

Safety Database
Report 2013

Significant Accidents 2012
Public Report



Department of
fundamental values

Safety Unit

September 2013



INTERNATIONAL UNION
OF RAILWAYS

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Foreword

The safety Database results for the year 2012 are in line with many of the trends observed during the last decade. Compared with 2006, the number of accidents, as well as fatalities and serious injuries decreased by 20%.

Nevertheless, not all indicators have decrease so obviously and vary from one year to another. In 2011, for instance, we noticed a sharp decrease in serious passenger injuries and an increase in serious staff injuries. In 2012, the opposite was true.

Hence, we should remain very cautious when analysing accident statistics and never forget that trends might be inversed after a single accident, such as the one that unfortunately occurred last July.

Safety at stations is an important field of improvement and some infrastructure managers obtained very good results with some simple safety measures towards people on the platform or crossing the tracks in an unauthorised manner.

Therefore, this report focuses on accidents at station, mostly individuals hit by a train or falling from a train. We do hope you will find this analysis useful; it can be found in part 2 of the report.

The data quality within the database was strongly enhanced this year, through a general revision of previous years' data and the elaboration of a simplified causal tree.

We also invite you to consult the online database. There you find, not only statistical data, but also detailed info on

single events. All criteria should be considered together to obtain the most accurate picture of railway safety in Europe, observe specific trends and check best practices. This database was created by us for our internal use. Our safety strategy is fundamental and no way to enhance it should be neglected.

2012 figures compared to the average annual figures on the 2006-2011 period	
SIGNIFICANT ACCIDENTS	-14%
Collisions with obstacles	-2%
Collisions between trains	9%
Derailments	15%
Individuals hit by a train	-19%
Individuals falling from a train	-14%
Accidents at level crossings	-7%
FATALITIES	-18%
LC fatalities	-7%
Passenger fatalities	8%
Staff fatalities	21%
SERIOUS INJURIES	-13%
Serious passenger injuries	15%
Serious staff injuries	-39%

Peter Kleinschuster

Chairman of the Safety Platform



Part 1

**General safety
indicators**

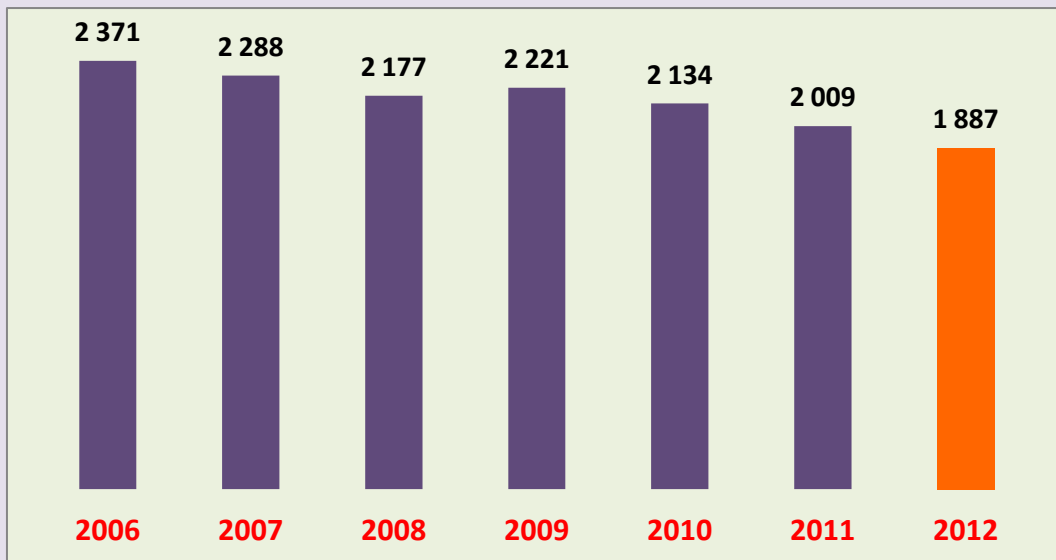
Part 1 - General Report on Significant Accidents

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1.1 Summary of accidents and their human consequences

Years	Significant accidents	Number of fatalities per 100 significant accidents			All victims per 100 significant accidents	Significant accidents per million train-km	Fatalities per million train-km
		Passengers	Staff	3rd parties			
2012	1 887	1,7	2,3	49,5	102,4	0,46	0,25
2011	2 009	1,6	1,4	51,5	98,9	0,49	0,27
2010	2 134	1,9	1,8	50,5	107,5	0,53	0,29
2009	2 221	1,2	1,1	58,4	103,6	0,56	0,34
2008	2 177	1,4	2,0	51,4	103,9	0,53	0,29
2007	2 288	1,0	1,8	56,7	109,6	0,56	0,34
2006	2 371	1,0	1,7	51,5	102,4	0,59	0,32



- 6% decrease in significant accidents declared for the year 2012.
- Lowest rate of accidents and fatalities per train runs on the 7-year period.

1.2 Types of accidents according to UIC-SDB and EU definitions

2012	Types of accidents as defined in UIC – SDB	Additional information from UIC -SDB	Types of accidents as defined in Safety Directive
Collective accidents 32,9%	6,6% Derailment of trains		6,6% Derailment of trains
	1,9% Train collision with another train		7,7% Collisions including collisions with obstacles within the clearance gauge
	24,5% Train collision with an obstacle	5,9% Train collision with an obstacle not at LC	
18,6% Train collision with an obstacle at LC		27,0% LC accidents, including accidents involving pedestrians at LC	
Individual accidents 66,6%	59,4% Individual hit by a train		8,4% Individual hit by a train at LC
		51,0% Individual hit by a train not at LC	
	7,2% Individual falling from a train		58,2% Accidents to persons caused by rolling stock in motion, with the exception of suicides.
Other types of accidents 0,5%	0,1% Fire in rolling stock		0,1% Fire in rolling stock
	0,4% Electrocution by overhead line or third rail		0,4% Other types of accidents
	0,0% Accident involving dangerous goods		

- Almost 60% of accidents involved individuals hit by a train.
- Collision with an obstacle was the second most common accident (one fourth of all accidents).
- Accidents at level crossings accounted for 27% of all significant accidents.
- No accident involved dangerous goods during the year 2012.
- Accidents at level crossings are divided in the UIC database between collisions with an obstacle at LC and individuals hit by a train at LC.

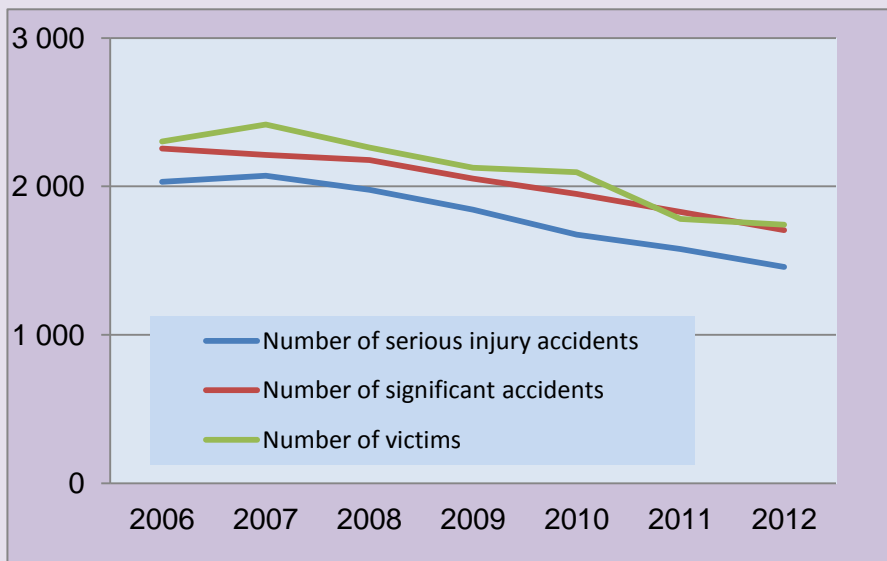
1.3 Main causes of accidents in the year 2012

2012	Causes at first level	Causes at second level
EXTERNAL CAUSES 79,0%	THIRD PARTIES 76,4%	Trespassing 45,8%
		Vehicle (LC accident) 18,2%
		Pedestrian (LC accident) 8,3%
		Pedestrian on public railway area 2,1%
		Other or not specified 2,0%
WEATHER & ENVIRONMENT 2,5%	Environment 1,5%	
	Weather 1,1%	
INTERNAL CAUSES 20,5%	INFRASTRUCTURES 2,3%	Tracks and structures 1,7%
		Energy system 0,3%
		Other or not specified 0,2%
	ROLLING STOCK 3,3%	Running gear 1,5%
		Other or not specified 1,8%
	HUMAN FACTORS (Railway staff & subcontractors) 7,8%	Track and switch maintenance staff 2,9%
		Traffic operating and signalling staff 1,1%
		Train drivers 2,0%
		Other or not specified 1,9%
	RAILWAY USERS 7,0%	Passengers 6,7%
Other or not specified 0,3%		
CAUSES NOT IDENTIFIED		0,5%

- Almost 80% of accidents had external causes.
- The number of accidents with no identified causes was half what it was in 2011.
- Internal causes relate to both the infrastructure manager and railway undertakings.

1.4 Trend of accidents and rates on the last seven years (19 railways)

ALL RAILWAYS except MAV and HZ	2006	2007	2008	2009	2010	2011	2012
Number of serious injury accidents	2 031	2 071	1 976	1 843	1 675	1 579	1 458
Serious injury accidents per million train-km	0,52	0,52	0,50	0,48	0,43	0,40	0,37
Number of fatalities	1 230	1 320	1 194	1 253	1 050	987	936
Fatalities per million train-km	0,32	0,33	0,30	0,33	0,27	0,25	0,23
Number of significant accidents	2 256	2 212	2 177	2 052	1 949	1 829	1 706
Significant accidents per million train-km	0,58	0,56	0,55	0,53	0,50	0,46	0,43
Number of victims	2 302	2 418	2 262	2 125	2 096	1 781	1 741
Victims per million train-km	0,59	0,61	0,57	0,55	0,54	0,45	0,44
Number of million train-kilometres	3 890	3 948	3 976	3 855	3 910	3 980	3 988



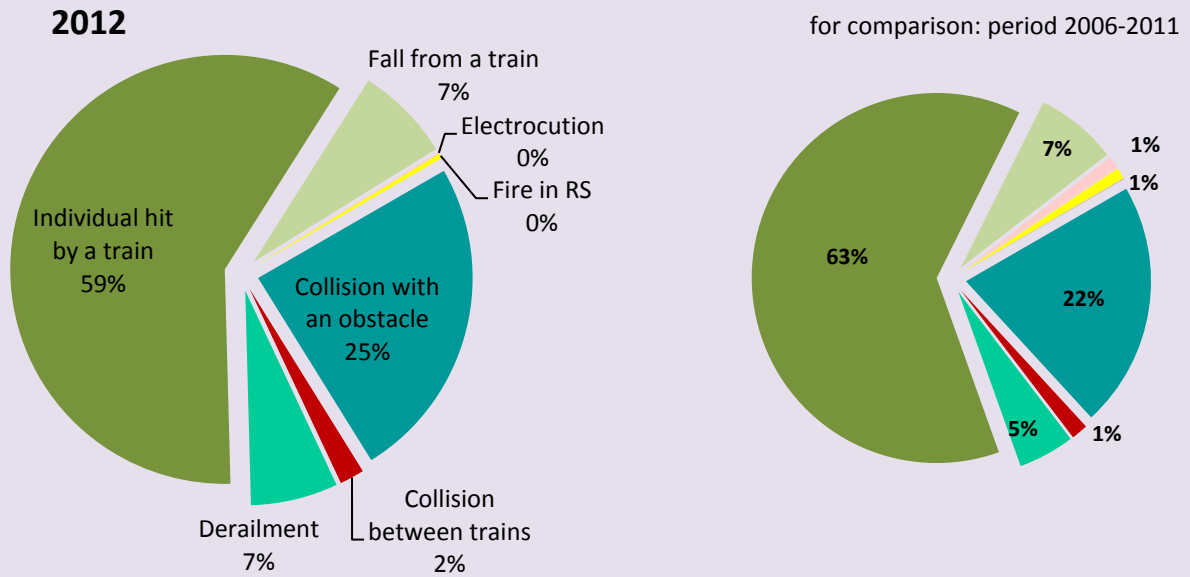
➤ This table allows a comparison on a constant perimeter, based on the 19 railways that have provided UIC with data every year since 2006.

1.5 Number of accidents and victims per type of accident

2012		Number of accidents	FATALITIES			SERIOUS INJURIES			ALL VICTIMS
			Passengers	Staff	3rd parties	Passengers	Staff	3rd parties	
At station	Collisions with an obstacle (not at LC)	30	-	2	3	-	5	3	13
	Collisions between trains	16	-	1	-	6	5	-	12
	LC accidents	75	-	-	40	-	1	43	84
	Derailments	61	-	1	-	-	-	-	1
	Hit by a train (not at LC)	354	-	13	181	-	15	148	357
	Falling from a train	110	11	1	1	90	3	6	112
	Other cases	3	-	-	1	-	-	-	1
	Total at station	649	11	18	226	96	29	200	580
In open line	Collisions with an obstacle (not at LC)	79	1	1	7	4	4	12	29
	Collisions between trains	15	12	8	2	80	13	1	116
	LC accidents	405	-	1	267	3	1	246	518
	Derailments	44	-	-	-	2	5	-	7
	Hit by a train (not at LC)	600	-	15	409	-	5	186	615
	Falling from a train	25	8	-	2	13	-	3	26
	Other cases	6	-	-	-	-	-	1	1
	Total in open line	1174	21	25	687	102	28	449	1312
not specified	64	-	1	22	-	7	10	40	
GRAND TOTAL	1887	32	44	935	198	64	659	1932	

- 62% of accidents occurred on open line, whilst 34% happened in stations.
- 72% of fatalities occurred on open line (25% in stations).
- Persons hit by a train and LC accidents represented 94% of fatalities on open line (92% in stations).

1.6 Accidents per type



	Victims per accident	Fatalities per accident	Serious injuries per accident
Passengers	0,12	0,02	0,10
Staff	0,06	0,02	0,03
Third parties	0,84	0,50	0,35
Total	1,02	0,54	0,49

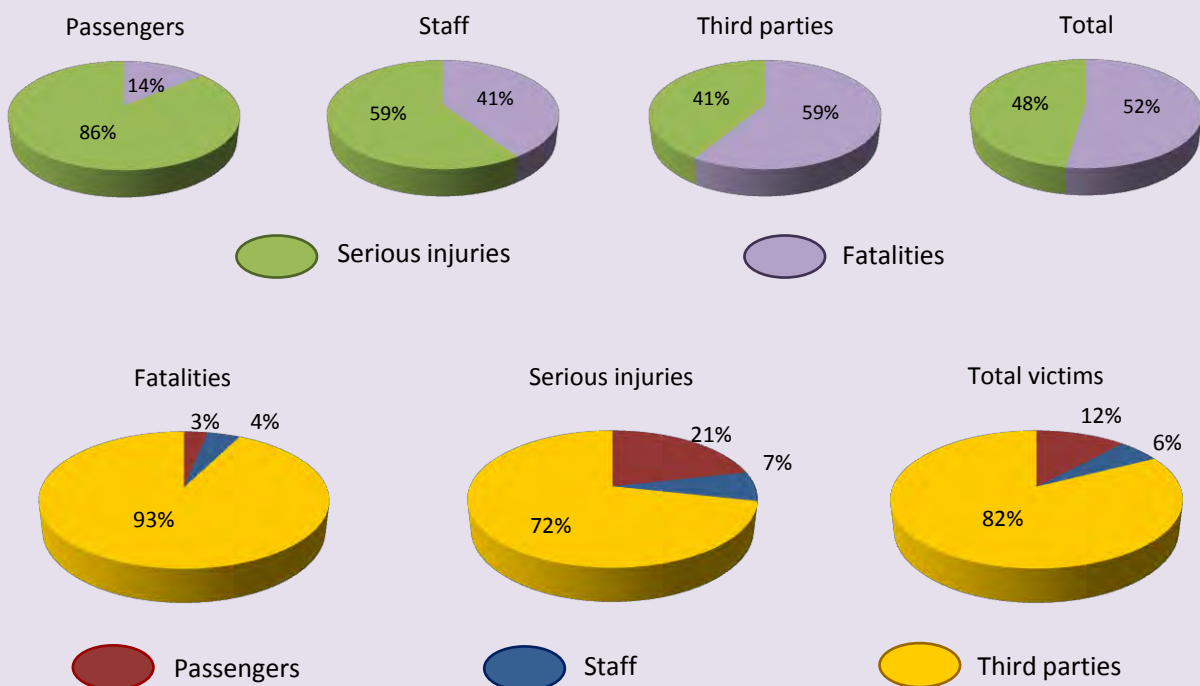
- Collisions with an obstacle include collisions at LC.
- Individual hit by a train include pedestrians at LC.
- For LC accidents, refer to table 1.11.

Type of accident - year 2012	Accidents		Victims	
	Number	%	Fatalities	Serious injuries
Collision with an obstacle	462	24,5%	221	290
Collision between trains	35	1,9%	23	106
Derailment	124	6,6%	1	8
Individual hit by a train	1121	59,4%	742	400
Fall from a train	136	7,2%	23	116
Electrocution	2	0,1%	1	1
Fire in RS	7	0,4%	-	-
Dangerous goods accidents (no release)	-	0,0%	-	-
Dangerous goods accidents (with release)	-	0,0%	-	-
Total	1 887		1 011	921

1.7 Fatalities and serious injuries per type of accident

2012	Fatalities			Serious injuries		
	Passengers	Staff	Third parties	Passengers	Staff	Third parties
Collision with an obstacle	1	4	216	7	12	271
Collision between trains	12	9	2	86	19	1
Derailment	-	1	-	2	6	-
Individual hit by a train	-	29	713	-	23	377
Fall from a train	19	1	3	103	4	9
Electrocution	-	-	1	-	-	1
Fire in rolling stock	-	-	-	-	-	-
Dangerous goods accidents (no release)	-	-	-	-	-	-
Dangerous goods accidents (with release)	-	-	-	-	-	-
Total	32	44	935	198	64	659

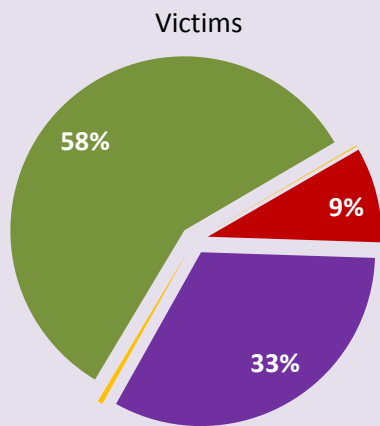
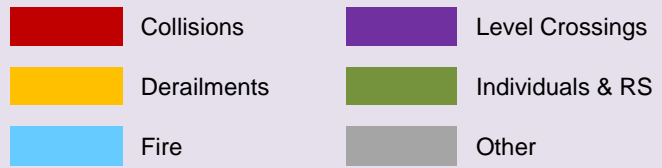
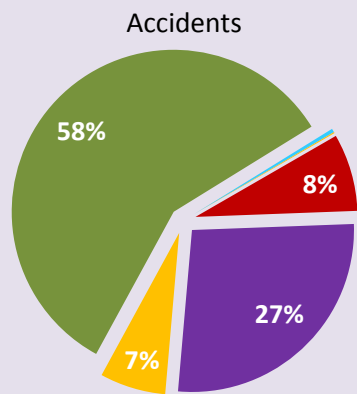
1.8 Distribution of victims



Reading method: fatalities account for 14% of passenger victims and passengers represent 3% of fatalities

- Third parties represented 93% of all fatalities and 72% of serious injuries.
- Passengers accounted for 21% of serious injuries, but 3% of fatalities.

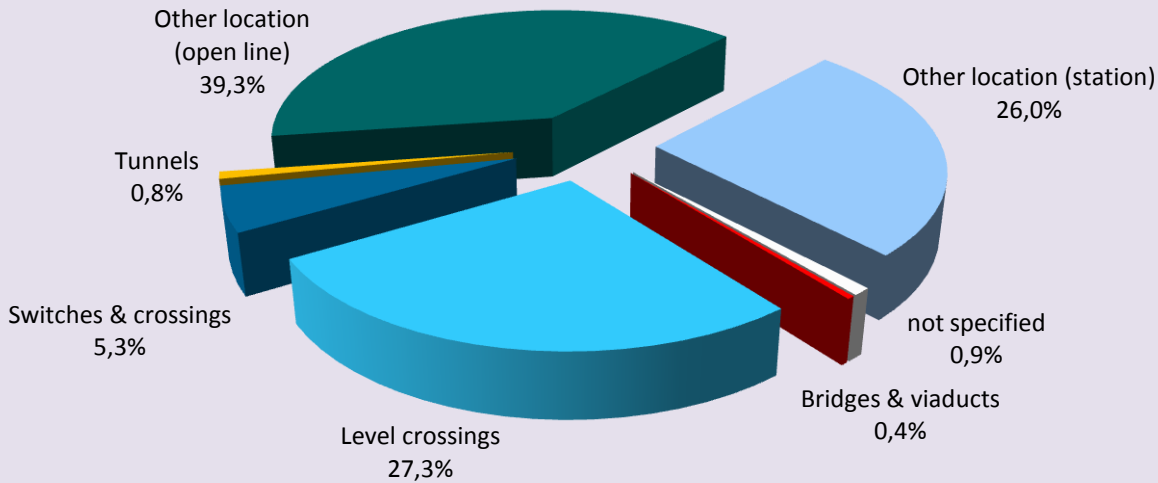
1.9 Victims per type of accident according to Safety Directive definitions



Breakdown of human consequences			
	Fatal.	Injur.	All
Passengers	2%	10%	12%
Staff	2%	3%	6%
Third parties	48%	34%	83%
All categories	52%	48%	100%

Type of accident	Number of events	%	Fatalities			Serious injuries		
			Passengers	Staff	3rd parties	Passengers	Staff	3rd parties
Collisions (not at LC)	146	8%	13	12	12	90	28	16
Level crossings	509	27%	-	1	325	3	3	298
Derailment	124	7%	-	1	-	2	6	-
Individuals & RS in motion (not at LC)	1 099	58%	19	30	597	103	27	344
Fire	7	0%	-	-	-	-	-	-
Other types	2	0%	-	-	1	-	-	1
Total	1 887		32	44	935	198	64	659

1.10 Accidents per location details

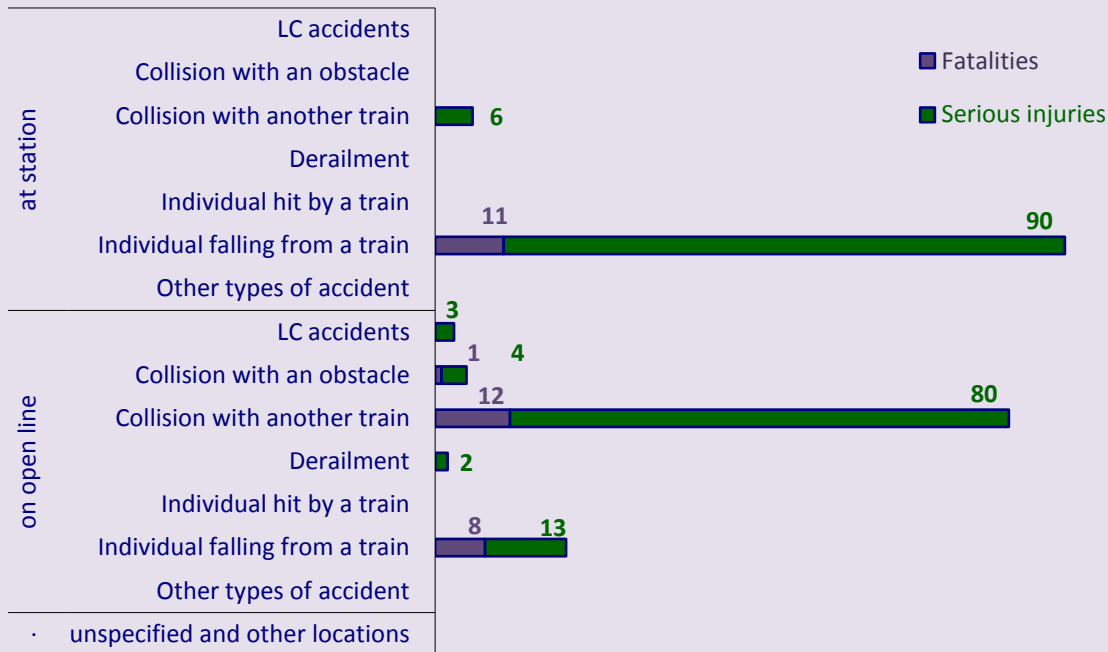


1.11 Accidents at level crossings

	Accidents at LC	Number of fatalities			% of all accidents	% of all fatalities	LC accidents per million train-km	LC fatalities per million train-km
		Passengers	Staff	Third parties				
2012	509	-	1	325	27%	32%	0,12	0,08
2011	447	6	1	277	22%	26%	0,11	0,07
2010	495	1	3	315	23%	28%	0,12	0,08
2009	493	2	1	374	22%	28%	0,12	0,10
2008	539	-	3	325	25%	27%	0,13	0,08
2007	634	2	1	428	28%	32%	0,16	0,11
2006	664	1	2	350	28%	27%	0,17	0,09

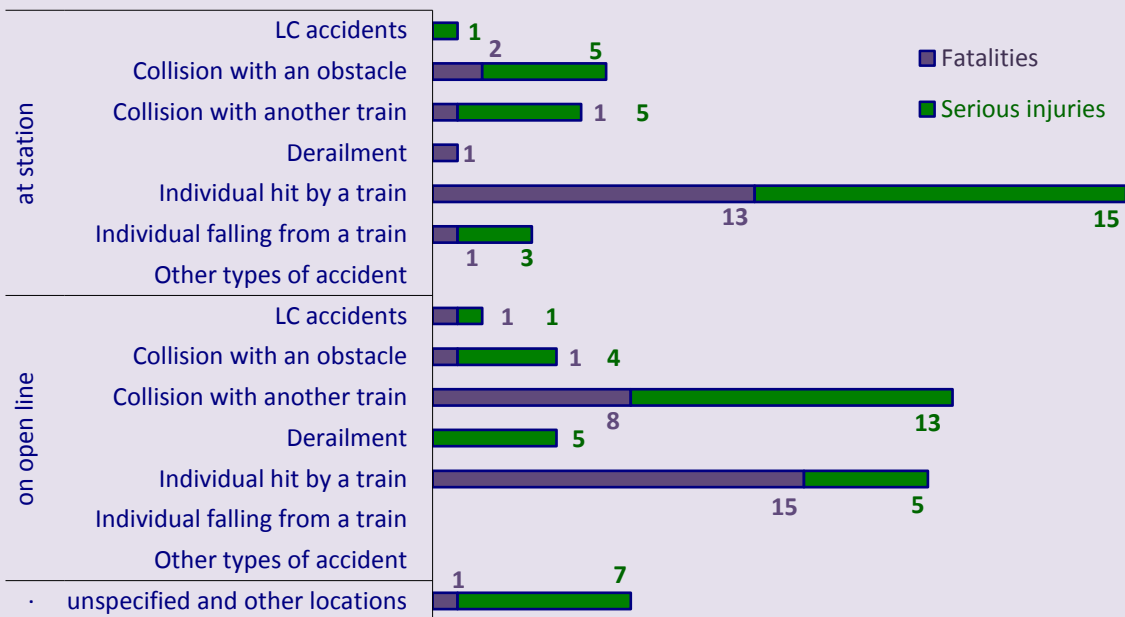
- Accidents at LC decreased 23% compared with 2006 but increased 14% compared with 2011.
- Fatalities at LC decreased 8% compared with 2006 but increased 15% compared with 2011.

1.12 Passenger victims per type of accident and location



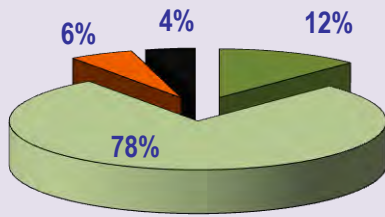
- Individual falling from a train is the main risk in stations (94% of victims).
- Collision between trains is the main risk on open lines (75% of victims).

1.13 Staff victims per type of accident and location



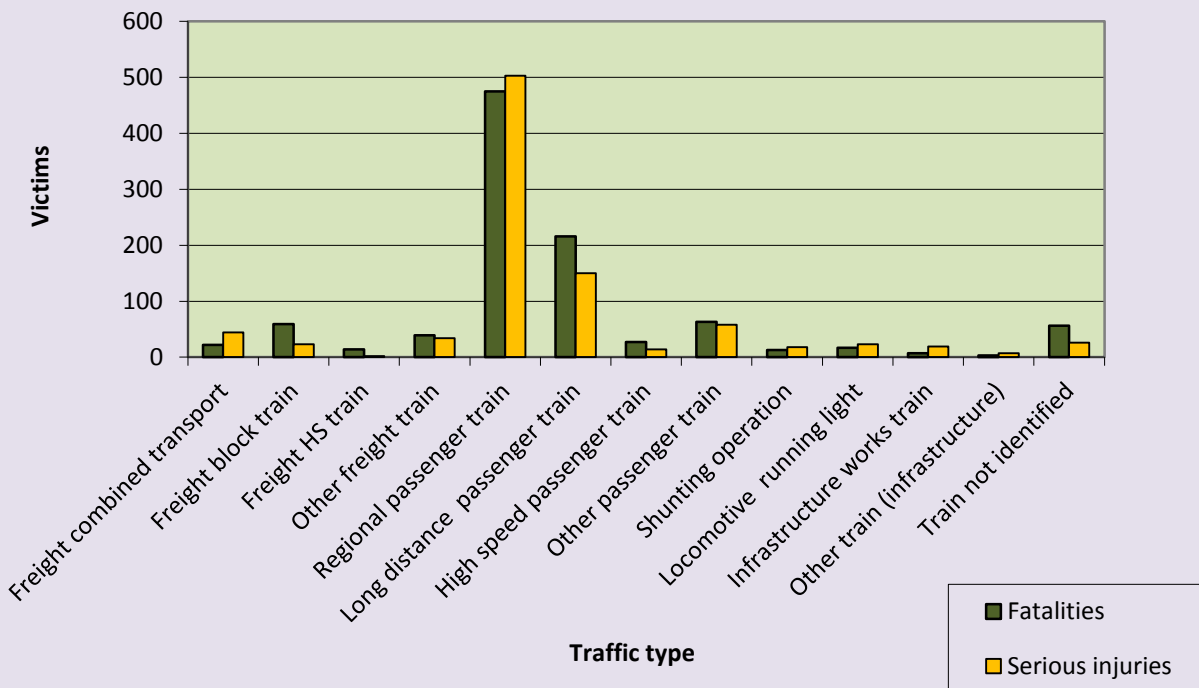
- Individual hit by a train is the main risk in stations (76% of victims).
- Collision between trains and staff hit by a train show equivalent risk on open line.

1.14 Victims per type of traffic



- Freight trains
- Passenger trains
- Locomotive running light, shunting, infrastructure works train and other infrastructure train
- Train not identified

Type of accident	Freight trains	Passenger trains	Locomotive running light, shunting, infrastructure works train and other infrastructure train	Train not identified
Collision	10	140	14	7
Derailment	-	7	2	-
Level-crossing accidents	78	509	35	8
Accidents to persons caused by rolling stock in motion	148	849	56	67
Other accidents	1	1	-	-
TOTAL victims	237	1506	107	82



- Passenger trains were involved in four out of five accidents.
- Regional trains were largely more involved than long distance trains.

1.15 Accidents and victims per type of accident, causes and location

Type of accidents	Causes		Location						Victims			
			Type of location			Location details			Fatal.	S. Inj.		
Individual hit by a train	INF	-	-	OL	707	724	LC	158	161	P	-	-
	RS	-	-				SC	33	33			
	HF	47	48	S	393	397	BV	5	5	S	29	23
	RU	11	11				T	9	9			
	WE	-	-	Ot	21	21	O	916	934	T	713	377
	TP	1060	1080									
Train collision with an obstacle	INF	9	7	OL	377	438	LC	351	469	P	1	7
	RS	12	4				SC	6	3			
	HF	32	18	S	66	57	BV	1	-	S	4	12
	RU	2	4				T	2	-			
	WE	40	1	Ot	19	16	O	102	39	T	216	271
	TP	366	473									
Individual falling from a train	INF	-	-	OL	25	26	LC	1	1	P	19	103
	RS	-	-				SC	-	-			
	HF	5	5	S	110	112	BV	-	-	S	1	4
	RU	119	122				T	1	1			
	WE	-	-	Ot	1	1	O	134	137	T	3	9
	TP	11	11									
Train collision with another train	INF	-	-	OL	15	116	LC	4	3	P	12	86
	RS	2	-				SC	8	19			
	HF	29	126	S	16	12	BV	1	-	S	9	19
	RU	-	-				T	1	-			
	WE	-	-	Ot	4	1	O	21	107	T	2	1
	TP	4	3									
Derailment	INF	34	-	OL	44	7	LC	2	-	P	-	2
	RS	42	1				SC	53	1			
	HF	35	7	S	61	1	BV	-	-	S	1	6
	RU	-	-				T	3	5			
	WE	8	1	Ot	19	1	O	66	3	T	-	-
	TP	-	-									
Electrocution	INF	-	-	OL	1	1	LC	-	-	P	-	-
	RS	-	-				SC	-	-			
	HF	-	-	S	1	1	BV	-	-	S	-	-
	RU	1	1				T	-	-			
	WE	-	-	Ot	-	-	O	2	2	T	1	1
	TP	1	1									

Type of accidents	Causes			Location					Victims			
				Type of location			Location details		Fatal.	S. Inj.		
Fires 7 -	INF	-	-	OL	5	-	LC	-	-	P	-	-
	RS	7	-				SC	-	-			
	HF	-	-	S	2	-	BV	-	-	S	-	-
	RU	-	-				T	-	-			
	WE	-	-	Ot	-	-	O	7	-	T	-	-
	TP	-	-									
Accident involving dangerous goods without release - -	INF	-	-	OL	-	-	LC	-	-	P	-	-
	RS	-	-				SC	-	-			
	HF	-	-	S	-	-	BV	-	-	S	-	-
	RU	-	-				T	-	-			
	WE	-	-	Ot	-	-	O	-	-	T	-	-
	TP	-	-									
Accident involving dangerous goods with release - -	INF	-	-	OL	-	-	LC	-	-	P	-	-
	RS	-	-				SC	-	-			
	HF	-	-	S	-	-	BV	-	-	S	-	-
	RU	-	-				T	-	-			
	WE	-	-	Ot	-	-	O	-	-	T	-	-
	TP	-	-									

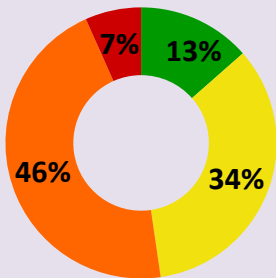
TOTAL	INF	43	7	OL	1174	1312	LC	516	634	P	32	198
	RS	63	5				SC	100	56			
	HF	148	204	S	649	580	BV	7	5	S	44	64
	RU	133	138				T	16	15			
1887	WE	48	2	Ot	64	40	O	1248	1222	T	935	659
1932	TP	1442	1568									

1011	921
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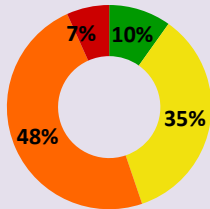
number of accidents	INF: Infrastructures RS: Rolling stock HF: Human Factors RU: Railway users	OL: Open line S: At station Ot: Other locations	LC: Level crossings SC: Switches & Crossings BV: Bridges & Viaducts T: Tunnels O: Other or unidentified	P: passengers S: Staff T: Third parties
number of victims	WE: Weather-Environment TP: Third Parties			

1.16 Accidents per type and number of victims

All accidents 2012
(1 887 events)



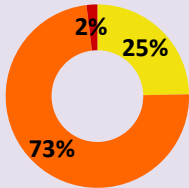
2006-2011
(13 200 events)



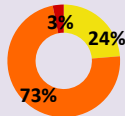
- no victim *
- 1 serious injury
- 1 fatality
- 2 or more victims *

* a victim is a fatality or a serious injury

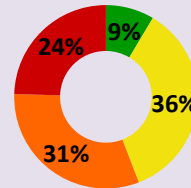
Individual hit by a train at LC
2012 (158 events)



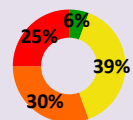
2006-2011
(954 events)



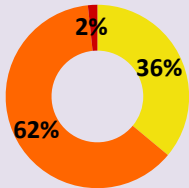
Collision with an obstacle at
LC 2012 (351 events)



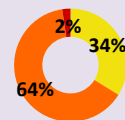
2006-2011
(2 318 events)



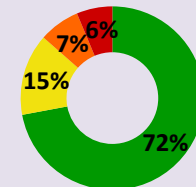
Individual hit by a train not
at LC 2012 (963 events)



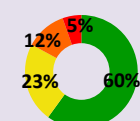
2006-2011
(7 340 events)



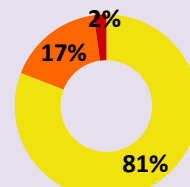
Collision with an obstacle
not at LC 2012 (111 events)



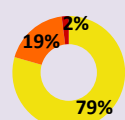
2006-2011
(520 events)



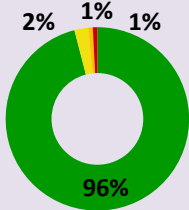
Fall from a train 2012
(136 events)



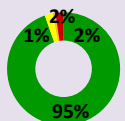
2006-2011
(947 events)



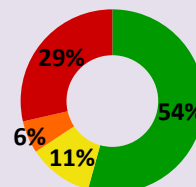
Derailment 2012
(124 events)



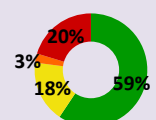
2006-2011
(649 events)



Collision between trains
2012 (35 events)



2006-2011
(192 events)



- Fires in RS: 7 accidents (all without victims)
- Electrocutions: - 1 event with a serious injury
- 1 event with 1 fatality
- Dangerous goods: no accidents



Part 2

**Focus on accidents
in stations**

Part 2 - Focus on accidents in stations

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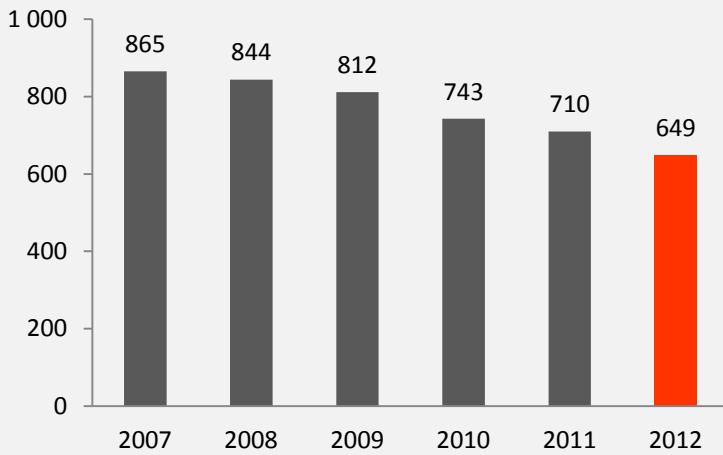
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- 2.2 Accidents in stations per type of accident
- 2.3 Part of events occurring in stations per type of accident
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- 2.5 Victims of accidents in stations per type of victim since 2007
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- 2.9 Individuals hit by a train in stations: victims per category
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Definition of station

Point where tracks in addition to the running trains, are generally used for boarding (disembarking) passengers and/or for loading (unloading) goods. The stations are generally defined as a part of the infrastructure (tracks, switches, fixed installation, platform etc..) located between entry signals in each direction.

Accidents at stops are included in the category "accidents in station"

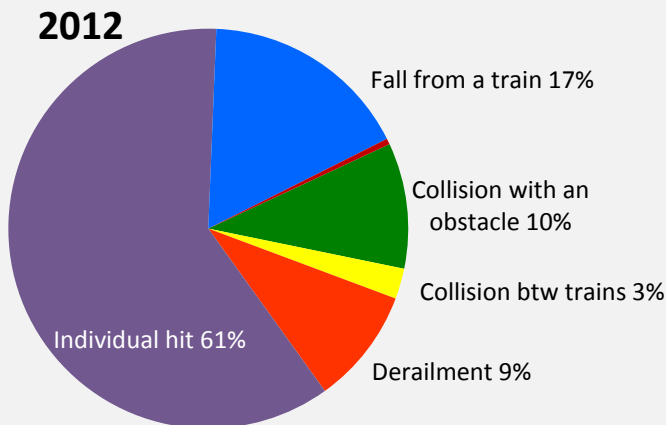
2.1 Accidents in stations since 2007



In % of all significant accidents	
2007	38%
2008	39%
2009	37%
2010	35%
2011	35%
2012	34%

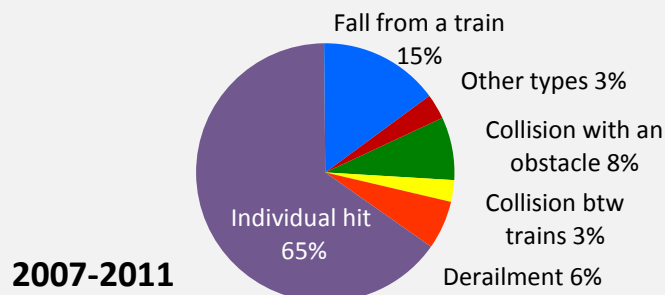
- Accidents in stations represent 34% of all declared significant accidents for the year 2012.
- Accidents in stations have decreased more rapidly (-25% since 2007) than accidents on open line (-13%).

2.2 Accidents in stations per type of accident

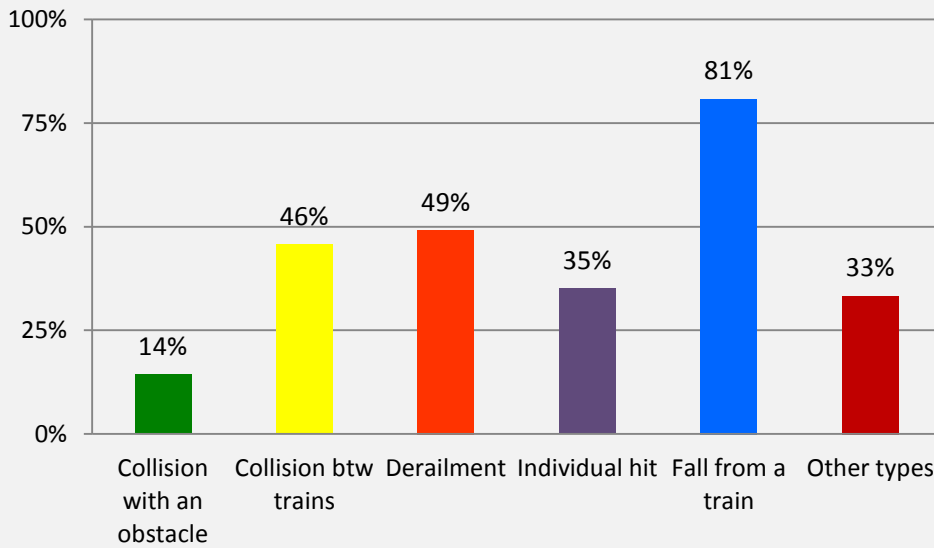


Most accidents in stations were individuals hit by a train, followed by individuals falling from a train.

The other types of accidents (fires and electrocutions) accounted for less than 0.5% (3 events only) in 2012.

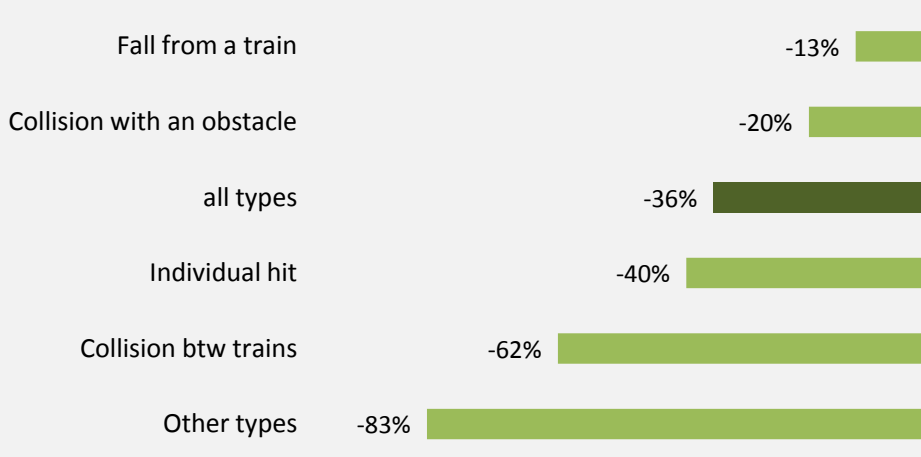


2.3 Proportion of events occurring in stations per type of accident



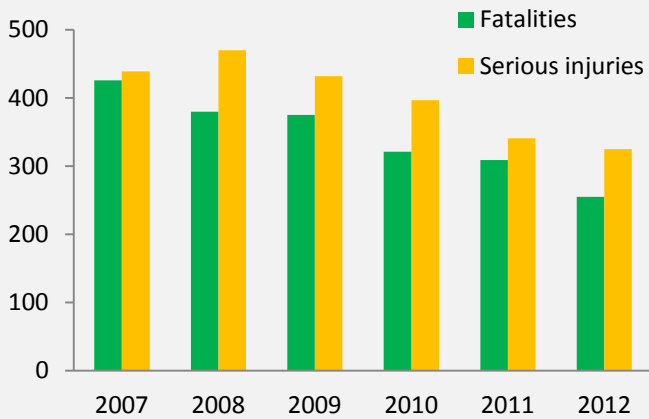
81% of falls from a train occurred in stations. Considering the other types of accidents, fewer events occur in stations than on open line. In particular, only 14% of collisions with an obstacle occurred in stations.

2.4 Evolution of victims in stations per type of accident since 2007



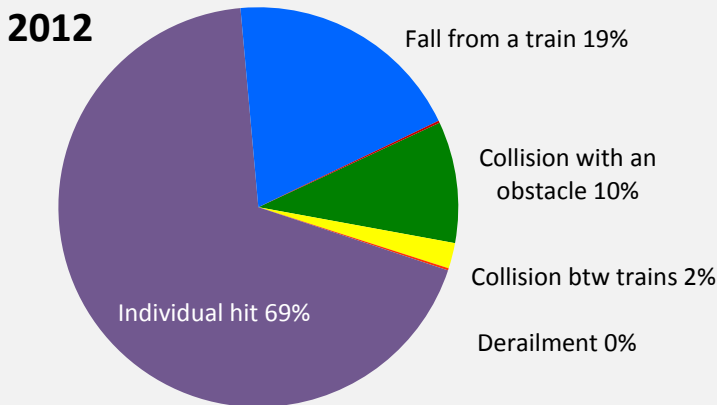
The number of victims globally decreased one third. Derailments are included in "other types". Only one derailment caused victims in 2012.

2.5 Victims of accidents in stations per type of victim since 2007

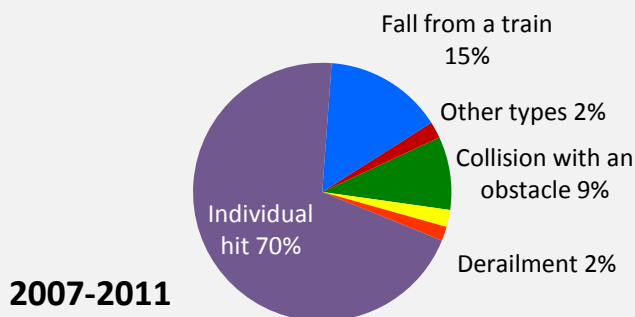


- Fatalities in stations decreased 40% since 2007.
- Serious injuries in stations decreased 31% since the maximum observed in 2008.

2.6 Victims of accidents in stations per type of accident



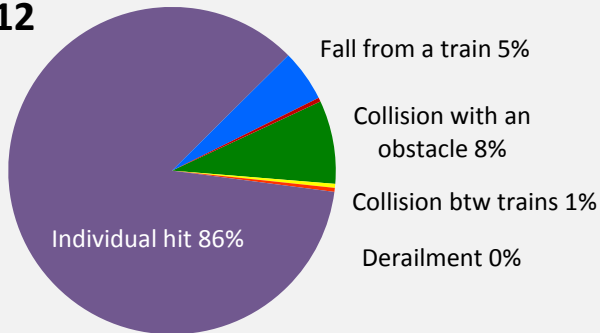
The representation of victims per type of accident is very similar to the representation of accidents (graph 2.2). The most important difference relates to derailments, with 9 % of accidents and less than 0.5 % of victims. Hence a severity rate (average number of victims per accident) far lower than other types of accident.



	Severity rate 2012
Individual hit	1,01
Fall from a train	1,02
Collision with obstacle	0,86
Collision btw trains	0,75
Derailment	0,02

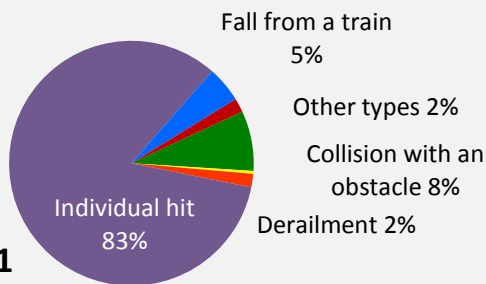
2.7 Fatalities in accidents in stations per type of accident

2012



Individuals hit by a train represented 8% of fatalities in stations in 2012 when they only represent 61% of accidents. Hence a far higher fatality rate (average number of fatalities per accident).

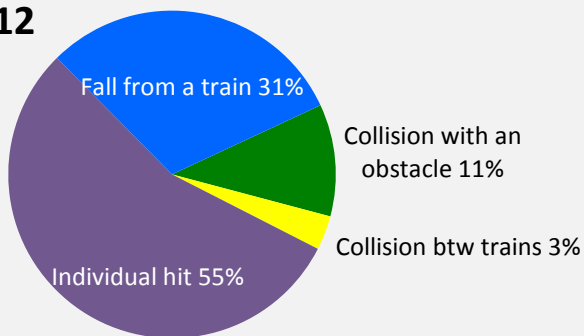
2007-2011



	Fatality rate 2012
Individual hit	0,55
Fall from a train	0,12
Collision with obstacle	0,32
Collision btw trains	0,06
Derailment	0,02

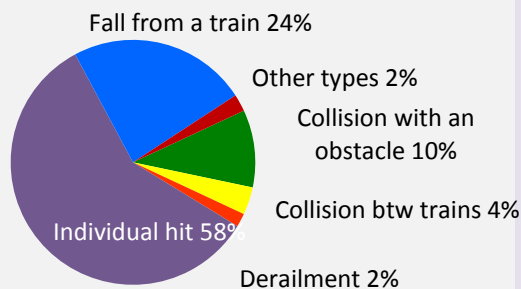
2.8 Serious injuries in accidents in stations per type of accident

2012



"Individuals falling from a train" accounted for 31% of serious injuries in 2012. This type of accident causes 8 times more injuries than fatalities. Conversely, "individuals hit by a train" generate more fatalities than injuries.

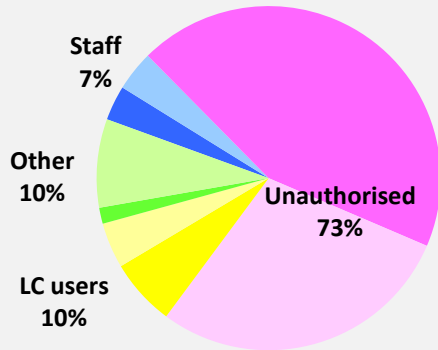
2007-2011



	Injury rate 2012
Individual hit	0,46
Fall from a train	0,90
Collision with obstacle	0,55
Collision btw trains	0,69
Derailment	0,00

2.9 Individuals hit by a train in stations: victims per category

2012



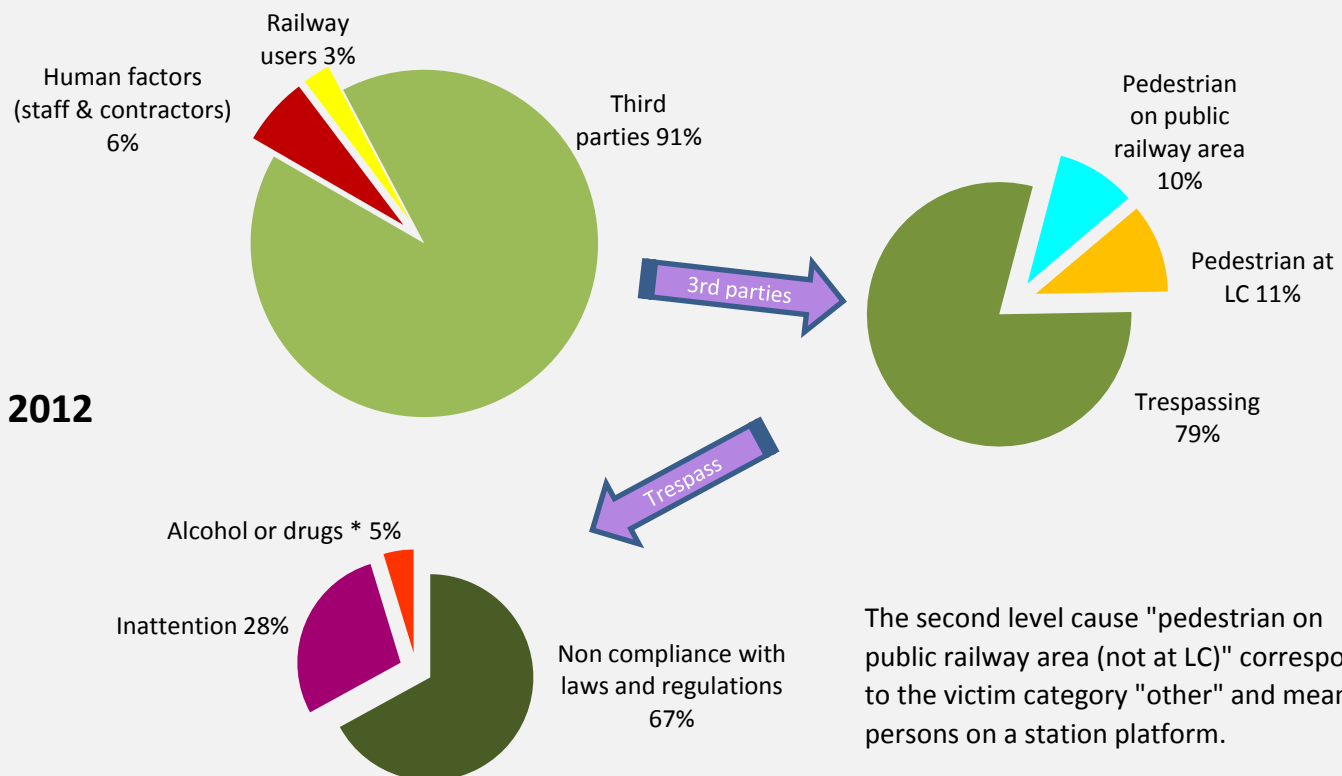
A large majority of victims were unauthorised persons, mostly people crossing tracks in a forbidden way.

"Other" victims accounted for 10% of the victims. This mainly concerned persons on a platform being struck by an incoming train.

light colours: serious injuries

dark colours: fatalities

2.10 Individuals hit by a train in stations: causes

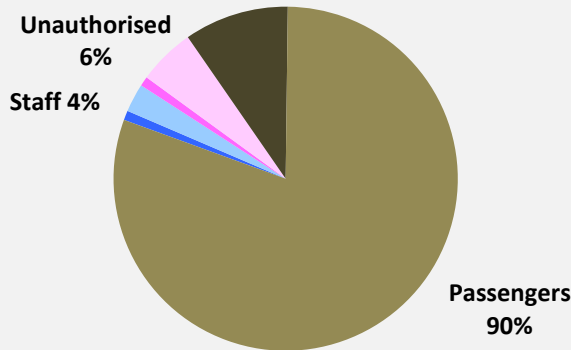


The second level cause "pedestrian on public railway area (not at LC)" correspond to the victim category "other" and means persons on a station platform.

* This percentage only represents the use of alcohol or drugs with police evidence. The real percentage is far higher.

2.11 Individuals falling from a train in stations: victims per category

2012

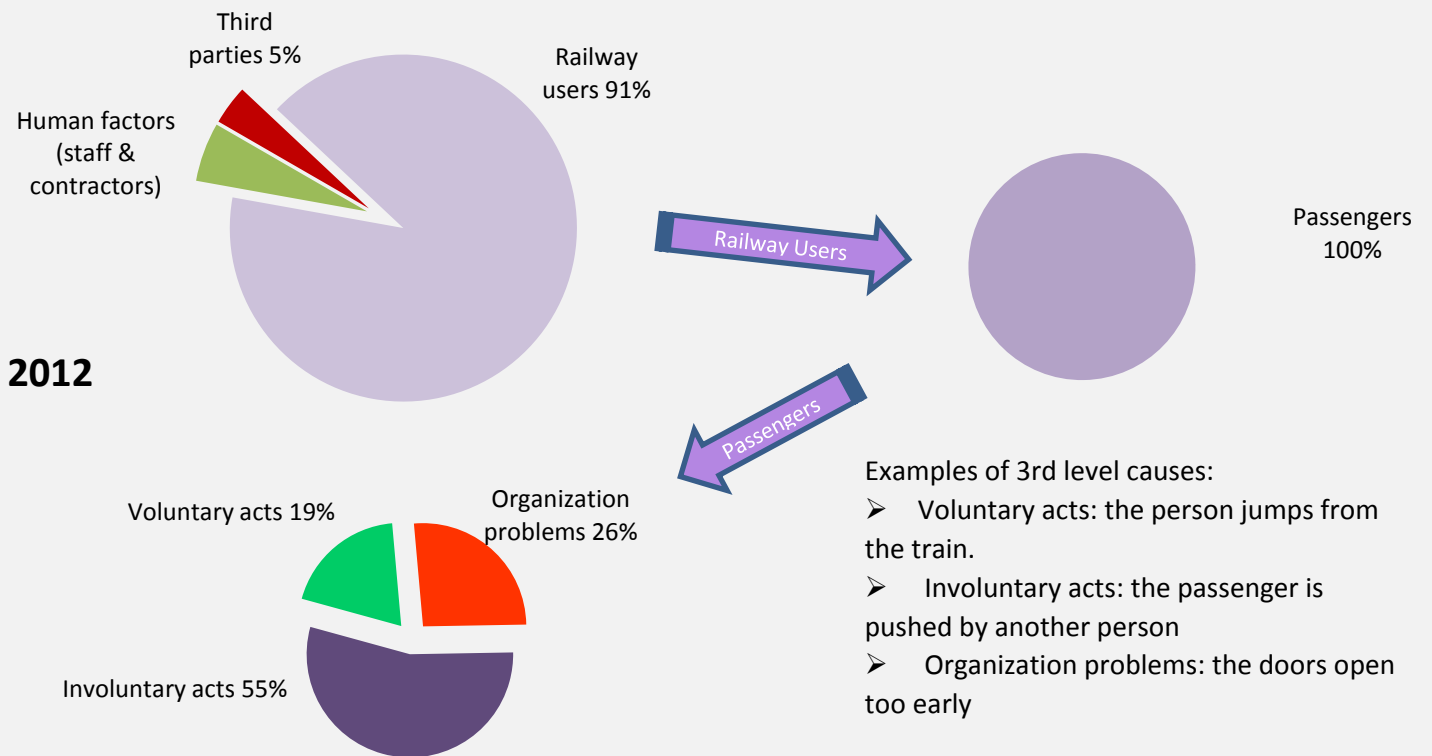


90% of individuals falling from a train are passengers. Only persons inside a train in motion or trying to embark / disembark are considered as passengers.

light colours: serious injuries

dark colours: fatalities

2.12 Individuals falling from a train in stations: causes



Accident definitions currently in force in Europe

“Significant accident” means any accident involving at least one rail vehicle in motion, resulting in at least one killed or seriously injured person, or in significant damage to stock, track, other installations or environment, or extensive disruptions to traffic. Accidents in workshops, warehouses and depots are excluded. Notes from the Safety Directive specify the following factors: significant damage over €150K and extensive disruptions to traffic with tracks blocked for more than 6 hours. *Commission Regulation (EC) N° 1192/2003*

“Serious injury accident” means any accident involving at least one rail vehicle in motion, resulting in at least one killed or seriously injured person. Accidents in workshops, warehouses and depots are excluded. (Where “person killed” means any person killed immediately or dying within 30 days as a result of an accident, excluding suicides; and “person seriously injured” means any person injured who was hospitalised for more than 24 hours as a result of an accident, excluding attempted suicides). *Commission Regulation (EC) N° 1192/2003*

Safety Database European Members

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JBV	Norway	NO
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UIC Safety Database

Report 2013

Significant Accidents 2012

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The electronic version of the report is available on the UIC website at the following address:

<http://safetydb.uic.org>



UIC Safety Database - Report 2013

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