Intelligent Transportation System, A Case Study of Anantnag City

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Abstract - **Mobility is a vital good in any modern society which is based on division of labour. However, daily increasing levels of congestion bring and enhance the importance of new technological developments, e.g., Intelligent Transportation Systems (ITS). The idea of such systems is to ensure the efficient utilisation of the available road capacity by controlling traffic operations and influencing driver's behaviour by providing him information. An example is Dynamic Route Guidance Systems, which helps the road user to navigate through the road network easily and more efficiently. Anantnag City being one of the busiest City Centres in Jammu and Kashmir has been facing considerable traffic problems due to congestion and overburdened scenario of traffic. The aim is to find suitable alternatives to get rid of the menace. Various Cities of India have already felt the need to implement these new techniques to lead for better development in the field of transportation. Currently, the traffic problem is often based on a lack of information regarding the routes. Of course when making travel choices, road users constantly combine various sources of information and expectations of traffic conditions, but they can hardly obtain data about the global situation. Thus, they have only a partial and inaccurate knowledge about the traffic conditions in the network and it is not possible for them to coordinate their behaviour with the others, e.g., change their departure time to relax the situation. Additionally, the most useful information to a driver is predictive information. Since, Intelligent Transportation System allows the road users to estimate the travel time of their trips and hence will provide real-time information about the current and future traffic state to the road users. The channels for data transfer used are radiobroadcast, in-vehicle devices and of course the Internet. Obviously, the idea is to remove jams and use the infrastructure more efficiently.**

keywords - **Intelligent Transport System, traffic congestion, Internet.**

[1] INTRODUCTION

The population boom and the economic developments have resulted in an enormous outburst in the automobile industry. The increase in the vehicular population in such a short time span has led to the necessity of developing an organisational setup for traffic users. The metropolitan cities and the other main cities have mostly faced many problems with the increase in traffic volume. The statics shows that cumulative growth of passenger vehicles in India during 2017-2018 was 12.7% and during this time span 9.6 million motorised vehicles were sold. This in itself shows the future trends and the burden that our cities will have to encounter in coming years. The complication is aided by the urbanization where a lot of population is migrating from rural areas to urban areas for better empowerment. Thus the heterogeneity of population inflow and the economic advancements complicate the transportation infrastructure. The losses already incurred have been assessed by World Bank, which says that in India a loss of $6 billion occurs in a year due to bad roads and congestion. The only solution is provided by making the system intelligent even though the problem is not resolved completely but at least we can minimise the loss. Intelligent transportation system includes the integration of vehicles, infrastructure and communication among all modes of transportation. Its use is not limited to only road transport, it visualises all the possible modes of transportation and embeds their use collectively.

Anantnag the administrative and business hub of Valley, with its urban agglomeration is the second largest city in the valley of Jammu and Kashmir. The convergence of roads from different districts to the city makes it a place of utmost importance in south Kashmir for development of economic importance. Urbanization of Greater Anantnag consists of Anantnag Muncipal Council, 20 out-growths; Bijbehara Town with 16 out-growth and Mattan town with 6 urban village settlements which are showing a consistent increase population accompanied with rapid growth in urban area. While Urban area is slowly increasing, but the centre of economic growth that is marketing area remains unchanged thus making it congested. Enormous commercial activities throughout the day take place along the main roads of the city. Offices , schools, hospitals, workshops, hotels, institutions and large number of shops also located in such a haphazard way that has created mess in the city. The effective area of Anantnag is very large than its administration periphery and the fact that the size of the floating population to the city is a s high as about 35.5% of the resident population. Some small urban centres close to Anantnag are Mattan, Bijbehara, Achabal,and Ashmuqaam. In terms of Population, facilities and economic activities all other urban local bodies are insignificant compared to Anantnag. The majorrole of Anantnag in the whole City is understandable. Anantnag now is likely to act as counter magnet to Srinagar.Pattern of travel and regulation requirements of the City are likely to increase in the upcoming years. Considering the vitality of traffic in Anantnag, traffic planning and regulation needs to commensurate with the growing travel demand and growth of vehicles. Thus to execute the above it becomes an utmost necessity to address various planning inputs like vehicular

ownership, traffic volume characteristics, parking characteristics, inventory of pre-existing roads, traffic capacity, space headway, future traffic patterns in a scientific manner.

[2] LITERATURE REVIEW

The traces of Intelligent Transportation system dates back to 1960 with the development of ERGS (Electronic Route guidance system) in the United States of America. It provided the users with route guidance information which was based on real time traffic analysis. A special hardware was used at various intersections along the route which communicated the driver with the ERGS system. A central computer system was provided that processed the information and acted as a mediator between the ERGS system and the drivers. In 1970 visual digital maps were introduced which led to the more sophisticated system known as ARCS (Automatic Route Control System) which connected various traffic signals and the centralized computer system for better traffic organisation.

During the same time CACS, Comprehensive Automobile Traffic Control System program was launched by Japan. They tried the route guidance system with an in vehicle display unit and electronic toll collection. Later Japan launched AMTICS and RACS projects for traffic management.

In 1970, German company Autofahrer and Leit Information System (ALI) also introduced the dynamic route guidance system based on real traffic conditions.

In London "Transport for London" produced digital map of all London's speed limits. Ring of Steel programme was launched which installed cameras on all important routes to monitor journey times and traffic flow.

[3] OBJECTIVES AND SCOPE OF THESIS

The principle goals of this work are:

- To check and implement concepts of Intelligent transportation System.
- To talk about potential advantages and disadvantages of providing features of Intelligent Transportation.
- To examine and assess the models of traffic systems.
- To build up a general specialist based traffic model, which is fit to incorporate the response of drivers to data.
- To study and model the route adopted by the driver at different times.
- To check and discuss various methods of traffic forecasting methods and check their validity oractically.

ITS has had various opinions among experts, some believe it has a scope in integration of the various components only when they are incorporated firmly and completely and some have suggested its scope in the future according to the changing scenario of the transportation systems. ITS includes exhibition of data and information relying on the necessity of the execution topic, and at the same time incorporating these segments combined to form a reliable structure of information. ITS depends on wide scope of innovations, like GPS, GIS, Data Collection, Trade , Arial Vision, Detection and grouping, In-vehicle frameworks and Digitalized Maps. In this paper we will examine the capability of these transportation advances for supportability of condition and different application fields.

[4] RESULTS AND OBSERVATIONS

The total length of the roads in Anantnag City is 128.36 KM. The road density is 0.67/1000 population and besides 110.60 square hectares of surface area is covered under roads.

STATISTICS OF ROAD CLASSIFICATION OF THE CITY (FUNCTIONAL CLASSIFICATION)

Serial Number	Road class	Road Length	%age
1	Arterial Road	16.84 KM	13.12
2	Sub-Arterial Road	21.40 KM	16.67
3	Collector Streets	58.12 KM	45.28
4	Local Streets	32.00 KM	24.93
	Total	**128.36 KM**	**100**

Arterial roads contribute only 13.12 % of the total road length of the city while sub arterial roads have a share of 16.67% which is insignificant as compared to the other two systems. The maximum part is covered by the Collector Streets which has become a headache for the road users. The distribution according to the functional classification is given as

Table 1: Functional classification of roads in Anantnag

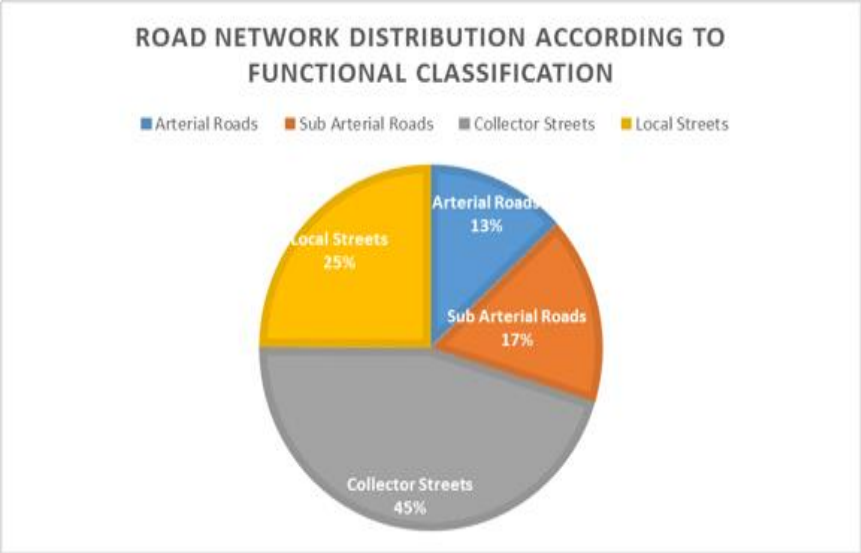

Figure 5.1 Road network distribution of Anantnag (according to function)

CARRIAGEWAY WIDTH

About 78.45% of the roads in Anantnag City have single lane carriage way, 7.56% roads have two lanes, 6.26% have three lanes and 7.73 % have four lanes. The distribution is shown as under.

Table 2: Road network distribution of Anantnag (according to carriageway width)

Serial Number	Carriageway Width	Length (in KM)	%age
1	One Lane	100.70	78.45
2	Two Lane	9.71	7.56
3	Three Lane	8.04	6.26
4	Four Lane	9.91	7.73
TOTAL			**100.00**

Table 3: Distribution of Traffic in Anantnag

Serial Number	Name of Road	Incoming Traffic/day	Out-going Traffic/day
1.	Anantnag – Srinagar	5350	6540
2.	Anantnag- Jammu	4774	4428
3.	Anantnag – Pahalgam	3100	2158
4.	Anantnag – Achabal	4320	3816
5.	Anantnag- Verinag	2780	2920
6.	Anantnag – Kulgam	2400	4355
7.	Bijbehara – Saller	538	625
8.	Bijibehara – Arawani	615	790

Table 4: MVD statistics of Vehicles of Anantnag City up to March 2018

Busses	Mini Busses	Trucks	Taxis	3-Wheelers	Cars	Jeeps	2-Wheelers	Others	**Total**
202	1175	8361	5963	2977	24148	152	26581	2373	**71932**

Table 5: Parking accumulation on various roads in Anantnag

Serial Number	Name of Road	Equivalent car spacing
1.	DC Office - Janglat Mandi	523 ECS
2.	Mehndi Kadal- Mattan Adda	410 ECS
3.	Mehndi Kadal- Khannabal Bridge	310 ECS
4.	Khannabal Chowk – Bus Stand	294 ECS

Table 6: Pedestrian Traffic at important junctions in Anantnag

Junction	Pedestrian Traffic 9:30 am to 11:30 am	Pedestrian Traffic 3:30 pm to 5:30 pm
Lal chowk	6725	6810
Mehandi Kadal Chowk	5900	5840
Khanabal Chowk	4820	4735
Janglat Mandi Chowk	4150	4086
Bus Stand (KP Road)	3940	3790

CONCLUSION AND SCOPE FOR FUTURE WORK

The increasing population in Anantnag City aided by economic development has clearly put a burden on the existing road network in the City. The classifications made in the thesis put forth the current scenario of the traffic in the city. The data can be analysed and thereby modern techniques of intelligent transport can be implemented. The adoption of Location and information based technologies into vehicles, infrastructure, traffic management and traveller information services can show a lot of improvement in safety and efficient mobility of people and freight. The decision makers and key planners have to analyse the situation and understand the full potential of Intelligent Transportation System.

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