

Feasibility of Metro in Nashik City

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Abstract— The cities around the world are facing serious problems related to traffic congestion, road accidents and environmental pollution due to increasing traffic demand. The project refers to analysing the traffic need in the city and finding the places of heavy traffic in the city. Analysing the traffic density and finding the feasibility of construction of metro in the Nashik city. For the first phase of construction two corridors have been identified i.e. N-E Corridor (Maharashtra University of Health Science (MUHS) to Nashik-Road Railway Station) And Central-West Corridor (Triyambak Naka to Pimpalgaon Bahula). Primary study on alignment of both the corridors has been done in this paper. Metro is without a doubt fastest mode of transportation with maximum carrying capacity in less time.

Key words: Traffic Scenario, Feasibility Study of Metro

I. INTRODUCTION

The aim of any transport facility is to provide fast and safe movement of people and goods. The increasing traffic in the city makes one to think over alternative solution for transportation in the city also increasing heavy population expects more traffic facility. Metro is one of fastest mode of transportation also it save the time to travel and similarly prove to be economical during long turn.

As the cities are growing in size, so is the number of vehicular trips on the road network. This necessitates a dynamic policy shift to discourage the use of private modes and encouraging the use public mode of transit facilities once the volume of traffic along any travel stretch of corridor in one direction exceeds 8000 passenger vehicles per hour. The introduction of a rail based (MRTS) Mass Rapid Transit System is required in such cases only as these networks are capital intensive. It is being noticed that in developed countries, plan for mass transportation system starts once the city population has exceeded 10 lakhs; the system is completed by the time the city population has reached 20 to 30 lakhs or so, planned extensions of the Mass Rapid Transit Systems is seriously taken up.

A. Objective

- 1) Population and traffic study.
- 2) Examine and measures dense traffic areas.
- 3) Finding incoming and outgoing source of traffic and quantities to the same.
- 4) Studying scope for development of city.
- 5) Analyze and select feasible route to the metro.

II. NASHIK AT GLANCE

Nashik is a city in the northwest area of Maharashtra and it is the authoritative headquarter of the Nashik District and Nashik Division. The city is located at the foothills of the Western Ghats Mountains. At 700 m above sea level, its rise is most noteworthy among the other cities in Maharashtra and one of the most astounding among the cities in India. It

lies on the western edge of the Deccan Plateau, which is also a volcanic formation. The Godavari River starts 24 KM from Brahmagiri Mountain and streams along the northern limit of the city via the old residential settlement. Nashik is fourth largest city in Maharashtra in terms of population. With a population of approximately 17.50 lakhs, Nashik Metropolitan Area is the 13th largest urban conglomeration in India. The last decade population Growth rate in NMC area was 10.77%. Current Vehicle Statistics (2017) shows numbers of registered vehicles are 14.64 lakh out of which 10.88 lakhs are two wheelers.

III. DATA COLLECTION PROCEDURE

The points considered to be connected that are more congested in the city and required to develop a public transport facility through that area are railway station, central bus stand, district court, zilhaparishad, market yard, vidyapit, MIDC area of the city.

A. Traffic Data

There are 5 main stops in Nashik city covered on these corridors are BitcoChauk at Nashik-Road, Mylan Circle, Triyambak Naka (Near CBS), Ashokstamb, ABB Circle. Where traffic congestion is noted to be the highest during peak hours. It is important that the introduction of Metro is first justified at these locations. Thus, traffic volume count for Peak Hour Peak Direction Traffic (PHPDT) was done at these locations. Traffic count was done at peak hours in the morning from 8:30 AM to 11:00 AM as well as in the evening from 05:00 PM to 07:00 PM for both directions, as these are office rush hours. Table 1 and Figure 1, illustrates the percentage break up of PHPDT as per type of the vehicles.

Vehicle Type	Percentage
Cars	21.73
Two Wheelers	48.83
Autos / Three Wheelers	25.39
Buses	2.21
Others	1.84
Total	100 %

Table 1: Vehicular break up of PHPDT

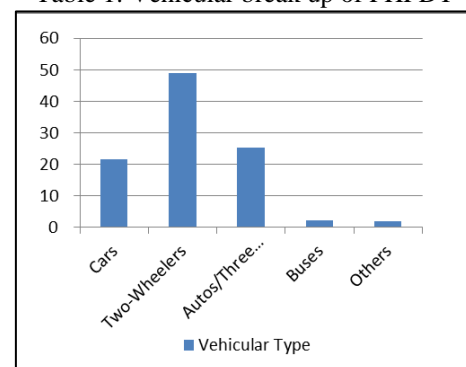


Fig. 1: Vehicular break up of PHPDT

IV. STUDY OF ALIGNMENT

A. N-E Corridor:

Maharashtra University of Health Science (MUHS) to Nashik-Road Railway Station (Corridor 1)

This corridor will provide metro connectivity to the Dindori road, Market yard Ashok Sthamb, CBS, Mylan Circle, Nashik-Road Railway Station and other institutional buildings as well as public buildings. The corridor will intersect with the Central-West Corridor at Triyambak Naka near CBS, enabling connectivity to Satpur, Pimpalgaon Bahula. The entire length of corridor from the Nashik-Road to Vaiduwadi over 16.1 km is elevated And from Vaiduwadi to MUHS it is under-ground over 3.7 km length.

B. Central-West Corridor:

Triyambak Naka to PimpalgaonBahula (Corridor 2)

This corridor will originate from Triyambak Naka near CBS and will provide connectivity to ABB Circle, Ambedkar Chawk, Mahindra Circle, Papaya Narsari, Pimpalgaon Bahula. This corridor will be elevated from Triyambak Naka to Mahindra Circle over entire length of 5.4km and under-ground to 2.4km up to Pimpalgaon Bahula.

Description	Elevated (km)	Under-ground (km)	Total (km)
Line 1- MUHS to Nashik-Road Railway station	16.1	3.7	19.8
Line 2- TriyambakNaka to PimpalgaonBahula	5.4	2.4	7.8
Total	21.5	6.1	27.6

Table 2: Length of route

Description	Elevated	Under-ground
Line 1- MUHS to Nashik-Road Railway station	11	2
Line 2- TriyambakNaka to PimpalgaonBahula	3	2
Total	14	4

Table 3: Number of stations

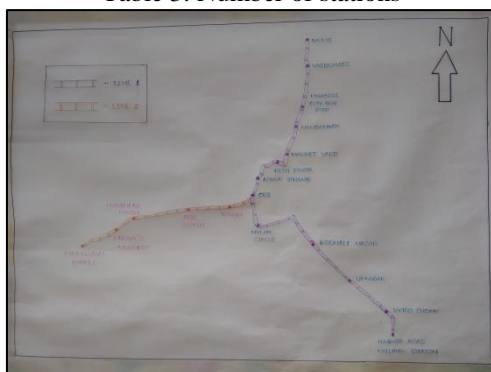


Fig. 3: Plan showing Line-1 and Line-2 with respective stations.

V. ECONOMICAL ANALYSIS

The contingencies which are associated with the introduction of Metro that must be taken into account and speculated should include:-

- Initial Capital investment and long term operating cost of transporting in case if metro project is not implemented.

- Saving in the total running costs of all the buses and other vehicles.
- Time saved by the commuters using the metro over the existing mode of transportation due to faster running speed of metro.
- Saving in terms of fuel consumptions and reducing the number of vehicles running on the road, thus reduce in pollution by introducing metro.

VI. CONCLUSIONS

The population of Nashik according to Census of India 2011 is 17.50 lakhs with decadal growth rate 62% in the past decade. Considering past growth rate data the projected population for the year 2021 will be nearly 26.00 lakhs which definitely will cross 20 lakh. Also, in 2018 PHPDT at the most congested locations on the N-E corridor is 10,320 PHPDT and Central-West Corridor is 7,198 PHPDT which indicate that a rail based mass rapid transit system seems to be applicable and necessary. Further considering parameters like connectivity within city and aesthetic of the city beautiful introducing Metro will reduce problems of traffic congestion within city. It is without a debate a fast mode of transportation with maximum carrying capacity in less time. It can be concluded that in order to make a city like Nashik smart it is necessary to introduce metro as it seems to be feasible as desirable.

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