ABSTRACT

Título: Modelització dels accidents en vies interurbanes. Aplicació a la determinació de velocitats màximes.

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The traffic accidents are the principal reason of death among the young men of the Spanish state. Against this epidemic, the safety vial, as a discipline of the engineering of the transport investigates solutions to such problems. Of another point of view, the current limits of speed in Spain seem to satisfy not even the expectations of the users not of the administration, yet that is for very different motives. If to this, is added the practices in Germany where there are sections without limits of speed and there is an equal or minor rate of accidents than in Spain, a review of speed limits it’s made necessary. The present document places in the above mentioned discipline and makes concrete in the search of the risk of accidents in the frame of the inter-city routes to be able to determine the influence of the speed limits in the accidents and his consequences.

For such company first a bibliographical reference has been realized, so much of the principal theories assumed like valid for the majority of the specializing community like of the last realized studies. Nowadays, the speed is associated with the rate of accidents but up to the moment a clear thesis does not exist on his effect. Other factors like the Average Daily Traffic (ADT) show his good capacity to predict. The relation between the speed and the gravity of the accidents it seems to be accepted widely. Established these bases, variables that could affect to the risk of accidents have been searched from the analysis of the ratio of accidents in Spain and the experience of other studies. Once determined the variables a functional relation has been established: the theoretical model of prediction of the risk. Then the intention has been validate and calibrate the model. For it there has been used information of 400 sections of the Catalan net vial of that there was had information of annual frequencies of accidents (total and serious), hurt (total and serious) and dead. Besides there were known certain geometric characteristics of the route and of the ADT. The different proofs have showed that alone there was an effect statistically significant pro a variable: the ADT. The result has been the obtaining of a model of prediction of the frequency of the event from an exponential relation with the ADT, with nearby values of the exponent to 0.7. Similar models realized in studies of other countries have obtained similar values of this exponent.

Validated and calibrated the model in inter-city Catalan net, has carried out a discussion of the effect that from this model supposes a variation of the speed limit. A series of hypothesis have realized as the direct relation between the speed limit the average speed or restrictions as the situation of free traffic. Departing from the case of a distance between two nodes in which there are two manners of transport it has come near to the following conclusions. If the cost of realizing the distance in vehicle even changing the speed limit is not different, then, using a model of demand deduces that the intensities will be constant and therefore the ADT also. Then the frequency of accidents will be kept practically constant though it is true that the gravity, being still the potential model, will change. Besides, the above mentioned situation will be to the possible practice only in a speed range between 60km/h and 100km/h unless those very high variations of the speed limits are realized. In the second situation, the costs to realize the distance will change changing on having changed the speed limits. In the above mentioned situation the model of demand will determine the variation of flows, and that will take one new ADT. Analyzing the variation of the ADT comes near to the conclusion that a variation in and speed limit supposes a variation in the frequency of accidents in the same sense that this but the intensity of the variation will be great more raised in variations inside minor limits of speed that 80 km/h. This result seems in agreement with the ratio of accidents little differentiated between highway and Spanish railcars (with limits of 120 km/h) and those Germans (multitude of sections without speed limit).