

# Statistical Analysis of “CBD Bottleneck” Traffic Formation

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**Abstract**— Transportation is the backbone for any country. Efficient transportation plays a wide role in economy of any developing country like India. Especially in CBD areas of cities are facing the problems of traffic congestion. It is very important to study about the CBD traffic for the future planning. A statistical and modern approach to solve various traffic flow parameters (types of vehicles, flows, density, speed, friction) has been described in this report. A statistical analysis of queuing has been conducted on traffic flow data on ward area in Vadodara. Central Business District (CBD) are indisputable areas of traffic attraction occasioned by the growing population concentration, rapid urbanization and increasing commercial and economical activities. In this report, for reducing the traffic congestion, it has been tried to analyses the traffic behavior at locations where bottleneck traffic occurs. The data which is obtained by observing traffic flow in peak hours and non-peak hours were analyzed. The survey conducted on four locations and varying time periods.

**Key words:** Traffic, Bottleneck, Congestion, Queuing, CBD

## I. INTRODUCTION

A critical point of traffic congestion suspected by queues upstream and free flowing traffic downstream in ward area, is known as bottleneck. This paper work on the four gates in vadodara CBD area in 2015. To describe the congestion of bottleneck traffic at that area to try to control a traffic in CBD area to conduct timely peak & non-peak hours. The data calculation & analysis of vehicles passing at the junction in particular time period.

## II. SCOPE OF STUDY

A statistical analysis of queuing has been conducted on traffic flow data on ward area or CBD area, in Vadodara. In vadodara city areas of traffic attraction occasioned by the growing population, rapid urbanization and increasing commercial and economical activities, so we can try to solve this bottleneck traffic in ward area.

## III. OBJECTIVES

To provide safe reliable & comfortable public transport to all citizens, to improve level of service of transportation, to reduce air & noise pollutions, to reduce traffic accident injuries & deaths, to provide max personal mobility, to improve urban traffic management, to improve economic efficiency of transportation .To improve traffic safety, to reduce fuel consumption.

## IV. ENVIRONMENT AND SITUATION

1) Accidents. 2) Heavy vehicles passes through narrow roads. 3) On road parking by rickshaws, two wheelers, cars, etc. 4) Narrowing of roads because of gates. 5) Vendors sitting on road

## V. DESCRIPTION OF DATA COLLECTION

Site selection where bottleneck situation is frequently developed. Selection of suitable time for data collection. Recording videos of traffic congestion at morning and evening time. Analysis of the data collected of three Hrs. Taking distance of 60 meters. Graph plotting of analyzed data for better understanding. The data are collected on the following four gates around Mandvi - Lehipura Gate, Champaner Gate, Pani Gate, Gendi Gate.

## VI. ANALYSIS OF DATA

From the analysis of data by line marking method and videography method, the graphs are plotted according to the data analysed. The graphs shows the number of vehicles passing through a certain cross section in 3 hours.

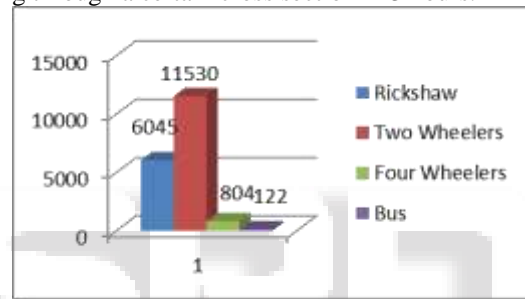


Fig. 1: Lehipura gate

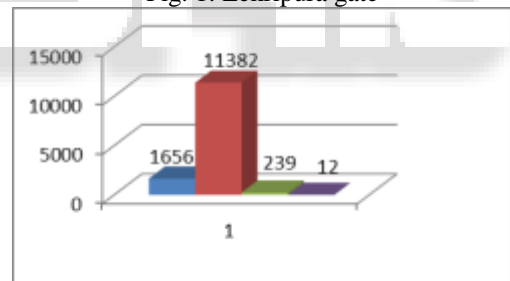


Fig. 2: Pani Gate

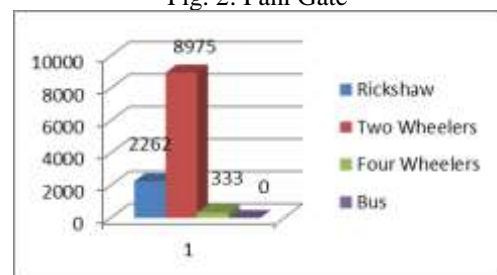


Fig. 3: Gendi Gate

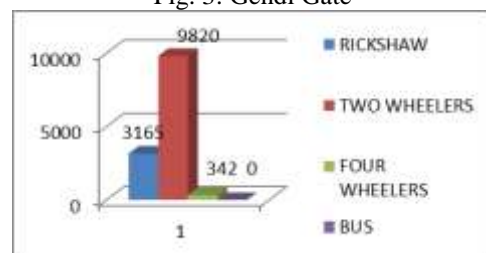


Fig. 4: Champaner Gate

## VII. POSSIBLE SOLUTIONS

A strict law should be implemented for the unwanted parking of vehicles on road and heavy penalty should be taken. We can allow restriction of cars and heavy vehicles on weekends. Removing hawkers and vendors from road and providing a different space for them from as they occupy much space of the pedestrians and the space on road also. Per hour parking rents should be collect by government authority. Provide cameras; so it's helpful for traffic management (safety, traffic control, fine). The traffic signals and signs should be provided. By adopting above solution we assure that it's create homogeneous traffic & reduce air pollution.

## VIII. CONCLUSION

This data analysis traffic flow parameters (flow, density & speed) over various freeway section on CBD area. An algorithm is develop to balance flows on any free section ensuring flow conservation. This algorithm searches for the region of list error & then calibrates the other freeway section based on this least –error section to minimize by the calibration procedure. The location of active bottlenecks on the freeways based on statistical analysis & their correspondence to visual relationships between flow density & speed.

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