

E-IS

E-ISSN: 2582-2160 • Website: <u>www.ijfmr.com</u>

• Email: editor@ijfmr.com

Need for Transport Multimodality Through Statutory Unified Transport Authority in the Mumbai Metropolitan Region

Ms. Prajakta Surendra Bhide

PhD Research Scholar, Department of Civics and Politics, University of Mumbai

Abstract

The Mumbai Metropolitan Region is witnessing huge urban transport transformations, such as the first underground Metro line 3, Atal Setu, and Coastal Road. Such infrastructural projects often face challenges such as low ridership due to high tolls, escalation of project costs, delays in clearances, challenges in land acquisition, and lack of departmental coordination. High ticket prices, lack of feeder services & intermodal connectivity, low frequency, and incomplete phases contribute to low metro ridership. The present research paper highlights the need for transport multimodality in the Mumbai Metropolitan Region (MMR) for convenient and affordable transport service delivery. It discusses the need for a statutory Unified Metropolitan Transport Authority (UMTA) to undertake multimodal projects through quick institutional coordination, resulting in better transport administration. The paper is based on primary data collected at the monorail stations of Wadala Bridge, Sant Gadge Maharaj Chowk, Lower Parel, and Chembur.

Keywords: Multimodality, UMTA, Urban Mobility, Transport Governance, Mumbai Metropolitan Region.

1. Introduction

The present decade has witnessed tremendous growth in the urban transport infrastructure of the Mumbai Metropolitan Region. The extension of the coastal road, projected to ensure end-to-end connectivity from south Mumbai to Bandra, has reduced the travel time and congestion. Mumbai Trans Harbour Link (MTHL) is connecting the mainland with the Navi Mumbai region. It will also enhance connectivity with Jawaharlal Nehru Port Trust and the Navi Mumbai International Airport. The underground Goregaon-Mulund Link Road and Thane Borivali Link Road have the potential to address east-to-west traffic congestion in the suburbs. The existing metro lines 2 & 7 have managed to share the ridership load with the Western Express highway to some extent. The upcoming underground metro line 3 running from Colaba to Santacruz Electronics Export Processing Zone (SEEPZ), running through densely congested areas, can reduce the burden on suburban railways and highways. We also have some upcoming projects connecting Madh Island with Versova through a cable-stayed bridge, and a pod taxi project in Bandra Kurla Complex. We also witnessed a water taxi project from Belapur to the Gateway of India, which was later suspended due to losses. Thus, we can see that the Mumbai Metropolitan Region has the capability of optimising various modes like road, rail, and water transport in these infrastructure projects.



E-ISSN: 2582-2160 • Website: <u>www.ijfmr.com</u> • Email: editor@ijfmr.com

However, if we look at the connectivity between these modes, we find that the intermodal connectivity between monorail, metro, bus, suburban railway, and ferries is quite low. As far as metro or monorail corridors are concerned, we need to connect them through transfer terminals with suburban railways as well as buses. So far, we only have such intermodal connectivity at Ghatkopar (Metro line 1 & Central Railway), DN Nagar & Andheri (Metro line 1 & 2), and Gundavali & Western Express Highway (Metro line 1 & 7). At Chembur, Wadala Bridge, Lower Parel, Sant Gadge Maharaj Chowk, the monorail route passes near the harbour suburban railway & western suburban railway at Chembur, Wadala Road, Currey Road & Lower Parel, Chinchpokli & Mahalaxmi, respectively. However, there is no transfer terminal. Passengers need to get down at one station, walk for some time, and then enter another mode. This makes travel less convenient. Buying separate tickets for every mode further adds to the inconvenience.

Transport service delivery can become affordable and convenient with effective transport governance. Presently, urban transport governance is polycentric with multiple transport modes governed by different institutions. Often, this fractured structure leads to delayed project approvals and a lack of coordination and accountability. As each transport body is working to enhance the efficiency of its mode, there is an institutional gap for undertaking multimodal projects, which are presently undertaken by regional developmental authorities. However, regional developmental authorities will not necessarily have the expertise to undertake such projects. Thus, we need institutional reforms in the form of a regulator and a coordinator in the transport governance of the Mumbai Metropolitan Region. This regulator can improve the accountability of transport projects and can initiate multimodal projects.

This paper analyses the primary data to explain how a unified transport authority through multimodal transport projects can make transport service delivery affordable and convenient.

2. Literature Review

Minal Mapuskar, in her book 'Right to the City: In the Context of Road Transformation in Mumbai' (2021) [1], has conducted a case study of metro rail commuters to study if there is any significant modal shift after the commissioning of the metro line. The author has analysed whether the metro has helped decongest the roads by reducing private cars. The study looks at the changes in preferences given to the metro over other modes, resulting in qualitative changes in the daily lives of commuters. As per the study, the commencement of Metro Line 1 helped reduce the burden on the suburban railway station of Dadar. However, this resulted in the reduction of BEST bus travellers due to the metro providing speed and time-saving travel. This trend was reversed with a hike in metro fares¹. This study, however, has not looked at the need for transfer terminals at the intermodal junction.

In a book, namely 'Urbanization in Asia: Governance, infrastructure and the Environment' (2014) [2], edited by Kala Seetharam Sridhar & Guanghua Wan, author Pawan Kumar explains the value of travel time saved in the modal shift from bus to metro at Rohini (west) Delhi metro station. The study highlights how the modal shift from metro to bus and vice versa is important for the reduction in congestion, pollution, fuel use, travel time, and road accidents. A study in the same chapter mentions that the value of travel time saved due to modal shift at Rohini (west) Delhi Metro Station is 2.54/min and 2.12/min² for government employees and private sector employees, respectively. The average time saved is 29 minutes per passenger due to the quick modal shift from bus to metro in a trip.

Similarly, one can observe a modal shift in the case of New Delhi Railway Station, where two metro corridors run in its vicinity. This provides direct connectivity from the railway to the metro corridor running North-South and the airport express line. This multimodality helps to address the congestion of



E-ISSN: 2582-2160 • Website: <u>www.ijfmr.com</u> • Email: editor@ijfmr.com

the private & intermediate transport near the railway station.

In an article namely 'Mumbai Monorail turns the corner,' author Sweety Adimulum has elaborated on the importance of modal connectivity. She has discussed the proposal by the monorail authority in the Mumbai Metropolitan Region for the foot-over bridges (FOBs), which would connect the existing railway stations with the upcoming nearby Metro stations. As per studies, this would increase the ridership of the monorail. In 2024, the weekday ridership was 16,000 per day³, while on weekends, the ridership was recorded to be 10,000 daily. The daily ridership would rise over 1.5 lakh daily with a multi-modal integration in the next three years. The authority has planned the integration at the monorail station near Bhakti Park with the Metro Line 4 from Wadala to Kasarvadavali through an FOB, which is around 215 metres long. Similarly, another FOB of 300 metres is planned at Jacob Circle monorail station, which would link the suburban railway station with the upcoming Metro line 3, both named as Mahalaxmi. There are a few other monorail station is near Metro Line 2B (from DN Nagar to Mandale) V N Purav station. Also, the monorail's Wadala Bridge station is close to the existing Wadala Road Western Railway station. This highlights that comprehensive transport planning can increase the use of public transport if there is a proper modal transfer.

This explains that there is a need for a 'meta governor' who can bring all stakeholders of urban transport administration together and is accountable for such projects to the local developmental authorities (Hansson, 2013) [3].

3. Method

To analyse how multimodal transport terminals can increase convenience and affordability for travellers, primary data was collected at four monorail stations. To understand the role of UMTA in transport administration and urban planning, the researcher interviewed experts.

3.1 Research Design

This research paper uses using descriptive-analytical method for its research. The data is quantitative as well as qualitative. The methodology used was structured interviews and a closed-ended questionnaire. To get this data, the sample was selected through convenience sampling, which is a method of non-probability sampling where samples that are conveniently located around a location are collected. The responders were commuters who were interchanging between the monorail and suburban railway on the weekdays between 11 AM to 3 PM. The total sample size was fifty, collected at the monorail stations. The structured questionnaire consisted of twenty-two questions based on demographics, travel data, modal transfer data, and service experience. The researcher-administered printed questionnaire was used as a data collection method for the study. The structured questionnaire consisted of twenty-two questions based on the components of demographics, travel data, mode transfer data & service experience. One-to-one interaction was conducted in the exit corridors of the monorail stations leading to the staircases. The interaction was conducted between June 19, 2024, to June 28, 2024.

3.2 Objective

- 1. To study if the riders find the connectivity between the monorail and suburban railway convenient.
- 2. To analyse whether single ticketing can benefit the riders.

3.3 Interaction with the Experts and Officials

The researcher interacted with officials from Mumbai Metropolitan Regional Development Authority (MMRDA), Central Railways, Municipal Corporation of Greater Mumbai (MCGM), Mumbai Metro Rail Corporation (MMRC), Maharashtra State Road Development Corporation (MSRDC), Maharashtra State



Road Transport Corporation (MSRTC), Brihanmumbai Electric Supply & Transport (BEST), and independent transport experts to understand institutional perspectives and expert analysis about the relevance of a unified authority in intermodal connectivity.

3.4 Data Analysis

The riders were travelling from western railway stations like Goregaon, Virar, Andheri, Grant Road, and Bandra, central railway stations like Sion, CST, Dombivli, Diva, and Titwala, harbour railway stations like Vashi, Panvel, Chembur, Wadala, Ghansoli, and areas like Antop Hill, Nagpada, and travelling to different routes across railway corridors.

While studying which aspects make travel convenient, the following parameters (Table 1) were considered, and the researcher included these parameters in the questionnaire.

Table 1: Parameters of Convenience

Travel is convenient	Travel is not convenient	
Saving time & money, easy accessibility, safety, less	Buying two separate tickets, crowded travel,	
stress, convenience to carry belongings, last mile	waiting time, less reliability, limited availability,	
connectivity, privacy and relaxation, and flexibility.	traffic congestion, and limitations of parking.	

The table given below (Table 2) explains the distance and the time consumed to change the mode from monorail to railway station or from the railway station to monorail in their travel at the corresponding stations.

Modal transfer	Distance	Time
		(walk)
Wadala Bridge-Wadala Road (harbour railway)	110 metres	1 min
Mahalaxmi/Chinchpokli- Sant Gadge Maharaj	Mahalaxmi (Western Railway): 650	10 mins
Chowk	metres	9 mins
	Chinchpokli (Central Railway): 650	
	metres	
Currey Road/Lower Parel-Lower Parel	Currey Road (Central Railway): 130	2 mins
	metres	8 mins
	Lower Parel (Western Railway): 550	
	metres	
Chembur-Chembur (harbour railway)	650 metres	9 mins

Table 2: Modal Transfer Data



- 4. Observation And Discussion
- 4.1 Demographic Data



Most of the respondents from the age group of 20 to 35 can be attributed to the use of public transport by the young working population who are physically able to use multiple modes of travel in a day. Most riders were employed in the monorail. These staff members typically are assigned duties across any station on the monorail route (Figure 2). They usually take a suburban local train and ride onto the nearest monorail station. The reluctance to share the information observed on the part of most of the female riders resulted in fewer numbers compared to men. Out of 50 participants, 14 were women and 36 were men (Figure 1).





As the Central and Western railways are aligned in a North-South direction, the transversing of the monorail from east to west helps riders connect with some of the nearby suburban railway stations. For a total travel time of 15 to 30 minutes, riders spend less than INR 50. For a travel time between 60 to 90 minutes or more, the expenditure ranges from INR 50 to INR 200 (Figure 3).

If we look at the fare structure of suburban railways, they charge around INR 0.416 for every kilometre. For the same distance, the monorail charges approximately INR 3.076. If we add the expenditure on intermediate or private transport to reach these stations, including parking charges, daily expenses range



between INR 50-200 for any travel of 60-90 minutes or more. These expenses are quite burdensome for most of the riders.

Almost all riders prefer to walk to the nearest public transport station, except some who prefer a shared autorickshaw. The average time is 15 minutes, except in a few cases where it is 15-30 minutes. This shows the preference to live near the station to reduce expenses and save time. This also highlights the density of the population near the mass transit systems. These structural dynamics form the basis of transit-oriented development.

The average waiting time at public transport stations (5-15 mins, Figure 4) depends on the frequency of the monorail, of 15 minutes. The average frequency of suburban railway till around 65 km from Churchgate/CSMT is between 4-8 minutes. After that, the frequency is around 10-15 mins.

4.3 Mode Transfer Data

If we analyse this data, we find that all riders usually prefer to walk to change modes, which takes 1-10 minutes (Table 1). More time is consumed in buying two tickets. As none of the monorail stations has transfer passages in the form of a bridge or skywalk for connecting to the suburban railway station, which lies between 110-650 metres (Table 1), it causes inconvenience to the riders (Figure 5).



There are no signboards put on either the monorail stations or the railway stations, except at the Chembur monorail station (Figure 6).

There is no information shared on any of these stations for the next train service. The areas connecting the monorail stations with the suburban railway stations are full of parked vehicles & vendors and not convenient to walk (Figures 7,8,9). This lack of physical & information integration makes travel inconvenient.



E-ISSN: 2582-2160 • Website: <u>www.ijfmr.com</u>

• Email: editor@ijfmr.com



4.4 Service Experience Data

There are mixed views on travel affordability, even though monorail staff who are given concessions on monorail fares form the major share of respondents. If we analyse Figures 10 & 11, we can see that for the majority of the riders, convenient travel consists of accessibility, safety, convenience in carrying belongings, saving of time, and flexibility. For them, buying separate tickets, overcrowding, and tiring journeys cause inconveniences.



An ideal multimodal integration includes physical, network, fare, information, geographic, and institutional integration. If we look at these responses, we can consider that multimodal transport with transfer passages or terminals, equipped with single ticketing and information integration through displays and signboards, can make travel easier, accessible, ensuring hassle-free connectivity. This can save their time and can give them flexibility in planning trips.



E-ISSN: 2582-2160 • Website: <u>www.ijfmr.com</u> • Email: editor@ijfmr.com

5. Multimodality and Unified Metropolitan Transport Authority

Multimodality in urban transport projects focuses on physical, network, fare, information, geographic, and institutional integration. Such integration aims to bring more convenience in connectivity. Figure 12 shows upcoming metro projects in the Mumbai metropolitan region. There are many metro interchanges. We also have a few upcoming multimodal projects, like the Wadala Multimodal Hub. This will integrate Wadala monorail station, metro station (Line 4), Wadala road railway station, and an inter-city bus terminal. Such integration necessitates that various stakeholders related to the transport administration will have to work together. This coordination is important for the timely completion of projects. Some of the case studies mentioned in this paper are trying to analyse how a unified authority can fill the institutional gap, specifically to accelerate the multimodal aspect of urban mobility.

In Mumbai, the first metro service started from Ghatkopar to Versova. This multimodal hub of Ghatkopar is important as it connects not only the metro and suburban railway but also the bus stop, which serves more than thirty routes (Ahmed et al, 2020) [4]. In the Mumbai Metropolitan Region, Reliance Infra-led Mumbai Metro One Private Limited (MMOPL) was awarded the contract for developing the Versova-Andheri-Ghatkopar metro corridor in 2007. Mumbai Metropolitan Region Development Authority (MMRDA), the nodal agency of the project, could not make sufficient land available to MMOPL. However, it could hardly hand over 45% in 2008 when construction started (HT Correspondent, 2014).



Source : https://www.mmmocl.co.in/project-brief.html)

Removal of encroachments, poor records of underground utilities, and lags in safety certification due to delay in the No Objection Certificate from the fire department caused further hindrances⁴. In the Mumbai Metropolitan Region, MMRDA is the regional planning authority, and the Municipal Corporation of Greater Mumbai (MCGM) is responsible for the day-to-day upkeep of the ROW of the metro line⁵. A private entity is responsible for fare collection. Benefits due to increased property tax collection go to MCGM. In such a polycentric structure, a unified authority, or a special purpose vehicle with stakeholders



E-ISSN: 2582-2160 • Website: <u>www.ijfmr.com</u> • Email: editor@ijfmr.com

from respective agencies, can overcome the challenges of coordination.

National Urban Transport Policy (NUTP) 2006 stipulated the setting up of the 'Unified Metropolitan Transport Authority' (UMTA) for cities with a population of more than one million. The policy stated that UMTA would directly report to the District or Metropolitan Planning Committee and not to the Department of Urban Transport at the level of the State Government. A unified authority, as proposed in Metro Rail Policy, 2017, and discussed in detail in Comprehensive Transport Study II, 2021, is supposed to undertake integrated planning and provide common services. UMTA as an institution is empowered with multiple regulatory, strategic, and policy functions. UMTA will look at day-to-day matters and monitor work assigned to urban transport authorities in the region. It is tasked to manage travel demand and organize services. Such authority can also undertake multimodal projects where usually not a single institution is held accountable for the delays.

The concept of unified authority is not new. We do have similar unified transport authorities in London in the form of 'Transport for London' or 'Land Transport Authority' in Singapore. In India, UMTA has been constituted only in Agra, Kanpur, Bengaluru, Kochi, Lucknow, Pune, Chennai, and Hyderabad (Ministry of Housing and Urban Affairs, 2022) [5]. However, only in Bengaluru, Chennai, Hyderabad, and Kochi, it has been somewhat active. In the case of the Mumbai Metropolitan Region, the Government of Maharashtra constituted the Unified Mumbai Metropolitan Authority (UMMTA) on February 12, 2008 (MMRDA, 2024) [6]. This resolution specified that UMMTA will be provided with statutory status over the period. MMRDA is supposed to equip UMMTA with the necessary staff and expenditures and is working as its technical secretariat. Mumbai Metropolitan Region Development Authority (MMRDA) also drafted a Bill on this framework in 2011. The Core Committee of UMMTA, so far, has conducted DPR studies for metro corridors and feasibility studies for the Virar-Alibaug Multi-Modal Corridor. It has initiated the process of Public Water Transport Ro-Ro facilities on the East Coast. The UMMTA committee meeting held in 2011 endorsed the core committee recommendation to provide a legal framework for UMMTA. The latest meeting of the Main Committee UMMTA took place on 6th June 2019. Now, the draft UMMTA is working on appointing consultants who would prepare the UMTA bill for MMR. However, there is no progress ahead till date. In 2021, MMRDA released the Comprehensive Transport Study, namely 'TransForm 2', where in it has discusses the structure, functionality & working of UMMTA (Figure 13).



Figure 13: UMMTA Composition, Sub Committees Source: Comprehensive Transport Study (TransForm 2); Chapter 9, Page number 11)



E-ISSN: 2582-2160 • Website: <u>www.ijfmr.com</u> • Email: editor@ijfmr.com

The experiments of UMTA in India show that either they do not have effective powers, as in the case of the Bengaluru Metropolitan Land Transport Authority in Bengaluru, or they have inefficient leadership, as in the case of the Kochi Metropolitan Transport Authority in Kochi. In the case of Hyderabad, the absence of periodic meetings could not result in much modal integration, except for initiatives like single ticketing and the Bus Rapid Transit System. An authority, when given a statutory status, wields financial autonomy and institutional influence to enforce the legal mandate.

This shows that granting the statutory status, supplemented with committed and empowered leadership, a defined mandate and jurisdiction that avoids overlap with the functions of all other transport institutions, has the potential to bring an overhaul in the transport governance of metropolitan cities. However, given the present state of UMTAs, not giving them the statutory status can potentially nullify any possibility of their role in transport governance shortly.

O. P. Aggarwal, in personal interaction, suggested a way forward for the complexity that UMTAs are facing. Firstly, existing transport powerhouses may perceive a new statutory unified authority as someone who can take away their existing powers. Secondly, there is no agreement on who will head the body. Depending on whether it is a chief minister or a chief secretary, the political and bureaucratic influence will impact the functioning. Thirdly, there is hardly any willingness in the present set-up to bring any unification, as the Chief Minister's War Room undertakes the majority of the big transport projects, where appointed consultants conduct departmental coordination. Therefore, UMTA needs to carve out its own space by initiating multimodal projects where there is an institutional gap and a lack of accountability. This has the potential to speed up the decision-making of such transfer terminals, resulting in the deescalation of costs and faster implementation. For this, UMTA can collaborate with developmental authorities to integrate land use with planning.

Such multimodal projects involving transfer terminals and fare integration offer multiple areas of problemsolving. Firstly, UMTA can decide on a common fare structure for the multiple modes involved and can bring uniformity in the taxation regime of the transport services. It can work on revenue-sharing arrangements with the institutions involved. Single ticketing will offer hassle-free, seamless travel. Chennai Unified Metropolitan Transport Authority (CUMTA) has recently issued tenders to develop a mobile application for QR-based Unified Ticketing and a Multi-Modal Journey Planner (T E Raja Simhan, 2024) [7]. Such fare integration can reduce administrative costs and bring information integration. Secondly, providing transfer terminals can save time for riders. It will promote the use of public transport, such as the monorail and metro. This can share the ridership burden of the suburban railways. Thirdly, having a single unified authority can help the spatial planning of such transfer terminals and avoid delays. This spatial planning refers to the planning of the Mass Rapid Transit System (MRTS) corridors. Presently, if we look at the Mumbai monorail project, two reasons are cited as causes for low ridership. The first phase of the Monorail corridor passed through marshy lands with no shops, residential blocks, or offices around (Kamble, 2019) [8]. It is not integrated fully with any other Mass Rapid Transit Systems (MRTS) corridor, as discussed before. Thus, UMTA can be looked to conduct a comprehensive land use planning for multimodal hubs by bringing all stakeholders to the table.

6. Conclusion

From the 1980s and especially after we adopted the New Economic Policy in 1991, consumers have become a source of profit for banks. This gave rise to high-risk investment banking. From this era, we see that mortgages, credit cards, motor car loans, and student loans have increased. The role of consumers in



E-ISSN: 2582-2160 • Website: <u>www.ijfmr.com</u> • Email: editor@ijfmr.com

the financial markets has grown (Vellucci, 2021) [9]. The outcome of this process is the slow and steady increase in the number of private vehicles over the last 30 years. April 2024 recorded a vehicle density of 2300 vehicles every kilometre of road, with a 100% increase over a decade (Sen, 2024) [10]. This highlights the need for promoting public transport. With new metro corridors, multimodality must be the key to attracting riders. Any establishment of multimodal hubs like Wadala should start with a detailed beneficiary analysis first to avoid low ridership-related losses later. Multimodal hubs need to be established at places that have a higher number of passengers per hour in the peak direction (pphpd). Such multimodal hubs can also be created near water transport terminals like the Belapur water taxi terminal, which started the water taxi to the gateway in 2022. Among the several reasons for its failure were the higher fare, low frequency, and long travel time. Providing regular connectivity through bus routes to such terminals can also support the optimization of multimodality. Along with water transport, the upcoming pod taxi project in the Bandra-Kurla Complex connecting the business hub with Bandra and Kurla stations must also focus on transfer terminals for convenience in intermodal transfer.

The transforming urban mobility demands an overhaul in transport governance. It creates a need for efficient expertise, consultants, and ease of doing business. UMMTA offers a platform where personnel of various departments, such as the Urban Development Department, Planning, Finance, Transport, Law & Judiciary, Environment, Railways, and Public Works Department, will work in coordination with MMRDA, MCGM, police, City and Industrial Development Corporation of Maharashtra (CIDCO), MSRDC, MSRTC, BEST, and airport authorities. This comprehensive institutional network has the capacity and competency to expand the multimodal hubs.

The primary data collected indicates that convenient and affordable transport service delivery depends on the accessibility of public transport. Accessibility depends on the flexibility in modal transfer. For many years, BEST has integrated its bus stops near most of the suburban railway stations. Similarly, one of the factors leading to the higher ridership on the Ghatkopar-Versova metro line is the interchange available at Ghatkopar railway station. We must plan transfer terminals for modal integration while delineating any MRTS corridor, like a monorail or metro. Instead of overburdening developmental authorities with such projects requiring multiple approvals, the Unified Metropolitan Transport Authority in the Mumbai Metropolitan Region can initiate detailed project reports for such projects. With the statutory status, there is a possibility that it can accelerate the projects and raise funding autonomously. It has the competency to fill the institutional gap in urban transport governance to make it more efficient and effective.

References

- 1. Ahmed M., Srivastava N., Tipnis, G. and Matsumura S., A Study of Mumbai and Hyderabad's Intermodal Transportation Hubs and Their Potential in The Future Railway-Led Urban Development in India, Transportation Research Procedia, 2020, Volume 48, Pg.1968-1986.
- 2. Adimulum S, Mumbai Monorail Turns the Corner, Indian Express, April 6, 2023. <u>Https://Indianexpress.Com/Article/Cities/Mumbai/Mumbai-Monorail-Turns-The-Corner-8520685/</u>
- Adimulam S., Land Acquisition Cost for Alibaug to Virar Multi-Modal Corridor Shoots to Rs. 21,000 Cr, Total Project Cost Also Spirals Over Four-Fold, Indian Express, January 3, 2023. <u>Https://Indianexpress.Com/Article/Cities/Mumbai/Land-Acquisition-Cost-Shoots-To-Rs-21000-Cr-Total-Project-Cost-Also-Spirals-Over-Four-Fold-8333588/</u>.



E-ISSN: 2582-2160 • Website: www.ijfmr.com • Email: editor@ijfmr.com

- HT Correspondent, Mumbai Metro: 10 Deadlines Missed, What Caused the Delay?, Hindustan Times, June 8, 2014. <u>Https://Www.Hindustantimes.Com/Mumbai/Mumbai-Metro-10-Deadlines-Missed-</u> What-Caused-Delay/Story-4xiqvfzoysxwr1zmfis3fj.Html
- 5. Kala S. S. And Guanghua W, Urbanization in Asia: Governance, Infrastructure, And the Environment, Springer, India, 2014.
- Kamble G., Failure of Mumbai's Monorail Holds Lessons for Urban Planners Everywhere, The Wire, January 10, 2019. <u>Https://Thewire.In/%22urban%22/Failure-Of-Mumbais-Monorail-Holds-Lessons-For-Urban-Planners-Everywhere</u>
- 7. Lea Associates, Comprehensive Transport Study for Mumbai Metropolitan Region, Report for Mumbai Metropolitan Region Development Authority, 2021.
- 8. MMRDA, Unified Mumbai Metropolitan Transport Authority, April 3, 2025. <u>Https://Mmrda.Maharashtra.Gov.In/Projects/Transport/Ummta/Overview</u>
- 9. Mapuskar M., Right to the City: In the Context of Road Transportation in Mumbai, Writers Choice, New Delhi, 2021.
- 10. Lok Sabha Secretariat, Action Taken by The Government on The Recommendations Contained in the 13th Report of the Standing Committee on Housing and Urban Affairs on the Subject, 'Implementation of Metro Rail Projects – An Appraisal', Report for Ministry of Housing and Urban Affairs, 2022.
- 11. Ministry Of Housing and Urban Affairs, Metro Rail Policy, 2017.
- 12. Ministry Of Housing and Urban Affairs, Unified Metropolitan Transport Authority UMTA And Urban Transport Fund UTF Documents, 2016.
- 13. Naik Y, Mumbai: Green Nod to Section of Virar-Alibaug Multi-Modal Corridor Project, Indian Express, June 22, 2021. <u>Https://Indianexpress.Com/Article/Cities/Mumbai/Mumbai-Green-Nod-To-Section-Of-Virar-Alibaug-Multi-Modal-Corridor-Project-7369564/</u>
- Sen S, at 46 Lakhs, Mumbai Now Has 2,300 Vehicles for Every Km of Road, Times of India, April 14, 2024. <u>Https://Timesofindia.Indiatimes.Com/City/Mumbai/At-46-Lakh-Mumbai-Now-Has-2300-Vehicles-For-Every-Km-Of-Road/Articleshow/109282111.Cms</u>
- Sorensen C., Hansson L. and Rye T., The Role of Meta-Governance in Public Transport Systems: A Comparison of Major Urban Regions in Denmark and England, Transport Policy, 2023, Volume 130, 2023, Pages 37-45.
- 16. T E Raja Simhan, Chennai Will Soon Have Single Ticketing Across Public Transport, The Hindu Business Line, May 16, 2024. <u>Https://Www.Thehindubusinessline.Com/Economy/Logistics/Chennai-Will-Soon-Have-Single-Ticketing-Across-Public-Transport/Article68182236.Ece</u>
- 17. The Metro Rail Guy, Virar- Alibaug Multimodal Corridor: Information and Status, The Metro Rail Guy, December 10, 2023. <u>Https://Themetrorailguy.Com/Msrdc-Virar-Alibaug-Multimodal-Corridor-Route-Map-Status-Update/Viraralibaugmultimodalcorridor/</u>
- 18. Vellucci P., A Critique of Financial Neoliberalism: A Perspective Combining Multidisciplinary Methods and Commodity Markets, SN Bus Econ 1, 2021, 50.

¹ Mapuskar M., Right to The City: In the Context of Road Transportation in Mumbai, Writers Choice, New Delhi, 2021.

 ² Kala S. S. And Guanghua W., Urbanization in Asia: Governance, Infrastructure, and the Environment, Springer, India, 2014.
 ³ Adimulum S., Mumbai Monorail Turns the Corner, Indian Express, April 6, 2023. <u>Https://Indianexpress.Com/Article/Cities/Mumbai/Mumbai-Monorail-Turns-The-Corner-8520685/</u>

⁴ HT Correspondent, Mumbai Metro: 10 Deadlines Missed, What Caused the Delay?, Hindustan Times, June 8, 2014. <u>Https://Www.Hindustantimes.Com/Mumbai/Mumbai-Metro-10-Deadlines-Missed-What-Caused-Delay/Story-</u> 4xiqvfzoysxwr1zmfis3fj.Html



⁵ Ahmed M., Srivastava N., Tipnis G. and Matsumura S., A Study of Mumbai and Hyderabad's Intermodal Transportation Hubs and Their Potential in the Future Railway-Led Urban Development in India, Transportation Research Procedia, 2020, Volume 48, Pg.1968-1986.