

TRAFFIC ENGINEERING

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Spot Speed Studies

- Speed is an important transportation consideration because it relates to safety, time, comfort, convenience, and economics.
- Spot speed studies are used to determine the speed distribution of a traffic stream at a specific location.
- The data gathered in spot speed studies are used to determine vehicle speed percentiles, which are useful in making many speed-related decisions.
- Spot speed study data have a number of safety applications, including the following:
 1. Evaluating proper speed limits.
 2. Establishing the limits of no-passing zones.
 3. Determining proper intersection sight distance.
 4. Determining proper passing sight distance.
 5. Determining proper stopping sight distance.
 6. Determining the proper placements of traffic control signs and markings.

Definitions :

Speed : the rate of movement of vehicle, generally expressed in miles per hour.

Average spot speed : the arithmetic mean of the speeds of all traffic.

Space mean speed (SMS) : this is the speed corresponding to the average travel time over a given distance.

$$\text{Space mean speed (SMS)} = n * \frac{\text{distance}}{\sum t}$$

where:

n : No. of test run.

Time mean speed (TMS) : this corresponding to the average of overall travel speeds, its higher than the space mean speed.

$$\text{Time mean speed (TMS)} = \frac{\sum \left(\frac{\text{dist.}}{t} \right)}{n}$$

Example: Compute the SMS and TMS

Run	overall travel time (min)	overall travel speed (mph)
1	2.0	60
2	2.4	50
3	3.0	40
<u>Solution:</u>		
Average	2.47	50 mph

$$\therefore TMS = 50 \text{ mph}$$

$$SMS = \frac{\left(\frac{2}{60}\right)(60)}{(2.47)\left(\frac{1}{60}\right)} = 48.6 \text{ mph}$$

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Overall travel time: the time of travel, including stops and delay (except those off the traveled way).

Running time: the time the vehicle in motion.

Overall travel speed: the speed over a specified section of highway that is the distance divided by the overall travel time.

Running speed: the speed over a specified section of highway that is the distance divided by the running time.

- Design speed: a speed determine for a design as related to the physical features of highway that might be influence vehicle operation. Or max. safe speed that can be maintained over a specified section.

- Eighty five percentile speed (85%): the speed below which 85 percent of all traffic travel and above which 15 percent travel.

الوسطية
- Median speed: speed represented by the middle value when all speed values are arranged in ascending order. Half the speed values will lie above the median, half below.

الذاتية
- Modal speed: the speed values occurring most frequently. In a frequency distribution of speeds obtained in speed study, the modal speed would be the value with the highest frequency of observation.

الخطوة
- Pace: a given increment of speed that includes the number of observations. It usually taken in 10-mile increments.

- Operating speed: the highest overall speed, exclusive of stops, at which a driver can travel on a given highway under prevailing conditions.