

Observations on the relationship between European standards for safety barrier impact severity and the degree of injury sustained

Abstract

Road restraint systems are roadside structures that include safety barriers, crash cushions, terminal of barriers, the transitions among different road restraint systems, motorcyclist protection devices, etc. These systems are used to protect vehicle occupants from dangerous roadside elements and are a key issue in roadside safety.

In Europe, safety barriers are currently designed for different performance levels using three main criteria: containment, impact severity and deformation of the barrier.

The impact severity level is exclusively associated with injury risk to vehicle occupants and assumes that different severity levels correspond to different levels of injuries.

From these observations, three questions emerge: what consequences can be expected for the passengers of an errant vehicle when it is contained by a safety barrier? Systems with different impact severity levels lead to diverse severity consequences? What are the benefits of using barriers with lower impact severity levels?

To answer these questions this paper examines how the number of run-off-the-road crashes and victims – associated with different safety barriers impact severity levels – change as traffic grow.

The empirical results show that the effect of safety barriers functional characteristics on road safety only depends on impact severity levels adopted if level C is considered. Hence the need to revise the threshold for impact severity levels A and B, as, in practice, they currently seem to be identical.

Keywords: Safety barrier; Injury risk; Injury criteria; Crash frequency model; EN1317
