Tactful Management Research Journal
ISSN :2319-7943
Impact Factor : 2.1632 (UIF)

PASSENGER TRANSPORT IN MUMBAI METROPOLITAN REGION

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Abstract : Mumbai Metropolitan region comprises 1.71% Population of the nation, but 14.20% of the motor vehicles. The MMR has in recent years, witnessed the present transport system faces a number of serious problems of human mobility pertaining to transportation. The growth of motor vehicles in MMR is faster than the growth of human population. The cost of travel time due to congestions on the roads and on the railway lines has made routine movements of Mumbaikar highly expensive. The unplanned inflow of population from various states has created the problem of transport planning and traffic management. This study mainly focuses on the growth and emerging problems relating to- (1) Public Passenger Transport in (a) organize sector-Suburban passenger trains, Bombay Electric Supply and Transport undertaking buses NMMT, TMT etc. and (b) unorganized sector – taxis, private buses etc. (2) Private Motor Vehicles and Private Non-Automotive Vehicles

Keywords: Passenger, Transport, Mumbai Metropolitan Region, MMRDA

INTRODUCTION

The geographic conditions of Mumbai Metropolitan Region (MMR) confine it to a narrow strip with exiguous breadth. Residential population is located in the North (Vasai, Virar, direction), North-East (Kalyan, Badlapur direction), East (Navi Mumbai), South-East (Kalamboli- Panvel) and employment in the south, the pattern of travel is oriented in the south direction recent trend across the region (i.e between Andheri- Borivali and Navi Mumbai- Panvel). Consequently in the morning hours large size of Mumbai's population move towards south and in the evening they shuttle back commuting in all the modes of available transport. This has led to inadequacy of public transport facilities causing the reduction of trips, increase in transport cost and a terrible menace of growing road accidents.

MMR's transport problem anchored at dealing with peak hour. Most of the work, business, fire-stations, private markets, municipal markets, commercial establishments, residential hotels, are located in the Mumbai city. Therefore persons working in these establishment starts commute between 8.30 a.m. and 11 a.m. The same people return from their work between 5 p.m and 11 p.m..

THE PROBLEM TO BE INVESTIGATED

The number of motor vehicles is inadequate comparing to the number of commuters who rely only on transport facilities.. Can we provide sufficient and efficient transit facilities to Mumbai's growing population? Although it is possible to provide sufficient transport facilities, it is questionable regarding how chalk out a plan to achieve this goal.

OBJECTIVE OF THE STUDY

The main objectives of this study are:

(a) to analyze the pattern of growth of population in city MMR.
(b) to analyze the pattern of density in MMR.
(c) to study pressure of traffic and the degree of accidents on The roads of MMR.
(d) to study the magnitude of accidents on the suburban tracks.
(e) to study growth of unorganized mode of passenger transport and the problems encountered by them.

RESEARCH DESIGN AND METHODOLOGY

The study will be based on the secondary data collected from the offices of (a) Mumbai Electric Supply and Transport undertaking (BEST), (b) Traffic Planning Department, Mumbai Municipal Corporation. (c) Traffic Cell, Mumbai Police (d) Sub-divisional Police Office (Railways). The study will also use primary data through questionnaire to study pattern of travel demand.

SIGNIFICANCE OF THE STUDY

The study has special significance to the society. Transport is basically a public utility. It provides mobility. A balanced transport network offers safe, regular, dependable and economic means of movement to men and materials, and thus it is indispensable to the society.

RELEVANCE OF THE STUDY TO PRESENT DAY PROBLEMS

Passenger transport system is an integral part of all functional life of Mumbaikar (MMR is all Mumbaikar). A balanced passenger transport network is a vital element without which the daily life of the city MMR would almost come to a standstill.

Passenger transport system of MMR must provide adequate means of movement to the commuters from the place of residence to the place of work and vice-versa daily at two specific rush hour periods. To several lacks of MMR residents shuttle to and fro daily relying on train journey. There are office goer, a factory worker, student or businessman, all these people use the different modes of available transport, such as local trains, buses, taxis, private cars or motorbike.

RESEARCH STUDY

Mumbai formerly known as Bombay, is the capital city of the Indian state of Maharashtra. It is the most populous city in India, and the fourth most populous city in the world, with 20.5 of million. Along with the neighboring urban areas, including the cities of Navi Mumbai and Thane, it is one of the most populous urban regions in the world Known as Mumbai Metropolitan Region. Mumbai lies on the west coast of India and has a deep natural harbour. In 2009, Mumbai was named an alpha world city. It is also the wealthiest city in India, and has the highest GDP of any city in South, West or Central Asia.

The Mumbai Metropolitan Region (MMR) is encompasses the metropolis of Mumbai and its satellite towns. Developing over a period of about 20 years, it consists of seven municipal corporations and fifteen smaller municipal councils. The entire area is overseen by the Mumbai Metropolitan Region Development Authority (MMRDA), a Maharashtra State Government organization in charge of town planning, development, transportation and housing in the region. The MMRDA was formed to address the challenges in planning and development of integrated infrastructure for the metropolitan region. The areas outside of Brihan Mumbai (Greater Mumbai) and Navi Mumbai have lacked organised development. Navi Mumbai, developed as one of the largest planned cities in the world, was promoted by a Maharashtra Government-owned company, City and Industrial Development Corporation (CIDCO). The region has had problems related to haphazard and illegal development as a result of rapid urbanization. The Villages along the NH3 in Bhiwandi Taluka are examples of haphazard development in the MMR, with some of the largest warehousing areas in India. Government agencies such as the Town Planner and Collector of Thane have had challenges in addressing unorganized development.

POPULATION

The region has an area of 4,355 sq. km. and with a population of 20,998,395, it is among the top ten most populated urban agglomerations in the world. It is linked with Mumbai through the Mumbai Suburban Railway system and a large network of roads.

Table No.1: Population of M M R

Municipal Corporations	Population (2001 census)	Population (2011 census)	Area (sq.km.)	Density (per sq. km.)
Greater Mumbai	11,978,450	12,478,447	603.40	20,694
Navi Mumbai	704,002	1,119,447	163.00	4,319
Thane	1,818,872	1,262,551	147.00	8,589
Kalyan-Dombivali	1,193,512	1,546,381	137.15	8,702
Vasai-Virar	N/A	1,221,233	105.00	11,614
Mira-Bhayandar	520,388	814,655	88.75	5,863
Bhiwandi-Nizampur	598,741	811,329	28.31	21,149
Ulhasnagar	473,731	506,937	27.54	17,201
Totals	19,635,521	20,748,395	1,176.38	16,692

COMMERCIAL CITY

Mumbai is the commercial and entertainment capital of India, it is also one of the world's top 10 centers of commerce in terms of global financial flow, generating 5% of India GDP, and accounting for 25% of industrial output, 70% of maritime trade in India (Mumbai Port Trust & JNPT), and 70% of capital transactions to India's economy. The city houses important financial institutions such as the Reserve Bank of India, the Bombay Stock Exchange, the National Stock Exchange of India, the SEBI and the corporate headquarters of numerous Indian companies and multinational corporations is also home to some of India's premier scientific and nuclear institutes like BARC, NPCL, IREL, TIFR, AERB, AECI, and the Department of Atomic Energy. The city also houses India's Hindi (Bollywood) and Marathi film and television industry. Mumbai's business opportunities, as well as its potential to offer a higher standard of living, (18) attract migrants from all over India and, in turn, make the city a melting pot of many communities and cultures.

The name Mumbai is derived from Mumba or Maha-Amba the name of the Koli goddess Mubadevi and Aai, "mother" in the language of Marathi, and The Mumbai Conurbation is a conurbation that comprises the metropolitan city of Mumbai (City, Suburban and Navi Mumbai), and seven urban areas – Thane, Mira-Bhayandar, Kalyan-Dombivali, Ulhasnagar, Vasai- Virar and Bhiwandi-Nizampur as well as several other towns and villages. Several public authorities are responsible for development and maintenance of the Mumbai Conurbation. While each urban area or township has its own local self government the MMRDA undertakes projects parallel to the function of the local government. Mumbai city – especially the Greater Mumbai area – is plagued with troubles due to concentration of businesses and lack of supporting infrastructure. Some of the projects MMRDA undertook were to move some of these businesses to other areas in the Mumbai Conurbation. For example, some of the wholesale markets were moved out of Greater Mumbai to other areas in the Conurbation e.g. wholesale food grain market to Vashi. The entire island is called the Mumbai Metropolitan Area.

TRANSPORT

Transport and Communication are the vital components of infrastructure of modern economy. An efficient transport system integrates remote, backward & urban areas and plays a vital role in increasing productivity & improving quality of life. Moreover, development of the is sector generates large employment opportunities. The transport system comprises of road transport, railways, water transport and air transport, the main components of communication systems are postal services, telephones and internet services.

A) Surface Transport:

(i). Motor Vehicles:

The total number of motor vehicles on road in the State as on 1st January, 2013 was 208 lakh (i.e. 18,014 vehicles per lakh population), showing an increase of 9.9 per cent over previous year. Of the total vehicles in the State, about 21.60 lakh vehicles (10.4 per cent) were in Brihanmumbai. The number of vehicles per km road length in the State is 86. The category wise number of motor vehicles in the State & Brihanmumbai on road are given in Table No.2.

Table No.2: Category wise number of motor vehicles on road

Category	As on 1st January					
	Maharashtra State			Brihanmumbai		
	2012	2013	Per cent-change	2012	2013	Per cent-Change
Two wheelers	13,513.6	14,928.6	10.5	1,118.1	1,205.3	7.8
Auto rickshaws	661.5	660.9	(-)0.1	113.5	118.5	4.4
LMV	2,841.0	3,144.1	10.7	691.4	755.4	9.3
Cars, Jeeps, Station wagons & Taxis & Buses	87.1	96.1	10.3	12.0	12.3	2.5
Goods vehicles	1,053.6	1,135.8	7.8	62.9	64.9	3.2
Tractors	404.7	449.0	10.9	0.6	0.6	0.0
Trailers	316.7	338.9	7.0	0.2	0.2	0.0
Ambulances	10.5	11.1	5.7	1.4	1.4	0.0
Other vehicles	30.5	35.0	14.8	1.5	1.5	0.0
All	18,919.2	20,799.5	9.9	2,001.6	2,160.2	7.9

Note:

- Two wheelers includes-Motorcycles, Scooters & Mopeds
- Goods vehicles includes - Articulated/Multiaxel vehicles, trucks & lorries, tankers, delivery vans (3 & 4 wheelers), etc
- Buses includes- Stage carriages, contract carriages, school buses & PSV.

Source: Transport Commissioner's Office, GoM *Provisional, LMV-Light Motor Vehicles, PSV- Public Service Vehicles.

The number of valid motor driving licenses in the State at the end of March, 2012 was 238.7 lakh, showing an increase of 12.0 per cent over the previous year. The number of learning licenses issued in the State during 2011-12 was 24.31 lakh.

Road accidents cause loss of human lives and damage to the property. Road Safety was observed in first fortnight of January, 2013 with the theme “Stay Alive Don't Drink & Drive.” Plays and lectures based on theme of road safety were organised in the State. The number of accidents, persons killed & injured during 2008 to 2012 in the State and Brihanmumbai are given in Table. No.3

Table No. 3: Number of accidents, persons killed & injured in the State and Brihanmumbai

Year	Number of accidents			Number of persons killed			Number of persons injured		
	State	Brihan-Mumbai	Perce-ntage	State	Brihan-Mumbai	Perce-ntage	State	Brihan-Mumbai	Perce-ntage
2008	75,527	29,780	39.4	12,397	621	5.0	52,780	6,453	12.2
2009	71,995	29,440	40.9	11,396	620	5.4	47,878	6,589	13.8
2010	69,573	23,499	33.8	12,287	549	4.5	46,528	4,896	10.5
2011	68,438	25,471	37.2	13,057	563	4.3	45,616	5,059	11.1
2012	66,316	24,592	37.1	13,333	488	3.7	43,847	4,543	10.4

Source: Motor Transport Statistics of Maharashtra @ percentage of accidents in Brihanmumbai to State, # percentage of persons killed in Brihanmumbai to State, $ percentage of persons injured in Brihanmumbai to State.

(ii). City Passenger Transport:

The public passenger transport is the major mode of transport in cities. This facility is available in 25 cities in the State. Of these, MSRTC provides local transport facility in nine cities (Arnala, Vasai, Nalasopara, Ratnagiri, Sangli-Miraj, Chandrapur, Nashik, Aurangabad and Nanded); BEST in Brihanmumbai, PMTC in Pune & Pimpri-Chinchwad Municipal Corporation area and in remaining 13 cities respective Municipal Council / Corporations are providing such facilities. During 2011-12, on an average MSRTC was operating 506 city buses per day, while 16 local municipal transports were operating 6,482 city buses per day, of which BEST alone was operating average 3,933 buses. Operational statistics of these City Transport Services is given in Table No.4

Table No.4: Operational statistics of city passenger transport services

Transport service provider	Average no. of buses on road per day		Average no. of passengers carried per day (lakh)		Average effective kms operated per day (lakh)		Net profit/loss (Rs. In Lakh)	
	2011	2012	2011	2012	2011	2012	2011	2012
B.E.S.T.	4,082	3,933	42.06	39.33	7.16	7.00	-19,352	-84,776

Note : B.E.S.T.- Brihanmumbai Electricity Supply & Transport.
Source: Data collected from Mumbai Municipal Corporation and B.E.S.T.

(iii). Railways:

Indian Railways is the backbone of India's transport infrastructure and has been the prime mover of the nation with its network of 65,202 km as on 31st March, 2012, of which 5,984 km (9.2 per cent) railway route length is in the State.

(iv). Mumbai Suburban Railway:

Local Rail network is the principal mode of mass transport in Mumbai. Two zonal railways, the Western Railway (36 stations) and the Central Railway(62 stations) operate Mumbai suburban railway system. The Harbour line (38 stations) is part of the Central Railway. A fleet of 195 rakes (train sets) are utilized to run 2,736 train services, carrying 7.41 million passengers per day. The year wise number of local trains is given in Table No.5.

Table No. 5: Year-wise number of local trains (rakes)

Year	9 car	12 car	15 car	Total
1970-71	73	-	-	73
1980-81	94	-	-	98
1990-91	128	1	-	129
2000-01	118	39	-	157
2009-10	87	97	1	185
2010-11	56	136	1	193
2011-12	47	147	1	195

Source: Data collected from Mumbai Rail Vikas Corporation.

Mumbai Rail Vikas Corporation Ltd (MRVC) is implementing rail component of MUTP II, under which the additional 5th & 6th line between CST-Kurla, 5th & 6th line between Thane-Diva on Central Railway and 6th line between Mumbai Central-Borivali, extension of Harbour line from Andheri to Goregaon on Western Railway are being taken. In addition, 72/12 car rakes (864 coaches) are being procured for Mumbai Suburban of Central & Western Railways.

(v). Navi Mumbai Metro Rail Project:

CIDCO decided to review the master plan for transportation connectivity in view of proposed SEZ and Navi Mumbai International Airport (NMIA). Five metro rail corridors have been initialized for development in three phases. CBD Belapur-Pendhar-Kalamboli-Khandeshwar-NMIA corridor shall be executed in the first phase in three stages, out of which the work of first stage, Belapur-Pendha (11.1 km) is in progress. Estimated cost of project is Rs. 2,111.51 crore and expenditure of Rs. 183.32 crore has been incurred upto January, 2013. Belapur-Pendhar (first stage) has planned to be commissioned by December, 2014.

B) Air Transport:

There are three international and five domestic airports in the State. Passenger and cargo traffic statistics of all these airports are given in Table No. 6.

Table No.6: Passenger and cargo traffic by airports

Airport	Passengers (lakh)		Cargo (tones)	
	2011	**2012**	**2011**	**2012**
Domestic				
Mumbai	199.95	210.44	1,99,831	1,90,288
Pune	27.53	32.29	27,828	24,134
Nagpur	12.00	13.77	9,145	4,588
Aurangabad	2.66	4.01	1,841	1,227
Kolhapur	0.06	0.08	0	0
Total	**242.20**	**260.59**	**2,38,645**	**2,20,237**
International				
Mumbai	87.48	94.93	4,70,402	4,67,182
Nagpur	0.37	0.39	346	388
Pune	0.56	0.64	0	0
Aurangabad	0.05	0.03	0	0
Total	**88.46**	**95.99**	**4,70,748**	**4,67,570**

Source: Data collected from Airport Authority of India @ Passenger traffic by chartered plane.

To reduce congestion in Mumbai International Airport, an additional airport has been proposed in four phases at Navi Mumbai with estimated cost of about Rs. 14,500 crore. Project cost for phase-I is about Rs.9,150 crore which includes a pre-development cost of Rs. 4,017 crore. The total area earmarked for airport development is 2,072 ha. Of which 1,572 ha.(75.9 per cent) land is in possession of CIDCO, 25 ha. (1.2 per cent) belongs to Govt. Departments and about 475 ha. (22.9 per cent) is under acquisition. Five airports in the State viz Nanded, Latur, Osmanabad, Yavatmal and Baramati were awarded to Reliance Airport Developers Private Limited (RADPL) by MIDC to develop, upgrade, operate, manage and maintain for 95 years of lease in November, 2009. Scheduled and non-scheduled flights operate from airports at Nanded and Latur. Only non-scheduled flights operate from airports at Baramati, Yavatmal and Osmanabad.

CONCLUSION

The historical development of Greater Mumbai and scarcity of land had resulted in an upsurge in growth of satellite towns that in total form as Mumbai Metropolitan Region. In Mumbai Metropolitan Region especially The Greater Mumbai area – is plagued with troubles due to concentration of business and lack of supporting infrastructure despite faster growth in the number of motor vehicles than human population. That has caused an acute shortage of mass transport services. Therefore, there is need to provide better linkages within Mumbai and with the hinterland, which would minimize travel time and cost as well as lead to decongestion. The facilities for transportation should include widening of the arterial roads for transport, development of other connectivity linkages which are crucial for economic development and decongestion, strengthening of public transport and regulation of private transport. MMRDA has undertaken to move some of the businesses to other areas in MMR, and it has also undertaken various projects in MMR for the Mass Rapid Transport System needed to be implemented within ten years duration which in fact a long period.

SUGGESTIONS

Mumbai Metropolitan Region Development Authority:

Mumbai Metropolitan Region Development Authority (MMRDA) has undertaken various projects in MMR. Mumbai Metro Rail project is the Mass Rapid Transport System project being implemented under Public Private partnership (PPP) basis. Transport projects in MMR are given as follows to insist for implementation without delay.

SUGGESTION I:

1) MUTP : Rail Components

Phase-I: New lines: Mahim-Santacruz, Kurla-Thane, conversion of DC to AC, etc. including new rakes. Development of two vital roads connecting the eastern and western suburbs of Jogeshwari & Vikhroli and

Santacruz & Chembur.

2) Mumbai Metro Rail Project: (Three phases, 75 km)
Phase I: Versova-Andheri-Ghatkopar (14 km)
Phase II: Charkop-Bandra-Mankhurd (32 km)
Phase III: Colaba-Bandra (29 km)

3) Mumbai Mono Rail Project: Wadala to Chembur & Sant Gadge Maharaj Chowk (Jacob circle) to Wadala (20 km)

4) Extended MUIP: Project to complement the MUIP. Under this Project, 24 sub-projects are undertaken. (11 Roads, 7 Flyovers, 3 Creek Bridges and 3 Rail Over Bridges)

5) Multi-Modal Corridor from Virar to Alibaug: Construction of freeway having eight lanes for the vehicles besides dedicated lanes for buses (140 km)

6) Mumbai Trans – Harbour link: Link from sea front at Sewri to Nhava (22 km)

SUGGESTION II:

Future expansion: MRVC has developed a road map for MUTP III and following are the important projects with estimated cost of Rs. 52,000 crore and time horizon of year 2031.
- Fast corridor on Harbour line between CSTM-Panvel.
- New suburban corridor on Virar-Vasai Road- Diva- Panvel.
- IIIrd & IVth additional lines between Virar & Dahanu Road.
- Extension of Harbour line from Goregaon to Borivali.
- Vth & VIth additional lines between Borivali-Virar.
- IIIrd & IVth lines between Kalyan-Kasara.
- IIIrd & IVth lines between Kalyan-Karjat

SUGGESTION III:

To develop port with participation of private sector pertaining to Build, Own, Operate, Share and Transfer (BOOST) basis.

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