

FEASIBILITY STUDY OF METRO RAIL PROJECT IN CHANDIGARH CITY

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Abstract - The developing interest for public transport in urban areas has seriously affected the urban ecological systems, particularly because of the increased air contamination and changes in area use patterns. Evaluation of modern transportation framework of Metro Rail facility proposed in Chandigarh city is the primary aim of this study. For the first phase of construction two Corridors have been identified i.e. N-S Corridor (Capitol Complex to Gurudwara Singh Shaheeda, Mohali) and E-W Corridor (Transport Terminus Mullapur to Grain Market, Panchkula). Primary study on alignment of both the corridors has been done in this paper. Traffic Volume Count (TVC) was performed on the E-W Corridor at Sector-26 and Timber Market locations, which are considered to have highest congestion, for obtaining Peak Hour Peak Direction Traffic (PHPDT) data. Further public survey was conducted to obtain a general opinion in regards to introduction of metro in the city. The traffic data and the data collected from the public surveys was compared to the DPR prepared by DMRC and RITES collectively, to obtain the disparity between the proposition and the demand. Metro is without a doubt a fast mode of transportation with maximum carrying capacity in less time, but larger capacity and greater speed does not necessarily generate higher demand and ridership. It can be concluded that in order to make a city like Chandigarh smart it seems unnecessary to introduce metro as it should be more feasible than desirable.

Key Words: Feasibility Study, Metro, Public Transportation, Traffic Scenario.

1. INTRODUCTION

At present five Indian cities have operational metro rails – to be specific, Kolkata Metro in West Bengal, Delhi Metro, Rapid Metro in Gurugram, Delhi Airport Express Link in the National Capital Region (NCR) of Delhi, and Bangalore Metro in Karnataka. Similar upcoming metro rail projects are being planned or are under development in Ahmedabad, Bhopal, Indore, Chandigarh, Ludhiana, Jaipur, Kochi, Pune, Mumbai and Hyderabad.

Proper and advanced transportation facilities are very important for the development of any nation to ensure fast movement of populace and resources. Appropriate, feasible

and effective planning of transportation facility is essential before implementation, for fruitful development of any country. Every mass transportation system should satisfy all of these aspects thus, providing much needed support to the traffic movement in an efficient way.

As 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 and once the population has gone beyond 40 lakhs or so, planned extensions of the Mass Rapid Transit Systems is seriously taken up.

The construction of the Chandigarh Metro Project, as proposed by the Delhi Metro Rail Corporation (DMRC) after feasibility analysis was planned to commence from the year 2016 and would be completed by 2031. During the first phase of Chandigarh Metro two corridors would be completed. The detailed discussion of the two corridors has been done in the following sections.

2. STUDY OF ALIGNMENT

2.1 N-S Corridor – Capitol Complex to Gurudwara Singh Shaheeda, Mohali (Corridor 1)

This corridor will provide metro connectivity to the High Court, Secretariat and other institutional buildings such as the Chandigarh UT Secretariat, Punjab Mini Secretariat, etc along Jan Marg. Tourist places such as Rock Garden and Rose Garden, Sector-17 City Centre, Interstate Bus Terminus of both Sector 17 and 43. This corridor will directly serve Sectors 9, 21, 22, 34, 35, 43, 44, 51, 52 of Chandigarh and Sectors 61, 62, 68, 69 & 70 of Mohali. The corridor will intersect with the E-W Corridor at Matka Chowk, enabling connectivity with Mullanpur in Punjab and Panchkula in Haryana. The corridor will be integrated with the existing

bus system through the bus terminus at sectors 17 and 43. The entire length of this corridor in the Mohali area has been proposed to be elevated. Future extension of the corridor to include Aero City in Mohali is also being examined.

2.2 E-W Corridor - Transport Terminus Mullanpur to Grain Market, Panchkula (Corridor 2)

This corridor will originate from Transport Terminal at Mullanpur with Grain Market in Panchkula via, Sarangpur, Khuda Lahora, PGI, General Hospital, Sector 9, Sector 7, Sector 26, Timber Market, Chandigarh Railway station, Housing Board Chowk, MDC Panchkula, HUDA Office Complex, Panchkula City Center, Panchkula Bus Stand, District Center, and Village Raili. This corridor will provide metro connectivity to the proposed new residential cum commercial development in Mullanpur and Sarangpur Area near Chandigarh. The corridor integrates with other transport modes such as Panchkula Bus Terminus and Chandigarh Railway station directly to the sectors 14, 11, 12, 10, 16, 9, 18, 8, 7, 19, 26, 27, 28, Manimajra. This corridor provides metro connectivity to the Panjab University, Punjab Engineering College, PGI Hospital, City Museum, Chandigarh Grain market and Timber Market, Sector 26. This corridor is proposed to be elevated only in the area of Mullanpur, Sarangpur and Panchkula.

TABLE 1: Length of route

Description	Elevated (km)	Under-ground (km)	Total (km)
Line 1 – Capitol Complex to Gurudwara Singh Shaheeda	4.427	8.070	12.497
Line – 2 Transport Terminus to Grain Market	19.041	6.035	25.076
Total	23.468	14.105	37.573

TABLE 2: Number of stations

Description	Elevated	Under-ground
Line 1 – Capitol Complex to Gurudwara Singh Shaheeda	4	6
Line – 2 Transport Terminus to Grain Market	15	5
Total	19	11

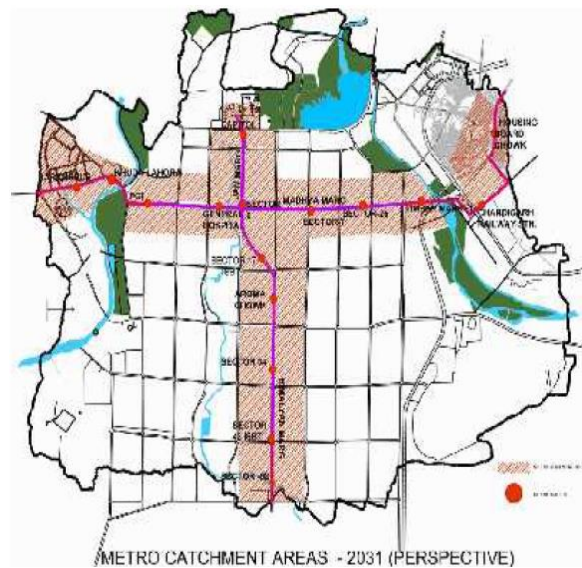


Figure 1: Areas which will be directly benefitted by Metro.

3. DATA COLLECTION PROCEDURE

3.1 Traffic Data

There are 6 main stops in Chandigarh city on East-West Corridor from PGI to Timber market, the rest of the stops are mainly in Punjab or Haryana region. On this corridor, Sector-26 and Timber market are the two major locations 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 two locations (i.e.Sector-26 and Timber market) on this route. 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 the directions, as these are office rush hours. Table 3 and Figure 1, illustrates the percentage break up of PHPDT as per type of the vehicle.

TABLE-3: Vehicular break up of PHPDT

Vehicle Type	Percentage
Cars	32%
Two-Wheelers	38%
Autos / Three-Wheelers	11.4%
Buses	0.7%
Cycles	15.5%
Others	2.4%
Total	100%

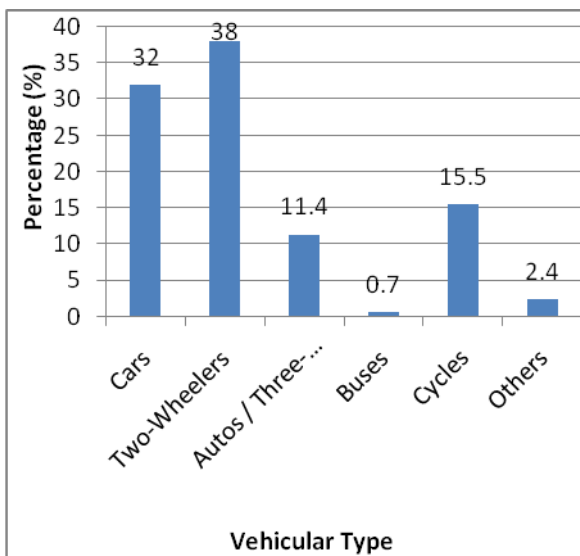


Figure 2: Vehicular break up of PHPDT

3.2 Public Survey

Public surveys were conducted at the various locations on East-West Corridor where traffic data was also calculated. As many as 180 people were interviewed with basic questions to know their travel characteristics. On compiling all the responses a general trend of public opinion was formed.

The public opinion is a major factor for the introduction of any new mode of transportation system. The public surveys clearly show the basic reasons to shift to alternate mode of transportation. Figure 3, here represents a few basic motivating factors for the general public to use a better mode of travel.

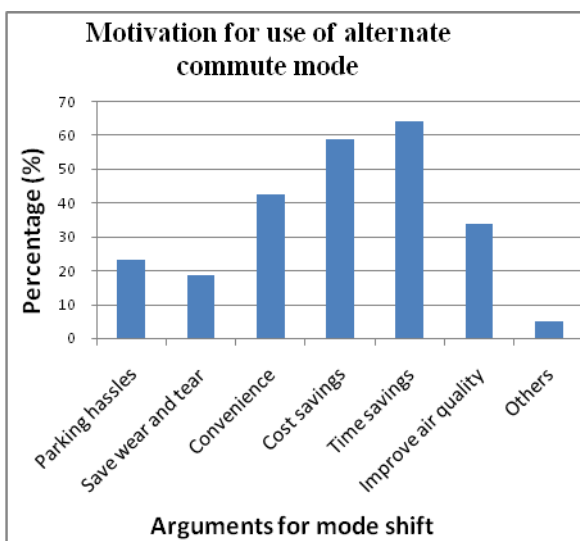


Figure 3: Motivating factors for the public to use a Metro.

After the combining the survey responses, the major concern of the commuters is towards time saving during travel. The average travel from the responses was recorded to be about

15-20 mins. The DPR of the Chandigarh metro prepared by DMRC suggests the train frequency will be 16mins till 2021. Thus, in maximum commuter cases the wait period will equal to the travel time.

Further the commuters were encouraged to extend their view on the requirement of Metro in Chandigarh city. Based on their personal opinions and travel requirements many responses were accepted. Figure 4 represents the opinion of the general public on, whether Metro is the only alternative for improving transport facilities in the city.

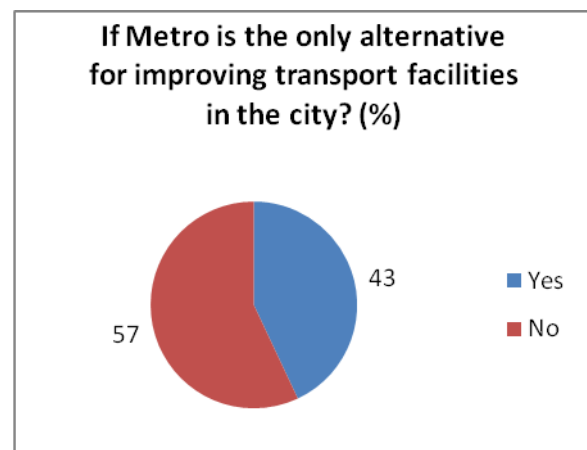


Figure 4: Public opinion on, whether Metro is the only alternative for improving transport facilities in the city.

Enquired on whether a new rail based system would be preferable over an improved bus transit system the responses are presented in figure 5. The public opinion shows that the prospect of a better bus transit system has a clear edge over metro rail services.

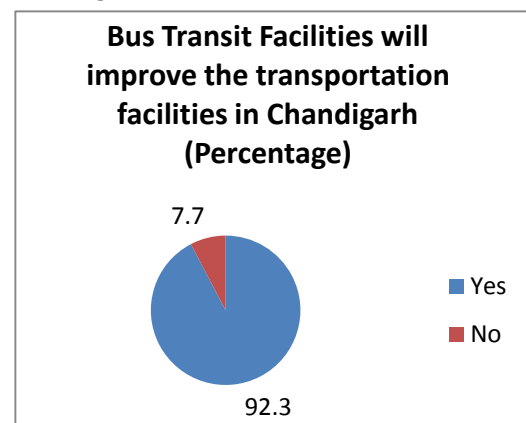


Figure 4: Mode of Transportation used by Public

4. ECONOMIC ANALYSIS

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

- 1) Initial capital investment and long term operating cost of transporting the total volume of passengers by the existing bus system and personal vehicles, in the case if metro project is not implemented.
- 2) Savings in the total running costs of all the buses and other vehicles due to the resulting de-clogging including the individuals who might keep on using the current transport network even after the introduction of metro.
- 3) Time saved by the commuters using the metro over the existing mode of transportation because of faster running speed of metro.
- 4) Savings in the form of reduction in the number of accidents and decrease in pollution accompanied by the introduction of metro.
- 5) Savings in terms of fuel consumption and reduction in the number of vehicles plying on the road and reduced congestion effected by the introduction of metro are included in that of the vehicle operating cost.

5. CONCLUSIONS

The population of Chandigarh according to Census of India 2011 is 10.55 lakhs with just 17.10% growth in the past decade. At present the population of the city is 11.65 lakhs. Considering the same growth rate of the previous decade, the projected population for the year 2021 will be nearly 12.34 lakhs. But according to DPR the projected population is considered to be 23 lakhs which seems highly unlikely, as there are no indicators of such a phenomenal growth. Also, in 2016 PHPDT at the most anticipated congested locations on the E-W Corridor is 3500 PHPDT which is almost 50% of the projected value in the feasibility report prepared by DMRC, so a rail based mass rapid transit system seems impractical and unnecessary. As per Traffic Volume Count (TVC) survey the studied E-W corridor is not feasible and the further phases there hence. The revenue generated within the first 10 years will not be anywhere equal to total cost of the project when not even 10% of the population will choose metro rail, as it was expected from Delhi metro which still remains under-achieved. Further, considering parameters such as availability of land for construction, feeder mode services for last mile connectivity and aesthetics of the city beautiful should also be taken into account before implementing such a huge project. It is without a debate a fast mode of transportation with maximum carrying capacity in less time, but larger capacity and greater speed does not necessarily generate higher demand and ridership. The decision to resort to metro system seems to have been influenced by over ambitiousness of the decision makers which might have put eclipsed some key issues. It can be concluded that in order to make a city like Chandigarh smart it seems unnecessary to introduce metro as it should be more feasible than desirable.

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