DISTRIBUTION OF VEHICLE SPEEDS AND TRAVEL TIMES

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1. Summary

Data on speeds and travel times of motor vehicles are essential to traffic engineers responsible for design and operation of streets and highways. The usefulness of the data, however, is related to procedures followed in assembly and analysis.

This paper outlines different methods for analyzing distributions of vehicle speeds and travel times, investigates the relationship between speeds and travel times, sets forth applications to preliminary data, suggests which techniques of analysis are best suited to the requirements of the engineers, and points out the need of further study.

The Highway Research Board of the National Research Council is now organizing a Committee on Speed Characteristics to assemble and analyze data on motor vehicle speeds under different physical, traffic, and environmental conditions. This paper is intended as a preliminary study to assist the new Committee in its planning.

2. Definitions

Spot speed—A spot speed is the speed, in miles per hour, of a vehicle as it passes a given location on a street or highway.

Travel time—The total time required to traverse a given distance, including all traffic stops and delays.

Running time—The total time required to traverse a given distance, excluding the stopped time.

Over-all speed—The total distance traversed, divided by the total travel time, expressed in miles per hour.

Running speed—The total distance traversed, divided by the running time, expressed in miles per hour.

Design speed—The highest continuous speed at which individual vehicles can travel with safety upon a highway when weather conditions are favorable, traffic density is low, and the highway design features are the governing conditions.

10 *mph pace*—The 10 mph speed range containing the largest percentage of the vehicles, in a distribution of spot speeds at a location.

3. Variables

Spot speeds and travel times of motor vehicles may vary because of different *physical* factors (curvature, grade, sight distance, frequency of intersections, and