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Traffic Congestion Analysis of High Volume Road Stretches in Srinagar and Pulwama

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ABSTRACT: This study seeks to propose a new framework for the roads of Srinagar and Pulwama where the users belong to various user classes depending on the network dynamics and to develop more realistic DMS information strategies based on the dynamic user class framework by explicitly accounting for key practical features of real-world traffic operations. Further to investigate the performance of the proposed traffic management strategy under varying information, incident and congestion attribute levels. The study has been conducted on 8 links in Srinagar and Pulwama, Traffic volume is counted for 12 hours from morning 8:00am To 8:00pm. The techniques like Traffic Volume count, Capacity, Carriageway width, Link Length, Vehicle Occupancy, Average Vehicle Speed, Roadway Congestion Index, Level of service, Peak hour factor and Design flow rate, and Congestion delay were used in this study. The highest volume/capacity ratio was observed as same link TRC fountain to ME lodgings guest house link 2.1 whereas the lowest one was observed as 0.72 in Murran Chowk to B.ED college Pinglena link road. At 4 links, the major portion of vehicle was private vehicle which was followed by motorcycle, scooter, 3-- wheeler, auto rickshaw, minibus, cycle, large bus ,truck. At one link Imambara Pandrathan to petrol pump (Panthachowk) situation is different here the highest amount of vehicle at link was observed as private car (62%), which was followed by motor cycle ,scooter (20%), truck (9%), 3 wheeler , auto rickshaw (4%), minibus (3%), large bus (1%), cycle (1%). the highest speed of vehicles was observed 22.12Kmph at link Imambara Pandrathan to petrol pump (Panthachowk) whereas the lowest was observed as 5.63 Kmph at link airport road crossing (JehangirChowk) to Mominabad Rd crossing at same link congestion delay was 7.99 minute and 929 person hours delayed in 1 km stretch . This indicated high traffic congestion in Srinagar and Pulwama. Traffic congestion mainly occurred by private car 53%, illegal occupation on the road side by mobile shops hawkers etc., construction work, lack of planning of city roads, unplanned stoppage parking were among the major causes of traffic congestion in Srinagar and Pulwama. The end of this report some solutions have been recommended that can help to decongest the city.

I. INTRODUCTION

Traffic Congestion is a growing problem in many of the Kashmir cities over the past few decades. A rush hour trip in 2018 takes thrice as long as a rush hour trip in 1982. In the same period, the annual hours of delay per person has increased by 19 hours. Apart from personal inconvenience, traffic congestion can hamper economic productivity in an area and increase the pollution caused due to vehicle emissions thus reducing the quality of life of the people. According to Meyers (1997), congestion mitigation strategies can be broadly classified into three categories: Transportation System Management (TSM), Travel Demand Management (TDM) and Land Use Management [1-2].

TSM techniques seek to improve the traffic flow through better management of existing facilities [3]. The consequence of these restrictive assumptions is the possibility of seriously erroneous estimates of DMS effectiveness and system performance.

The congestion of traffic in Srinagar and Pulwama is very high. The Traffic Department is behaving like a revenue generating department as they have limited their work to just filing challans and collecting fines and pay little heed to improving quality of traffic services". It is to mention here that the roads that were built many decades ago were not widened to accommodate increasing vehicular traffic [4-5].

There is also a huge deficit of traffic signal men who control traffic on busiest spots of city's roads. This deficiency can be gauged by the fact that one signal man deployed at a beat at Polo view has to spend about 12 hours on the beat to render his duty of controlling traffic. About half a kilometer stretch of Residency road that traverses Srinagar city's commercial hub, Lal Chowk, remains occupied with cars parked by shopkeepers and customers badly effecting smooth flow of traffic. "A yellow line was drawn on the Residency Road to demarcate car parking for customers. But the people and Shopkeepers are violating rules and park their own cars on the road which creates problems for smooth traffic. Most of the vendors have occupied roads and footpaths. The footpaths meant for pedestrians have been occupied by vendors creating traffic chaos in the Srinagar.

The main objective of the study was to propose a new framework for the roads of Srinagar and Pulwama where the users belong to various user classes depending on the network dynamics and to investigate the performance of the proposed traffic management strategy under varying information, incident and congestion attribute levels.

II. METHODOLOGY

A. Traffic Volume count

The most important data are generated through the modern survey techniques like traffic volume count at different links. Knowledge of the vehicular volume using a road network is important for understanding the efficiency at which the system works at the present and the general quality of service offered to the road users. Knowing the flow characteristics one can easily determine whether a particular section of the road is handling traffic much above or below its capacity. If the traffic is heavy, the road suffers from congestion with consequent loss in journey speed [6].

The traffic volume survey is carried out for twelve hour (8:00 to 20:00) on working days at eight links such as TRC fountain to ME lodgings guesthouse on Abdullah bridge, Imambara Pandrethan to petrol pump (Pantha chowk) on Srinagar- Ladakh Highway, Airport (IG) Rd crossing (jehangir chowk) to Mominabad Rd crossing on Qamarwari- Batamaloo Rd, TRC fountain to M.A. residency link Rd on Residency Rd, HDFC bank ATM to Jhelum market (Batamaloo) on Qamarwari- Batamaloo Rd, Murran Chowk to Pinglena, Pulwama Main Chowk to Awantipora, Main Chowk Pulwama to Guest house. By analyzing the twelve hours traffic volumes, the period of peak flow are assessed. The traffic volume is expressed car unit per hour (PCU/h).

B. Capacity

Traffic flow capacity of those roads was calculated and expressed as PCU/h according to Indian Roads Congress (IRC) and highway capacity manual. These theoretical traffic volumes are compared with the actual traffic volume and the ratio of volume to capacity is assessed

C. Carriageway width, Link Length

Carriageway width and link measured all the five road stretches and expressed in meter.

D. Vehicle Occupancy

Vehicle occupancy obtained by manual observation technique and the recording of how many occupants within a vehicle. Vehicle categorized in to five major travel modes such as car (jeep, van, taxi), Bus (mini bus, full bus), Truck, 3- wheeler (auto rickshaw), Two wheeler (motorcycle, scooter), The survey carried out at all five links such as TRC fountain to ME loadings guesthouse, Imambara Pandrethan to petrol pump (Pantha Chowk), Airport (IG) Rd crossing (Jehangir chowk) to Mominabad Rd crossing, TRC fountain to M.A. residency link Rd, HDFC bank ATM to Jhelum market (Batamaloo). Vehicle occupancy rate is the number of passengers in a vehicle during a trip. This rate is expressed as the number of person per vehicle.

E. Average Vehicle Speed

Speed is one of the most important characteristics of traffic and its measurement is a frequent necessity in traffic engineering studies. The average speed observed at all the five link road stretches and vehicle are categorized in to a five major travel modes such as car (jeep, van, taxi), Bus (mini bus, full bus), Truck, 3-wheeler (auto rickshaw), Two wheeler (motorcycle, scooter). The average speed of vehicles represents space – means speed in a certain road length at any time. This is obtained from the observed travel time of all the vehicles over a stretch of the road.

Space – means is calculated from the relation

$$V_S = \text{No of Vehicles / Inverse of vehicle speed}$$

Where

V_S = space - means speed, Kmph

F. Roadway Congestion Index

The Roadway Congestion Index (RCI) is selected to quantify for five study links. Traffic congestion impacts can be measured based on roadway volume to capacity ratios (V/C). A V/C less than 0.85 is considered at capacity, and over 1.0 is considered over capacity. RCI can be calculated by the following equation:

$$R=\frac{\sum((VOLUMEPERVEHICLE \div LINKCAPACITY)\times(VOLUMEPERPEAK \div LINKLENGTH))}{\sum(VEHICLEPERPEAKHOUR \times LINKLENGTH)}$$

Here the RCI stands as the average of volume capacity ratio.

G. Peak hour factor and Design flow rate

PHF and the actual (design) flow rate measured for five study links. The peak hour traffic volume in evaluating capacity and other parameter because it represents the most critical time period. And as any motorist who travels during the morning or evening rush hour knows, it is the period during which traffic volume is at its highest. Peak hour factor (PHF) as shown in the following equation:

$$PHF = \frac{HOURVOLVUME}{PEAKRATE\ OF\ FLOW\ WITHIN\ ONE\ HOUR}$$

For 15 minute periods, the PHF is computed as:

$$PHF = \frac{V}{4 \times V15}$$

Where V= Peak hour volume (vph)

V_{15} = Volume during the peak 15 minutes of flow (veh /15 minutes)

The actual (Design) flow rate can be calculated by dividing the peak hour volume by the PHF, the actual (design) flow rate is expressed as the passenger's car unit per hour.

III. RESULTS

Table 1: Traffic volume data count for link TRC Fountain to ME lodgings guest house.

Time/ Vehicle type	8 am to 9 am	9 am to 10 am	10 am to 11 am	11 am to 12 pm	12 pm to 1 pm	1 pm to 2 pm	2 pm to 3 pm	3 pm to 4 pm	4 pm to 5 pm	5 pm to 6 pm	6 pm to 7 pm	7 pm to 8 pm
Trucks	44	16	35	14	16	14	10	9	8	9	28	19
Mini buses	130	148	198	101	98	102	70	64	74	75	59	43
Large buses	103	42	56	8	16	38	54	52	28	28	32	14
Car, jeep van taxi	1380	1690	1765	1540	1761	1895	1990	2199	2360	2360	2051	1482
3 wheeler, auto rickshaw	382	360	440	555	562	468	571	573	463	463	379	336
Motorcycle, Scooter	605	862	916	900	924	909	998	960	1045	1045	G881	518
Cycle	58	66	76	35	37	28	37	44	51	51	58	42
Total PCU/H	2729.5	2910	3271	2780	3046.5	3140	3375.5	3553	3590	3594.5	3168	2261

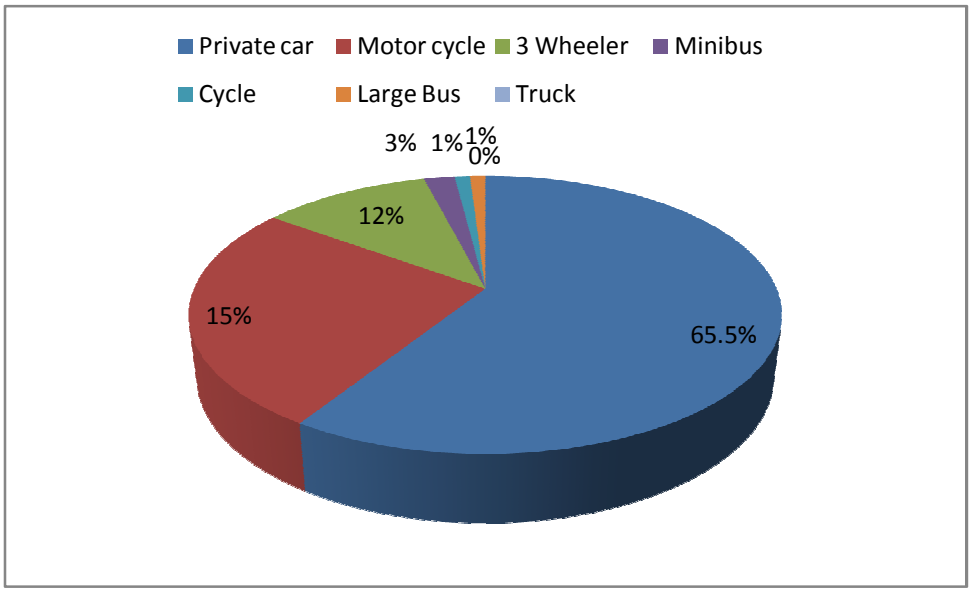

Fig. 1. Composition of Vehicles at the link TRC fountain to ME lodgings guest house.

Table 2: Traffic volume data count for link Imambara Pandrethan to petrol pump Pantha Chowk

Time/vehicle type	**8 am to 9 am**	**9 am to 10 am**	**10 am to 11 am**	**11 am to 12 pm**	**12 pm to 1 pm**	**1 pm to 2 pm**	**2 pm to 3 pm**	**3 pm to 4 pm**	**4 pm to 5 pm**	**5 pm to 6 pm**	**6 pm to 7 pm**	**7 pm to 8 pm**
Trucks	216	211	269	209	264	180	221	222	200	168	146	97
Mini buses	99	63	59	51	36	40	52	51	63	64	36	36
Large buses	21	24	24	11	19	12	65	65	99	50	6	3
Car, jeep ,van taxi	1092	1385	610	1222	1090	1178	1074	1073	745	822	1152	650
3 wheeler , auto rickshaw	73	101	109	84	102	99	104	104	112	125	96	82
Motorcycle, Scooter	248	439	318	232	262	238	286	285	336	300	332	257
Cycle	16	20	8	-	4	8	12	10	10	7	19	11
Total PCU/H	2156.5	2542	1849.5	2158.5	2228	2236	2263	2262	2021.5	1850.5	1928.5	1220

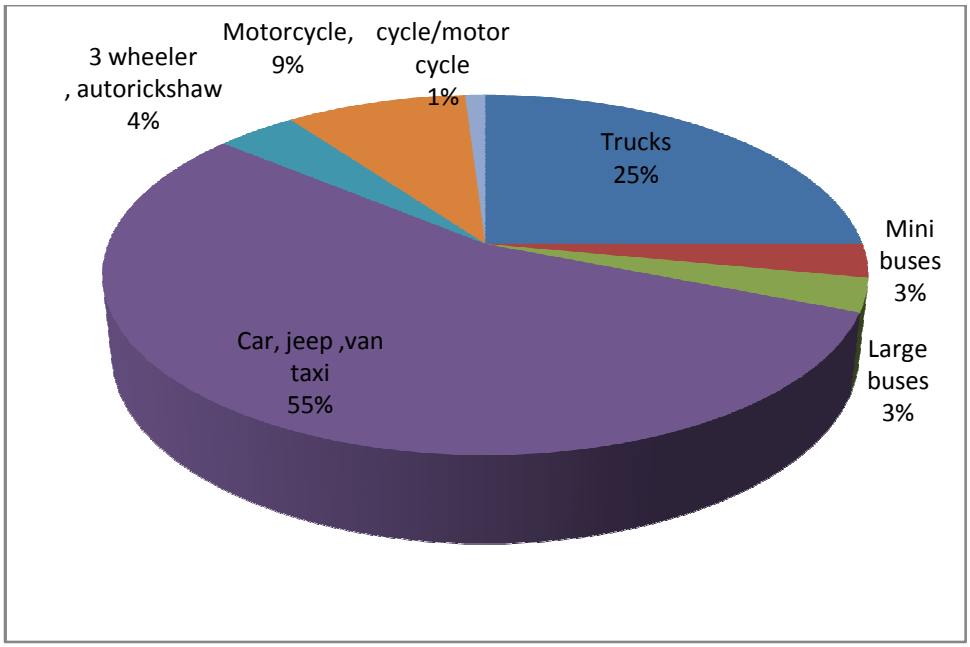

Fig. 2. Composition of vehicles for link Imambara Pandrethan to Petrol Pump (Pantha Chowk).

Table 3: Traffic Volume Data Count for Link Airport (IG) Road Crossing (Jehangir Chowk) to Mominabad Road Crossing.

Time/vehicle type	8 am to 9 am	9 am to 10 am	10 am to 11 am	11 am to 12 pm	12 pm to 1 pm	1 pm to 2 pm	2 pm to 3 pm	3 pm to 4 pm	4 pm to 5 pm	5 pm to 6 pm	6 pm to 7 pm	7 pm to 8 pm
Trucks	-	6	6	3	4	3	4	3	3	4	3	3
Mini Buses	132	184	166	156	140	114	116	113	116	110	86	55
Large Buses	18	21	4	4	3	4	4	8	5	6	3	3
Car, Jeep ,Van Taxi	376	680	560	558	562	576	560	625	674	606	530	372
3 Wheeler , Auto rickshaw	164	309	251	321	328	350	350	367	300	326	260	210
Motorcycle, Scooter	120	323	260	280	278	324	287	382	352	311	356	252
Cycle	28	33	28	12	17	18	12	19	25	24	20	34
Total PCU/H	**886**	**1524**	**1234**	**1277**	**1265.5**	**1289**	**1257.5**	**1395**	**1360.5**	**1288**	**1125**	**813.5**

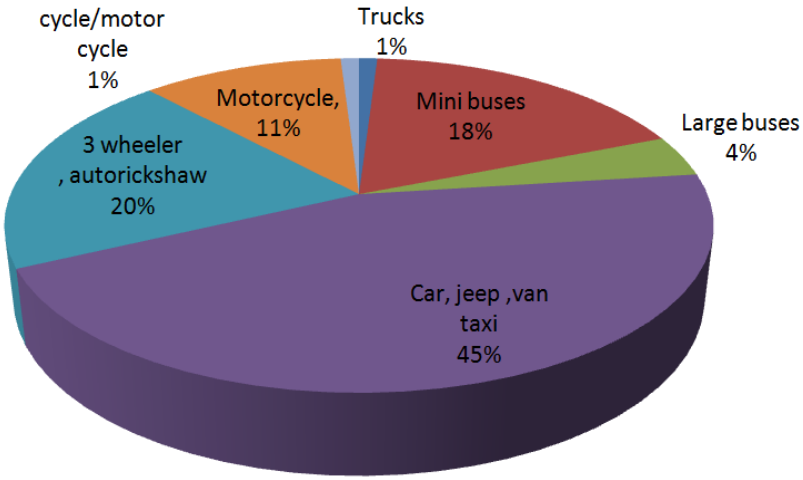

Fig. 3. Vehicle composition for link airport (IG) road crossing Jahangir chowk to Mominabad road crossing.

Table 4: Traffic volume data count for link TRC fountain to M.A Residency link road

Time/vehicle type	**8 am to 9 am**	**9 am to 10 am**	**10 am to 11 am**	**11 am to 12 pm**	**12 pm to 1 pm**	**1 pm to 2 pm**	**2 pm to 3 pm**	**3 pm to 4 pm**	**4 pm to 5 pm**	**5 pm to 6 pm**	**6 pm to 7 pm**	**7 pm to 8 pm**
Trucks	7	8	4	12	14	6	4	2	6	5	2	-
Mini buses	99	212	76	99	88	95	80	76	45	30	29	19
Large buses	9	9	5	-	3	-	2	-	-	-	2	-
Car, jeep, van taxi	370	910	984	965	900	845	880	865	875	892	715	462
3 wheeler, auto rickshaw	99	193	240	298	290	300	286	232	270	252	180	90
Motorcycle, Scooter	200	448	555	706	625	621	760	750	565	602	425	300
Cycle	15	30	38	28	33	23	16	21	14	21	18	8
Animal drawn vehicle												
Total PCU/H	773	1711	1161.5	1806.5	1702	1627.5	1692	1602.5	1520	1515.5	1172	734.5

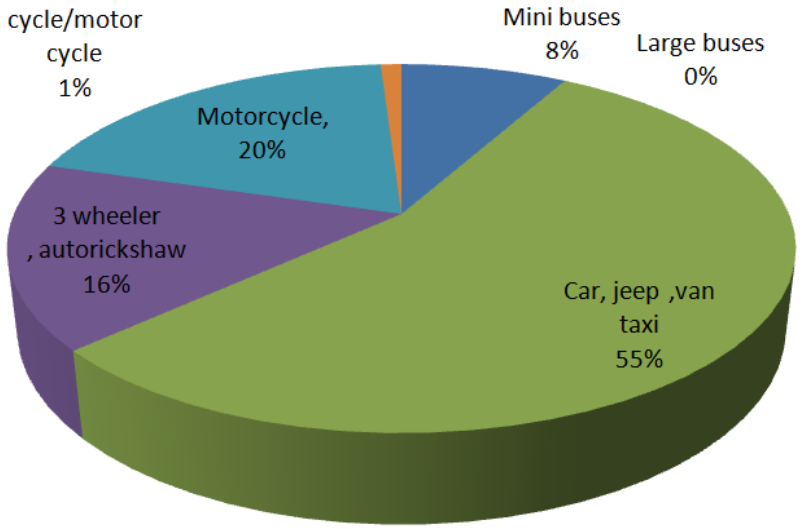

Fig. 4. Composition of vehicles for link TRC fountain to M.A residency link road.

Table 5: Peak hour volume data, average vehicle speed and average vehicle occupancy for link HDFC to Jhelum Market.

Time/vehicle type	**8 am to 9 am**	**9 am to 10 am**	**10 am to 11 am**	**11 am to 12 pm**	**12 pm to 1 pm**	**1 pm to 2 pm**	**2 pm to 3 pm**	**3 pm to 4 pm**	**4 pm to 5 pm**	**5 pm to 6 pm**	**6 pm to 7 pm**	**7 pm to 8 pm**
Trucks	9	8	5	6	5	7	4	3	7	3	2	1
Mini buses	77	92	61	69	60	64	58	59	71	82	84	21
Large buses	5	24	11	12	11	10	13	9	8	15	4	3
Car, jeep, van taxi	620	1100	1070	961	711	701	630	591	693	714	558	442
3 wheeler, auto rickshaw	242	363	260	203	208	241	245	229	203	234	106	62
Motorcycle, Scooter	373	596	492	466	440	460	412	373	360	470	252	160
Cycle	42	40	19	14	20	24	22	28	24	30	30	10
Total PCU/H	1227	2015	1725	1562.5	1487	1331.5	1230	1145	1239.5	1375	872	482.5

Table 6: Traffic Volume Data Count for Link Rajpora Chowk To Guest House Pulwama.

Time/ Vehicle type	**8 am to 9 am**	**9 am to 10 am**	**10am to 11 am**	**11am to 12 pm**	**12 pm to1 pm**	**1 pm to 2 pm**	**2 pm to 3 pm**	**3 pm to 4 pm**	**4 pm to 5 pm**	**5 pm to 6 pm**	**6 pm to 7 pm**	**7 pm to 8 pm**
Trucks	40	12	28	10	8	8	6	5	6	6	18	14
Mini buses	110	653	160	80	72	80	50	40	56	55	35	23
Large buses	101	38	44	6	8	24	54	30	20	20	22	9
Car, jeep van taxi	915	1220	1220	1000	815	875	925	828	920	700	800	830
3 wheeler , autorickshaw	220	280	320	320	362	310	430	320	323	315	280	299
Motorcycle, Scooter	420	680	720	700	682	625	675	620	698	588	675	480
Cycle	48	44	66	28	25	16	22	32	32	30	32	32
Total PCU/H	1957	1893.5	2389	1852	1686.5	1721.5	1958	1639	1770	1484.5	1606	1485

Table 7: Traffic Volume Data Count For Murran Chowk To BED College Pinglena.

Time/vehicle type	**8 am to 9 am**	**9 am to 10 am**	**10 am to 11 am**	**11 am to 12 pm**	**12 pm to 1 pm**	**1 pm to 2 pm**	**2 pm to 3 pm**	**3 pm to 4 pm**	**4 pm to 5 pm**	**5 pm to 6 pm**	**6 pm to 7 pm**	**7 pm to 8 pm**
Trucks	200	180	220	209	264	180	215	222	200	168	146	97
Mini buses	70	54	59	50	36	30	52	51	63	64	36	36
Large buses	21	22	24	11	19	12	45	65	99	50	6	3
Car, jeep, van taxi	800	900	500	800	700	800	920	840	745	822	912	650
3 wheeler, auto rickshaw	53	101	109	84	102	99	104	104	112	125	96	82
Motorcycle, Scooter	248	310	318	232	262	238	281	285	336	300	332	257
Cycle	10	20	6	-	4	8	10	8	9	6	15	8
Total PCU/H	1750	1853	1591.5	1735	1838	1443	2042.5	2028	2021	1850	1691	1218.5

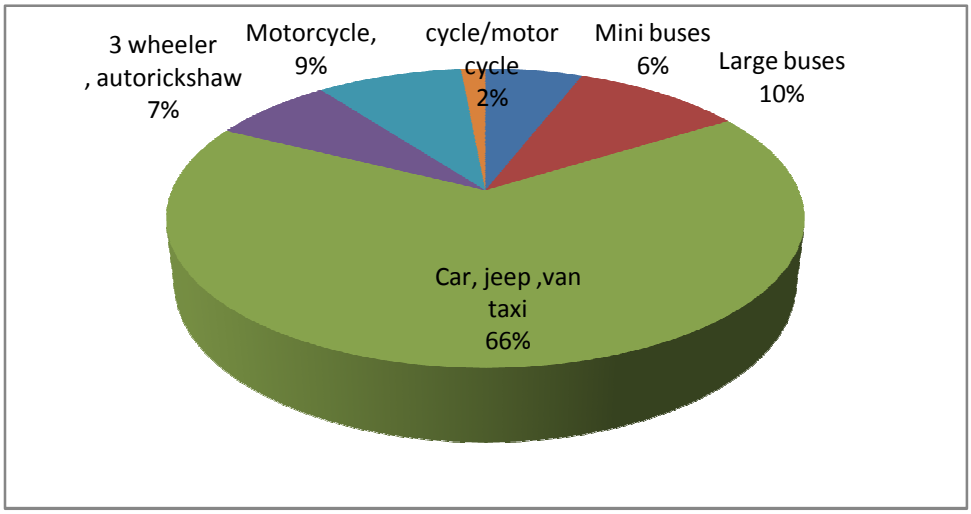

Fig. 5. Vehicle composition for link Murran Chowk.BED College to Pinglena.

Table 8: Traffic Volume Data Count for Link Pulwama Chowk To Awantipora Road.

Time/vehicle type	**8 am to 9 am**	**9 am to 10 am**	**10 am to 11 am**	**11 am to 12 pm**	**12 pm to 1 pm**	**1 pm to 2 pm**	**2 pm to 3 pm**	**3 pm to 4 pm**	**4 pm to 5 pm**	**5 pm to 6 pm**	**6 pm to 7 pm**	**7 pm to 8 pm**
Trucks	7	8	4	12	14	6	4	2	6	5	2	-
Mini buses	60	80	76	99	88	95	80	76	45	30	29	19
Large buses	9	9	5	-	3	-	2	-	-	-	2	-
Car, jeep, van taxi	280	280	484	665	700	445	580	665	675	592	615	462
3 wheeler, autorickshaw	70	160	240	298	290	300	286	232	270	252	180	90
Motorcycle, Scooter	180	180	255	406	525	621	760	650	565	602	425	300
Cycle	8	20	25	24	33	23	16	21	14	21	18	8
Animal drawn vehicle												
Total PCU/H	5824	711	1005	1362.5	1452	1227.5	1392	1352.5	1320	1215.5	1072	734.5

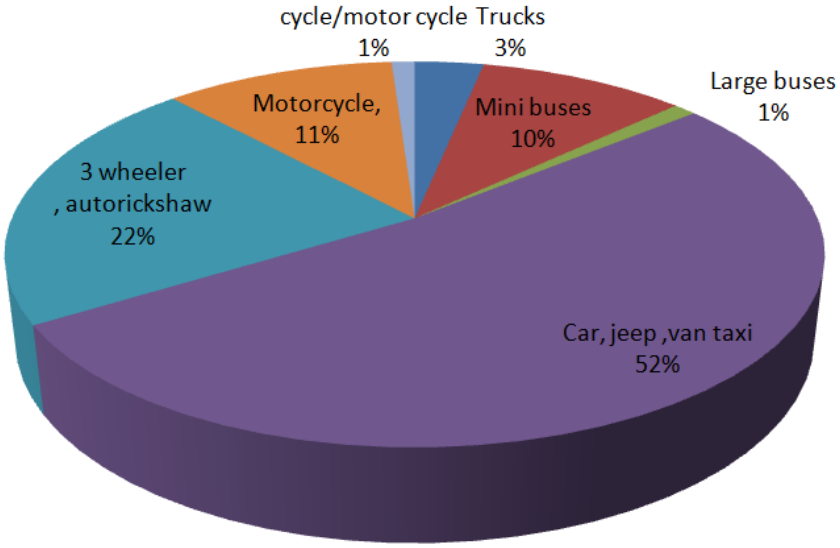

Fig. 6. Vehicle Occupancy for Link Awantipora Road to Pulwama Chowk.

Table 9: Traffic volume data count for link Payer to Pulwama Chowk.

Time/vehicle type	8 am to 9 am	9 am to 10 am	10 am to 11 am	11 am to 12 pm	12 pm to 1 pm	1 pm to 2 pm	2 pm to 3 pm	3 pm to 4 pm	4 pm to 5 pm	5 pm to 6 pm	6 pm to 7 pm	7 pm to 8 pm
Trucks	9	8	6	6	6	5	4	4	7	5	2	2
Mini buses	80	94	65	72	65	63	62	62	73	86	36	26
Large buses	5	26	12	14	12	11	16	12	10	16	8	4
Car, jeep, van taxi	626	1100	1078	965	912	702	632	596	696	718	565	450
3 wheeler, autorickshaw	248	366	265	206	212	245	247	232	206	240	110	64
Motorcycle, Scooter	380	600	500	470	414	465	412	378	365	472	256	165
Cycle	46	45	16	16	26	24	26	30	28	35	32	16
Animal drawn vehicle				3		2						
Total PCU/H	1394	2239	1942	7494	1647	1517	1399	1314	1385	1572	1009	727

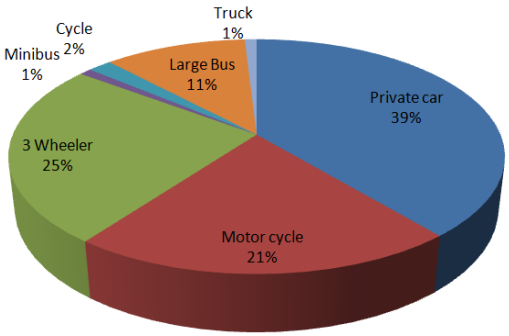

Fig. 7. Vehicle composition for link Traffic volume data count for link Payer to Pulwama Chowk.

Table 10: Computing RCI, Avg. vehicle speed, PHP, delay and LOS in 5 links of study area.

Link name	Carriage way width (m)	Link length (km)	Volume(v) of vehicles (no's)	Volume in PCU (Vpcu)	Capacity (c) Of carriage way	Road way congestion index	Avg. vehicle speed (Kmph)	Peak hour factor(PHP)	Actual(design) flow rate (pcu/hr)	Congestion delay (minute)	Intensity (delay in person hours)	Level of service (LOS)	Level of service(LOS)as per avg.speed.
TRC to ME Guest House	8.9	0.5	3800	3594.5	1776	2.02	9.7	0.96	3744	2.59	407	E	F
Imam Bara to Pantha Chowk	10.8	1	2600	2517	2517	1	18.6	0.95	2694	2.32	342	D	E
Airport to Mominabad	8.7	1	1620	1524	1524	1	6.7	0.8	1731	7.99	929	E	F
TRC to MA Road	10.6	1.1	1990	1852.5	2037	0.90	8.13	0.93	1991	685	773	E	F
Rajpora to Guest House Pulwama	7.5	1	2200	2389	2389	1	7.9	0.92	2596	6.5	845	F	F
Murran Chowk to Pinglena Bed College	8	0.5	2735	2042.5	1021.5	1.9	11.3	0.72	2723	2.35	242	C	F
Pulwama to Awantipora	8.5	1.2	1625	1452	1742.4	0.84	8.5	0.91	1596	7.27	704	E	F
HDFC to Jhelum Market	8	0.9	2115	2015	1813	1.1	7.48	0.94	2143	6.31	694	F	F

IV. DISCUSSIONS

The volumes were counted at 8 links for 12 hours morning 8.00 am to evening 8.00 pm and compared with the capacity of those links. Table 4.7 represents the peak hour volume in the day both form volume in terms of number of vehicles and volume in PCU/hour and volume/capacity ratio at different links. The highest traffic volume was found in TRC fountain to ME lodgings guesthouse link (3594 PCU/h). However the highest volume/capacity ratio was observed as same link TRC fountain to ME lodgings guest house link 2.1 where as the lowest one was observed as 0.72 in Murran Chowk to B.ED college Pinglena link road. At 4 links, the major portion of vehicle was private vehicle which was followed by motorcycle, scooter, 3--wheeler, autorickshaw, minibus, cycle, large bus, truck. At one link Imambara Pandrethan to petrol pump (Panthachowk) situation is different here the highest amount of vehicle at link was observed as private car (62%), which was followed by motor cycle ,scooter (20%), truck (9%), 3 wheeler , autorickshaw (4%), minibus (3%), large bus (1%), cycle (1%). the highest speed of vehicles was observed 22.12Kmph at link Imambara Pandrethan to petrol pump (Panthachowk) where as the lowest was observed as 5.63 Kmph at link airport road crossing (Jehangir chowk) to Mominabad Rd crossing at same link congestion delay was 7.99 minute and 929 person hours delayed in 1 km stretch . The case study road lack parking bay and thus parking vehicles inhibits the free flow of traffic. The case study road operates under level of service F (in most time) which is generally unacceptable and level of service E during low traffic period.

Bottleneck road charge means charging to vehicles which run on the bottleneck road by setting toll station at the main street intersection. The theory of this method is the bottleneck model of path charge system Vickery proposed in 1969 year, which pointed out that traffic congestion just likes redundancy line of the bottleneck place. Collecting charge instead of losing time caused by congestion may result in transportation flow divergence and eliminate queuing phenomenon. But this method has not solved congestion problem from system angle. If it isn't deal with properly, new congestion will be produced. So it must be used carefully [7].

There are two methods to charge congestion fare: manual charge and electron charge. Manual charge is done as the following: First divide congestion area. Vehicles entering into this area at specific time have to buy region pass ahead in Srinagar. Law enforcement officials are equipped at the region entrance to record violating regulation information, and sends traffic ticket to the driver who violates regulation in two weeks in Srinagar. The investment of this method is few, but its efficiency is low in Srinagar. The phenomenon of escaping taxes and fees often occurs and there is only fixed charge pattern that can be chosen which can't reflect congestion degree in Srinagar.

Congestion charging is useful to enhance road efficiency, but looking from stationary state, it seems to take away the greater part of traveler's individual welfare. If government can't use the charge income reasonably, it will be opposed by public. Looking from the social justice angle, traffic jamming charge should not deprive of traveling right of low income earners, instead it should benefit all road users. Therefore, traffic congestion charging should return to road users directly or indirectly [8].

Urban road congestion in Srinagar and Pulwama charge is a system engineer involving government, public and industrial benefit. Charge plan should include charge purpose, charge tariff, charge region as well as charge method. Each item should be made clear and scientific and in accordance with the local transportation condition and financial situation.

V. CONCLUSIONS

- Traffic congestion takes place on the roads, but it is not only, nor necessarily primarily, a traffic engineering problem in Srinagar and Pulwama.
- Most of the traffic congestion in Srinagar and Pulwama has been observed between morning hours (9:00 to 10:00 am) and evening hours (4:00 to 5:00 PM) i.e., during office hours.
- Congestion in Srinagar and Pulwama is due to poor policy or even transport policy failure,
- Congestion in Srinagar and Pulwama is also due to rapid economic development, employment, housing, cultural, etc. policies that make people want to live and work relatively close to major cities
- Some forms of congestion in Srinagar and Pulwama are the direct outcome of poor policy choices, inadequate transport planning and/or a lack of system management.
- Sets of indicators in Srinagar and Pulwama should be used to communicate both the extent and relative scale and evolution of congestion.
- A basic set of congestion indicators should communicate for the entire network or for specific network links: – a measure of travel time, – a measure of reliability/travel time predictability and, if possible, – some measure of traveller exposure to congestion.
- Effective congestion management policies in Srinagar and Pulwama should be based on a location and context specific diagnosis of the scale and scope of the congestion problem faced by an urban region.

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