

POST FEASIBILITY STUDY OF BRTS ON KIWALE TO SANGVI PHATA ROUTE IN PIMPRI CHINCHWAD

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Abstract: Presently traffic is increasing at high rate because of high population increase rate. It is motive we need extra numbers of street while considering Traffic management issues. In such conditions we engineers have to be more accurate at our own work. Though we take care of smooth functioning of site visitors operation, there is need of clever mode of public transportation like Bus Rapid Transit System which is proved as very beneficial in developed countries. In this paper, authors reflect on consideration on prior and feasibility to find out about BRTs at the place where BRTs is already implemented. For this study, the Kiwale to Sangvi Phata route in Pimpri Chinchwad area is taken into account. After the implementation of any new public transport mode one have to have to find out about user's behavior, influence on modern city visitors system, demand performance. Further on, the feasibility of enforcing this system is discussed, and the last part is committed to future tendencies to system and how it can be elevated to make lifestyles simpler for commuting people.

Index Terms - Bus Rapid Transit (BRT), Traffic Management, Feasibility, Pimpri Chinchwad, Performance

I. INTRODUCTION

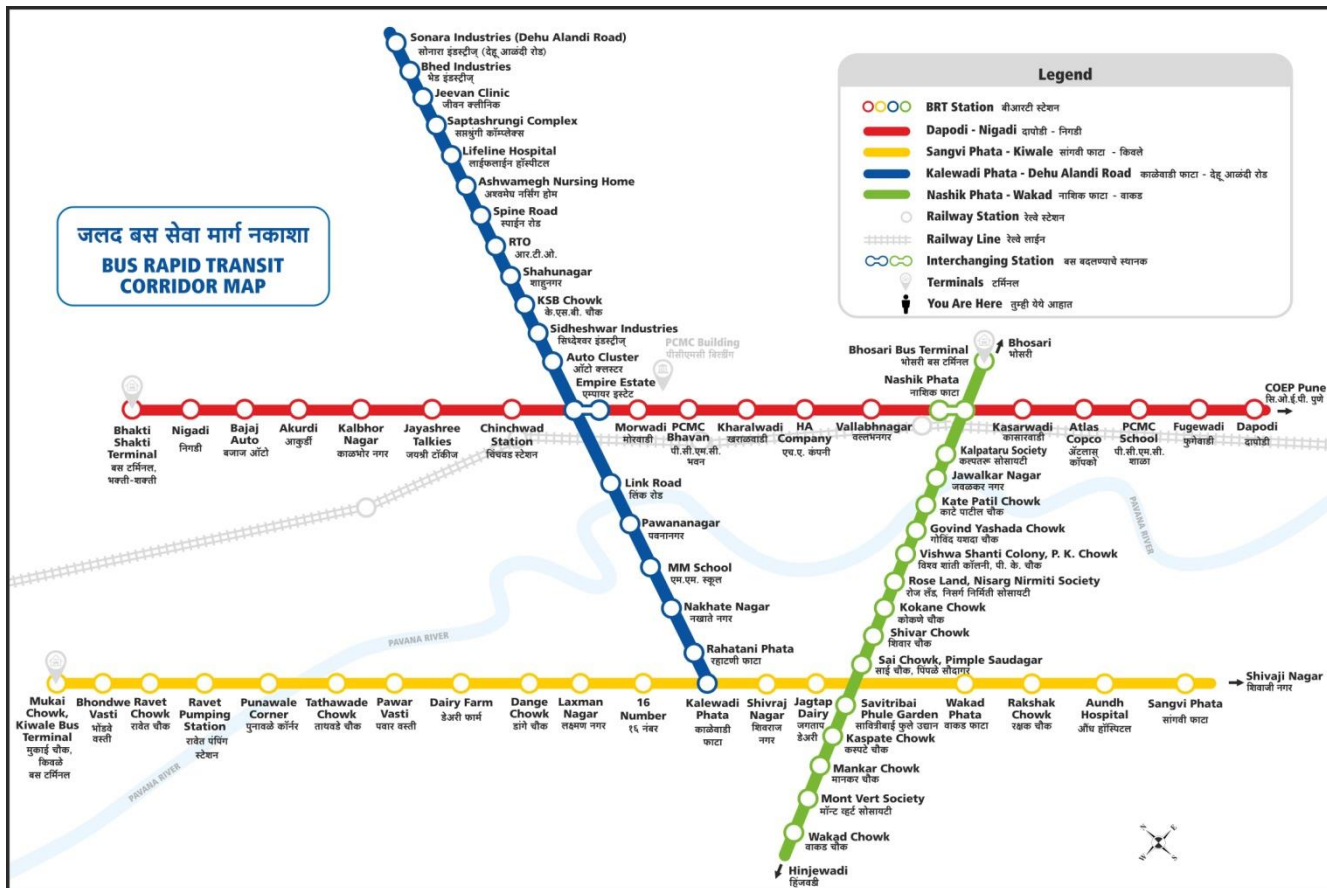
The Bus Rapid Transit System is developed by the Pimpri Chinchwad and Pune Municipal Corporations along with the bus utility the Pune Mahanagar Parivahan Mahamandal Ltd. The project is supported under the GEF India Sustainable Urban Transport Program implemented by the Ministry of Urban Development, Government of India. In Pimpri Chinchwad, the BRT is initially being implemented in four corridors namely:

- 1) Sangvi - Kiwale Corridor
- 2) Wakad - Nashik Phata (Bhosari) Corridor
- 3) Dapodi - Bhakti Shakti (Old NH4) Corridor
- 4) Kalewadi Phata - Dehu Alandi Road Corridor

The Pimpri-Chinchwad BRTS was once introduced in December 2008, when eight routes covering 112 km have been proposed. Construction of the first route used to be due to be executed within 18 months. By January 2009, 90% of development work on an 11 km pilot route between Nigdi and Dapodi had been completed. However, a string of disputes between the Pimpri-Chinchwad Municipal Corporation (PCMC), civic administrators and corporators led to the venture being delayed, with corporators citing funding difficulties and issues encountered on the similar Delhi BRTS and Rainbow BRTS initiatives as the causes. In September 2009 it was once announced to the press that, though most work had been completed, difficulties deciding to buy the 650 buses required to run on the machine had led to the venture being indefinitely postponed. It used to be additionally discovered that the proposed new bus shelters had been due to be installed on the incorrect side of the road, leading to delays in their construction, while passenger records systems had but to be installed. The PCMC cited that this used to be no longer a principal difficulty as the shelters ought to be built rapidly from prefabricated materials, and that the vehicles would be bought by way of December 2009. A month later it was revealed that the cost of the venture had overrun via 230 crore, around 50% of the total project cost. By May 2010, funding for the completion of four BRT routes had been agreed, with the last four sanctioned through the national government but no longer yet funded. A quantity of high-rise buildings alongside the routes had also been approved for construction. Both the structures had been merged to structure Rainbow BRTS which is presently underneath expansion. The purpose of the post feasibility is to obtain a broad grasp of the perceptions about public transport and non-motorized transport infrastructure, and receptivity to bus rapid transit, and modifications in such perceptions after the implementation of the BRTs.

Fig.1: Map showing various BRT corridors in Pimpri Chinchwad

II. LITERATURE REVIEW



Ananth Rangarajan (2010) has made an effort to compare the BRTS system with the regular one by modeling and simulating both systems under various scenarios. Further on, the feasibility of implementing this method is mentioned, along with its pros and cons, and the final section is dedicated to future developments to system and how it is improved to create life easier for travelling Puneites. This paper is aimed toward modeling the traffic situation in this a part of Pune town wherever the BRT has been enforced, each before and once the implementation of the system. Using Mathematical modeling software system, a applied mathematics or graphical model of the place has been created and also the 2 situations are thoroughly simulated and a few terribly fascinating facts surface as a result. Based on the simulation study and a feasibility analysis, an attempt has been created to draw a conclusion concerning the system and its effects on Pune’s society.

Yogita S.Jadhav (2017) et.al, have also provided solution for pedestrian crossing issues use BRT service. They also suggest, it is a good idea to conduct safety audits at different stages like new proposed BRTs bus stop, underpass for BRTs and underpass for pedestrian. Traffic police and other security personnel need to back and help the Municipal Corporation and other levels of government organizations to effectively manage the proposed BRTS system. It ought to be unbroken in mind that gap day isn't an honest time to assess what the system are sort of a week or a month later, when lessons that is learned will hopefully be place into observe to enhance the system. Through this study the author found out the few safety issues for vehicles as well as pedestrians.

Rohit R. Galande (2016) et.al, studied the real time BRT system in Pune facing some problems regarding to the delay and congestion due to unavailability of bus transit priority rules as well because the BRT Network in Pune is unfold terribly great distance in spite of that it's just one operational center to manage the system. The results of that, many times the system lags the schedule and users have to face inconvenience. But the fluency of the system is achieved by increasing the numbers of operational centers and there correct management. Around the study done before a press release is done that Nagpur town fulfills the specified parameters to ascertain a BRT system. The parameters like population, physical parameters of road network and the frequency of public transport users observed in origin destination survey provides the strong weightage of need of BRT system in Nagpur. It is

clearly seen from higher than study that if dimension of road increase with correct priority of lane for various traffic class then load of traffic on urban routes automatically decreases with remarkable benefits and useful results can be found. Strategies used for brand new public transit reduction the period and delay of each transport users and private vehicle users. Cost needed for application of system is extremely less as compared to different choices out there which may be balances in future once many of us use transport.

Darshit M. Shah (2013) et.al, studied impact analysis of Keshavbaug To Anjali BRT Corridor to measure all the benefits and costs from project covering a total distance of 4.1kms in Western Ahmedabad. The prime objective of the study is to establish the impacts of the BRT project and comparing BRT to Do Nothing scenario. In this study, the benefits and costs of converting a lane to a BRT lane depend heavily on how such a project affects traffic speed, delay, and vehicle miles traveled, both in the mixed flow lanes and the BRT lane.

Prof. Rohit Galande (2017) et.al, studied the Bus Rapid Transit System in Pune city, it was found that the system has a number of drawbacks. It is not used to its full efficiency. Due to the flaws, reliability of the people on public transport is reducing day by day. As there is scope for improvement, Pune can avoid the mistakes done in the planning and implementation of Delhi Bus Rapid Transit System. One major factor in its failure can be the lack of proper planning and survey before the implementation of Bus Rapid Transit System.

Chetan Kumavat (2016) et.al, emphasizes on the common problems endured by Delhi and Pune BRTS corridor. Urban Traffic commutation has a eloquent place in urban life. BRTS could be a terribly recent kind of transport, however it's still a replacement conception for developing countries like India, because of its psychological aspects. Bus mass rapid transit involves synchronic enhancements during a transport system's infrastructure, equipment, working, performance and technology that give preference to buses on urban roadways. The author gives an overall outlook of Delhi and Pune BRT systems and observed some common problems in operating both the system, and some recommendations are mentioned so that could help improving Pune BRTS immensely and influentially and have a better result avoiding bottlenecks those faced by Delhi BRTS. The main current study intent to focus on issues and to beat those problems.

Ghulam Dastagir (2013) et.al, performed survey of all the existing public transport stops on University Road Peshawar conducted for identification of bus lane. Peak hour demand was calculated in terms of actual Passengers per hour per direction (Pphpd) on the whole passageway that acts a warrant check for the availability of a separate lane for conveyance vehicles in Bus rapid transit (BRT) System. From data analysis, the Saturation Levels and Dwell Times at every stop were found higher than the recommended values mainly because of the obstruction due to private vehicles in front of conveyance vehicles, a relatively high share of personal vehicles with regard to conveyance vehicles and also the prolong keep of drivers at bus stops. The Saturation Levels and Dwell Times (sec) for the planned BRT system was re-analyzed. Finally, results of the planned BRT system was incorporated in S-Paramics software system to develop a conveyance model.

III. STUDY AREA

The Kiwale-Sangvi Phata corridor has a stretch of 14 km. There are total 18 stops along the corridor. Kiwale is a terminal station of Sangvi to Kiwale BRTs. Capacity of bus terminal is about 200-250 persons. Kiwale bus terminal connects both National highway NH 4 and Mumbai-Pune expressway. Due to congested traffic, so their ought to provide suitable sign device to avoid accident and in order to easily running traffic. In order to smoothly run traffic we better to furnish diligent sign gadget so therefore we can reduce frequency of accidents. People park their motors close by bus end because of lots of area available for buses, commuters often tend to park their vehicle in this space.

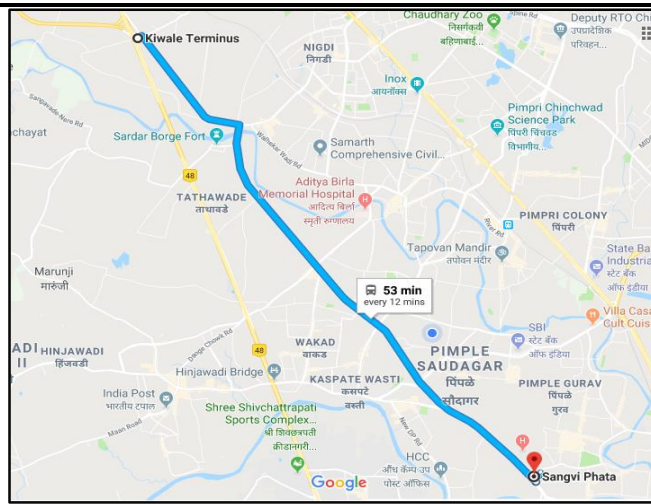


Fig.2: Kiwale to Sangvi Phata Corridor

IV. DATA ANALYSIS

4.1 Spot Speed Study

Vehicle Type	Mean Speed (m/s)	
	Dange Chowk	Jagtap Dairy
Two Wheelers	11.78	12.24
Three Wheelers	5.16	5.35
Cars	8.65	8.76
Bus	6.56	6.16
Trucks	5.44	5.22

Table 1: Mean Spot Speeds on Typical Mid-Block Section of the BRT Corridor

4.2 Time Study

Type of Vehicle used	Total journey time (in mins)	Total journey time on BRT (in mins)	Percentage of travel time on BRT
Bus	40.8	16.6	40.69%
Auto	44	16	36.36%
Two wheeler	42.6	17	39.61%
Car	39.4	22	55.84%
Cycle	33.6	18.5	55.06%

Table 2: Perceived Average Journey Time across Different Vehicle Users

4.3 Delay (Queue Length Study)

Date:22/02/19		Hour of the day:7pm									
Time (minutes)		0	1	2	3	4	5	6	7	8	9
Queue length (km)		0	0.18	0.14	0.17	0.16	0.18	0.17	0.18	0.16	0.15
Time (minutes)		10	11	12	13	14	15	16	17	18	19
Queue length (km)		0.19	0.18	0.19	0.19	0.2	0.16	0.17	0.19	0.15	0.17
Time (minutes)		20	21	22	23	24	25	26	27	28	29
Queue length (km)		0.18	0.18	0.16	0.19	0.2	0.21	0.2	0.21	0.2	0.2
Time (minutes)		30	31	32	33	34	35	36	37	38	39
Queue length (km)		0.19	0.18	0.18	0.17	0.18	0.16	0.17	0.17	0.18	0.16
Time (minutes)		40	41	42	43	44	45	46	47	48	49
Queue length (km)		0.18	0.17	0.19	0.18	0.13	0.17	0.15	0.16	0.17	0.18
Time (minutes)		50	51	52	53	54	55	56	57	58	59
Queue length (km)		0.18	0.14	0.18	0.19	0.15	0.18	0.17	0.17	0.16	0.18

Table 3: Length of the queue at signal during evening hours.

4.4 Volume Capacity Ratio Analysis

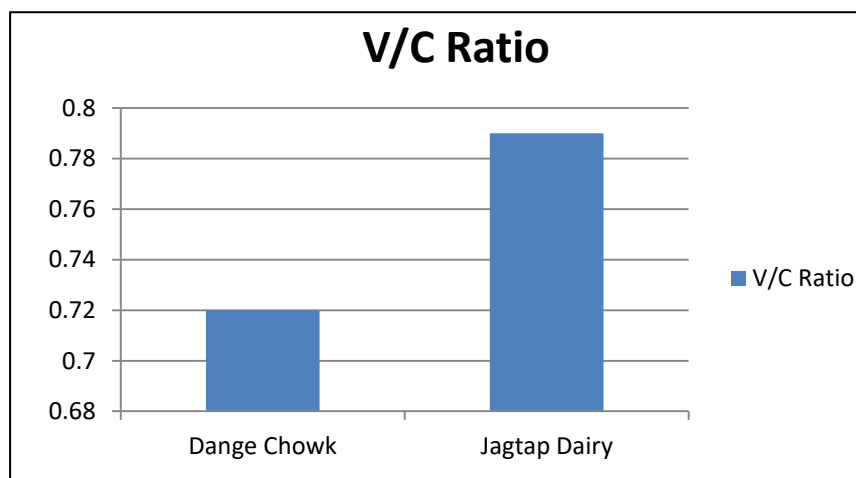


Fig.3: Volume capacity ratio at intersections

V. RESULTS AND DISCUSSION

This research was conducted to know the impact of BRTs corridor. The key findings of the work are related to effect on lane traffic in terms of flow, spot speed and queue length.

- 1) The traffic flow is very high more than the capacity of mid-block section.
- 2) Because of the heavy traffic flow at the mid-block sections the mean spot speeds get reduced.
- 3) The average journey time spend by the passenger along the corridor is quite high.
- 4) The queue lengths on the signals are high along the BRT lane approaches as compared to other approaches because of less number of traffic lanes.
- 5) At the intersections, the volume capacity ratio is greater than 0.7 and less than 0.8 hence representing the level of service 'C'.

VI. CONCLUSION

The increasing infrastructural development of Hinjewadi and Ravet, increasing population density of that area, vicinity of the IT hub and location of a number of educational institutes along the route were some major factors adding to the vehicles on road. Thus, traffic situation was deteriorating. On conducting traffic studies at the intersection, it was found that the existing Bus Rapid Transit System failed to operate with full efficiency collectively due to a number of reasons.

On conducting the traffic studies on the Kiwale-Sangvi Phata route, it was seen that the present system is inadequate to meet the needs of the rising population. Hence, the frequency of buses flowing should be increased. Also, enforcement of rules will help to improve the traffic situation.

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