International Journal of Innovative Technology and Exploring Engineering (IJITEE)
ISSN: 2278-3075 (Online), Volume-11 Issue-11, October 2022

The Promotion of Public Transport to Decongest the Traffic From Metro Areas of Mumbai Metropolitan Region

Jeevan Anant Pawaskar, Digvijay Sanjay Deshmukh, Sagar Pawar

Abstract*: The article explains evolution of transportation sector and concept of public transport. It links with the transportation scenarios in India and Mumbai as a case. The importance of public transportation in India and Mumbai is explained by quoting various numerical datasets published by authorities and research agencies. The development of public transport sector will mostly depend upon the total number of private vehicles and registrations. In Mumbai, currently the trend of using public transport is decreasing while on other hand private vehicles registration is increasing day by day. Proposed transportation projects of MMRDA will give relief to the internal traffic if implemented on time. But still they need to be supported by the additional planning interventions such as planning for industrial areas, business centers and growth centers on periphery of MMR. New transportation modes are required to be experimented since existing modes are insufficient to handle the public transport demand of MMR. The proposed waterway project, need for new airports and integration of last mile connectivity through public transport is emphasized relating to the proposed projects of MMRDA.

***Keywords*: Private Vehicles, Public Transport, Last-mile Connectivity, Mumbai Metro.**

I. INTRODUCTION

The transportation history begins from the human era which has changed over a period of time. The human feet are considered as first means of transportation. People use to walk large distances to commute to their respective destinations. They started exploring the new regions and adapted different surfaces such as snow and ice. The transportation history has drastically changed with the invention of wheels. The axel and wheel were previously used in other small machines such as wheelbarrows. Thereafter, the existing means of transportation were continuously improved. Humans started experimenting with modes of transportation by clubbing for example, attachment of horse to the wheel cart. Later on in 17th century, transportation started gaining large momentum. The term 'Public Transport' emerged due to introduction to new modes of transportation such as steam boats, submarines and hot air balloons. People started using it on large scale. In 18th and 19th century, scholars such as Jean Lenoir and Wright Brothers introduced the gas engine motorcycle and manned aircraft respectively [12]. Air transport improved the global connectivity due to drastic increase in public air transport users [10]. Looking at the scenario in India, it generally consists of transport by land, water and air. Public transport is the primary mode of road transport for most of the Rural India. It is said that India's public transport systems are most heavily used in the world. In India, the population has increased the load on public transportation systems. The metro cities such as Mumbai, Delhi, Chennai and Kolkata are facing very serious traffic congestion issues [6]. Also, the increased emissions from vehicles are causing serious environmental implications. These are happening not only in India but also the globe is facing climate change issue due to such uncontrolled growth of transportation sector. India, being a developing country has started drafting policies which are oriented towards sustainable transportation and environmental conservation.

II. IMPORTANCE OF PROMOTING PUBLIC TRANSPORTATION IN INDIA

As per the article published in Business Standard, the Indian Public Transport's share in commute will decrease from 75 percent to 44 percent by 2030. The report took account of 14 major cities in the country including Delhi, Mumbai, Bengaluru, Lucknow, Bhopal and Jaipur [5]. The pollution problem in India is directly linked to the intensity of using private vehicles for daily commute. The report titled, "The Urban Commute" by Centre for Science and Environment states that more than 40 percent oil and oil products are burnt to run vehicles. It negatively impacts the environment and economy since 80 percent of crude oil in India is imported [5]. The cities have become gas chambers due to smoke emissions. The new policies of economic liberalization have led to the entry of international brands and now the cars of these global brands have become status symbols of upper middle class. In year 2001, around 7 million cars were registered and in year 2016, nearly 30 million cars were registered. These increased number of private vehicles has not only implicated on environment but also on the social health [7]. The emissions are affecting the eyes and lungs of citizens giving rise to all types of respiratory and cardiovascular diseases.

Manuscript received on 16 September 2022 | Revised Manuscript received on 21 September 2022 | Manuscript Accepted on 15 October 2022 | Manuscript published on 30 October 2022.

***** Correspondence Author (s)
Jeevan Anant Pawaskar*, Assistant Urban Planner, Techcomm Urban Management Consultants, Thane, India. Email: jeevanap98@gmail.com
Digvijay Sanjay Deshmukh, HSC, Shubham Raje Jr. College, Thane, India Email: digvijaysd16@gmail.com
Sagar Pawar, HOD Planning, Techcomm Urban Management Consultants, Thane, India. Email: pawarsagar52@gmail.com

The use of private vehicles is increasing day by day and it is very crucial to promote the use of public transportation in India.

A. Existing Scenario of Private Vehicles in Mumbai

As Mumbai is the financial capital of India which has the highest traffic congestion rates in India. It was witnessed under "Mission Begin Again" in Mumbai that some commuters commute for over 8 hours in a day. Mumbai has traditionally had a higher public transport (PT) modal share (59 percent) [8]. Mumbai reported world's highest congestion in 2017, 2018, 2019 and was the fourth highest in 2020. The vehicle density in Mumbai is 1900 vehicles packed in just 1 kilometers of road length. The number of private vehicles in Mumbai have increased from 6.5 lakhs in 1998 to 30.4 lakhs in 2018 [8]. It has witnessed 385 percent rise in two-wheelers, 340 percent rise in private cars and 360 percent rise in total private vehicles [14]. Mumbai and its peripheral cities such as Navi Mumbai, Thane, Mira-Bhayandar and Bhiwandi are facing traffic jam issues on daily basis. MMRDA is responsible for the regional development of Mumbai Metropolitan Region. It has planned for infrastructure and is implementing large projects to resolve the traffic congestion issues.

Being a business and financial hub, Mumbai attracts people from all over India. According to the Census 2011 data, migrants comprise 51 percent population of Mumbai. It includes skilled, unskilled, organized and unorganized. As compared to year 2001, the migrant population has increased by 11 percent [1]. The people have migrated for employment opportunities and educational facilities. They commute to their workplaces on daily basis either using their private vehicles or other using public transport. The Mumbai locals or "Life line of Mumbai" are saturated and carrying passengers exceeding their capacities [11]. The system was designed for a population which has already saturated. Along with the BEST, most of the municipal corporations falling within MMR have their own public transport systems such as TMT, NMMT and MBMT etc. Mumbai monorail has started functioning but only 8-9 percent area of MMR is covered by monorail network. The only way to reduce the traffic congestion issues within MMR and thereby to reduce the environmental implications is promoting public transport and last-mile connectivity [2]. The incorporation of last-mile connectivity through public transport is to be made mandatory under the development plans of Municipal Corporations.

B. Mumbai Metro and Proposed Transportation Scenario

MMRDA has proposed the metro network which includes total 14 lines. After implementation of all these metro lines nearly half of the existing traffic from MMR can be reduced if the project is implemented on or before time. Amongst these 14 lines, metro line 3 (Colaba-Bandra-SEEPZ) is being constructed underground. As per the CTS published by MMRDA [8], the road projects such as Mumbai Trans Harbour Link, Mumbai Coastal Road, Mumbai-Nagpur Samruddhi Expressway, Mumbai-Vadodara SPUR, Coastal Highway, Konkan Expressway and Mumbai-Goa Highway will add on to the internal traffic of MMR. Currently, the traffic coming from Gujarat and going towards Pune and Konkan uses Ghodbunder Road of Thane. It can be then bypassed using Mumbai-Vadodara SPUR and directed towards Mumbai Pune Expressway or the proposed connectors of Konkan region. The Mumbai-Nagpur Samruddhi Highway will reduce the travel time by 4-5 hours and will end near Bhiwandi. It will connect with SPUR at Padgha which is a part of Bhiwandi Surrounded Notified Area (BSNA) [8]. The SPUR will again act as half ring road and divert the traffic towards Pune or Konkan without letting them enter into internal areas of Mumbai.

If the truck terminals or Bus terminals are proposed and constructed on periphery of MMR where these major roads are connecting would help to disperse the population using public transport. For example, MSRTC can construct its bus depot near Padgha at interception of Mumbai-Vadodara SPUR and Samruddhi Expressway. The commuters from Nagpur will alight at Padgha and compulsorily take the public transport for further travel to Mumbai and its surrounding cities. Currently, the heavy goods vehicles are also passing through MMR instead of which, the traffic can be stopped at the periphery by proposing new growth centers on potential peripheral areas. These growth centers can be developed through private developers where there will be win-win situation for government, private developer and the project affected people (PAPs). These truck terminals and bus terminals need to be connected with metro or monorail network to reduce the travel time using public transport. Large car and bike parking facilities need to be provided at the periphery similar to the truck parking facilities. Commercial facilities can be developed at such locations which can give an ultimate boost to the local economy.

C. Proposed Waterway Projects: A new public transportation option in MMR

MMRDA has proposed two waterway projects namely, Vasai-Thane-Kalyan and Thane-Vashi-Belapur. These projects are being implemented with the help of Maharashtra Maritime Board. But based on the data from DPR of Vasai-Thane-Kalyan waterway, it is found that the area allotted for the construction of water terminals is not sufficient. All the calculations regarding inbound and outbound passengers are carried out but the potential of heritage and tourism development is not considered. The proposed waterway circuits will help to boost the tourism sector. There are many forts constructed by Portuguese situated along the proposed way such as Vasai fort, Parsik fort, Ghodbunder Fort and Thane fort [4]. Also, there are two eco-sensitive areas namely, Sanjay Gandhi National Park and Tungareshwar Bird Sanctuary. Which have potential to be developed for tourism purpose without compromising on their conservation. An area near TS Chanakya in Nerul is reserved as a Flamingo Sanctuary which can be connected with the proposed Thane-Belapur waterway. It is necessary to allot land parcels of 20-25 hectares each for the water terminals where commercial and recreational activities can be clubbed along with full-fledged parking spaces.

Published By:
Blue Eyes Intelligence Engineering
and Sciences Publication (BEIESP)

To promote these waterways, firstly the fare can be kept free. It would make users used to with the new public transport mode in MMR. Later on, when the ferry passengers will increase, the charges can be imposed similar to the Metro-Mono and existing suburban rail network in MMR.

D. Integration of Last-Mile Connectivity

As per CMP, it is estimated that 60 per cent of trips on public transport start or end with walking. Maharashtra state government's draft transport policy calls for 80 per cent trips to be made through walking, cycling or public transport [3]. To promote the last-mile connectivity, it is important to allot large multi-level parking spaces (MLPs) at proposed metro-stations. The concept of last-mile connectivity can be incorporated using implementation of non-motorized transport (NMT). Hence, cycle sharing facilities and electric scooters can be planned near the residential areas within MMR. It would be the sole responsibility of local municipal corporation to maintain and manage these facilities. The commuters will have to use these cycles to reach their nearest public bus stops. They can continue their further sectoral travel using public buses which would be purely electric buses. These buses will feed traffic to metro or monorail stations. From these stations, passengers can commute to their respective destinations within MMR. Similarly, they will follow the pattern till their workplaces. Demoting the use of private vehicles is absolutely necessary to reduce the traffic load on roads within MMR. The Electric Vehicle Policy (EV Policy) of India will bring change if implemented on time. Navi Mumbai Municipal Corporation has started constructing electric charging stations at public places to promote the use of electric vehicles [13]. Most of the public buses of NMMT are converted from CNG driven system to electricity driven system. Similarly, all other transportation agencies can upgrade their modes as per the financial availability.

E. Emerging need of new airports in MMR

Chatrapati Shivaji Maharaj International Airport is second busiest airport of India after Delhi's IGIA. It was designed for a capacity of 40 million passengers but today it is handling more than 100 million passengers. Existing airport is not complying with the IATA and ICAO norms for air travel. The existing airport is situated at core of MMR and hence all the passengers travelling to international destinations need to travel till the core. Hence, to decentralise the air travellers, Navi Mumbai International Airport is proposed near Chirle. Its design capacity is 90 million passengers. Same airlines and routes which are being operated from CMIA would be handled from NMIA. It been now 10 years, the construction is going on. It would take another 3-4 years to complete the NMIA. Since, MMRDA has extended its planning area towards Palghar in north and Alibaug in south [9], an international airport can be proposed at Palghar which will triangulate the air traffic. It would further reduce the load on internal roads of MMR. Since, two major ports are proposed at Vadhvan in north of Palghar and Dighi on south of Alibaug, the cargo traffic can be diverted and connected to the proposed international airports [9]. If the extended areas of MMR are planned considering all these future traffic scenarios, the heavy goods traffic and traffic of private vehicles can be restricted successfully at periphery. It would successfully boost the public transport sector within Mumbai Metropolitan Region and help to reduce the environmental degradation due to vehicular emissions.

III. CONCLUSION

The CMP of Mumbai admits that the existing institutional arrangements for transportation are not adequate. There is a strong need for institutional strengthening at both urban and regional level. Also, there is a need of creating a high functioning and effective unified transport authority. The inspiration can be taken from Transport for London (TfL). It can enable standard data gathering framework between different modes while serving as nodal authority. The authority can help public transport planning and integrating last mile connectivity options. The new normal in Mumbai must not continue with the same fundamental problems in mobility and deserves a comprehensive overhaul.

REFERENCES

1. Census. (2011). *Census of India*. Retrieved 08 30, 2022, from Census of India: https://censusindia.gov.in/census.website/
2. DMRC. (2022). *Delhi Metro Rail Corporation*. Retrieved August 30, 2022, from DMRC: https://www.delhimetrorail.com/last-mile-connectivity
3. Govt. of Maharashtra. (2018). *Maharashtra Urban Transport Policy*. Mumbai: Government of Maharashtra.
4. HT. (2018, May 20). *Hindustan Times*. Retrieved August 30, 2022, from Hindustan Times: https://www.hindustantimes.com/mumbai-news/these-forts-tell-story-of-city-s-glorious-past/story-kTp0ycQBmvIhhIRL3uWfkO.html
5. Jain, M. (2018, August 29). Public transport's share in commute to decrease from 75% to 44% by 2030. *Buisness Standard*. Retrieved August 30, 2022, from https://www.business-standard.com/article/current-affairs/public-transport-s-share-in-commute-to-decrease-from-75-to-44-by-2030-118082900092_1.html
6. Jha, R. (2020, July 22). Fundamental steps towards tackling traffic congestion in Indian cities. *Urban Futures*. Retrieved August 30, 2022, from https://www.orfonline.org/expert-speak/fundamental-steps-towards-tackling-traffic-congestion-in-indian-cities/
7. Karuna. (2018). Article on the Importance of Public Transport. *The Fresh Reads*. Retrieved August 30, 2022, from https://www.thefreshreads.com/article-on-the-importance-of-public-transport/
8. LASA. (2018). *CTS Transport Study for Mumbai Metropolitan Region*. Mumbai: MMRDA. Retrieved August 30, 2022
9. MMRDA. (2016). *Regional Plan for Mumbai Metropolitan Region*. Mumbai: MMRDA.
10. NASM. (2022). *The Wright Brothers : The Invention of an Aerial Age*. Retrieved August 30, 2022, from National Air and Space Museum: https://airandspace.si.edu/exhibitions/wright-brothers/online/
11. Paranjape, S. (2021). The Life-lines of Mumbai. *Indian Railways Fan Club*. Retrieved August 30, 2022, from https://www.irfca.org/articles/mumbai-locals.html
12. SMG. (2021). *Science Museum Group: Collection*. Retrieved August 30, 2022, from Science Museum Group: https://collection.sciencemuseumgroup.org.uk/objects/co8002419/lenoirs-gas-engine-1860
13. The Free Press Journal. (2022, May 25). *Navi Mumbai: NMMC's first EV charging station to be operational in Nerul soon, trial underway*. Retrieved from The Free Press Journal: https://www.freepressjournal.in/mumbai/navi-mumbai-nmmcs-first-ev-charging-station-to-be-operational-in-nerul-soon-trial-underway

14. TOI. (2018, October 22). *Cars, bikes now occupy 77% of Mumbai roads, buses 2%*. Retrieved August 30, 2022, from The Times of India: https://timesofindia.indiatimes.com/city/mumbai/cars-bikes-now-occupy-77-of-mumbai-roads-buses-2/articleshow/66309267.cms

AUTHORS PROFILE

Jeevan Anant Pawaskar is working as an Assistant Urban Planner at Techcomm Urban Management Consultants, Thane. Currently he is working on preparation of GIS based Master Plan for Navi Mumbai Municipal Corporation. He has completed his graduation in Architecture from University of Mumbai and Masters in Regional Planning from School of Planning and Architecture, New Delhi. He has worked with various reputed organizations such as Airports Authority of India, GMR Group Hyderabad, Larsen & Tubro and M/S Archetype Consultants Pvt. Ltd., Thane for training programs. As part of academic projects, he has worked on an Outline Development Plan for Bhubaneshwar, Orissa, Block Development Plan for Karimnagar Rural, Telangana and District Development Plan for Puri, Orissa. He has conducted research on topic of Flood Mitigation Strategies for Ratnagiri District, Maharashtra and presented it as a thesis for his master's program. As an architecture student he has participated and won international competitions organized by uni.xyz competitions (Bharat Bhavan International Design Competition) and Arch sharing competitions (Nepal Community Center Design Competition). He is a registered architect under the Council of Architecture. He holds a specialization in urban-regional planning, regional transportation & infrastructure as well as disaster management projects.

Digvijay Sanjay Deshmukh is a dedicated young student aspiring for higher education opportunities in fields of civil engineering, planning, construction management and transportation sectors. He is currently pursuing his higher secondary education and holds distinction grades. Apart from academics, his interest in thinking and envisaging about urban development makes him an aspiring urban development enthusiast.

Sagar Pawar is the Planning Head of Techcomm Urban Management Consultants Pvt Ltd. He has completed his M. Tech in Town and Country Planning from College of Engineering, Pune and B.E. in Civil Engineering from Pune University. He has more than 5 years of elaborative experience in preparation of Town Planning Schemes, GIS Based Development Plans, Area Based Master Planning and various Urban and City Planning assignments.