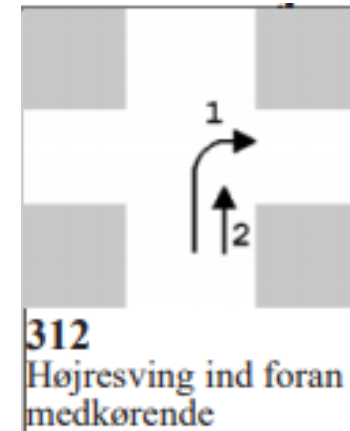


Danish investigations on accidents with heavy vehicles and cyclists

Anne Eriksson, Danish Road Directorate
Volvo Workshop Gothenburg
November 8th 2017

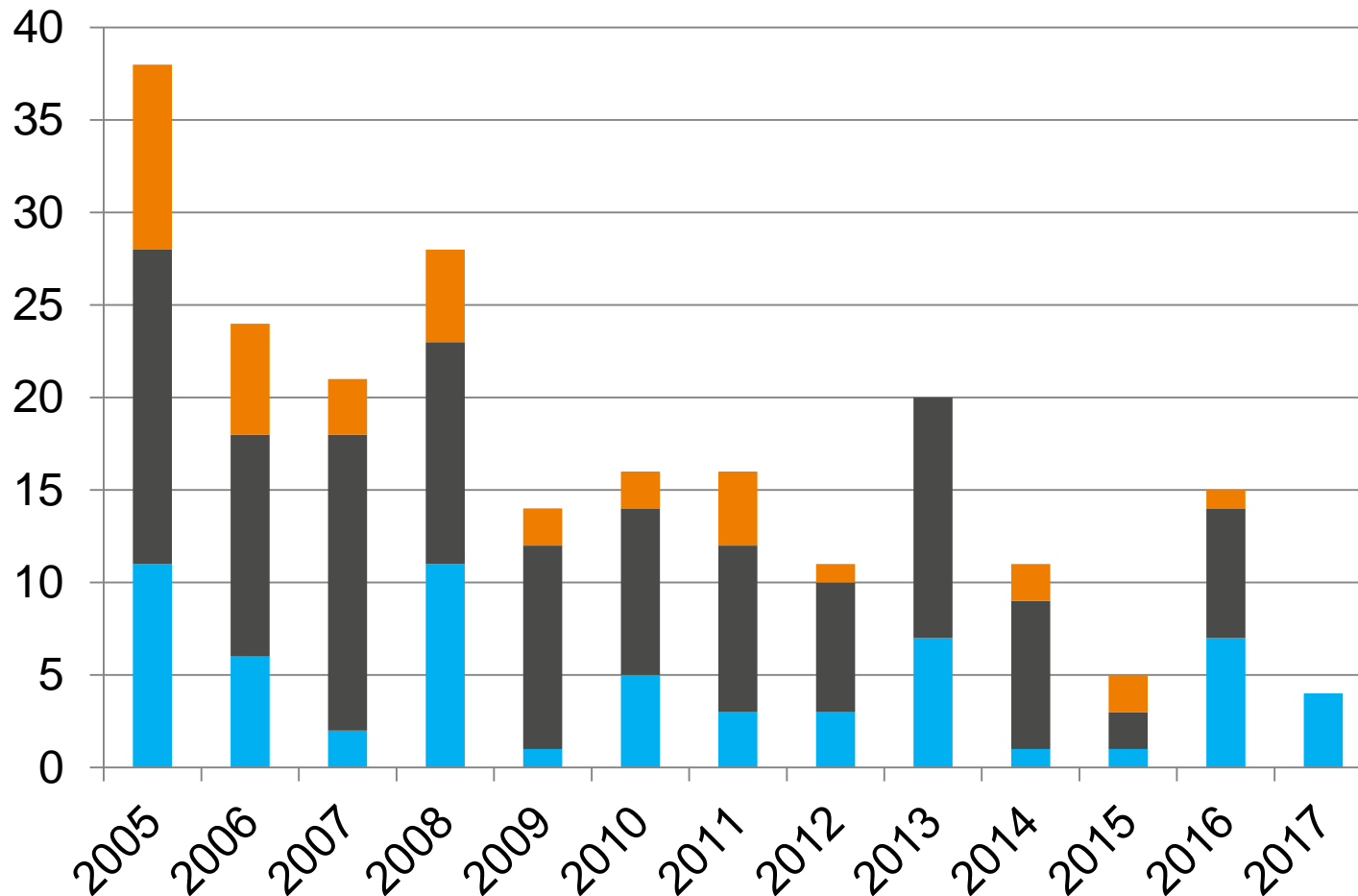


Right turn accidents between heavy vehicles and bicycles



312: Right turn in front of other vehicle going straight ahead

Criteria:
 Unit 1 lorry or road tractor for semitrailer
 Unit 2 bicycle



Only 1-3% of injury accidents with cyclists but are often very serious outcome because of the difference in size/weight

- Slightly injured
- Seriously injured
- Killed

Investigations in Denmark

This presentation, a brief overview of three investigations:

- In depth investigation carried out by Danish Accident Investigation Board (AIB) in 2006
- AIB carried out new investigation in 2016 about serious accidents with trucks
- Data study in 2017 on all serious accidents between right turning heavy vehicles and cyclists

Danish Accident Investigation Board (AIB)

Created in 2001

The purpose of AIB is to:

- Compile knowledge
- Raise awareness
- Make recommendations
- Encourage preventive actions
- Not to determine the question of guilt



Organisation

Board:

- Road Administration (member and chair)
- National Police
- Transport Authority
- Danish Technical University (Dep transport)
- University Teaching Hospital

Crash investigation:

- Police
- Medical doctor
- Vehicle inspector
- Road engineers
- Psychologist

Secretariat:

- Project manager
- Team-coordinator
- Individuals from the Road crash investigation team



Havarikommisjonen
for vejtrafikulykker

Method

- Collection of accident data *within a certain theme*
- Accident reports (20-40), fatal or serious injury accidents
- Thematic report incl. recommendations



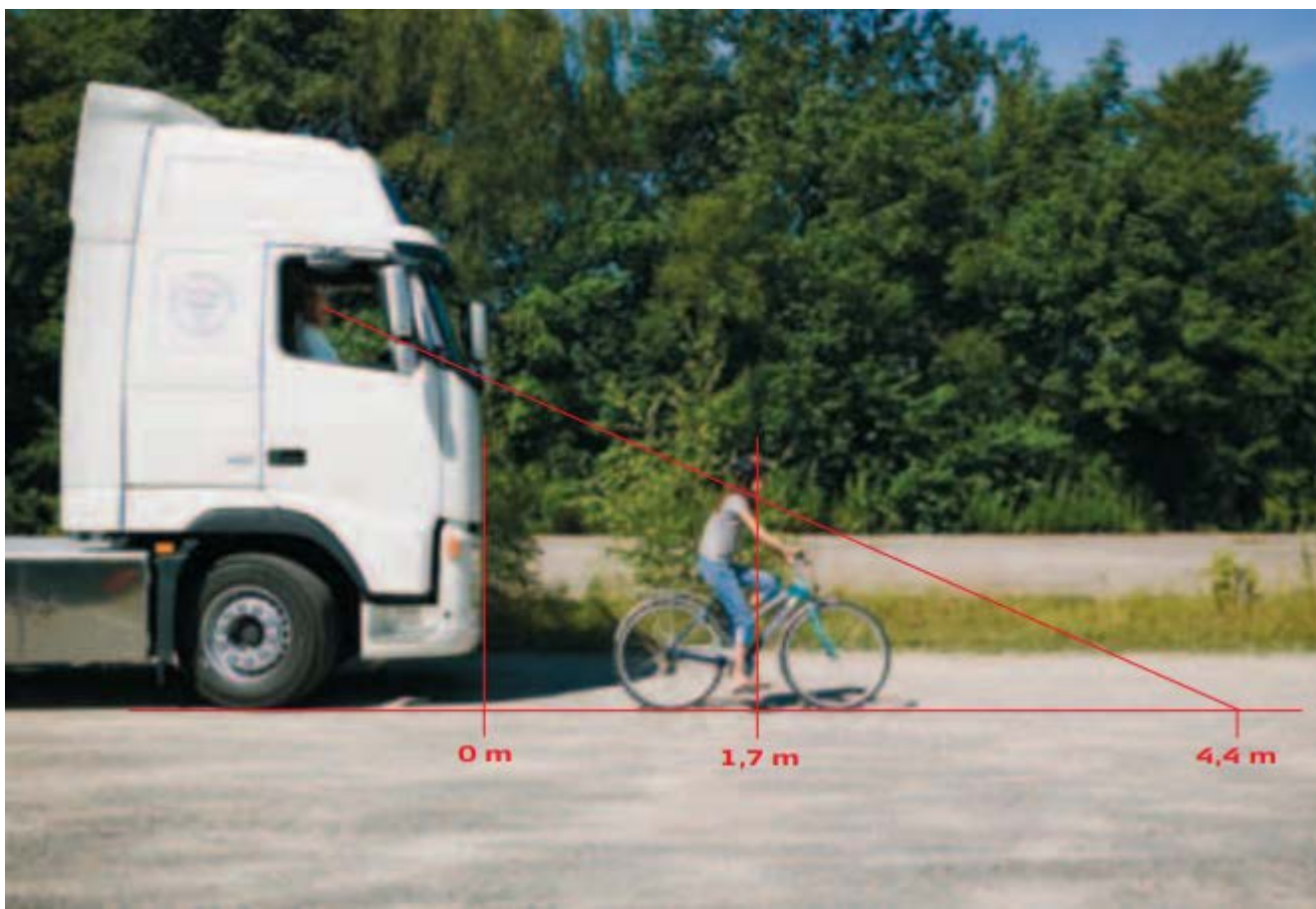
Theme report no. 4, 2006

Accidents between right turning lorries and cyclists going straight

- 25 accidents with killed or seriously injured cyclists
- Unsuccessful look out for cyclists was an accident factor in all 25 accidents
- Findings have led to:
 - More focus on use of mirrors
 - Proposal in EU for better direct vision from truck cabins



Direct vision is limited from cabin with typical design

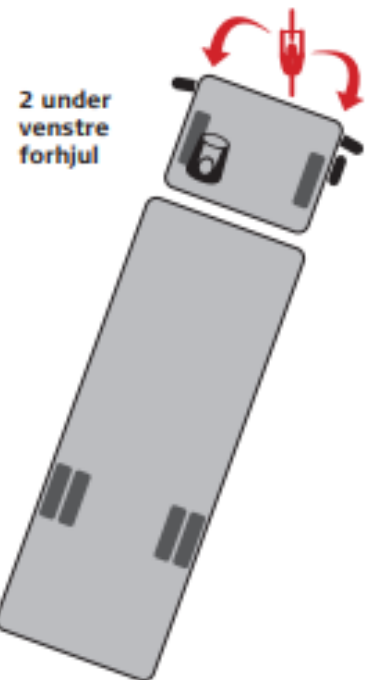


Findings about cyclists' position before crash

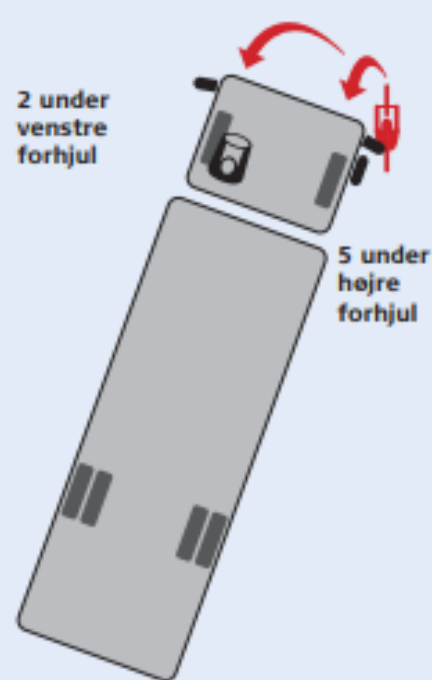
16 cyclists were run over by truck: Their position before being hit

Overkørte cyklister

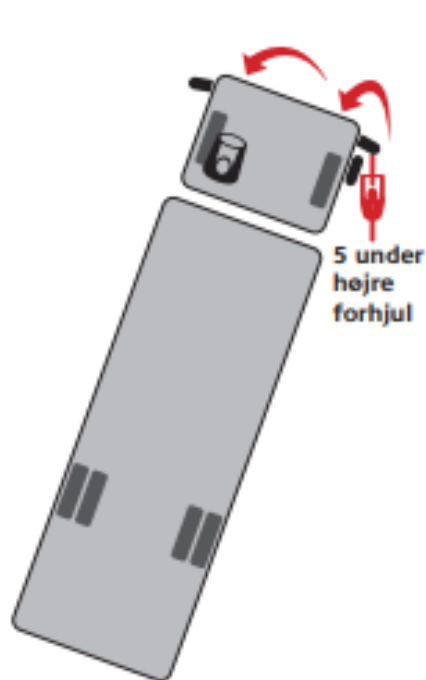
2 cyklister rammes af lastbilens front



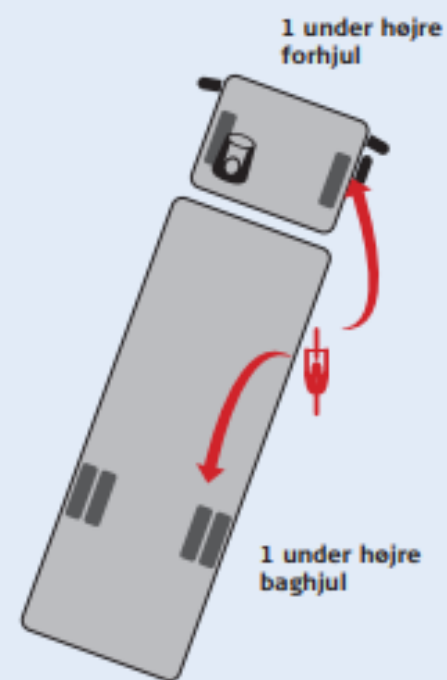
7 cyklister rammes af lastbilens højre forhjørne



5 cyklister rammes af lastbilens førerhus i højre side



2 cyklister rammes af lastbilens højre side bag førerhuset



Theme no. 13, 2016

Truck accidents

- 30 accidents (2014)
- 4 main types of accidents:
 - Urban:
 - *Cyclists and pedestrians (9)*
 - Rural:
 - *On road sections (8)*
 - *Intersections and turning (6)*
 - *Truck accidentally hit*



Accidents involving cyclists and pedestrians



- 4 right-turn accidents
- 2 left-turn accidents
- 2 accidents square
- 1 accident involving a crane
- Complex to "see all" in mixed busy traffic
- Distribution of goods difficult

Main findings (all 30 accidents)

- Insufficient orientation/attention in 22/30 accidents, both truck drivers and other parties
 - *Rushed orientation in complex situations*
 - *Inattention and sleepiness in "easy" situations*
- Trucks with direct vision could have eliminated the accidents in 4/9 accidents with cyclists and pedestrians
- Vehicle errors and illegal driving (speeding, resting time etc.) counted for 1/3 of the accidents
- 19/30 could have been prevented with better safety equipment, like pedestrian detection and automatic braking systems.

Right turn accidents, recent data analysis

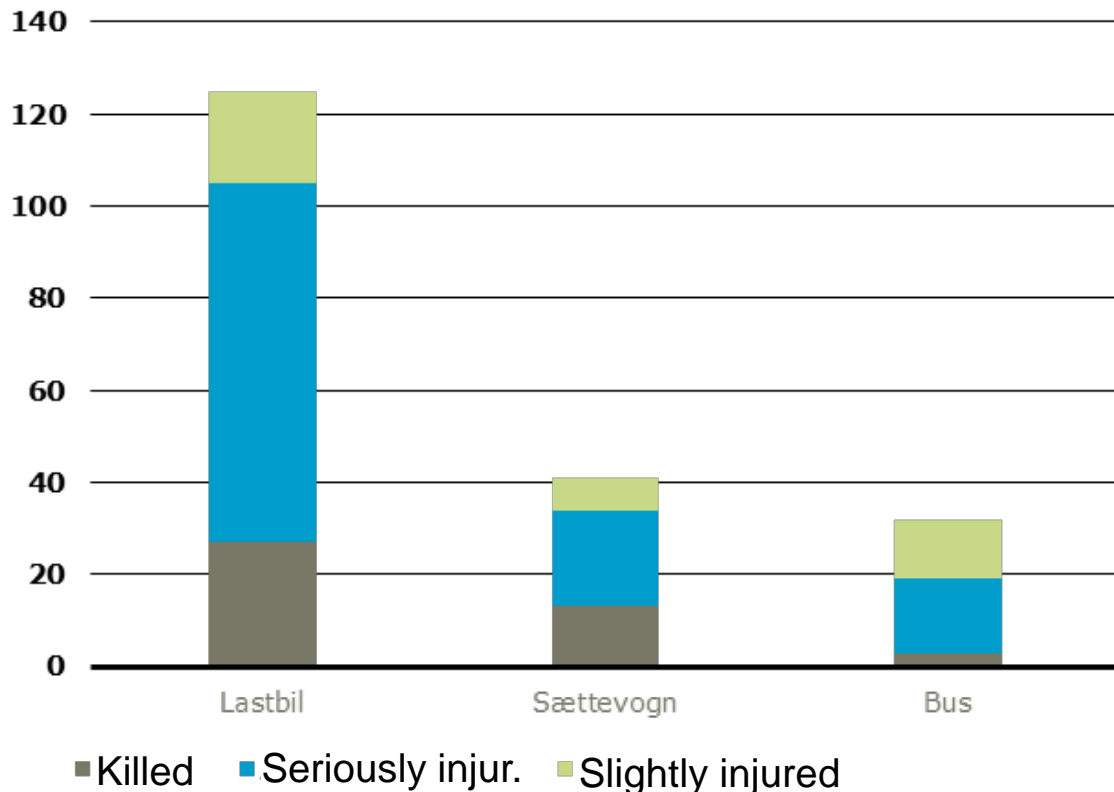
7 fatal accidents in 2016, led to:

- Analysis of police data on right turn accidents with personal injury 2006 – 2015
- Heavy vehicles, also including busses
- Geographic and geometric analysis of all accident sites, based on orto photo, map services, police accident data, fatal accident register etc.
 - Geometric design registered and classified



Right turn accidents 2006 – 2015

- Accidents with road tractor for semi trailers were the most serious

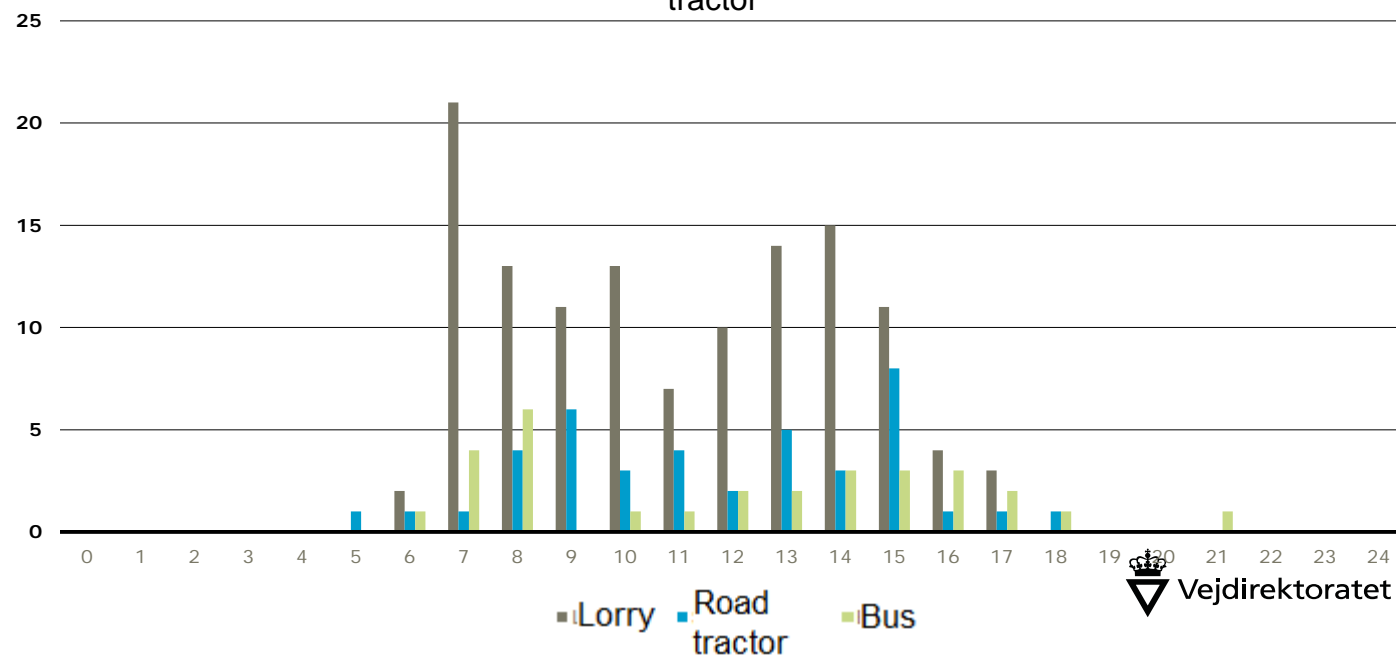
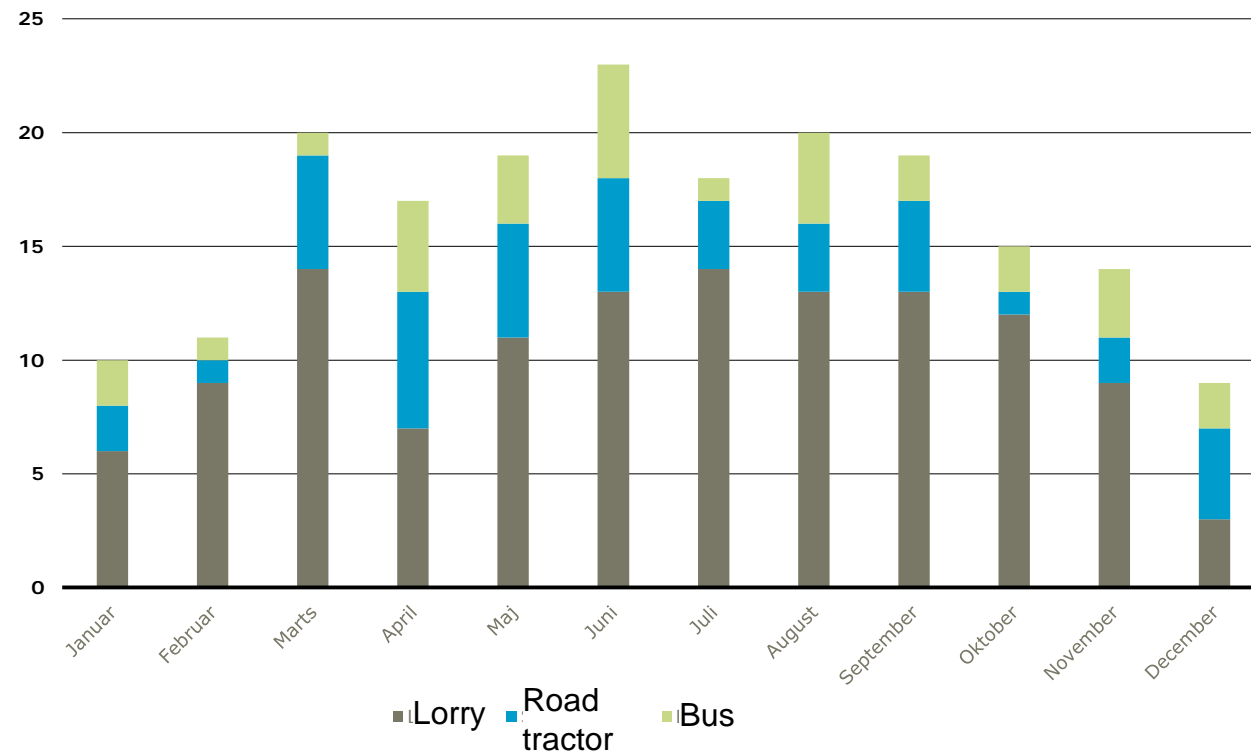


	Lorry	Road tractor	Bus	Total
No accidents	124 (64%)	41 (21%)	30 (15%)	195
	Lorry	Road tractor	Bus	Total
Killed	27	13	3	43
Seriously injured	78	21	16	115
Slightly injured	20	7	13	40
Killed and injured in total	125	41	32	198

Accident data

Characteristics:

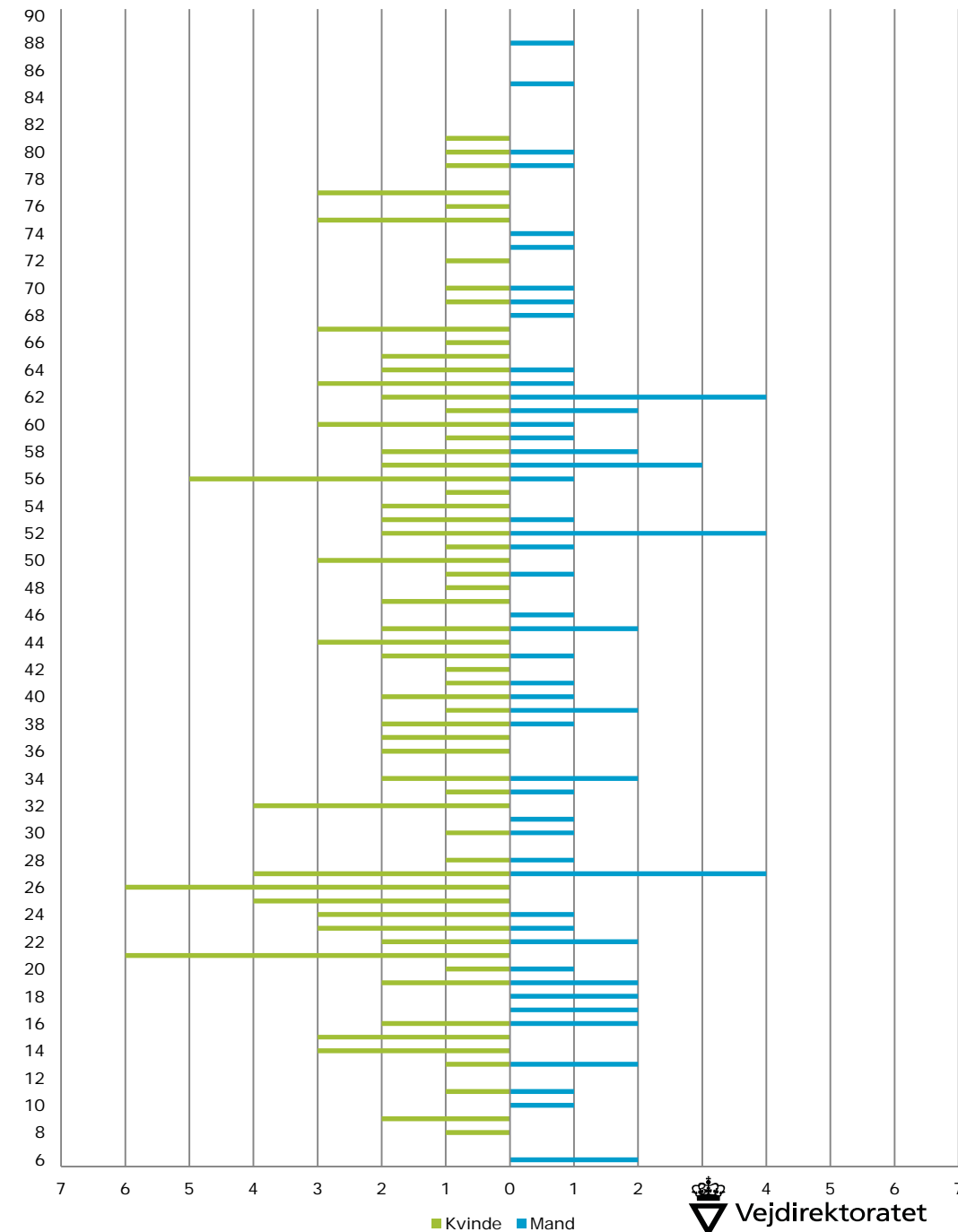
- Daylight (95%)
- Day time 6 – 18 (97%)
 - 6 – 15 (80%)
- Dry weather conditions(80%)
- March - November (85%)
- Work days (96%)



The cyclists

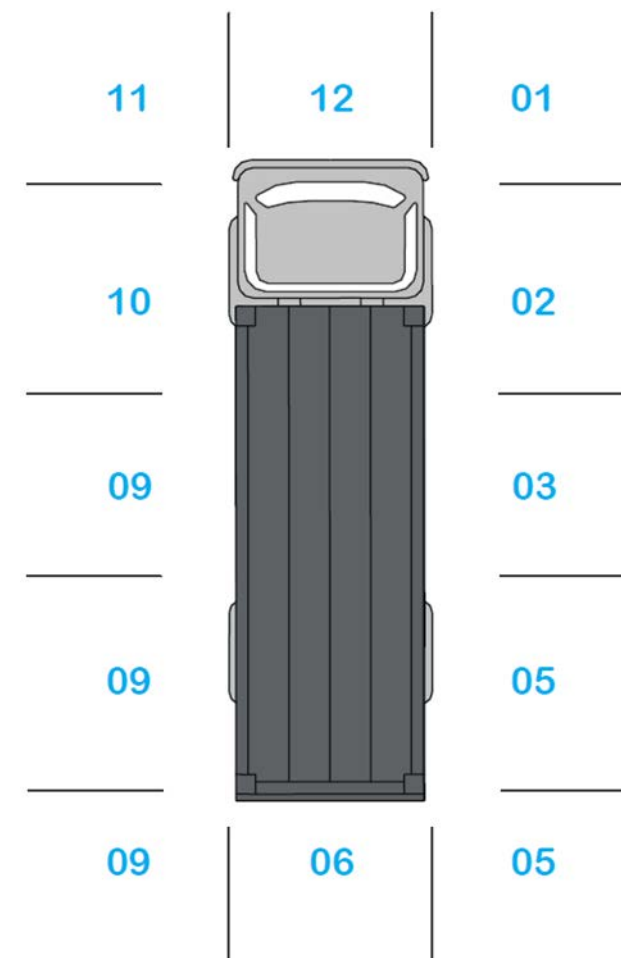
- 196 cyclists
 - 64% of cyclists were women
 - 28% of killed were over 64 years
 - 17% of cyclists used a helmet
 - 14% of killed used a helmet
 - 58% of killed did not use helmet
 - No intoxicated cyclists
 - 98% of cyclists were in motion
 - 91% were Danish citizens

Cyclist age



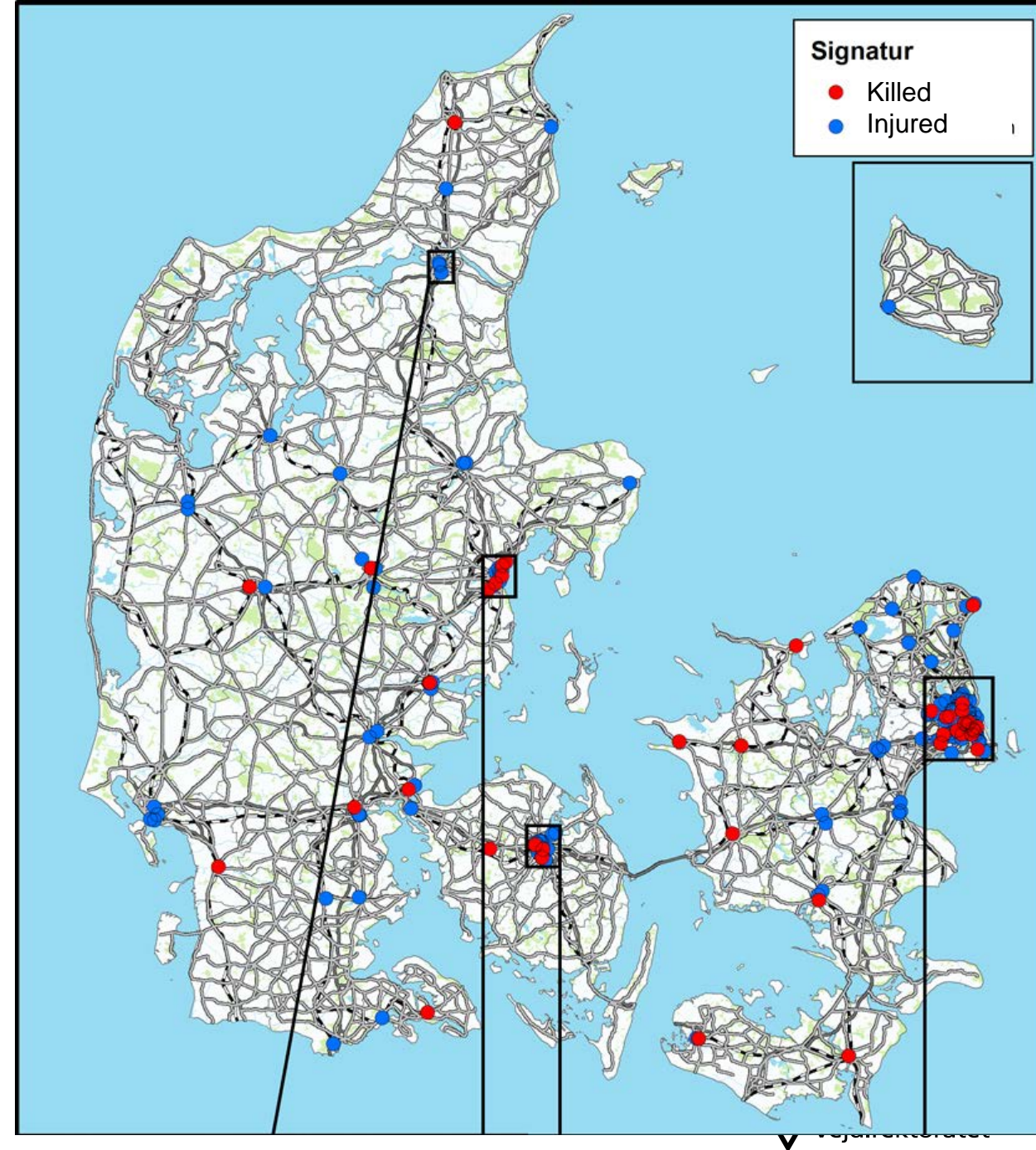
Drivers and vehicles

- 188 drivers (7 escaped the site)
 - 96% were men
 - 50% were age 45 – 69
 - 1% had a level of alcohol over 0,5 ‰
 - 81% were Danish citizens
 - *In road tractors 55% were Danish*
- 70% of cyclists are hit by right, front part of vehicle
 - Collision point 01, 02, 03
 - Lorries mostly hit cyclists with side of cabin (02)
 - Road tractors with right front corner (01)
 - Busses with right side (03)



Geographic analysis

- Combined information from police data and maps/photos of site



Accident sites

Accidents found place in:

- Urban areas (97%)
 - 63% in larger cities
 - Industrial areas and build up areas
- Signalized intersections, all urban (73%)
- On the primary road in the intersection (60%)
- Intersections with cycle path (67%)



Characteristics of roads/intersections with many cyclists

	Lorry	Road tractor	Bus	Total
Urban	120	40	29	189 (97%)
Rural	3	0	1	4 (2%)
No info	1	1	0	2 (1%)
Total	124	41	30	195



For more info (mostly in Danish)

- http://www.vejdirektoratet.dk/DA/viden_og_data/temaer/trafiksikkerhed/hojresvingsulykker/Sider/default.aspx

TRAFIKINFO PROJEKTER VEJSEKTOR **VIDEN OG DATA** OM OS

PUBLIKATIONER STATENS VEJE STATISTIK **TEMAER**

CYKELTRAFIK ITS KLIMA OG MILJØ STØJ **TRAFIKSIKKERHED** STRATEGISKE ANALYSER FREMTIDENS TRAFIK SELVKØRENDE BILER

Sorte pletter
Spøgelsesbiler
Cykel-højresving for rødt
Højresvingsulykker
Cykelbokse
Reklamer og trafikfare
Kontakt en ekspert i trafiksik...

Højresvingsulykker mellem cyklister og lastbiler

Hvad er en højresvingsulykke?

Der findes ingen officiel definition på en højresvingsulykke. Almindeligvis bruges betegnelsen om alle ulykker mellem to parter, hvor begge parter forud for ulykken har kørt i samme retning på samme vej, og den ene part efterfølgende er drejet til højre ind foran den anden.

De fleste højresvingsulykker, som registreres af politiet, involverer en højresvingende personbil og en ligeudkørende cyklist. Når der især er fokus på ulykker mellem højresvingende lastbiler og ligeudkørende cyklister, er det fordi disse ulykker resulterer i de mest alvorlige personskader.

Ulykkestal for højresvingsulykker

Antal dræbte og tilskadedkomne cyklister i ulykker med højresvingende lastbiler, 2005-2017

Personskader

År	Dræbt	Alvorligt tilskadedkomne	Lettere tilskadedkomne	Totalt
2005	10	18	10	38
2006	8	10	6	24
2007	5	13	4	22
2008	10	12	6	28
2009	3	10	4	17
2010	2	12	4	18
2011	1	10	4	15
2012	1	9	4	14
2013	2	17	10	29
2014	1	9	4	14
2015	1	8	4	13
2016	1	12	4	17
2017 *)	1	10	4	15

■ Dræbt ■ Alvorligt tilskadedkomne ■ Lettere tilskadedkomne

Linkliste

- Læs rapporten "Højresvingsulykker"
- Strategi for forebyggelse af højresvingsulykker
- Læs folderen "Undgå højresvingsulykker"
- Prevent right-turn accidents
Road and traffic engineering measures in signalized intersections
- Forsøg med cykelbokse
- Udenlandske erfaringer om højresvingsulykker
- Havarikommisionens rapport om højresvingsulykker
- Pulje mod højresvingsulykker

Kontakt

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