Solar Power on RESCO model by metro projects

The Committee note that RESCO model of Solar Power development is a zero-investment model in which the consumer pays only for the electricity generated, while the solar plant is owned by the RESCO developer. One can enjoy the electricity that is generated without worrying about any of the associated operations and maintenance issues. In return, all one need to do is pay a pre-decided monthly tariff which is lower than prevailing grid electricity tariff. The Committee have also been apprised about Nagpur metro being the Greenest Metro by integration of Rooftop Solar Energy right from inception stage to meet 65% of energy requirements under RESCO PPP Model. Kochi metro has also adopted this model.

The Committee feel that adoption of this model will ensure generation of green energy by Metro networks without extra financial burden on metros for capacity creation. This can augment country's efforts in meeting climate change targets. The Committee, therefore desire that MoHUA may consider encouraging states to adopt RESCO model for Solar Power generation on metro rooftops, depots and other possible areas.

Recommendation Srl. No. 18

Registering for Carbon Credits

The Committee are aware that a carbon credit is a tradable permit or certificate that provides the holder of the credit the right to emit one tonne of carbon dioxide or an

equivalent of another greenhouse gas – it's essentially an offset for producers of such gases. Several metro projects have registered/applied for Green House Gas (GHG) emission under two platforms viz. Clean Development Mechanism (CDM) under UNFCCC and the Gold Standard Registry (GS) to demonstrate emission reduction. The Committee have been apprised that Delhi metro has earned 4.4 million carbon credits from CDM and GS projects, Kochi & Lucknow metros have stated that their registration for Carbon Credits is under process while Nagpur metro will apply for it after commissioning of the project, Bhopal and Indore metros on the other hand have informed that their stations and depot are being planned/designed for India Green Building council (IGBC) Platinum Rating leading to Carbon Credits in due course. Hyderabad, Kanpur and Agra metros have not registered for Carbon Credits. Ahmedabad, Surat, Patna, Bengaluru, Jaipur and Kolkata metros have not provided any information regarding carbon credits. On the other hand Pune and Mumbai metros have merely informed that their projects are under implementation remaining silent on the issue of meeting power requirements from renewables. Since several metros are either using or planning to use renewable energy to a considerable extent to meet their requirements, the Committee feel that it is important to ensure that all these metro rail networks are registered for carbon credits so that they earn benefits for being environment friendly. However, the Ministry have informed that it is merely desirable for metro networks to register for carbon credits and not a mandate. That is perhaps the reason why several metro networks have not yet registered for it. Therefore, the Committee recommend the Ministry to impress upon all the metro rail projects and ensure that they register for carbon credits. The Committee are of the view that it may be made mandatory to make metro rail networks to register for carbon credits.

Recommendation Srl. No. 19
Regenrative Breaking System

The Committee are aware that Regenerative Braking System (RBS) is an energy recovery mechanism that slows down a moving vehicle or object by converting its kinetic energy into a form that can be either used immediately or stored until needed. In this mechanism, the electric traction motor uses the vehicle's momentum to recover energy that would otherwise be lost to the brake discs as heat. The Committee have been informed that adoption of Regenerative braking systems by metro projects are

resulting in power saving and reutilization. For instance, Regenerative Braking system adopted by L&T Metro Hyderabad is stated to be resulting in 35% power regeneration and reutilization. The Committee have also been apprised that all the metro rail projects are following the regenerative braking and setting up solar panels which are leading to considerable reduction in power consumption and savings in expenditure on power. The Committee are happy to note that various operational and under construction metro rail projects have adopted the regenerative braking system in rolling stocks viz. Delhi Metro, Nagpur Metro, Pune Metro, Metro Railway Kolkata, Jaipur Metro, Patna Metro, Lucknow Metro, Kanpur Metro, Chennai Metro, Ahmedabad Metro, Surat Metro, Kochi Metro, Mumbai Metro Line-1, Mumbai Metro Line-3, Bhopal Metro, Indore Metro, NCRTC, etc.

The Committee appreciate the Ministry for promoting Regenerative Braking System which ensures energy saving thereby making the metro projects more energy efficient. The Committee also desire the Ministry to ensure that Regenerative Braking Systems are adopted in all upcoming metro projects including MetroLite projects.

Recommendation Srl. No. 20
Need for a platform for sharing ideas and experience

The Committee have been apprised that there is a centralized institutional mechanism / system named 'Indian Metro Rail Organizations Society' (I Metro), headquartered at New Delhi in place to provide a common platform for all Metro Rail Companies, Regional Rapid Transit System (RRTS) /Mono Rail Organization, etc. in India in terms of sharing knowledge, experience, information, best practices, innovations in all aspects of urban rail transport and learn from one another in order to improve performance of members. The Committee were further informed that at present I Metro governing body consists of 15 members of various Metro Rail Organizations and under the Presidentship of Secretary (MoHUA). The forum also helps in coordination of the members with Government and other stake holders. However, the Committee note that Kolkata, the oldest metro and Patna metro are not the members of I metro so far.

The Committee are of the opinion that such robust centralized institutional mechanism/ system to share the experiences and to exchange ideas in implementation and operations of the Metro rail projects in India can help metros learn from

experiences of each other, discuss the problems and arrive at solutions. The Committee appreciate Ministry for launching the initiative of I – Metro. However, it feels that I – Metros can be made more robust and an effective platform. The Committee desire that I – Metros is revitalized and metros are encouraged to share ideas and experiences on this platform and all the metro networks are brought under its fold.

Recommendation Srl. No. 21

Requirement of a Central Database for Metro Projects

The Committee note that the Ministry of Housing and Urban Affairs provide substantial funds for funding Metro projects every year which accounted for about 43.1 per cent of the Budget Estimates in 2021-22 and 31.2 per cent for 2022-23. However, the Committee are dismayed to note that the Ministry does not have a Central database of various metro projects funded by it. The Committee feel that a Centralized database containing data on various facets of functioning of the Metrorail networks is imperative from the policy making perspective viz. data about funds released *vis-a-vis* utilized, physical progress, ridership, First and Last Mile Connectivity, Fare and Non-Fare Box revenue, Green Energy initiatives, etc. The Committee are glad that the Ministry have also agreed to the need of maintaining a centralized database for various metro projects. The Committee, therefore, desire that a robust central database on various facets of metro projects must be created and maintained at the earliest. The database may be made in such a way that as and when any updates in the metro rail networks take place, the same should get reflected in the central base.

JAGDAMBIKA PAL,

Chairperson,
Standing Committee on
Housing and Urban Affairs

New Delhi;
April, 2022
Chaitra, 1944 (Saka)

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Annexure - I

Status of formation of Unified Metropolitan Transport Authority (UMTA)

Sl no	Name of the state	City	Status
01	Bihar	Patna	Setting up of UMTA is in the process.
02	NCR of Delhi	Delhi	Process of setting up of UMTA has been initiated in September, 2021. The proposal is under consideration of GNCTD for taking necessary action.
03	Karnataka	Bengaluru	Bengaluru was one of the first cities to set up an UMTA under the name Bangalore Metropolitan Land Transport Authority (BMLTA). It was established in 2007 by the Government of Karnataka and headed by an empowered committee, with representatives from the transport sectors in Bengaluru and the Government of Karnataka along with sector experts. Therefore, the BMLTA Bill was prepared by Directorate of Urban Land Transport in 2019 in accordance with the guidelines issued by MoHUA. The BMLTA Bill was reviewed and discussed in the BMLTA meeting held on 16.03.2020 under the chairmanship of Chief Secretary. Bengaluru Metropolitan Land Transport Authority (BMLTA) Bill has been submitted to Govt. of Karnataka for approval.
04	Gujarat	Ahmedadab	It has not yet been set up by State Govt.
		Surat	No specific reply was given given
05	Kerala	Kochi	Kochi Metropolitan Transport Authority (KMTA) has been established and operational since 01.11.2020 (P.90)
06	Madhya Pradesh	Bhopal and Indore	Operations documents for UMTA and UTF for Bhopal have been prepared.
07	Maharashtra	Pune	Vide G.R. No. PMR 3319/Pra hra. .07/ Navi07 dated 04.06.2019 the Govt of Mahrashra has set up Pune Unified metropolitan Transport Authority (PUMTA) for Pune Metropolitan region (P.110)
		Nagpur	Maha Metro has submitted the proposal for the establishment of Nagpur Unified Metropolitan Transport Authority (NUMTA) on 13/12/2019 to Additional Chief Secretary (UD-I) of Urban Development Department of GoM (GoM was reminded on 10/08/2020 and 16/07/2021). The proposal is under active consideration of GoM. P.121)
		Mumbai	Unified Mumbai Metropolitan Transport Authority (UMMTA) has been established.
08	Rajasthan	Jaipur	The draft UMTA Bill is under consideration.

09	Tamilnadu	Chennai	The Govt of Tamilnadu has notified the Chennai Unified metropolitan Development Authority (CUMTA) on 16.01.2019 and the rules for Chennai metropolitan Development Authority has also been approved
10	Telangana	Hyderabad	Hyderabad Unified Metropolitan Development Authority (HUMTA) was established in the year 2008 under Hyderabad Metropolitan Development Authority (HMDA) Act. Further, the Government of Telangana has prepared Comprehensive Mobility Plan (CMP) for Hyderabad in the year 2018 through Hyderabad Metro Rail Limited (HMRL) in accordance with the Metro Rail Policy 2017.(p.169)
11	Uttar Pradesh	Lucknow, Kanpur, Agra	The State Govt. has constituted a "Unified Metropolitan Transport Authority (UMTA)" vide office memo no. 4991/IX-5-2012-83 SA/09TC dated 28.06.2010.
12	Haryana	Gurugram	Gurugram Metropolitan development Authority (GMDA) shall be the UMTA for the Gurugram city.

Annexure - II

RIDERSHIP- AVERAGE DAILY RIDERSHIP REQUIRED (ADRR) FOR BREAKEVEN AND ACTUAL AVERAGE DAILY RIDERSHIP (AADR)

(IN LAKHS)

S no.	Year	2015-16		2016-17		2017-18		2018-19		2019-20		2020-21		Remarks
		ADRR For BE	AADR	ADRR For BE	AADR	ADRR For BE	AADR	ADRR For BE	AADR	ADRR For BE	AADR	ADRR For BE	AADR	
01	Delhi	16.07	26.14	18.59	28.00	16.26	25.86	17.03	25.93	38.24	50.65			
02	Ahmedabad	Year wise data not submitted. 415 for operational stretch of 6.15 kms.												
03	Bengaluru	NA	NA	7.65	1.48	10.09	3.40	12.32	4.52	13.19	4.89	18.54	0.96*	
04	Cochin	NA	NA	NA	NA	0.59	0.35	0.40	0.35	0.64	0.51	1.00	0.19	
05	Mumbai Line 1			1.75 lakh Aprox	286826	1.75 lakh Aprox	324446	1.75 lakh Aprox	367267	1.75 lakh Aprox	359363	1.75 lakh Aprox	27864*	Lines 2-12 are yet to be commissioned.
06	Jaipur	90049	27214	90032	19789	76906	16891	95336	19671	84008	19292	103287	9375*	Phase- 1B became operational on 23.09.2020.
07	Hyderabad p.161	NA	NA	NA	NA	19.00	0.67	19.00	1.26	19.00	2.76	19.00	0.65	
08	Lucknow	Not operational								0.943	0.537	0.943	0.258	
09	Chennai p.147	NA	NA	92209	10,923	108694	23,301	204903	50,312	253989	92,200	433644	45,393	Average daily ridership for breakeven is not given .
	Kolkata (p.187)			15	5.40	15	5.64	15	5.84	15	5.71	10.58	1.56	**Required for breakeven is 15 lakhs.**

***low ridership due to pandemic.**

Annexure -III

SOURCE OF POWER AND ENERGY CONSERVATION MEASURES BY METRO RAIL NETWORKS

Sl no	Name of the Metro	Total power consumption	Renewable energy consumption	% of 3 to 2	Carbon credits	Remarks
	1	2	3	4	5	6
1	Patna					
2	Delhi	65,84,41,957 kwh	22,53,04,300 kwh	34.22% (20-21)	Earned carbon credits for reducing greenhouse gas emissions. Registered GHG emission mitigation projects under two platforms viz. Clean Development Mechanism (CDM) under United Nations Framework Convention on Climate Change (UNFCCC) and The Gold Standard Registry (GS) to demonstrate emission reduction. Under each platform DMRC has registered 4 projects. So far, DMRC has earned 4.4 million carbon credits from CDM and GS projects	Nearly 45 MWp on Roof top Solar in various locations 99 MW from Offsite solar plant at Rewa 1MW Waste to energy at Ghazipur , Delhi It is not feasible to run metro operations entirely on renewable energy .it operates metro system for 20 hars a day for public service, therefore reliable, round the clock electric energy is required for operating the network. As renew ble power is variable depending on weather/ season, there is considerable variation in its availability and reliability. Due to restriction of exemptions for various charges (Transmission charges, wheeling charges, additional charges, etc.) by regulatory commissions and Ministry of Power, to Renewable Power Obligations (RPO) only, it is not feasible to use only renewable energy for meeting the operational requirements of a metro network
3	Ahmedabad	Not given	Not Given	Not Given	Not mentioned / given	Roof top solar plants operational are as follows: Apparel Park Depot:- 200KW installed and operational. Apparel Park Depot:- 206KW (Tender warded) GyaspurDepot: 200KW (Tender awarded)
4	Surat					
5	Bengaluru		1%			Roof top solar generation is 1% approx. LED lights usage is resulting in 50-55% saving in energy consumption.
6	Kochi Metro Rail Ltd	-----	40%	60%	Presently KMRL do not have the	KMRL has adopted Energy Management policy and Solar

	(KMRL)				registration for Carbon Credits, the process for getting the registration for Carbon Credit is in progress. As per the study conducted, quantum of emissions helped to reduce in 2018 is 46914 tCO2/Year and expected to reduce 79,736 tCO2/Year by 2033, 1,14,313 tCO2/Year by 2044.	energy policy to use the renewable power to the maximum. KMRL has installed and commissioned solar power project for an installed capacity of 7.28MWp on the roofs of Metro station buildings and Depot buildings. This project was implemented through RESCO (Renewable Energy Service Company) model, with which the power producer (contractor) will invest money and install the plant and do operate and maintenance, whereas the power purchaser (KMRL) will purchase the power at an agreed rate for the 25 years life of the plant. Presently with the above capacity of the plant, KMRL is able to achieve 40% energy neutrality. An additional a capacity of 3.54MWp is under execution. Once the project is completed, KMRL is likely to enhance its energy neutrality to 60%. In addition, is planning to achieve 100% energy neutrality by providing floating solar plants.
7	Bhopal	Not Given			Stations and Depot are being planned/designed for IGBC Platinum Rating leading to Carbon Credits in due course	Renewabale energy source (solar power) in station and depot has been planned.
8	Indore					
9	Pune	Metro rail project is under implementation				It is proposed that~60% of Energy requirement at Pune MetroStations to be obtained through Solar Panels.
10	Nagpur	Not given	Renewable Solar and Non renewable - MSETCL		Nagpur metro will apply for carbon credits after commissioning of metro rail project p.120	It will be ensured during design and commissioning.(p.113) Maha-Metro, Nagpur Metro Rail Project (NMRP) has planned to meet 65% of its total operational energy requirements from Solar Energy. A DPR for installation of 14 MWp of Solar PV systems has been prepared. Solar PV capacity of about 1600 kWp is already operational and another 2500 kWp capacity is in various stages of implementation.P.121
11	Mumbai Line 3	under implementation				No specific info was given in r/o line 1 to 12 in this regard. Approximately 2.3 MW of renewable power is installed or proposed to be installed in different office buildings/ depots of Mtero line 3. p.130
12	Jaipur Metro	Not given / NIL				100 KWP solar plant under CAPEX model commissioned on 18.12.2015

13	Chennai Metro				The Chennai Metro Phase I extension and Phase II Projects have been registered in UNFCCC – Clean Development Mechanism and it is estimated that around 5,68,495 tCO2 would be reduced once the above projects are operational.	CMRL has so far commissioned 5.7 MWp solar Power at Koyambedu Depot roof top and at the ground level, Elevated metro station roofs, Underground Metro Station roofs, Ancillary Building etc., from these solar panels, so far (up to 31.03.2021) 225,30,000 units of electricity have been generated and the last years (2020-21) generation is 73,64,904 units. Energy Conservation and Technology absorption a) Regenerative Braking in train CMRL trains are fitted with a system of regenerative braking which is effective to break the train till the speed of 5kmph. During the regenerative braking, the energy is regenerated and fed back to the system, which is utilized by other trains and equipment. On the average about 32% of the traction energy is regenerated, which is one of the highest among the world metros. b) Energy efficient equipment and methods CMRL is using energy efficient equipment and fixtures in stations like LED lights, energy efficient compressors, motors, 3 speed escalators (stop, creep and run) with auto operation, usage of only star rated equipment. Air Cooled Chillers in HVAC, which is more energy efficient, has been adopted for HVAC system. Vertical Fan for Tunnel Ventilation System: Vertical fan design has been adopted for the phase- 1 extension underground stations, which is one of the unique systems in metro, resulting in a huge space saving and the energy saving as well. c) Provision of PSD at underground station which Reduce the penetration of dust from the tunnel.

						Increase in comfort for Passenger. Reduce in noise level generated by train. Save about 33 % of the air conditioning load, thus reducing the carbon footprint of the underground stations. Proposed to install Roof mounted PV Solar Power Plants in the Terrace of Main Head Quarter building in future after completing entire project.
14	Hyderabad				Not registered for carbon credits.	8MWp capacity of captive solar installed and operational .Approx 10 % of captive power consumption is from installed solar power plant
15	Lucknow,	Not mentioned			it is under process	Till date UPMRC have installed 1.38 MWof solar rooftop in its Lucknow metro project
16	Kanpur				Have not registered for carbon credits.	Not mentioned
17	Agra					
18	Kolkata	Not given				Non renewables. However,solar power is being installed. The basic power feeder is from conventional energy source of WB state electricity Board.But supplementary renewable source (Solar power) with installed capacity of 1.24 MVA is commissioned by Metro railway.

Annexure- IV

FUNDING PATTERN OF DIFFERENT METRO RAIL NETWORKS

(Rs in cr)

State /metro	Equity (in absolute amounts as well as % of total cost)		Debt (in absolute amounts as well as percentage of total cost)				Grants from Central/ State Govts / others	Funds through Property Devp.	Funds from private companies	Details of the debt such and Rate of Interest (RoI), repayment period , T&C of the repayment, guarantees given, if any , repayment period, tied debt or otherwise, other terms & conditions , etc.
	GoI	State Govt	Internal Sources		External Sources					
			Details of the source	Amount in absolute &% of total debt	Details of the source	Amount in absolute &% of total debt				
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**09**	**10**	**11**
Patna, Bihar	Not given	Not Given	Not given	Not Given	Not given	Not given	GoB - Rs. 262.50 GoI- Rs. 213 Total- Rs. 475.50	NIL	NIL	Not Given
Delhi Phase I	1464 (13.44%)	1464 (13.44%)	Interest free subordinate debt from GoI and GNCTD for land acquisition	504.00 (4.62%)	Loan GoIi arranged from JICA through Pass through Assistance (PTA) from GOI	6,356.45 (58.36%)	320.00 (2.94%)	782.55	NIL	**RoI on JICA Loan varies from 1.3% to 2.3% p.a. depending upon concerned tranche.** **Repayable in 30 years with moratorium of 10 years.** **Loan agreement (untied) signed between GOI & JICA and GOI provides the loan to DMRC through PTA** **Subordinate Debt will be repaid in five equal installments after the Senior Debt (JICA Loan) will be fully repaid.**

1	**2**	**3**	4	**5**	**6**	**7**	8	9	10	**11**
Phase II (including Extensions and addl rolling stock)	3,078.70 (14.56%)	3,078.70 (14.58%)	Interest free subordinate debt from GoI &GNCTD for land acquisition and from GOI,GNCTD and other state authorities for central taxes	1,358.50 (6.43%)	Loan GoI arranged from JICA through Pass through Assistance (PTA) from GOI	10,231.6 (48.39%)	1,907.94(9.02%) Including land free of cost by state govt/ authorities	1488.00 (7.04%)	NIL	RoI on JICA Loan varies from 1.2% to 1.4% p.a. depending upon concerned tranche. Repayable in 30 years with moratorium of 10 years. Loan agreement (untied) signed between GOI & JICA and GOI provides the loan to DMRC through PTA The Subordinate Debt will be repaid in five equal installments after the Senior Debt (JICA Loan) will be fully repaid.
Phase III (including Extensions and addl rolling stock	4,200 (8.65%)	4,200 (8.65%)	-Do-	7,737.64 (15.93%)	-DO-	20,273* (41.24%) 8incl IDC of Rs.617.	8,374.48(17.24%) Incl land free of cost by state Govt /authorities	3,780.00 (7.78%)	NIL	RoI on JICA Loan varies from 1.4% to 1.5% p.a. depending upon concerned tranche. Repayable in 30 years with moratorium of 10 years. Loan agreement (untied) signed between GOI & JICA and GOI provides the loan to DMRC through PTA Subordinate Debt will be repaid in five equal installments after the Senior Debt (JICA Loan) isl be fully

										repaid.
1	2	3	4	5	6	7	8	9	10	11
Phase IV (3 priority Corridors)	**2,664.90 (10.68%)**	**2,664.90 (10.68%)**	**DO**	**5,200.78 (20.85%)**	**DO**	**12,930.9 (51.83%)**	1,000 (4.00%)	59.51 (0.12%)	427.64 (1.71%)	**The rate of interest on JICA Loan is 1.15% p.a. for the first tranche signed on 26.03.2021.** **2.Repayable in 30 years with moratorium period of 10 years.** **Loan agreement (untied) has been signed between GOI & JICA and GOI provides the loan to DMRC through PTA** **The Subordinate Debt will be repaid in five equal installments after the Senior Debt (JICA Loan) will be fully repaid.**
Airport Express Line	995.42 (22.23%)	---	---	---	---	665.40 (14.87%)	----	---	1821.15 (40.67%)	N.A
Mumbai Metro Line -1	-	133 (3.31%)	Subordinated debt from holding co.	759 cr. (28.25 %r.)	Term loans from banks	1508 (56.12%)	567	-	Equity-Reliance Infra. Ltd. 379 cr	Bank Interest rate: 9.80% to 10.75% p.a. Repayment till March 2037
					ECB in foreign currency	420 (15.63%)				

Ahemdabad &Surat P.34-35	1,412 (13%)	1412 (13%)s	GoI GoG	578 (5%) 1305 (12%)	JICA	6066 (56%)	---	---	---	RoIon JICA loans – 1.4%p.a. Repayment – 30 years
Bengaluru Phase I	1983.26 (14.32%)	1983.26 (14.32%)	GoI	1089.94 (7.87%)	AFD	873.29 (6.31%)				
					JICA	3208.12 (23.17%)				
			GoK	3077.56 (22.19)	HUDCO	650 (4.69%)				
					BONDS	300 (2.17%)				
					Others	679.58 (4.96%)				
Bengaluru Phase II p.67 Innovative financing at p. 70&71	3868.35 (14.65%)	3868.35 (14.65%)	Sub debt +Other debt+GIA Other senior debt .Yet to be finalized	5114.65 (19.37%) 3,044.54 (11.53%)	Agence fancaise De Development (AfD) EIB AIIB JICA	1,440.00 (5.45%) 3973.40 (15.05%) 2,330.26 (8.83%) 1,352.94 (5.12%)	----	----	----	Floating 6 months Euribor + 130 BPS / (5+15) years Floating 6 months Euribor + EIB margin / (5+20) years Floating 6 months SOFR + AIIB Fixed : 1. 15% / (10+30) years Margin / (5+25) years
1	**2**	**3**	**4**	**5**	**6**	**7**	8	9	10	11
Kochi Phase I Aluva – Petta	753.73 12%	753.73 12%	Subordinate debt from GoI for central taxes Subordinate debt from GoK for central and state taxes & loand cost escalation. Loan from	248.50 1786.07 1349.00	AfD,France	1327.10 (50% of total debt)				RoI- 6 monthly EURIBOR +margin of 155 basis points No guarantee Can bank loan RoI 9.20% for borrowing sof Rs. 1170 cr with no guarantee 8.00% for addl borrowing of Rs.179 cr with guarantee from GoK RoI on loans from kerala stste

			Canara Bank Kerala State Co op bank HUDCO-Phase-I	(50%) Amount – NA Not given						coop bank is-9.75% RoI on lonas from HUDCO 9.75% for land acquisition 9.25% for works with guaran tee from state Govt of Kerala
Kochi Phase II JLN stadium to Info park P.79-81	274.90 (14%)	274.90 (14%)	Sub debt from GoI for Central taxes. Sub debt from GoK for taxes and land cost	63.85 280.28	Loans from bilateral and multilateral agencies	1016. 24 (100%)				Debt details are not finalized as the final approval from GoI is yet to be received. Percentage of total debt to cost 52%
Lucknow Metro Rail Phase I	1003 (15.43%)	1003 (15.43%)	-	-	European Investment Bank	450 million (Rs. 3502 cr)	245 cr	-	-	Repayment period of Principal amount shall be 20 years, with a moratorium period of 4 years @ 0.1610 to 0.2870%
Bhopal and Indore p.97	**Under construction/ implementation. Pp state Govt has released its equity contribution of Rs.227 cr for each of these projects. Financial closure is yet to be achieved.**									
1	2	3	4	5	6	7	8	9	10	11
Pune p.107	1310 (13.41%)	1310 (13.41%)	GOI* GoM* ULB*	644(5.64%) 946.2 (8.29%) 1210.8 (10.60%)	AfD, France &EIB, Luxembourg	5831.50 (59.70%)	Grants from ULB 28.50	32921 (as mentioned in DPR up to 2045-46	NIL	Pl see the addl information on loans given from col. 1-10

* The company has received interest free subordinate debt from GoI , GoM and ULB. European Investment Bank (EIB), loan of 600 Million Euro through Govt. of India for Pune Metro in 4 tranches. Loan agreement signed for the first tranche amounting to 200 Million Euro between GOI & EIB on 18.07.2019 and 22.07.2019 and second tranche of 150 Million Euro between GOI & EIB on 07.05.2021. The Project Agreement between EIB and the company was signed on 31.01.2020. The tranche-wise loan amount committed by EIB and loan drawn is as under: Euro 20 crore in first, ,15 crore each in second and third and 10 crore in fourth tranche Loans are repayable in two equal yearly installments over a period of 15 years after the expiry of moratorium period. The moratorium period is 5 years in respect of AFD Loans and 4 years in respect of EIB loan from the date of signing of loan agreement. AFD, committed to provide 245 Million Euro. for Pune project. The Loan agreement for Pune project first tranche for 180 Million EUR has been signed. Rate of Interest AfD loan - 6 months EURIBOR+ 1.20% margin p.a.EIB loan- six months EURIBOR +1.22% margin p.a									
Nagpur	Nagpur Metro Rail Project is yet to achieve financial closure.(p.115). However, at p. 116 data on release of share of GoM equity was given . Need clarification .Whether the Central Govt has equity stake in it is not clear. Need answers p.116. Ii has started commercial operations from 2018-19 (p.119) and is earning income also.									
1	2	3	4	5	6	7	8	9	10	11
Jaipur 138	1,337 Ph-IA 157 Ph-1B Equity of GoR 200.00 Equity of RHB &RIICO	NIL	Loan of GoR	266.00	ADB Loan	966 core (Phase1B)	Grant of GoR Rs.100.00 Grant of JDA for Ph 1A Rs.120 .00	NA	NA	Phase 1's cost - Rs 3149 cr. Phase 1Bs cost of Rs 1126 Cr is just one portion of it. Loan from ADB for Phase 1B.Lloan component is very low vs-a-vis over al cost of Ph-1.

Chennai p.150 **Ph-1**	3,125.78 17% (Phase-i)	3,125.78 17% (phase-i)	GoI GoTN SD	3482.36 19%	JICA	8646.00 47%	312.72	NA	NA	JICA's RoI is @ 1.20% / 1.40% and other subordinate debt fromGoTN& GoI are interest free loan.
Chennai Phase-I Extension	508.00 (13%)	508.00 (13%)	GoI GoTN SD	613 16%	JICA	2,141.00 57%	NIL	NA	NA	JICA is 1.40% and other subordinate Debtfrom GoTN&GoI are interest free loan
1	2	3	4	5	6	7	**8**	9	**10**	**11**
Hyderabad	NA	NA	Term loans from consortium of PSU banks	Rs.13,259cr - 89% of total debt	Nil	NIL	**VGF received of Rs.1204 Crs (6% of the total cost) out of the sanctioned grant of Rs.1458crs**	NIl	**Rs 4596 crs – 24% of the total cost**	**Current ROI – 9%** **- Repayment over 36 unequal quarterly installments** **- Security over all the assets of the company except project assets** **Pledge over 51% of the shares held by the promoter**

Kanpur Agra	**Financial closure has not been achieved**									
Agra										
Lucknow	NA	NA	NA	NA	NA	NA	**NA**	NA	**NA**	**NA**

Metro	**Equity (in absolute amounts as well as % of total cost)**		**Debt (in absolute amounts as well as percentage of total cost)**				**Grants from Central/ State Govts / others**	**Funds through Property Devp**	**Funds from private companies**	**Details of the debt such and Rate of Interest (RoI), repayment period , T&C of the repayment, guarantees given, if any , repayment period, tied debt or otherwise, other terms & conditions , etc.**
	GoI	**State Govt MMRDA % of total cost**	**Internal Sources**		**External Sources**					
			Details of the source	**Amount in absolute &% of total debt**	**Details of the source**	**Amount in abso lute &% of total debt**				
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**09**	**10**	**11**
Dahisar- D.N. Nagar Ml 2A	Not applicable	2,185 34%	Subordinate loan from GoI&GoM	758	ADB&NDB	2,803 44%	665	Not Given	Not Given	Not Given
DN nagar-MandaleML2B		3,727 34%		1,290	ADB&NDB	4,695 43%	1,274			
Wadala-Kasarwadavalli ML4		6,940 48%		1,861	KFW	3,916 27%	1,832			
Kasarwadavalli-Gaimukh ML4		518 55%		123	KFW	274 29%	35			
Thane – Bhiwandi ML5		4,707 56%		1,205	AIIB/OFID	2,357 28%	147			
Ssamanthanagar -Vikhorili ML-6		3,196 48%		876	NDB	1,700 25%	945			
Dahisar- Andheri ML7		2,622 42%		734	ADB&NDB	2,246 36%	606			
Dahisar-Mira Bhyander& Andheri ML9		3,337 51%		772	ADB&NDB	1639 25%	859			

Gaimukh- Shivaji Chowk ML-10		354 08%		1,304	JICA	2,818 63%	NIL			
Wadala-CSMT ML-11		2,754 32%		2,124	JICA	2,022 23%s	NIL			
Kalian-Dombivli Taloja ML12		798 14%		1,282	JICA	3,077 52%	NIL			

*** ADB and NDB approved the loan for Dahisar - Mira Bhayander& Andheri ML 9 but MMRDA has decided to make expenditure from saving of ML2A, ML2B & ML7**

**** Land will be provided by Government of Maharashtra.**

MMRDA- Mumbai Metro projects - Funding Status as on 31.01.2022

Sr. No.	Name of the Projects	Total Project Cost	External funding Agency.	Loan Sanctioned	Loan Sanctioned by Agency in INR Crores	Loan Released by Banks as on 31.12.2021 in INR Crores.	Loan Status	Repayment Start Date
1	Line 2A (Dahisar - D.N. Nagar) and Line 7 (Dahisar (East) – Andheri (East)) and Line 2B (D. N. Nagar - Mandale)	Line 2A-6410	Asian Development Bank and New Development Bank	USD 906 Million	6,653	1291.19	Agreements Signed with ADB on 01.03.2019 disbursement from Funding agency has started	15.08.2024
2		Line 7 - 6208		USD 260 Million. Remaining from MMRDA own fund	1,909	373.82	Agreements Signed with NDB on 26.12.2018 and disbursement from Funding agency has started	15.03.2024
3		Line 2B-10986						
4	Line 4 (Wadala – Kasarvadavali)	14,549	KfW Bank Germany	Euro 545 Million. Remaining from MMRDA own fund	4,190		Agreements Signed on 02.11.2020, disbursement will begin shortly.	15.11.2025
5	Line 4A (Kasarvadavali - Gaimukh)	949						
6	Line 5 (Thane-Bhiwandi-Kalyan)	8,417	Asian Infrastrucrture Investment Bank and OPEC Fund for International Development	USD 335 Million. Remaining from MMRDA own fund	2,357		Loan finalization under progress.	_
7	Line 6 (Swami Samarth Nagar – Vikhroli)	6,716	New Development Bank	USD 241 Million. Remaining from MMRDA own fund	1,700		Loan finalization under progress.	_

Sr. No.	Name of the Projects	Total Project Cost	External funding Agency.	Loan Sanctioned	Loan Sanctioned by Agency in INR Crores	Loan Released by Banks as on 31.12.2021 in INR Crores.	Loan Status	Repayment Start Date
8	Line 9 (Dahisar - Mira Bhayander & Andheri – CSIA)	6,607	MMRDA Own Funds	-	-		-	_
9	Line 10 (Gaimukh – Shivaji Chowk)	4,476	Japan International Cooperation Agency.	USD 395 Million. Remaining from MMRDA own fund	2,818		Loan finalization under progress.	_
10	Line 11 (Wadala – CSM Terminus)	8,739	Japan International Cooperation Agency.	USD 283.4 Million. Remaining from MMRDA own fund	2,022			
11	Line 12 (Kalyan - Dombivili – Taloja)	5,865	Japan International Cooperation Agency.	USD 431 Million. Remaining from MMRDA own fund	3,077			

Annexure-V

Data on physical features of Metro rail projects

(Rs in Crore)

Metro	No of stations	Length /Distance	Capacity in terms of Passenger per hour per direction (PPHPD) for 6 car train	Peak Hour Peak Direction Traffic (PHPDT)	Cost per KM (Rs in crore)				Project Type				Mode of execution	DPR prepare by
					Phase-I	Phase II	Phase III	Phase IV	Phase-I	Phase II	Phase III	Phase IV		
Patna	Elevated-08 UG- 06-CI Elevated-05 UG-07 C-II	17.933-CI 14.554-CII	60,000 As per 2018 DPR 67,000 As per revised DPR 20219(for both the corridors I&II)	14,481 & 14,516 as per 2018 DPR & revised DPR 2021	Corridor I&II 37.04 (elevated) 125 (UG)	NIL	NIL	NIL	Metro	NIL	NIl	NIL	EPC	RITES
Delhi	46- Ph I 35-PHII 31-PHIIExt 37-PHIII 36-PHIV Ext 27- PH IV	I-64.751 II-52.868 IIE incl NCR&AEL-70.432 III-106.386 IIIExt-53.684 IV- 65.10	This parameter is not maintained phase wise. Line wise info is as under: Line 1- 35,760 Line2- 58,600 Line 3&4 - 54,464 Line 5- 15,996 Line6-28,296 Line7-21,684 Line 8- 20,016 Line 9- 8,340 AEL- 6,600		Elevated 152.71	176.86	246.52	Estimated base cost 215.95	MRTS	MRTS	MRTS	MRTS Metrolite Kirtinagar – bamnoli Village 19Kms	EPC	RITES –I RITES-II DMRC-III DMRC IV
					UG 403.51	333.59	432.62	Estimated base cost 448.27						
					At grade 122.93	154.65	NIL	NA						
Ahmadabad	13 – Elevated 04 - UG 17- Total (C-I of Ph-I) east-west) 15elevated 00-UG Total-15 total	20.91-CI 19.12-CII (Phase-I) 22.83-CI 5.4-CII (phase-II)	Phase-I Thaltej Gam to Vstral Gam-19251 Gyaspur depot to Motera Stadium- 17778	19251-CI 17,778-CII (Ph-I) 5733-CI 1326-CII (Ph-II)	269.12	190.56	NIL	NIL	MRTS				SPV	DMRC

	(CII of Ph I) **20 Elevated 00-UG –CI 20-Total CI 02- elevated 00-UG 02-Total (CII) (Ph-II)**		**Phase-II Motera to Mahatma Mandir- 5733** **GNLU to Gift City- 1326**								
Surat	**Corridor -1 Elevated 14 UG 06 Total 20 Corridor -II Elevated 18 UG 00 Total 18**	**21.61-CI 18.74-CII**	**Sarthana to Dream City- 20856 (2031)** **Bhesan to Saroli- 12573 (2031)**	**20856 (2036)** **12573 (2036)**	**297.90**	**NIL**	**NIL**	**NIL**	**MRTS**		**SPV**	**DMRC**
<u>Bengaluru</u>	**Elevated-34 UG 07 Total -41 (Ph-I) Elevated-12 UG - 49 Total-61 (Ph II)**	**18.10- CI 24.20-CII (Ph-I) 75.06 (Ph IIof six Reachs)**	**R1&R2 ext 17863 & 25380 respectively** **R3&R4 Ext 25,380&27593 respectively** **Reach 5 – 17275 Reach 6- 16381**		**Elevated - 220 UG-488**	**Elevated – 262.93 UG- 618.02**	**NIL**	**NIL**	**MRTS**		**EPC**	**DMRC**
Kochi	**All are elevated**	**25.20 - Ph I 02.00- Ph IA 01.20-PhIB 11.20 –Ph-II**	**2015-38187 2020-46813 2025-53943 (Ph I. for others not given)**	**2015-13681 2020-17663 2025-21065 2030-23621 (Ph-I)**	**246.75* (Ph I)**	**355.45 * (Ph 1A)**	**373.60 * (Ph1B)**	**174.73 * (Ph-2)**	**MRTS**		**EPC, BOQ and PPP compone nents in all the phases.**	**DMRC- Ph I RITES -Ph 1A In house Ph- IB RITES revised by UMTC Ph II**
					***incl property Development at stations**							
Bhopal	Elevated -14 UG-02 Total -16 (C-I) Elevated-14	14.99 Km (as per GOI sanction) (Prposed 16.74 km	40,000 Ultimate capacity	40,000 Ultimate capacity	Elevated 211.77 UG 447.91 (C-I) Elevated	**NIL**			**MRTS**	**NIL**	**EPC**	M/s Rohit Associate Architect and Engineer

	UG-00 Total- 16	due to change in alignment) 12.88 km (as per GOI sanction) (Proposed 14.21 km due to change in alignment)			213.30 (C-II)							s Pvt Ltd in Consortium with LRTC GmbH, Germany. To meet the guidelines of New Metro Policy – 2017, Supplementary documents to DPR were prepared and submitted to Government of India for sanction.
Indore	Elevated-23 UG -06 Total-29	31.55 (as per GOI sanction) (31.46 km proposed due to change in alignment)	Ring Line 2031- 13060 2041- 17382 2054- 25526	2031-13060 2041-17382 2054-25526	Elevated 204.50 UG-456.70	NIL			MRTS			EPC	
<u>Pune</u>	**Elevated -25 UG-05 Total-25**	**17.534C-I 15.749C-II**	**27,480 as on 2021**	Corridor 1 2021-18961 2031-20035 Corridor 2 2021-8519 2031-10982	**321.5-C I 239.52CII incl land cost**	**NIL**	**NIL**	**NIL**	**MRTS**			**EPC**	**DMRC**
Nagpur	Elevated -35 UG-00 At Grade - 3 Of Ph-I	19.658 C I 18.557 C-II of Ph-I	Phase I (2041) Corridor I-15743 Corridor 2-	15,743 16,889 C-I&II of Ph-I	Elevated 248.12 At grade 105.5							**EPC**	**DMRC (Ph-I) Maharashtra**

	Elevated -30 UG-NIL At Grade -2 of Ph-II	Corridor 1A:- 18.7 km Corridor 2A:- 13 km Corridor 3A:- 6.6 km Corridor 4A:- 5.5 km of Ph II	16889 Phase II (2041) Corridor1A - 5695 Corridor 2A- 11445 Corridor 3A- 5137 Corridor 4A- 5213	respectively by 2041 5695, 11445, 5137 & 5213 in C IA, 2A,#A & 4A respectively of ph II by 2041	(Ph I) Elevated 155.18 UG-Nil At grade- 84 (Ph II)									**metro Rail Corporation Ltd. (Ph-II)**
Nashik **111-112**	**Elevated - 30 UG-NIL At grade -NIL**	**22-C-I 10 C-II**	Corridor 1- 6000 (2023) 10800 (2041) Corridor 2- 2800 (2023) 4900 (2041)	6000 in 2023,10800 by 2041(C-I) 2800in 2023&4900 in 2041	Elevated 65.38 UG-Nil At Grade- NIL	NIL	NIL	NIL	Metro Neo					EPC	Maharashtra metro Rail Corporation Ltd.
Mumbai	Elevated - 12,17, 20,1,30, 15,13,13,2 &9 in line 1-9 respectively. UG stations are there in line 3 only . 20 UGs in Line3.	Line 1- 11.40 Line 2A - 18.60 Line 2B - 23.64 Line3 -33.5 Line 4-32.32 Line5-24.90 Line6 14.5 Line 7- 16.50 Line 8-12.70 Line9- 13.50	***mentioned below the table	72,000	**206.67, 344.6, 465.5, 690.6,450.4, 338,463,376for Lines 1-7 respectively .** **Line8 –not given** **Line-9 -378.83**				MRTS (All Lines)					EPC	Lines 1-2B, 4 & 6-9 DMRC Line3- RITES Line5 M/s. D'appolonia S.P.A & Tata Consulting Services Ltd.
<u>Jaipur</u>	**Elevated -08 UG-01 Total 09 (PhIA)**	**9.13 – elevated 0.50- UG 9.63 –Total (Ph IA)**	**2014- 11264 2021- 16376 2031- 27750**	**2014- 11264 2021- 16376**	**Elevated- Not given UG-1126**				**MRTS**					**EPC**	**<u>DMRC</u>**

	Elevated –NIL UG-02 Total -02 (Ph I B)	**Elevated-00 UG2.01 Total 2.01 (Ph I B)**		**2031- 27750**	**At Grade- Nil**					
Chennai	**Elevated -11 UG-12 Total- 23 (Corridor-1) Elevated -08 UG-09 Total -17 (Corridor II) Elevated -20 UG 30 Total -50 (Corridor –III) Elevated- 18 UG-12 Total-30 (corridor –IV) Elevated 42 UG-08 Total 50 (corridor V)**	**32.13 & 21.95 of Corridor 1&2 respectively of Ph-I 45.80, 26.10&47.0 kms of Corridors 3,4 &5 of Ph II**	Corridor 3 2025- 16289 2035- 22115 2045- 24301 2055- 27361	Corridor 3 2025- 16289 2035- 22115 2045- 24301 2055- 27361	276 (Ph-I) 255 (Ph I Ext)	295 (PhII)	**NIL**	**MRTS**	**EPC**	**DMRC Ph-I RITES (Ph II)**
			Corridor 4 2025- 11707 2035- 18944 2045- 23816 2055- 29940	Coridor4 2025- 11707 2035- 18944 2045- 23816 2055- 29940						
			Corridor 5 2025- 17539 2035- 24528 2045- 29441 2055- 35714	Coridor5 2025- 17539 2035- 24528 2045- 29441 2055- 35714						
Hyderabad L&T	**27, 9 &23 in corridors1,2& 3 respectively**	**29,11&29 in corridors 1,2 &3 respectively**	**50000, 35000 and 50000 in corridor 1,2 &3 respectively.**		**275 elevated**			**MRTS**	**DBFOT**	
Lucknow	**Elevated 17 UG -04 Total -21**	**22.878 Ph IA**	**2019- 11396 2025- 25890 2030- 34955 2041- 44408**		**Elevated -193.022 UG- 449.20**			**MRTS**	**SPV**	**DMRC**

Kanpur	**Elevated- 14 UG-07 (C-I) 04 each of elevated and UG (C-II)**	**23.785 C-I 8.6 C-II**	**Corridor-1 2024- 12628 2031- 21300 2041- 27,900 Corridor- 2 2024- 8783 2031- 17800 2041- 20,800**		**Elevated -202.29 UG- 445.82**	**MRTS**	**SPV**	**RITES**
Agra	**Elevated -06 UG-07 Total -13**	**14- C-I 15.4 -CII**	**Corridor-1 2021- 7140 2031- 15300 2041- 19,400 Corridor- 2 2021- 9940 2031- 18700 2041- 23,300**		**Elevated -178.342 UG- 369.48**	**MRTS**	**SPV**	**RITES**
Kolkata	**Line1 – 32.13 Line2 -07.0 (east West metro corridor) Line2 (under Construction) -9.34 Line 3-14.32 Line 4- 18.13 Line 5(on hold)-12.50 Line6 -29.87**	**11,6, 0,8,6,11&23 nos Elevated in r/o Lines 1-6 15,1,05,04,0 4,0,1 nos in UG in r/o Line 1-6.**	**Line1- 34,200 Line 2 23829 in 2025 Line3- 17280 Line4- 7420 Line5-17280 Line6-17280**	**Line 1- 42750 Line 2- 32386in 2025 Line3 – 15100 Line 4- 15290 Line5- 15000 Line 6- 16000**	**110, 308,308,255.76,190.69, NIL,146.87 in r/o elevated of Lines1-6 100, 630,630,341.04,450,NIL,NIL in r/o UG of Line1-6**	**MRTS**	**EPC**	**Line1-2 Railways Lines 3-6 RITES**

***PHPDT details for various metro rail lines in Mumbai				
Metro Line	**Corridor**	**PHPDT**		**Remarks**
		2021	**2031**	
1	Versova Ghatkoper	45000		
2A	Dahisar to D.N. Nagar	11560	15565	
2B	D.N. Nagar to Mandale	35141	38509	

3	Colaba-SEEPZ		72000	
4	Wadala to Kasarwadavali	28107	33417	
4A	Kasarwadavli to Gaimukh	27570	30708	
5	Thane-Bhiwandi-Kalyan	17957	26143	
6	SwamisamarthNagar to Vikhroli	24716	29658	
7	Andheri(East) to Dahisar(East)	18086	18584	
8	CSMIA to Mankhurd	-	-	Draft DPR received from DMRC
9	Dahisar to Mira Bhayander/Andheri to CSMIA	24585	30389	
10	Gaimukh to Shivaji Chowk	47102	48122	
11	Wadala to CSMT	32460	36635	
12	Kalyan to Taloja	5761	9156	
13	Shivaji Chowk (Mira Road) - Virar	-	-	DPR beingfinalized

Annexure- VI

STATUS OFLAST MILE CONNECTIVITY

Metro name	First and Last mile connectivity					
	Pedestrian walkways	**Non motorized transport (NMT) infrastructure**	**Facilities for para transit modes**	**Stations for public bike sharing**	**Infrastructure for feeder buses**	**Parking space for personal vehicles**
Patna *	YES	NA	NA	NA	Provisioned in DPR	NA. Parking provided at one station in Corridor II
Delhi	Available at all stations	E cycles service E rickshaw E rick charging stations	Bus stop, kerb cuts, drop off points, ramped access, signage, lighting , etc	E cycle service	Electric feeder bus CNG bus depots	Available at 114 stations
Ahmedabad	Ahmadabad Metro is being planned as a Multi-modal system, where the proposed Metro complements the existing BRTS, AMTS services and other means of Transport for last mile connectivity in the city of Ahmedabad. Usage of auto rickshaws, buses, GRSTS, cab services will be reduced significantly post operation of Project. Annual Fuel Cost and annual Vehicle Operating Cost saved by Metro Passengers are around 80% as per DPR.					
Surat	Gujarat metro rail Corpn. Ltd. has informed that consultant has been appointed for the comprehensive feasibility study and multi modal integration proposals for all 38 stations of Surat Metro Rail Project.					
Bengaluru	yes	In Phase 1, at most of the Metro Stations, well paved and continuous footpaths have been provided in and around the Metro stations. FOBs also have been constructed at various Metro Stations for seamless movement of pedestrians. In phase 2 also it is proposing to provide the similar facilities.	BMRCL has allocated space for the app based taxis and three wheelers in the design stage itself for Phase 2 Metro Stations.	BMRCL has provided space for parking Yulu bikes/PBS and bicycles at 40 Metro Stations. BMRCL is also encouraging EV (electric vehicle) players in 3W and 2W segment. Provision of charging for first and last mile electric vehicles at metro stations are explored in case of 10 metro stations.	Currently, 56 feeder buses are plying on 12 routes at/from 12 metro stations. Further, a total of 90 electric buses as feeder services to Metro has been planned. Stopping and idling space for feeder services have been planned at phase 2 metro stations also. The bus stops are planned closer to the Metro Stations so as to minimize the walking distance and time.	In Phase 1, BMRCL has provided parking space at 26 metro stations to park 10,079 two wheelers and 1789 four wheelers.In Phase II, provision for parking for 1565 two wheelers and 380 four wheelers has been provided at 4 Metro stations and similarly provision for parking for 661 two wheelers and 23 four wheelers have been provided at 3 metro stations.

Kochi	Yes .49.3 kms planned/ in operation in all the phases	2.2 km Cycle track. Provided 1000 bicycles (MYBYK) at different stations.	Conventional auto available at Metro station and E auto are available at one station	NIL	Feeder Electric bus from Aluva Metro station to Airport. Also proposal for 8 Electric bus is under process	34737, 5154 and 3800 sq.Kms of parking space at 22, 2 and 1 stations of ph1, 1A and IB respectively is made available.
Bhopal	**Under Construction. Proposed to provide these facilities**					
Indore						
Pune	Yes.Parking spaces in Development plan of Pune are identified and proposed to Planning Authority for development. Parking spaces in possession of Maha Metro are being developed.					
Nagpur	Yes. At all stations	Cycle parking is provided at all stations	Pick up and Drop off bays for para transit modes are provided at all Stations	Ensured public bike sharing at stations duly entering an MoU with bike operators.	Pick up and drop off bays for feeder buses are provided at all Metro Stations with signages.	Provided at all stations
	These are proposed to be provided in all the phases which are under implementation.					
Nashik	These are proposed to be ensured during design and commissioning.					
Jaipur	Provided at all 11 stations	NMT infrastructure facility is available at nearby to all metro stations.	Para transit modes like low floor bus services etc. are available at nearby to all metro stations.	station areas are available for public bike sharing spaces	Feeder buses from nearby catchment areas are available to metro stations.	Parking facility is available at all Phase-1A's 9 stations.
Chennai	Yes	Yes (Bicycle facilities are available)	Yes	Yes	Yes	Yes
	Chennai Metro has informed that it ensures for all passengers travelling through Metro safe, efficient and comfortable journey. Chennai Metro Rail Limited provides seamless travel experience to its commuters by extending its service through Last Mile connectivity. To ensure the same CMRL has Bi-cycle, smart Bikes, E bikes, Howdy bikes, Feeder buses, all CMRL stations are connected with Metropolitan Transport Corporation (MTC) buses and MTC is also running 13 Para transit buses.					
Hyderabad	YES	YES	YES	YES	YES	YES
Lucknow	YES	YES	**YES**	**yes**	Not available	Available at 16 stations.
Kanpur	**Planned**					
Agra						
Kolkata	All these facilities are not available at all the stations in the existing stations. These are proposed to be provided in the projects in design and implementation stages.					

*Patna Metro has informed that Multi Modal Integration and drop off facility is planned in Patna Metro Rail Project.

Annexure- VII

PBT AND PAT OF VARIOUS OPERATING METRO NETWORKS FROM 2010-11 TO 2019-20 except Delhi Metro

Rs. in Cr.

Year	2015-16		2016-17		2017-18		2018-19		2019-20		2020-21	
	PBT	PAT	PBT	PAT	PBT	PAT	PBT	PAT	PBT	PAT		
Patna												
Bengaluru	NA	NA	-457.57	-457.57	-351.10	-351.10	-496.54	-496.54	-595.67	-595.67	-902.54	-902.54
Mumbai Metro Line 1	286.89	286.89	273.50	273.50	238.29	238.29	235.57	235.57	242.13	242.13	419.69	419.69
Ahmedabad	**Not operational**						NA	NA	NA	NA	NA	NA
Kochi	**Not Operational**				-16733.74 lakhs	-16733.74 lakhs	-28123.30 lakhs	-28123.30 lakhs	-31001.83 lakhs	-31001.83 Lakhs	-33440.66 lakhs	-33440.66 Lakhs
Bhopal	Not operational											
Indore	Not operational											
Pune	Will commence operations in December, 2022											
Nagpur	Since about 69%metro length is operational at present this figure can not be evaluated till entire project is operational. P.112.											
Nashik	Project is under sanction											
Jaipur	90.20	70.28	69.03	89.29	51.48	51.69	52.97	52.97	39.65	39.65	57.91	57.91
Chennai	-80.61	-7073.10	-9,394.14	2,341.09	-22,964.21	34,320.30	-42,206.81	-42,235.50	-52,519.85	-52,714.21	NA	NA
Hyderabad	2.91	2.91	3.54	2.82	-58.36	-58.35	-147.32	-148.87	-382.21	-377.35		
Lucknow	Not operational								-25026.85 lacs	-25026.85 lacs	-32984.69 lacs	-32984.69 lacs

Annexure- VIII

PBT AND PAT OF DELHI METRO RAIL CORPORATIONS FROM 2010-11 TO 2019-20

(Rs.in crore)

Year	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
Profit/Loss Before Tax (PBT)	(-) 12.70	(-) 68.10	(-)7.94	(-)60.74	(-)275.46	(-) 470.74	(-) 348.15	(-) 144.98	(-) 764.32	(-)626.24
Profit/Loss After Tax (PAT)	(-) 413.86	(-) 185.15	(-) 90.91	(-) 99.80	(-) 104.79	(-) 296.77	(-) 229.35	(-) 94.99	(-) 464.04	(-) 468.27

Annexure- IX

FINANACIAL RATE OF RETURN (FIRR) AND ECONOMIC RATE OF RETURNS(ERR)

<table>
<tr><th>Metro</th><th>Financial Internal Rate of Return (FIRR)</th><th>Economic Internal Rate of Return (EIRR)</th><th>Remarks</th></tr>
<tr><td>Patna</td><td colspan="2">Under construction</td><td></td><td></td></tr>
<tr><td>Delhi</td><td colspan="2">
<table>
<tr><th colspan="2">Project</th><th>FIRR (without taxes)</th></tr>
<tr><td colspan="2">Phase-I (including Dwarka Sub-city)</td><td>5.1%</td></tr>
<tr><td rowspan="4">Phase-II</td><td>Within Delhi (including Dwarka Sec-9 to 21)</td><td>8.18%</td></tr>
<tr><td>Metro Extension to Noida</td><td>1.17%</td></tr>
<tr><td>Metro Extension to Gurgaon</td><td>2.23%</td></tr>
<tr><td>Metro Extension to Vaishali</td><td>-</td></tr>
<tr><td rowspan="9">Phase-III</td><td>Within Delhi (including Metro Extension to Shiv Vihar)</td><td>0.93%</td></tr>
<tr><td>Dwarka-Najafgarh</td><td>1.18% (#)</td></tr>
<tr><td>Mundka to Bahadurgarh (Delhi Portion)</td><td>6.04%</td></tr>
<tr><td>Mundka to Bahadurgarh (Haryana Portion)</td><td>2.29%</td></tr>
<tr><td>Metro Extension to Faridabad</td><td>0.69%</td></tr>
<tr><td>Metro Extension toBallabhgarh</td><td>-</td></tr>
<tr><td>Najafgarh to Dhansa Bus Stand</td><td>-</td></tr>
<tr><td>Noida City Centre to Sector-62</td><td>2.03%</td></tr>
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	<table><tr><td></td><td>Kalindi Kunj to Botanical Garden</td><td>1.11%</td></tr><tr><td></td><td>Dilshad Garden to Ghaziabad New Bus Adda</td><td>2.90%</td></tr><tr><td>Phase-IV</td><td>(3 Priority corridors)</td><td>8.03%** 9.60%^</td></tr></table> (#) with taxes;(**) Without additional TOD and VCF income;(^) With additional TOD and VCF income				
Ahmedabad	Phase I- 7.44%*; Phase II - 2.12%*(*As per DPR)				
Surat	5.74% (As per DPR)				
Kochi	3.04% (Ph-I) 4.52% (Ph-IA)	5.63% (Ph1B) 5% (Ph-2)	14.2% (Ph-I) 14.16% (Ph 1A)	14.23% (Ph-IB) 16.24%(Ph-II)	
Pune	6.90%				
Nagpur	10.35 % (Ph-I) 12.00% (Ph II)		**17.70 % (Ph-I) 18.96% (Ph-II)**		
Nashik	17.02%		**16.26%**		
Mumbai	Line1- 7.56% Line2 -8.65% Line 2A- 10.78% lIne-3- 2.17% Line 4- 8.22%	Line5- 6.02% Line6- 8.46 Line7- 8.43 Line-817.4% Line9- 11.12%	17.93 (Line3) **For other lines the data is not given.**		
Jaipur	8.24%		18.6%		
Hyderabad					
Lucknow	with PD-8.12% without PD-4.43,		19.43%		
Kanpur	8.89%		18.48%		
Agra	10.07%		17.32%		
Kolkata	1.1% (Line2)		14.53% (Line2)		No info was given in respect of other lines.

Annexure- X

AVERAGE DAILY EARNINGS required for breakeven AND actual AVERAGE DAILY EARNINGS of all metros except Delhi

(Rs.in crore)

Year	2015-16		2016-17		2017-18		2018-19		2019-20		2020-21		Remarks / comments
Metro	ADE ForBE	Actual ADEs	ADE forBE	Actual ADEs	ADE ForBE	Actual ADEs	ADE forBE	Actual ADEs	ADE forBE	Actual ADEs	ADE ForBE	Actual ADEs	
Delhi	3.86	5.97	4.39	5.97	5.72	8.29	7.00	9.82	8.58	10.95			
Bengaluru (Rs in lakh)	-----	-------	155.53	30.16	228.59	76.99	265.19	97.27	285.27	105.87	462.01	23.88	
Kochi Rs in lakh	NA	NA	NA	NA	18.75	18.75	12.89	12.89	20.02	20.02	34.03	34.03	
Hyderabad (Rs in lakh)	NA	NA	NA	NA	NA	25.21	683	46.90	683	102.76	NA	NA	
Chennai	NA	NA	---	3.66	---	8.48	---	17.82	---	34.22	---	15.30	Rs. in lakhs

Annexure- XI

AVERAGE DAILY EARNINGS REQUIRED FOR BREAKEVEN AND ACTUAL AVERAGE DAILY EARNINGS IN R/O DMRC

(Rs. in crore)

Actual Average Daily earnings	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
	2.57	3.50	4.17	4.51	4.99	5.57	5.97	8.29	9.82	10.95*****
Average daily earnings Required for Break even **^**	1.39	1.71	2.35	2.71	3.35	3.86	4.39	5.72	7.00	8.58

* Due to Covid-19 pandemic, the operation of Delhi Metro was closed on account of nationwide lockdown declared by Government *w.e.f.* 22nd March 2020

^The break even covers the operating expenses (Energy, Salaries &wages and Maintenance & other cost) and excludes JICA Payment (Interest & Repayment of loan) and depreciation & amortization expenses.

Annexure- XII

SOURCES OF REVENUE - FARE BOX COLLECTIONS

Name of metro Rail	Year	Revenue generated through											Discounts offered, if any
		Tokens' (for single journey) fares				Smart cards (Store Value cards)			Tourist Smart cards		Group tickets		
		Zone	Distance from origin	Fare (Cr. Rs.)	Validity (Business days)	Recharge value (Cr. Rs)	Gained value (Rs)	Validity (Rs)	Value Rs)	Validity	Value	validity	
Patna	**Under construction**												
Delhi Metro Rail Corporation (Phase-I,II & III)	10-11			328.07		418.52							a) DMRC offered 10% discount for those passenger using DMRC smart card for travelling purpose. b) In addition to (a) above, an additional discount of 10% on smart card is being provided during non-peak hours, Further, there is special discounted fare on sunday and

													National Holiday. The above discount is offered from 10.05.2017.
	11-12	-	-	398.53	-	617.77	-	-	-	-	-	-	
	12-13	-	-	423.99	-	799.01	-	-	-	-	-	-	
	13-14	-	-	438.70	-	926.14	-	-	-	-	-	-	
	14-15	-	-	506.44	-	999.31	-	-	-	-	-	-	
	15-16	-	-	548.35	-	1,100.84	-	-	-	-	-	-	
	16-17	-	-	554.44	-	1,210.94	-	-	-	-	-	-	
	17-18	-	-	791.55	-	1,821.25	-	-	-	-	-	-	
	18-19	-	-	897.66	-	2,221.36	-	-	-	-	-	-	
	19-20	-	-	920.52	-	2,468.61	-	-	-	-	-	-	
GMRCL	19-20		0-2.5 2.5 to 5.33	05-10	01	5years fromlast sale or recharge			0	0	25880	Business day	
	20-21		0-2.5 2.5 to 5.33	05-10	01				0	0	1600		
	21-22		0-2.5 2.5 to 5.33	05-10	01				0	0	7610		
Bengaluru	Not furnished the info in the desired format												
Kochi	2017	NIL	ALVA-PARV :13 Km (19.06.2017 – 02.10.2017)	40	01	2682873	986998	3years	0	1business day	---	---	RJT for 40 days with 50%

													discount
	2017	NIL	ALVA-MACE:18 Km (03.10.2017 – 31.12.2017)	50	01	6730021	4018769	3 year	0	1 business day			
	2018	NIL	ALVA-MACE:18Km (01.01.2018 – 31.12.2018)	50	01 business day	51595976	37639802	3 year	0	1 business day	389771	13359159	Free ride to all commuters on 19.06.18
	2019	NIL	ALVA-MACE:18Km (01.01.2019 – 03.09.2019)	50	01	74250554	42489331	3 year	0	1 business day	208620	6939096	
	2019	NIL	ALVA-TKDM:23.66 Km (04.09.2019 – 31.12.2019)	60	1	74237370	40401955	3 year	134875	1 business day	148864	4541677	50% discount for SJT, RJT and E-Purse for 15days. 20% discount for SJT,RJT and 25% for E-Purse for 12 days
	2020	NIL	ALVA-TKDM:23.66 Km (01.01.2020 – 06.09.2020)	60	1 business day	59223792	29422809	3 year	123125	1 business day	110297	3611090	

	2020	NIL	ALVA –PETT: 24.78Km(07.09.2020 - 31.12.2020)	60	1 business day	40352562	12288699	3 year	52125	1 business day	958	32860	
	2021		ALVA – PETT:24.78Km(01.01.2021 – 20.09.2021)		1 business day	66106257	35301736	3 year	163250	1 business day	25286	824490	
Bhopal and Indore	Metro rail projects are under construction												
Pune	Metro rail project is under construction												
Nagpur	18-19	NIL	NIL	7.37* Lacs	---	0.00	0.00	--	--	--	0.03	NIL	
	19-20			149.84*	---	2.19 Lacs	1.27	--	--	--	6.15	NIL	
	20-21			147.73*	---	13.79 Lacs	8.91	--	--	--	7.70	Nil	
	*Total fare + total of col 8&12.												
Mumbai	No data was furnished in the format sought in r/o Line-1-9 of Mumbai metro												
Jaipur	15-16			74967335		10042390			15100		61486	739022	
	16-17			69171370		13903385			15100		26810	278829	
	17-18			68669413		13155355			33100		21928	265409	
	18-19			76246112		12846539			42800		19284	206415	
	19-20			72871137		14009385			18300		36381	466465	
	20-21			18721130		6495250			89500		867	11471	
	21-22 **(UPTO Sept-**			18792666		4867270			12200		913	10051	

	21)											
Chennai	2015	Line 2 (SKO-SAL)	9.365 km	5,25,69,716	Single day	1,00,48,535	-	1 year	1,97,400	1 day/30 days	4,86,459	Single day
	2016	Line 1 (SAP-SLM) L22 (SKO-SMM)	18.35 km	8,60,33,868	Single day	2,28,79,695	-	1 year	5,46,450	1 day/30 days	5,64,372	Single day
	2017	Line 1 (SAP-SLM) Line 2 (SNP-SMM)	24.825 km	11,18,51,670	Single day	16,33,26,151	-	1 year & 5 years (from Sep 16, 2017)	40,11,230	1 day/30 days	46,88,564	Single day
	2018	Line 1 (SAP-SGM) Line 2 (SCC-SMM)	34.374 km	23,67,89,788	Single day	28,31,16,998	-	5 years	66,65,300	1 day/30 days	1,75,62,528	Single day
	2019	Line 1 (SAP-SWA) Line 2 (SCC-SMM)	45.1 km	54,84,73,870	Single day	54,90,66,755	-	5 years	2,19,10,340	1 day/30 days	2,07,14,280	Single day
	2020	Line 1 (SAP-SWA) Line 2 (SCC-SMM)	45.1 km	18,61,94,659	Single day	26,79,78,096	-	5 years	62,33,200	1 day/30 days	49,22,762	Single day
	2021	Line 1 (SAP-	54.151		Single	26,26,12,6	-			1 day/30		Single

		SWN) Line 2 (SCC-SMM)	km	23,29,59,131	day	68		5 years	50,03,850	days	80,02,140	day	
	Token fare value calculated based on average fare for the year 2015-2019: * For the year 2015 - Rs.23.3;**For the year 2016 - Rs.29.16;***For the year 2017 - Rs.35;****For the year 2018 - Rs.40.83and,*****For the year 2019 - Rs.35												
Hyderabad	17-18	Not mentioned	Not mentioned	22.6cr	One business day	06	No validity	NA	NA	NA	NA	NA	10% discount on Smart Cards for every single journey
	18-19	DO	DO	109.80	-Do-	56.58	DO	NA	NA	NA	NA	NA	
	19-20	DO	DO	173.92	-Do-	196.12	DO	NA	NA	NA	NA	NA	
	20-21	DO	DO	41.45	-Do-	42.83	DO	NA	NA	NA	NA	NA	

Name	year	Singles Journey Token (SJT) (with one day validity)	Smart card (valid for for one year w.e.f. recharge date)	Tourist card (1 day validity)	Tourist card (3 day validity)	Group tickets (1 day validity)	**Discounts**
Lucknow Metro		sale amount (in lacs)	SV Recharge value amount	Amount (in lacs)	Amount (in lacs)	Amount (in lacs)	
	17-18	397.67	48.90	0.002	0	1.79	10% discount on each trip by smart card.
	18-19	958.50	164.31	0.730	0.048	2.27	
	19-20	4170.99	1364.00	1.993	0.910	5.31	
	20-21	1161.87	442.13	0.335	0.463	0.71	
	21-22	905.94	293.14	0.285	0.175	0.53	

Annexure- XIII

Sources of revenue other than Fare Box Collections

Name of the metro	Fin. Year	Fare/ ticket sales		Property development		Advertisements		Any others		Comments ,if any
Patna	**Under construction**									
Delhi MRTS project (Phase-I,II& III)		Amount	% of total revenue	Amount	% of total revenue	Amount	% of total revenue	Amount	% of total revenue	Other sources of revenue include property business, feeder buses, consultancy works and external projects
	2002-03	2.48	44.16%	1.80	32.05%	NA	0.00%	1.34	23.78%	
	2003-04	12.75	29.37%	24.00	55.28%	NA	0.00%	6.67	15.35%	
	2004-05	45.93	70.17%	6.01	9.18%	Included in Property business		13.52	20.65%	
	2005-06	101.38	24.16%	296.22	70.58%	7.65	1.82%	14.42	3.44%	
	2006-07	191.55	39.82%	251.80	52.34%	14.69	3.05%	23.02	4.79%	
	2007-08	246.31	54.70%	153.45	34.08%	25.19	5.59%	25.33	5.62%	
	2008-09	298.08	44.76%	244.99	36.79%	32.15	4.83%	90.77	13.63%	
	2009-10	413.30	61.48%	29.27	4.35%	31.18	4.64%	198.50	29.53%	
	2010-11	746.59	51.74%	98.37	6.82%	56.57	3.92%	541.38	37.52%	
	2011-12	1016.30	52.13%	57.26	2.94%	78.00	4.00%	798.01	40.93%	
	2012-13	1223.00	50.51%	45.88	1.89%	81.00	3.35%	1071.59	44.25%	
	2013-14	1364.84	46.23%	60.95	2.06%	75.16	2.55%	1451.07	49.16%	
	2014-15	1505.75	49.91%	53.59	1.78%	77.07	2.55%	1380.56	45.76%	
	2015-16	1649.19	43.19%	55.75	1.46%	102.05	2.67%	2011.83	52.68%	
	2016-17	1765.38	37.02%	82.30	1.73%	115.51	2.42%	2806.11	58.84%	
	2017-18	2612.80	47.66%	91.50	1.67%	129.61	2.36%	2648.72	48.31%	
	2018-19	3119.02	54.78%	97.28	1.71%	145.86	2.56%	2331.94	40.95%	
	2019-20	3389.13	56.95%	112.62	1.89%	147.02	2.47%	2302.22	38.69%	
GMRL	2018-19	3,81,439	97.44	10,000	2.46	---	---	---	---	
	2019-20	27,88,000	95.87	1,20,000	4.13	----	---	---	---	
	20-21	07,09,860	78.64	1,20,000	21.36	---	---	---	---	
	21-22 (till 30.9.21)	7,09,860	100%							

Bengaluru	**Data not furnished in the given format.**									
Kochi 87	17-18	446663000	78.14	9113657.13	1.59	15191433.04	2.66	10,06,34,028.01	17.61	Any others - includes mainly Semi naming Rights, AFC Royalty Premium etc
	18-19	813720000	66.86	50709418.38	4.17	104947726.17	8.62	24,76,73,206.33	20.35	
	19-20	567712727.45	60.38	48586862.91	5.17	60121208.15	6.39	26,38,76,924.09	28.06	
	20-21	128986881.2	32.27	26921334.68	6.74	17326945.5	4.34	22,64,62,681.12	56.66	
Bhopal	**Under construction / implementation**									
Indore										
Nagpur	2018-19	7.37	0.70	208.70	19.80	0		837.82	79.50	NIL
	2019-20	149.84	3.09	813.56	16.80	6.79	0.14	3873.04	79.97	
	2020-21	147.73	7.02	211.87	10.09	2.75	0.13	1739.78	82.76	
Mumbai Metro Line 1	2014-15	122.08	89.65	-	-	5.30	3.89	8.79	6.46	-
	2015-16	188.43	89.63	-	-	8.62	4.10	13.19	6.28	-
	2016-17	212.73	89.69	-	-	11.07	4.67	13.37	5.64	-
	2017-18	254.48	87.32	-	-	13.96	4.79	22.99	7.89	-
	2018-19	293.24	88.89	-	-	15.60	4.73	21.04	6.38	-
	2019-20	300.42	86.73	-	-	13.80	3.98	32.17	9.29	Metro Operation shut down for 10 days due to Covid19 Pandemic
	2020-21	26.10	50.92	-	-	6.01	11.72	19.15	37.36	Metro

										Operation shut down for more than 200 days due to Covid19 Pandemic	
Mumbai Line3	MMRCL has signed station semi-naming rights contracts with the winning bidders recently under Non-Fare Box Revenue (NFBR). In all, 5 stations have been awarded in the first phase. The metro stations are Bandra Kurla Complex (BKC) and CSMT (VT) stations awarded to Kotak Mahindra Bank, Churchgate and Hutatma Chowk (Fort) stations to Life Insurance Corporation (LIC) and Siddhivinayak station to ICICI Lombard. The winning bids in the form of annual license fee are in the range of ₹ 5 to 11 crores, with the highest bid being received for BKC station. With this MMRCL has successfully secured ~₹ 40 crore annual revenue (5 year cumulative Rs 200 cr +) from the 5 winning bids. These rights awarded are for a period of 5 years from RoD The winning brand will get 300 sqm of branding space, up to 20 sqm of kiosks space, rights to colour the station with the brand colour theme, mention in station announcements and station maps, large logo and name at the main entrances, in addition to pre-fixing of their brand name to the station name all across the station.									Info in r/o other lines not given.	
Jaipur	15-16	85763847	Not given	8425027		100000	Not given	1334775	Not given	43190	Revenue from Feeder Services
	16-17	83368684		14741482		2963429		2443662		329975	
	17-18	82123277		19765856		13697961		2954932		87305	
	18-19	89341866		18700195		77615248		3313002		120691	
	19-20	87365287		19294956		5391321		3543229		324904	
	20-21	25317351		12583650	Not given	6728361		1310380		22976	
	21-22 (Tillsept,21)	23682187		Not given		Not given		Not given		Not given	
Chennai	15-16	10.70	81.6	2.41*			18.4	It earned Rs. 1.09, 2.25 and 5.18 crore by		Data on non	
	16-17	13.81	65.0	7.44*			35.0				

	17-18	29.73	42.0	41.01*			58	awarding naming rights in r/o 02, 03 and 08 stations respectively.		fare box revenue (property Devp and Advts Put together).
	18-19	66.62	77.3	19.60*			22.7			
	19-20	127.97	74.4	37.29*			22.6			
Hyderabad	17-18	28.6	41%	4.62	7%	16.33	23%	19.98	29%	
	18-19	166.41	52%	92.21	29%	29.56	09%	30.28	10%	
	19-20	370.04	62%	135.83	23%	53.68	09%	38.65	06%	
	20-21	83.98	37%	60.12	26%	21.38	09%	62.47	27%	
Lucknow	17-18	435.45	73.76	4.57	0.77%	115.38	19.54%	34.98	5.93%	
	18-19	1079.96	48.70	57.49	2.59%	366.56	16.53%	713.40	32.17%	
	19-20	5473.31	73.56	566.57	7.61%	712.40	9.57%	688.30	9.25%	
	20-21	1594.00	53.49	493.92	16.57%	476.71	16.00%	415.26	13.94%	
Kanpur	Under construction									
Agra	Under Construction									

Annexure- XIV

GENERATION OF REVENUE THROUGH NAMING RIGHTS OF METRO RAIL STATIONS

Metro Rail Network	Policy	Data on Revenue generated through naming rights (co branding) (Rs. in crore)						
		2015-16	2016-17	2017-18	2018-19	2019-20	**20-21**	
Delhi	..there is no dedicated policy for generating revenue from naming rights of Metro stations. DMRC floats open E-tender to award the contracts for naming rights of metro stations. DMRC also share its revenue for outdoor advertisement space allotted under the naming right contracts with concerned MCDs as per Outdoor Advertisement Policy (OAP) 2017. The year wise revenue generated from naming rights of metro rail stations is as under: -	12.80	9.02	26.82	39.68	51.86		
Bengaluru	Bengaluru Metro Rail Corporation (BMRCL) aims to raise funds by implementing the Innovative Financing Schemes Wherein Corporates have been involved to augment funds. These schemes are in the form of bundled and unbundled rights to be given to the corporates by BMRCL.	Details are given separately						
Kochi	**NA**	**NA**	**NA**	5,61,69,315.07	12,32,72,299.76	11,22,61,113.92	3,75,31,821.29	**NA**
Nagpur	Maha-Metro presently adopting the policy of DMRC regarding Semi Naming Rights with minor modifications on case-to-case basis with the approval of Competent Authority.	Presently, till 30th September 2021, Maha-Metro earned revenue of Rs. 21 Lakhs (approx.) from two metro stations co branding rights						
Mumbai Line 3	MMRCL has signed station semi-naming rights contracts with the winning bidders recently under Non-Fare Box Revenue (NFBR).	In all, 5 stations have been awarded in the first phase. The metro stations are Bandra Kurla Complex (BKC) and CSMT (VT) stations awarded to Kotak Mahindra Bank, Churchgate and Hutatma Chowk (Fort) stations to Life Insurance Corporation (LIC) and Siddhivinayak station to ICICI Lombard. The winning bids in the form of annual license fee are in the range of ₹ 5 to 11 crores, with the highest bid being received for BKC station. With this MMRCL has successfully secured ~₹ 40 crore annual revenue (5 year cumulative Rs 200 cr +) from the 5 winning bids. These rights awarded are for a period of 5 years from RoD The winning brand will get 300 sqm of branding space, up to 20 sqm of kiosks space, rights to colour the station with the brand colour theme, mention in station announcements and station maps, large logo and name at						

<table>
<tr><td></td><td></td><td>the main entrances, in addition to pre-fixing of their brand name to the station name all across the station</td></tr>
<tr><td>Jaipur</td><td>JMRC has identified almost all its potentials in the field of non-fare revenue and is continuously in process of monetizing the assets through open tender in a phased manner. Advertisement inventory has been awarded till now and almost all retail spaces available at street level are leased out and JMRC is also trying to lease out retail spaces at concourse level but due to low ridership results are nor much encouraging.</td><td>.JMRC has earmarked three metro stations for award under Station Brnding/Semi naming rights. The three station are Mansarovar, Railway Station and Sindhi Camp. These rights have been awarded thorugh open tender system. Monthly revenue for these stations (excluding GST) are as under:
Mansarover: INR 2,01,666; Railway Station: INR 2,84,000 and Sidhi Camp: INR 3,82,977.</td></tr>
<tr><td>Chennai</td><td>NIL</td><td>Semi-Naming Rights awarded stations list:
<table><tr><th>Sl.no</th><th>No. of station</th><th>Year</th><th>Amount in lakhs</th></tr><tr><td>1</td><td>2</td><td>2019</td><td>100.99</td></tr><tr><td>2</td><td>3</td><td>2020</td><td>225.00</td></tr><tr><td>3</td><td>8</td><td>2021</td><td>518.05</td></tr></table></td></tr>
<tr><td>Hyderabad</td><td>NIL</td><td>There is no policy as such, but Hyderabad Metro Rail Project has outlined plans to generate non-fare revenues to offset metro rail operation costs by offering Station Naming Rights to third parties. We have presently offered station naming rights of two stations viz. Raidurg (to M/s. Synchrony Financials) and Prakash Nagar (to M/s. Invesco Asset Management India Pvt. Ltd.) for a cumulative value of Rs.4.1 cr per annum and are in the process of offering station naming rights of few other stations in this financial year.</td></tr>
<tr><td>Lucknow</td><td></td><td>The contracts LKCB-01 & LKCB-02 for Co-branding rights (including naming rights) of Amausi and CCAP Metro Stations of Lucknow Metro were awarded vide LOA dated 06.08.2019. A revenue of Rs. 35.50 lakhs (approx.) has been realized till 24.07.2020 (termination date) from these contracts.</td></tr>
<tr><td>Kanpur</td><td></td><td>In case of Kanpur Metro Rail Project, a tender for advertising rights along with semi-naming rights of Metro Stations has been floated. The bids for the same are presently scheduled to be opened on 17.11.2021</td></tr>
</table>

GENERATION OF REVENUE THROUGH NAMING RIGHTS OF METRO RAIL STATIONS

Innovative Financing Scheme- Bengaluru Metro Rail Corporation (BMRCL) aims to raise funds by implementing the Innovative Financing Schemes Where in Corporates have been involved to augment funds. These schemes are in the form of bundled and unbundled rights to be given to the corporates by BMRCL.

BMRCL offers a basic set of rights for the corporates for a period of 30 years. In order to implement this scheme, the following set of rights are provided by BMRCL:

a. BMRCL offers Naming rights on all the direction boards around the station and on all the route maps within the metro trains

b. BMRCL provides a cumulative area of 1,000 sq. ft. inside the station for advertisement.

c. BMRCL provides a cumulative area of 3,000 sq. ft. of inside the station for commercial purposes.

d. BMRCL provides direct access/connectivity to the metro walkway

Costing: The total package for all above mentioned facilities has been computed at Rs.100 cr considering factors like economic viability, time duration, and others. In the interest of flexibility of parties interested in one or more of the services, the package has been bundled as a set of three components and any or all of them can be considered by interested parties.

The details of the package are as under:

Sl. No	Facilities	Amount in Rs.
1	Prefix Company/ Brand name to the station name, display of name on direction boards and route maps, announcements in station/ trains for a period of 30 years.	65 Crs.
2	Rentals of advertisement space of 1000 sq. ft. at the ground floor and 3000 sq. ft. of commercial space at concourse level for the period of 30 years.	25 Crs.
3	Direct access to the metro walkway leading directly to the company premises for the period of 30 years. (cost of construction of walk way to be borne by the Company)	10 Crs.

Note: BMRCL may consider payment of the amount earmarked for the above facilities in tranches based on later discussions. However, full payment needs to be completed before commencement of operation of that particular metro line.

Agreements: BMRCL has signed a number of agreements and MoUs with several companies such as Embassy Property Developments Pvt. Ltd (Kadubeesanahalli Metro Station-Rs. 100 Crores), Intel Technology India Pvt. Ltd (Bellandur Metro Station- Rs. 100 Crores), Prestige Exora Business Park (Kodibeesanahalli Metro Station- Rs. 100 Crores), Embassy Property Developments Pvt. Ltd. (BettaHalasuru Metro Station for Rs. 140 Crores) and a MoU for back ended PPP with BIAL has also been signed. Apart from this, BMRCL also offers these in the form of unbundled rights, in lieu of the contributions from the

companies. For ex: A definitive agreement has been signed with with Infosys Ltd for KonappanaAgrahara Metro Station for Rs. 100 Crore and Biocon Ltd for Hebbagodi Metro Station (only naming rights) for Rs. 65 Crores. Several other companies (like Indian oil, Century group etc) have also evinced interest for the Innovative financing scheme. Please find the below details of the companies involved with BMRCL for innovative financing schemes:

1. Innovative Funding (Phase 2A)

Sl No	Company Name and Station	Land Provided by Company	Commercial Space	Contribution	Facilities Provided by BMRCL	Remarks
1	Intel Technology India Pvt. Ltd. (Bellandur Metro Station)	1,200 Mts (20X60) free of cost. (Entry and Exit from Road)	1,000 Sq Ft Advertising Space. 3,000 Sq Ft commercial space. Naming Rights.	Rupees One hundred crores.	30 years for commercial space and naming rights. 99 Years for walkway access.	MoU entered on 17th January, 2018.
2	Mr. Irfan Razack-Prestige Exora business park. (Kodibeesanahalli Metro Station)	1200 Mts (20X60) Land acquisition cost borne by BMRCL (Entry and Exit from Road)	1,000 Sq Ft Advertising Space. 3,000 Sq Ft commercial space. Naming Rights.	Rupees One hundred crores.	30 years for commercial space and naming rights. 99 Years for walkway access.	MoU entered on 28th March, 2018.
3	Embassy Property Developments Pvt. Ltd. (Kadubeesanahalli Metro Station)	1,200 to 1,500 Sq Mts. (Entry and Exit) The concessionaire shall transfer by way of relinquishment deed.	1,000 Sq Ft Advertising Space. 3,000 Sq Ft commercial space. Naming Rights.	Rupees One hundred crores.	30 years for commercial space and naming rights. 99 Years for walkway access.	MoU entered on 04th June, 2018.

Note: The Stations at Konappana Agrahara and Hebbagodi serves major IT BT companies located at electronic city and complements Phase-2A and Phase-2B network is providing metro connectivity for IT BT companies.

2. Innovative Funding (Phase 2)

Sl No	Company Name and Station	Land Provided by Company	Commercial Space	Contribution	Facilities Provided by BMRCL	Remarks
1	**Infosys Foundation #** (Konappana Agrahara Metro Station)	2,447.70 Sq Mtrs by BMRCL (99 Years lease – Rs. 1000/- per annum)	1,000 Sq Ft Advertising Space. 3000 Sq Ft commercial space. Naming Rights.	Rupees One hundred crores.	30 years for commercial space and naming rights. 99 Years for walkway access.	MoU entered on 19th July, 2018. Grant Agreement Signed on 06th December, 2019.
2	**Biocon Foundation #** (Hebbagodi Metro Station)	Nil	Naming Rights of the station.	Rupees Sixty Five crores.	30 years for naming rights.	MoU entered on 08th October, 2020. Grant Agreement Signed on 18th March, 2021.

3. Innovative Funding (Phase 2B)

Sl. No.	Company Name and Station	Land Provided by Company	Commercial Space	Contribution	Facilities Provided by BMRCL	Remarks
1	Embassy Property Developments Pvt. Ltd. (BettaHalasuru Station)	3,482 Sq Mts land on either side of NH-44 to be acquired by BMRCL at the cost of Embassy Group.	1,000 Sq Ft Advertising Space. 3,000 Sq Ft commercial space. Naming Rights.	Rupees One hundred and forty crores (Including cost of Land Acquisition for the Metro Station)	30 years for commercial space and naming rights.	MoU entered on 08th September, 2020.
2	Manyatha Promoters Pvt. Ltd (VeerannaPalya Station)	3,000 Sq Mts for realignment of Metro Line. 575 Sq Mts (Within Manyata Land)	Flyover access along with ingress and egress ramps into the Manyata Embassy Business Park.	Rupees Thirty Two crores for realignment cost and reimbursement of cost of additional land.	Nil	Contract Agreement Signed on 04th June, 2018.

Note: This Station is on Phase-2 corridor, but serves major IT hubs located at Whitefield in providing connectivity to the Airport.

4. Under Discussion for funding to Metro project

Sl. No.	Company Name	Station	Concession Fee	MoU Signed on
1	Bhagmane Tech Park. **(Phase 2A)**	DRDO station at ORR in Phase-2A	Under Discussion	NIL
2	Bhagmane Tech Park. **(Phase 2A)**	ISRO station at ORR in Phase-2A	Under Discussion	NIL
3	Indian Oil Corporation **(Phase 2)**	K.R. Puram / Mahadevapura station Reach-1 Extn	Under Discussion	NIL
4	The Century Group **(Phase 2B)**	Jakkur Plantation at Airport Line in Phase-2B	Under Discussion for including new station	NIL

Annexure- XV

DEBT SERVICING

<table>
<tr><th>Name</th><th></th><th>Details of debt servicing</th><th>Remarks</th></tr>
<tr><td>Delhi</td><td>Please state whether the metro projects are able to service the loan repayments (both interest and principal repayments) as per the schedule mentioned in the loan agreements? If so, please state whether such repayments are made from operational revenues of the metro projects? please furnish the details; and, if not state the reasons for not able to service the loans taken for the metro project.</td><td>Delhi Metro has been servicing the JICA Loan repayment as per the schedule mentioned in the loan agreement from its operational revenue. The detail is tabulated as under:

Rs./Crore
<table><tr><th>FY</th><th>Repayment of Loan</th><th>Interest payment</th><th>Total</th></tr><tr><td>2006-2007</td><td>13.69</td><td>153.79</td><td>167.48</td></tr><tr><td>2007-2008</td><td>27.38</td><td>104.02</td><td>131.40</td></tr><tr><td>2008-2009</td><td>27.38</td><td>98.95</td><td>126.33</td></tr><tr><td>2009-2010</td><td>27.38</td><td>114.97</td><td>142.35</td></tr><tr><td>2010-2011</td><td>33.72</td><td>225.04</td><td>258.76</td></tr><tr><td>2011-2012</td><td>67.69</td><td>213.48</td><td>281.17</td></tr><tr><td>2012-2013</td><td>129.04</td><td>231.90</td><td>360.94</td></tr><tr><td>2013-2014</td><td>218.28</td><td>239.05</td><td>457.33</td></tr><tr><td>2014-2015</td><td>291.60</td><td>249.19</td><td>540.79</td></tr><tr><td>2015-2016</td><td>322.63</td><td>300.33</td><td>622.96</td></tr><tr><td>2016-2017</td><td>348.31</td><td>332.95</td><td>681.26</td></tr><tr><td>2017-2018</td><td>442.66</td><td>355.18</td><td>797.84</td></tr><tr><td>2018-2019</td><td>622.71</td><td>440.92</td><td>1,063.63</td></tr><tr><td>2019-2020</td><td>764.77</td><td>429.96</td><td>1,194.73</td></tr><tr><td>2020-2021</td><td>808.69</td><td>433.85</td><td>1,242.54</td></tr><tr><td>Total</td><td>4,145.93</td><td>3,923.58</td><td>8,069.51</td></tr></table></td><td></td></tr>
<tr><td>BENGALURU</td><td></td><td>**Information provided below this table</td><td></td></tr>
<tr><td>KOCHI</td><td></td><td>Yes, as per the schedule mentioned in the loan agreements, the metro projects are able to service the loan payments. Such repayments are not made from operational revenues for the metro projects. The</td><td></td></tr>
</table>

		required fund for the debt servicing is released by GoK as per the terms of MOU between GOI, GoK and KMRL…	
Pune		**Under construction**	
Nashik		**DO**	
Nagpur		Nagpur Metro is operational for a length of 26.50 km out of 38.215 km. Ridership has been on the lesser side than the Projected due to Covid- and commissioning of balance corridor. All efforts will be taken, after commissioning of all Corridors, for enhancement of ridership. Company will also give adequate emphasis on increase of non-fare box revenue which includes revenue from TOD, relevant charges, Property Development, advertisement, solar power etc. In spite of all efforts, as stated above, if there is still shortfall company shall approach GoM for bailing out the liabilities.	
Mumbai Metro		***MMRDA- Mumbai Metro projects - Funding Status as on 31.01.2022 attached below this table No information provided about Mumbai Line 3	
Jaipur		Jaipur Metro Phase 1B has a loan portion of INR 969 crore from Asian Development Bank and as per the loan agreement condition, repayments will start from year 2022.	
Chennai		CMRL has cash deficit and hence it is not able to service both interest and loan repayment. Until Mar'21, there was principal repayment commitment for CMRL is Rs. 658.36 crores of which Rs.32.07 crores have been paid. In the cumulative interest liability of Rs.811.51 crores, an amount of Rs.252.83 crores (which was out of project funds received for Interest and Expenses During Construction (IEDC) have been paid. As per MoU, when CMRL is not in a position to service the loan, state government has to meet out the same.	
Hyderabad		The operational revenues of Hyderabad Metro are not sufficient to meet the Interest and principal repayments. Currently, the promoter of the project SPV, Larsen & Toubro Limited, is providing regular fund infusions into the Project in order to support the debt service obligations of the SPV, thereby avoiding NPA situation for the PSU lenders of the Project 4. Existing shortfall in debt service is continuing to add further to the debt burden in the project	
Lucknow		Finance Contract between Republic of India and European Investment Bank for Tranche A EURO 200 Million was signed on 30.03.2016 and Finance Contract for Tranche B of EURO 250 Million was also signed on 31st March, 2017 for Lucknow Metro Project . As per the Disbursement Notification dated 19/01/2017 first repayment of installment was due on 29.01.2021 and second installment was due on 30.07.2021 of Lucknow Metro Rail Project. As you are aware that, the Covid-19 is poised to become one of most severe and public health and economic crisis the world has faced in 21st century. Along with sweeping loss of human lives, the virus has left an impact on many sectors including transport. Operation of Lucknow metro has been severely affected due to Covid-19 pandemic since March 2020. Also second wave of Covid-19 was more severe and badly affected the operation of Lucknow metro. Due to the above, we are finding it difficult to meet out our financial obligations.	

****** Bengaluru Metro- DetailsofLoanrepaidinrespectofPhase-1&Phase-2tothefundingagenciesduringlast5years

BANGALOREMETRORAILCORPORATIONLIMITED

S. No	Fundingagency	Loans Availed	FY2016-17		FY2017-18		FY2018-19		FY2019-20		FY2020-21		FY2021-22 (till31/12/2021)	
			Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest	Principal	Interest
PHASE-1														
1	JICA-ID-P171	2,221.12	-	-	270.87	98.11	108.35	25.01	108.35	23.72	108.35	22.19	54.17	10.59
2	JICA-ID-P-220&220A	987.00	-	-	-	29.62	-	9.80	-	10.74	-	10.76	49.35	10.60
3	AFD-Phase-1	873.29	-	-	29.11	53.63	58.22	10.32	58.22	9.46	58.22	8.14	29.11	3.34
4	HUDCO	650.00	58.06	53.40	58.24	47.03	58.06	39.59	58.00	33.99	58.00	22.05	272.37	18.73
5	KUIDFC-Megacityscheme loan	14.75	1.84	0.25	1.85	0.18	1.84	0.10	1.38	0.03	-	-	-	-
6	KUIDFC-ChainLinkfencing	2.66	-	0.05	0.46	0.06	0.46	0.07	0.46	0.06	0.46	0.04	0.35	0.02
7	Boands	300.00	-	26.37	-	26.37	-	26.37	-	26.37	-	26.37	-	26.37
	Total-Phase-1(A)	**5,048.82**	**59.90**	**80.07**	**360.53**	**255.00**	**226.93**	**111.26**	**226.41**	**104.37**	**225.03**	**89.55**	**405.35**	**69.65**
PHASE-2														
1	AFD-Phase-2	1,440.00	-	-	-	-	-	13.37	-	11.81	72.00	15.45	144.00	10.68
2	KUIDFCLoanforUnderpass7 Parking(MCRF)	18.34	-	0.01	-	0.24	2.25	0.46	4.50	0.51	4.50	0.40	3.38	0.18
3	EIB	3,973.40	-	-	-	-	-	-	-	-	-	-	-	17.98
4	AIIB	2,330.26	-	-	-	-	-	-	-	-	-	0.09	-	5.70
5	JICA-Phase-2	1,352.94	-	-	-	-	-	-	-	-	-	-	-	-
	Total-Phase-2(B)	**9,114.94**	**-**	**0.01**	**-**	**0.24**	**2.25**	**13.83**	**4.50**	**12.32**	**76.50**	**15.94**	**147.38**	**34.54**
	GrandTotal (A+B)	**18,229.88**	**59.90**	**80.08**	**360.53**	**255.24**	**229.18**	**125.09**	**230.91**	**116.69**	**301.53**	**105.49**	**552.73**	**104.19**

Note:1)ASpertripartiteMemorandumofUnderstanding,thecashlosses(includinginterestonloans)andPrincipalrepaymentisbackstoppedbytheGovt.ofKarntaka .BMRCLhasbeenincurringcashlosses.GOKhasreleasedfundstomeetinterestandprincipalrepayment.Initially,thesameismetoutoftemporarysurplusfundsfromtheProjecttillrecoupementbyGoK.

2) IncaseofJICA-Phase-1,theprincipalrepaymentstartedfromJune2017insteadofMarch2016.

3) IncaseofHUDCOloan,entireoutstandingprincipalwasprepaidinDec2021inordertoreducecashlosses.

***MMRDA- Mumbai Metro projects - Funding Status as on 31.01.2022

Sr. No.	Name of the Projects	Total Project Cost	External funding Agency.	Loan Sanctioned	Loan Sanctioned by Agency in INR Crores	Loan Released by Banks as on 31.12.2021 in INR Crores.	Loan Status	Repayment Start Date

Sr. No.	Name of the Projects	Total Project Cost	External funding Agency.	Loan Sanctioned	Loan Sanctioned by Agency in INR Crores	Loan Released by Banks as on 31.12.2021 in INR Crores.	Loan Status	Repayment Start Date
1	Line 2A (Dahisar - D.N. Nagar) and Line 7 (Dahisar (East) – Andheri (East)) and Line 2B (D. N. Nagar - Mandale)	Line 2A-6410	Asian Development Bank and New Development Bank	USD 906 Million	6,653	1291.19	Agreements Signed with ADB on 01.03.2019 disbursement from Funding agency has started	15.08.2024
2		Line 7 - 6208		USD 260 Million. Remaining from MMRDA own fund	1,909	373.82	Agreements Signed with NDB on 26.12.2018 and disbursement from Funding agency has started	15.03.2024
3		Line 2B-10986						
4	Line 4 (Wadala – Kasarvadavali)	14,549	KfW Bank Germany	Euro 545 Million. Remaining from MMRDA own fund	4,190		Agreements Signed on 02.11.2020, disbursement will begin shortly.	15.11.2025
5	Line 4A (Kasarvadavali - Gaimukh)	949						
6	Line 5 (Thane-Bhiwandi-Kalyan)	8,417	Asian Infrastrucrture Investment Bank and OPEC Fund for International Development	USD 335 Million. Remaining from MMRDA own fund	2,357		Loan finalization under progress.	–
7	Line 6 (Swami Samarth Nagar – Vikhroli)	6,716	New Development Bank	USD 241 Million. Remaining from MMRDA own fund	1,700		Loan finalization under progress.	–
8	Line 9 (Dahisar - Mira Bhayander & Andheri – CSIA)	6,607	MMRDA Own Funds	-	-		-	–
9	Line 10 (Gaimukh – Shivaji Chowk)	4,476	Japan International Cooperation Agency.	USD 395 Million. Remaining from MMRDA own fund	2,818		Loan finalization under progress.	–
10	Line 11 (Wadala – CSM Terminus)	8,739	Japan International Cooperation Agency.	USD 283.4 Million. Remaining from MMRDA own fund	2,022			
11	Line 12 (Kalyan - Dombivili – Taloja)	5,865	Japan International Cooperation Agency.	USD 431 Million. Remaining from MMRDA own fund	3,077			

Appendix

STANDING COMMITTEE ON HOUSING & URBAN AFFAIRS (2021-22)

Minutes of the Eighth Sitting of the Standing Committee on Housing & Urban Affairs held on Monday, 4 April, 2022

The Committee sat from 1530 hours to 1630 hours in Committee Room 2, First Floor, Block-A, Parliament House Annexe Extension Building, New Delhi.

PRESENT

Members

Lok Sabha

1. Shri Ramcharan Bohra
2. Shri Rahul Ramesh Shewale
3. Shri Benny Behanan
4. Shri Shankar Lalwani
5. Shri Sunil Kumar Soni
6. Shri P.C. Mohan
7. Shri Syed Imtiaz Jaleel

Rajya Sabha

8. Shri Ram Chander Jangra - In the Chair
9. Shri Kumar Ketkar
10. Thiru K.R.N. Rajesh Kumar
11. Shri Sanjay Singh
12. Shri Subhasish Chakraborty
13. Shri Y.S. Chowdary

Secretariat

1.	Shri V.K. Tripathi	Joint Secretary
2.	Shri Srinivasulu Gunda	Director
3.	Ms. Swati Parwal	Deputy Secretary

2. As the Chairperson has not been able to attend the meeting due to compelling circumstances, the Committee, after deliberation, chose Sh. Ramchander Jangra, MP, Rajya Sabha as acting Chairperson in the absence of Chairperson under *Rule 258 (3) of the Rules of Procedure and Conduct of Business in Lok Sabha.*

3. Thereafter, Hon'ble Acting Chairperson welcomed Members of the Standing Committee on Housing & Urban Affairs to the Sitting.

4. The Committee then took up for consideration the Draft Report on the subject, 'Implementation of Metro Rail Projects – An Appraisal' and adopted the same without any modification and authorized the Chairperson to finalize them in the light of factual verification received from MoHUA and present it to the Parliament.

The Committee then adjourned.