



EFFECTS OF ROAD FACTORS ON VEHICLE TRAVEL SPEED

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Abstract

The speed at which motorists choose to drive is a major component of their behavior on the road, and one that plays a leading role in the frequency and severity of incidents. In-depth accident studies in all over the world have identified inappropriate speed choice as being one of the factors most frequently contributing to accidents. However, the factors that affect the speeds adopted by individual drivers are less well understood, and there is a need for such information in order to develop more effective ways to modify drivers' speed choice. The objectives of this study are to identify those factors a driver that are most influential in determining his or her choice of speed, and to explore the links between these factors and the speeds chosen. In this study a spot-speed study technique was used objectively. The speed characteristics analysis, motorists' compliance and factors affecting their choice of speed analysis were conducted subsequently and correlated to each. Results of analysis showed compliance to speed limit drops as the speed limit reduces. As a result, a simple linear regression procedure estimates that 37% of the variation in vehicle speeds can be explained by variables related to traffic control devices also, 38% of vehicle speed variation is explained by road environment and geometrics.

Keywords: Driver behaviour, Speed compliance, Road factors, Linear regression

1. INTRODUCTION

Setting speed limits at the appropriate level of road, and ensuring compliance with these limits, play a key part in certifying greater safety for all users. The relationship between speed and likelihood of collision as well as severity of injury is complex, but there is a strong correlation. As a general rule for every 1 km/h reductions in average of speed, collision frequency reduces by around 5% [1].

Reported road casualty statistics also show the role exceeding the speed limit and travelling too fast for the conditions as contributory factors in road traffic collisions. Other reported contributory factors such as loss of control or careless, reckless or in a hurry can often be related to excess or inappropriate speed, and even where the contributory factors are unrelated to the vehicle speed, higher speeds will often aggravate the outcome of the collision and injuries.

It has also been found that people's perceptions of other people's speeds are inaccurate. A study [2] found that more than 50% of drivers failed to respect speed limits despite most claiming to be in favor of compliance. Given this finding it is clear that other variables, other than willingness to obey the law, influence the observation of speeds. Drivers who overestimate the speed of other vehicles are also more likely to maintain higher speeds [3].

Studies that have examined the contribution of speed limits to speeding behavior have shown that drivers do not usually comply strictly with speed limits [3]. The extent of speeding tends to vary based on the perceived reasonableness of the speed limit, the driving context and the driver's own characteristics. The perceived speed of other road users also has an influence, as does the driver's perception of the utility (e.g. reduced travel time, thrill seeking) and disutility of non-compliance (e.g. penalties, likelihood of getting caught, fuel consumption, accident risk). Some may believe they are safe drivers at high speeds, so it is the probability of detection that is likely to have the greatest impact on this group. Posted speed limits can be described as one influence on speed choice, but social norms are extremely important. The importance of social norms has been also [4], who found that 'social conformity', has an important role to play in average road speeds.

Posted speed limits are undoubtedly a significant factor in determining driver's choice of speed, although research has also shown that speed choice is affected by factors such as: roadway design, geometry, forms of traffic regulation, prevailing weather conditions, time of day, purpose of trip, and level of congestion [5, 6]. Importantly setting suitable speed limits and designing traffic regulation strategies as part