Investigation of Roadside Friction Effects on Suburban Road Links

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Abstract- *Side friction factors are described as any actions pertaining to the activities happening on the roadsides, but also within the road, which impede the traffic flow on the driven path. To do this work, empirical methodology for case study was used in Airoli, New Mumbai in India. The scope was on two-lane two-way suburban road links. Videography and manual processes for collection of data, MS-Excel for analysis of data collected and the method of analysis was by Linear Regression as the statistical method. These findings should be used to develop management programmes aimed at reducing side friction on high-mobility suburb lanes in order to boost traffic safety and efficiency, as per the study.*

Keywords- side friction, suburban, roadside, linear regression

I. INTRODUCTION

The urban transit system is the main driver of economic activity in all-urban areas throughout the world, and as a result, it insures the sustenance of the people who live there. Railways, rivers, planes, and roadways are all common modes of urban transportation. The majority of planning and study has logically relied on the road system. In essence, the road transportation system is a crucial performer in most metropolitan areas' economic activity. Many cities have witnessed a tremendous rise in road traffic and transportation demand in recent years, resulting in a reduction of capacity and inefficient traffic system performance. It was often assumed that the only way to fix the capacity problem was to simply give additional road space. Throughout the years, a far broader audience, including experts such as environmentalists, has been required (i.e. air quality and noise experts). These processes, on the other hand, were designed for the normal conditions prevalent in developed countries, where transportation is more uniform and regulated. As a result, they are unable to be properly implemented under traffic circumstances that are notably different from those seen in most developing nations. In Airoli, for example, side friction causes a significant amount of traffic flow disruption, and the number of sources of friction is likewise enormous. As a result, traffic flow is significantly disrupted, lowering traffic operations performance and jeopardizing the road's capacity and functional integrity.

II. IDENTIFYING THE VARIABLES

Its purpose was to identify factors that would be included in the study in order to meet the predetermined goals. Average speed, capacity, free-flow speed, flow rates, flow composition, and side friction were identified as these factors. Vehicles halting and occasionally parking on the side of the travelled route, non-motorized vehicles on shoulders and sometimes sharing the roadway, and pedestrian and bicycle flows on the highway or on shoulders were recognized as key frictional factors. The geometric and environmental conditions were identified in their various ranges. These factors included road kinds, location inside the city, weather conditions, and study hours.

III. DATA COLLECTION AND DATA REDUCTION

A long-based video approach with synchronized video cameras at either end was proposed as the comprehensive way for collecting speed and flow data. Individual cars were visually matched in neighboring displays in the lab, allowing the journey time and vehicle type to be determined. Manual observation in the field was used to collect friction data.

In terms of data reduction, the raw data was inspected for mistakes and outliers before being summarised in the format required for the study. This entailed converting data like passing times into journey times and then speed in order to check for any inaccuracies or anomalies.

IV. ANALYSIS

The two main methods of analyzing impact by individual friction factors on free flow speed. These methods are ‘average speed method’ and the ‘spot speed method’. The average speed method applied average speed of ‘free-flow vehicles’ through a studied segment whereby two types of data sets were obtained. The impact was identified analytically by comparing average speeds of the two speed data sets and it

was demonstrated graphically by comparing linear models of each data set.

V. CONCLUSION

The attributes of the various side friction components discovered in this study can also help transportation planners in developing nations where friction is an issue by influencing their planning and traffic operations strategies. This variable should be included in highway capacity analyses, particularly in developing countries, but in a form that is appropriate for their specific conditions.

VI. FUTURE SCOPE

This study was majorly based on macroscopic scale. Further study on the microscopic scale, where simulation models may be developed and evaluated, is advised for high accuracy findings. This is offered with the awareness that no simulation models have been established to account for friction considerations at this time. Simulation's application will be viewed as a game-changer in this industry.

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