

## Frontal collisions between trucks and cars

*The Dutch contribution to Phase A (Accident data and statistics) of EEVC Working Group 14*

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# 1. Introduction

The frequency and seriousness of collisions between trucks and cars - especially the frontal collisions - are investigated.

The national data of accidents with casualties in the Netherlands as registered by police officers were used. Yearly the SWOV received these data from the AVV of the Ministry of Transport and Public Works. Accidents with material damage only (MDO) were not included owing to the interest for the more serious accidents.

The selected accident data are completed with vehicle data, supplied by the Department of Road Transport (RDW) of the Ministry of Transport and Public Works.

This study is the Dutch contribution to Phase A (Accident Data and Statistics) of the research programme of EEVC Working Group 14: "Development of a Test Procedure for Energy-absorbing Front Underrun Protection Systems for Trucks". The study is carried out by SWOV Institute for Road Safety Research in commission by TNO Road-Vehicles Research Institute.

The accidents are considered over a period of 5 years (1989 to 1993). Analysing the tendency, the years are taken separately. The more detailed tables comprise this five years as total.

The number of accidents are given and the seriousness is expressed in the number of death (AIS 6), hospital casualties ( $\approx$  AIS 3-5) and casualties with minor injuries ( $\approx$  AIS 1-2).

Some general variables are included to get more information about the circumstances of the accident, such as inside and outside built-up areas, intersections and road sections. These data give e.g. an impression about the impact velocity.

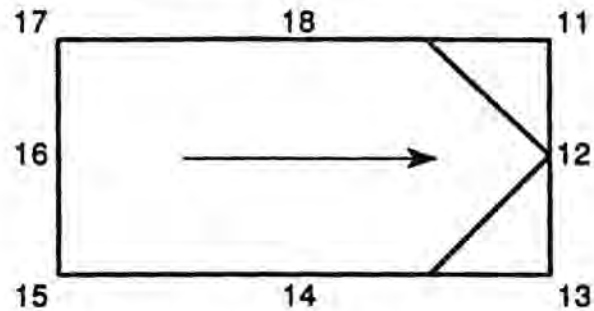
Special attention is paid to the location of the front damage. In the Dutch accident data the vehicle front is divided in three parts: left front, middle front and right front. The number of accidents and casualties are given by crossing these parts e.g. left front of the truck against middle front of the car.

Collisions with parked cars are not included in these statistics. However collisions with parked trucks are included.

In the official accident reports no collision angles are registered. So it is not possible to give information about the angle of impact. This variable is more or less covered by the given vehicles manoeuvres prior to the accident.

## 2. Description of the coding of the location of damage

The location of the front damage is coded, based on pictures of the collision. The following codes are used.



The numbers on the corners are related to frontal as well as side collisions. To make a distinction, the vehicle's manoeuvre prior to the accident has been taken into account. In case a manoeuvre is coded as 'frontal collision', it is probably that code '11' means a location of damage at the front.

In the tables this particular manoeuvre is specified as 'frontal collision in opposite direction'.

### 3. Truck-car accidents

#### 3.1. Description

In all tables the frequency and seriousness of collisions between trucks and cars is expressed in all tables as the number of accidents and the number of casualties. The casualties are divided in the number of death, hospital casualties and casualties with minor injuries (expressed as 'other'). Only Tables 1 and 2 make a distinction in frontal collisions in opposite direction and other collisions, e.g. side and rear collisions. All other tables include the frontal collisions in opposite direction only. In Table 1 the accident year is given separately. In all other tables the total number of accidents of the years together is given.

#### 3.2. Results

The Tables 1 through 6 are given as Appendix. Following, the results are discussed briefly.

Table 1. *Trend in accidents and casualties for truck-car collisions (1989 to 1993)*

The accident types are divided in frontal collisions in opposite direction and other collisions. The accidents and casualties are given for the years 1989 to 1993.

It appears that the contribution of the frontal collisions in opposite direction is 29% of the total number of accidents.

The number of accidents is decreasing from 1989 to 1993 for both accident types. Also the number of deaths and hospitalizations of car occupants is decreasing.

The accident group 'frontal collisions' in comparison with the group 'other collisions' are the most serious accidents: the average total percentages of deaths among the car occupants are 14.9% vs 5.8% and of hospitalizations among the car occupants: 34.7% vs 29.0%.

Also for the truck occupants the group 'frontal collisions' is more serious: 1210 accidents give 7 killed occupants, contrary to the group 'other collisions' with 2 killed truck occupants in 3028 accidents.

Truck-car accidents give in average on every one killed truck occupant 48 killed car occupants.

Table 2. *Location of damage for frontal and other types of accidents (1989 to 1993)*

With frontal collisions the locations of damage are divided in only frontal and other locations. With other accident types the locations of damage are divided in:

- truck front vs car front (front means here also front angular point)
- truck front vs car side
- truck front vs car rear
- truck side vs front car
- truck rear vs front car
- all locations truck vs car trailer
- truck trailer vs all locations car
- and a rest group

This table shows that the seriousness of the frontal collisions is caused by two types of collisions: truck front vs car front and truck front vs other car damage locations (resp. 19.2 and 18.2% death of car occupants).

Within the group 'other collisions' the truck front vs car side and truck trailer vs all locations car are the most serious accidents: death percentage of car occupants resp. 12.1 and 8.7%.

It is remarkable that the percentages of the hospital injuries are very similar for the various collisions types (often over the 30%). It means that the seriousness of all kinds of collisions is high.

Table 3. *Frontal collisions for built up areas (1989 to 1993)*

The areas are divided in inside and outside built up areas. This table gives the data for the frontal collisions only. It emphasizes the seriousness of the frontal truck-car accidents for outside built up areas: death percentage of car occupants for these areas is 20.4% in comparison with the percentage for inside built up areas of 4.3. The differences for the hospital casualties are minor.

Table 4. *Frontal collisions for road situations (1989 to 1993)*

A similar table is made for the difference in intersections and road sections. The highest percentage of killed car occupants is found on road sections 21.4% death vs 8.8% on intersections. On intersections the most dangerous collisions are of the type: truck front against non frontal locations of the car (e.g. an inclined collision in the cars side: death percentage 17.4).

On road sections the front-front and front-other collisions score the highest: death percentages resp. 27.4 and 21.4.

Table 5. *Frontal collisions for built-up areas and road situations (1989 to 1993)*

This table gives the combination of Tables 3 and 4. The most hazardous situation is the road section outside built-up areas: death percentage 26.3. On these locations the collision type "front-front" scores worst: a death percentage of 33.7.

In the following table this collision type is specified.

Front-front collisions	Accidents		Death car occupants	
	N	%	N	%
<i>Inside</i>				
intersections	105	17.9	3	2.1
road sections	84	14.3	5	3.5
<i>Outside</i>				
intersections	119	20.3	14	9.9
road sections	278	47.4	119	84.4
<i>Total</i>	586	100	141	100

In number and seriousness the front-front collisions are overrepresented on the road sections outside the built-up areas.

Table 6. *Front truck - front car collisions for location of damage (1989 to 1993)*



Specific for the 586 front-front accidents the location of damage is split up in the particular front damage locations (a 3 x 3 matrix). The collisions 'left truck - middle car' and 'middle truck - middle car' are overrepresented with about 30% of the number of accidents. The 'middle truck - middle car' collision scores worst (car death percentage 32.3). The types 'left truck -left car', 'left truck - middle car' and 'right truck - right car' score equal with about 16% (death percentage). The latter is based on only 8 accidents. The hospital casualties are with 16.7% underrepresented; so the relative high death percentage is probably accidental.

## 4. Truck-car accidents divided in vehicle mass

### 4.1. Description

To complete the accident data of the former chapter with vehicle data, a connection is established between the accident data base and vehicle data base. The key for these bases is the license number of the car.

Some problems were found with these license numbers: wrong accident registration, wrong accident coding (instead of coding a truck, a van was coded), the data of some vehicles involved in accidents of older date were not in the data base anymore (only on micro fiches).

To a total of 586 accidents of the type 'front vs front', 202 cases (34%) were more or less incomplete owing to the following reasons:

- mass of both vehicle types unknown: 8%
- coding a 'van' instead of a truck: 6%
- mass of truck unknown: 7%
- mass of car unknown: 13%

Since the mass of the other vehicle of the two first mentioned categories is well known, these data are partly useful. Consequently the data are given in the tables.

The vehicle data, supplied by the Department of Road Transport (RDW) of the Ministry of Transport and Public Works, are divided in the following classes:

#### *Passenger cars (empty mass)*

- light class (L):  $\leq 800$  kg
- middle class (M):  $> 800$  kg -  $\leq 1100$  kg
- heavy class (H):  $> 1100$  kg

#### *Trucks (GVW)*

- light class (L):  $\geq 3,500$  kg -  $\leq 7,500$  kg
- middle class (M):  $> 7,500$  kg -  $\leq 12,000$  kg
- heavy class (H):  $> 12,000$  kg

The mass codes L, M and H are also used in the tables.

Owing to the interest in the front-front collisions, the mass distribution is only given for these types of accidents. In the Tables 2-6 these accidents are marked with a '\*' with a reference to the tables in which the mass data are given (Tables 7-11).

### 4.2. Results

The Tables 7 through 11 are also given as Appendix.

Table 7d gives the total of the frontal collisions in opposite direction (number of accidents 1209). In comparison with Table 2 the data of one accident was incorrect and not given in the Tables 7 - 11.

Leaving the accidents with the label 'unknown' and 'vans' aside, in Table 7a the following distribution of vehicle mass is found.

<i>Trucks</i>	
≥ 3,500 kg - ≤ 7,500 kg	34%
> 7,500 kg - ≤ 12,000 kg	14%
> 12,000 kg	52%

<i>Passenger cars</i>	
≤ 800 kg	20%
> 800 kg - ≤ 1100 kg	62%
> 1100 kg	18%

The non equal distribution make it necessary to the analyses to consider the relative amount of the serious injured casualties (deaths and hospital casualties) within a vehicle mass category.

In general the analyses concern the discussion about the percentage of death (and hospital casualties) of car occupants for the three mass categories of trucks. Within each mass category of trucks, the severity for the car occupants is considered.

Briefly the following results are discussed.

*Table 7. Frontal collisions and location of damage*

In the Tables 7a through 7d only the frontal collisions in opposite direction are split up. The following tables with a distinction in locations of damage are made:

- Table 7a: truck front vs car front
- Table 7b: truck front vs other locations of the car
- Table 7c: other locations of the truck vs car front
- Table 7d: total of Tables 7a through 7c.

In Table 7a the total percentages of death car occupants for the three truck mass classes (light, middle and heavy) are resp. 21, 28, 18%. Adding the percentages for the hospital casualties these result in resp. 58, 62 and 52%. As a first remark can be given that the difference between the three truck mass classes is small. Secondly there is an absence in relationship between the given mass classes and these values of percentages.

The same applies for the death percentages of the different car mass categories within the three mass categories of trucks: a light car gives not always the most serious casualties. This applies for the light trucks as well as for the middle and heavy classes.

The results of Table 7b are comparable with the results of Table 7a.

The data in Table 7c are less important owing to the minor number of casualties among the car occupants.

*Table 8. Front vs front collisions for built up areas*

In Table 8a and 8b the 586 front-front accidents of Table 7a are distinguished in resp. inside and outside built up areas. Since the less serious accidents occurs inside the built up areas, Table 8b gives the seriousness of the truck-car problem.

Also Table 8b expresses that the difference between the total percentages of death and hospital casualties car occupants for the three truck mass classes (light, middle and heavy) is minor, resp. 67, 68 and 63%.

The death percentages of the different car mass categories within the three mass categories of trucks are:

- light trucks: car death percentages 27, 15 and 29% (resp. light, middle and heavy cars)

- middle class trucks: car death percentages 38, 42 and 11%
- heavy class trucks: car death percentages 16, 27 and 6%

These data show that a pronounced relation between car mass and death percentage of the occupants is not found.

Table 9. *Front vs front collisions for road situations*

In Tables 9a and 9b data are given for intersections and road sections. Most car occupants were killed on intersections in the light truck mass class (Table 9a). The reason for this is unknown.

In general the most serious accidents occur on road sections (Table 9b). Car occupants percentages (death + hospital) give a light declining relation with truck mass: light, middle and heavy resp. 67, 66 and 60%.

Within the three mass categories of trucks, the relation between the percentages of car occupants (death and also hospital) is not uniform.

Table 10. *Front vs front collisions for built up areas and road situations*

119 of the 141 car occupants were killed on road sections outside the built-up areas (see Table 10d). Only this table will be discussed.

Car occupants percentages (death + hospital) for the three classes truck mass give here also less difference: light, middle and heavy resp. 70, 67 and 69%. Also this table shows that within the three mass categories of trucks, no clear relationship between the percentages of car occupants (death and also hospital) is found.

Table 11. *Front vs front collisions for location of damage*

Within the data of table 6 only those accidents are selected which are represented in a sufficient amount:

Table 11a: front left side truck vs front left side car; number of accidents 72 and 15 killed car occupants

Table 11b: front left side truck vs front middle car; number of accidents 165 and 33 killed car occupants

Table 11c: front middle truck vs front middle car; number of accidents 178 and 75 killed car occupants

Table 11d: front right side truck vs front middle car; number of accidents 70 and 6 killed car occupants.

The number of accidents and killed car occupants are without the accidents with vans.

Concerning Table 11c the following remarks can be given. In Table 6 it was already found that the 'middle truck - middle car' collision scores highest: in 42% of the accidents a car occupant was killed. Relatively the most car occupants were killed in collisions of trucks in the mass class 'middle' with cars in the middle mass class (death percentage 66.7); nevertheless the extent of the accidents in these mass classes is minor (7 accidents).

Table 1. Trend in accidents and casualties for truck-car collisions (1989 to 1993).

Year	Accidents		Casualties trucks						Casualties cars									
			Death		Hospital		Other		Total		Death		Hospital		Other		Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
<u>Frontal collisions in opposite direction</u>																		
1989	269	22.2	4	19.0	3	14.3	14	66.7	21	100	51	16.2	121	38.4	143	45.4	315	100
1990	256	21.2	2	10.5	7	36.8	10	52.6	19	100	55	16.9	111	34.2	159	48.9	325	100
1991	232	19.2	0	0.0	5	27.8	13	72.2	18	100	40	14.3	90	32.1	150	53.6	280	100
1992	230	19.0	1	5.0	3	15.0	16	80.0	20	100	41	13.9	105	35.5	150	50.7	296	100
1993	223	18.4	0	0.0	9	39.1	14	60.9	23	100	37	12.8	95	33.0	156	54.2	288	100
Total	1210	100	7	6.9	7	26.7	67	66.3	101	100	224	14.9	522	34.7	758	50.4	1504	100
<u>Other collisions</u>																		
1989	624	20.6	0	0.0	10	28.6	25	71.4	35	100	51	6.9	251	33.8	441	59.4	743	100
1990	618	20.4	0	0.0	7	17.5	33	82.5	40	100	44	6.2	195	27.6	467	66.1	706	100
1991	620	20.5	1	2.6	5	12.8	33	84.6	39	100	40	5.5	201	27.6	488	66.9	729	100
1992	594	19.6	1	2.4	8	19.5	32	78.0	41	100	37	5.2	199	28.1	471	66.6	707	100
1993	572	18.9	0	0.0	4	11.1	32	88.9	36	100	34	5.0	187	27.6	456	67.4	677	100
Total	3028	100	2	1.0	34	17.8	155	81.2	191	100	206	5.8	1033	29.0	2323	65.2	3562	100
<u>Total</u>																		
1989	893	21.1	4	7.1	13	23.2	39	69.6	56	100	102	9.6	372	35.2	584	55.2	1058	100
1990	874	20.6	2	3.4	14	23.7	43	72.9	59	100	99	9.6	306	29.7	626	60.7	1031	100
1991	852	20.1	1	1.8	10	17.5	46	80.7	57	100	80	7.9	291	28.8	638	63.2	1009	100
1992	824	19.4	2	3.3	11	18.0	48	78.7	61	100	78	7.8	304	30.3	621	61.9	1003	100
1993	795	18.8	0	0.0	13	22.0	46	78.0	59	100	71	7.4	282	29.2	612	63.4	965	100
Total	4238	100	9	3.1	61	20.9	222	76.0	292	100	430	8.5	1555	30.7	3081	60.8	5066	100

Table 2. Location of damage for frontal and other types of accidents (1989 to 1993).

Location of damage	Accidents		Casualties trucks								Casualties cars							
	N	%	Death	Hospital	Other	Total	Death	Hospital	Other	Total	Death	Hospital	Other	Total				
Truck-Car	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%		
<u>Frontal collisions in opposite direction</u>																		
front-front	586	48.4*	3	4.8	16	25.4	44	69.8	63	100	141	19.2	264	36.0	328	44.7	733	100
front-other	273	22.6*	3	14.3	5	23.8	13	61.9	21	100	62	18.2	114	33.5	164	48.2	340	100
other-front	351	29.0*	1	5.9	6	35.3	10	58.8	17	100	21	4.9	144	33.4	266	61.7	431	100
Total	1210	100*	7	6.9	27	26.7	67	66.3	101	100	224	14.9	522	34.7	758	50.4	1504	100
<u>Other collisions</u>																		
front-front	353	11.7	0	0.0	7	24.1	22	75.9	29	100	12	3.0	115	29.2	267	67.8	394	100
front-side	578	19.1	0	0.0	6	18.2	27	81.8	33	100	89	12.1	254	34.5	393	53.4	736	100
front-rear	562	18.6	0	0.0	8	22.9	27	77.1	35	100	14	2.1	133	20.0	517	77.9	664	100
side-front	291	9.6	0	0.0	4	15.4	22	84.6	26	100	11	3.3	98	29.5	223	67.2	332	100
rear-front	466	15.4	1	3.6	3	10.7	24	85.7	28	100	11	2.1	138	26.1	379	71.8	528	100
all-trailer	11	0.4	0	-	0	-	0	-	0	-	0	0.0	4	33.3	8	66.7	12	100
trailer-all	420	13.9	1	11.1	2	22.2	6	66.7	9	100	46	8.7	196	37.3	284	54.0	526	100
other	347	11.5	0	0.0	4	12.9	27	87.1	31	100	23	6.2	95	25.7	252	68.1	370	100
Total	3028	100	2	1.0	34	17.8	155	81.2	191	100	206	5.8	1033	29.0	2323	65.2	3562	100
<u>Total</u>																		
front-front	939	22.2	3	3.3	23	25.0	66	71.7	92	100	153	13.6	379	33.6	595	52.8	1127	100
front-other	273	6.4	3	14.3	5	23.8	13	61.9	21	100	62	18.2	114	33.5	164	48.2	340	100
other-front	351	8.3	1	5.9	6	35.3	10	58.8	17	100	21	4.9	144	33.4	266	61.7	431	100
front-side	578	13.6	0	0.0	6	18.2	27	81.8	33	100	89	12.1	254	34.5	393	53.4	736	100
front-rear	562	13.3	0	0.0	8	22.9	27	77.1	35	100	14	2.1	133	20.0	517	77.9	664	100
side-front	291	6.9	0	0.0	4	15.4	22	84.6	26	100	11	3.3	98	29.5	223	67.2	332	100
rear-front	466	11.0	1	3.6	3	10.7	24	85.7	28	100	11	2.1	138	26.1	379	71.8	528	100
all-trailer	11	0.3	0	-	0	-	0	-	0	-	0	0.0	4	33.3	8	66.7	12	100
trailer-all	420	9.9	1	11.1	2	22.2	6	66.7	9	100	46	8.7	196	37.3	284	54.0	526	100
other	347	8.2	0	0.0	4	12.9	27	87.1	31	100	23	6.2	95	25.7	252	68.1	370	100
Total	4238	100	9	3.1	61	20.9	222	76.0	292	100	430	8.5	1555	30.7	3081	60.8	5066	100

\* For the distribution in truck and car mass see tables 7a, 7b, 7c and 7d.

Table 3. Frontal collisions for built up areas (1989 to 1993).

Location of damage	Accidents		Casualties trucks						Casualties cars									
			Death		Hospital		Other		Total		Death		Hospital		Other		Total	
Truck-Car	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
<u>Inside built-up area</u>																		
front-front	189	45.7*	0	0.0	1	7.1	13	92.9	14	100	8	3.6	64	28.6	152	67.9	224	100
front-other	114	27.5	0	0.0	0	0.0	4	100.0	4	100	12	7.7	57	36.5	87	55.8	156	100
other-front	111	26.8	0	0.0	1	11.1	8	88.9	9	100	2	1.5	41	30.6	91	67.9	134	100
Total	414	100	0	0.0	2	7.4	25	92.6	27	100	22	4.3	162	31.5	330	64.2	514	100
<u>Outside built-up area</u>																		
front-front	397	49.9*	3	6.1	15	30.6	31	63.3	49	100	133	26.1	200	39.3	176	34.6	509	100
front-other	159	20.0	3	17.6	5	29.4	9	52.9	17	100	50	27.2	57	31.0	77	41.8	184	100
other-front	240	30.2	1	12.5	5	62.5	2	25.0	8	100	19	6.4	103	34.7	175	58.9	297	100
Total	796	100	7	9.5	25	33.8	42	56.8	74	100	202	20.4	360	36.4	428	43.2	990	100
<u>Total</u>																		
front-front	586	48.4	3	4.8	16	25.4	44	69.8	63	100	141	19.2	264	36.0	328	44.7	733	100
front-other	273	22.6	3	14.3	5	23.8	13	61.9	21	100	62	18.2	114	33.5	164	48.2	340	100
other-front	351	29.0	1	5.9	6	35.3	10	58.8	17	100	21	4.9	144	33.4	266	61.7	431	100
Total	1210	100	7	6.9	27	26.7	67	66.3	101	100	224	14.9	522	34.7	758	50.4	1504	100

\* For the distribution in truck and car mass see tables 8a and 8b.



Table 4. Frontal collisions for road situation (1989 to 1993).

Location of damage	Accidents		Casualties trucks								Casualties cars							
	N	%	Death		Hospital		Other		Total		Death		Hospital		Other		Total	
N			%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	
<b>Truck-Car</b>																		
<u>Intersections</u>																		
front-front	224	36.2*	2	10.5	4	21.1	13	68.4	19	100	17	6.1	103	36.8	160	57.1	280	100
front-other	206	33.3	0	0.0	1	14.3	6	85.7	7	100	47	17.4	93	34.4	130	48.1	270	100
other-front	189	30.5	0	0.0	2	22.2	7	77.8	9	100	5	2.2	76	32.9	150	64.9	231	100
Total	619	100	2	5.7	7	20.0	26	74.3	35	100	69	8.8	272	34.8	440	56.3	781	100
<u>Road sections</u>																		
front-front	362	61.3*	1	2.3	12	27.3	31	70.5	44	100	124	27.4	161	35.5	168	37.1	453	100
front-other	67	11.3	3	21.4	4	28.6	7	50.0	14	100	15	21.4	21	30.0	34	48.6	70	100
other-front	162	27.4	1	12.5	4	50.0	3	37.5	8	100	16	8.0	68	34.0	116	58.0	200	100
Total	591	100	5	7.6	20	30.3	41	62.1	66	100	155	21.4	250	34.6	318	44.0	723	100
<u>Total</u>																		
front-front	586	48.4	3	4.8	16	25.4	44	69.8	63	100	141	19.2	264	36.0	328	44.7	733	100
front-other	273	22.6	3	14.3	5	23.8	13	61.9	21	100	62	18.2	114	33.5	164	48.2	340	100
other-front	351	29.0	1	5.9	6	35.3	10	58.8	17	100	21	4.9	144	33.4	266	61.7	431	100
Total	1210	100	7	6.9	27	26.7	67	66.3	101	100	224	14.9	522	34.7	758	50.4	1504	100

\* For the distribution in truck and car mass see tables 9a and 9b.



Table 5. Frontal collisions for built up areas and road situation (1989 to 1993).

Location of damage	Casualties trucks								Casualties cars									
	Death		Hospital		Other		Total		Death		Hospital		Other		Total			
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%		
<u>Inside built-up area - Intersections</u>																		
front-front	105	37.6*	0	0.0	1	16.7	5	83.3	6	100	3	2.4	30	24.2	91	73.4	124	100
front-other	98	35.1	0	0.0	0	0.0	3	100.0	3	100	11	8.0	51	37.0	76	55.1	138	100
other-front	76	27.2	0	0.0	1	16.7	5	83.3	6	100	1	1.1	26	28.6	64	70.3	91	100
Total	279	100	0	0.0	2	13.3	13	86.7	15	100	15	4.2	107	30.3	231	65.4	353	100
<u>Inside built-up area - Road sections</u>																		
front-front	84	62.2*	0	0.0	0	0.0	8	100.0	8	100	5	5.0	34	34.0	61	61.0	100	100
front-other	16	11.9	0	0.0	0	0.0	1	100.0	1	100	1	5.6	6	33.3	11	61.1	18	100
other-front	35	25.9	0	0.0	0	0.0	3	100.0	3	100	1	2.3	15	34.9	27	62.8	43	100
Total	135	100	0	0.0	0	0.0	12	100.0	12	100	7	4.3	55	34.2	99	61.5	161	100
<u>Outside built-up area - Intersections</u>																		
front-front	119	35.0*	2	15.4	3	23.1	8	61.5	13	100	14	9.0	73	46.8	69	44.2	156	100
front-other	108	31.8	0	0.0	1	25.0	3	75.0	4	100	36	27.3	42	31.8	54	40.9	132	100
other-front	113	33.2	0	0.0	1	33.3	2	66.7	3	100	4	2.9	50	35.7	86	61.4	140	100
Total	340	100	2	10.0	5	25.0	13	65.0	20	100	54	12.6	165	38.6	209	48.8	428	100
<u>Outside built-up area - Road sections</u>																		
front-front	278	61.0*	1	2.8	2	33.3	23	63.9	36	100	119	33.7	127	36.0	107	30.3	353	100
front-other	51	11.2	3	23.1	4	30.8	6	46.2	13	100	14	26.9	15	28.8	23	44.2	52	100
other-front	127	27.9	1	20.0	4	80.0	0	0.0	5	100	15	9.6	53	33.8	89	56.7	157	100
Total	456	100	5	9.3	20	37.0	29	53.7	54	100	148	26.3	195	34.7	219	39.0	562	100
<u>Total</u>																		
front-front	586	48.4	3	4.8	16	25.4	44	69.8	63	100	141	19.2	264	36.0	328	44.7	733	100
front-other	273	22.6	3	14.3	5	23.8	13	61.9	21	100	62	18.2	114	33.5	164	48.2	340	100
other-front	351	29.0	1	5.9	6	35.3	10	58.8	17	100	21	4.9	144	33.4	266	61.7	431	100
Total	1210	100	7	6.9	27	26.7	67	66.3	101	100	224	14.9	522	34.7	758	50.41	504	100

\* For the distribution in truck and car mass see tables 10a, 10b, 10c and 10d.

Table 6. Front truck - front car collisions for location of damage (1989 to 1993).

Location of damage	Accidents		Casualties trucks						Casualties cars									
	N	%	Death		Hospital		Other		Total		Death		Hospital		Other		Total	
N			%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	
Truck-Car																		
left-left	76	13.0*	0	0.0	2	22.2	7	77.8	9	100	15	17.4	33	38.4	38	44.2	86	100
left-middle	176	30.0*	0	0.0	0	0.0	9	100.0	9	100	33	15.3	81	37.5	102	47.2	216	100
left-right	11	1.9	0	0.0	1	100	0	0.0	1	100	0	0.0	6	50.0	6	50.0	12	100
middle-left	29	4.9	0	0.0	1	20.0	4	80.0	5	100	3	8.3	12	33.3	21	58.3	36	100
middle-middle	188	32.1*	3	8.6	12	34.3	20	57.1	35	100	82	32.3	90	35.4	82	32.3	254	100
middle-right	8	1.4	0	0.0	0	0.0	11	100.0	1	100	0	0.0	5	62.5	3	37.5	8	100
right-left	15	2.6	0	0.0	0	0.0	21	100.0	2	100	0	0.0	6	40.0	9	60.0	15	100
right-middle	75	12.8*	0	0.0	0	0.0	11	100.0	1	100	6	6.4	29	30.9	59	62.8	94	100
right-right	8	1.4	0	-	0	-	0	-	0	-	2	16.7	2	16.7	8	66.7	12	100
Total	586	100	3	4.8	16	25.4	44	69.8	63	100	141	19.2	264	36.0	328	44.7	733	100

\* For the distribution in truck and car mass see tables 11a, 11b, 11c and 11d.

Table 7a. Frontal collisions in opposite direction; location of damage "front-front" (see table 2)

Mass categories		Casualties trucks								Casualties cars									
		Death		Hospital		Other		Total		Death		Hospital		Other		Total			
Trucks	Cars	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%		
Unkn	unkn	49	55.1	1	16.7	1	16.7	4	66.7	6	100	9	15.3	22	37.3	28	47.5	59	100
	L C	7	7.9	0	-	0	-	0	-	0	-	0	0.0	5	62.5	3	37.5	8	100
	M C	23	25.8	0	0.0	0	0.0	6	100.0	6	100	5	17.9	12	42.9	11	39.3	28	100
	H C	10	11.2	1	100.0	0	0.0	0	0.0	1	100	4	30.8	2	15.4	7	53.8	13	100
	Total	89	100	2	15.4	1	7.7	10	76.9	13	100	18	16.7	41	38.0	49	45.4	108	100
L T	unkn	23	13.6	1	100.0	0	0.0	0	0.0	1	100	17	54.8	10	32.3	4	12.9	31	100
	L C	32	18.9	0	0.0	2	66.7	1	33.3	3	100	9	19.6	19	41.3	18	39.1	46	100
	M C	86	50.9	0	0.0	1	11.1	8	88.9	9	100	11	11.3	36	37.1	50	51.5	97	100
	H C	28	16.6	0	0.0	1	33.3	2	66.7	3	100	8	22.2	12	33.3	16	44.4	36	100
	Total	169	100	1	6.3	4	25.0	11	68.8	16	100	45	21.4	77	36.7	88	41.9	210	100
M T	unkn	12	22.6	0	-	0	-	0	-	0	-	6	35.3	8	47.1	3	17.6	17	100
	L C	10	18.9	0	0.0	1	50.0	1	50.0	2	100	3	23.1	6	46.2	4	30.8	13	100
	M C	23	43.4	0	0.0	2	66.7	1	33.3	3	100	9	30.0	8	26.7	13	43.3	30	100
	H C	8	15.1	0	-	0	-	0	-	0	-	1	11.1	2	22.2	6	66.7	9	100
	Total	53	100	0	0.0	3	60.0	2	40.0	5	100	19	27.5	24	34.8	26	37.7	69	100
H T	unkn	43	17.9	0	0.0	1	25.0	3	75.0	4	100	19	29.7	26	40.6	19	29.7	64	100
	L C	31	12.9	0	0.0	0	0.0	1	100.0	1	100	3	9.1	12	36.4	18	54.5	33	100
	M C	140	58.3	0	0.0	3	37.5	5	62.5	8	100	29	16.9	54	31.4	89	51.7	172	100
	H C	26	10.8	0	0.0	0	0.0	1	100.0	1	100	1	3.7	11	40.7	15	55.6	27	100
	Total	240	100	0	0.0	4	28.6	10	71.4	14	100	52	17.6	103	34.8	141	47.6	296	100
Vans	unkn	3	8.6	0	0.0	1	100	0	0.0	1	100	0	0.0	2	50.0	2	50.0	4	100
	L C	3	8.6	0	-	0	-	0	-	0	-	0	0.0	2	66.7	1	33.3	3	100
	M C	18	51.4	0	0.0	2	25.0	6	75.0	8	100	6	23.1	9	34.6	11	42.3	26	100
	H C	11	31.4	0	0.0	1	16.7	5	83.3	6	100	1	5.9	6	35.3	10	58.8	17	100
	Total	35	100	0	0.0	4	26.7	11	73.3	15	100	7	14.0	19	38.0	24	48.0	50	100
Total	unkn	130	22.2	2	16.7	3	25.0	7	58.3	12	100	51	29.1	68	38.9	56	32.0	175	100
	L C	83	14.2	0	0.0	3	50.0	3	50.0	6	100	15	14.6	44	42.7	44	42.7	103	100
	M C	290	49.5	0	0.0	8	23.5	26	76.5	34	100	60	17.0	119	33.7	174	49.3	353	100
	H C	83	14.2	1	9.1	2	18.2	8	72.7	11	100	15	14.7	33	32.4	54	52.9	102	100
	Total	586	100	3	4.8	16	25.4	44	69.8	63	100	141	19.2	264	36.0	328	44.7	733	100

Mass categories: trucks

L T 3,500- 7,500 kg  
M T 7,500-12,000 kg  
H T > 12,000 kg

Mass categories: cars

L C < 800 kg  
M C 800-1,100 kg  
H C > 1,100 kg

Table 7b. Frontal collisions in opposite direction; location of damage "front-other" (see table 2)

Mass categories		Casualties trucks								Casualties cars									
		Death		Hospital		Other		Total		Death		Hospital		Other		Total			
Trucks	Cars	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%		
Unkn	unkn	25	42.4	1	25.0	1	25.0	2	50.0	4	100	6	19.4	12	38.7	13	41.9	31	100
	L C	5	8.5	0	0.0	0	0.0	2	100.0	2	100	0	0.0	2	40.0	3	60.0	5	100
	M C	23	39.0	0	-	0	-	0	-	0	-	4	13.3	10	33.3	16	53.3	30	100
	H C	6	10.2	1	25.0	3	75.0	0	0.0	4	100	1	20.0	1	20.0	3	60.0	5	100
	Total	59	100	2	20.0	4	40.0	4	40.0	10	100	11	15.5	25	35.2	35	49.3	71	100
L T	unkn	12	20.0	0	0.0	1	100	0	0.0	1	100	5	38.5	2	15.4	6	46.2	13	100
	L C	13	21.7	0	-	0	-	0	-	0	-	6	37.5	4	25.0	6	37.5	16	100
	M C	31	51.7	0	0.0	0	0.0	1	100.0	1	100	4	10.0	17	42.5	19	47.5	40	100
	H C	4	6.7	1	50.0	0	0.0	1	50.0	2	100	0	0.0	3	75.0	1	25.0	4	100
	Total	60	100	1	25.0	1	25.0	2	50.0	4	100	15	20.5	26	35.6	32	43.8	73	100
M T	unkn	4	12.9	0	-	0	-	0	-	0	-	2	28.6	1	14.3	4	57.1	7	100
	L C	8	25.8	0	-	0	-	0	-	0	-	2	14.3	10	71.4	2	14.3	14	100
	M C	14	45.2	0	-	0	-	0	-	0	-	1	6.7	4	26.7	10	66.7	15	100
	H C	5	16.1	0	-	0	-	0	-	0	-	2	40.0	1	20.0	2	40.0	5	100
	Total	31	100	0	-	0	-	0	-	0	-	7	17.1	16	39.0	18	43.9	41	100
H T	unkn	24	22.2	0	0.0	0	0.0	1	100.0	1	100	9	28.1	10	31.3	13	40.6	32	100
	L C	22	20.4	0	0.0	0	0.0	1	100.0	1	100	7	29.2	5	20.8	12	50.0	24	100
	M C	50	46.3	0	0.0	0	0.0	3	100.0	3	100	10	15.6	21	32.8	33	51.6	64	100
	H C	12	11.1	0	0.0	0	0.0	1	100.0	1	100	3	20.0	5	33.3	7	46.7	15	100
	Total	108	100	0	0.0	0	0.0	6	100.0	6	100	29	21.5	41	30.4	65	48.1	135	100
Vans	unkn	1	6.7	0	-	0	-	0	-	0	-	0	0.0	1	100	0	0.0	1	100
	L C	2	13.3	0	0.0	0	0.0	1	100.0	1	100	0	0.0	1	33.3	2	66.7	3	100
	M C	9	60.0	0	-	0	-	0	-	0	-	0	0.0	4	40.0	6	60.0	10	100
	H C	3	20.0	0	-	0	-	0	-	0	-	0	0.0	0	0.0	6	100.0	6	100
	Total	15	100	0	0.0	0	0.0	1	100.0	1	100	0	0.0	6	30.0	14	70.0	20	100
Total	unkn	66	24.2	1	16.7	2	33.3	3	50.0	6	100	22	26.2	26	31.0	36	42.9	84	100
	L C	50	18.3	0	0.0	0	0.0	4	100.0	4	100	15	24.2	22	35.5	25	40.3	62	100
	M C	127	46.5	0	0.0	0	0.0	4	100.0	4	100	19	11.9	56	35.2	84	52.8	159	100
	H C	30	11.0	2	28.6	3	42.9	2	28.6	7	100	6	17.1	10	28.6	19	54.3	35	100
	Total	273	100	3	14.3	5	23.8	13	61.9	21	100	62	18.2	114	33.5	164	48.2	340	100

Mass categories: trucks

L T 3,500- 7,500 kg  
M T 7,500-12,000 kg  
H T > 12,000 kg

Mass categories: cars

L C < 800 kg  
M C 800-1,100 kg  
H C > 1,100 kg

Table 7c. Frontal collisions in opposite direction; location of damage "other-front" (see table 2)

Mass categories		Accidents								Casualties trucks								Casualties cars							
Trucks	Cars	N		Death		Hospital		Other		Total		N		Death		Hospital		Other		Total					
			%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%				
Unkn	unkn	37	46.8	1	25.0	1	25.0	2	50.0	4	100	1	2.6	20	52.6	17	44.7	38	100						
	L C	10	12.7	0	0.0	0	0.0	3	100.0	3	100	0	0.0	3	25.0	9	75.0	12	100						
	M C	19	24.1	0	0.0	1	100	0	0.0	1	100	1	3.4	11	37.9	17	58.6	29	100						
	H C	13	16.5	0	0.0	0	0.0	1	100.0	1	100	0	0.0	5	31.3	11	68.8	16	100						
	Total	79	100	1	11.1	2	22.2	6	66.7	9	100	2	2.1	39	41.1	54	56.8	95	100						
L T	unkn	17	20.5	0	-	0	-	0	-	0	-	1	4.8	9	42.9	11	52.4	21	100						
	L C	13	15.7	0	0.0	0	0.0	1	100.0	1	100	2	14.3	5	35.7	7	50.0	14	100						
	M C	43	51.8	0	-	0	-	0	-	0	-	8	14.8	15	27.8	31	57.4	54	100						
	H C	10	12.0	0	0.0	1	100	0	0.0	1	100	0	0.0	2	15.4	11	84.6	13	100						
	Total	83	100	0	0.0	1	50.0	1	50.0	2	100	11	10.8	31	30.4	60	58.8	102	100						
M T	unkn	8	20.5	0	-	0	-	0	-	0	-	1	11.1	1	11.1	7	77.8	9	100						
	L C	6	15.4	0	-	0	-	0	-	0	-	1	12.5	5	62.5	2	25.0	8	100						
	M C	14	35.9	0	-	0	-	0	-	0	-	0	0.0	4	25.0	12	75.0	16	100						
	H C	11	28.2	0	-	0	-	0	-	0	-	0	0.0	7	50.0	7	50.0	14	100						
	Total	39	100	0	-	0	-	0	-	0	-	2	4.3	17	36.2	28	59.6	47	100						
H T	unkn	22	16.9	0	-	0	-	0	-	0	-	1	3.4	14	48.3	14	48.3	29	100						
	L C	17	13.1	0	-	0	-	0	-	0	-	1	5.0	4	20.0	15	75.0	20	100						
	M C	73	56.2	0	0.0	1	50.0	1	50.0	2	100	3	3.2	28	29.8	63	67.0	94	100						
	H C	18	13.8	0	-	0	-	0	-	0	-	0	0.0	6	31.6	13	68.4	19	100						
	Total	130	100	0	0.0	1	50.0	1	50.0	2	100	5	3.1	52	32.1	105	64.8	162	100						
Vans	unkn	1	5.3	0	-	0	-	0	-	0	-	0	0.0	1	100	0	0.0	1	100						
	L C	4	21.1	0	-	0	-	0	-	0	-	0	0.0	1	25.0	3	75.0	4	100						
	M C	8	42.1	0	0.0	2	100	0	0.0	2	100	0	0.0	2	22.2	7	77.8	9	100						
	H C	6	31.6	0	0.0	0	0.0	2	100.0	2	100	0	0.0	1	10.0	9	90.0	10	100						
	Total	19	100	0	0.0	2	50.0	2	50.0	4	100	0	0.0	5	20.8	19	79.2	24	100						
Total	unkn	85	24.3	1	25.0	1	25.0	2	50.0	4	100	4	4.1	45	45.9	49	50.0	98	100						
	L C	50	14.3	0	0.0	0	0.0	4	100.0	4	100	4	6.9	18	31.0	36	62.1	58	100						
	M C	157	44.9	0	0.0	4	80.0	1	20.0	5	100	12	5.9	60	29.7	130	64.4	202	100						
	H C	58	16.6	0	0.0	1	25.0	3	75.0	4	100	0	0.0	21	29.2	51	70.8	72	100						
	Total	350	100	1	5.9	6	35.3	10	58.8	17	100	20	4.7	144	33.5	266	61.9	430	100						

Mass categories: trucks

L T 3,500- 7,500 kg  
M T 7,500-12,000 kg  
H T > 12,000 kg

Mass categories: cars

L C < 800 kg  
M C 800-1,100 kg  
H C > 1,100 kg

Table 7d. Frontal collisions in opposite direction; location of damage "total" (see table 2)

Mass categories		Accidents/Casualties trucks								Casualties cars									
Trucks	Cars	Death		Hospital		Other		Total		Death		Hospital		Other		Total			
		N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%		
Unkn	unkn	37	46.8	1	25.0	1	25.0	2	50.0	4	100	1	2.6	20	52.6	17	44.7	38	100
	L C	22	9.7	0	0.0	0	0.0	5	100.0	5	100	0	0.0	10	40.0	15	60.0	25	100
	M C	65	28.6	0	0.0	1	14.3	6	85.7	7	100	10	11.5	33	37.9	44	50.6	87	100
	H C	29	12.8	2	33.3	3	50.0	1	16.7	6	100	5	14.7	8	23.5	21	61.8	34	100
	Total	227	100	5	15.6	7	21.9	20	62.5	32	100	31	11.3	105	38.3	138	50.4	274	100
L T	unkn	52	16.7	1	50.0	1	50.0	0	0.0	2	100	23	35.4	21	32.3	21	32.3	65	100
	L C	58	18.6	0	0.0	2	50.0	2	50.0	4	100	17	22.4	28	36.8	31	40.8	76	100
	M C	160	51.3	0	0.0	1	10.0	9	90.0	10	100	23	12.0	68	35.6	100	52.4	191	100
	H C	42	13.5	1	16.7	2	33.3	3	50.0	6	100	8	15.1	17	32.1	28	52.8	53	100
	Total	312	100	2	9.1	6	27.3	14	63.6	22	100	71	18.4	134	34.8	180	46.8	385	100
M T	unkn	24	19.5	0	-	0	-	0	-	0	-	9	27.3	10	30.3	14	42.4	33	100
	L C	24	19.5	0	0.0	1	50.0	1	50.0	2	100	6	17.1	21	60.0	8	22.9	35	100
	M C	51	41.5	0	0.0	2	66.7	1	33.3	3	100	10	16.4	16	26.2	35	57.4	61	100
	H C	24	19.5	0	-	0	-	0	-	0	-	3	10.7	10	35.7	15	53.6	28	100
	Total	123	100	0	0.0	3	60.0	2	40.0	5	100	28	17.8	57	36.3	72	45.9	157	100
H T	unkn	89	18.6	0	0.0	1	20.0	4	80.0	5	100	29	23.2	50	40.0	46	36.8	125	100
	L C	70	14.6	0	0.0	0	0.0	2	100.0	2	100	11	14.3	21	27.3	45	58.4	77	100
	M C	263	55.0	0	0.0	4	30.8	9	69.2	13	100	42	12.7	103	31.2	185	56.1	330	100
	H C	56	11.7	0	0.0	0	0.0	2	100.0	2	100	4	6.6	22	36.1	35	57.4	61	100
	Total	478	100	0	0.0	5	22.7	17	77.3	22	100	86	14.5	196	33.1	311	52.4	593	100
Vans	unkn	5	7.2	0	0.0	1	100	0	0.0	1	100	0	0.0	4	66.7	2	33.3	6	100
	L C	9	13.0	0	0.0	0	0.0	1	100.0	1	100	0	0.0	4	40.0	6	60.0	10	100
	M C	35	50.7	0	0.0	4	40.0	6	60.0	10	100	6	13.3	15	33.3	24	53.3	45	100
	H C	20	29.0	0	0.0	1	12.5	7	87.5	8	100	1	3.0	7	21.2	25	75.8	33	100
	Total	69	100	0	0.0	6	30.0	14	70.0	20	100	7	7.4	30	31.9	57	60.6	94	100
Total	unkn	281	23.2	4	18.2	6	27.3	12	54.5	22	100	77	21.6	139	38.9	141	39.5	357	100
	L C	183	15.1	0	0.0	3	21.4	11	78.6	14	100	34	15.2	84	37.7	105	47.1	223	100
	M C	574	47.5	0	0.0	12	27.9	31	72.1	43	100	91	12.7	235	32.9	388	54.3	714	100
	H C	171	14.1	3	13.6	6	27.3	13	59.1	22	100	21	10.0	64	30.6	124	59.3	209	100
	Total	1209	100	7	6.9	27	26.7	67	66.3	101	100	223	14.8	522	34.7	758	50.4	1503	100

Mass categories: trucks

L T 3,500- 7,500 kg  
M T 7,500-12,000 kg  
H T > 12,000 kg

Mass categories: cars

L C < 800 kg  
M C 800-1,100 kg  
H C > 1,100 kg



Table 8a. Front-front collisions for inside built-up area (see table 3)

Mass categories		Accidents								Casualties trucks								Casualties cars							
Trucks	Cars	N		Death		Hospital		Other		Total		N		Death		Hospital		Other		Total					
			%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%				
Unkn	unkn	37	46.8	1	25.0	1	25.0	2	50.0	4	100	1	2.6	20	52.6	17	44.7	38	100						
	L C	1	3.6	0	-	0	-	0	-	0	-	0	0.0	1	100	0	0.0	1	100						
	M C	6	21.4	0	0.0	0	0.0	1	100.0	1	100	0	0.0	3	50.0	3	50.0	6	100						
	H C	4	14.3	0	-	0	-	0	-	0	-	1	20.0	1	20.0	3	60.0	5	100						
	Total	28	100	0	0.0	0	0.0	1	100.0	1	100	3	9.7	6	19.4	22	71.0	31	100						
L T	unkn	1	2.3	0	-	0	-	0	-	0	-	0	0.0	1	100	0	0.0	1	100						
	L C	12	27.9	0	0.0	0	0.0	1	100.0	1	100	0	0.0	3	23.1	10	76.9	13	100						
	M C	23	53.5	0	0.0	0	0.0	3	100.0	3	100	0	0.0	5	21.7	18	78.3	23	100						
	H C	7	16.3	0	-	0	-	0	-	0	-	0	0.0	2	25.0	6	75.0	8	100						
	Total	43	100	0	0.0	0	0.0	4	100.0	4	100	0	0.0	11	24.4	34	75.6	45	100						
M T	unkn	4	22.2	0	-	0	-	0	-	0	-	2	66.7	1	33.3	0	0.0	3	100						
	L C	6	33.3	0	0.0	0	0.0	1	100.0	1	100	0	0.0	1	20.0	4	80.0	5	100						
	M C	8	44.4	0	-	0	-	0	-	0	-	1	9.1	4	36.4	6	54.5	11	100						
	Total	18	100	0	0.0	0	0.0	1	100.0	1	100	3	15.8	6	31.6	10	52.6	19	100						
H T	unkn	12	14.0	0	-	0	-	0	-	0	-	0	0.0	8	53.3	7	46.7	15	100						
	L C	13	15.1	0	-	0	-	0	-	0	-	0	0.0	5	35.7	9	64.3	14	100						
	M C	53	61.6	0	0.0	1	33.3	2	66.7	3	100	2	2.8	19	26.4	51	70.8	72	100						
	H C	8	9.3	0	0.0	0	0.0	1	100.0	1	100	0	0.0	4	44.4	5	55.6	9	100						
	Total	86	100	0	0.0	1	25.0	3	75.0	4	100	2	1.8	36	32.7	72	65.5	110	100						
Vans	unkn	1	7.1	0	-	0	-	0	-	0	-	0	0.0	0	0.0	1	100.0	1	100						
	L C	1	7.1	0	-	0	-	0	-	0	-	0	0.0	0	0.0	1	100.0	1	100						
	M C	9	64.3	0	0.0	0	0.0	3	100.0	3	100	0	0.0	3	27.3	8	72.7	11	100						
	H C	3	21.4	0	0.0	0	0.0	1	100.0	1	100	0	0.0	2	33.3	4	66.7	6	100						
	Total	14	100	0	0.0	0	0.0	4	100.0	4	100	0	0.0	5	26.3	14	73.7	19	100						
Total	unkn	35	18.5	0	-	0	-	0	-	0	-	4	10.3	11	28.2	24	61.5	39	100						
	L C	33	17.5	0	0.0	0	0.0	2	100.0	2	100	0	0.0	10	29.4	24	70.6	34	100						
	M C	99	52.4	0	0.0	1	10.0	9	90.0	10	100	3	2.4	34	27.6	86	69.9	123	100						
	H C	22	11.6	0	0.0	0	0.0	2	100.0	2	100	1	3.6	9	32.1	18	64.3	28	100						
	Total	189	100	0	0.0	1	7.1	13	92.9	14	100	8	3.6	64	28.6	152	67.9	224	100						

Mass categories: trucks

L T 3,500- 7,500 kg  
M T 7,500-12,000 kg  
H T > 12,000 kg

Mass categories: cars

L C < 800 kg  
M C 800-1,100 kg  
H C > 1,100 kg

Table 8b. Front-front collisions for outside built-up area (see table 3)

Mass categories		Accidents		Casualties trucks						Casualties cars									
Trucks	Cars	N	%	Death		Hospital		Other		Total	Death		Hospital		Other		Total		
				N	%	N	%	N	%		N	%	N	%	N	%			
Unkn	unkn	32	52.5	1	16.7	1	16.7	4	66.7	6	100	7	17.5	21	52.5	12	30.0	40	100
	L C	6	9.8	0	-	0	-	0	-	0	-	0	0.0	4	57.1	3	42.9	7	100
	M C	17	27.9	0	0.0	0	0.0	5	100.0	5	100	5	22.7	9	40.9	8	36.4	22	100
	H C	6	9.8	1	100.0	0	0.0	0	0.0	1	100	3	37.5	1	12.5	4	50.0	8	100
	Total	61	100	2	16.7	1	8.3	9	75.0	12	100	15	19.5	35	45.5	27	35.1	77	100
L T	unkn	22	17.5	1	100.0	0	0.0	0	0.0	1	100	17	56.7	9	30.0	4	13.3	30	100
	L C	20	15.9	0	0.0	2	100	0	0.0	2	100	9	27.3	16	48.5	8	24.2	33	100
	M C	63	50.0	0	0.0	1	16.7	5	83.3	6	100	11	14.9	31	41.9	32	43.2	74	100
	H C	21	16.7	0	0.0	1	33.3	2	66.7	3	100	8	28.6	10	35.7	10	35.7	28	100
	Total	126	100	1	8.3	4	33.3	7	58.3	12	100	45	27.3	66	40.0	54	32.7	165	100
M T	unkn	8	22.9	0	-	0	-	0	-	0	-	4	28.6	7	50.0	3	21.4	14	100
	L C	4	11.4	0	0.0	1	100	0	0.0	1	100	3	37.5	5	62.5	0	0.0	8	100
	M C	15	42.9	0	0.0	2	66.7	1	33.3	3	100	8	42.1	4	21.1	7	36.8	19	100
	H C	8	22.9	0	-	0	-	0	-	0	-	1	11.1	2	22.2	6	66.7	9	100
	Total	35	100	0	0.0	3	75.0	1	25.0	4	100	16	32.0	18	36.0	16	32.0	50	100
H T	unkn	31	20.1	0	0.0	1	25.0	3	75.0	4	100	19	38.8	18	36.7	12	24.5	49	100
	L C	18	11.7	0	0.0	0	0.0	1	100.0	1	100	3	15.8	7	36.8	9	47.4	19	100
	M C	87	56.5	0	0.0	2	40.0	3	60.0	5	100	27	27.0	35	35.0	38	38.0	100	100
	H C	18	11.7	0	-	0	-	0	-	0	-	1	5.6	7	38.9	10	55.6	18	100
	Total	154	100	0	0.0	3	30.0	7	70.0	10	100	50	26.9	67	36.0	69	37.1	186	100
Vans	unkn	2	9.5	0	0.0	1	100	0	0.0	1	100	0	0.0	2	66.7	1	33.3	3	100
	L C	2	9.5	0	-	0	-	0	-	0	-	0	0.0	2	100	0	0.0	2	100
	M C	9	42.9	0	0.0	2	40.0	3	60.0	5	100	6	40.0	6	40.0	3	20.0	15	100
	H C	8	38.1	0	0.0	1	20.0	4	80.0	5	100	1	9.1	4	36.4	6	54.5	11	100
	Total	21	100	0	0.0	4	36.4	7	63.6	11	100	7	22.6	14	45.2	10	32.3	31	100
Total	unkn	95	23.9	2	16.7	3	25.0	7	58.3	12	100	47	34.6	57	41.9	32	23.5	136	100
	L C	50	12.6	0	0.0	3	75.0	1	25.0	4	100	15	21.7	34	49.3	20	29.0	69	100
	M C	191	48.1	0	0.0	7	29.2	17	70.8	24	100	57	24.8	85	37.0	88	38.3	230	100
	H C	61	15.4	1	11.1	2	22.2	6	66.7	9	100	14	18.9	24	32.4	36	48.6	74	100
	Total	397	100	3	6.1	15	30.6	31	63.3	49	100	133	26.1	200	39.3	176	34.6	509	100

Mass categories: trucks

L T 3,500- 7,500 kg  
M T 7,500-12,000 kg  
H T > 12,000 kg

Mass categories: cars

L C < 800 kg  
M C 800-1,100 kg  
H C > 1,100 kg



Table 9a. Front-front collisions for intersections (see table 4)

Mass categories		Casualties trucks								Casualties cars									
Trucks	Cars	Accidents		Death		Hospital		Other		Total		Death		Hospital		Other		Total	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Unkn	unkn	16	42.1	1	50.0	0	0.0	1	50.0	2	100	0	0.0	6	33.3	12	66.7	18	100
	L C	5	13.2	0	-	0	-	0	-	0	-	0	0.0	3	50.0	3	50.0	6	100
	M C	12	31.6	0	0.0	0	0.0	2	100.0	2	100	0	0.0	7	50.0	7	50.0	14	100
	H C	5	13.2	1	100.0	0	0.0	0	0.0	1	100	3	37.5	1	12.5	4	50.0	8	100
	Total	38	100	2	40.0	0	0.0	3	60.0	5	100	3	6.5	17	37.0	26	56.5	46	100
L T	unkn	4	6.2	0	-	0	-	0	-	0	-	2	33.3	2	33.3	2	33.3	6	100
	L C	18	27.7	0	-	0	-	0	-	0	-	2	8.3	10	41.7	12	50.0	24	100
	M C	38	58.5	0	0.0	0	0.0	5	100.0	5	100	4	10.3	10	25.6	25	64.1	39	100
	H C	5	7.7	0	-	0	-	0	-	0	-	2	20.0	2	20.0	6	60.0	10	100
	Total	65	100	0	0.0	0	0.0	5	100.0	5	100	10	12.7	24	30.4	45	57.0	79	100
M T	unkn	5	23.8	0	-	0	-	0	-	0	-	2	28.6	5	71.4	0	0.0	7	100
	L C	6	28.6	0	0.0	1	50.0	1	50.0	2	100	0	0.0	2	40.0	3	60.0	5	100
	M C	10	47.6	0	0.0	1	100	0	0.0	1	100	0	0.0	7	43.8	9	56.3	16	100
	Total	21	100	0	0.0	2	66.7	1	33.3	3	100	2	7.1	14	50.0	12	42.9	28	100
H T	unkn	12	14.1	0	0.0	1	33.3	2	66.7	3	100	1	5.9	7	41.2	9	52.9	17	100
	L C	12	14.1	0	-	0	-	0	-	0	-	0	0.0	6	42.9	8	57.1	14	100
	M C	48	56.5	0	0.0	1	100	0	0.0	1	100	1	1.6	20	31.7	42	66.7	63	100
	H C	13	15.3	0	-	0	-	0	-	0	-	0	0.0	6	46.2	7	53.8	13	100
	Total	85	100	0	0.0	2	50.0	2	50.0	4	100	2	1.9	39	36.4	66	61.7	107	100
Vans	unkn	1	6.7	0	-	0	-	0	-	0	-	0	0.0	0	0.0	1	100.0	1	100
	L C	1	6.7	0	-	0	-	0	-	0	-	0	0.0	0	0.0	1	100.0	1	100
	M C	8	53.3	0	0.0	0	0.0	2	100.0	2	100	0	0.0	4	40.0	6	60.0	10	100
	H C	5	33.3	0	-	0	-	0	-	0	-	0	0.0	5	62.5	3	37.5	8	100
	Total	15	100	0	0.0	0	0.0	2	100.0	2	100	0	0.0	9	45.0	11	55.0	20	100
Total	unkn	38	17.0	1	20.0	1	20.0	3	60.0	5	100	5	10.2	20	40.8	24	49.0	49	100
	L C	42	18.8	0	0.0	1	50.0	1	50.0	2	100	2	4.0	21	42.0	27	54.0	50	100
	M C	116	51.8	0	0.0	2	18.2	9	81.8	11	100	5	3.5	48	33.8	89	62.7	142	100
	H C	28	12.5	1	100.0	0	0.0	0	0.0	1	100	5	12.8	14	35.9	20	51.3	39	100
	Total	224	100	2	10.5	4	21.1	13	68.4	19	100	17	6.1	103	36.8	160	57.1	280	100

Mass categories: trucks

L T 3,500- 7,500 kg  
M T 7,500-12,000 kg  
H T > 12,000 kg

Mass categories: cars

L C < 800 kg  
M C 800-1,100 kg  
H C > 1,100 kg

Table 9b. Front-front collisions for road sections (see table 4)

Mass categories		Accidents					Casualties trucks					Casualties cars							
Trucks	Cars	Death		Hospital		Other		Total		Death		Hospital		Other		Total			
		N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%		
Unkn	unkn	33	64.7	0	0.0	1	25.0	3	75.0	4	100	9	22.0	16	39.0	16	39.0	41	100
	L C	2	3.9	0	-	0	-	0	-	0	-	0	0.0	2	100	0	0.0	2	100
	M C	11	21.6	0	0.0	0	0.0	4	100.0	4	100	5	35.7	5	35.7	4	28.6	14	100
	H C	5	9.8	0	-	0	-	0	-	0	-	1	20.0	1	20.0	3	60.0	5	100
	Total	51	100	0	0.0	1	12.5	7	87.5	8	100	15	24.2	24	38.7	23	37.1	62	100
L T	unkn	19	18.3	1	100.0	0	0.0	0	0.0	1	100	15	60.0	8	32.0	2	8.0	25	100
	L C	14	13.5	0	0.0	2	66.7	1	33.3	3	100	7	31.8	9	40.9	6	27.3	22	100
	M C	48	46.2	0	0.0	1	25.0	3	75.0	4	100	7	12.1	26	44.8	25	43.1	58	100
	H C	23	22.1	0	0.0	1	33.3	2	66.7	3	100	6	23.1	10	38.5	10	38.5	26	100
	Total	104	100	1	9.1	4	36.4	6	54.5	11	100	35	26.7	53	40.5	43	32.8	131	100
M T	unkn	7	21.9	0	-	0	-	0	-	0	-	4	40.0	3	30.0	3	30.0	10	100
	L C	4	12.5	0	-	0	-	0	-	0	-	3	37.5	4	50.0	1	12.5	8	100
	M C	13	40.6	0	0.0	1	50.0	1	50.0	2	100	9	64.3	1	7.1	4	28.6	14	100
	H C	8	25.0	0	-	0	-	0	-	0	-	1	11.1	2	22.2	6	66.7	9	100
	Total	32	100	0	0.0	1	50.0	1	50.0	2	100	17	41.5	10	24.4	14	34.1	41	100
H T	unkn	31	20.0	0	0.0	0	0.0	1	100.0	1	100	18	38.3	19	40.4	10	21.3	47	100
	L C	19	12.3	0	0.0	0	0.0	1	100.0	1	100	3	15.8	6	31.6	10	52.6	19	100
	M C	92	59.4	0	0.0	2	28.6	5	71.4	7	100	28	25.7	34	31.2	47	43.1	109	100
	H C	13	8.4	0	0.0	0	0.0	1	100.0	1	100	1	7.1	5	35.7	8	57.1	14	100
	Total	155	100	0	0.0	2	20.0	8	80.0	10	100	50	26.5	64	33.9	75	39.7	189	100
Vans	unkn	2	10.0	0	0.0	1	100	0	0.0	1	100	0	0.0	2	66.7	1	33.3	3	100
	L C	2	10.0	0	-	0	-	0	-	0	-	0	0.0	2	100	0	0.0	2	100
	M C	10	50.0	0	0.0	2	33.3	4	66.7	6	100	6	37.5	5	31.3	5	31.3	16	100
	H C	6	30.0	0	0.0	1	16.7	5	83.3	6	100	1	11.1	1	11.1	7	77.8	9	100
	Total	20	100	0	0.0	4	30.8	9	69.2	13	100	7	23.3	10	33.3	13	43.3	30	100
Total	unkn	92	25.4	1	14.3	2	28.6	4	57.1	7	100	46	36.5	48	38.1	32	25.4	126	100
	L C	41	11.3	0	0.0	2	50.0	2	50.0	4	100	13	24.5	23	43.4	17	32.1	53	100
	M C	174	48.1	0	0.0	6	26.1	17	73.9	23	100	55	26.1	71	33.6	85	40.3	211	100
	H C	55	15.2	0	0.0	2	20.0	8	80.0	10	100	10	15.9	19	30.2	34	54.0	63	100
	Total	362	100	1	2.3	12	27.3	31	70.5	44	100	124	27.4	161	35.5	168	37.1	453	100

Mass categories: trucks

L T 3,500- 7,500 kg  
M T 7,500-12,000 kg  
H T > 12,000 kg

Mass categories: cars

L C < 800 kg  
M C 800-1,100 kg  
H C > 1,100 kg

Table 10a. Front-front collisions for inside built-up area and intersections (see table 5)

Mass categories		Accidents								Casualties trucks								Casualties cars							
Trucks	Cars	N		Death		Hospital		Other		Total		N		Death		Hospital		Other		Total					
			%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%				
Unkn	unkn	9	60.0	0	-	0	-	0	-	0	-	0	0.0	1	11.1	8	88.9	9	100						
	M C	4	26.7	0	0.0	0	0.0	1	100.0	1	100	0	0.0	2	50.0	2	50.0	4	100						
	H C	2	13.3	0	-	0	-	0	-	0	-	1	33.3	0	0.0	2	66.7	3	100						
	Total	15	100	0	0.0	0	0.0	1	100.0	1	100	1	6.3	3	18.8	12	75.0	16	100						
L T	L C	10	35.7	0	-	0	-	0	-	0	-	0	0.0	2	18.2	9	81.8	11	100						
	M C	16	57.1	0	0.0	0	0.0	2	100.0	2	100	0	0.0	2	13.3	13	86.7	15	100						
	H C	2	7.1	0	-	0	-	0	-	0	-	0	0.0	0	0.0	3	100.0	3	100						
	Total	28	100	0	0.0	0	0.0	2	100.0	2	100	0	0.0	4	13.8	25	86.2	29	100						
M T	unkn	3	23.1	0	-	0	-	0	-	0	-	1	50.0	1	50.0	0	0.0	2	100						
	L C	4	30.8	0	0.0	0	0.0	1	100.0	1	100	0	0.0	0	0.0	3	100.0	3	100						
	M C	6	46.2	0	-	0	-	0	-	0	-	0	0.0	4	44.4	5	55.6	9	100						
	Total	13	100	0	0.0	0	0.0	1	100.0	1	100	1	7.1	5	35.7	8	57.1	14	100						
H T	unkn	4	9.5	0	-	0	-	0	-	0	-	0	0.0	2	50.0	2	50.0	4	100						
	L C	7	16.7	0	-	0	-	0	-	0	-	0	0.0	3	37.5	5	62.5	8	100						
	M C	27	64.3	0	0.0	1	100	0	0.0	1	100	1	2.6	8	21.1	29	76.3	38	100						
	H C	4	9.5	0	-	0	-	0	-	0	-	0	0.0	2	50.0	2	50.0	4	100						
Total	42	100	0	0.0	1	100	0	0.0	1	100	1	1.9	15	27.8	38	70.4	54	100							
Vans	L C	1	14.3	0	-	0	-	0	-	0	-	0	0.0	0	0.0	1	100.0	1	100						
	M C	4	57.1	0	0.0	0	0.0	1	100.0	1	100	0	0.0	1	20.0	4	80.0	5	100						
	H C	2	28.6	0	-	0	-	0	-	0	-	0	0.0	2	40.0	3	60.0	5	100						
	Total	7	100	0	0.0	0	0.0	1	100.0	1	100	0	0.0	3	27.3	8	72.7	11	100						
Total	unkn	16	15.2	0	-	0	-	0	-	0	-	1	6.7	4	26.7	10	66.7	15	100						
	L C	22	21.0	0	0.0	0	0.0	1	100.0	1	100	0	0.0	5	21.7	18	78.3	23	100						
	M C	57	54.3	0	0.0	1	20.0	4	80.0	5	100	1	1.4	17	23.9	53	74.6	71	100						
	H C	10	9.5	0	-	0	-	0	-	0	-	1	6.7	4	26.7	10	66.7	15	100						
	Total	105	100	0	0.0	1	16.7	5	83.3	6	100	3	2.4	30	24.2	91	73.4	124	100						

Mass categories: trucks

L T 3,500- 7,500 kg  
M T 7,500-12,000 kg  
H T > 12,000 kg

Mass categories: cars

L C < 800 kg  
M C 800-1,100 kg  
H C > 1,100 kg

Table 10b. Front-front collisions for inside built-up area and road sections (see table 5)

Mass categories		Casualties trucks										Casualties cars							
Trucks	Cars	Accidents		Death		Hospital		Other		Total		Death		Hospital		Other		Total	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Unkn	unkn	8	61.5	0	-	0	-	0	-	0	-	2	20.0	0	0.0	8	80.0	10	100
	L C	1	7.7	0	-	0	-	0	-	0	-	0	0.0	1	100	0	0.0	1	100
	M C	2	15.4	0	-	0	-	0	-	0	-	0	0.0	1	50.0	1	50.0	2	100
	H C	2	15.4	0	-	0	-	0	-	0	-	0	0.0	1	50.0	1	50.0	2	100
	Total	13	100	0	-	0	-	0	-	0	-	2	13.3	3	20.0	10	66.7	15	100
L T	unkn	1	6.7	0	-	0	-	0	-	0	-	0	0.0	1	100	0	0.0	1	100
	L C	2	13.3	0	0.0	0	0.0	1	100.0	1	100	0	0.0	1	50.0	1	50.0	2	100
	M C	7	46.7	0	0.0	0	0.0	1	100.0	1	100	0	0.0	3	37.5	5	62.5	8	100
	H C	5	33.3	0	-	0	-	0	-	0	-	0	0.0	2	40.0	3	60.0	5	100
	Total	15	100	0	0.0	0	0.0	2	100.0	2	100	0	0.0	7	43.8	9	56.3	16	100
M T	unkn	1	20.0	0	-	0	-	0	-	0	-	1	100.0	0	0.0	0	0.0	1	100
	L C	2	40.0	0	-	0	-	0	-	0	-	0	0.0	1	50.0	1	50.0	2	100
	M C	2	40.0	0	-	0	-	0	-	0	-	1	50.0	0	0.0	1	50.0	2	100
	Total	5	100	0	-	0	-	0	-	0	-	2	40.0	1	20.0	2	40.0	5	100
H T	unkn	8	18.2	0	-	0	-	0	-	0	-	0	0.0	6	54.5	5	45.5	11	100
	L C	6	13.6	0	-	0	-	0	-	0	-	0	0.0	2	33.3	4	66.7	6	100
	M C	26	59.1	0	0.0	0	0.0	2	100.0	2	100	1	2.9	11	32.4	22	64.7	34	100
	H C	4	9.1	0	0.0	0	0.0	1	100.0	1	100	0	0.0	2	40.0	3	60.0	5	100
	Total	44	100	0	0.0	0	0.0	3	100.0	3	100	1	1.8	21	37.5	34	60.7	56	100
Vans	unkn	1	14.3	0	-	0	-	0	-	0	-	0	0.0	0	0.0	1	100.0	1	100
	M C	5	71.4	0	0.0	0	0.0	2	100.0	2	100	0	0.0	2	33.3	4	66.7	6	100
	H C	1	14.3	0	0.0	0	0.0	1	100.0	1	100	0	0.0	0	0.0	1	100.0	1	100
	Total	7	100	0	0.0	0	0.0	3	100.0	3	100	0	0.0	2	25.0	6	75.0	8	100
Total	unkn	19	22.6	0	-	0	-	0	-	0	-	3	12.5	7	29.2	14	58.3	24	100
	L C	11	13.1	0	0.0	0	0.0	1	100.0	1	100	0	0.0	5	45.5	6	54.5	11	100
	M C	42	50.0	0	0.0	0	0.0	5	100.0	5	100	2	3.8	17	32.7	33	63.5	52	100
	H C	12	14.3	0	0.0	0	0.0	2	100.0	2	100	0	0.0	5	38.5	8	61.5	13	100
	Total	84	100	0	0.0	0	0.0	8	100.0	8	100	5	5.0	34	34.0	61	61.0	100	100

Mass categories: trucks

L T 3,500- 7,500 kg  
M T 7,500-12,000 kg  
H T > 12,000 kg

Mass categories: cars

L C < 800 kg  
M C 800-1,100 kg  
H C > 1,100 kg



Table 10c. Front-front collisions for outside built-up area and intersections (see table 5)

Mass categories		Casualties trucks								Casualties cars									
Trucks	Cars	Accidents		Death		Hospital		Other		Total		Death		Hospital		Other		Total	
		N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Unkn	unkn	7	30.4	1	50.0	0	0.0	1	50.0	2	100	0	0.0	5	55.6	4	44.4	9	100
	L C	5	21.7	0	-	0	-	0	-	0	-	0	0.0	3	50.0	3	50.0	6	100
	M C	8	34.8	0	0.0	0	0.0	1	100.0	1	100	0	0.0	5	50.0	5	50.0	10	100
	H C	3	13.0	1	100.0	0	0.0	0	0.0	1	100	2	40.0	1	20.0	2	40.0	5	100
	Total	23	100	2	50.0	0	0.0	2	50.0	4	100	2	6.7	14	46.7	14	46.7	30	100
L T	unkn	4	10.8	0	-	0	-	0	-	0	-	2	33.3	2	33.3	2	33.3	6	100
	L C	8	21.6	0	-	0	-	0	-	0	-	2	15.4	8	61.5	3	23.1	13	100
	M C	22	59.5	0	0.0	0	0.0	3	100.0	3	100	4	16.7	8	33.3	12	50.0	24	100
	H C	3	8.1	0	-	0	-	0	-	0	-	2	28.6	2	28.6	3	42.9	7	100
	Total	37	100	0	0.0	0	0.0	3	100.0	3	100	10	20.0	20	40.0	20	40.0	50	100
M T	unkn	2	25.0	0	-	0	-	0	-	0	-	1	20.0	4	80.0	0	0.0	5	100
	L C	2	25.0	0	0.0	1	100	0	0.0	1	100	0	0.0	2	100	0	0.0	2	100
	M C	4	50.0	0	0.0	1	100	0	0.0	1	100	0	0.0	3	42.9	4	57.1	7	100
	Total	8	100	0	0.0	2	100	0	0.0	2	100	1	7.1	9	64.3	4	28.6	14	100
H T	unkn	8	18.6	0	0.0	1	33.3	2	66.7	3	100	1	7.7	5	38.5	7	53.8	13	100
	L C	5	11.6	0	-	0	-	0	-	0	-	0	0.0	3	50.0	3	50.0	6	100
	M C	21	48.8	0	-	0	-	0	-	0	-	0	0.0	12	48.0	13	52.0	25	100
	H C	9	20.9	0	-	0	-	0	-	0	-	0	0.0	4	44.4	5	55.6	9	100
	Total	43	100	0	0.0	1	33.3	2	66.7	3	100	1	1.9	24	45.3	28	52.8	53	100
Vans	unkn	1	12.5	0	-	0	-	0	-	0	-	0	0.0	0	0.0	1	100.0	1	100
	M C	4	50.0	0	0.0	0	0.0	1	100.0	1	100	0	0.0	3	60.0	2	40.0	5	100
	H C	3	37.5	0	-	0	-	0	-	0	-	0	0.0	3	100	0	0.0	3	100
	Total	8	100	0	0.0	0	0.0	1	100.0	1	100	0	0.0	6	66.7	3	33.3	9	100
Total	unkn	22	18.5	1	20.0	1	20.0	3	60.0	5	100	4	11.8	16	47.1	14	41.2	34	100
	L C	20	16.8	0	0.0	1	100	0	0.0	1	100	2	7.4	16	59.3	9	33.3	27	100
	M C	59	49.6	0	0.0	1	16.7	5	83.3	6	100	4	5.6	31	43.7	36	50.7	71	100
	H C	18	15.1	1	100.0	0	0.0	0	0.0	1	100	4	16.7	10	41.7	10	41.7	24	100
	Total	119	100	2	15.4	3	23.1	8	61.5	13	100	14	9.0	73	46.8	69	44.2	156	100

Mass categories: trucks

L T 3,500- 7,500 kg  
M T 7,500-12,000 kg  
H T > 12,000 kg

Mass categories: cars

L C < 800 kg  
M C 800-1,100 kg  
H C > 1,100 kg

Table 10d. Front-front collisions for outside built-up area and roadsections (see table 5)

Mass categories		Accidents/Casualties trucks								Casualties cars											
Trucks	Cars	N		Death		Hospital		Other		Total		N		Death		Hospital		Other		Total	
			%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Unkn	unkn	25	65.8	0	0.0	1	25.0	3	75.0	4	100	7	22.6	16	51.6	8	25.8	31	100		
	L C	1	2.6	0	-	0	-	0	-	0	-	0	0.0	1	100	0	0.0	1	100		
	M C	9	23.7	0	0.0	0	0.0	4	100.0	4	100	5	41.7	4	33.3	3	25.0	12	100		
	H C	3	7.9	0	-	0	-	0	-	0	-	1	33.3	0	0.0	2	66.7	3	100		
	Total	38	100	0	0.0	1	12.5	7	87.5	8	100	13	27.7	21	44.7	13	27.7	47	100		
L T	unkn	18	20.2	1	100.0	0	0.0	0	0.0	1	100	15	62.5	7	29.2	2	8.3	24	100		
	L C	12	13.5	0	0.0	2	100	0	0.0	2	100	7	35.0	8	40.0	5	25.0	20	100		
	M C	41	46.1	0	0.0	1	33.3	2	66.7	3	100	7	14.0	23	46.0	20	40.0	50	100		
	H C	18	20.2	0	0.0	1	33.3	2	66.7	3	100	6	28.6	8	38.1	7	33.3	21	100		
	Total	89	100	1	11.1	4	44.4	4	44.4	9	100	35	30.4	46	40.0	34	29.6	115	100		
M T	unkn	6	22.2	0	-	0	-	0	-	0	-	3	33.3	3	33.3	3	33.3	9	100		
	L C	2	7.4	0	-	0	-	0	-	0	-	3	50.0	3	50.0	0	0.0	6	100		
	M C	11	40.7	0	0.0	1	50.0	1	50.0	2	100	8	66.7	1	8.3	3	25.0	12	100		
	H C	8	29.6	0	-	0	-	0	-	0	-	1	11.1	2	22.2	6	66.7	9	100		
	Total	27	100	0	0.0	1	50.0	1	50.0	2	100	15	41.7	9	25.0	12	33.3	36	100		
H T	unkn	23	20.7	0	0.0	0	0.0	1	100.0	1	100	18	50.0	13	36.1	5	13.9	36	100		
	L C	13	11.7	0	0.0	0	0.0	1	100.0	1	100	3	23.1	4	30.8	6	46.2	13	100		
	M C	66	59.5	0	0.0	2	40.0	3	60.0	5	100	27	36.0	23	30.7	25	33.3	75	100		
	H C	9	8.1	0	-	0	-	0	-	0	-	1	11.1	3	33.3	5	55.6	9	100		
	Total	111	100	0	0.0	2	28.6	5	71.4	7	100	49	36.8	43	32.3	41	30.8	133	100		
Vans	unkn	1	7.7	0	0.0	1	100	0	0.0	1	100	0	0.0	2	100	0	0.0	2	100		
	L C	2	15.4	0	-	0	-	0	-	0	-	0	0.0	2	100	0	0.0	2	100		
	M C	5	38.5	0	0.0	2	50.0	2	50.0	4	100	6	60.0	3	30.0	1	10.0	10	100		
	H C	5	38.5	0	0.0	1	20.0	4	80.0	5	100	1	12.5	1	12.5	6	75.0	8	100		
	Total	13	100	0	0.0	4	40.0	6	60.0	10	100	7	31.8	8	36.4	7	31.8	22	100		
Total	unkn	73	26.3	1	14.3	2	28.6	4	57.1	7	100	43	42.2	41	40.2	18	17.6	102	100		
	L C	30	10.8	0	0.0	2	66.7	1	33.3	3	100	13	31.0	18	42.9	11	26.2	42	100		
	M C	132	47.5	0	0.0	6	33.3	12	66.7	18	100	53	33.3	54	34.0	52	32.7	159	100		
	H C	43	15.5	0	0.0	2	25.0	6	75.0	8	100	10	20.0	14	28.0	26	52.0	50	100		
	Total	278	100	1	2.8	12	33.3	23	63.9	36	100	119	33.7	127	36.0	107	30.3	353	100		

Mass categories: trucks

L T 3,500- 7,500 kg  
M T 7,500-12,000 kg  
H T > 12,000 kg

Mass categories: cars

L C < 800 kg  
M C 800-1,100 kg  
H C > 1,100 kg

Table 11a. Front leftside truck against front leftside car (see table 6)

Mass categories		Casualties trucks										Casualties cars									
Trucks	Cars	Accidents		Death		Hospital		Other		Total		Death		Hospital		Other		Total			
		N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%		
Unkn	unkn	2	20.0	0	-	0	-	0	-	0	-	0	0.0	1	50.0	1	50.0	2	100		
	M C	7	70.0	0	0.0	0	0.0	2	100.0	2	100	1	14.3	4	57.1	2	28.6	7	100		
	H C	1	10.0	0	-	0	-	0	-	0	-	0	0.0	0	0.0	1	100.0	1	100		
	Total	10	100	0	0.0	0	0.0	2	100.0	2	100	1	10.0	5	50.0	4	40.0	10	100		
L T	unkn	3	15.0	0	-	0	-	0	-	0	-	2	50.0	1	25.0	1	25.0	4	100		
	L C	4	20.0	0	-	0	-	0	-	0	-	1	16.7	4	66.7	1	16.7	6	100		
	M C	10	50.0	0	0.0	1	100	0	0.0	1	100	2	18.2	5	45.5	4	36.4	11	100		
	H C	3	15.0	0	-	0	-	0	-	0	-	0	0.0	2	66.7	1	33.3	3	100		
	Total	20	100	0	0.0	1	100	0	0.0	1	100	5	20.8	12	50.0	7	29.2	24	100		
M T	unkn	1	25.0	0	-	0	-	0	-	0	-	0	0.0	0	0.0	1	100.0	1	100		
	L C	1	25.0	0	-	0	-	0	-	0	-	0	0.0	0	0.0	1	100.0	1	100		
	M C	1	25.0	0	-	0	-	0	-	0	-	0	0.0	1	50.0	1	50.0	2	100		
	H C	1	25.0	0	-	0	-	0	-	0	-	0	0.0	0	0.0	1	100.0	1	100		
	Total	4	100	0	-	0	-	0	-	0	-	0	0.0	1	20.0	4	80.0	5	100		
H T	unkn	2	5.3	0	-	0	-	0	-	0	-	0	0.0	1	50.0	1	50.0	2	100		
	L C	5	13.2	0	-	0	-	0	-	0	-	1	20.0	1	20.0	3	60.0	5	100		
	M C	28	73.7	0	0.0	1	33.3	2	66.7	3	100	7	22.6	12	38.7	12	38.7	31	100		
	H C	3	7.9	0	-	0	-	0	-	0	-	1	33.3	0	0.0	2	66.7	3	100		
	Total	38	100	0	0.0	1	33.3	2	66.7	3	100	9	22.0	14	34.1	18	43.9	41	100		
Vans	M C	2	50.0	0	0.0	0	0.0	1	100.0	1	100	0	0.0	0	0.0	1	100.0	1	100		
	H C	2	50.0	0	0.0	0	0.0	2	100.0	2	100	0	0.0	1	20.0	4	80.0	5	100		
	Total	4	100	0	0.0	0	0.0	3	100.0	3	100	0	0.0	1	16.7	5	83.3	6	100		
Total	unkn	8	10.5	0	-	0	-	0	-	0	-	2	22.2	3	33.3	4	44.4	9	100		
	L C	10	13.2	0	-	0	-	0	-	0	-	2	16.7	5	41.7	5	41.7	12	100		
	M C	48	63.2	0	0.0	2	28.6	5	71.4	7	100	10	19.2	22	42.3	20	38.5	52	100		
	H C	10	13.2	0	0.0	0	0.0	2	100.0	2	100	1	7.7	3	23.1	9	69.2	13	100		
	Total	76	100	0	0.0	2	22.2	7	77.8	9	100	15	17.4	33	38.4	38	44.2	86	100		

Mass categories: trucks

L T 3,500- 7,500 kg  
M T 7,500-12,000 kg  
H T > 12,000 kg

Mass categories: cars

L C < 800 kg  
M C 800-1,100 kg  
H C > 1,100 kg

Table 11b. Front leftside truck against front middle car (see table 6)

Mass categories		Casualties trucks								Casualties cars									
Trucks	Cars	Death		Hospital		Other		Total		Death		Hospital		Other		Total			
		N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%		
Unkn	unkn	10	58.8	0	-	0	-	0	-	0	-	1	8.3	2	16.7	9	75.0	12	100
	L C	2	11.8	0	-	0	-	0	-	0	-	0	0.0	2	100	0	0.0	2	100
	M C	3	17.6	0	-	0	-	0	-	0	-	0	0.0	1	33.3	2	66.7	3	100
	H C	2	11.8	0	-	0	-	0	-	0	-	0	0.0	0	0.0	3	100.0	3	100
	Total	17	100	0	-	0	-	0	-	0	-	1	5.0	5	25.0	14	70.0	20	100
L T	unkn	8	21.6	0	-	0	-	0	-	0	-	2	20.0	5	50.0	3	30.0	10	100
	L C	5	13.5	0	-	0	-	0	-	0	-	2	25.0	3	37.5	3	37.5	8	100
	M C	21	56.8	0	0.0	0	0.0	2	100.0	2	100	4	16.7	10	41.7	10	41.7	24	100
	H C	3	8.1	0	-	0	-	0	-	0	-	0	0.0	0	0.0	4	100.0	4	100
	Total	37	100	0	0.0	0	0.0	2	100.0	2	100	8	17.4	18	39.1	20	43.5	46	100
M T	unkn	4	19.0	0	-	0	-	0	-	0	-	1	16.7	4	66.7	1	16.7	6	100
	L C	1	4.8	0	-	0	-	0	-	0	-	1	100.0	0	0.0	0	0.0	1	100
	M C	11	52.4	0	0.0	0	0.0	1	100.0	1	100	3	20.0	4	26.7	8	53.3	15	100
	H C	5	23.8	0	-	0	-	0	-	0	-	1	16.7	1	16.7	4	66.7	6	100
	Total	21	100	0	0.0	0	0.0	1	100.0	1	100	6	21.4	9	32.1	13	46.4	28	100
H T	unkn	19	21.1	0	0.0	0	0.0	1	100.0	1	100	9	30.0	14	46.7	7	23.3	30	100
	L C	11	12.2	0	0.0	0	0.0	1	100.0	1	100	1	8.3	6	50.0	5	41.7	12	100
	M C	49	54.4	0	-	0	-	0	-	0	-	8	14.0	19	33.3	30	52.6	57	100
	H C	11	12.2	0	0.0	0	0.0	1	100.0	1	100	0	0.0	5	41.7	7	58.3	12	100
	Total	90	100	0	0.0	0	0.0	3	100.0	3	100	18	16.2	44	39.6	49	44.1	111	100
Vans	unkn	2	18.2	0	-	0	-	0	-	0	-	0	0.0	0	0.0	2	100.0	2	100
	M C	6	54.5	0	0.0	0	0.0	2	100.0	2	100	0	0.0	3	50.0	3	50.0	6	100
	H C	3	27.3	0	0.0	0	0.0	1	100.0	1	100	0	0.0	2	66.7	1	33.3	3	100
	Total	11	100	0	0.0	0	0.0	3	100.0	3	100	0	0.0	5	45.5	6	54.5	11	100
Total	unkn	43	24.4	0	0.0	0	0.0	1	100.0	1	100	13	21.7	25	41.7	22	36.7	60	100
	L C	19	10.8	0	0.0	0	0.0	1	100.0	1	100	4	17.4	11	47.8	8	34.8	23	100
	M C	90	51.1	0	0.0	0	0.0	5	100.0	5	100	15	14.3	37	35.2	53	50.5	105	100
	H C	24	13.6	0	0.0	0	0.0	2	100.0	2	100	1	3.6	8	28.6	19	67.9	28	100
	Total	176	100	0	0.0	0	0.0	9	100.0	9	100	33	15.3	81	37.5	102	47.2	216	100

Mass categories: trucks

- L T 3,500- 7,500 kg
- M T 7,500-12,000 kg
- H T > 12,000 kg

Mass categories: cars

- L C < 800 kg
- M C 800-1,100 kg
- H C > 1,100 kg



Table 11c. Front middle truck against front middle car (see table 6)

Mass categories		Accidents				Casualties trucks				Casualties cars									
Trucks	Cars	Death		Hospital		Other		Total		Death		Hospital		Other		Total			
		N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%		
Unkn	unkn	25	71.4	1	20.0	1	20.0	3	60.0	5	100	8	25.8	13	41.9	10	32.3	31	100
	L C	1	2.9	0	-	0	-	0	-	0	-	0	0.0	0	0.0	1	100.0	1	100
	M C	5	14.3	0	0.0	0	0.0	1	100.0	1	100	3	30.0	5	50.0	2	20.0	10	100
	H C	4	11.4	1	100.0	0	0.0	0	0.0	1	100	4	66.7	1	16.7	1	16.7	6	100
	Total	35	100	2	28.6	1	14.3	4	57.1	7	100	15	31.3	19	39.6	14	29.2	48	100
L T	unkn	7	11.5	1	100.0	0	0.0	0	0.0	1	100	9	81.8	2	18.2	0	0.0	11	100
	L C	12	19.7	0	0.0	2	66.7	1	33.3	3	100	6	33.3	7	38.9	5	27.8	18	100
	M C	26	42.6	0	0.0	0	0.0	4	100.0	4	100	3	10.7	10	35.7	15	53.6	28	100
	H C	16	26.2	0	0.0	1	33.3	2	66.7	3	100	8	36.4	9	40.9	5	22.7	22	100
	Total	61	100	1	9.1	3	27.3	7	63.6	11	100	26	32.9	28	35.4	25	31.6	79	100
M T	unkn	3	18.8	0	-	0	-	0	-	0	-	3	60.0	2	40.0	0	0.0	5	100
	L C	5	31.3	0	0.0	1	50.0	1	50.0	2	100	2	25.0	5	62.5	1	12.5	8	100
	M C	7	43.8	0	0.0	2	100	0	0.0	2	100	6	66.7	2	22.2	1	11.1	9	100
	H C	1	6.3	0	-	0	-	0	-	0	-	0	0.0	0	0.0	1	100.0	1	100
	Total	16	100	0	0.0	3	75.0	1	25.0	4	100	11	47.8	9	39.1	3	13.0	23	100
H T	unkn	15	22.7	0	-	0	-	0	-	0	-	9	42.9	8	38.1	4	19.0	21	100
	L C	7	10.6	0	-	0	-	0	-	0	-	1	12.5	3	37.5	4	50.0	8	100
	M C	38	57.6	0	0.0	1	25.0	3	75.0	4	100	13	27.1	14	29.2	21	43.8	48	100
	H C	6	9.1	0	-	0	-	0	-	0	-	0	0.0	3	42.9	4	57.1	7	100
	Total	66	100	0	0.0	1	25.0	3	75.0	4	100	23	27.4	28	33.3	33	39.3	84	100
Vans	unkn	1	10.0	0	0.0	1	100	0	0.0	1	100	0	0.0	2	100	0	0.0	2	100
	M C	6	60.0	0	0.0	2	40.0	3	60.0	5	100	6	50.0	4	33.3	2	16.7	12	100
	H C	3	30.0	0	0.0	1	33.3	2	66.7	3	100	1	16.7	0	0.0	5	83.3	6	100
	Total	10	100	0	0.0	4	44.4	5	55.6	9	100	7	35.0	6	30.0	7	35.0	20	100
Total	unkn	51	27.1	2	28.6	2	28.6	3	42.9	7	100	29	41.4	27	38.6	14	20.0	70	100
	L C	25	13.3	0	0.0	3	60.0	2	40.0	5	100	9	25.7	15	42.9	11	31.4	35	100
	M C	82	43.6	0	0.0	5	31.3	11	68.8	16	100	31	29.0	35	32.7	41	38.3	107	100
	H C	30	16.0	1	14.3	2	28.6	4	57.1	7	100	13	31.0	13	31.0	16	38.1	42	100
	Total	188	100	3	8.6	12	34.3	20	57.1	35	100	82	32.3	90	35.4	82	32.3	254	100

Mass categories: trucks

L T 3,500- 7,500 kg  
M T 7,500-12,000 kg  
H T > 12,000 kg

Mass categories: cars

L C < 800 kg  
M C 800-1,100 kg  
H C > 1,100 kg

Table 11d. Front right side truck against front middle car (see table 6)

Mass categories		Accidents/Casualties trucks								Casualties cars									
Trucks	Cars	Death		Hospital		Other		Total		Death		Hospital		Other		Total			
		N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%		
Unkn	unkn	8	42.1	0	-	0	-	0	-	0	-	0	0.0	4	40.0	6	60.0	10	100
	L C	4	21.1	0	-	0	-	0	-	0	-	0	0.0	3	60.0	2	40.0	5	100
	M C	5	26.3	0	-	0	-	0	-	0	-	1	16.7	2	33.3	3	50.0	6	100
	H C	2	10.5	0	-	0	-	0	-	0	-	0	0.0	1	50.0	1	50.0	2	100
	Total	19	100	0	-	0	-	0	-	0	-	1	4.3	10	43.5	12	52.2	23	100
L T	unkn	1	4.3	0	-	0	-	0	-	0	-	1	50.0	1	50.0	0	0.0	2	100
	L C	5	21.7	0	-	0	-	0	-	0	-	0	0.0	0	0.0	6	100.0	6	100
	M C	12	52.2	0	-	0	-	0	-	0	-	1	7.1	5	35.7	8	57.1	14	100
	H C	5	21.7	0	-	0	-	0	-	0	-	0	0.0	0	0.0	6	100.0	6	100
	Total	23	100	0	-	0	-	0	-	0	-	2	7.1	6	21.4	20	71.4	28	100
M T	unkn	1	16.7	0	-	0	-	0	-	0	-	1	100.0	0	0.0	0	0.0	1	100
	L C	1	16.7	0	-	0	-	0	-	0	-	0	0.0	0	0.0	1	100.0	1	100
	M C	3	50.0	0	-	0	-	0	-	0	-	0	0.0	1	33.3	2	66.7	3	100
	H C	1	16.7	0	-	0	-	0	-	0	-	0	0.0	1	100	0	0.0	1	100
	Total	6	100	0	-	0	-	0	-	0	-	1	16.7	2	33.3	3	50.0	6	100
H T	unkn	6	27.3	0	0.0	0	0.0	1	100.0	1	100	1	10.0	3	30.0	6	60.0	10	100
	L C	4	18.2	0	-	0	-	0	-	0	-	0	0.0	0	0.0	4	100.0	4	100
	M C	11	50.0	0	-	0	-	0	-	0	-	1	7.1	3	21.4	10	71.4	14	100
	H C	1	4.5	0	-	0	-	0	-	0	-	0	0.0	1	100	0	0.0	1	100
	Total	22	100	0	0.0	0	0.0	1	100.0	1	100	2	6.9	7	24.1	20	69.0	29	100
Vans	L C	2	40.0	0	-	0	-	0	-	0	-	0	0.0	1	50.0	1	50.0	2	100
	M C	2	40.0	0	-	0	-	0	-	0	-	0	0.0	2	40.0	3	60.0	5	100
	H C	1	20.0	0	-	0	-	0	-	0	-	0	0.0	1	100	0	0.0	1	100
	Total	5	100	0	-	0	-	0	-	0	-	0	0.0	4	50.0	4	50.0	8	100
	Total	unkn	16	21.3	0	0.0	0	0.0	1	100.0	1	100	3	13.0	8	34.8	12	52.2	23
L C		16	21.3	0	-	0	-	0	-	0	-	0	0.0	4	22.2	14	77.8	18	100
M C		33	44.0	0	-	0	-	0	-	0	-	3	7.1	13	31.0	26	61.9	42	100
H C		10	13.3	0	-	0	-	0	-	0	-	0	0.0	4	36.4	7	63.6	11	100
Total		75	100	0	0.0	0	0.0	1	100.0	1	100	6	6.4	29	30.9	59	62.8	94	100

Mass categories: trucks

L T 3,500- 7,500 kg  
M T 7,500-12,000 kg  
H T > 12,000 kg

Mass categories: cars

L C < 800 kg  
M C 800-1,100 kg  
H C > 1,100 kg