

STATISTICAL TECHNIQUES IN THE FIELD OF TRAFFIC ENGINEERING AND TRAFFIC RESEARCH

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1. Introduction

Although the use of mathematical statistics has not been very extensive in traffic engineering until fairly recently, there is coming to be a greater use of statistical methods and techniques in this field and especially in the field of traffic research. An attempt will be made in this paper to review briefly the types of statistical techniques that have been used as well as to indicate certain types of problems where such techniques will probably be of greater use in the future. It has not been possible to cover all of the available studies so that no claim is made of completeness. Many other studies of equal merit could have been used as illustrations of methods in place of those selected.

2. Traffic surveys—estimates of central tendency and sampling

Of first importance historically and also in the extent of general use is the use of statistical techniques in connection with traffic surveys. Here the important questions to be answered are: How can the best estimate of average daily traffic volume be obtained? How large a sample is necessary? How should the sample be selected to give the most accurate estimate for the least cost? Similar questions also apply to origin and destination, parking and other types of surveys. The problems involved are essentially those of obtaining the best estimate of central tendency and involve the general problem of obtaining an adequate and a representative sample.

Before the days of the automatic traffic counting devices cooperative surveys were carried on by various states and the Federal Bureau of Public Roads to investigate traffic on Federal aid highways. These involved the obtaining of counts of daily traffic at certain stations on these highways. Later as the attempt was made to apply traffic engineering methods to city traffic the need for more information at a smaller cost led to the development and use of what has come to be known as the "short count method" of making traffic surveys [16].

Although the method was proposed on a basis of logic and common sense rather than of statistical theory, it did represent an attempt to obtain a representative sample. It was noted from 24 hour counts, for instance, that "the percentage of total daily traffic occurring in any given hour is approximately constant at different points along the same route" and that "the total volume of traffic does not

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