THE ANALYSIS OF TRAFFIC ACCIDENT CAUSES MADE BY HUMAN FACTOR

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This study gives a survey of results of the traffic accident set analysis provided by the research team in the framework of the task "The Clinical Analysis of Traffic Accidents of Selected Sets in CSR and SSR", that was realised by Research Traffic Institute in Žilina.

Two teams working according to the same methodics were set up to try to solve this task. Various special professions were represented in both teams, especially those having a close contact to problems of safety in traffic - traffic engineer, road engineer, medical jurisprudence traumatologist, traffic psychologist, transport engineer.

The methodics of research ensued from the result of the previous periods, the aim was to gain the maximal number of data and knowledge to each followed accident which could contribute to make clear its origin, course and consequences. A special functional group made the own notes and photodocumentation directly at the place of accident, where it was asked to be on the base of an agreement with both police and first-aid station immediately after an accident. The data were coded into the single forms especially intended on the individual elements of traffic system - car, road, driver.

On the basis of the gained data each expert of team worked out an evaluation of the given accident from the point of view of its specialization /for instance - with a view to road marking or traffic marking, state and surface of the road, technical state of the car, global state and qualification etc./.

The Knowledge of each specialization were integrated at team consultations and the partial conclusions were completely worked out in the form of research information. Owing to the complex analysis of causes and course of the traffic accidents a great number of measures was suggested to increase the safety of road traffic, first of all as to road marking, constructional changes of vehicles, organizational measures in traffic, instruction and training of drivers, judging the state of health of drivers.

The main task of psychologists of the Institute for Road
and Urban Transportation in Prague was to follow and evaluate the influence of the human factor as to the origin and course of an accident situation, namely in two aspects. First, to evaluate the direct participation of a driver, let us say, of his mind and behaviour in the origin and course of a traffic accident, and second, to analyse those factors which could have negatively influenced the full applying of driver's psychological functions necessary to drive a car in a safe manner.

The data to evaluate an influence of human factor as to the origin and course of an accident situation were gained by means of detailed questionnaires, personal debates with accident drivers, medical documentation, documentation of traffic accident or directly by psychological consultation of an accident driver in the psychological laboratory of the Institute for Road and Urban Transportation in Prague. The Alternative Methodics of Testing Psychological Qualification for Driving Motor Vehicles that was worked out in this Institute and is applied in many psychological centres of road and traffic enterprises, was used to do the psychological consultation. To take part in this consultation was voluntary, so that we sometimes failed to acquire objective data, especially in the case of those drivers causing serious traffic accidents and being rightfully suspected of reduced psychological qualification. In some cases, when the accident was caused by a professional driver, a psychological consultation of an enterprise traffic psychologist was for our disposal.

In the questionnaires for accident drivers there are the data following their state of health before the accident (the longer lasting diseases, too), state of mind, interpersonal contacts before accident, way of living and the whole regime, enough sleep and rest before the critical travelling, momental conducting leading into the accident, doing in the course of the accident, subjective evaluation of the causes of the accident, present time practice in driving motor vehicles and a serie of the other auxiliary data.

The conclusions of the analysis of the five years' period were worked out and summed up in the final report in 1985. A traffic accident was considered to be the result of a serie of factors where being breaking down of human factor the most important of them. Another important knowledge were required in the sphere of the construction and equipment of vehicles, parameters and quality of road comunikations, mechanism of wounding and injuring of travelling persons. These knowledge were maximally employed to make suggestions and measures to improve the safety of road traffic.

The following knowledge were gained from the standpoint of the human factor:

The wrong manner of driving was most often cause of a traffic accident, then it was breaking priority in driving.
Further, inadequate speed, especially of young unexperienced drivers and wrong overtaking. These causes and its order more or less correspond to the national-wide statistics of traffic accidents.

Except for these evident, noted causes deeper causes were determined reflecting the origin of an accident situation and its development towards the traffic accident. The insufficient, superficial exploration of the given traffic situation together with the slight anticipation of its further development appeared to be the most often and most consequential cause of wrong and dangerous traffic conducting. This cause is probably connected with the fact the majority of the registered accidents occurred in the place the driver passed daily or very often what led to the decrease of attention and watchfulness. The over-stress caused by a great quantity of means of travel equally appeared as very dangerous in the same way as the dispersion of attention or its concentration out of driving motor vehicle (for instance personal problems and troubles, straying in an unknown terrain, blind and complicated road junction).

Also the inadequate perception and evaluation of road traffic had its influence on accidents, above all as to density of vehicles and pedestrians, owing to the real state. The ability to judge adequately a traffic situation and adapt one's traffic conduction is connected with driver's experience, ability of anticipation, way of perception, cognitive capacity etc.

It was the desinformation that contributed to the accident in several cases, too, a wrong understanding of the intention of the other participant of the traffic situation.

Affecting of driver's mind by his unfavourable state of health or by taking alcohol represents a very weighty and dangerous cause in its consequences.

The conditions were chosen as well (subjective and objective) which existed being catalysts in the moment of accident or which became the accident factor (in the sense of overstressing the driver's psychological capacity). We must first of all take into account those organizational defects as building repairs of the road and of its near surroundings, diversions, temporary direction of traffic, broken traffic lights, wrong architectonic construction of communication and its surroundings when the outlook and orientation are aggravated in the crossways.

The factor of mental load in the form of personal, financial and working problems, conflict family home, mental unstableness and lower tolerance to attacking of unfavourable stimulations in the road traffic, finally, incompetence to drive motor vehicles because of bad health in both mental and physical aspect, all those are the factors which mostly ap-
peared to be the subjective conditions.

The realized psychological consultations of the accident drivers signalized the defects in their personal characters and mental functions, especially in their perception. These characters of the personality were evaluated to be unfavourable from the point of view of safe driving of motor vehicles: emotional unstableness, unrespectableness in conducting, lack of criticism to the own abilities and consequences of conducting, irresponsibility, aggressivity, intolerance to the faults of other participants of road traffic, tendency to risk, immaturity of personality in the whole.

There was a weight fact regarding the following driver's career that only a small part of the accident drivers was able or ready to formulate their share in causing the accident, to be aware of fault and to confess it. On the contrary, there was an evident effort to bagatelize all the situation saying "anything like that could happen to everybody".

The decisive part of the accident drivers already was the participant of an traffic accident and confessed a number of traffic offences.

These concrete knowledge led to the suggestion of measures to improve the safety of road traffic aimed at the human factor. It was, for instance, recommended: to take into account the future safety in constructing communications as soon as they are in the phase of being planned, to do away with objective defects that could lead to relapses of trouble incidence, to test consistently the competence of drivers with regard to their health, to continue to struggle against alcoholism, to pay more attention to the instruction of drivers and the publicity of motoring.

Finally, still an illustration of a traffic accident from the point of view of the human factor:

Traffic accident No. 266

The accident occurred at twenty past 2 p.m. In the time of the accident the street was sprinkled by a road sprinkler, other contiguous streets in the direction of running of the accident vehicle were dry.

The driver of the mass city transportation was late because of technical defect and was sent with the vacant bus to the next terminal station. He started to overtake a car before the crossways, he went in the left part of the roadway into the street. There was a load carrier coming in the opposite direction, that's why he tried to come back to his part of the roadway, however he skidded and the bus stopped to be controllable and both vehicles came into collision.
Consequences of the accident: considerably high material damage, grave injury of the load carrier driver and death of his assistant.

The driver of the bus I.M., 25 years old, single, no children, motor mechanic, two years professional driver in Prague Traffic Enterprise. In the drivers past there are 5 traffic offences confessed - high speed, 2 accidents - side and back clash. In the case history there is a series of injuries - fracture of forearm, collar bone, knee, lacerated wound of ear, left heel, knee. He had not undergone psychological assessment when coming to work to Prague Traffic Enterprise.

Psychological consultation in IRCT:

Common mental functions (i.e., memory, vigilance, reaction time etc.) quite comply with the normality, serious exceptions however, must be taken to the characters of personality. The driver manifested a tendency of frivolity, low anticipation, impulsivity of conducting, bad moments of self-control, immaturity of personality and some infantile aspects in conducting and answers.

The day before the accident he ran at about 120 km up to the morning shift and slept 4 hours.

The cause of accident: crossing over the opposite direction, high and risky speed, unsuitable characters of the driver I.M. with regard to driving motor vehicles, lack of sleep. The sprinkling of the street without any warning starting in the half of the street behind the crossways contributed to the accident, too.