

Abstract for the second Annual Scientific Seminar of the NTSA: Theories and research methods in Road Traffic Safety Science.

Aalborg, Denmark May 13-14 2013

Author: Jesper Sandin, VTI, jesper.sandin@vti.se

Abstract:

Longer Combination Vehicles (LCVs) ranging from 25 m to 53 m in length have received increased interest in recent years as they are expected to increase transport efficiency and thereby decrease costs as well as carbon dioxide emissions. However, before they are introduced in the traffic system on a larger scale, their impact on traffic safety and other road users' behavior has to be investigated.

Because the time required to overtake a vehicle increases with the length of the overtaken vehicle, overtaking-related crashes are often supposed to increase with LCVs. A Swedish study analyzed police-reported accidents involving heavy vehicles in Sweden during the years 2003 to 2005. The authors found no statistical evidence in that material indicating that overtaking accidents were more frequent for combination vehicles up to 25.25 m than for rigid 18 m vehicles. There is a general lack of studies that quantify the risks of overtaking maneuvers in terms of accidents rates.

As alternative to accident involvement, indirect measures of traffic safety can be used. One measure related to the risk of overtaking longer LCVs is the concept of meeting margins. Meeting margin is defined as the time elapsed from the conclusion of an overtaking maneuver to the moment the overtaking vehicles front meets the front of an oncoming vehicle in the opposite lane.

A study was conducted with the purpose to study the effect of vehicle length on meeting margins during overtaking maneuvers. A field study video-recorded overtaking maneuvers of a 30 m and a 24 m truck on a two-lane road. The difference in average meeting margins between the trucks was not statistically significant. An ocular assessment of the video material revealed a few critical situations during the overtaking maneuvers of the 30 m truck; all with meeting margins less than 3 s. Although these results should be interpreted with great caution as the number of analyzed overtaking maneuvers was limited, two previous studies describe similar findings. The conflict technique is discussed as a tool in the assessment of critical meeting margins. It is concluded that more field studies and data are needed to estimate the risks when overtaking Longer Combination Vehicles.