



APROSYS FINAL EVENT

Integrated Project on Advanced Protection Systems

New Assessment and Test Tools

Test methods for vulnerable road users

Standard assessment procedures for heavy vehicles



FUNCTIONALITY

The heavy vehicle aggressivity index HVAI provides test protocols allowing to assess the European heavy vehicle fleet with regard to its VRU protection capability. The holistic test approach covers evaluation of injury risks due to primary impact and run over. Active safety is considered by determination of the driver's field of vision

EXPLOITATION

- Comparison of heavy vehicles designs to identify VRU friendly design solutions

SOCIO-ECONOMIC IMPACT

- Promotion of enhanced vulnerable road user protection for heavy vehicles

TECHNICAL DESCRIPTION

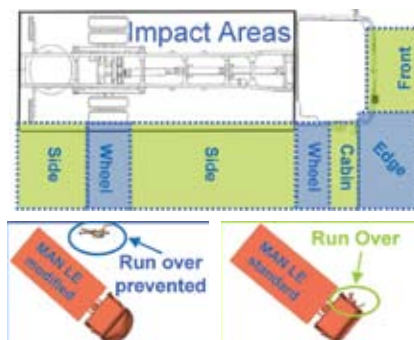
Structural (experimental testing)



impact zones for structural testing

- Propelling the standard pedestrian headform with 40kph to the front of the cabin
- Different zones for adults and children are defined
- The whole front is separated in clusters to be tested

Run Over (virtual testing)

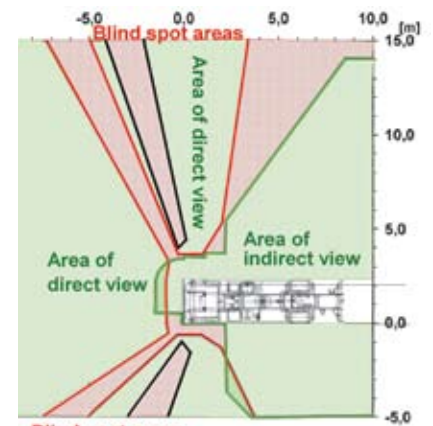


critical areas and simulation results for different front geometries

- A virtual method is defined using multi body simulation
- Up to 21 scenarios have to be tested
- Front and side design is tested on runover prevention

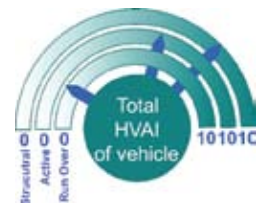
Active (visibility measurement)

- Boundaries around the truck are defined
- Geometrical dimensions of truck (windows, pillars) are used
- Direct, indirect (mirror) and blind spot area are calculated



Evaluation scheme of drivers view

Overall rating

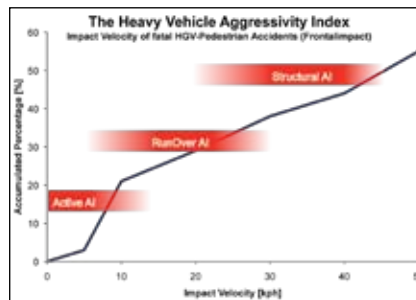


Rating scheme for HVAI

- All three independent tests are rated (1 to 10)
- Overall score & individual scores are monitored

Summary

- Accident analysis shows that HGV-VRU impacts mainly occur up to 40kph.
- Different injury mechanisms and preventive measures have to be
 - Low speeds – avoiding impacts by active measures / view
 - Middle speeds – avoid run-over by advanced geometries and lateral protection
 - High speeds – reduce severity of impact (e.g. safety bar)



Speed ranges for different preventive measures and assessment methods

Future work

- Integration of the design in future concepts
 - Integrated benefits are necessary (e.g. reduced fuel consumption due to aerodynamic design, which is beneficial for VRU safety)
- The HVAI will support to develop VRU friendly designs

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SIXTH FRAMEWORK PROGRAMME