

# A STUDY ON BUS OCCUPANCY LEVEL; CASE STUDY OF VINAYAK LOGISTIC

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**Abstract:** *The importance of the vehicle occupancy level and its impact on the transportation system has been discussed thoroughly in many papers. The more use of the private vehicle and increasing number of the private ownership of the vehicle is a serious threat to the transportation problems. The use of public vehicle is becoming less and less throughout the years and the main problem it's causing is congestion. Various factors needed to be considered to analyze the problem related to the bus system. The relationship between the user and bus system and users is the key factor for the present solution. The study suggests that the number of bus modal share has to be increase to cut down the serious problem, which in case in future is not done, will increase too many problem by it. The basic aim is to see vehicle (bus) ridership gets improved so to get maximum number of passengers.*

**Index Terms** – vehicle ownership, congestion, ridership, passenger

## I. INTRODUCTION

In most of the developing countries, there are several factors that contribute to the severity of transport problems. The rapid growth of the large cities due to the growth in population coupled with increase in urbanization has posed serious challenges in developing adequate infrastructure facilities. The major transportation problems are haphazard and unplanned development at the suburban fringe with little or no provision of transportation facilities, poor public transport facilities, inadequate parking, and increasing number of vehicle these all problems has a high impact on mobility.

India being one of the fastest growing economics in the world with growth rate of 7.5% per annum. The transportation system plays the vital role in achieving the goal of the growth rate. The cities of the India have seen the rapid urban growth and the travel demand is increasing correspondently. The need and importance of the public transportation system has increased in enormous numbers for better living and economic growth of the both people and country. The urban population of India occupies 30% of the total population which generate 60% of nation's GDP. The urban mobility has emerged as an challenge due to various factors which has an adverse effect upon the nation's economic status.

## II. HISTORY OF BUS

The starting of the bus service was done by (GSRT) known as Gujarat state transport corporation. The bus fleet at the time of (GSRT) running the service declined from 200 in 2003 to 85 in 2005. After 2005, VMSS (Vadodara Mahanagar Seva Sadan) came into the scene and took the initiative to organize the city bus service using PPP (Public private partnership) model.

VTCOS transportation service was introduced on 18th may, 2008 after agreement with Vadodara Municipal Corporation gradually the number fleet increased and in March 2010 there were high growth in operating bus (120 CNG bus in 42 routes). May 2013 the contract between VTCOS and Vadodara Municipal Corporation expired and Vinayak Logistic Pvt.Ltd came. Before it was total fleet of 67 buses in 30 routes were operated, the present scenario is 50 buses in 31 routes. The routes are radial in nature as every journey starts from the origin (central bus stop), opposite to railway station of Vadodara.

Table no. Vinayak logistic details

No.	Parameters	Statistic/Information
1	Bus operator	Vinayak logistic Pvt. Ltd
2	Type of operator	Private operator
3	Number of bus	Running bus 50 11 regular bus 3double Decker 5 Tata magic 24 medium bus 17 mini bus
4	No of bus routes	31
5	Geographical coverage	VMSS Limit
6	Passenger carried per day by all buses	95000 to 100000 and above
7	Number of bus stops	Total 320 stops (124 bus stops and old GSRTC bus stops.
8	Number and location of bus stops	One opposite railway stations
9	Fare structure	5 rupees for initial 0-2 km
10	Headways (frequency)	15 to 20 minutes
11	Service period	16 hours ( 5:30 A.M to 9:30 P.M)
12	Concession on fares	50% concession for students, 30% for regular,

		90% for blind and handicapped
13	Fleet utilization (%)	86%
14	Total number of drivers and conductors	300
15	Bus capacity	Minibus 32 seating Regular bus 38 seating
16	Typical route speed	20-25 km/h

Source: Vinayak logistic statistics 2017

## 2.1 ROUTES AND COVERAGE

The bus routes were designed and approved by the GSRTC, VMSS and Government of Gujarat. The geographical area of city bus services was limited to municipal corporation area. The existing bus routes operate by Vinayak logistic is shown in table below.

Table: Vinayak logistic routes

No.	Route no.	Route origin	Via	Route destination
1	1	Railway station	Raopura Tower, Nyay Mandir	Mandvi
2	3	Railway station	Raopura Tower, mandvi, panigate, uma, vrindavan	Bapod bypass
3	3/D	Railway station	Fatehgunj, Amit nagar, Manek park, Khodiyar	Bapod bypass
4	4	Railway station	Tower, Mandvi, Panigate, Navjivan	Sayaji park
5	4/D	Railway station	Kamati bagh, Fatehgunj, Amit nagar, Manerk park	Sayaji park
6	5	Railway station	Tower, Mandvi, Panigate, Uma, mahvir hall, sangam, VUDA circle, Fateh gunj, kamati bagh, railway station	Railway station
		Railway station		
7	7/D	Railway station	Fatehgunj, Amit nagar, Sangam, Parivar char rasta, Soma talav, Kapurai	Dabhoi bypass
8	9/A	Railway station	Tower, Mandvi, Uma cross road, Vrindavan, Ranchod park, Parivar	Parivar soma talav
9	9	Railway station	Tower, Mandvi, Punam ayurvedic, Parivar	Parivar soma talav
10	10	Railway station	Jail road, Lal bagh, Manjalpur, Alwa naka, Vadsar	Vadsar GIDC
11	10/A	Railway station	Jail road, Lalbagh, Manjalpur, Tulsi dham, Susain	GIDC
12	10/D	Railway station	Towar, Nyay mandir, kirti stambh, Lalbagh, Manjalpur, Darbar cross road, Pramukh Prasad cross road, Subodh nagar	Subodnagar
13	11	Railway station	Jail road, Lal bagh, dairy jn.,ITI	Tarsali
14	11/D	Railway station	Jail road, Lal bagh, Susain, Novino, Padam park	Ravi park
15	12	Railway station	Jail road, Lal bagh, Susian, Novino, Makarpura	Maneja
16	15/A	Railway station	Dawakhana, Slat wada, Nagar wada, Bhutdi jampa	Harni bypass
17	18	Railway station	Kamati bagh, Fateh gunj, Nizampura Deluxe	Sama
18	19	Railway station	Pandaya hotel, sardar nagar, navayard	Chhani
19	20	Railway station	Tower, Mandavi Chokhandi, Pratapnagar	Danteshwar
20	22	Railway station	Race course, Bird circle, Manisha, Akshar chowk	Atladra
21	23	Railway station	Via diwali pura, Vasna	Bhaili

22	24	Railway station	Race course, liora park, Arunachal	Akshar Apt
23	25	Railway station	Race course, Genda circle, Gorwa, Panchawati	Panchawati
24	25/A	Railway station	Kamati bagh, Fateh gunj, Pandaya bridge, Genda circle, Gorwa	Panchawati
25	27	Railway station	Race course, INOX, Harinagar, Gotri	Gokulnagar
26	27/D	Railway station	Race course, Bird circle, Harinagar, Gotri	Sevasi
27	27/F	Railway station	Via Harinagar	Radiyaba nagar
28	28	Railway station	Race course, Iilora park, Subhanpura, Samta	Balajinagar
29	29	Railway station	Race course, INOX, Hari nagar, Iscon Mandir	Jalaran nagar
30	30	Railway station	Race course, Iilora park, Gorwa workshop, Darpan	laxmipura
31	31	Railway station	Via genda Circle, Gorwa	Karodia, bajwa

### III. DATA COLLECTION & ANALYSIS

Data collection is the process of procuring required information for each selected unit in the study area. It includes detailed description such as survey method, data requirements, as well as sample size selection which can be helpful to full fill objectives of the study. The questionnaire is formed and given to public and answer is recorded. This process is very expensive, time consuming, requires extensive resources and has direct impact on data quality.

- Boarding and alighting survey
- Point occupancy survey
- Questionnaire data user perspective

#### 3.1 VEHICLE OCCUPANCY SURVEY:

Seating capacity: 32

Route name: Railway station to Karchan

Date: November 6<sup>th</sup> 2017 (Monday)

Sn	Time duration	Stop name	Boarding passenger	Alighting passenger	Point occupancy	Average occupancy
1.	8:50 am	Railway station	32		1	57%
		Genda circle	1		1.03125	
		Gorwka		25	0.25	
		Karchan		null	0	
2.	9:30 am	Railway station	32		1	64%
		Genda circle	1	3	1.066	
		Gorwka	1	15	0.5	
		Karchan		null	0	
3.	10:10 am	Railway station	31		0.96875	71%
		Genda circle	3		1.0625	
		Gorwka	1	9	0.8125	
		Karchan		null	0	
4.	2:10pm	Railway station	20		0.625	42.9%
		Genda circle	3		0.7185	
		Gorwka		11	0.375	
		Karchan		null		
5.	5:30 pm	Railway station	32		1	77.34%
		Genda circle	6		1.1875	
		Gorwka	2	11	0.90625	
		Karchan		null	0	

Route name: karchan to Railway station

Sn	Time duration	Stop name	Boarding passenger	Alighting passenger	Point occupancy	Average occupancy
1.	9:30 am	Karchan	30		0.9375	71.09%
		Gorwka	10	9	0.96875	
		Genda circle		1	0.9375	
		Railway station		null		
2.	10:10 am	Karchan	32		1	90.31%
		Gorwka	9		1.28125	
		Genda circle		8	1.03125	
		Railway station		null		
3.		Karchan	30		0.9375	71.8%
		Gorwka	1	1	0.0375	
		Genda circle	2		1	
		Railway station		null		
4.	2:50pm	Karchan	8		0.25	34.3%
		Gorwka	11		0.59375	
		Genda circle		2	0.53125	
		Railway station		null		
5.	6:10 pm	Karchan	30		0.9375	67.1%
		Gorwka	1		0.96875	
		Genda circle		6	0.78125	
		Railway station		null		

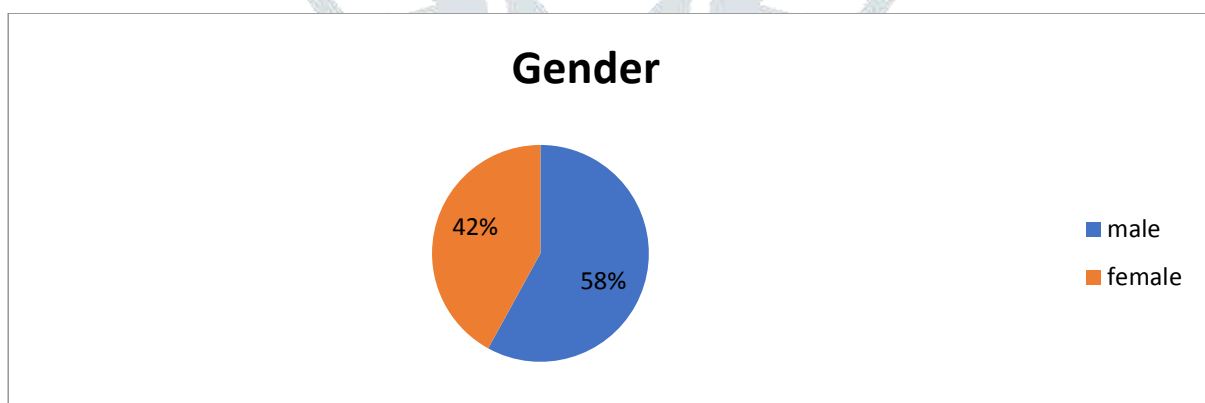
In the above similar manner different routes boarding and alighting survey is done on 2 weekdays and 1 weekend days on each route to get more clear picture regarding the intermediate stops occupancy and passenger load factor.

### 3.2 Questionnaire data

The feedback survey is done to see the customer's reaction on the system they are using day to day in their life. It gives the overall picture of the current scenario of the system as well as the people's view towards it. The survey was conducted in November mid in the city bus center. 500 samples are taken into account.

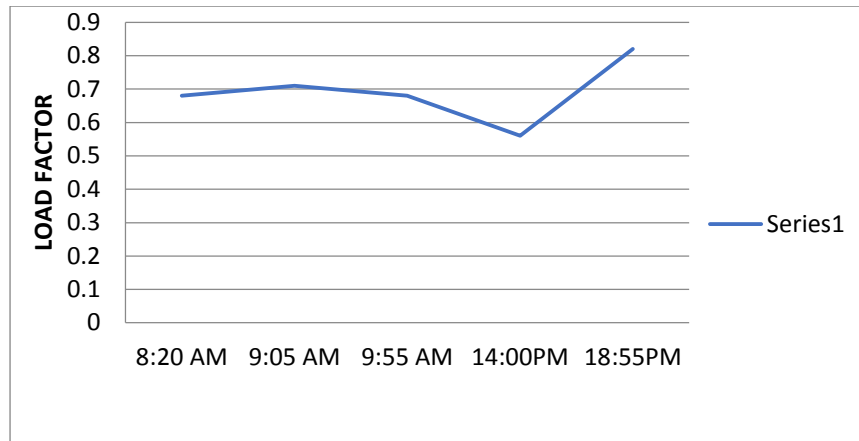
The questionnaire includes 10 box type tick question and 9 ratings question such as comfort level, bus punctuality etc.

One of the few questions was the gender which concludes 58% are male users and 42% are female. And ratings analysis are done with likert scale analysis which includes safety, comfort, economy, condition of bus, travel time etc.



## IV. RESULTS& DISCUSSIONS

As the work has been carried out the result concludes the average occupancy level is more than 50% on both weekends and weekdays on more routes and passenger load factor is uniform. This concludes there is demand of more transportation of the bus service in present.



## V. CONCLUSION

There are no fixed intermediate stops between the origin and destination as a result there is no proper bus stops. A proper bus stops needs to be made and by this research we can see the travel load on different routes time scheduling and route re planning can play vital role in minimizing the congestion problem where as in other hand the number of buses should be increased so that passenger don't have to wait for long time to get bus service as there is demand time management and incensement of number of bus can play vital role.

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