DESIGN OF PUBLIC TRANSPORTATION IN ANANTNAG CITY OF JAMMU AND KASHMIR

Mohammad Musaib[1], Umer Nazir[2], Mir Danish Amin[3], Swaid Shahzad[4], Malik Aneeq Manzoor[5], Waseem Bhat[6]

B.tech final year (Civil Engineering), Lovely Professional University, Phagwara – 144411, Punjab, India.

[6]Assistant Professor School of Civil Engineering Lovely Professional University, Phagwara – 144411, Punjab, India.

Abstract

In this research work, emphasis was made on Study of traffic flow, To estimate the required demand of public transportation, To generate a proper schedule (journey time table for different roads leading to Anantnag city (Kashmir Indian union territory). The public transportation is a key position within side the revolutionary improvement, well balanced regional development and as well as the well-being of the society. It reduces adverse environmental impacts and improves road safety. The role of public transportation is to provide people with mobility and simultaneously boosts the accessibility of basic services. In this examine, the numerous surveys on the site of district Anantnag have been conducted and the viable effects for the most use of publication transportation have been procured. So, in order to promote economic benefits to the inhabitants of Anantnag, reduce traffic congestion and keeping the conducted surveys into consideration, we have designed a time table for public transportation in Anantnag to bring more public transportation in use than the private ones.

Keywords: Public Transport, Busses, Cabs, Private Transport, Cars, Time Table.

Introduction

Public transport (also known as public transportation, public transit, mass transit, or simply transit) is a system of transport, in contrast to private transport, for passengers by group travel systems accessible for use by the public, typically achieved on a schedule, worked on established routes, and that charge a posted fee for each trip. Public transportation helps in travel and enables more people to travel together along selected routes. Examples of types of public transportation include buses, trains, and trams. High-speed rails, airlines, and coaches dominate public transportation between cities. Introduction of public transport in city like Anantnag, which is nearly 55 Km far from Srinagar. It is the third largest city in Jammu and Kashmir after Srinagar and Jammu with an urban population of 159,838 and municipal limit population of 109,433**.** Due to the large population of the city and roads leading towards tourist destinations like Pahalgam through the center of the city, concerns like width of the road and need of increasing the public transportation needs to be solved. However, most public transport trips include other modes of travel, such as passengers walking or catching bus services to access train stations. Share taxis offer on-demand services in many parts of the world, which may compete with fixed public transport lines, or complement them, by bringing passengers to interchanges. Paratransit is sometimes used in areas of low demand and for people who need a door-to-door service. Some of the examples of various modes of public transport e.g., Buses, Train, Light Rail, Metro System, Airplane's, Ferry etc.

1.2 Need of public transport in Cities

Public transport also called "mass transit" or "public transit" is means of shared public transportation. It is available for public in general, but it is different from the general modes of transportation like private cars, carpooling, cabs, taxi, shared vehicles which cannot be shared by general public without any kind of private arrangements. Although, Private cars are considered more comfortable and less time consuming than the public transportation but simultaneously leads to the increase in pollution and traffic jams. Also, when comparing mass transit with the private mode of transportation, it seems mass transit is more advantageous.

1.3 Introduction About Study Area

Anantnag is a district among the 20 districts of Jammu and Kashmir UT of India. It is having the total population of 1,078,692, according to census 2011 and the population density is 375inhabitants per square kilometer [1]. The district is well known hilly district and is famous for its numerous shrines, which are of religious importance to both Hindus and Muslims. Hazrat Baba Reshi, Goswami Gund Ashram, Shilagram Temple and Nila Nag are some of the prominent shrines in the district of Anantnag. paddy and mustard are the major crops cultivated in Anantnag; the district is having lush green beautiful forests. The economic development of the people is much dependent upon the agricultural production, although it is having an abundant capacity of natural beauty and a wildlife sanctuary at Pahalgam which is 35 kilometers from the Anantnag main. This can flourish the tourist sector not only of the Anantnag but of whole Jammu and Kashmir (UTof india). To the extent district Anantnag is having well road connectivity with the

nearby districts of Kulgam, Shopian and Pulwama but is lacking in rail network [2]. In Jammu and Kashmir (UT of India) road transportation runs public transport (Busses) in every major city and making connectivity between villages and districts but it is also lacking in Anantnag district. The road transport on the one hand if well-developed but the passengers still have to use either personal transport of the sheared taxies like Tavera, Tata sumo due to the non-availability of the proper public transportation.

1.4 Existing public transportation conditions

The public transportation currently running in the city of Anantnag mainly includes,sheared taxi, four wheelers and the busses which are playing with extremely limited availability on the Anantnag to Srinagar route. The major outer city connecting roads Anantnag to Pahalgam, Anantnag to kulgam, Anantnag to Srinagar. As most of the trips to reach these cities are via different roads other than highways which requires special vehicles if necessary, as the availability of public transport is limited.

2. LITERATURE REVIEW

2.1 Kwang Sik Kim, Lucien Benguigui, Maria Marinov(2003)[3] From this paper the author have come to the point and have got the issue of the relationship between the past of the urban spatial pattern in the sense of population and development, and the development oftransportation network, and its consequent fractal dimension. The results indicate that Seoul is the case where a subway system is retrofitted already to a largely urbanized area, and thus does not knowingly affect the urban spatial patterns, while the rail system precedes and thus shapes the urbanization process.

2.2 Saad Yousif, Purnawan(2016)[5] Studied On- street parking will effect on traffic congestion this paper describes the characteristics of different type of vehicles when they enter or leave the on street parking. These factors are ignored by the traffic engineer in the design process and hence lead to traffic congestion due to which this gives rise to traffic volume. This study includes legal parking and illegal on street parking. This study is all about that on street angle parking give rise to more congestion as compared to parallel parking. The sites use for the data collection for this study are busy roads serving retail and commercial activities.in this study different parking patterns have been observed. These patterns are due to reasons like type of parking, distance of travel, traffic condition etc. Also, in parallel parking reversing movement is only once required at time of entering the parking while as in angle parking reversing is always required. These movements can give rise to bottlenecks due to which traffic volume gets increased. This study can help in determining which type of parking is batter and what type of parking should be avoided at the time of designing of on- street parking.

2.3 Muhmmad atiullah saif et.al (2018) [6] As per him accessibility is one of the most important outcomes of the transportation system. Accessibility has been applied in the fields such as urban and land use planning, transportation management, and public facility location analysis the public sector is responsible for the implementation of transport public policies that maximize the competitiveness of urban space and minimize the negative effects of its growth for that proposal of actions must be guided by good performance indices.

2.4 Abrar Ul Haq Bhat, Dr.Rakesh Gupta(2018)[7] Study of traffic volume and its safety measures on national highways this study is based on the quantity of traffic and analysis and this was done with the help of manual method. This method is used to collect data of different traffic pattern at different periods of time. This study helps in controlling traffic and some measures to improve safety in that particular area. In this study traffic flow pattern was find out with 15 minutes interval variation.

2.5 Xueqin Wang et.al (2020) [8] Studied about the safety of public transport that with the growing demand of public transport, the safety of public transport becomes a pertinent issue. Road traffic injuries are the leading cause of death for young people globally, many collisions are caused by drivers because of their unsafe behavior or habits. In public transport passenger's safety awareness can positively improve passenger's safety behaviors, safety education and communication are important to enhance the road safety, by encouraging safety behavior traffic collisions can be reduced.

2.6 Dimitra Tarassi et.al (2020) [9] This study Identifies the critical implications of the COVID-19 pandemic on urban mobility. Two Cretan popular tourism urban destinations (Chania and Rethymno) were analyzed.The citizens' performance was modelized on two factors: "car restrictions' driven" and"secondary".The research revealed that both cities, Chania and Rethymno, are car-centric since almost 40% of the study population uses a private vehicle daily and almost 50% of the citizens choose walking for their daily commuting. On the contrary, cycling is not a preferred transport mode.One-third of the study population is unwilling to alter their travel habits and limit car use.Lockdown due to COVID-19 reduced traffic congestion and consequently travel time.Future studies could investigate whether people perceive the long-term benefits of limiting private car use and are willing to shift towards active transportation. As urban commuting gradually restarts, it would be useful to register the alterations in citizens' mobility patterns and compare them with pre-pandemic and quarantine ones, in order to identify the mobility trends. The data analysis and modelling would be useful in the future design of more flexible, sustainable, and resilient mobility strategies.

2.7 John Preston (2020) [10] Studied that any mode of transport for hire and reward and used by general public is called as public transport, with the emergence of shared mobility the distinction between individual / private and collective / public / are becoming blurred. Low capacity and low-cost public transport consist of micro-mini buses, taxis while as medium capacity public transport includes single-deck, double-deck, and articulated buses/coaches and trolley buses. Bus system may have their own road maps through guidance (either curb, electronic or optical). Bus fleets often face high failure rates because of low investment in vehicle and maintenance facilities and shortage of spare parts.

2.8 Christoffel J. Venter(2020)[11] Performed a research in which it is highlighted that the quality of first/last mile (1LM) have a good impact for the satisfaction of the passengers which in turn attract passengers to retain on public transport modes .The main factors which highly effect the quality of 1LM are : the bus stops are poorly equipped, lacking benches and shelter; and the fact that many origins/destinations can only be reached with a feeder bus trip, which raises the time and cost associated with the first/last mile connection. The main issues which are responsible for the dissatisfaction of passengers are security, punctuality and fares, time required for the access trip, and poor amenities at bus stops, the time for the access trip could be reduced by better feeder bus strategies (such as increased frequencies or dedicated bus-lanes).

2.9 Yash, Ankit Kumar (2020) [12] This paper is all about the on-video traffic flow analysis in distributed system the main focus was on scheduling and congestion due to traffic the date of traffic was collected from the dada centres this provide an approach that could improve link utilization. This distribution hierarchical network system controls all the local and remote store multimedia services. Also, in this study authors have innovatively adopted the mechanisms to get the feedback queue for the congestion control. This data will help the government in improving the traffic flow and safety by analysing these videos.

3.Methodology

Under the tremendous burden for city transportation caused by people's commuting and interflow of goods, crowded roads, strong traffic jams, and out-of-order transportation systems have begun to become progressively severe. Our goal was to demonstrate that network preparation and architecture can be a critical factor in public transportation efficiency, as well as to suggest some key aspects of planning philosophy and design concepts for the public transportation system. We've taken a number of actions on our platform to do analysis on public transportation, and the following are a few of them:

3.1 Method (video and manual) We quantify the traffic flow on an hourly basis during the day by recording video on different roads heading towards Anantnag. Manually counting traffic under subcategories such as (public and private transport) two-wheelers, four-wheelers, taxis, mini-buses, cabs, and so on, and we decide that public transportation was less available, as people choose to drive their own cars instead of using public transportation.

3.2 Questioning: To find out why people don't use public transportation, we conducted a survey in which we asked a series of common questions to a variety of people. The most common responses were, less availability of public transportation, which was limited to particular routes with specific scheduling and often took too long to complete due to multiple stops.

3.3 Timetable formulation: We handle timetables from reputable bus and taxi stands, know their running times for a certain route, and make recommendations based on surveys so that people can use public transportation on a large scale.

4. Results and discussion

4.1 On all the four routes generating from Anantnag the traffic data was collected as the analysis is being done for the same for the introduction of the public transportation on all the four routes as below:

4.1 Table: Flow of traffic on different route of Anantnag

From Anantnag to Srinagar Time 8.00AM to 7.00PM				
Two Wheelers	Private Cars	Cabs	Buses	Total
654	3550	1615	148	5967
Total flow of traffic in percent				
Two Wheelers	Private Cars	Cabs	Buses	
10.96%	59.49%	27.08%	0.02%	
Number of passengers travelling daily				
Private	Public	Total		
7754	16336	24090		
Private and Public transport users in percent				
Private		Public		
32.1%		67.8%		
New willing to use public transport				
Already public transport users	New willing to use	Total		
16336	5976	22312		
Already public transport users and new willing to use in percent				
Public transport users		New willing to use		
73.2%		26.7%		
From Srinagar to Anantnag Time 8.00AM to 7.00PM				
Two Wheelers	Private Cars	Cabs	Buses	Total
712	2675	685	223	4294
Total flow of traffic in percent				

Two Wheelers	Private Cars	Cabs	Buses	
16.58%	62.27%	15.95%	5.19%	
Number of passengers travelling daily				
Private	Public	Total		
6060	13715	19775		
Private and Public transport users in percent				
Private		Public		
30.64%		69.35%		
New willing to use public transport				
Already public transport users	New willing to use	Total		
13715	4672	18387		
Already public transport users and new will to use in percent				
Public transport users		New willing to use		
74.59%		25.40%		
From Anantnag to Kulgam Time 8.00AM to 7.00PM				
Two Wheelers	Private Cars	Cabs	Buses	Total
538	3601	1035	91	5265
Total flow of traffic in percent				
Two Wheelers	Private Cars	Cabs	Buses	
10.21%	68.39%	19.6%	1.72%	
Number of passengers travelling daily				
Private	Public	Total		
8616	10885	19501		
Private and Public transport users in percent				
Private		Public		
44.18%		55.8%		
New willing to use public transport				
Already public transport users	New willing to use	Total		
10885	5966	16851		
Already public transport users and new willing to use in percent				
Public transport users		New willing to use		
64.59%		35.40%		
From Kulgam to Anantnag Time 8.00AM to 7.00PM				
Two Wheelers	Private Cars	Cabs	Buses	Total
741	1853	830	63	3487
Total flow of traffic in percent				
Two Wheelers	Private Cars	Cabs	Buses	
21.25%	53.14%	23.80%	1.80%	
Number of passengers travelling daily				
Private	Public	Total		
4420	7970	12390		
Private and Public transport users in percent				
Private		Public		
35.67%		64.32%		
New willing to use public transport				
Already public transport users	New willing to use	Total		
7970	3525	11495		
Already public transport users and new willing to use in percent				
Public transport users		New willing to use		
69.33%		30.66%		
From Verinag to Srinagar Time 8.00AM to 7.00PM				
Two Wheelers	Private Cars	Cabs	Buses	Total
680	2633	936	166	4415
Total flow of traffic in percent				
Two Wheelers	Private Cars	Cabs	Buses	
15.4%	59.63%	21.2%	3.7%	
Number of passengers travelling daily				
Private	Public	Total		
5946	13192	19138		
Private and Public transport users in percent				

Private		Public		
31.0%		68.9%		
New willing to use public transport				
Already public transport users	New willing to use	Total		
13192	4634	17821		
Already public transport users and new willing to use in percent				
Public transport users		New willing to use		
74.0%		26.0%		
From Srinagar to Verinag Time 8.00AM to 7.00PM				
Two Wheelers	Private Cars	Cabs	Buses	Total
723	1766	867	129	3485
Total flow of traffic in percent				
Two Wheelers	Private Cars	Cabs	Buses	
20.7%	50.0%	24.8%	3.7%	
Number of passengers travelling daily				
Private	Public	Total		
4255	11229	15484		
Private and Public transport users in percent				
Private		Public		
27.4%		72.5%		
New willing to use public transport				
Already public transport users	New willing to use	Total		
11229	3272	14506		
Already public transport users and new will to use in percent				
Public transport users		New willing to use		
77.4%		22.5%		
From Pahalgam to Srinagar Time 8.00AM to 7.00PM				
Two Wheelers	Private Cars	Cabs	Buses	Total
251	526	159	83	1019
Total flow of traffic in percent				
Two Wheelers	Private Cars	Cabs	Buses	
24.6%	57.6%	15.6%	8.1%	
Number of passengers travelling daily				
Private	Public	Total		
1303	4469	5475		
Private and Public transport users in percent				
Private		Public		
22.5%		77.4%		
New willing to use public transport				
Already public transport users	New willing to use	Total		
4469	1006	5475		
Already public transport users and new willing to use in percent				
Public transport users		New willing to use		
81.6%		18.3%		
From Srinagar to Pahalgam Time 8.00AM to 7.00PM				
Two Wheelers	Private Cars	Cabs	Buses	Total
329	652	379	57	1480
Total flow of traffic in percent				
Two Wheelers	Private Cars	Cabs	Buses	
26.4%	44.05%	25.6%	3.8%	
Number of passengers travelling daily				
Private	Public	Total		
1696	5003	6699		
Private and Public transport users in percent				
Private		Public		
25.3%		74.6%		
New willing to use public transport				
Already public transport users	New willing to use	Total		
5003	1309	6312		

Already public transport users and new willing to use in percent	
Public transport users	New willing to use
79.2%	20.7%

By taking 1 passenger travelling by each two-wheeler, 2 passengers are travelling by one car, 7 passengers travelling by one cab and 40 passengers travelling by one bus. We calculated the total number of travelers travelling by different private and public transportation, while indicating two wheelers and private cabs as the private mode of transportation and cabs and busses as the public mode of transportation.

Passengers using private vehicle throughout the day had been interviewed at some stage in the short survey achieved as elaborated in detail in the above section and observed if the services are provided as sited in the same section, on Anantnag to Srinagar route 73.2% of them are using public mode of transportation and 26.7% are new willing to use public mode of transportation , on Srinagar to Anantnag route 74.59% of them are using public mode of transportation and 25.40% are new willing to use public mode of transportation, on Anantnag to Kulgam route 64.59% of them are using public mode of transportation and 35.40% are new willing to use public mode of transportation, on Kulgam to Anantnag route 69.33% of them are using public mode of transportation and 30.66% are new willing to use public mode of transportation, on Verinag to Srinagar route 74% of them are using public mode of transportation and 26% are new willing to use public mode of transportation, on Srinagar to Verinag route 77.4% of them are using public mode of transportation and 22.5% are new willing to use public mode of transportation, on Pahalgam to Srinagar route 81.6% of them are using public mode of transportation and 18.3% are new willing to use public mode of transportation, on Srinagar to Pahalgam route 79.2% of them are using public mode of transportation and 20.7% are new willing to use public mode of transportation.

Hence on the above survey conducted it is observed that the maximum number of public transport users are on Pahalgam to Srinagar route and maximum number of new willing public transport users are on Anantnag to Kulgam route.

4.2 Number of required cabs and buses from Anantnag to different routes are tabulated below:

Table 4.2 Time Table of public transport on different routes of Anantnag.

Cabs and Buses required from Anantnag to Srinagar Time 8.00AM to 7.00PM		
Cabs	Buses	Total
2613	123	2736
Percentage of cabs required	95.0%	
Percentage of buses required	4.49%	
Cabs and Buses required from Srinagar to Anantnag Time 8.00AM to 7.00PM		
Cabs	Buses	Total
2438	49	2487
Percentage of cabs required	98.02%	
Percentage of buses required	1.97%	
Cabs and Buses required from Anantnag to Kulgam Time 8.00AM to 7.00PM		
Cabs	Buses	Total
2176	42	2218
Percentage of cabs required	98.10%	
Percentage of buses required	1.89%	
Cabs and Buses required from Kulgam to Anantnag Time 8.00AM to 7.00PM		
Cabs	Buses	Total
1392	44	1436
Percentage of cabs required	96.93%	
Percentage of buses required	3.06%	
Cabs and Buses required from Verinag to Srinagar Time 8.00AM to 7.00PM		
Cabs	Buses	Total
2194	79	2273
Percentage of cabs required	96.5%	
Percentage of buses required	3.4%	
Cabs and Buses required from Srinagar to Verinag Time 8.00AM to 7.00PM		
Cabs	Buses	Total
1678	69	1747

Percentage of cabs required	96.0%	
Percentage of buses required	3.9%	
Cabs and Buses required from Pahalgam to Srinagar Time 8.00AM to 7.00PM		
Cabs	Buses	Total
596	33	629
Percentage of cabs required	94.7%	
Percentage of buses required	5.2%	
Cabs and Buses required from Srinagar to Pahalgam Time 8.00AM to 7.00PM		
Cabs	Buses	Total
812	17	829
Percentage of cabs required	97.9%	
Percentage of buses required	2.0%	

The main scope of this survey was to get the feedback from the people about the changes to be done in the public transport so that they can use it maximum.

As per the survey conducted, we therefore observed that the 95% are willing to travel by buses and 4.49% are willing to travel by cabs, but due to non-availability of the same they were forced to use private mode of transportation. The people were asked that if they want to travel by buses and cabs maximum number of them agreed to travel through the public mode of transportation i.e., buses and cabs on Anantnag to Srinagar route.

At the same time people were questioned that whether the public mode of transportation is economical and safer than private mode of transportation or not, where maximum people agreed that public mode of transportation is both economical and safer than the private mode of transportation.

Acknowledgement

We are very thankful to the daily passengers and the local people of the Anantnag district who gave their views and suggestions related to the structured public transportation system and we are also thankful to our guide and mentor Mr. Waseem Bhat under the guidance of whom this research report got successfully completed

Conclusion

The inspection unveils that due to inadequacy of the proper public transport, the passenger trips are extremely disturbed in the city of Anantnag. The inadequacy of public transport facilities has left the population immensely simulated. In the matter of student community of the city, the excursionist vexation is seen while leading the surveys. However, the facilities provided by the existing transportation system is ineffective to the required level as claimed by the surveyor of the inspected area. The population in the periphery would get the additional benefits if associated by the public transit system. The inspection farther considered, the number of excursionists travelling every day on distinct tracks generation from Anantnag and back, the surveys with regard to consultation/ interview were directed and the distinct ratio of the private transport users that are reluctant to utilize public transport effectively and thorough facilities of the buses and cabs have been put forward appropriately. Even though, the schedules have been put together further, for the attainable services benefits of the excursionists.

References

[1] https://www.census2011.co.in/census/district/632-anantnag.html

[2] http://distancebetween2.com/anantnag/pahalgam

[3] Adam Piotr Zajac [2016] City Accessible for Everyone – "Improving Accessibility of Public Transport Using the Universal Design Concept". Institute of Sociology, University of Warsaw. 27 June 2016.

[4] Saad Yousif, Purnawan [2016] A STUDY INTO ON-STREET PARKING: EFFECTS ON TRAFFIC CONGESTION

[5] Muhammed atiullah saif[2018] Public transport accessibility: a literature review

[6] Abrar ul haq, Dr Rakesh gupta [2018] ''Traffic Flow Study at Majura-Gate Intersection of Surat City''

[7] Xueqin Wang et al [2020]" Environmental governance of transportation infrastructure under Belt and Road Initiative: A unified framework." Civil and Environmental Engineering, Nanyang Technological University, Singapore. 20 July 2020.

[8] Dimitra Tarassi [2020] ''Transportation in the Mediterranean during the COVID-19 pandemic era.'' DOI: **10.1016/j.glt.2020.12.003**

[9] John Preston [2020] Accessibility, mobility and transport-related social exclusion. Journal of transport geography

[10] Venter, C.J. [2020] Measuring the quality of the first/last mile connection to public transport. Research in Transportation Economics, Vol. 83, 100949.

[11] Yash, Ankit Kumar [2020] ''Review Paper on Video Traffic Flow Analysis in Distributed System.'' International Journal of Emerging Technology and Innovative Engineering