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# Increasing road worker safety in The Netherlands

A Dutch study investigated the road traffic crash risk of road construction workers by means of a literature study, accident registration investigation, a survey among road workers and observation of road works. Outcomes of the study are a causation model that can be used for accident registration and investigation and road safety promotion materials for workers.



## The study

During 2006 and 2007 a study was performed in The Netherlands in order to better understand the crash risk for road construction workers during road works. The study aimed both at the magnitude of the problem and at clarification of accident causation. Accident data were studied, road workers questioned and observed during actual road works. Based on the outcomes of the study an accident model was developed and safety promotion materials were constructed for road workers.

## Magnitude of the risk

- It was estimated from data on fatal crashes that the risks to be killed during work time is higher for construction workers working on roads than for construction workers in general.
- Observation of road works revealed that in a team of road workers a road worker enters the no go zone between work area and traffic area almost 20 times per hour.
- Half of the road workers feel unsafe often or always when working on the road.

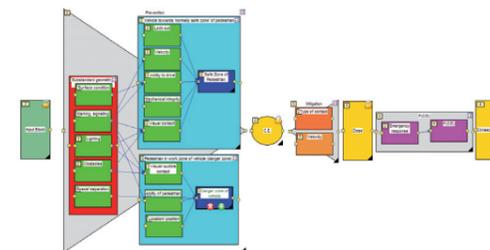
## Crash causes

The most prominent crash causes are:

1. Limited work space
2. Unsatisfactory barriers between work and traffic

3. Ability of the driver
4. Visual contact of the driver with the road workers
5. Visual and auditory contact of road worker with traffic
6. Ability of the road worker

Figuur 1 Story Builder model: Worker (= pedestrian) is struck by moving vehicle (Ale et al., 2008).



## Conclusions and recommendations

Working conditions of road workers are far from ideal. The safety of road workers must be placed higher on the agenda of constructors, road managers, government and road workers alike. Both on the job as in the bidding and planning phases. Accident and incident registration and investigation should be improved. Innovative barriers should be developed to prevent workers from entering the traffic zone. Finally, workers themselves should be more aware of the crash hazard.

## References

Venema, A. et al. (2008) The road traffic crash risks of road construction workers (presently only available in Dutch), Zwammerdam: Van den Berg Infrastructuuren.

Ale, B.J.M.; Bellamy, L.J.; Baksteen, H.; Damen, M.; Goossens, L.H.J.; Hale, A.R.; Mud, M.; Oh, J.; Papazoglou, I.A.; Whiston, J.Y. (2008) Accidents in the construction industry in the Netherlands: An analysis of accident reports using Storybuilder. Reliability Engineering & System Safety, Volume 93, Issue 10, October 2008, Pages 1523-1533.

## Road safety promotion

In order to promote safe behaviour in road construction workers a video was prepared to make workers aware of their own behaviour. The video uses actors, but the situations were based on actual behaviour video taped during the observations. Also, stickers were prepared for the types of behaviour that can prevent accidents:



Keep distance



Keep an eye



Be visible