

UIC Safety Report **2016**

Significant Accidents 2015 Public Report



Department of
fundamental values

Safety Unit

September 2016



INTERNATIONAL UNION
OF RAILWAYS

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UIC Safety Report **2016**

Significant Accidents
occurred in Europe
during the year 2015

Public Report

UIC Safety Report 2016

Table of contents

Foreword by the Chairman

Part 1 - General Report on Significant Accidents 2015

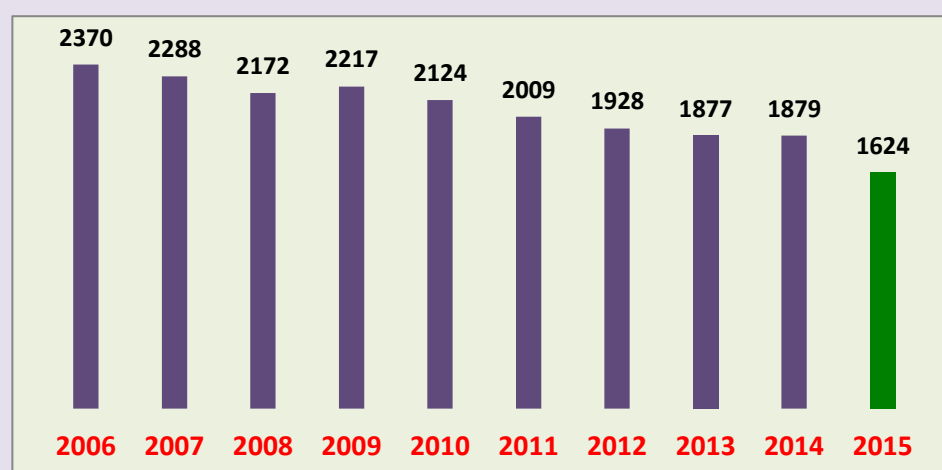
Part 2 - Time series and trends

Foreword

For over 10 years, the International Union of Railways (UIC) has collected and analysed data on significant accidents and incidents. Since 2006, tables and graphs of comparable data provided by 21 UIC members have established a benchmark and allowed trends and developments in railway safety to be identified.

Statistical analysis of significant accidents in recent years has shown that overall, the positive trend in Europe continues. The many safety-related initiatives taken by the railways are bearing fruit amongst the 22 members of the UIC Safety Database.

Annual number of significant accidents



We can observe an almost continuous decrease of significant railway accidents in Europe on the last decade. Between 2006 and 2015, accidents were reduced by 31%.

The number of victims followed the same trends with a decrease of -38% since 2006.

The most important accidents during 2015 were a collision between trains, which caused 26 serious injuries and three collisions with a road vehicle at level crossing with 7 to 8 victims each.

For most indicators, the year 2015 appears as the safest year of the decade, along with 2014.

As a reference, we may underline that no victim was deplored in derailments during 2015, for the second consecutive year. This has never occurred since the first train run at the beginning of the 19th century.

“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. Suicides and accidents in workshops, warehouses and depots are excluded.

In order to better fit with EU definitions, accidents during shunting operations or due to runaway railway vehicles are considered separately from now on. They will be found under the title "other accidents".

The second part of the report covers "**Time series and trends 2006-2015**". This measures the number of railway accidents and their consequences over a longer period, and analyses them in-depth. One immediate stand-out result is that the number of victims has fallen by 38% since 2006, with 2015 the best year since records began.

A further aspect I wish to mention is the analysis of the causes of accidents. Some 75 % of accidents are caused by "third parties" (mostly level crossing users and people trespassing on the track). Here, society as a whole must pull in the same direction in order to improve matters.

I believe this year's Safety Database Report 2016 will supply you with valuable information for your railway's daily business, and with food for thought regarding improvements in safety levels, both at your own railway and across Europe. I wish all the railways every success in improving railway safety going forward.

Peter Kleinschuster

Chairman of the Safety Platform



Part 1

General Report on Significant Accidents 2015

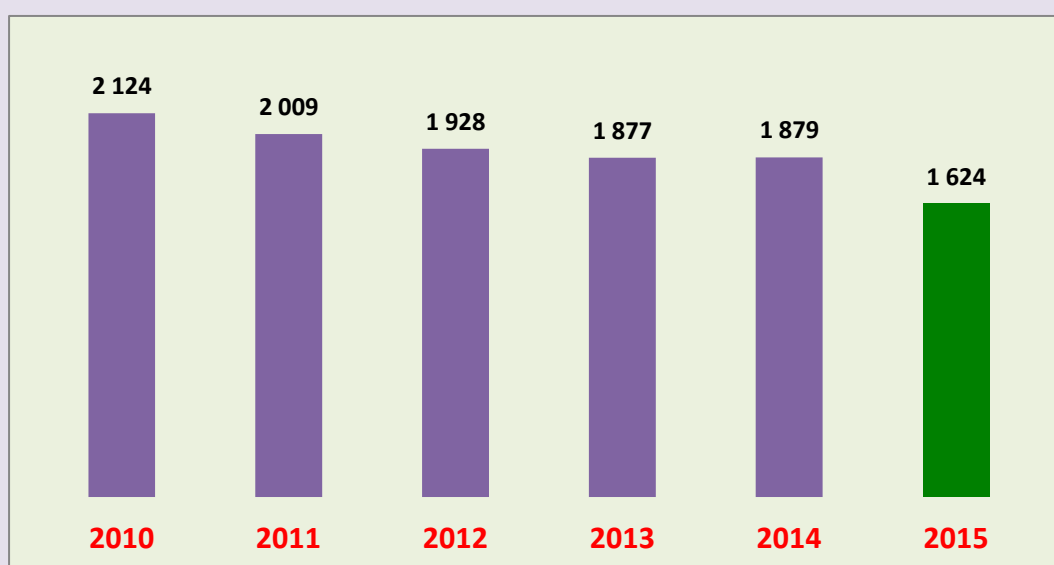
Part 1 - General Safety Indicators

- 1.01 Summary of accidents and their human consequences
- 1.02 Types of accidents according to UIC-SDB and EU definitions
- 1.03 Main causes of accidents in the year 2015
- 1.04 Trend of accidents and rates on the last six years
- 1.05 Accidents by type
- 1.06 Fatalities and serious injuries by type of accident
- 1.07 Distribution of victims
- 1.08 Victims by type of accident according to Safety Directive definitions
- 1.09 Accidents by location details
- 1.10 Accidents at level crossings
- 1.11 Number of accidents and victims by type of accident
- 1.12 Passenger victims by type of accident and location
- 1.13 Staff victims by type of accident and location
- 1.14 Victims by type of traffic
- 1.15 Accidents and victims by type of accident, causes and location
- 1.16 Accidents by type and number of victims
- 1.17 UIC Global Safety Index
- 1.18 Measures to improve safety levels

1.01 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			
2015	1 624	1,4	1,6	49,8	93,1	0,39	0,21
2014	1 879	0,3	1,1	49,0	90,4	0,46	0,23
2013	1 877	5,1	1,4	50,5	108,5	0,46	0,26
2012	1 928	1,7	2,3	48,9	102,1	0,47	0,25
2011	2 009	1,6	1,4	51,4	98,9	0,49	0,27
2010	2 124	1,9	1,8	50,7	108,0	0,53	0,29

“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, excluding accidents in workshops, warehouses and depots.



- -14% decrease in significant accidents declared for the year 2015 compared to the previous year.
- Lowest rate of accidents and fatalities per million train-kilometre in the 6-year period.

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

Types of accidents as defined in UIC – SDB	Additional information from UIC -SDB	Types of accidents as defined in Safety Directive
4,6%	Derailment of trains	4,6% Derailment of trains
0,9%	Train collision with another train	8,3% Collisions including collisions with obstacles within the clearance gauge
23,4%	Train collision with an obstacle	
	7,4% Train collision with an obstacle not at LC	24,5% LC accidents, including accidents involving pedestrians at LC
	16,0% Train collision with an obstacle at LC	
59,7%	Individual hit by a train	
	8,5% Individual hit by a train at LC	56,3% Accidents to persons caused by rolling stock in motion, with the exception of suicides.
	51,2% Individual hit by a train not at LC	
5,2%	Individual falling from a train	
1,4%	Fire in rolling stock	1,4% Fire in rolling stock
0,2%	Electrocution by overhead line or third rail	4,9% Other types of accidents
0,0%	Accident involving dangerous goods	
4,7%	Shunting operations	
0,1%	Runaway vehicles	

- 60% of accidents involved individuals hit by a train.
- Collision with an obstacle was the second most common accident (a quarter of all accidents).
- Accidents at level crossings accounted for 25% of all significant accidents.
- Accidents during shunting operations and involving runaway vehicles are now separated to better fit with the EU definitions.
- Accidents at level crossings are divided in the UIC database between collisions with a motorized vehicle and pedestrians or cyclists hit by a train.

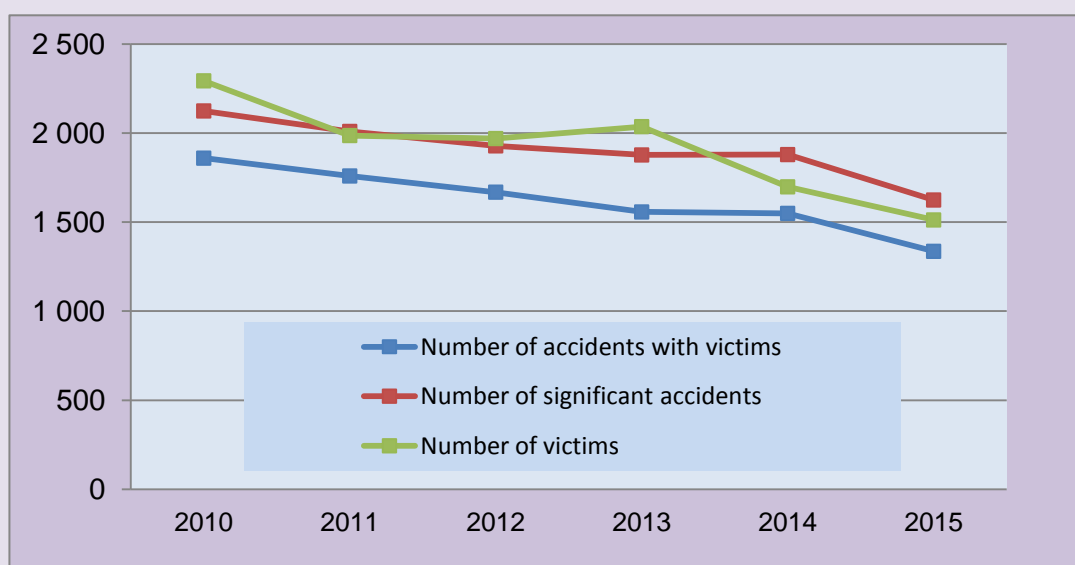
1.03 Main causes of accidents

2015	Causes at first level	Causes at second level	
EXTERNAL CAUSES	THIRD PARTIES 76,0%	Trespassing	47,0%
		Vehicle (LC accident)	15,8%
		Pedestrian (LC accident)	8,5%
		Pedestrian on public railway area	3,9%
		Other or not specified	0,7%
79,9%	WEATHER & ENVIRONMENT 3,9%	Environment	2,8%
		Weather	1,2%
INTERNAL CAUSES	INFRASTRUCTURES 3,9%	Tracks and structures	1,7%
		Energy system	1,4%
		Other or not specified	0,9%
	ROLLING STOCK 3,3%	Running gear	1,0%
		Other or not specified	2,3%
	HUMAN FACTORS (Railway staff & subcontractors) 8,0%	Track and switch maintenance staff	0,9%
		Traffic operating and signalling staff	1,5%
		Train drivers	1,7%
		Other or not specified	4,0%
	RAILWAY USERS 4,7%	Passengers	4,6%
		Other or not specified	0,1%
19,8%			
CAUSES NOT IDENTIFIED			0,2%

- 80% of accidents had external causes.
- Split of causes stable in percentage compared to previous years.
- Internal causes relate to both the infrastructure manager and railway undertakings.
- Increase of accidents involving passengers (falling from a train).

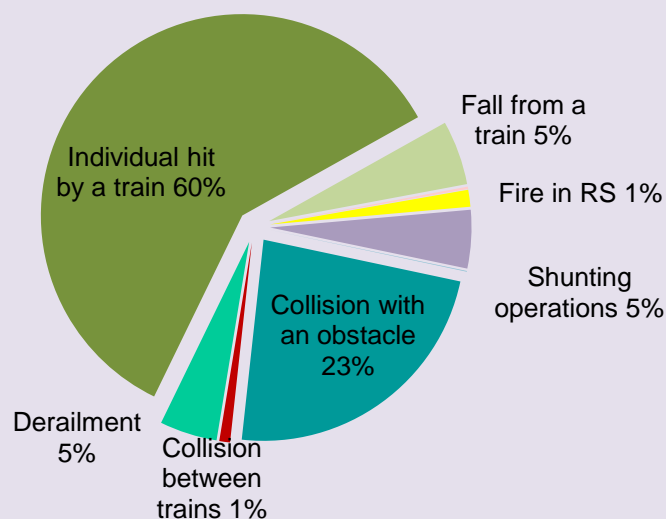
1.04 Trend of accidents and rates over the last six years

ALL RAILWAYS	2010	2011	2012	2013	2014	2015
Number of significant accidents	2 124	2 009	1 928	1 877	1 879	1 624
Significant accidents per million train-km	0,53	0,49	0,47	0,46	0,46	0,39
Number of accidents with victims	1 859	1 759	1 668	1 557	1 549	1 336
Accidents with victims per million train-km	0,46	0,43	0,41	0,38	0,38	0,32
Number of victims	2 293	1 986	1 969	2 036	1 698	1 512
Victims per million train-km	0,57	0,49	0,48	0,50	0,41	0,37
Number of fatalities	1 155	1 095	1 021	1 070	946	857
Fatalities per million train-km	0,29	0,27	0,25	0,26	0,23	0,21
Number of million train-kilometres	4 041	4 093	4 108	4 098	4 114	4 129

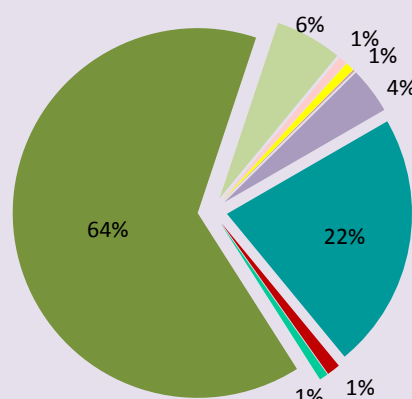


1.05 Accidents by type

2015



for comparison: period 2010-2014



	Victims per accident	Fatalities per accident	Serious injuries per accident
Passengers	0,075	0,014	0,061
Staff	0,044	0,016	0,028
Third parties	0,813	0,498	0,315
Total	0,931	0,528	0,403

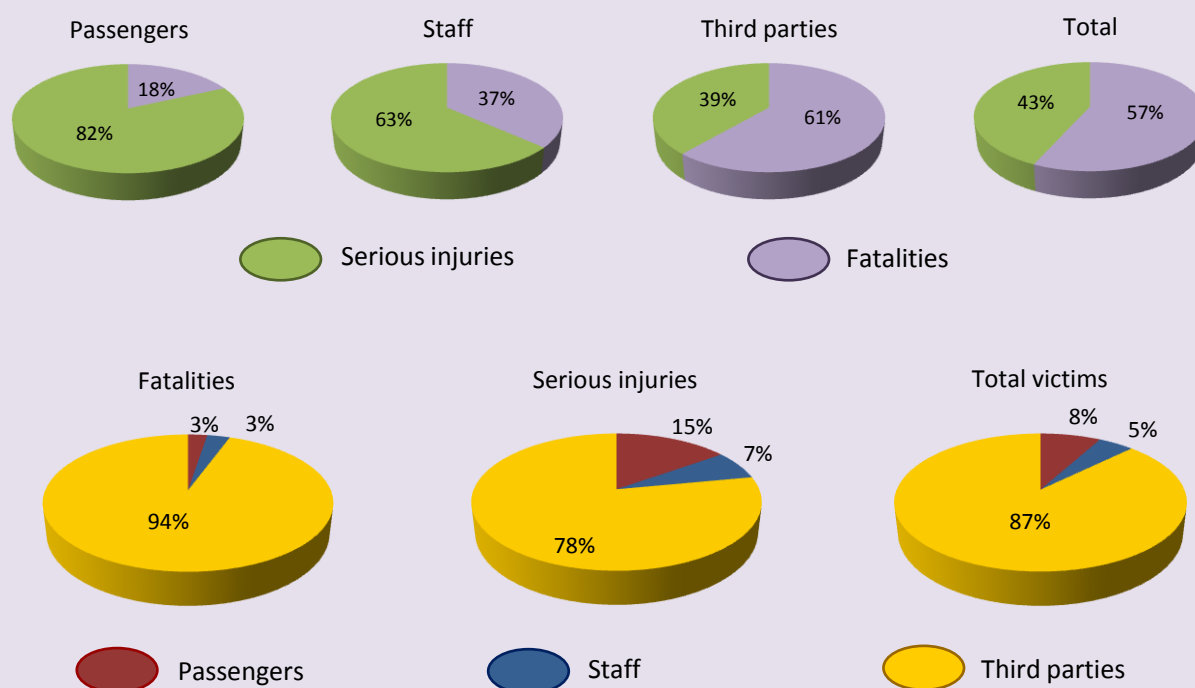
- Collisions with an obstacle include collisions at LC.
- Individual hit by a train include pedestrians at LC.
- For LC accidents, refer to table 1.11.

Type of accident - year 2015	Accidents		Victims	
	Number	%	Fatalities	Serious injuries
Collision with an obstacle	380	23,4%	148	217
Collision between trains	14	0,9%	1	37
Derailment	75	4,6%	-	-
Individual hit by a train	969	59,7%	671	317
Fall from a train	84	5,2%	24	60
Electrocution	3	0,2%	-	3
Fire in RS	22	1,4%	-	1
Dangerous goods accidents (no release)	-	0,0%	-	-
Dangerous goods accidents (with release)	-	0,0%	-	-
Shunting operations	76	4,7%	12	19
Runaway vehicles	1	0,1%	1	1
Total	1 624		857	655

1.06 Fatalities and serious injuries by type of accident

2015	Fatalities			Serious injuries		
Type of accident	Passen- gers	Staff	Third parties	Passen- gers	Staff	Third parties
Collision with an obstacle	4	4	140	17	9	191
Collision between trains	-	1	-	24	13	-
Derailment	-	-	-	-	-	-
Individual hit by a train	-	12	659	-	7	310
Fall from a train	18	2	4	54	2	4
Electrocution	-	-	-	1	1	1
Fire in rolling stock	-	-	-	1	-	-
Dangerous goods accidents	-	-	-	-	-	-
Shunting operations	-	6	6	2	12	5
Runaway vehicles	-	1	-	-	1	-
Total	22	26	809	99	45	511

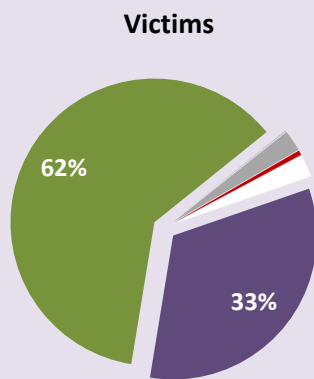
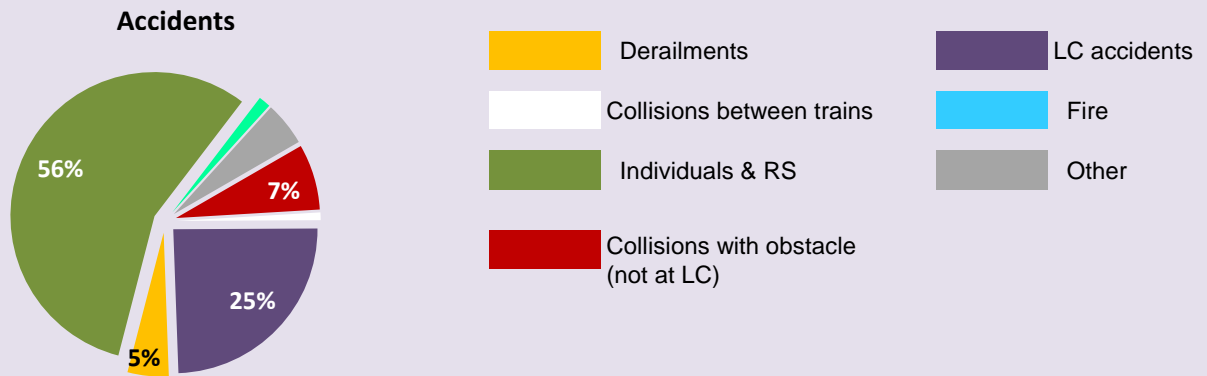
1.07 Distribution of victims



Reading method: fatalities account for 18% of passenger victims and passengers represent 3% of fatalities.

- Third parties represented 94% of all fatalities and 79% of serious injuries.
- Passengers accounted for 8% of all victims (5% in 2014 and 20% in 2013).

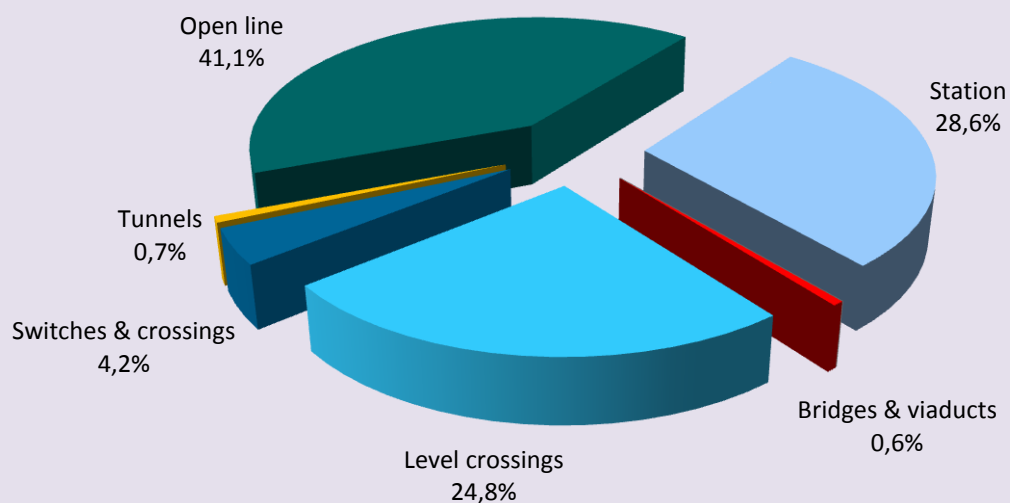
1.08 Victims by type of accident according to Safety Directive definitions



Breakdown of human consequences			
	Fatal.	Injur.	All
Passengers	1,5%	6,5%	8%
Staff	1,7%	3,0%	5%
Third parties	53,5%	33,8%	87%
All categories	57%	43%	100%

Type of accident	Number of events	%	Fatalities			Serious injuries		
			Passengers	Staff	3rd parties	Passengers	Staff	3rd parties
Collisions with obstacle (not at LC)	120	7,4%	-	-	2	1	3	2
Collisions between trains	14	0,9%	-	1	-	24	13	-
Level crossings	398	24,5%	4	4	242	16	6	225
Derailment	75	4,6%	-	-	-	-	-	-
Individuals & rolling stock in motion (not at LC)	915	56,3%	18	14	559	54	9	278
Fire	22	1,4%	-	-	-	1	-	-
Other types	80	4,9%	-	7	6	3	14	6
Total	1 624		22	26	809	99	45	511

1.09 Accidents by location details



1.10 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
		Passen- gers	Staff	Third parties				
2015	403	4	4	244	25%	29%	0,10	0,06
2014	454	-	2	261	24%	28%	0,11	0,06
2013	478	-	1	283	25%	27%	0,12	0,07
2012	515	-	1	330	27%	32%	0,13	0,08
2011	446	6	1	277	22%	26%	0,11	0,07
2010	500	1	3	319	24%	28%	0,12	0,08

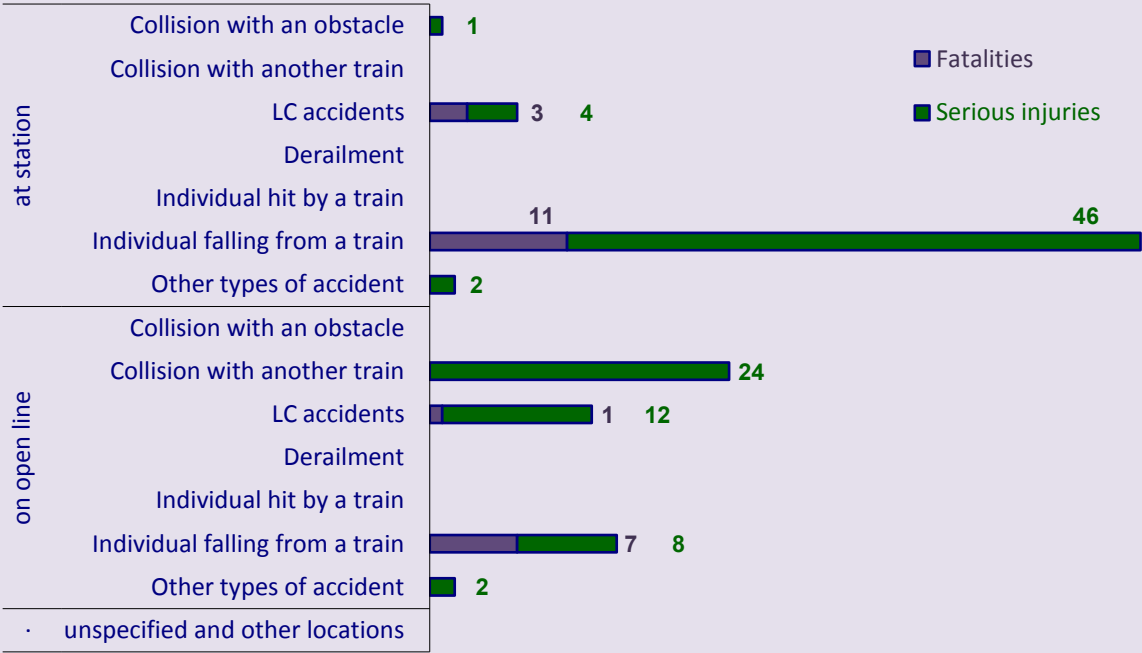
- Accidents at LC decreased by -11% compared with 2014 and -19% compared with 2010.
- Fatalities at LC decreased by -4% compared with 2014 and -22% compared with 2010.

1.11 Number of accidents and victims by type of accident

2014		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)	24	-	-	1	1	1	-	3
	Collisions between trains	6	-	-	-	-	2	-	2
	LC accidents	69	3	-	35	4	2	42	86
	Derailments	37	-	-	-	-	-	-	-
	Hit by a train (not at LC)	332	-	8	188	-	5	139	340
	Falling from a train	64	11	2	2	46	2	1	64
	Other accidents	76	-	5	6	2	9	5	27
	Total at station	608	14	15	232	53	21	187	522
On open line	Collisions with an obstacle (not at LC)	96	-	-	1	-	2	2	5
	Collisions between trains	8	-	1	-	24	11	-	36
	LC accidents	329	1	4	207	12	4	183	411
	Derailments	38	-	-	-	-	-	-	-
	Hit by a train (not at LC)	499	-	4	367	-	2	135	508
	Falling from a train	20	7	-	2	8	-	3	20
	Other accidents	26	-	2	-	2	5	1	10
	Total in open line	1016	8	11	577	46	24	324	990
not specified		-	-	-	-	-	-	-	-
GRAND TOTAL		1624	22	26	809	99	45	511	1512

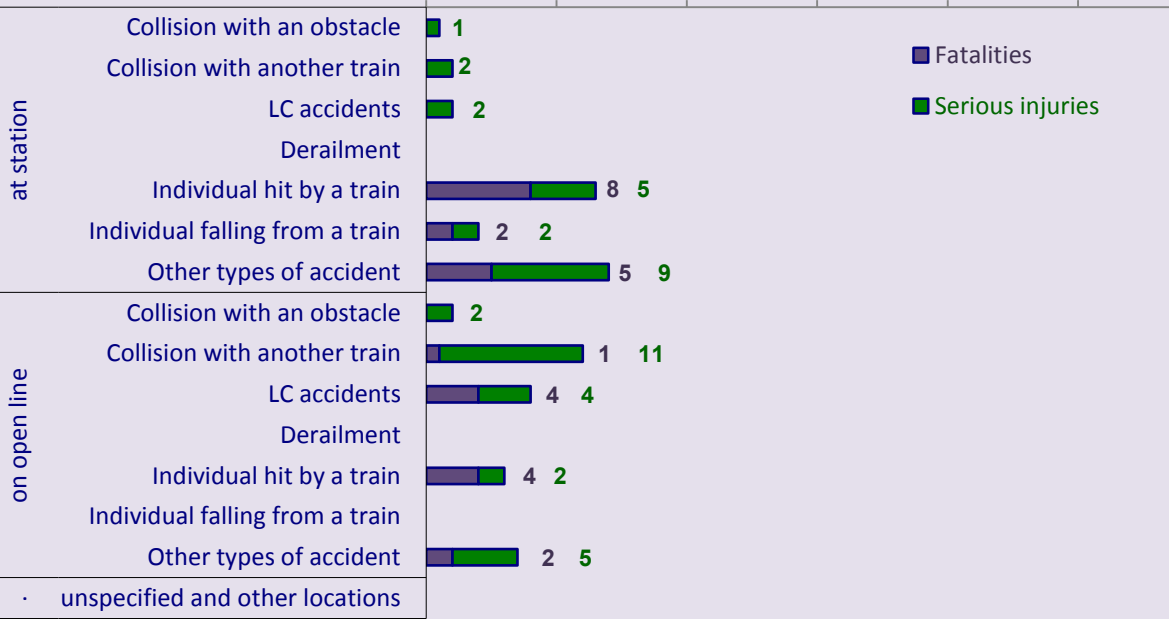
- 62% of accidents occurred on open line, whilst 38% happened in stations and stops.
- 70% of fatalities occurred on open line.
- Persons hit by a train and LC accidents represented 98% of fatalities on open line.

1.12 Passenger victims by type of accident and location



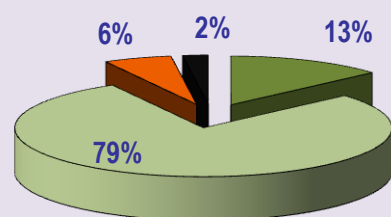
- "Fall from a train" represented 82% of passenger victims at station.
- 1 collision between trains on open line made 23 passenger injuries.

1.13 Staff victims by type of accident and location



- Most of staff victims were hit by a train, and particularly during shunting operations (included in 'other types of accidents').

1.14 Victims by type of traffic



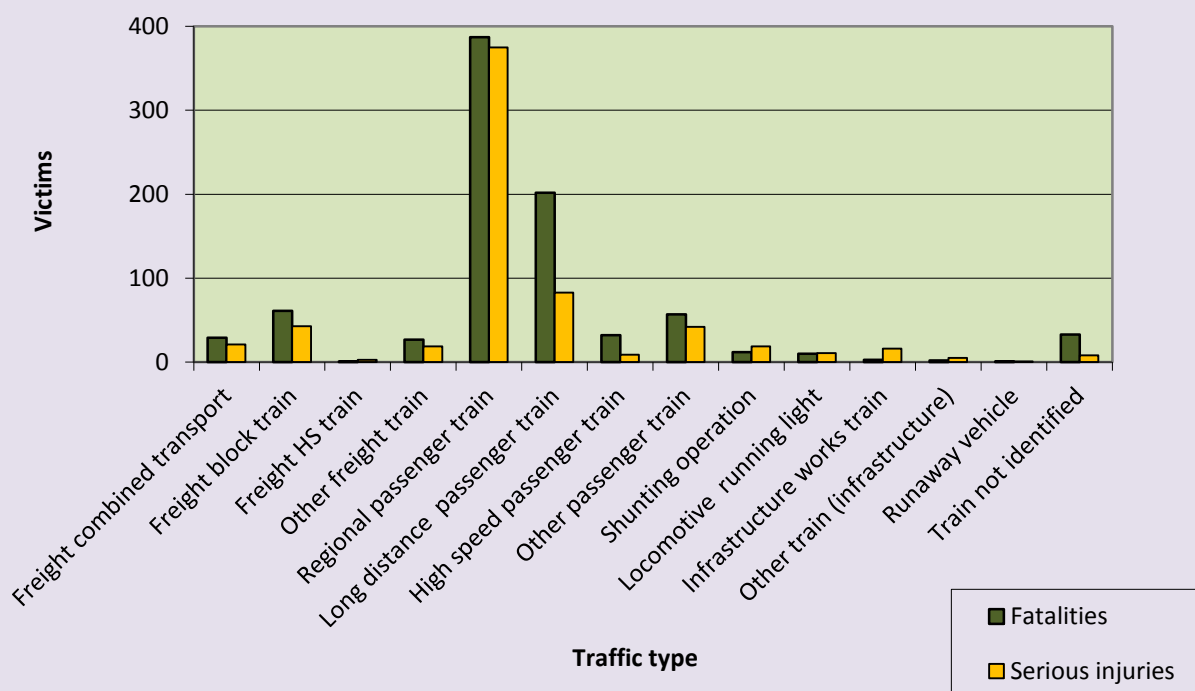
■ Freight trains

■ Passenger trains

■ Locomotive running light, infrastructure trains, not identified trains

■ Shunting and runaway vehicles

Type of accident	Freight trains	Passenger trains	Locomotive running light, infrastructure trains, not identified trains	Shunting and runaway vehicles
Collision	4	34	8	7
Derailment	-	-	-	-
Level-crossing accidents	64	424	9	4
Accidents to persons caused by rolling stock in motion	136	727	69	22
Other accidents	-	2	2	-
TOTAL victims	204	1187	88	33



- Passenger trains were involved in accidents leading to 79% of victims.
- Regional passenger trains were involved in accidents leading to 51% of victims (19% for long distance passenger trains).

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

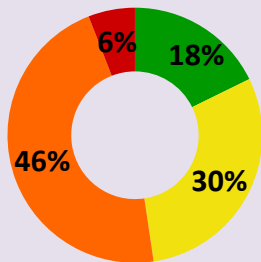
Type of accidents	Causes			Location					Victims Fatal. S. Inj.			
				Type of location			Location details					
Individual hit by a train 969 988	INF	1	1	OL	597	606	LC	138	140	P	-	-
	RS	-	-				SC	13	13			
	HF	18	20	S	372	382	BV	9	10	S	12	7
	RU	3	3				T	8	8			
	WE	-	-	Ot	-	-	O	801	817	T	659	310
	TP	947	964									
	Train collision with an obstacle 380 365	INF	27	2	OL	327	318	LC	260	357	P	4
RS		7	-	SC				3	-			
HF		19	7	S	53	47	BV	-	-	S	4	9
RU		-	-				T	2	-			
WE		60	4	Ot	-	-	O	115	8	T	140	191
TP		267	352									
Individual falling from a train 84 84		INF	-	-	OL	20	20	LC	-	-	P	18
	RS	2	2	SC				2	2			
	HF	5	5	S	64	64	BV	-	-	S	2	2
	RU	69	69				T	1	1			
	WE	-	-	Ot	-	-	O	81	81	T	4	4
	TP	8	8									
	Train collision with another train 14 38	INF	-	-	OL	8	36	LC	-	-	P	-
RS		-	-	SC				5	2			
HF		13	38	S	6	2	BV	-	-	S	1	13
RU		1	-				T	1	1			
WE		-	-	Ot	-	-	O	8	35	T	-	-
TP		-	-									
Derailment 75 -		INF	30	-	OL	38	-	LC	-	-	P	-
	RS	20	-	SC				21	-			
	HF	17	-	S	37	-	BV	-	-	S	-	-
	RU	-	-				T	-	-			
	WE	4	-	Ot	-	-	O	54	-	T	-	-
	TP	-	-									
	Electrocution 3 3	INF	-	-	OL	1	1	LC	-	-	P	-
RS		-	-	SC				-	-			
HF		1	1	S	2	2	BV	-	-	S	-	1
RU		1	1				T	-	-			
WE		-	-	Ot	-	-	O	3	3	T	-	1
TP		1	1									
Fires 22 1		INF	-	-	OL	15	1	LC	-	-	P	-
	RS	20	1	SC				-	-			
	HF	2	-	S	7	-	BV	-	-	S	-	-
	RU	-	-				T	-	-			
	WE	-	-	Ot	-	-	O	22	1	T	-	-
	TP	-	-									

Type of accidents	Causes			Location				Victims Fatal. S. Inj.				
				Type of location		Location details						
Accident involving dangerous goods without release - -	INF	-	-	OL	-	-	LC	-	-	P	-	-
	RS	-	-				SC	-	-			
	HF	-	-				BV	-	-			
	RU	-	-	S	-	-	T	-	-	S	-	-
	WE	-	-				O	-	-			
	TP	-	-				Ot	-	-			
Accident involving dangerous goods with release - -	INF	-	-	OL	-	-	LC	-	-	P	-	-
	RS	-	-				SC	-	-			
	HF	-	-				BV	-	-			
	RU	-	-	S	-	-	T	-	-	S	-	-
	WE	-	-				O	-	-			
	TP	-	-				Ot	-	-			
Shunting operations 76 31	INF	5	4	OL	9	6	LC	5	4	P	-	2
	RS	4	1				SC	24	1			
	HF	54	13				BV	-	-			
	RU	2	2	S	67	25	T	-	-	S	6	12
	WE	-	-				O	47	26			
	TP	11	11				Ot	-	-			
Runaway vehicles 1 2	INF	-	-	OL	1	2	LC	-	-	P	-	-
	RS	-	-				SC	-	-			
	HF	1	2				BV	-	-			
	RU	-	-	S	-	-	T	-	-	S	1	1
	WE	-	-				O	1	2			
	TP	-	-				Ot	-	-			
TOTAL	INF	63	7	OL	1016	990	LC	403	501	P	22	99
	RS	53	4				SC	68	18			
	HF	130	86				BV	9	10			
	RU	76	75	S	608	522	T	12	10	S	26	45
	WE	64	4				O	1132	973			
	TP	1234	1336				Ot	-	-			
										857	655	

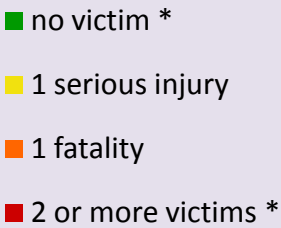
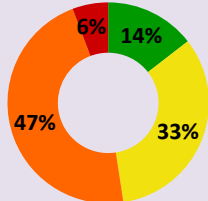
number of accidents	INF: Infrastructures RS: Rolling stock HF: Human Factors RU: Railway users WE: Weather-Environment TP: Third Parties	OL: Open line S: At station Ot: Other locations	LC: Level crossings SC: Switches & Crossings BV: Bridges & Viaducts T: Tunnels O: Other or unidentified	P: passengers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

1.16 Accidents by type and number of victims

All accidents 2015 (1624 events)

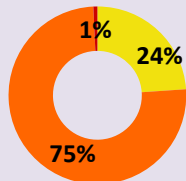


2010 - 2014
(9817 events)

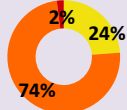


* a victim is a fatality or a serious injury

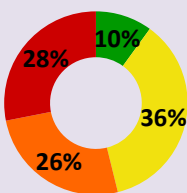
Individual hit by a train at
LC 2015 (138 events)



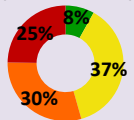
2010 - 2014
(809 events)



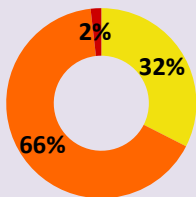
Collision with an obstacle at
LC 2015 (260 events)



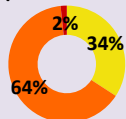
2010 - 2014
(1575 events)



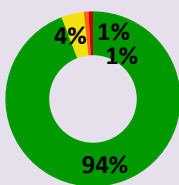
Individual hit by a train not at
LC 2015 (831 events)



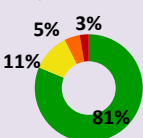
2010 - 2014
(5189 events)



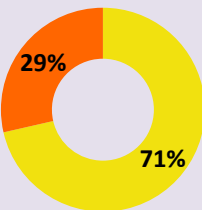
Collision with an obstacle not
at LC 2015 (120 events)



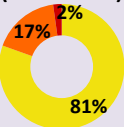
2010 - 2014
(517 events)



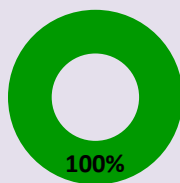
Fall from a train 2015 (84 events)



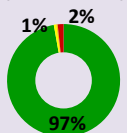
2010 - 2014
(548 events)



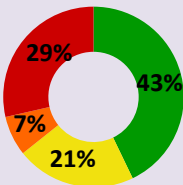
Derailment 2015 (75 events)



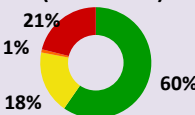
2010 - 2014
(538 events)



Collision between trains
2015 (14 events)



2010 - 2014
(109 events)



- Fires in RS: 22 events without victims and 1 event with a serious injury
- Electrocutions: 3 events with a serious injury
- Dangerous goods: 5 events without victims

1.17 UIC Global Safety Index



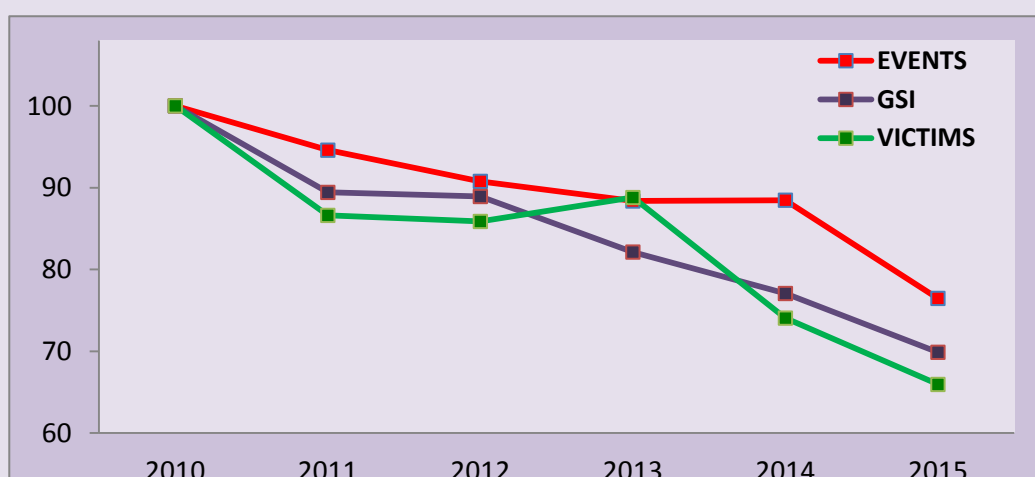
The UIC Global Safety Index was created in 2015 by the Safety performance Group. It reflects more aspects than the sole number of events. Each event is weighted following the type of accident, the category of victim, the number of victims and the railway system responsibility. Its general formula is as follows:

$$GSI = \sum (Cv \times Cn) + Ca \times Cr$$

where:

- Cv is the coefficient for the category of victim, from 1 (a serious trespasser injury) to 8 (a passenger fatality);
- Cn is the coefficient for the number of victims, from 0 (no victim) to 5 (more than 5 victims);
- Ca is the coefficient for the type of accident, from 1 (a person hit by a train) to 7 (a derailment or a collision between trains);
- Cr is the coefficient for the railway system responsibility, from 1 (external causes) to 2 (internal causes).

The graph below compares the trends of the GSI with the trends of number of events and number of victims (Base 100 in 2010).



1.18 Measures to improve safety levels

On behalf of the UIC Safety Platform, the Safety Performance Group launched a questionnaire on main measures set up to improve safety per type of accident among the Safety Platform members. This is a summary of the measures currently worked on by companies.

Preventing collisions between trains

New train protection systems.

Improving safety at level crossing

Technical upgrade and removal of level crossings, awareness campaigns.

Preventing derailments

Vehicle and track monitoring, hot box detectors.

Preventing individuals being hit by a train on platform

Warning against passing trains, platform height adjustment, awareness campaigns.

Preventing individuals being hit by a train on track

Protective measures against entering tracks, informing the public about dangers.

Preventing people falling from a train

Completing door lock systems on passenger trains (related to speed and platform side).



Part 2

Time series and trends

Part 2 - Time series and trends 2006-2015

CAUSES

2.01 Significant accidents

2.02 Causes

2.03 Internal causes

2.04 External causes

2.05 Third parties

HUMAN CONSEQUENCES

2.06 Human consequences

2.07 Severe accidents (two and more victims)

2.08 Passengers

2.09 Staff

2.10 Third parties

TYPE OF ACCIDENT

2.11 Collisions with an obstacle

2.12 Collisions between trains

2.13 Derailments

2.14 Individuals hit by a train

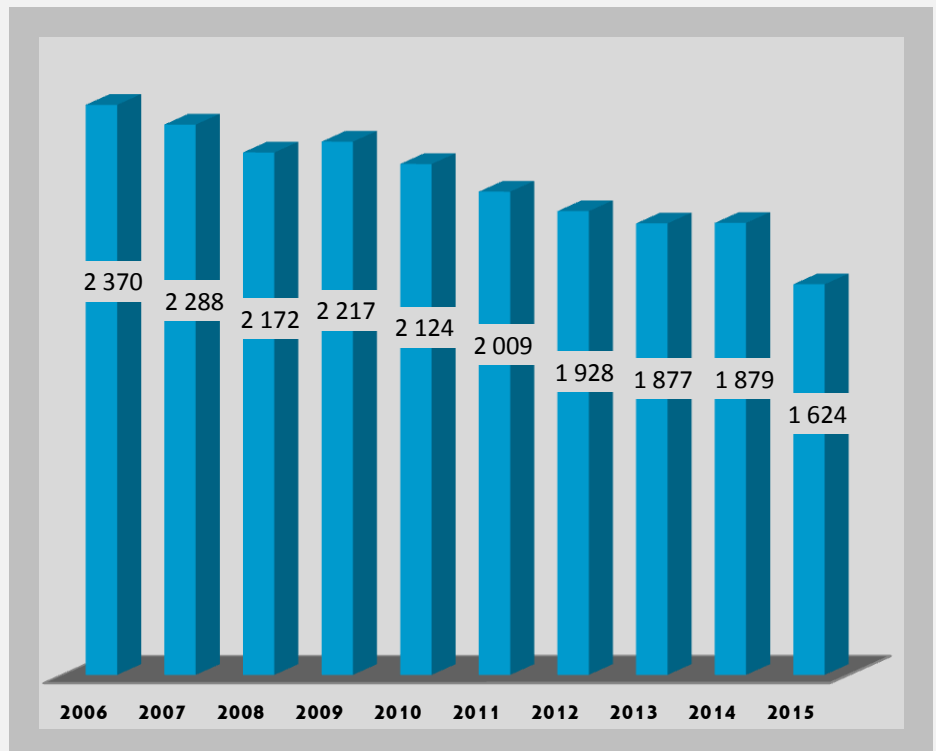
2.15 Individuals falling from a train

2.16 Accidents at level crossings

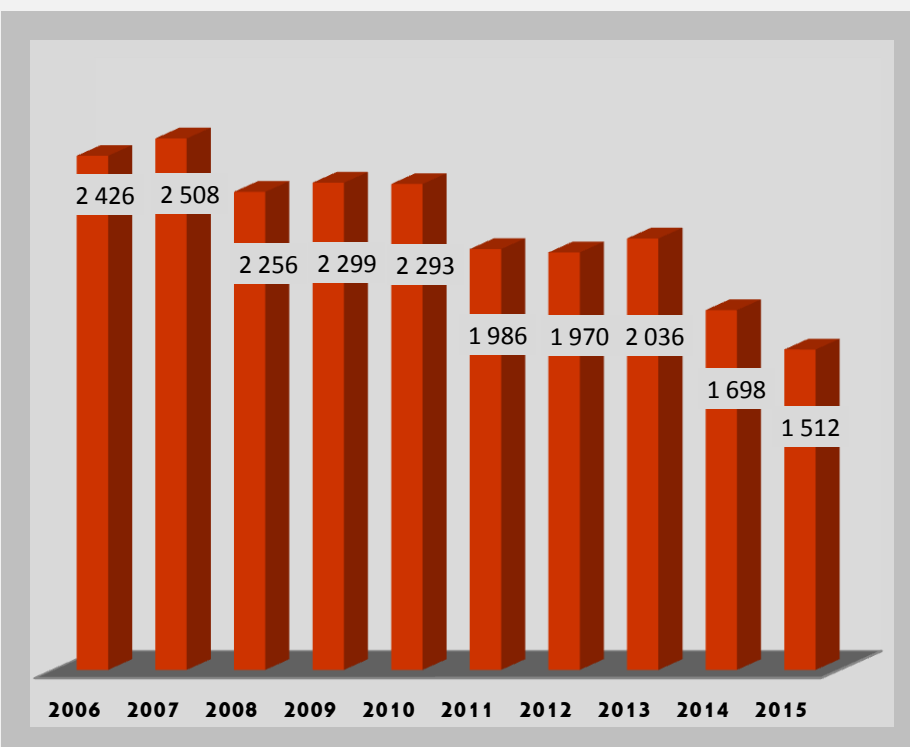
2.01a All significant accidents

Significant accidents declared by railway members of the Safety Database dropped from 2370 in 2006 to 1624 in 2015, which means a decrease of 31%.

“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, excluding accidents in workshops, warehouses and depots.



2.01b Victims of rail accidents



Trends in number of victims show three-year stages:

- around 2 500 victims per year in 2006-2007
- around 2 300 victims per year in 2008-2010
- around 2 000 victims per year in 2011-2013
- 1 698 victims in 2014 and 1 512 victims in 2015

The number of victims in 2015 represents 62% of the number of victims in 2006. This means that more than one third of 2006 victims were spared in 2014. This is the most positive trend in railway safety issues we may observe on the past ten years.

2.02a Accidents per internal / external causes

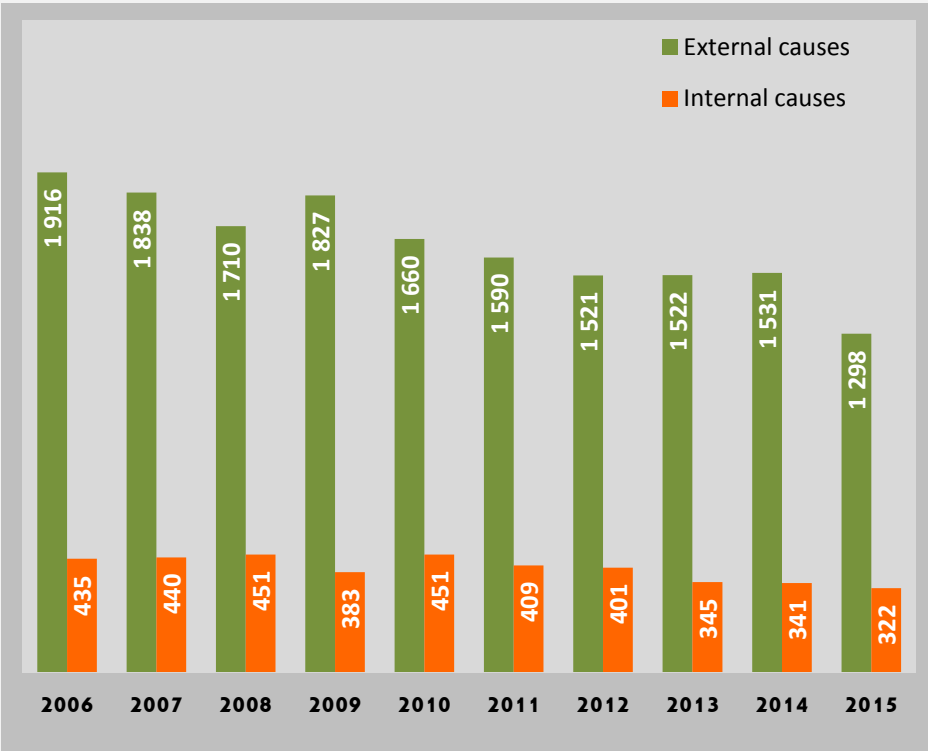
The number of accidents with internal causes decreased -25% between 2006 and 2014.

The number of accidents with external causes decreased -32% between 2006 and 2014.

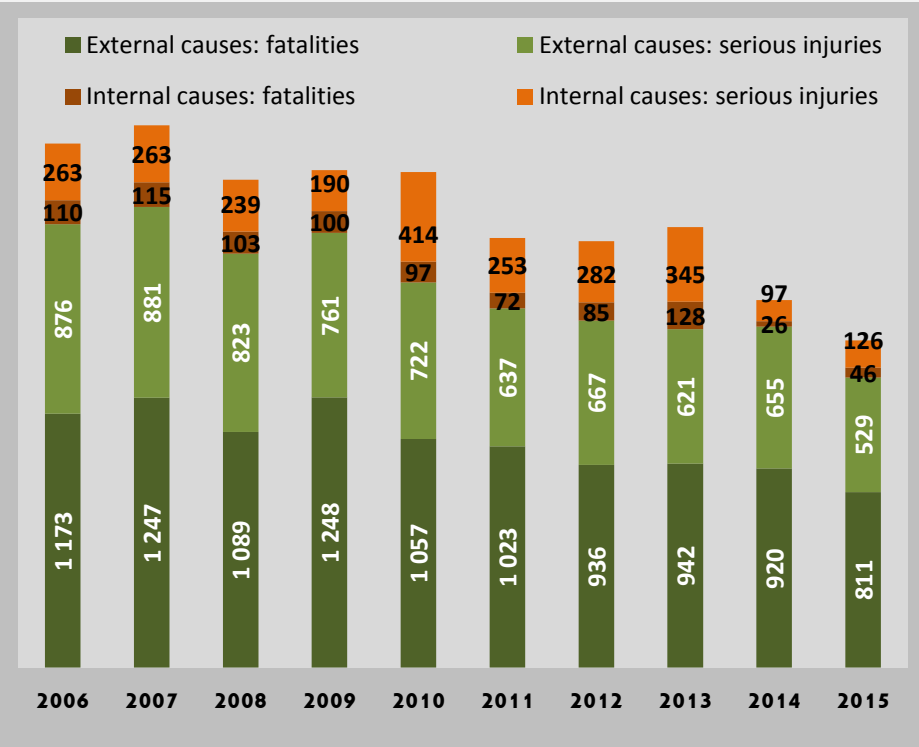
External causes are responsible for around 80% of accidents each year.

Reminder

- Internal causes: infrastructure, rolling stock, human factors and railway users;
- external causes: third parties, weather and environment.



2.02b Victims per internal / external causes



Decrease from 2006 to 2015

Internal causes	-55%
fatalities	-58%
serious injuries	-54%
External causes	-35%
fatalities	-31%
serious injuries	-40%

In the year 2015:

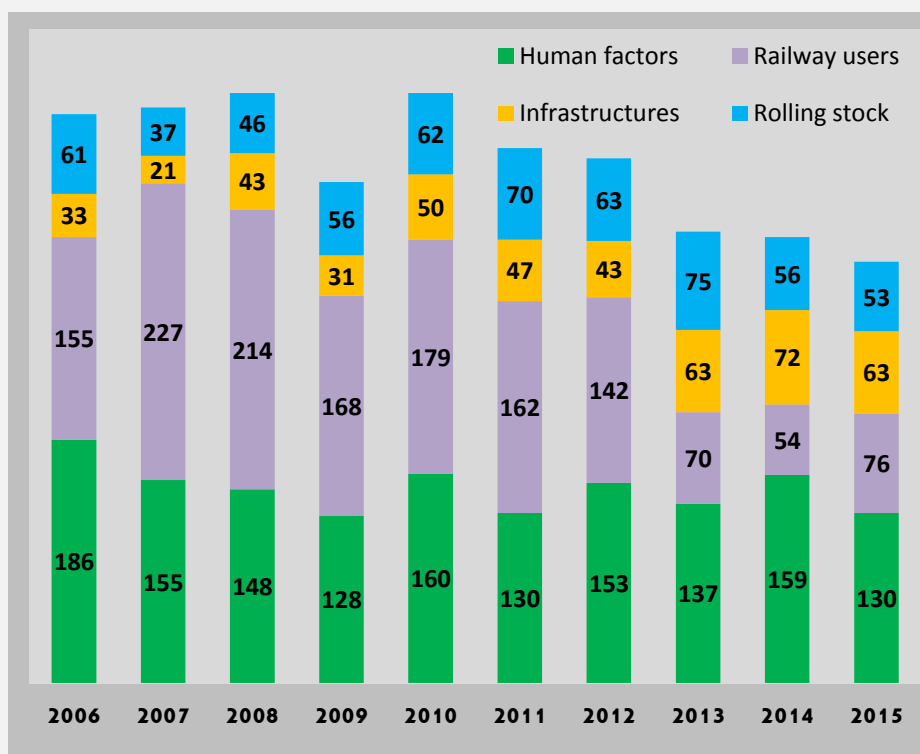
- ✓ External causes are responsible for 89% of all victims and 94% of all fatalities.
- ✓ 61% of victims of accidents with external causes are fatalities.
- ✓ Only 27% of victims of accidents with internal causes are fatalities.

2.03a Accidents per internal causes

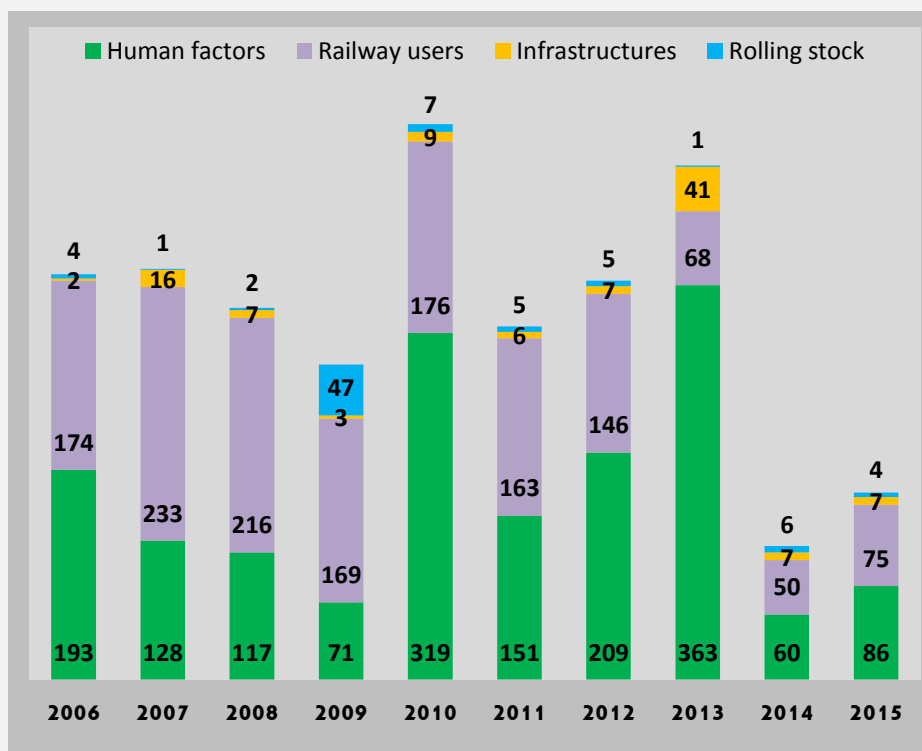
Accidents with "human factor" causes decreased -31% between 2006 and 2015.

We observe a huge drop of accidents with "railway users" causes: -51%

On the contrary, accidents with "infrastructure" causes doubled on the period and no change is noticeable for accidents with "rolling stock" causes.



2.03b Victims per internal causes



Victims of accidents with internal causes during the last two years represent less than a half of the 2006 victims.

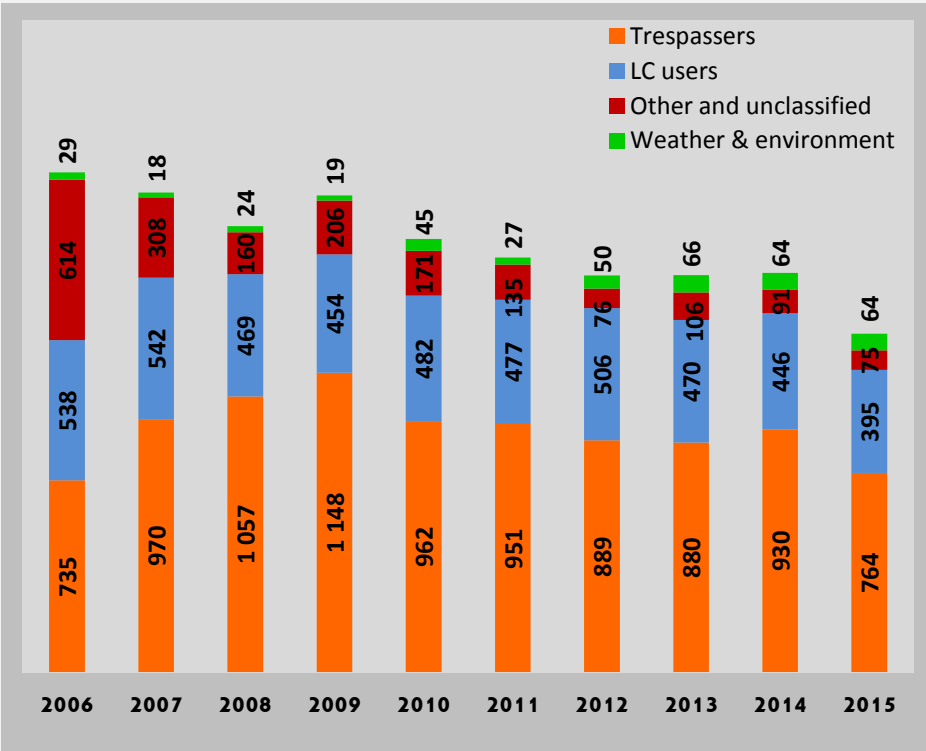
However, it seems difficult to observe well defined trends as accidents and victims are quite disconnected. A few severe accidents may have a huge number of victims (years 2010 and 2013, for instance).

To be noticed: accidents with rolling stock or infrastructure main causes do not generally lead to a large number of victims.

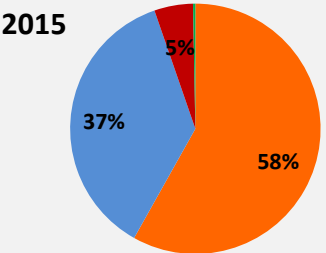
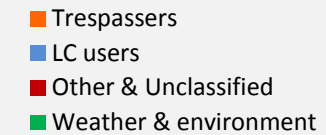
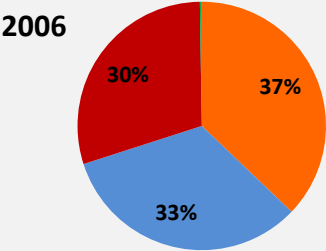
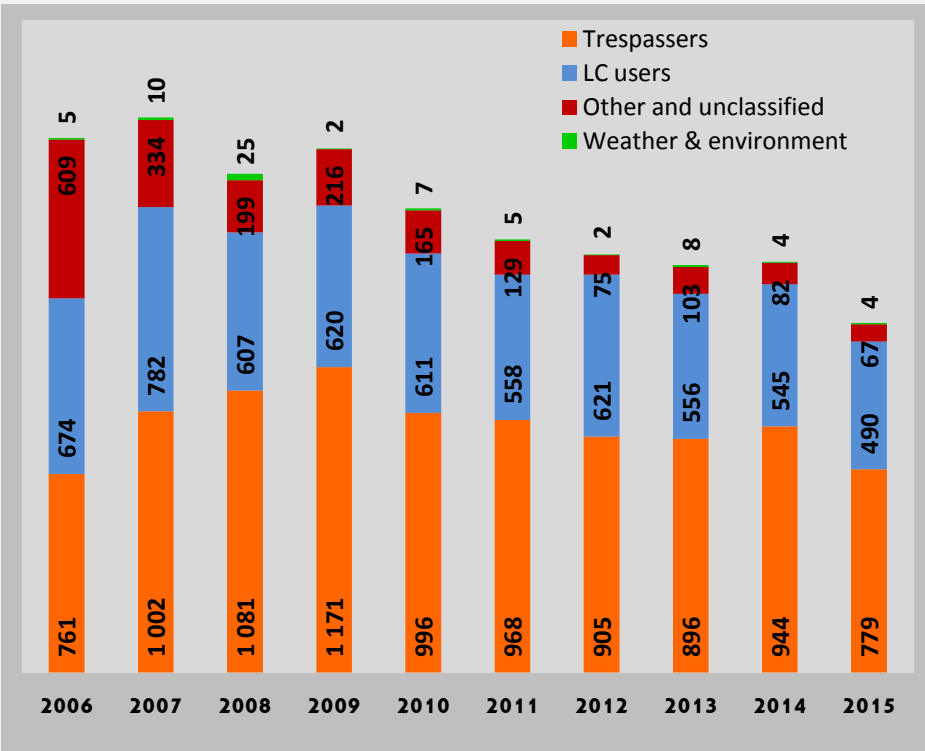
2.04a Accidents per external causes

Graphs 2.04a and 2.04b show a lot of accidents with unclassified causes as the database was first implemented.

The data quality improved over the years, reclassifying events in other established categories. Hence the difficulty to analyse trends over the whole period.



2.04b Victims per external causes



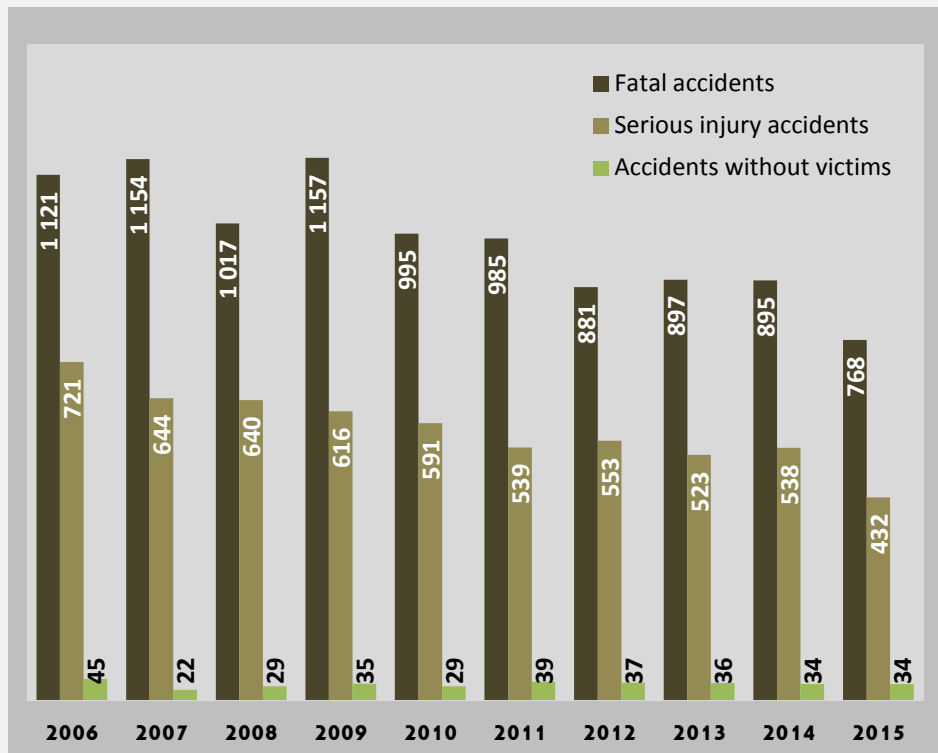
2.05a Accidents caused by third parties

Accidents caused by third parties decreased -35% between 2006 and 2015.

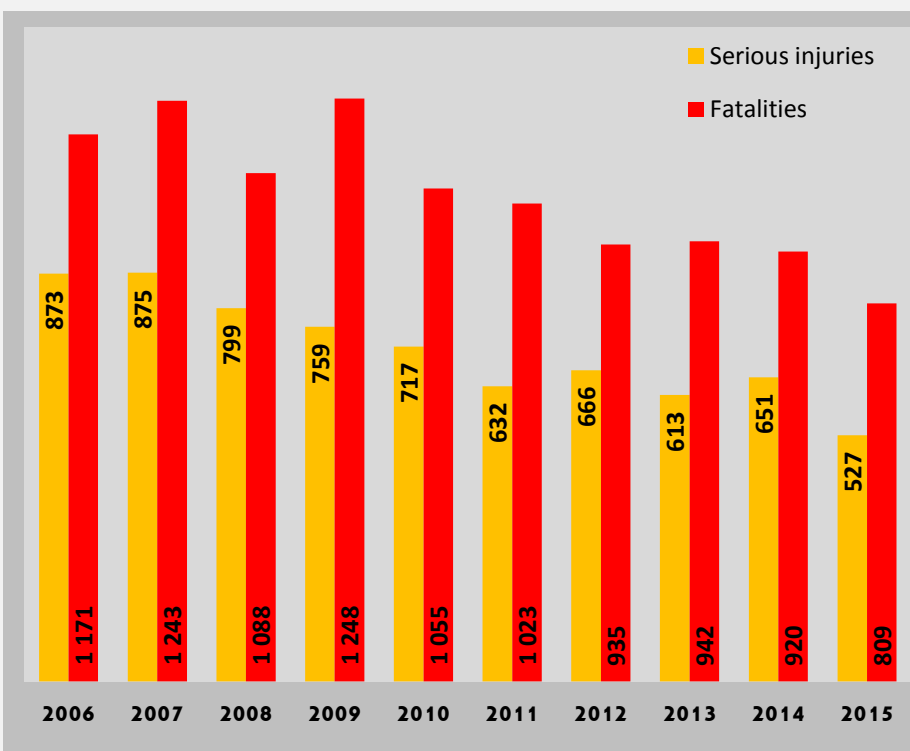
Serious injuries decreased -40% and fatalities decreased -30% on the 10-year period.

94% of all fatal accidents and 83% of all serious injury accidents are caused by third parties (2015 figures).

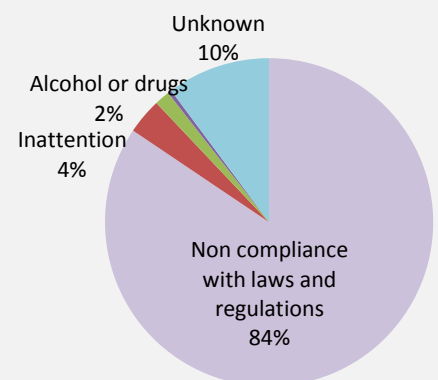
Non compliance with laws and regulations is the most used cause at third level, representing 84% of cases in 2015.



2.05b Victims of accidents caused by third parties



Split of victims per cause at third level 2015

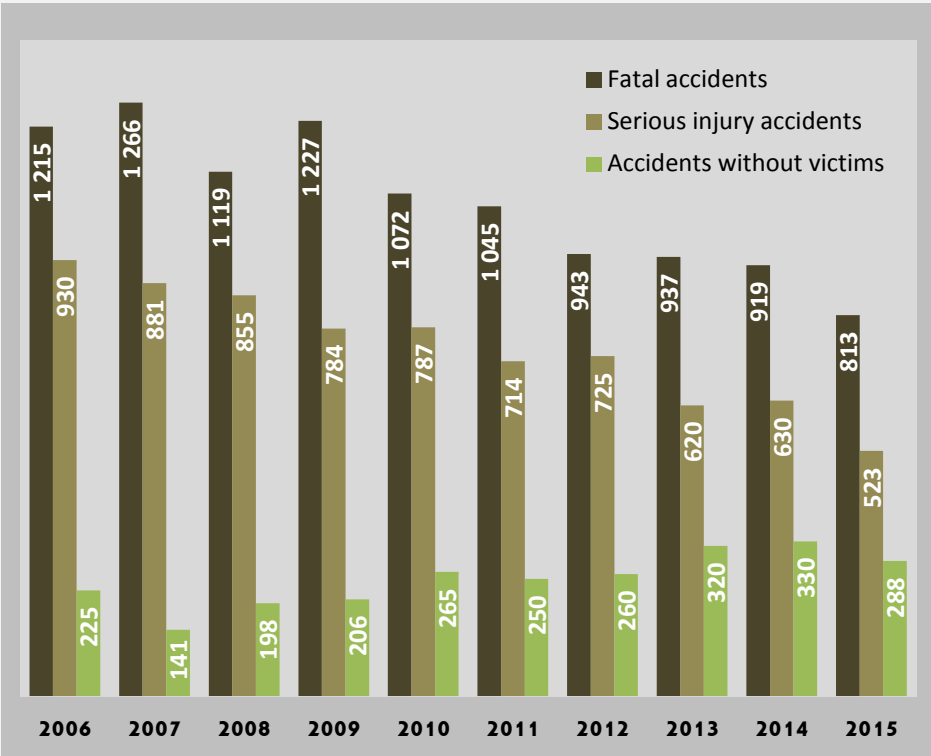


2.06a Accidents per human consequences

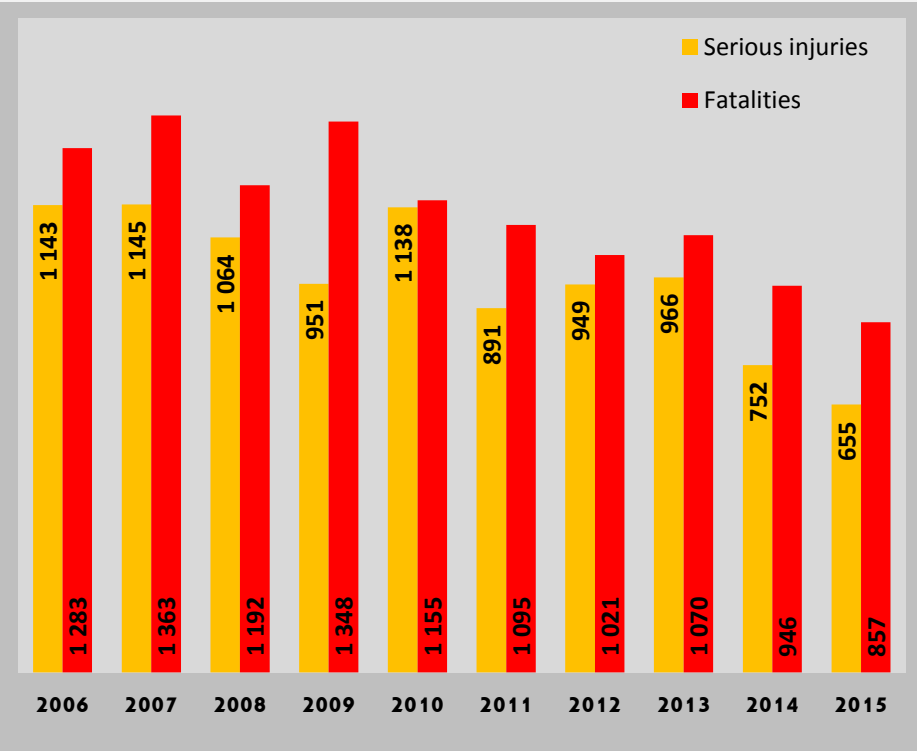
Fatal accidents roughly represent half of all significant accidents. This proportion is quite stable along the years, with a trend towards fewer fatal accidents.

A maximum of 55% of fatal accidents was observed in 2007 and 2009 and a minimum of 49% in 2014.

Fatal accidents decreased by 27% from 2006 to 2014 while serious injury accidents decreased by 35%.



2.06b Fatalities and serious injuries



We observe a decrease of fatalities as well as serious injuries.

This evolution appears quite erratic as it might depend on a small number of severe accidents.

From 2006 to 2015, fatalities decreased by -33% while serious injuries decreased by -43%.

Every year, railway accidents lead to more fatalities than serious injuries, due to the preeminence of "individuals hit by a train" (see graph 2.14).

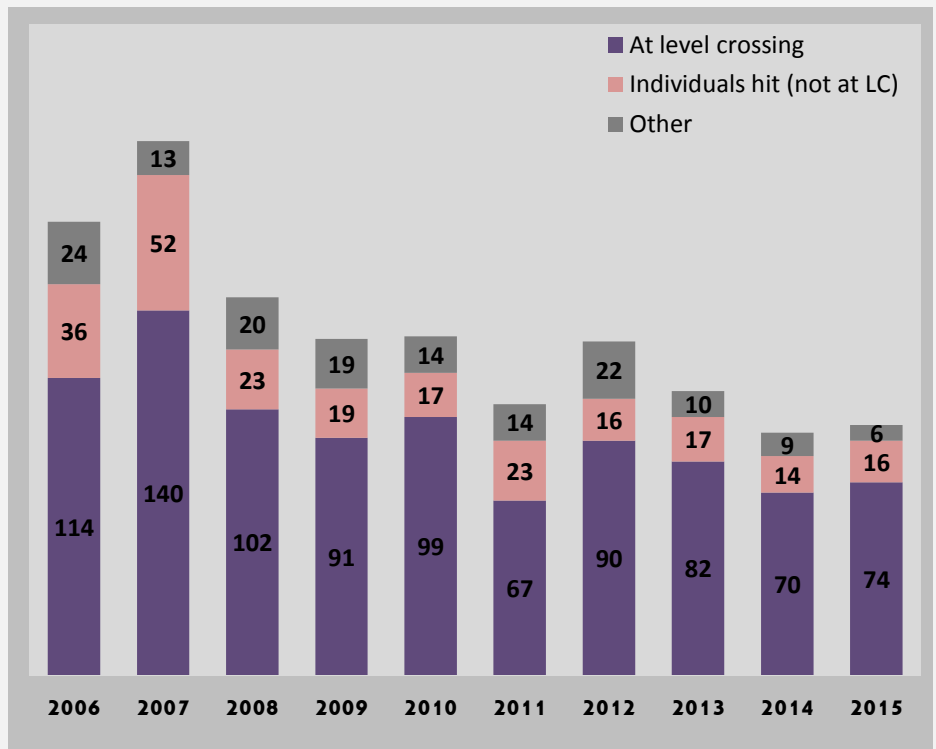
2.07a Severe accidents (two and more victims)

Accidents with two and more victims decreased -45% between 2006 and 2015.

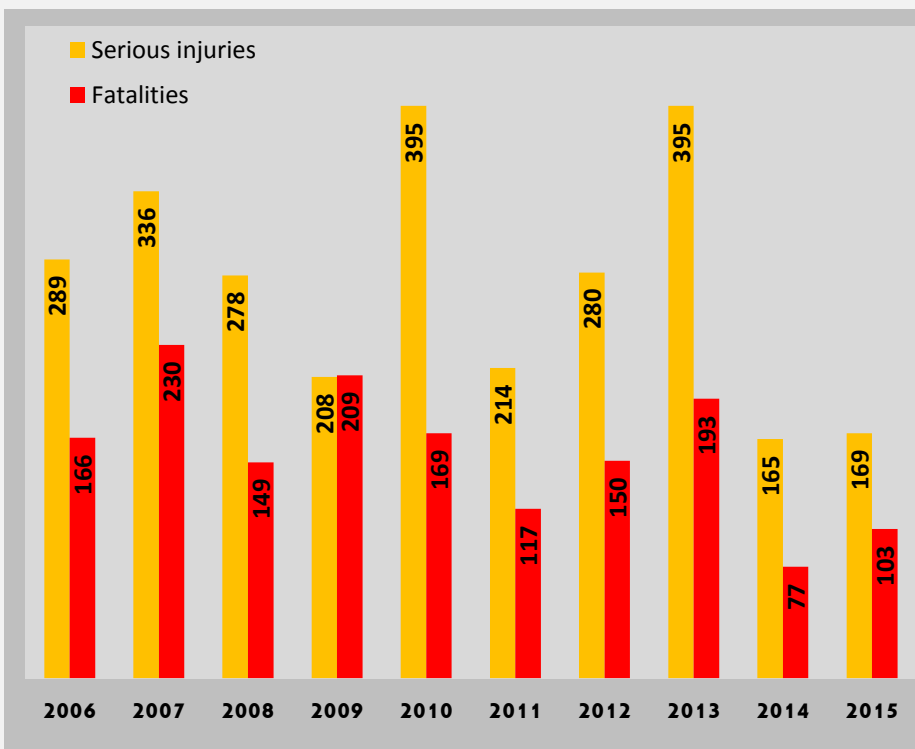
Collisions with road vehicles at level crossings represent 78% of the severe events (66% in 2006).

'Groups of individuals hit by a train' is the second most common severe accident : 10 events on open line and 6 events at station during 2015.

In 2015, the most severe event made 26 victims (serious injuries) in a collision between trains.



2.07b Victims of severe accidents



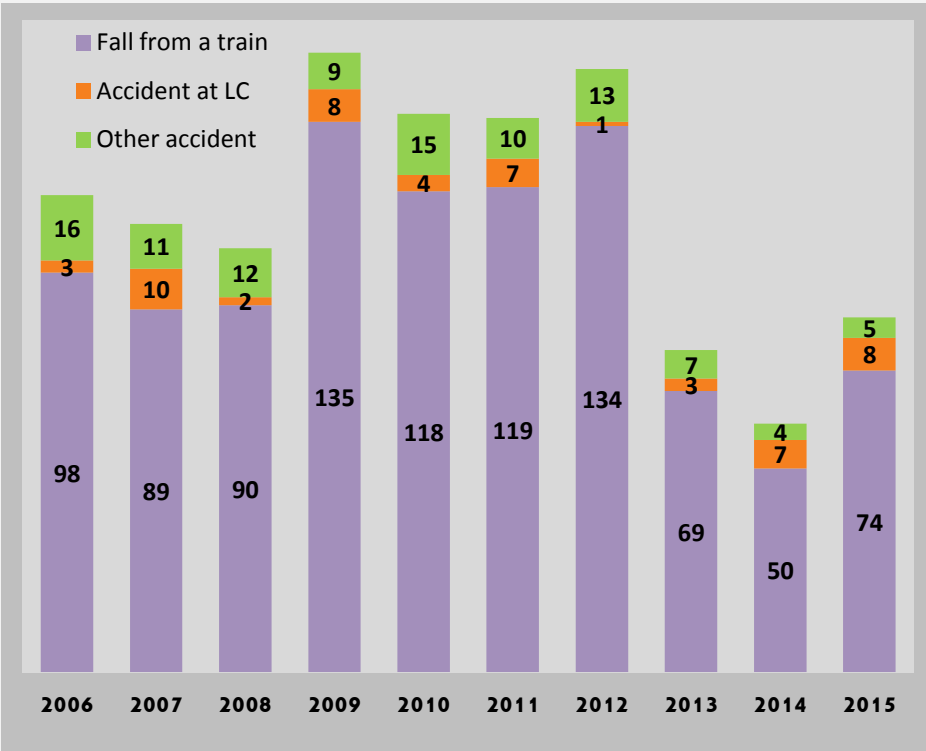
Severe accidents are unpredictable. 2014 and 2015 appear as the safest years of the decade.

Serious injuries decreased -43% and fatalities decreased -38% compared to 2006.

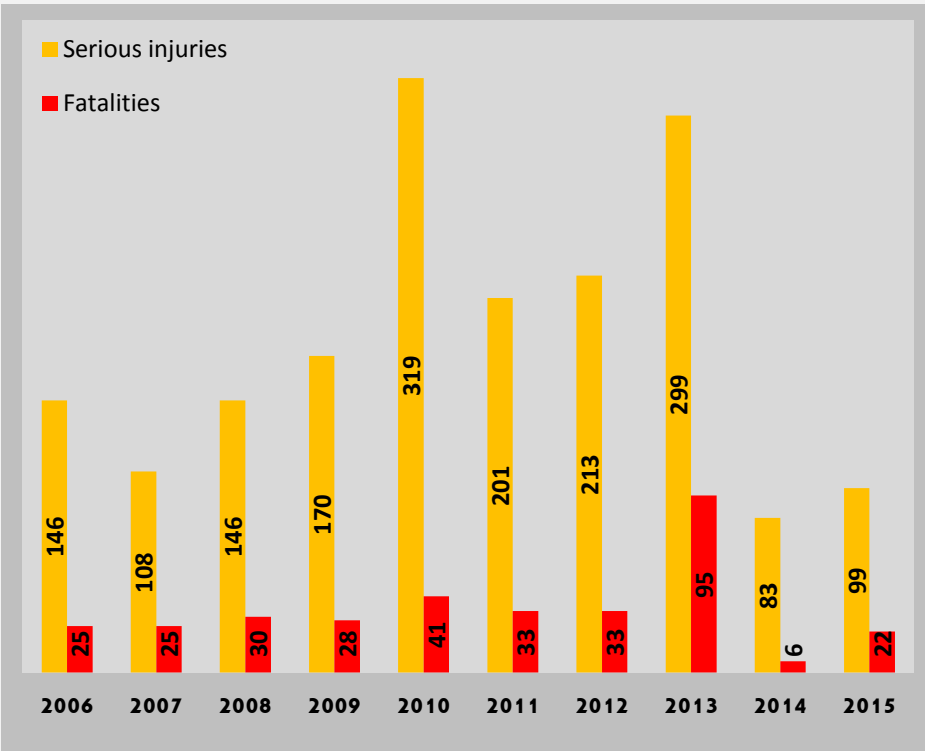
2.08a Accidents with passenger victims

The number of accidents with passenger victims was stable from 2006 to 2008 (around 110 events), rose to 140 on the 2009-2012 period, and decreased afterwards to levels unseen by the past.

Around 80% of events with passenger victims are "individuals falling from a train". They represent around 60 events a year since 2013.



2.08b Passenger victims



From 2013 to 2014, the number of passenger victims decreased -80%, confirming the fact that 2013 was the "annus horribilis" for rail safety in Europe.

From 2006 to 2013, there seemed to be an uncompressible threshold of 20 passenger fatalities. But 2014 smashed this threshold with a total of 5 passenger fatalities (individuals falling from a train).

Unfortunately, the 2015 figure is again above the threshold.

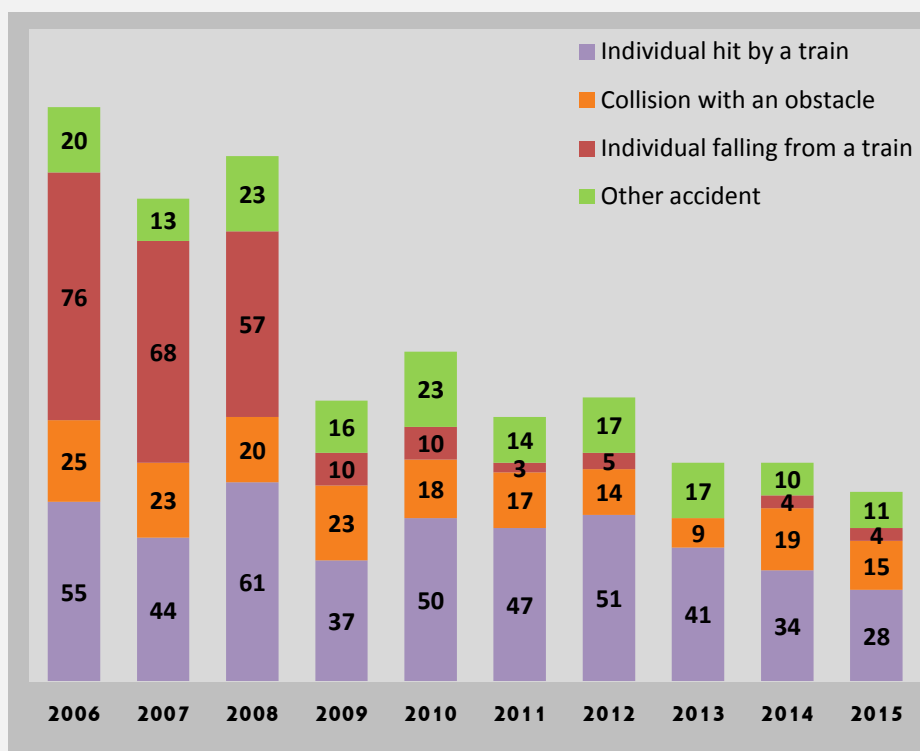
Serious passenger injuries slightly increased from 2014 to 2015 as well.

2.09a Accidents with staff victims

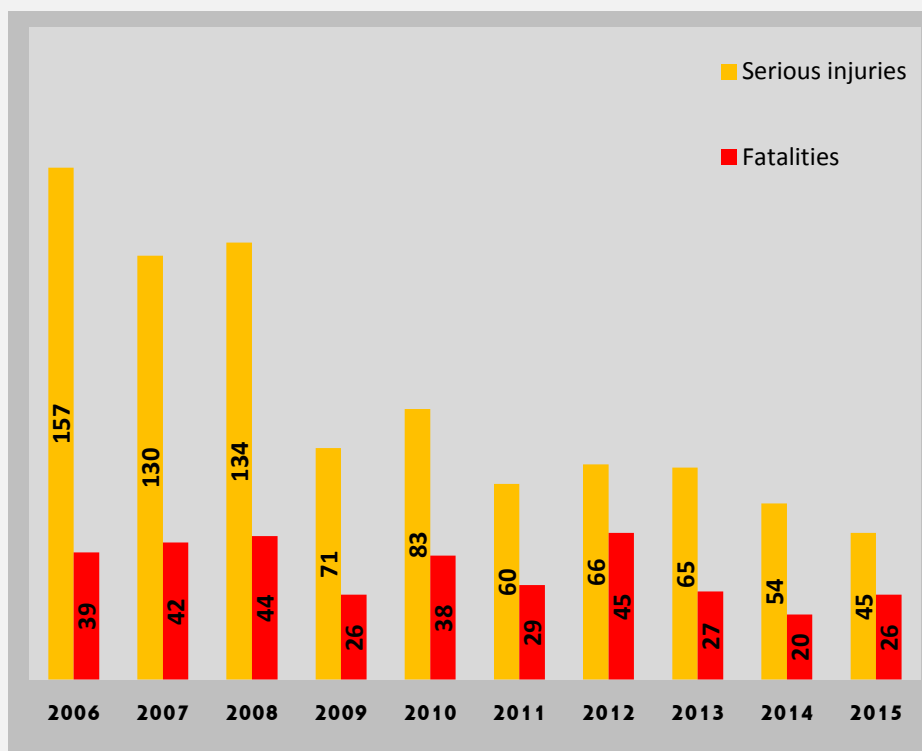
Accidents with staff victims decreased -66% on the whole period. The improvement of staff safety began in 2009.

We observe a peculiar high level of staff falling from a train till 2008. 90% of these events occurred on the same network, which means there was probably a misunderstanding of definitions at the beginning of the database project.

From 2009 to 2015, the number of accidents with staff victims decreased only -33%, showing the difficulty to improve the staff safety.



2.09b Staff victims



Staff serious injuries decreased - 71% since 2006, whilst staff fatalities decreased -33%.

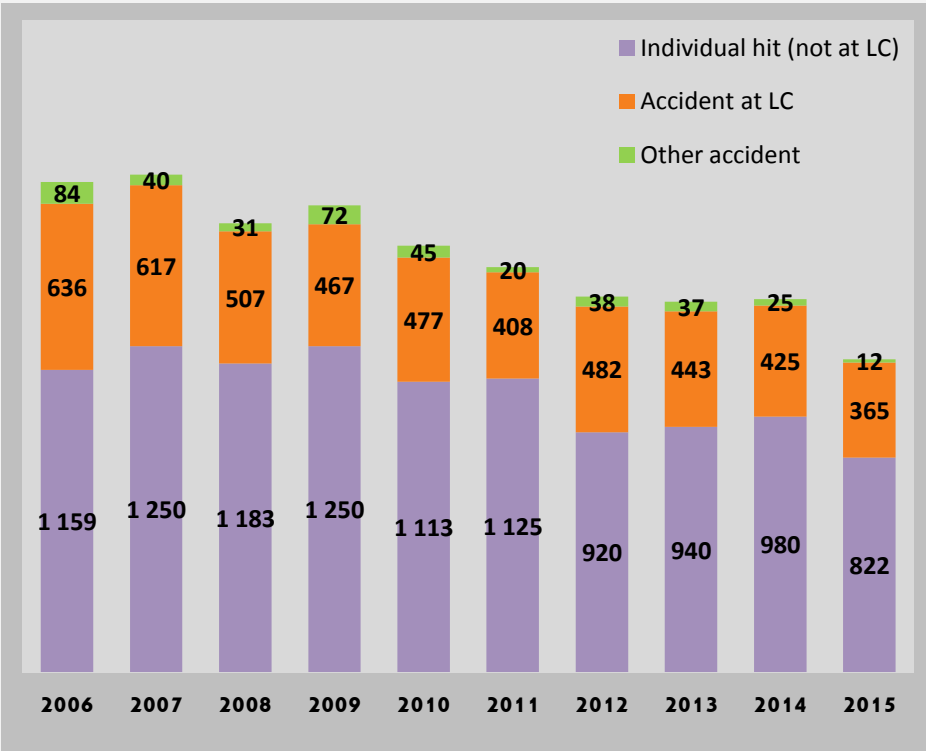
During 2015, 16 rail agents died when hit by a train, 5 in collisions with obstacle and 5 in other situations. All accidents are individual and one third occurred during shunting operations.

2.10a Accidents with third parties victims

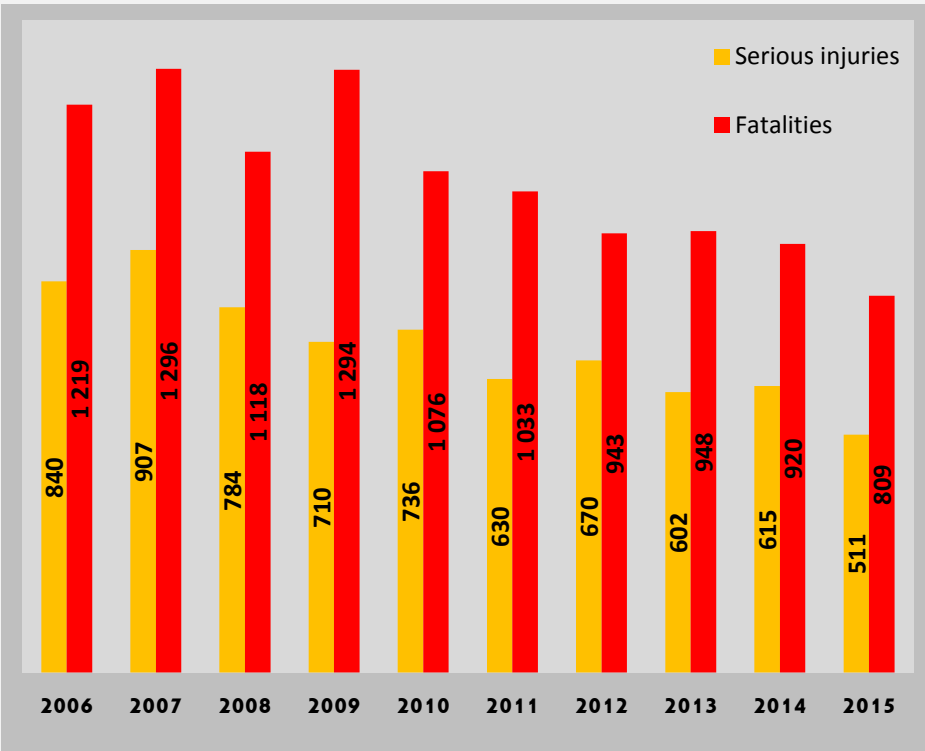
The number of accidents with third parties victims decreased -36% since 2006.

The number of accidents at LC decreased more deeply (-57%) than the number of individuals hit outside LC (-29%).

These two types of accidents represented 95% of accidents with third parties victims in 2006, and 99% in 2015.



2.10b Third parties victims



Fatalities decreased -34% from 2006 to 2015, whilst serious injuries decreased -39%.

Fatalities represent around 60% of all victims every year.

In 2015, most victims where trespassers (59%), followed by LC users (35%) and other third parties (6%), mostly pedestrians on public railway area (platforms).

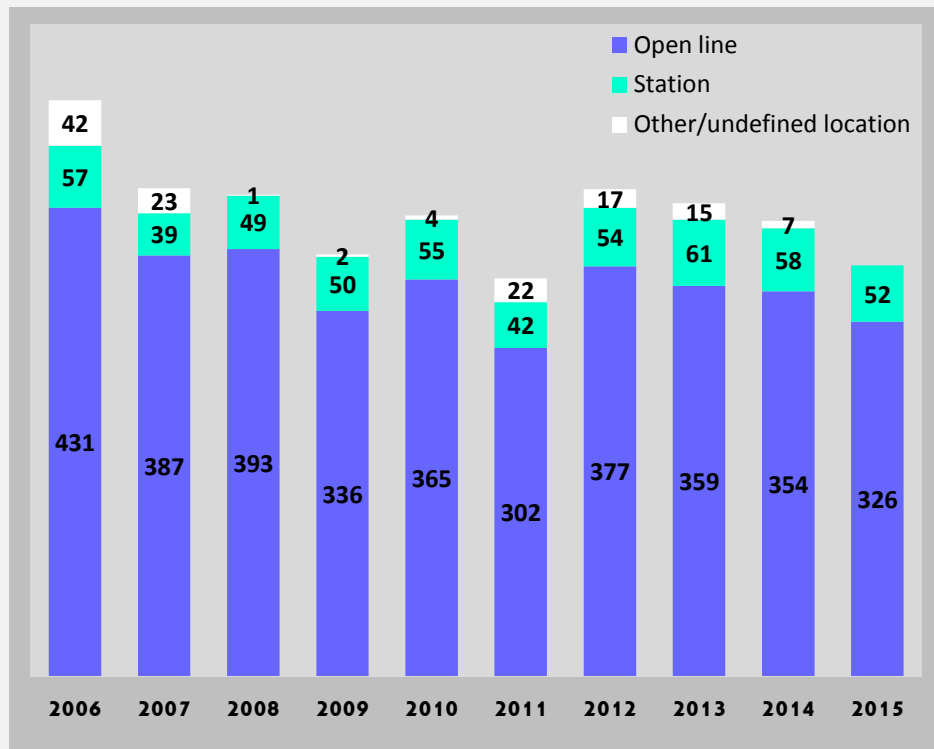
2.11a Collisions with an obstacle

This graph excludes shunting operations.

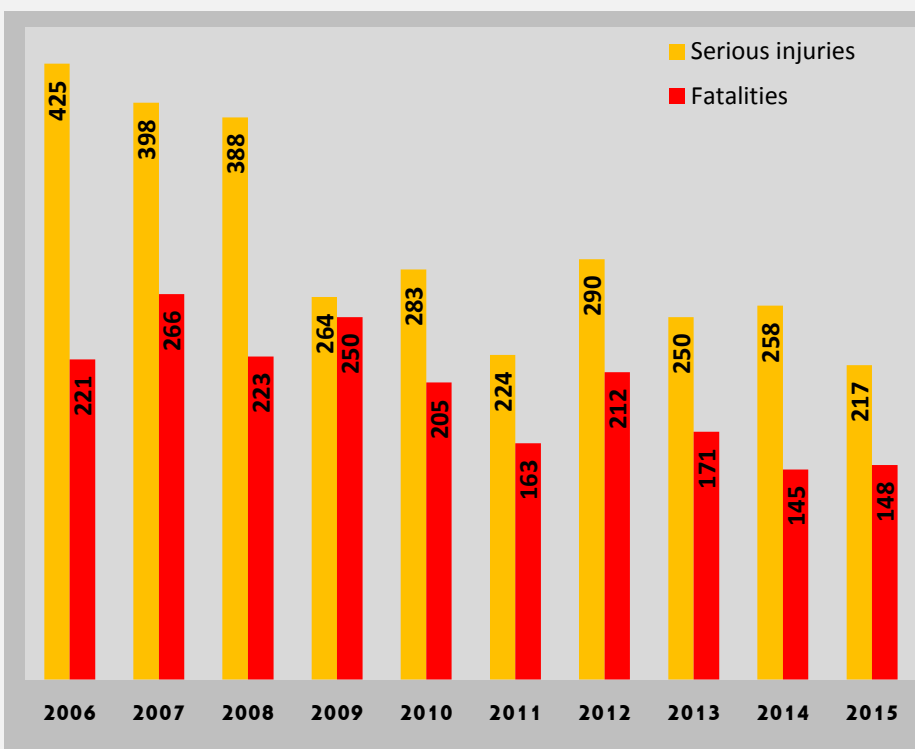
Collisions with an obstacle decreased -28% between 2006 and 2015.

There was no decrease in collisions with an obstacle at stations.

We shouldn't forget that most collisions with an obstacle occur at level crossings (see graph 2.15).



2.11b Victims of collisions with an obstacle



Collisions with an obstacle had fewer human consequences in 2015 than 2006:

- ⇒ 1.22 victim per event in 2006;
- ⇒ 0.96 victim per event in 2015.

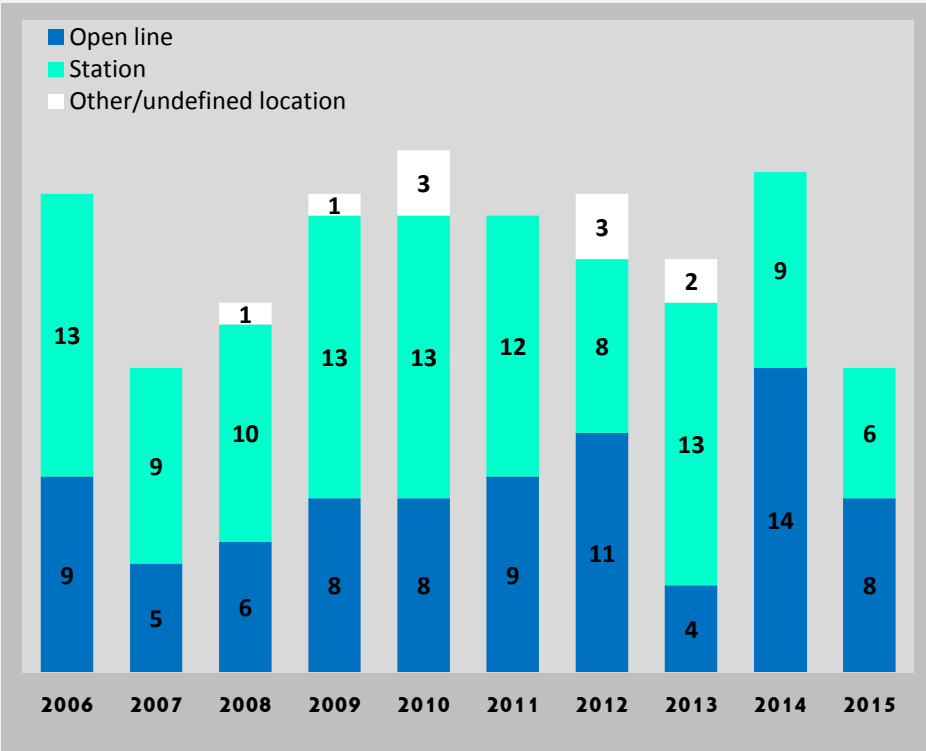
The total number of victims decreased -44% (fatalities:-33% and serious injuries: -49%).

We shouldn't forget that most collisions with an obstacle occur at level crossings. see graph 2.15.

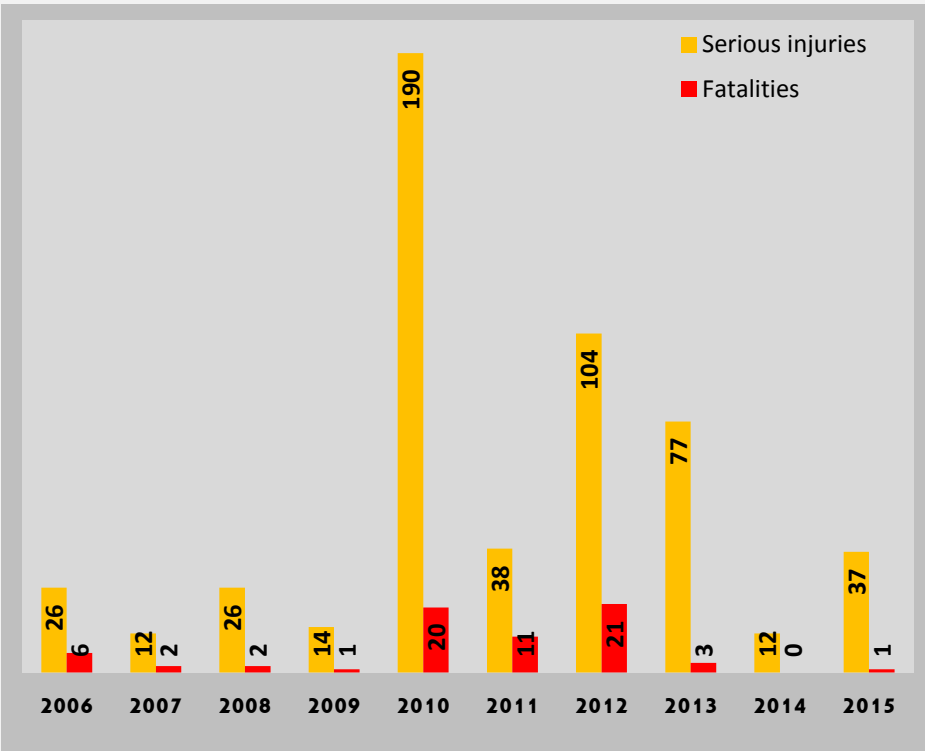
2.12a Collisions between trains

This graph excludes shunting operations.

There is no observable trend towards fewer collisions between trains, although 2015 appears as the best year after 2007.



2.12b Victims of collisions between trains



After four awful years (from 2010 to 2013), the number of victims of collisions between trains returned to the level of previous years.

In 2014, one sole accident led to 23 passengers and 3 agents injured, which means 75% of all victims.

The only fatality is the driver of a train that collided with another train after a SPAD.

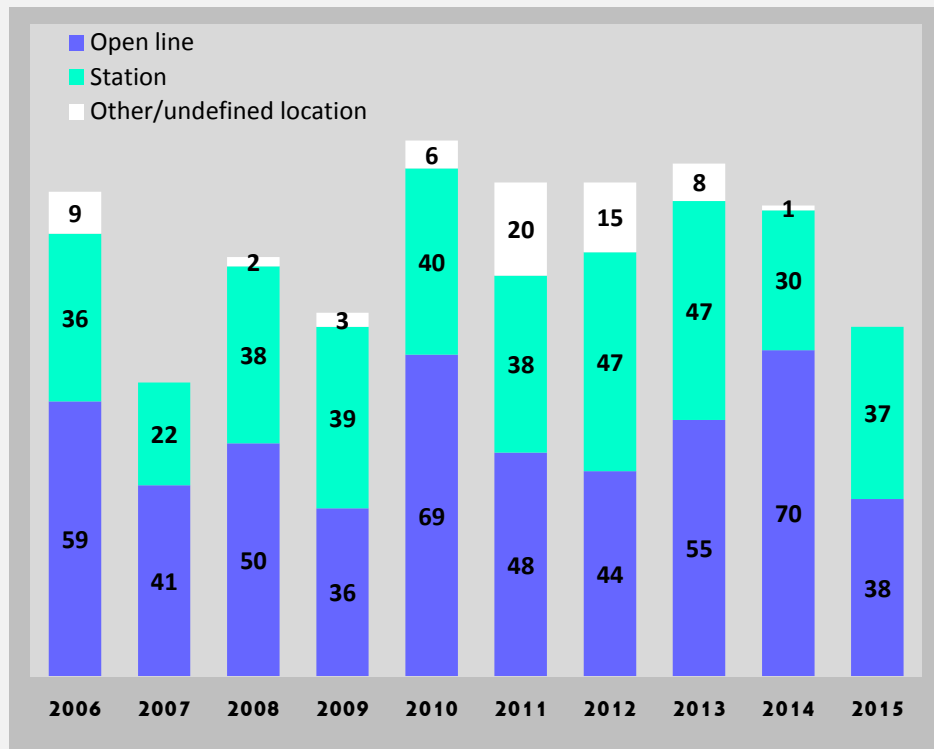
7 accidents made no victim.

2.13a Derailments

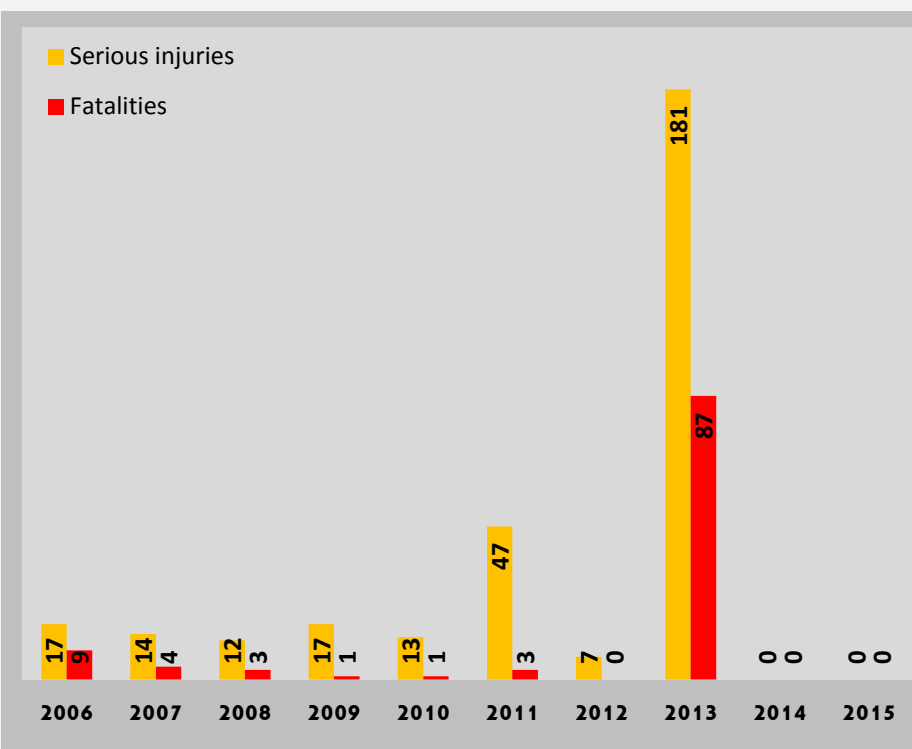
This graph excludes shunting operations.

Trends are not obvious.

The number of derailment was stable around 110 events a year between 2010 and 2014, but dropped to 75 in 2015.



2.13b Victims of derailments



On the whole period, we notice that 96% of derailment have no human consequences.

Unfortunately, 12 derailments (1% of all derailments) were disastrous and led to 5 or more victims.

This was particularly obvious with two accidents that occurred during 2013.

For the first year of history, there was no victim of derailment on participating rail networks during 2014.

No victim was neither reported during the year 2015.

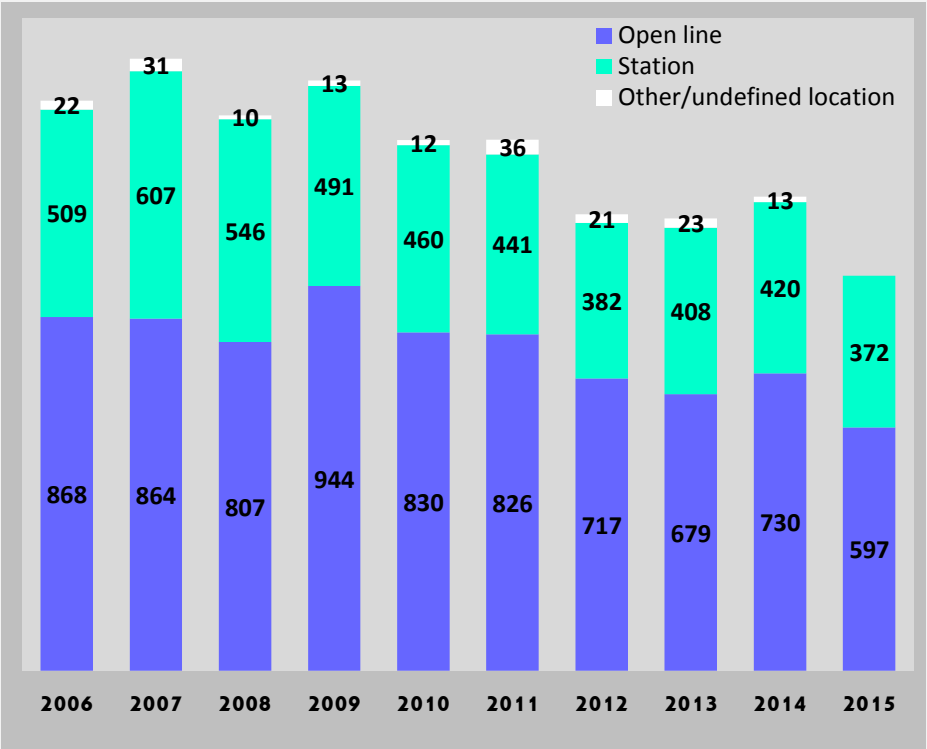
2.14a Individuals hit by a train: accidents

This graph excludes shunting operations.

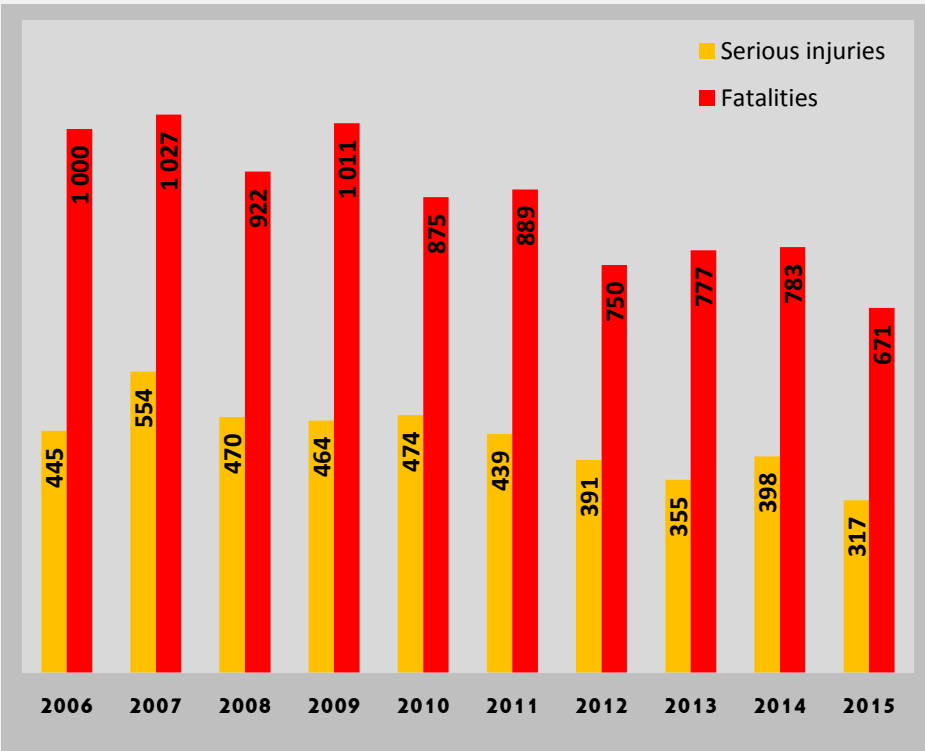
The number of accidents involving an "individual hit by a train" decreased -18% between 2006 and 2012.

No improvement was observed between 2012 and 2014.

The number of accidents dropped -17% between 2014 and 2015.



2.14b Individuals hit by a train: victims



Individuals being hit by a train is fatal in two thirds of events. This proportion remains equal along the years.

Split of victims in 2015:

- ⇒ Trespassers 78%
- ⇒ LC users 14%
- ⇒ Persons hit on platform 6%
- ⇒ Staff 2%

Split of accidents per number of victims in 2015:

- ⇒ 1 victim: 953 events
- ⇒ 2 victims: 13 events
- ⇒ 3 victims: 3 events

2.15a Individuals falling from a train: accidents

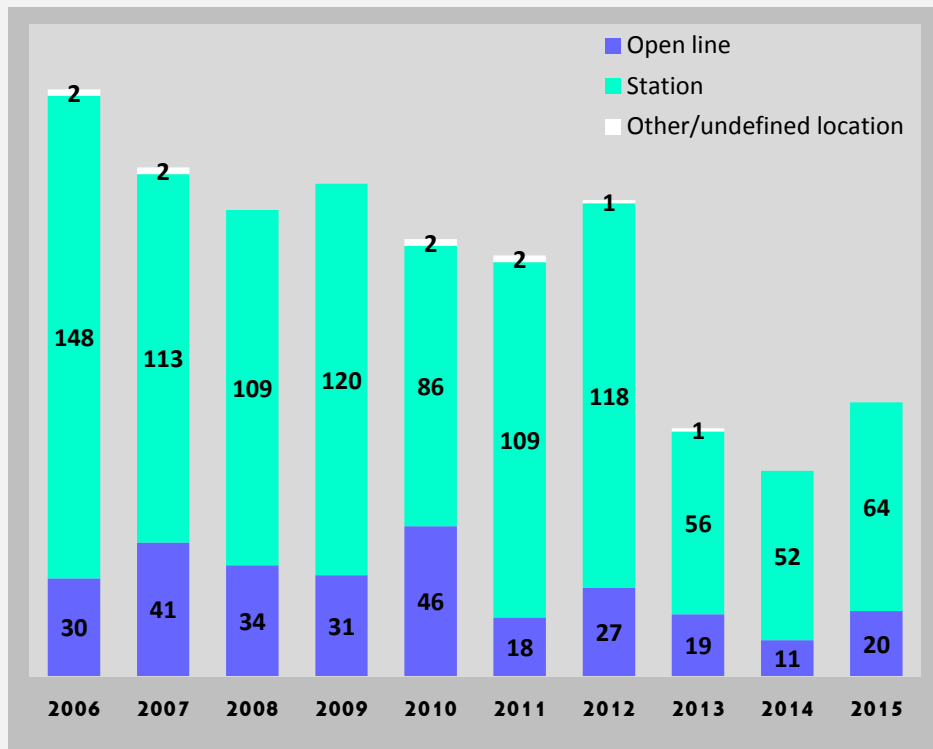
This graph excludes shunting operations.

The number of individuals falling from a train decreased -54% between 2006 and 2015.

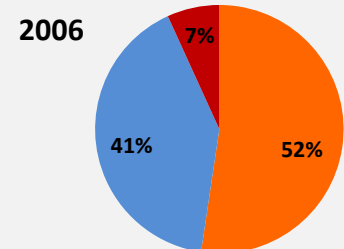
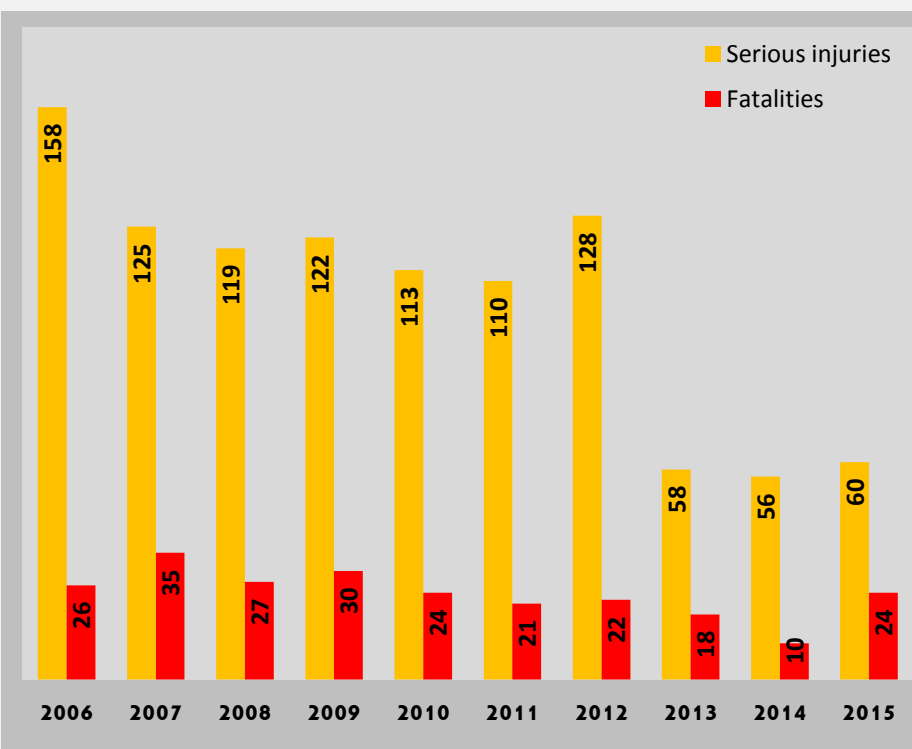
2013 showed a reduction of -50% compared to the previous year.

This was confirmed in the last two years, with a majority of cases at stations.

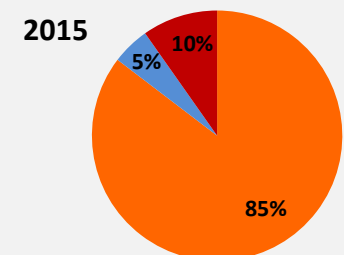
Passengers were involved in 70 cases, unauthorised persons in 8 cases and staff in 4 cases.



2.15b Individuals falling from a train: victims



Passengers
Staff
Unauthorised

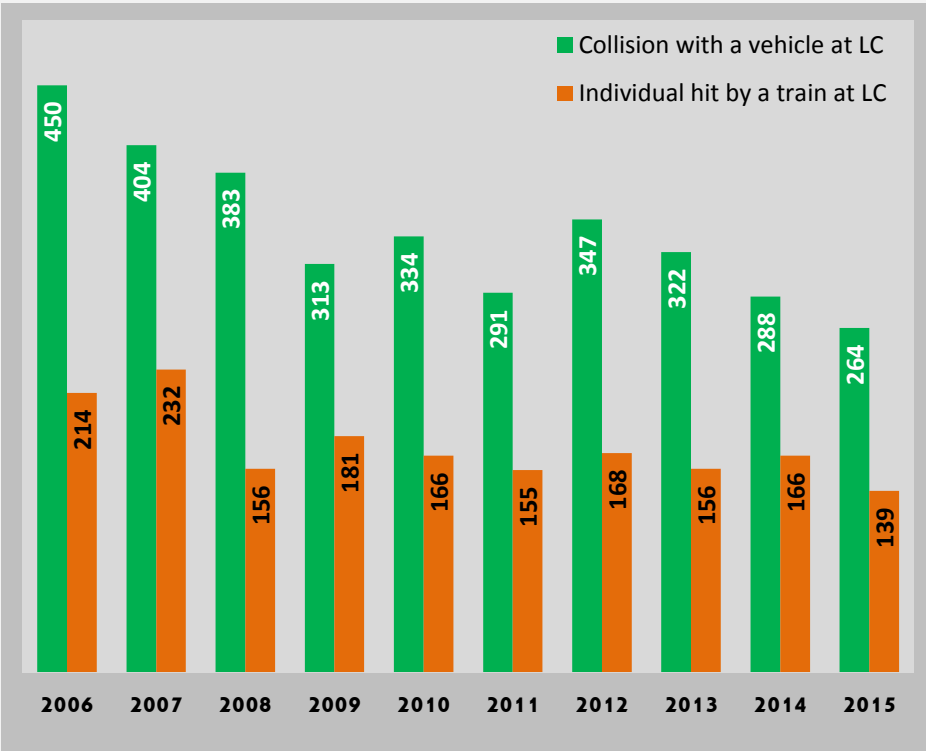


2.16a Accidents at level crossings

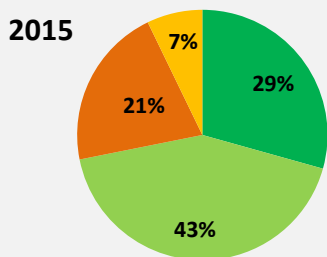
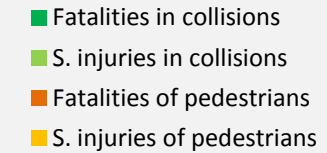
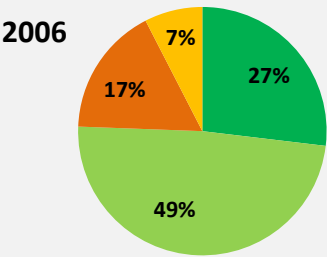
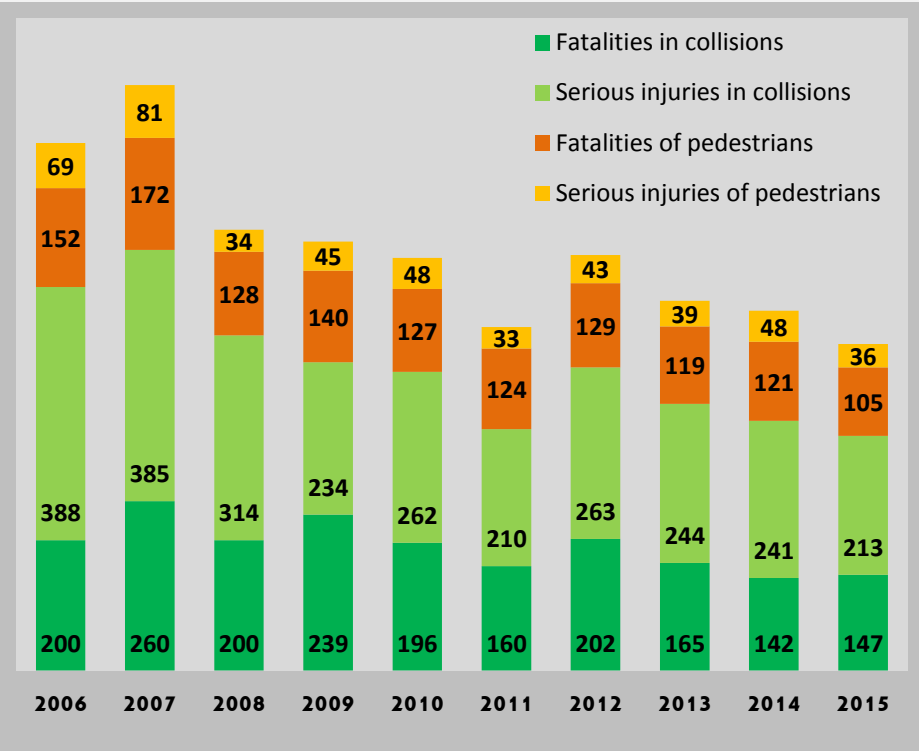
Safety at level crossings showed an huge improvement since 2006:

- ⇒ the number of collisions with a road vehicle dropped -41%;
- ⇒ the number of accidents involving pedestrians and cyclists decreased -35%. Unfortunately, we observe a relative stagnation since 2008.

The split of victims (see graph below) is remarkably stable along the years.



2.16b Victims of accidents at level crossings



Definitions from the Commission Directive 2016/798/EC ("Safety Directive")

"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, excluding accidents in workshops, warehouses and depots.

"Significant damage to stock, track, other installations or environment" means damage that is equivalent to EUR 150 000 or more.

"Extensive disruptions to traffic" means that train services on a main railway line are suspended for six hours or more.

European Safety Database Members

Company	Country	Code
ADIF	Spain	ES
ADIF AV	Spain	ES
CFL	Luxembourg	LU
CFR SA	Romania	RO
DB AG	Germany	DE
Eurotunnel	France - UK	-
HZ	Croatia	HR
Infrabel	Belgium	BE
JBV	Norway	NO
MÁV	Hungary	HU
Network Rail	United Kingdom	GB
ÖBB *	Austria	AT
PKP	Poland	PL
PRORAIL **	Netherlands	NL
REFER	Portugal	PT
RFF / SNCF	France	FR
RFI	Italy	IT
SBB CFF FFS	Switzerland	CH
SŽ	Slovenia	SI
SŽDC	Czech Rep.	CZ
Trafikverket	Sweden	SE
ŽSR	Slovak Rep.	SK

* chair of the Safety Performance Group 2015-2016

** chair of the Safety Performance Group 2016-2017

UIC Safety Database

Report 2016

Significant Accidents 2015

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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 Report 2016

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