

Study of Success and Failure Factors related to implementation of Bus Rapid Transit System.

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Abstract-Rapid rate of urbanization has led to huge transit demand (growth in motorization). People prefer using private vehicle rather than public transport which leads to more traffic congestion, pollution, long travel times etc. There is inadequate public transport in cities. The current level of public transport will not be able to meet the transit demand. Planned mass public transport is the need of hour. Providing BRTS can prove to be an efficient and cost effective means of public transport. Bus Rapid Transit Systems is implemented all over the world (including India). It was found that most of the BRTS project are successfully implemented in some cities, but there are some failure case studies as well, the objective of this Paper is to identify and analyze the success and failure factors related to implementation of BRTS in Indian cities. A questionnaire was designed and circulated to various respondents to obtain the rating for success and failure factors associated with BRTS, and the collected information is analyzed by using SPSS Software to obtain the critical success and failure factors.

Index Terms-BRTS (Bus Rapid Transit System); Success Factors; Failure Factors.

1. INTRODUCTION

Transportation is important for mobility of people and goods from place to place. Due to rapid rate of urbanization and economic growth there is an increase in the urban transport requirement. Public transportation is a sustainable mode of transport but now-a-days people prefer using private vehicles rather than the public transport services (bus, railways etc.) In developing county like India there is lack of efficient and reliable public transport services which has led to increase in rate of motorization causing problems such as pollution, accidents, traffic congestions, delays etc. providing a sustainable and efficient public transport in cities is the need of hour.

Bus rapid transit (BRT) is a sustainable and efficient public transport system which is implemented in many countries. It is a public transport system in which buses are used it improves capacity and reliability compared to a conventional bus system. Typically, in a BRT system in which exclusive lanes are provided for buses only. This system reduces the traffic congestion as the buses ply on a dedicated roadway without the interference of other vehicular traffic. BRT is "a rapid mode of transportation that can combine the quality of rail transit and the flexibility of buses" [Thomas (2001)]. Most of the developed

countries in the world have successfully implemented BRTS.

The main features of BRTS are, dedicated lanes and alignment, off-board fare collection, intersection treatment, platform level boarding, high capacity vehicles, quality stations etc.

Benefits of BRTS are, Efficient, reliable and frequent, safe and secure public transport system, decrease in road congestion, decrease energy consumption vehicle emissions, direct and indirect job creation in both the transportation and construction industries, economic development in and around the and areas of BRT operation, reduction in pollution etc.

Bus Rapid Transit System (BRTS) has been adopted in many developing countries with tremendous success. BRT delivers the speed and reliability of rail systems, it offers the convenience and flexibility of bus systems as well. In spite of it being adopted in India in many cities, none have the operational efficiency that an ideal BRTS should have. The Ahmedabad BRTS was rated Silver on BRT Standard in 2013, and is one of the most efficient BRTS in India. The Delhi BRTS was a bus rapid transit system in Delhi. The first route opened in 2008. The project failed to provide the required efficiency and led to more traffic congestion and accidents on the BRTS route. The system faced criticism from the private vehicle users due to which the system was scrapped.

BRTS is an efficient and cost effective means of public transport. It was found that most of the BRTS project are successfully implemented in some cities, but there are some failure case studies as well. Hence there is a need to study the success and failure factors associated with implementation of BRTS. The success and failure factors related to BRTS were obtained from the literature and through expert discussion.

2. OBJECTIVES

- To identify critical success and failure factors related to implementation of BRTS.
- To carry factor analysis using SPSS Software.

3. METHODOLOGY

The methodology for this study consist of following stages:

Stage 1: Literature review

The first stage will be identifying research objectives and research needs, and will include a comprehensive literature review.

Stage 2: Data collection

Data collection is carried out from comprehensive literature survey, discussion with experts and various case studies from all over the world

Stage 3: Preparation of Questionnaire survey

Preparation of questionnaire survey form by compiling the factors and sending to respondents. The random sampling technique is use to select number of respondents. The questionnaire form is send to the respondents by offline method. For offline method i.e. for direct respondents, face to face interview is carried out and questionnaire form is filled.

Stage 4: Data Analysis

Analysis of data collected using SPSS software in which descriptive statistical analysis is carried out. Then mean, rank, standard deviation and frequency for all factors were found out.

4. DATA COLLECTION

Data was collected using Journal papers related to BRTS projects, Discussion with experts, Success Stories of BRTS projects, Failure Stories of BRTS projects. Total 17 success factors and 13 failure factors were identified through literature survey and expert discussion.

The selected success and failure factors are given in table no.1 and table no.2 respectively

Table 1: Identified Success Factors related to implementation of BRTS.

Sr. No	Success Factors
1	Appropriate design standards
2	Right institutional setup
3	Political support
4	Good planning process
5	Faster rate of implementation
6	Citizens involvement
7	Clearly assigned responsibilities
8	Integration of new BRT with other modes of transport
9	Transparency in system monitoring and data reporting
10	Innovative technology
11	Publicity, marketing and branding
12	Providing Intelligent Transportation System
13	Proper operation and maintenance
14	Good road network (main corridor, feeder roads)
15	Good corridor design (location of station, station interval)
16	Availability of right of way (ROW)
17	Provision for non-motorized transport

Table 2: Identified Failure Factors related to implementation of BRTS.

Sr. No	Failure Factor
1	Increased rate of motorization (private vehicles)
2	Inadequate infrastructure
3	Lack of research in BRT project planning
4	Lack of technical support and participation of international organization
5	Strong criticism of system by mass media
6	High fare rates of BRT
7	Indiscriminate parking along corridor
8	Unstable government
9	Delayed land acquisition
10	Intersections along corridor
11	Technological failures
12	Lack of financing
13	Bus breakdowns

5. DATA ANALYSIS

The experts were asked to rate each success and failure factor based on likert scale from 1 to 5, where 1 is not important, 2 is slightly important, 3 is moderately important, 4 is important and 5 is very important. Further the collected factors and their

ratings were analyzed using SPSS Software in which descriptive statistical analysis is carried out. Then mean, rank, standard deviation and frequency for all factors were found out. The descriptive statistics for success and failure factors are shown in Table 3 and Table 4.

Table 3: Descriptive statistics for success factors.

Sr. No	Success Factor	N	Min	Mean	Rank
1	Appropriate design standards	38	3	4.447	9
2	Right institutional setup	38	3	4.263	10
3	Political support	38	3	4.473	8
4	Good planning process	38	4	4.552	7
5	Faster rate of implementation	38	3	3.552	16
6	Citizens involvement	38	3	4.236	11
7	Clearly assigned responsibilities	38	3	4.026	13
8	Integration of new BRT with other modes of transport	38	4	4.868	2
9	Transparency in system monitoring and data reporting	38	3	4.026	14
10	Innovative technology	38	3	4.052	12
11	Publicity, marketing and branding	38	2	3.421	17
12	Providing of ITS	38	4	4.605	5
13	Proper operation & maintenance	38	3	4.578	6
14	Good road network (main corridor, feeder roads)	38	4	4.868	3

15	Good corridor design (location of station, station interval)	38	4	4.789	4
16	Availability of right of way (ROW)	38	4	4.921	1
17	Provision for non-motorized transport	38	2	3.578	15

Table 4: Descriptive statistics for Failure Factors.

Sr. No.	Failure Factor	N	Min	Mean	Rank
1	Increased rate of motorization (private vehicles)	38	4	4.631	1
2	Inadequate infrastructure	38	3	4.263	5
3	Lack of research in BRT project planning	38	3	4.421	4
4	Lack of technical support & participation of international organization	38	3	4.052	7
5	Strong criticism of system by mass media	38	2	3.394	13
6	High fare rates of BRT	38	1	3.552	12
7	Indiscriminate parking along corridor	38	3	3.973	8
8	Unstable government	38	3	3.842	11
9	Delayed land acquisition	38	3	3.921	9
10	Intersections along corridor	38	2	4.5526	2
11	Technological failures	38	3	4.1316	6

12	Lack of financing	38	3	4.5263	3
13	Bus breakdowns	38	2	3.9211	10
2	Intersections along corridor			4.5526	2
3	Lack of financing			4.5263	3
4	Lack of research in BRT project planning			4.4211	4
5	Inadequate infrastructure			4.2632	5
6	Technological Failures			4.1316	6
7	Lack of technical support & participation of international organization			4.0526	7

6. RESULT AND DISCUSSION

The factors analysis is done using descriptive statistics using SPSS software and the ranks of factors are obtained according to their mean. The means are calculated according to their respective importance given by the respondents. The top seven success and failure factors having greater mean are considered as critical factors. The critical success and critical failure factors are shown in the table 5 and table 6 respectively. Before implementing a BRT System these critical success and failure factors should be considered.

Table 5: Critical Success Factors.

Sr. No.	Critical Success Factors	Mean	Rank
1	Availability of right of way (ROW)	4.9211	1
2	Integration of new BRT with other modes of transport	4.8684	2
3	Good road network (main corridor, feeder roads)	4.8684	3
4	Good corridor design (location of station, station interval)	4.7895	4
5	Providing of ITS	4.6053	5
6	Proper operation & maintenance	4.5789	6
7	Good planning process	4.5526	7

Table 6: Critical Failure Factors

Sr. No.	Critical Failure Factors	Mean	Rank
1	Increased rate of motorization (private vehicles)	4.6316	1

7. CONCLUSION

BRTS is an efficient and cost effective means of public transport. It was found that most of the BRTS project are successfully implemented in some cities, but there are some failure case studies as well. Hence, before implementing a BRTS in any city the success and failure factors should be studied. The critical success and failure factors related to BRTS are obtained in this study.

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