Impact of Kanpur Metro in Urban Transportation

[1]Ar. Prasant Singh, Assistant Professor, [2]Ar.Neha Mishra, CSJM University, Kanpur

Abstract

Most of the traffic and environmental pollution-related issues that major cities around the world are currently suffering from can be solved by a rail-based "Mass Rapid Transit System," which has gained widespread acceptance as a solution. In India, there is a significant increase in the construction of metro rail systems. The existing networks in Kolkata and Delhi are being enlarged, and those in Bangalore, Chennai, Mumbai, Lucknow, Kanpur, Agra, and Hyderabad are in various phases of development. In the essay at hand, significant environmental and other pressing issues that are responsible for the decline of Kanpur metro have been highlighted.

Keywords: Actual Average Daily Ridership (AADR), Mass Rapid Transit System, Urban transport, Ridership, Revenue generation.

Introduction

Infrastructure projects are crucial for a country's development and serve as a reflection of that development. Yet, most infrastructure projects unavoidably have considerable environmental and social implications during multiple phases (namely, pre-construction, construction, and operating phase) of the project because to their sheer size and character (specifically, kind, site/location, urban settling, etc.). Depending on their ability to affect the immediate environment as well as the local community, these impacts may be good or negative favorably or adversely in character.

Kanpur Metro is a Mass Rapid Transit System (MRTS) that is currently being built, with two lines and 31 stops, by the Uttar Pradesh Metro Rail Company Ltd. (UPMRCL). The 8.7-kilometer priority route connecting IIT Kanpur and Moti Jheel is currently operating, while construction on the additional corridors is in progress.

Just the Orange Line corridor is open to the public now. The 8.9 km-long corridor connects IIT Kanpur and Motijheel. The Uttar Pradesh Government is planned to build 12 more stations on the Orange Line during Phase 1, while simultaneously constructing a brand-new corridor called the Blue Line. Phase 1's net construction expenses are expected to total about INR 11,076.48 crores. The Blue Line will extend from Agricultural University to Barra-8 with future implementations, and the Orange Line will extend from IIT Kanpur to Naubastra.

Metro rail is a type of public transportation that uses trains for mass transit. In contrast to traditional rail-based systems, the metro rail network is grade separated from other traffic or given a separate right of way (ROW) to prevent conflicts with other urban transit networks. Most of the time, at least some of the tracks are buried (in tunnels), but the majority are left above ground (elevated). The system is offered in a metropolis and is primarily powered by electricity at high frequency and capacity. Critical metro rail project challenges that have an impact on the project's execution, viability (both technically and financially), and justification in comparison to other public transportation systems have been covered in this article. These significant problems reflect the Delhi metro's experiences throughout several project phases, despite being one of the world's metro rail networks with the quickest rate of growth. Depending on their specific socioeconomic, environmental, and land-use difficulties, some of these challenges described in the Indian context are also relevant to other emerging and developed countries.

Development of metro rail corridor in Kanpur. There are 22 stations along the first corridor, including 14 elevated and 8 underground. Key educational institutes including IIT-Kanpur, CSJM University, and GSYM Medical College will be connected by metro stations. This corridor will connect the important stations at Naubasta, Kanpur Central Railway Station, and Jhakarkati Bus Station. The railway station at Rawatpur will act as a hub. There will be eight stations along the corridor between Agricultural University and Barra-8, including Kakadeo, Vijay Nagar Chauraha, Shastri Chowk, and Govind Nagar. It will link residential regions with a high density of people. There will be eight stations total, with four elevated and the other four underground. Nine elevated stations are located along the 9 km-long installed stretch. IIT-Kanpur, Kalyanpur Railway Station,

SPM Hospital, CSJM University, Gurudev Chauraha, Geeta Nagar, and Rawatpur Railway are the stations.

Phase 1 of the Kanpur Metro project is expected to cost roughly Rs 11,000 crore. Rail India Technical and Economic Service (RITES) created the DPR (Detailed Project Report) for Kanpur Metro Phase 1, which included 32.5 km of routes. It was authorised by the State Cabinet in March 2016 and the Central Government's Cabinet in February 2019. The project is being funded with a EUR 650 million loan from the European Investment Bank (EIB), which was granted on July 15, 2020, as well as equity contributions from the governments of India and Uttar Pradesh on an equal footing (Technology, 2022 future prpspects).

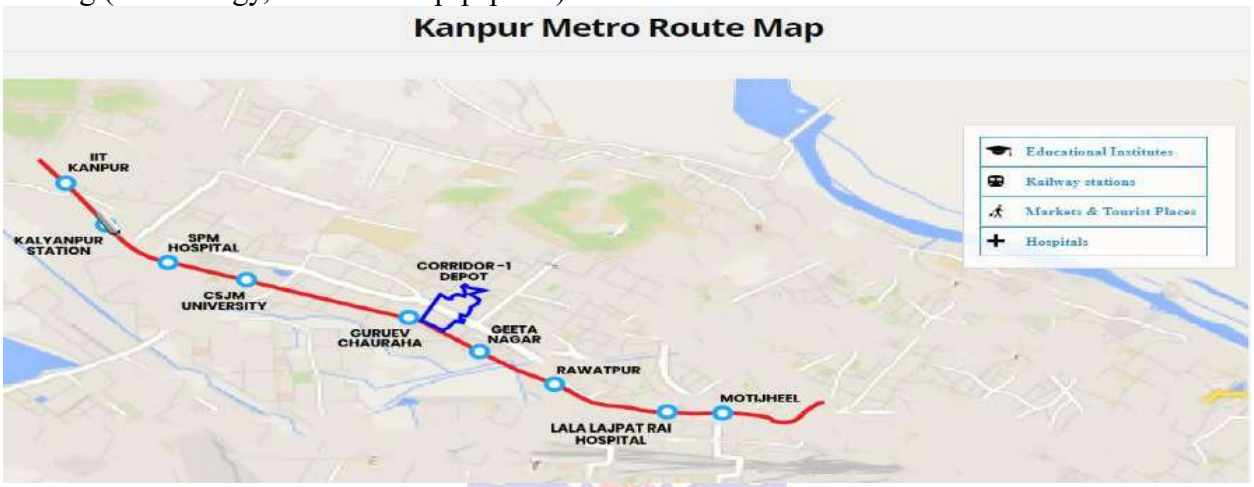

Figure 1 Image of existing orange line Source: UPMRCL

Issues responsible for the Decline of the Kanpur Metro.

The following issues are responsible for the decline of Kanpur mass transit system. However the parameter are extracted with in a short span from the inauguration of the metro in Kanpur but the less number of passengers and the uniform declination are due to few of the following reasons.

1. ***Overestimation of Ridership and Traffic Demand Predictions and low revenue generation.***

The percentage of traffic demand & supply forecasts/ridership estimation has a significant impact on the financial sustainability of any projects related to transportation, whether they are road-based transportation system, rail-based, or a combination of these two. These predictions offer these projects not only a technical explanation, but also a guide and tool for evaluating their socio-economic, environmental impact in relation to their estimated costs and their benefits. Nevertheless, the majority of these forecasting, and modelling exercises for transportation projects barely gives any real picture, frequently producing an inaccurate or perhaps even deceptive picture about that project, compelling the decisions- and policy-makings to make a poor or incorrect decision. In the case of city metro rail projects, an overestimation of the ridership figure results in oversizing and underutilization of the infrastructure and resources, which leads to an overinvestment in idle capacity and financial mis management or catastrophe for that project.

S.No	Estimated Ridership in the following year		
	2021-22	2022-23	2023-24
1.	0.08(Lakhs/ day)	0.02(Lakhs/ day)	6.0(Lakhs/ day)
	Actual Average Daily Ridership (AADR)		Estimated Average Daily Ridership (EADR)

Table1 1 Estimated ridership for Kanpur Metro Year wise (Malhotra, 2022)

Table 1 shows the actual average daily ridership (AADR) was 8000-10000 when the metro was launched in the initial days of the transit system. Passengers were curious and the peak was about 25000 passengers a day at the time of new year 2022. But sudden decline started with the initial

days of march and the AADR reached 1600-2000 persons a day. The capacity of the rail is 900 persons at a time and carrying this number of passengers with a lot of trips a day is a huge loss and it will be very difficult to generate revenue based on earned fares.

The following table provides information on the revenue received in the previous four fiscal years (up to June 30, 2022), which are being implemented by special purpose vehicles that are 50:50 joint ventures between the Central Government and the relevant State Governments (Bureau, 2022).

Revenue generation of Metro Rail Services (Bureau, 2022)

	Metro Rail Corporation	City	Revenue Earned (₹ in Crore)			
			2019-20	2020-21	2021-22	2022-23
1	Delhi Metro Rail Corporation, DMRC	Delhi & NCR	3,389.13	632.46	1,597.61	682.93
2	Bangalore Metro Rail Corporation, BMRC	Bangalore	376.88	49.19	163.33	89.89
3.	Chennai Metro Rail Corporation, CMRC	Chennai	119.25	30.08	85.34	44.25
4.	Kochi Metro Rail Corporation, KMRC	Kochi	56.77	12.90	30.80	15.24
5.	Gujarat Metro Rail Corporation, GMRC	Ahmedabad	0.27	0.04	0.22	0.10
6.	Noida Metro Rail Corporation, NMRC	Noida	22.31	5.48	15.19	8.17
7.	Maharashtra Metro Rail Corporation, MMRC	Nagpur	1.49	1.52	4.94	2.89
		Pune	Operation on the 12 km stretch was initially started from 6/03/2022.		0.76	0.81
8.	Uttar Pradesh Metro Rail Corporation, UPMRC	Lucknow	67.52	25.64	43.74	18.79
		Kanpur	The commercial operation on 9 km stretch started from 28th December 2021		1.64	1.08

Table1 2 ***Revenue generation of Metro Rail Services*** *Source : Ministry of Housing & Urban Affairs*

2. Severe traffic Issues arousing during metro Construction Phase

Many metro rail lines are being constructed alongside or within the right-of-way of existing highways, particularly elevated lines. As a result, temporary traffic rerouting is required (or only a small portion of the current road may be used for traffic flow) in order to facilitate construction activities and prevent accidents involving construction machinery or equipment. During the project's development phase, this diversion of the traffic away from the existing road corridors increases the traffic loads on the neighboring/nearby roads, causing congestion and traffic rush and inconvenience during peak hours. Due to issues with water logging,

excavation at the project site, the situation can get worse during the monsoon season. Before beginning construction, it is necessary to develop a plan indicating traffic diversion including barricading of the project site (i.e., the main section of the existing road that needs to be taken over temporarily taken). This is done in conjunction with the as major role played by traffic police and urban local authorities. To prevent inconvenience, the public should also be informed well in advance of these detours or closures.

3. Location of major nodal points very nearby.

The major city center and marketplaces are located at a very shorter distance from each other and hence people prefer the shared auto or 2-wheelers for access as it will be more cheaper and convenient for them. Meston Road, Halsary Road, P-Road, and Latouche Road The inner CBD circle includes Nayaganj Road, Sutarkhana Road, Cooperganj Road, and Birhana Road. As significant market centres and the shortest link routes, these roads see a lot of slow and fast traffic. On congested roadways, chaotic traffic conditions continue during rush hour (Final Report: Kanpur City Development Plan Under JNNURM, 2006). Although a very few metro line is touching the nearby area, on the other hand people find it convenient to opt for auto or two wheeler due to parking issues and excessive congestion in these areas. The metro services are avoided here as people will need to reach the nearby metro station using additional public convinces. So, the concept of metro fails here also.

4. Construction of low traffic Phase I earlier as compared to Phase II

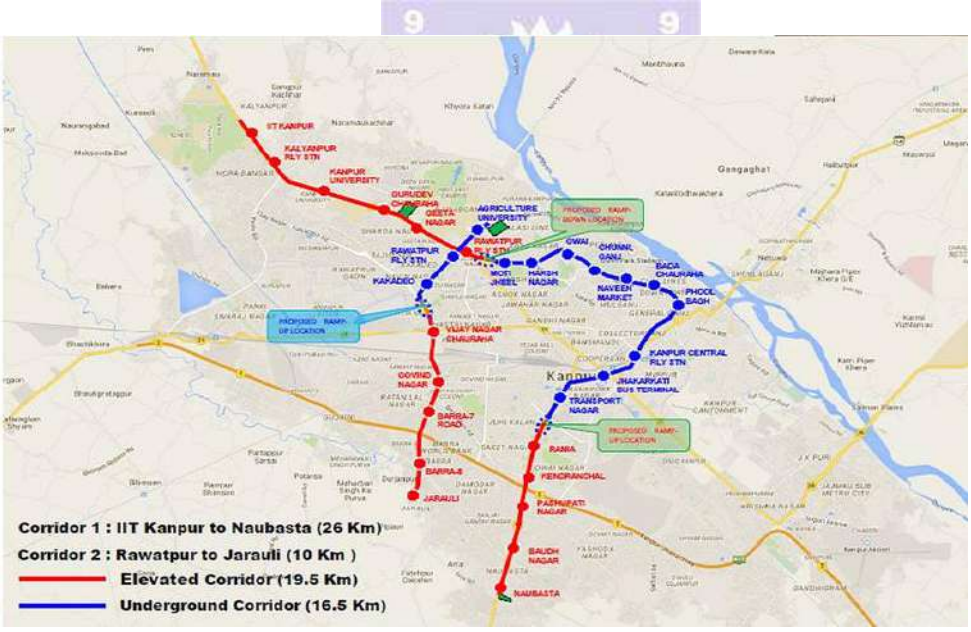

Figure 2 Image of different phases of metro construction in Kanpur, Source: UPMRCL

Phase 1 construction has already well transportation system. The issue of traffic congestion is only due to the subsequent crossings. People who will/ will not opting for metro will have to walk or travel with other public transport to cross the railway crossing. The concept of metro declines here too. The metro coaches are vacant throughout the day and night and even peak hours. Each coaches contain 5- 30 passengers in it. The rapid decline in the number raises a question to the government how it will generate revenue and make it successful. The high-cost maintenance and construction cost are way more than the revenue generated here. Despite of constructing orange line phase it would have better option If the government could have constructed metro for the naubasta area or Vijay Nagar area where people could have opted for metro for highly traffic congestion problem or transportation issues.

Conclusion

It is not compulsory if the mass transit, either bus or metro is a big successful option for major public transport. The thing is that it is a important thing that the location of metro, Population density, Traffic Congestion, Major Nodal Junctions, Elevated or underground construction, and also people's awareness are important parameter that could have been taken in account while investing a big amount in it. Major parking lots near the metro station could have been a big initiative for people who after travelling from the metro may use for other distance to be covered. For the CBD area specially when its not so far from each other two-wheeler or NMV could have better option. Some of the roads should restrict motorized transportation for encouraging metro transportation. Bicycle should be provided for better option. An awareness should be encouraged for the people to travel from metro to control accidents and pollution of air. Transit oriented Development can also increase the footprint in the metro. The commercial spaces near metro stations can also encourage peoples to opt for metro. An effective public transportation system motivates commuters to abandon their personal vehicles in favor of it. The optimal public transportation system should include several different public transportation systems (for example, metro rail). Instead of competing with one another, public transportation systems should support one another. An integrated strategy starting with the design phase is necessary. (Niraj Sharma, 2013)

References

(n.d.). Delhi: Ministry of Housing & Urban Affairs.
Bureau, O. D. (2021, April 25). Revenue Generation Of Metro Rail Services Declined Due To Pandemic, Says Kaushal Kishore. New Delhi: Orrisadiary.com.
(2006). Final Report: Kanpur City Development Plan Under JNNURM.
Last Name, F. M. (Year). Book Title. City Name: Publisher Name.
Malhotra, A. (2021). Kanpur metro completes one month of ridership. TOI.
Niraj Sharma, R. D. (2013). Critical Issues Related to Metro Rail Projects in India. Research Gate.
Technology, R. (2021). Kanpur Metro, Uttar Pradesh, India.