NEW RELEASE

HUMAN FACTORS GUIDELINE
FOR SAFER ROAD INFRASTRUCTURE
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Human factors can be described as people's contributions to damaging events. It is the generic term for the psychological and physiological patterns that contribute to operational errors in handling machines and vehicles. This concept is now recognised by the road safety profession as an important factor in road safety.

This report, prepared by World Road Association (PIARC) Technical Committee 3.1 aims to provide road safety engineers involved in all aspects of road operations (planning, design, construction and maintenance) a guideline to improve the identification of human factor design mistakes. The report is introduced by comparing the two distinct approaches to accident research. The post-accident approach assesses the safety of a design by reviewing the consequences of an accident. The pre-accident approach on the other hand, through the human factors concept, takes into consideration the triggers of the driver's reaction and patterns of behaviour which may lead to an accident.

German accident statistics were analysed to determine the contributory effect that human factors mistakes in design had on the accident. The results indicated that more than 60 percent of accidents were influenced by design mistakes corresponding to common types of human factor design mistakes.

Road features determine driver behaviour. By incorporating human factors into road design, the probability of an operational error occurring is reduced, thus minimising the possibility of an ensuing driver error. The report advocates that roads should be user-friendly and self-explanatory. Dangerous points should be designed such that they are easily perceived and understood – neither confusing the driver, nor inviting the driver to take risks.

The report investigates human factor mistakes in road design and recommends possible ameliorative measures. Human factors mistakes are classified into three broad categories:

1. The 6-second axiom: The road should give the driver enough reaction time;
2. The field of view axiom: The road must offer the driver a safe field of view;
3. The logic axiom: Roads should follow the driver's perception logic.

For each class of mistake, diagrammatic examples of good and poor road design characteristics are presented, followed by a discussion on the resultant driver reaction. Deficient designs are highlighted and recommendations provided to reduce the probability of the driver making a mistake according to one of the axioms. The diagrams can be used as a tool in the onsite investigation of accident points or in Road Safety Inspections. They can also be used to qualify decisions and recommendations arising from the road safety audit process.

The report also presents results from human profiling testing, which was undertaken during its research. This profiling was undertaken to assess engineers' abilities to determine human factors mistakes in road design. The study involved 34 experienced European road engineers. Results indicated that engineers were typically able to easily identify mistakes with respect to the 6-second axiom, but had more difficulties in detecting mistakes in the other axioms.

Preliminary results indicate a need to improve the awareness and understanding of human factor design mistakes. The report thus recommends the need to incorporate knowledge of the human factors concept into more established areas of road safety management, for example into road safety audits, road safety inspections and engineering design guidelines.

This report can be accessed through PIARC's Virtual Library at:
http://publications.piarc.org/en/search/det+ail.htm?publication=3235

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