Railway Safety Statistical Report 2010

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Executive Summary

This is the second separately published annual safety statistical report of the Railway Safety Commission (RSC). It has been prepared for the general public in line with section 9(A) of the Railway Safety Act 2005 (the Act), as amended by S.I. No 61 of 2008 European Communities (Railway Safety) Regulations 2008, which requires that the RSC operates in an open, non-discriminatory and transparent manner. This report provides background statistics to a number of key performance indicators with discussion when appropriate.

The RSC is the independent railway safety regulator in the Republic of Ireland and is responsible for overseeing the safety of all railway companies, including Iarnród Éireann, Veolia (Luas Operator), Bord Na Móna where their railway interfaces with public roads, a number of heritage railways and the approval of projects undertaken by the Railway Procurement Agency (RPA).

The safety performance of both Iarnród Éireann and Veolia is in the main positive. However, there are a number of precursor events with worsening trends and these will be subject of greater scrutiny by the RSC in the years ahead.

Available data indicates that Iarnród Éireann's continuing investment in assets and management systems is delivering significant safety benefits. However, imported risk, i.e., from third parties interfacing with the railway, continues to be an issue. While there were no passenger fatalities or serious injuries in 2010, two level crossing users lost their lives and seven trespassers lost their lives. One employee died at work in 2010. This occurred to a train driver, who having stopped his train in a station suffered a cardiac arrest.

In terms of train operations, there was a moderate increase in the number of Signals Passed at Danger. While in terms of infrastructure there was also a moderate increase in the number of broken rails in 2010. On a positive note, the number of bridge strikes (107) was slightly less than that in 2009 (114). Similarly, there were decreases in the number of train collisions, derailments and a continued reduction in the number of rolling stock incidents. It should also be noted that there were no collisions between trains in 2010.

The LUAS safety performance in 2010 was largely similar to previous years. There were no fatalities in 2010, but a small number of people sustained serious injury as a result of trespass. The number of road traffic accidents involving a tram was 30, an increase on the

2009 figure by some 30%. However, it should be noted that 5 RTA (16%) can be attributed to snow and ice on our roads (1 event in January and 4 in December).
In 2010, tram/pedestrian contact accidents also increased from 18 in 2009 to 22 in 2010. Three individuals required hospitalisation in 2010 as a result.

Bord Na Móna suffered just 1 collision with a road vehicle in 2010. A road vehicle driver stated they lost control of their vehicle in icy weather and collided with level crossing gates and the train as it passed through.
There were no reportable accidents or incidents on a heritage railway in 2010.

2010 was a good year overall in terms of railway safety. However, the significant accidents in 2009 most notably the partial collapse of the Broadmeadows Viaduct at Malahide and the Luas/Dublin Bus collision on O'Connell Street remains at the forefront of our minds. Going forward, the RSC will continue its supervision activities and work with the industry to promote and encourage railway safety.

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Glossary of Terms

Term	Meaning / Definition
ERA	European Railway Agency
IÉ	Iarnród Éireann (subsidiary of CIÉ)
HSA	Health & Safety Authority
km	kilometres
RPA	Railway Procurement Agency
RSC	Railway Safety Commission
RTA	Road Traffic Accident
S.I.	Statutory Instrument
SPAD	Signal Passed at Danger

Definitions

The terms accident, serious accident and incident are as defined in the Railway Safety Directive (RSD), i.e.,

*'**accident**' means an unwanted or unintended sudden event or a specific chain of such events which have harmful consequences; accidents are divided into the following categories: collisions, derailments, level-crossing accidents, accidents to persons caused by rolling stock in motion, fires and others;*

*'**serious accident**' means any train collision or derailment of trains, resulting in the death of at least one person or serious injuries to five or more persons or extensive damage to rolling stock, the infrastructure or the environment, and any other similar accident with an obvious impact on railway safety regulation or the management of safety; 'extensive damage' means damage that can immediately be assessed by the investigating body to cost at least EUR 2 million in total;*

***'incident'** means any occurrence, other than accident or serious accident, associated with the operation of trains and affecting the safety of operation;*

*A '**precursor of accident**' includes broken rails, track buckles, wrong-side signalling failures, signals passed at danger and broken wheels and axles on rolling stock in service.*

1 Introduction

This is the second annual safety statistical report of the Railway Safety Commission (RSC) prepared for the general public in line with section 9(A) of the Act which requires that the RSC operates in an open, non-discriminatory and transparent manner. This report provides background statistics to a number of key performance indicators with discussion when appropriate.

1.1 Overview of Report

In Chapter 2, a brief overview of the public representations received by the RSC is presented. Safety trends in Ireland are presented and discussed in Chapter 3. All types of train accidents are included. In chapter 4 a high level comparison to other European railways clearly shows where Iarnród Éireann (IÉ) are positioned in terms of railway safety. This includes a brief overview of significant accidents that have occurred in Europe in 2009. Chapter 5 concerns Railway Accident Investigation Unit (RAIU) recommendations made as a result of their investigations. The status of each recommendation is explained together with details of actions taken to date.

1.2 The Railway Safety Commission

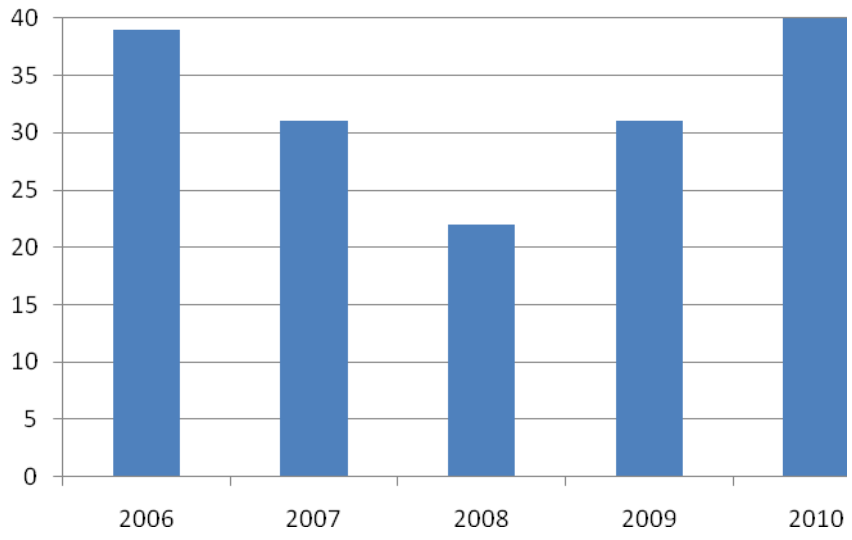
The RSC was established on 1st January 2006 under provision of the Railway Safety Act 2005, with responsibility for railway safety regulation and investigation. It is a small, professional organisation with a flat reporting structure. Its mission is to "advance the safety of railways in Ireland through diligent supervision and enforcement". This regulatory responsibility is without prejudice to the fact that the national railway operator, Iarnród Éireann, and the operator of the Dublin light railway, Veolia, each has the primary duty of care regarding the safety of operations and infrastructure.

S.I. No. 61 of 2008 defined the RSC as the National Safety Authority (NSA) in the context of the European Railway Safety Directive 2004/49/EC. It also amended some provisions of the 2005 Act to transpose the Railway Safety Directive. The RSC as NSA has responsibility for approving safety management systems, new rolling stock and infrastructure and monitoring the industry to ensure it is able to manage its own risk effectively. The RSC also co-ordinates and encourages railway safety initiatives between the industry and external stakeholders. Further details may be found on the RSC website. www.rsc.ie

2 Public Representations

The RSC value the public, passengers and others, as 'additional eyes and ears' and at all times encourage them to bring any railway safety concern to our attention. Where these issues relate to service rather than safety, the RSC directs the representation to the appropriate authority. Where the matter involves railway safety, the RSC endeavours, wherever possible, to deal with the matter directly. If necessary the RSC will seek information from the appropriate railway company to enable a full response to be provided.

In 2010, the RSC received forty one direct or indirect public representations representing an increase of 30% on the 2009 figure. These predominantly related to the Iarnród Éireann rail network with the majority of these relating to operational matters. Some prompted immediate action to control risks while the majority gave no specific cause for safety concern. However, it is RSC policy that all safety related concerns were investigated further. The RSC continues to track representations to identify any recurrence or trends that might indicate a need for intervention in the future.



Graph 1: Public Representations received by the RSC

There was no identifiable theme or trend to the representations received in 2010 with complaints ranging from train wheel maintenance to train dispatch at stations. There was an increase in the number of complaints or representations received by the RSC regarding Iarnród Éireann's (IÉ) stations, all of which were responded to with the assistance of IÉ when necessary.

3 Railway Safety Trends in Ireland

The safety performance of the duty holders in the Republic of Ireland is considered for the four principal railway sectors that the RSC regulates, namely heavy rail, light rail, industrial systems and the heritage railways. Each railway operator and infrastructure manager is obliged to notify railway incidents and accidents to the RSC. This data is used for assessing duty holder safety performance among other things.

3.1 Iarnród Éireann

At year end, the IÉ network in service was 1683 route-kilometres, an increase of 18 km. The main changes to the system in 2010 were:

- Commissioning of the line between Ennis and Athenry;
- Commissioning of the line between Clonsilla and Pace (M3);
- Services ceased on the South Wexford line between Snowhill (Waterford) and Rosslare Strand.

The number of recorded passenger journeys dropped by 1½ % to 38.2 million in the year 2010.

3.1.1 Iarnród Éireann Casualty Statistics

The following table 1 illustrates the fatalities and lost-time injuries reported for employees and fatalities and injuries to third parties on the national railway network for the years 2006 to 2010.

Railway operations and track maintenance: fatal injuries	2006	2007	2008	2009	2010
Fatal injury to person due to a train accident, not at level crossing	0	0	0	0	0
Fatal injury to passenger travelling on a train, other than in train accident	0	0	0	0	0
Fatal injury to passenger attempting to board or alight from train	0	0	0	0	0
Fatal injury to customer, no train involved	0	1	0	0	0
Fatal injury due to railway accident at a level crossing	0	1	1	0	2
Fatal injury to employee at a level crossing due to train in motion	0	0	0	0	0
Fatal injury to employee due to train in motion (other than at a level crossing)	0	0	0	0	0
Other fatal injury to employee on the railway	0	0	0	0	0
Fatal injury on railway or level crossing where trespass or suspicious death was indicated	7	5	8	3	7
Railway operations and track maintenance: injuries					
Injury to passenger due to a train accident not at level crossing	0	0	0	2	0
Injury to passenger travelling on train, other than in a train accident	41	35	22	40	28
Injury to passenger attempting to board or alight from train	55	50	43	17	64
Injury to passenger in station or visitor to premises	69	84	74	88	27
Employee injury involving train movement or train accident	15	8	9	13	12
Employee injury while working on railway	69	78	79	65	57
Employee injury at level crossing	2	4	0	0	0
Person injured in railway accident at level crossing	0	1	0	0	0
Passenger injury in railway accident at level crossing	0	0	0	0	0
Level crossing user injured	0	1	1	1	0
Injury to other person	5	1	2	0	1

Table 1: IÉ Operational fatality and Injury Statistics

3.1.1.1 Fatal Injuries

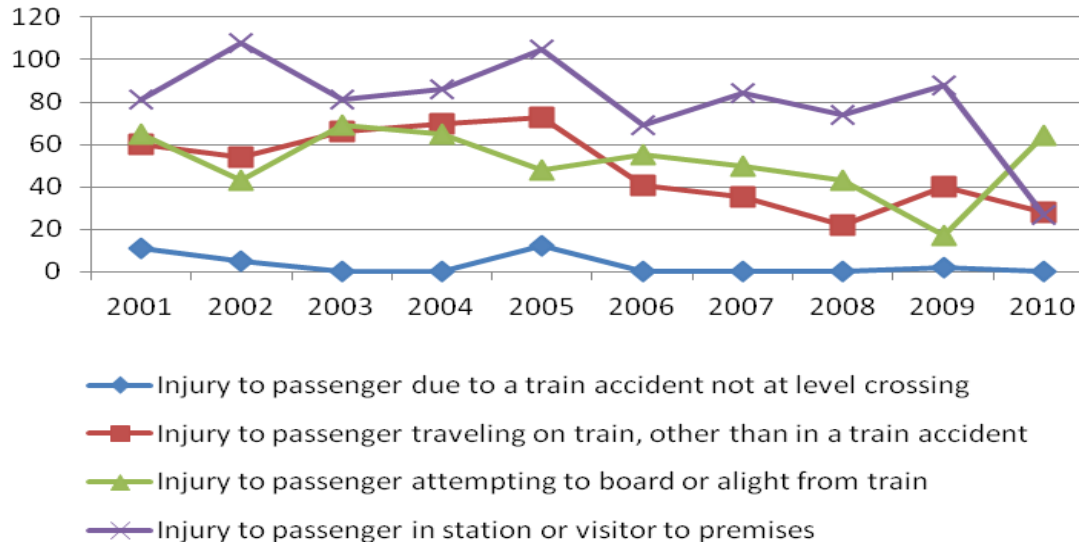
In terms of fatal injuries, there were two fatalities caused by train movements in 2010. Both occurred at level crossings, one on the Limerick to Ennis line and the other on the Dublin to Mayo line. The first occurred to a pedestrian and the latter to a road vehicle driver. It is internationally accepted that level crossings pose the greatest risk to railway safety owing to the fact that there is 'shared' risk between the railway company and the third party, i.e., the user/s of the level crossing.

One employee died at work on the railway. A train driver who had stopped his train at a station suffered cardiac arrest.

There were also seven fatal injuries on the railway where trespass or suspicious death was indicated. These incidents occurred at various locations around the railway network with two occurring on the same day in Co. Laois. The RSC uses a coroner's verdict, when available, to assist in classifying a fatality.

3.1.1.2 Passenger Injuries

There is a prevalence of injuries to passengers in stations or visitors to premises. Slips, trips and falls continue to dominate, however, IÉ continue to invest in upgrading many of its stations around the country in terms of accessibility. The inclement weather experienced in 2010 also caused problems in station areas, although the number of reported station injuries more than halved in 2010.

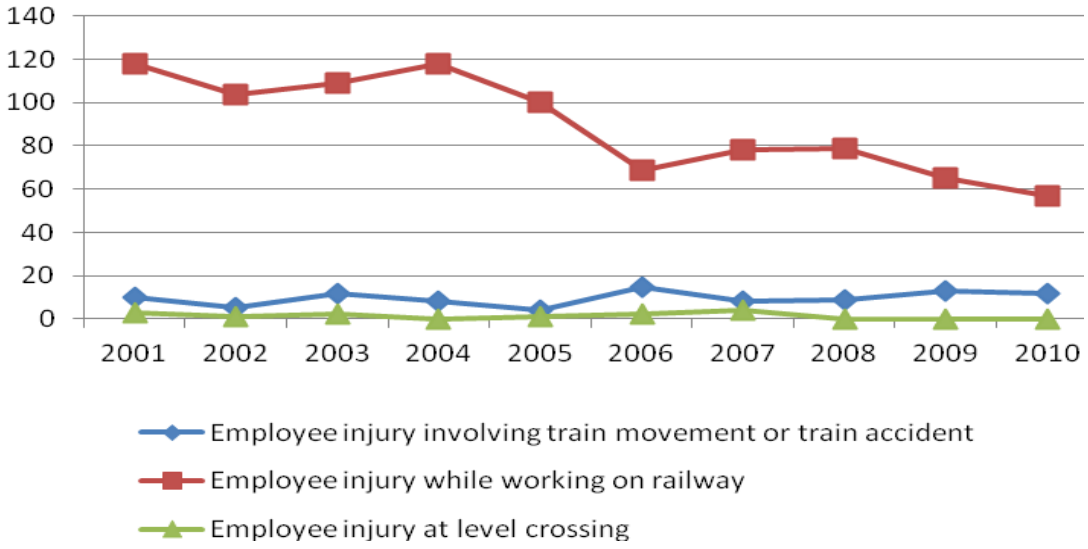


Graph 2: Passenger Injury statistics by year

Regarding injury to passengers travelling on a train, as was the case in 2009 most incidents involved people catching a foot, an arm or their bags in closing doors. Potentially more serious are those injuries to passengers sustained while boarding or alighting from a train. The risk to passengers in this category is falling between the train and the platform and in 2010 there were 18 such incidents which is more than double that suffered in 2009.

3.1.1.3 Employee Injuries

In 2010, there were 12 employee injuries involving train movement: all were of a minor nature with the exception of two instances where members of IÉ train crew staff were assaulted by passengers. Two involved maintenance staff. The remaining nine injuries involved either train drivers or shunting staff who sustained minor injuries e.g., twisting ankles.



Graph 3: Employee Injury statistics by year

Employee injuries while working on the railway continues to decline. In 2010 there were 57 such occurrences representing a decrease of 13% on the 2009 figure. The majority of these accidents were as a result of manual handling, slips, trips and falls and equipment related accidents. Of more concern, there has been an increase in the number of assaults on staff. IÉ have engaged an outside security firm to travel on trains and also have a presence in major stations; it is hoped that this will see a reduction in such occurrences.

3.1.2 Iarnród Éireann Incident Statistics

3.1.2.1 Train Collisions

Train collisions can pose a significant risk to passengers, train crew and third parties (if applicable) and have the potential to cause considerable damage to rolling stock. IÉ's fleet is one of the newest in Europe and has been designed to international standards that provide an enhanced level of safety to passengers and train crew should a train be involved in a collision. Graph 4 illustrates the trend for collisions over the past 10 years.

Graph 4: Train Collision Statistics by year

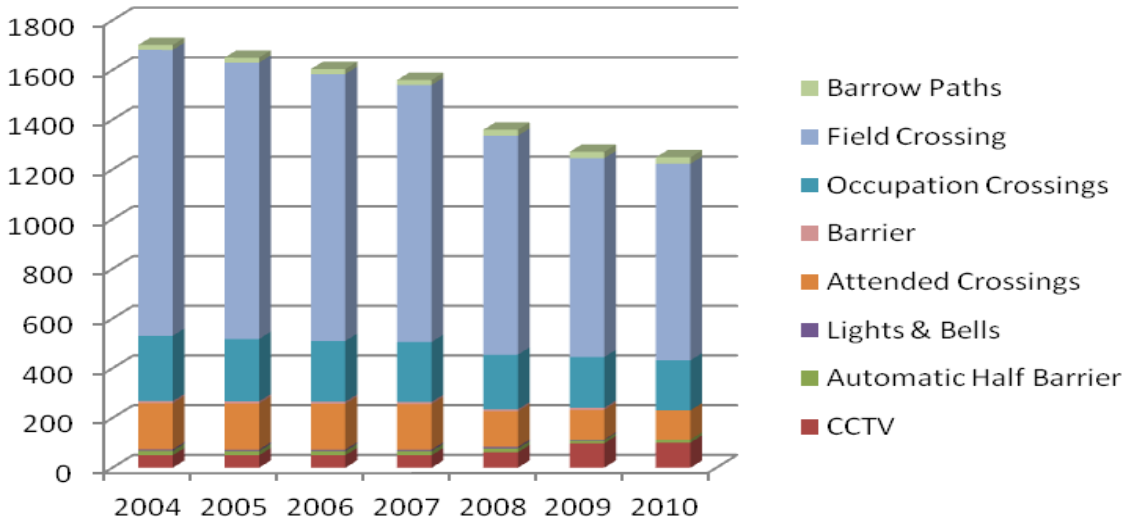
Regarding collisions with obstacles on the line there were 27 such incidents in 2010 which is a significant increase on that reported in 2009. The increase in this category is no doubt attributable to improved reporting, however, many are as a result of increased incidents of vandalism, i.e., persons leaving obstacles on the line such as wheelie bins, shopping trolleys etc.

There was a slight increase in the number of collisions with large animals, mostly deer, with 25 occurrences in 2010 compared to 20 in 2009. Fortunately, none resulted in significant damage to trains or injury to passengers. IÉ continues to invest heavily in upgrading the railway boundary and it is envisaged that the decrease seen in recent years will be sustained.

Train collisions with level crossing gates are infrequent and there was just one incident in 2010. This accident occurred in July 2010, when a Track recording vehicle crashed into the gates at Buttevant Level Crossing, on the Dublin to Cork main-line. Clearly, such occurrences have the potential to result in multiple injuries and the RSC undertook a post incident inspection on this accident.

Finally, there were two train collisions with road vehicles in 2010 at level crossings, one of which resulted in a single person fatality. Both accidents occurred at user worked level crossings on public roads. Both were investigated by the Railway Accident Investigation Unit (RAIU) and their reports are available on their website. www.raiu.ie

The accident which resulted in a fatality was also subject of a post incident inspection by the RSC and again the inspection report is available on the RSC's website. www.rsc.ie

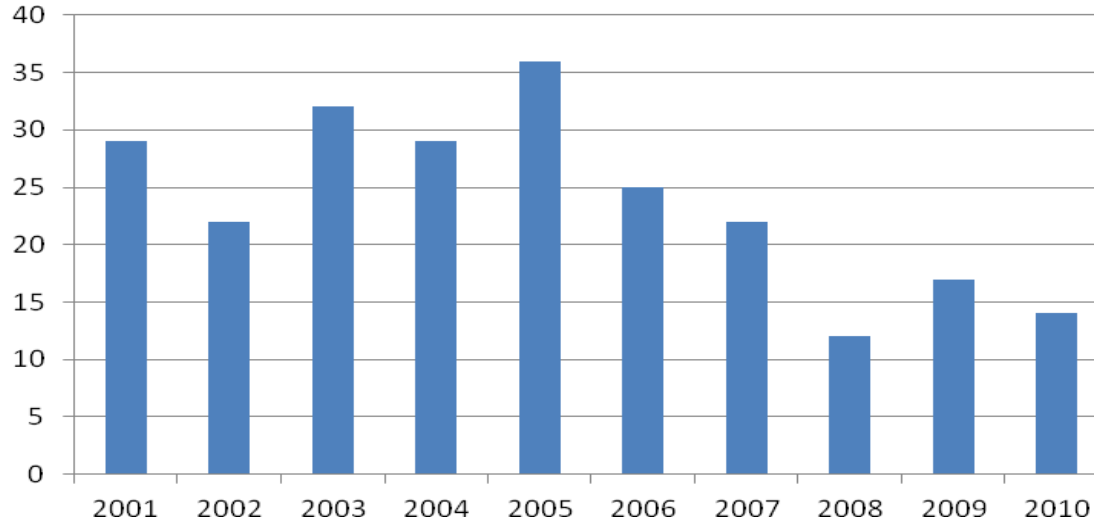


Graph 5: Number of level crossings by type by year (Total number inc. closed lines)

Level crossings are a significant risk to the railway and to any third parties who use them and in 2010 a number of level crossings were closed. Iarnród Éireann are now half-way into the final 5 years of the Governments Railway Safety Investment Programme (2009-2013) and work continues to upgrade and whenever possible close level crossings.

3.1.2.2 Signals Passed at Danger (SPAD)

A SPAD is defined as having occurred when a train passes a stop (red) signal. SPADs are particular precursor events that the RSC monitors regularly during its supervisory meetings with IÉ. The trend in recent years shows a steady decline which is encouraging.



Graph 6: Main (running) signal passed at danger where warning was given in time

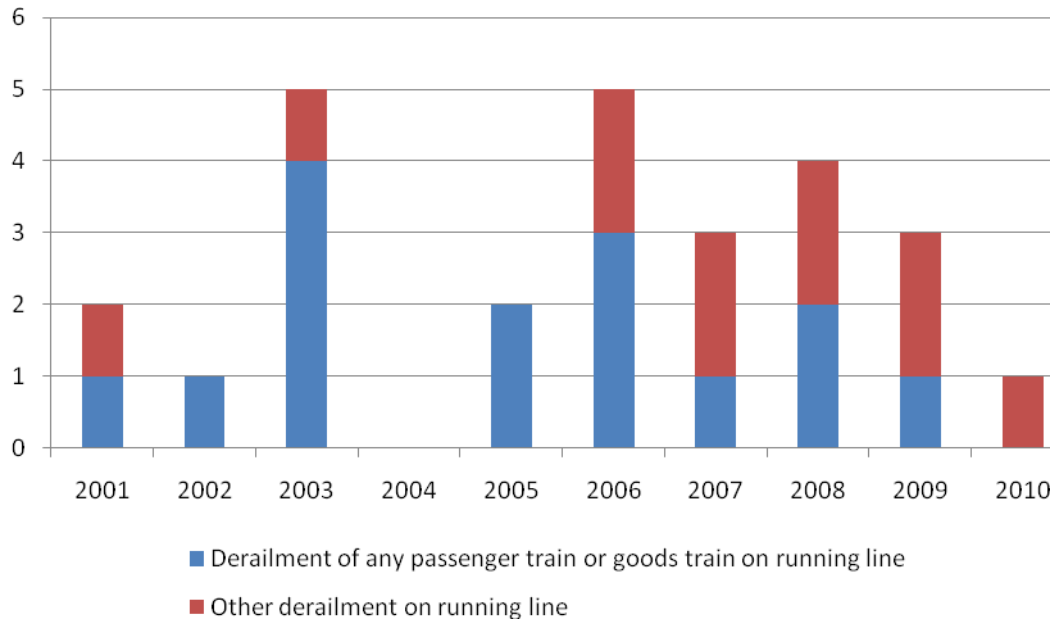
In 2010, there were a total of 14 SPADs on running lines, i.e., not including those that occurred in sidings or depots. IÉ use a ranking tool to determine whether each SPAD had the potential to cause an accident. IÉ collate a significant amount of information relating to the SPAD. Using this information IÉ determine a weighted numeric score for each one and the score dictates the level of internal investigation. SPADs are grouped into one of 3 severity bands, i.e.,

- ⇨ those classified as not a significant risk
- ⇨ those classified as potentially significant; and
- ⇨ those classified as potentially severe.

As previously stated there were 14 SPADs in 2010 and, of these, 1 was categorised as potentially severe. Regardless of severity, all SPADs are investigated by IÉ to determine if there are lessons to be learnt.

3.1.2.3 Train Derailment

Train derailments remain at low levels and continued track and rolling stock maintenance, in conjunction with targeted renewals of track, should ensure that this type of incident remains infrequent.



Graph 7: Train Derailments

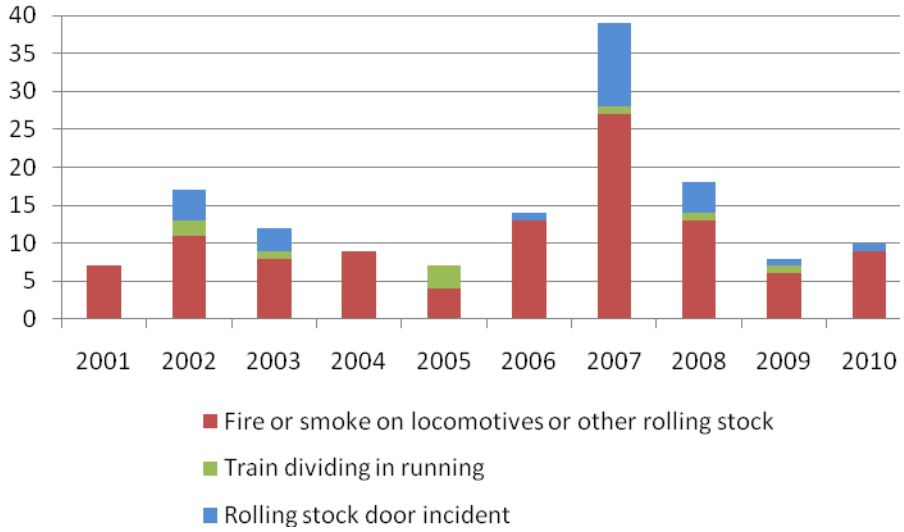
In 2010, one derailment occurred on a running line, i.e., a line used for passenger or freight services. This occurred between Portarlington and Portlaoise to an 'On-Track-Machine' working in an engineering possession, where no passenger of freight train movements were permitted. There was also 1 derailment in a siding which fouled the adjacent running loop. The loop was already protected from the running line and there was no potential for collision with another train.

3.1.3 Iarnród Éireann Rolling Stock Incidents

IÉ's rolling stock (trains) fleet is one of the newest in Europe and significant investment has been made in recent years. The newest trains, the 22000 series Intercity Railcars (ICRs) introduced from 2007, are now operating over the majority of the network. As with anything new there are often warranty issues and this has been the case with these trains.

There are a number of key safety statistics pertaining to rolling stock and they are:

- Fire or smoke
- A train dividing (splitting) while in service
- Door issues



Graph 8: Rolling Stock Incidents

2010 saw a small increase in the number of fire and/or smoke incidents on diesel multiple unit trains, a number of which were due to engine component failures. Principally these occurred on the relatively new 22000 series ICRs. In 2010 there were nine 'fire and/or smoke' occurrences. All were of a minor nature with on board automatic fire suppression systems functioning as designed.

A train divide is an occurrence where a train splits into two. The split would occur between carriages. In 2010 there was no such occurrence.

In terms of door issues, from the peak in 2007 the rate of incidents remains low. As in 2009, there was just one such incident in 2010 and this occurred when the driver of a passenger service enabled the doors in error. Clearly, this is a cause for concern and this driver was required to undergo corrective coaching and increased levels of internal monitoring.

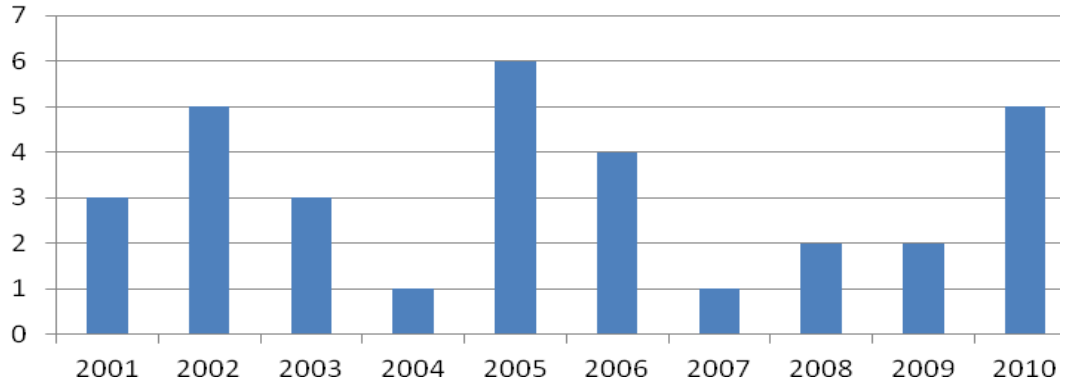
3.1.4 Iarnród Éireann Infrastructure Incidents

IÉ have many thousands of infrastructure assets including track, stations, bridges, culverts, tunnels, level crossings, buildings, cuttings and embankments, points and crossings, signals etc. all of which must be inspected and maintained at varying prescribed frequencies.

3.1.4.1 Broken rails

The network extent is 1683 route-km and 2165 track-km, 27% of which is multiple track (double, triple or quadruple). The extent of network in service has increased since 2009, with the opening of a double track 10 km suburban railway between Clonsilla and M3 Parkway in the north west Dublin suburbs, the reopening of 58 km of single track regional route between Ennis and Athenry, offset by the cessation of services between Waterford and Rosslare Strand.

IÉ visually inspects the track at least once per week and rails are ultrasonically tested at least every 2 years, with the vast majority including the main lines being tested annually.

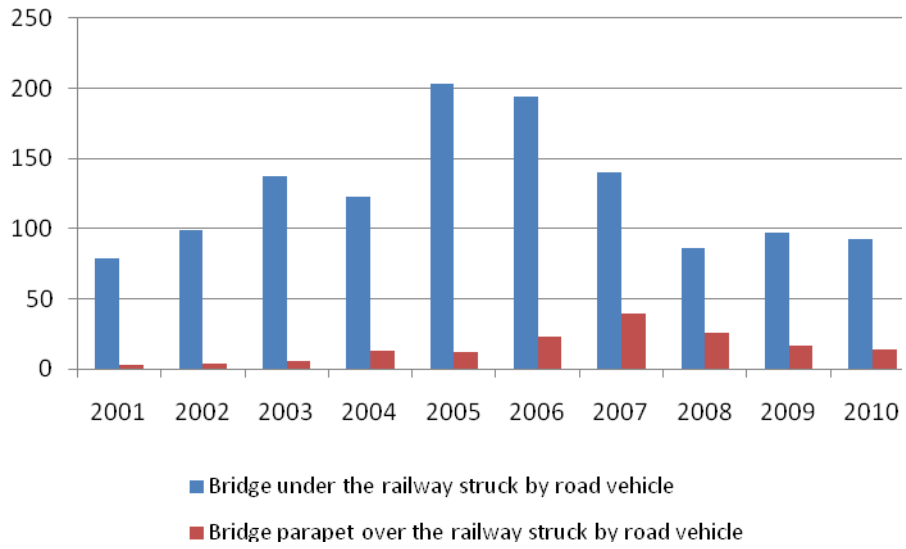


Graph 9: Broken rails on Passenger lines

The number of broken rails on passenger lines increased in 2010, to 5. While none resulted in a train accident it is an area where IÉ will need to be vigilant. The RSC will also closely monitor IÉ's management of its assets through its regular supervision meetings.

3.1.4.2 *Bridge Strikes*

A railway bridge may be a road over the railway or carry the railway over a road. A bridge strike is therefore where a road vehicle strikes the parapet or roadside containment of a bridge over the railway or where a road vehicle strikes the underside of a railway bridge. Both types can, in certain circumstances, result in very severe consequences and the road users should be mindful of their driving in the vicinity of the railway and, if driving an oversized vehicle, road vehicle drivers should know their vehicle height.



Graph 10: Railway Bridges struck by road vehicles

The total number of bridge strikes, i.e., under-bridge and over-bridge, in 2010 was slightly less than that for 2009. These figures demonstrate the decreasing trend fall from the highs of 2005 and 2006 nonetheless the numbers remain high. IÉ categorise each strike depending on the severity and the breakdown for 2010 is illustrated in table 2.

Category	Unspecified	Not Serious	Potentially Serious	Serious	Total
UB Strikes	46	44	3	0	93
OB Strikes	10	1	3	0	14
Total Strikes	56	45	6	0	107

Table 2: 2009 Bridge Strikes by category

Thankfully in 2010, there were no serious bridge strikes and just 6 were categorised as potentially serious. IÉ have, as of 2011, changed the way that bridge strikes are categorised in that all bridge strikes are considered potentially serious (with some actually serious). IÉ have introduced new procedures which includes the issuance of remits to investigate any type of technical issue, such as a bridge strike, that happens on the railway. The objective of the investigation is to try and ascertain root causes, and identify where lessons can be learnt.

3.2 Veolia (Luas) Statistics

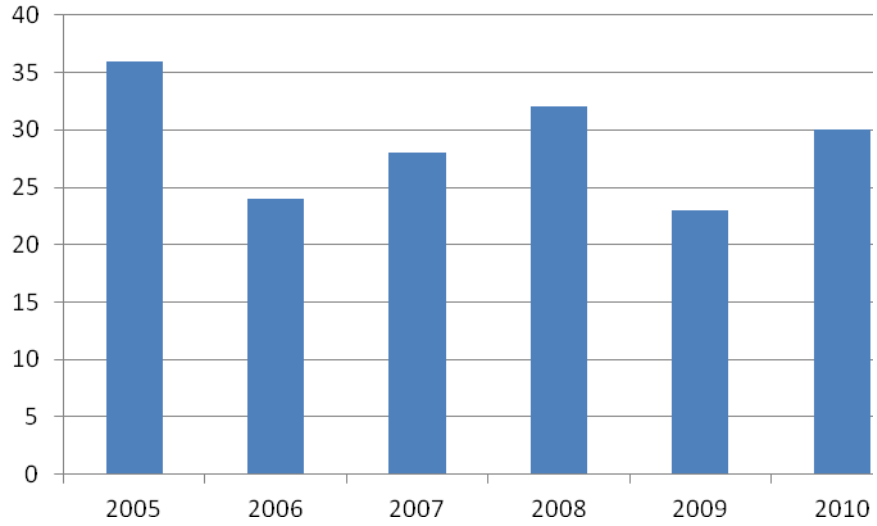
Veolia have been operating the Luas since it commenced operation in June 2004. 2010 saw the opening of the extension to Brides Glen (Line B1) and two severe snow falls in January and December leading to major disruption of the system. However, there was an increase in passenger journeys made in 2010 by approximately 9%. 2010 saw 27.6 million passenger journeys made compared to 25.4 million passenger journeys completed in 2009.

The total tram-kilometres (km) run in 2010 was 3.1 million (with circa 1.2 million km on the Green Line and 1.8 million km on the Red Line), representing an increase of approximately 14% compared to 2009.

Veolia's safety record remains good in comparison to other light railways in Europe. Nonetheless, the RSC actively monitors Luas operations under its supervision regime. Below are a number of key statistics for salient safety indicators.

3.2.1 Road Traffic Accidents.

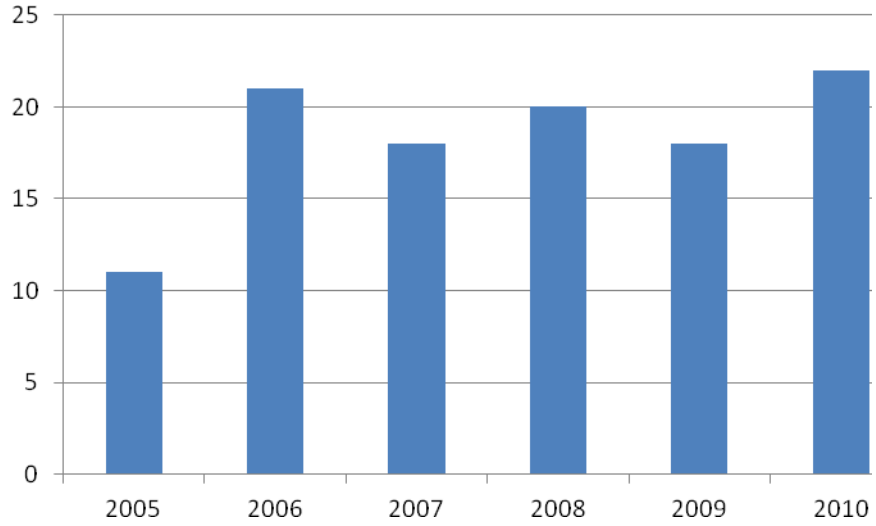
The Luas by its very design interfaces with the public and road traffic along significant sections of its alignment, most notably in the city centre. The Luas operates by 'line of sight' and is no different in its operation to the majority of light rail systems around the world. However, given that the Luas shares sections of the carriageway with road vehicles, road traffic accidents (RTA) can inevitably occur. The statistics show that the number of RTA has increased with 30 events in 2010 compared to 23 in 2009. However, it should be noted that 5 RTA events (16%) can be attributed to snow and ice on our roads (1 event in January and 4 in December).



Graph 11: Road Traffic Accidents involving a tram

Dublin City Centre remains the area where the majority of the road traffic accidents, with seven taking place in the Benburb Street / Blackhall Place area. In fact of the 30 RTA in 2010, 29 occurred on the Red line, i.e., Tallaght to Connolly/The Point. Similarly, some 63% (19) of RTA in 2010 occurred at traffic signal controlled junctions which suggests an issue of road vehicle driver behaviour in regard to obedience of road traffic signals.

3.2.2 Tram / Pedestrian Contact



Graph 12: Tram/Pedestrian coming into contacts

As with RTAs, the vast majority of contact incidents between trams and pedestrians occur in and around the city centre, with a significant proportion occurring along Abbey Street. Indeed the Abbey Street / O'Connell Street intersection accounts for 60% of all contacts. Since services began in 2005, there have been 7 incidents where people have been required to attend hospital, 3 of which occurred in 2010. Table 3 provides further detail.

Year	Total number of tram-pedestrian contact incidents	Taken to hospital	Confirmed serious injury
2005	11	6	0
2006	21	5	0
2007	18	7	2
2008	20	3	2
2009	18	1	0
2010	22	5	3

Table 3: Tram – Pedestrian Contact Statistics

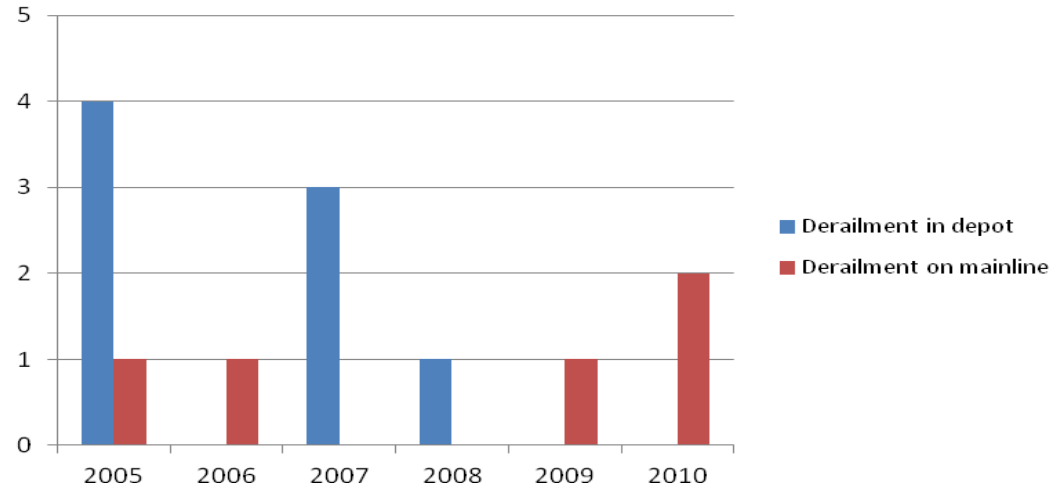
The three incidents in 2010, in which serious injury resulted related to;

- A fall to a youth who was tram-surfing (scutting) in the Rialto area. This resulted in head injury
- A tram coming into contact with a cyclist who had apparently not stopped at a red light. This resulted in a suspected broken leg to the cyclist.
- A tram coming into contact with a person crossing the Naas road and tramway reservation illegally. This resulted in multiple injuries to the individual.

3.2.3 Tram Derailments

In 2010 there were 2 tram derailments, bringing the total since operations began to 13. The two derailments in 2010 both occurred while in passenger service on the Connolly to The Point extension (Line C1).

The number of derailments remains low with a rate of one in-service tram derailment every 3.29 million tram-kilometres.



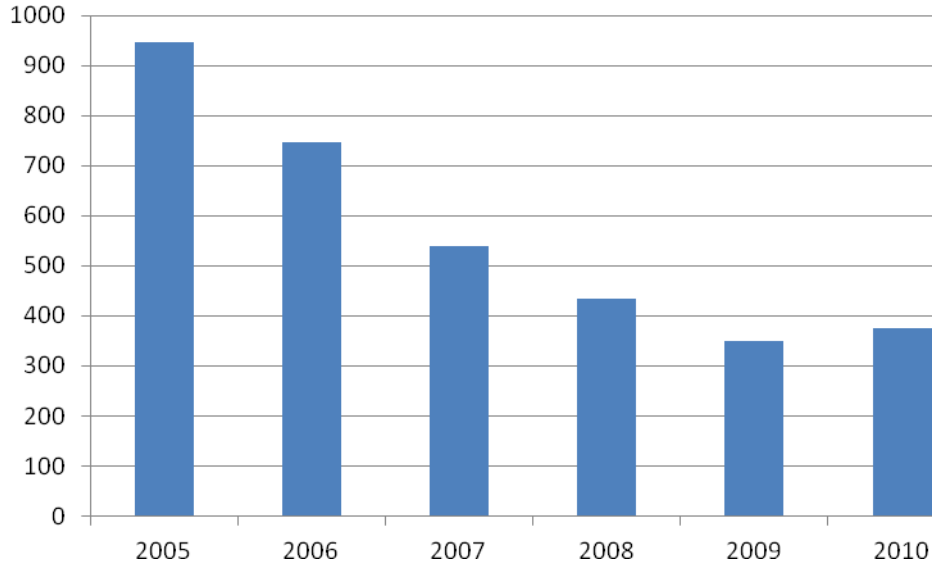
Graph 13: Tram Derailments

There were 2 tram derailments in 2010. The first occurred at the set of switches approaching 'The Point' stop. The tram derailed while engaged a wrong direction move. There were no injuries given the tram was moving slowly (approximately 15 kph)

The second derailment occurred in the Spencer Dock area after a road vehicle dislodged some of the embedded track which was undergoing some maintenance. The loose paving lead to an accumulation of cobbles on the carriageway which the tram under-body struck causing the derailment of one bogie.

3.2.4 Tram Emergency Brake Applications

A useful precursor event indicator is the number of emergency brake (EB) applications that tram drivers make. In addition to its standard brakes, a tram is fitted with an electromagnetic track brake or EB. Tram drivers are trained in defensive driving techniques and are constantly vigilant of pedestrians, cyclists and road vehicles. However, there are occasions when a driver may need to apply the EB to prevent a collision. Evidence suggests that these EB applications are often made because of acts of commission or omission by the third party, i.e., the road vehicle driver, cyclist or pedestrian.



Graph 14: Emergency Brake Applications

The 374 EB applications demonstrates a consistent improvement and suggests that the public are aware of the trams and tram drivers are more aware of potential incidents.

3.3 Bord Na Móna Industrial Railway Statistics

The remit of the RSC in terms of its oversight of Bord Na Móna's (BNM) industrial railway is limited to where it interfaces with public roads. These interfaces are at level crossings and where there are bridges over the industrial railway. In terms of key infrastructure statistics there is 570 km of permanent track, 98 level crossings and 50 underpasses, of which 47 are under roads and 3 are under Iarnród Éireann rail lines.

There were no reported derailments in 2010 and just one reported incident at a level crossing, No. 15-11, Noggus – Falsk. In late November 2010, 2 trains in convoy carrying peat were being hauled from Falsk to Derrinlough Tippler by Bord Na Móna employees. While the first train was crossing the main road, the R437, a car hit the crossing gates and one wagon of the train. The collision was due to the inclement weather conditions at the time which were foggy with ice on many regional roads. The car driver was apparently uninjured and the train and its crew were uninjured. The only damage was to one level crossing gate which needed replacing.

3.4 Heritage Railways

A heritage railway is defined in legislation as *'a person who only operates train services or railway infrastructure of historical or touristic interest..'.* The RSC monitor the operations of 9 heritage railways. They are;

- Cavan and Leitrim Railway
- Difflin Light railway, Oakfield, Raphoe
- Finntown & Glenties Railway
- Listowel Lartigue Monorail
- Irish Steam Preservation Society Stradbally
- Tralee & Dingle Railway
- Waterford & Suir Valley Railway
- West Clare Railway
- Railway Preservation Society of Ireland

There were no reported incidents or accidents in 2010 which is consistent with previous year's performance.

4 Railway Safety Trends in Europe

In European terms the RSC are defined as the National Safety Authority (NSA) in Ireland. Each European member state has an NSA which, in accordance with the Railway Safety Directive (2004/49/EC), must send its annual report on railway safety to the European Railway Agency (ERA). The ERA in turn analyses railway safety on a European scale and publish its report. The ERA produces a biennial report, the most recent being for 2009. Some noteworthy statistics from a European perspective are now presented.

4.1 Key European Statistics

In the most recent 'Railway Safety performance in the EU' report (ERA, 2011), data was supplied by 26 National Safety Authorities (NSA) and the Channel Tunnel Safety Authority. The tables below present the most recent coherent data set which is for 2009. The figures, normalised by train-km run, serve to illustrate how Ireland is performing when compared against the overall European average performance.

Significant* Accidents	Ireland (IE) 2010	Ireland (IE) 4 Year Average (2007-2010)	EU (Total) 4 Year Average (2007-2010)	IE Performance
Train-km (Million)	17.7	0.0	0.0	
		IE rate per 100 million train-km	EU rate per 100 million train-km	
Collision of Trains	0	2.76	8.02	Very Good
Derailment of Trains	0	1.38	7.95	Very Good
Level crossing Accidents	2	5.51	26.36	Very Good
Accidents to persons caused by rolling stock in motion	1	9.64	42.23	Very Good
Passenger fatalities	0	0	1.69	Good
Level Crossing User Fatalities	2	2.76	9.95	Very Good
Passenger Serious Injuries	0	1.38	7.28	Very Good
*Resulting in death or serious injury or damage more than €150000 or line closure for more than 6 hours				

Table 4: EU Accident Statistics for year 2009

In 2010 Ireland had approximately 21% more level crossings per track-kilometre than the European average. However, as previously stated in section 3.2.1, IÉ has an ongoing level crossing upgrade and closure programme which has undoubtedly been reaping safety benefits.

Table 5 presents the number of precursor events which is another useful indicator in terms of measuring safety performance. The figures, normalised by size of network or by train-km run, serve to illustrate how Ireland is performing when compared against the overall European average performance.

Precursor* Incidents	Ireland (IE) 4 Year Average (2006-2009)	EU 2009	IE Performance
Track-km (thousand)	2.12	303.34	
	IE rate per 1000 track-km	EU rate per 1000 track-km	
Broken Rails	1.89	17.81	Very Good
Track buckle	1.07	11.74	Very Good
Level crossing Accidents	0.48	3.61	Very Good
Train-km (million)	0.19	41.5	
	IE rate per 100 million train-km	EU rate per 100 million train-km	
Wrong Side Signalling Failure	11.85	28.67	Good
Signals Passed at Danger (SPAD)	100	111.73	Average
Broken Train Wheels	0	3.84	Very Good
Broken Train Axles	1.32	1.99	Average
*Forerunner events with potential to cause serious accidents			

Table 5: EU Precursor event statistics for year 2007

From the above tables it is evident that Iarnród Éireann (IÉ) is performing well in most categories. In a EU context Ireland is performing above average in terms of safety performance. The only category where Ireland has an average rating is with Signals Passed at Danger (SPAD). IÉ have taken note of this and have in their 2011 Operations Safety Plan developed a comprehensive SPAD Action Plan which it is hoped will see further reduction of this type of occurrence.

4.2 Major Accidents in other EU Member States

A number of major incidents occurred in 2010 in other EU countries and below is a brief synopsis (based on ERA and NSA information) of some of these.

On the 15th February 2010 there was a head-on collision between two passenger trains north of Halle in Belgium. There was significant damage to the leading carriages and the overhead power lines. There were 18 fatalities and 171 injured as a consequence.

On the 15th April 2010 a taxi and a passenger train collided at a level crossing in Chintulovo, Bulgaria. Despite the red-light signals the car did not stop before the crossing and was hit by the oncoming train. All car passengers were injured, 2 of them fatally.

A long distance passenger train travelling at a speed of 140 km/h hit people (illegally) crossing the tracks at Platja de Castelldefels Station in the out-skirts of Barcelona in Spain on the 23rd June 2010. There were 12 fatalities and 10 serious injuries.

The Ustí nad Labem railway accident on the 28th June 2010 in the Czech Republic occurred when the first three carriages of a passenger train derailed as it passed over a set of points (switches) and hit a concrete wall. The train driver died in the crash and 7 passengers were seriously injured.

On the 12th September 2010 a high-speed X200 passenger train collided with a mechanical digger which was adjacent to the track working near Kimstad in Sweden. The collision resulted in 1 fatality, 2 serious injuries and significant damage to the train.

5 Accident Investigations

The Railway Accident Investigation Unit (RAIU) is a functionally independent organisation which shares some of the administrative resources of the RSC. The RAIU undertakes 'for cause' investigations into accidents and incidents that either meet specific criteria in terms of severity or could have, in slightly different circumstances, resulted in a more serious accident or incident.

The purpose of an investigation by the RAIU is to identify improvements railway safety by establishing, in so far as possible, the cause or causes of an accident or incident with a view to making recommendations for the avoidance of similar accidents in the future, or otherwise for the improvement of railway safety. It is not the purpose of an investigation to attribute blame or liability. The RAIU's investigations are carried out in accordance with the Railway Safety Act 2005 as amended by S.I. 61 of 2008 and European Railway Safety Directive 2004/49/EC.

5.1 RAIU Active Investigations

In 2010, the RAIU initiated 7 investigations and they are listed in table 6. The RAIU have or will in due course, issue reports on these incidents and may make recommendations that the RSC will oversee the implementation of.

Date of Incident	Details	Duty Holder
20th January	Laois Train-care Depot Derailment	IÉ
7th May	Secondary suspension failure of a passenger train	IÉ
13th May	Tram derailment at The Point Stop on the Luas Red Line	Veolia
27th June	Person struck at level crossing XE039, County Clare,	IÉ
2nd July	Gate Strike at Buttevant Level Crossing (XC 219), County Cork,	IÉ
2nd September	Road vehicle struck at level crossing XM096,	IÉ
24th October	Car Strike at Knockaphunta Level Crossing (XM250), Co Mayo	IÉ

Table 6: RAIU investigations initiated in 2010

5.2 RAIU Investigation Reports

In accordance with the Railway Safety Act 2005, the RAIU endeavours to publish an investigation report not later than 12 months after the date of the incident. In 2010, the RAIU published 6 investigation reports and they are listed in table 7. As a result of their investigations the RAIU made a total of 26 recommendations which are discussed in section 5.3.

Date Report Published	Title of Report	No. of recommendations made	Duty Holder
4th March (2010-R001)	Collision of a Locomotive with Passenger Carriages at Plunkett Station in Waterford on the Dublin to Waterford line on the 29th March 2009	2	IÉ
21st April (2010-R002)	Derailment of LUAS tram at Connolly Station, LUAS Red Line, Dublin City 16th of July 2009	0	Veolia
10th June (2010-R003)	Derailment of an on track machine at Limerick Junction Station on the Dublin to Cork line on the 3rd July 2010	2	IÉ
16th August (2010-R004)	Malahide Viaduct Collapse on the Dublin to Belfast Line, on the 21st August 2009	15	IÉ
24th August (2010-R005)	Irregular operation of Automatic Half Barriers at Ferns Lock, County Kildare, on the Dublin to Sligo Line, 2nd September 2009	1	IÉ
15th November (2010-R006)	Derailment of empty train due to collision with landslip debris outside Wicklow Station, 16th November 2009	6	IÉ

Table 7: RAIU Investigation Reports published in 2010

5.3 RAIU Safety Recommendations

The RAIU, through their investigations identify, whenever possible, the immediate cause, contributory factors and any underlying factors. Having established these, the RAIU may make recommendations and as previously stated, in 2010, 26 recommendations were made as a result of 5 of their investigations. In accordance with the Railway Safety Directive the RAIU should address recommendations to the safety authority (the RSC) and, where needed by reason of the character of the recommendation, to other bodies or authorities in the Member State or to other Member States. Member States and their safety authorities shall take the necessary measures to ensure that the safety recommendations issued by the investigating bodies are duly taken into consideration, and, where appropriate, acted upon.

The RSC categorise the status of recommendations as being either 'Open', 'Complete' or 'Closed'. These are defined as follows;

Open (In progress)	- Feedback from implementer is awaited or actions have not yet been completed.
Complete	- Implementer has advised that it has taken measures to effect the recommendation and the RSC is considering whether to close the recommendation.
Closed	- Implementer has advised that it has taken measures to effect the recommendation and the RSC is satisfied that the work has been completed or it has confidence that the work is being completed and has closed the recommendation.

What follows is a summary of the actions taken in relation to the five RAIU Investigation Reports published in 2010 where recommendations were made, and the status of each recommendation as of 31st December 2010.

2010-R001 - Collision of a Locomotive with Passenger Carriages at Plunkett Station in Waterford on the Dublin to Waterford line on the 29th March 2009	
Summary: At 20.12 hours the 17.35 hours service from Dublin to Waterford arrived on the Platform Line at Plunkett Station in Waterford. The carriages were uncoupled from the locomotive in order to move the locomotive from one end of the carriages to the other. The locomotive was moved over a set of points onto the Up Main Line. The train driver then tried to change cab to travel in the opposite direction but could not as the MU-2-B1 valve was defective and therefore drove from the rear cab of the locomotive without a shunter controlling the movement from the leading cab. The locomotive was incorrectly routed back onto the Platform Line towards the carriages by the signalman. When the train driver became aware the locomotive was mis-routed the train driver applied the brakes but the locomotive collided with the carriages. A shunter who was at the rear of the carriages at the time was struck by the moving carriages. There were no fatalities. The shunter was hospitalised and released the same day. Two other members of staff who were in the carriages at the time of the collision suffered minor injuries. There were no passengers on the carriages at the time of the accident.	
Number of recommendations made	2
Recommendation 1	Iarnród Éireann (IÉ) should review their systems for training and competency management of signalmen ensuring working as a relief signalman is taken into account;
Action/s taken / in progress	IÉ have undertaken a review to verify the competence of relief signallers. A new standard (OPS-SMS-4.1) is in operation which deals with the selection, training and competence of Non-CTC (Central Traffic Control) Signal Staff.
Status	Closed
Recommendation 2	IÉ should ensure procedures are put in place for the operation and maintenance of MU-2-B1 valves.
Action/s taken / in progress	IÉ have modified their instructions ensuring maintenance has been added to the D Exam for locomotives. Training school briefing the operation of MU-2-B1 valves is now part of initial training and refresher training (for drivers).
Status	Closed

2010-R003 - Derailment of an on track machine at Limerick Junction Station on the Dublin to Cork Line 3rd of July 2009	
Summary: At approximately 04.50 hours on the 3rd of July 2009 a train consisting of two coupled On Track Machines, ballast regulator 703 and tamping machine 743, was travelling from a work site on the Dublin side of Limerick Junction Station to the Limerick Junction Sidings. For the final part of the movement unit 703 was leading. The leading left wheel of unit 703 did not follow the route the number 27A points were set for, it travelled over the top of the left switch rail of the points and along the stock rail before derailing.	
Number of recommendations made	2
Recommendation 1	Iarnród Éireann should put in place a formalised process to ensure that life expired points are removed from service, where this is not possible a risk assessment should be carried out and appropriate controls should be implemented to manage the risks identified;
Action/s taken / in progress	IÉ have developed detailed Asset Risk Registers for all relevant assets including points. Where risks are identified appropriate mitigations are identified and implemented. The risk register is reviewed regularly between IÉ's senior managers to review the current risks.
Status	In progress
Recommendation 2	Iarnród Éireann should ensure On Track Machine (OTM) maintenance personnel are trained and competent to examine the wheel-sets.
Action/s taken / in progress	7 IÉ staff associated with maintenance of OTMs have received training in Wheel Condition and Inspection. IÉ also advise that day to day inspection and maintenance will become the responsibility of the Chief Mechanical Engineer and be treated as a fleet in its own right.
Status	Closed

2010-R004 - Malahide Viaduct Collapse on the Dublin to Belfast Line, on the 21st August 2009	
Summary: On the 21st August 2009 as an Iarnród Éireann passenger service, travelling from Balbriggan to Pearse, passed over the Malahide Viaduct the driver witnessed a section of the viaduct beginning to collapse into Broadmeadow Estuary. The driver reported this to the controlling signalman who immediately set all relevant signals to danger ensuring no trains travelled over the viaduct. Within minutes of the report of the accident, by the driver, Pier 4 of the Malahide Viaduct had collapsed into the Broadmeadow Estuary. All post accident emergency procedures were properly employed by the operating staff resulting in no fatalities or injuries to any members of the public or staff.	
Number of recommendations made	15
Recommendation 1	Iarnród Éireann should put appropriate interface processes in place to ensure that when designated track patrolling staff (who report to two or more divisional areas) are absent from their patrolling duties, that appropriate relief track patrolling staff are assigned to perform these patrolling duties.
Action/s taken / in progress	Patrol Lengths have been rationalised so that no Ganger reports to more than one length (section of line).
Status	Complete
Recommendation 2	Iarnród Éireann should amend the Track Patrolling Standard, I-PWY-1307, to remove the requirement for track patrollers to carry out annual checks for scour.
Action/s taken / in progress	The relevant standard has been amended and re-issued without this requirement in the new version.
Status	Closed
Recommendation 3	Iarnród Éireann should formalise their "Civil Engineering and Earthworks Structures: Guidance Notes on Inspections Standard", I-STR-6515, which should include guidance for inspectors on conducting inspections and identifying structural defects. On formalising this document Iarnród Éireann should re-issue, in the appropriate format, to all relevant personnel.
Action/s taken / in progress	These guidelines have been formalised and re-issued.
Status	Closed

2010-R004 - Malahide Viaduct Collapse on the Dublin to Belfast Line, on the 21st August 2009 continued	
Recommendation 4	Iarnród Éireann should introduce a verification process to ensure that all requirements of their Structural Inspections Standard, I-STR-6510, are carried out in full.
Action/s taken / in progress	IÉ have introduced a verification process whereby structural inspections are signed off by a senior engineer and then entered into the Infrastructure Asset Management System .
Status	Complete
Recommendation 5	Iarnród Éireann should ensure that a system is put in place for effective implementation of existing standards and to manage the timely introduction of new and revised standards.
Action/s taken / in progress	IÉ are introducing a Quality Management System that will include a standard that will deal with 'Document Control'.
Status	Complete
Recommendation 6	Iarnród Éireann should ensure that a programme of structural inspections is started immediately in accordance with their Standard for Structural Inspection, I-STR-6510, and ensure that adequate resources are available to undertake these inspections.
Action/s taken / in progress	Structural inspections are underway. IÉ management advise that resources were reviewed, shortfalls identified and recruitment programmes undertaken. As a result an additional 9 Engineers have been recruited to assist in the task of structural inspections etc.
Status	Closed
Recommendation 7	Iarnród Éireann should carry out inspections for all bridges subject to the passage of water for their vulnerability to scour, and where possible identify the bridge foundations. A risk-based management system should then be adopted for the routine examination of these vulnerable structures.
Action/s taken / in progress	Detailed inspections of 105 bridges potentially vulnerable to scour have been undertaken by a specialist inspector. The reports of which are being reviewed by a hydrologist. A risk based approach to the management of these has been adopted.
Status	In progress

2010-R004 - Malahide Viaduct Collapse on the Dublin to Belfast Line, on the 21st August 2009 continued	
Recommendation 8	Iarnród Éireann should develop a documented risk-based approach for flood and scour risk to railway structures through: • Monitoring of scour risk at sites through scour depth estimation, debris and hydraulic loading checks, and visual and underwater examination; • Provision of physical scour / flood protection for structures at high risk; • Imposing of line closures during periods of high water levels where effective physical protection is not in place.
Action/s taken / in progress	A Flood and Scour Management Standard was issued in June 2011. Inspections continue to take place and remedial work is being identified and programmed.
Status	In progress
Recommendation 9	Iarnród Éireann should adopt a formal process for conducting structural inspections in the case of a report of a structural defect from a member of the public.
Action/s taken / in progress	A notice is published on a regular basis in the weekly circular advising staff what to do in the event of a phone call from a member of the public. This notice is also erected in booking offices and other locations around the system.
Status	Complete
Recommendation 10	Iarnród Éireann should introduce a training, assessment and competency management system in relation to the training of structural inspectors, which includes a mentoring scheme for engineers to gain the appropriate training and experience required to carry out inspections.
Action/s taken / in progress	IÉ have introduced a training system through a technical standard "Management of Structural Inspection Competence". This standard sets out the requirements for training and assessment of personnel carrying out structural inspections on Iarnród Éireann structures.
Status	In progress

2010-R004 - Malahide Viaduct Collapse on the Dublin to Belfast Line, on the 21st August 2009 continued	
Recommendation 11	Iarnród Éireann should review their network for historic maintenance regimes and record this information in their information asset management system. For any future maintenance regimes introduced on the network, Iarnród Éireann should also record this information in their information asset management system.
Action/s taken / in progress	The contract for archiving of bridge data has been awarded.
Status	In progress
Recommendation 12	Iarnród Éireann should incorporate into their existing standards the requirement for the input of asset information into the technical database system upon completion of structural inspections.
Action/s taken / in progress	A requirement has been incorporated into the structural inspections process. Senior engineer appointed in each division is responsible for ensuring this activity is done.
Status	Closed
Recommendation 13	Iarnród Éireann should carry out an audit of their filed and archived documents, in relation to structural assets, and input this information into their information asset management system.
Action/s taken / in progress	Contract has been awarded for phase 1 of overall archiving/logging of historical data/information. The timeline for this project is 6 months.
Status	In progress
Recommendation 14	The Railway Safety Commission should review their process for the closing of recommendations made to Iarnród Éireann by independent bodies, ensuring that they have the required evidence to close these recommendations. Based on this process the Railway Safety Commission should also confirm that all previously closed recommendations satisfy this new process.
Action/s taken / in progress	The RSC has formalised the way it closes RAIU and other external recommendations. This is outlined in guidance document RSC-G-023-A which is available on the RSC's website.
Status	In progress

2010-R004 - Malahide Viaduct Collapse on the Dublin to Belfast Line, on the 21st August 2009 continued	
Recommendation 15	The Railway Safety Commission, in conjunction with Iarnród Éireann, should develop an action plan in order to close all outstanding recommendations in the AD Little Review (2006) and the IRMS Reviews (1998, 2000, 2001). This action plan should include defined timescales for the implementation and closure of all these recommendations.
Action/s taken / in progress	An external consultant has been engaged to review all recommendations from historic reports and identify those that remain valid.
Status	In progress

2010-R005 - Irregular operation of Automatic Half Barriers at Ferns Lock, County Kildare, on the Dublin to Sligo Line, 2nd September 2009	
Summary: Scheduled upgrading work was being undertaken at the Ferns Lock Automatic Half Barrier. During these works an Iarnród Éireann power cable was inadvertently severed disabling the external power supply to the level crossing, this caused the crossing to fail and the barriers to automatically lower to the failsafe position. An Emergency Operator from Maynooth took control of the crossing while repairs were being undertaken to the cables. The Emergency Operators function is to ensure that a train can only use the level crossing when the barriers are down, preventing road traffic from accessing the rail line, this is done in conjunction with the controlling signalman and train driver. However, the signalman signalled the train through the crossing without advising the Emergency Operator of the approach of a passenger service, which resulted in the passenger service travelling through Ferns Lock Automatic Half Barrier while the barriers were in the raised position – open to road traffic.	
Number of recommendations made	1
Recommendation 1	Iarnród Éireann should review the competencies of all signalmen to ensure that when signalmen are assigned relief duties they have the required training and experience to perform these duties appropriately.
Action/s taken / in progress	A new standard is expected to be in place by 31/01/12.
Status	In progress

2010-R006 - Derailment of empty train due to collision with landslip debris outside Wicklow Station, 16th of November 2009	
Summary: At approximately 06.20 hours, on Monday the 16th of November 2009, an empty train travelling from Connolly to Arklow, derailed when it collided with an obstruction caused by a landslip. The immediate cause of this landslip was the result of soil deposition by a landowner, at the crest of the cutting.	
Number of recommendations made	6
Recommendation 1	Iarnród Éireann should review their vegetation management processes to ensure that vegetation covering substantial earthworks structures is adequately maintained to facilitate the monitoring and inspection of earthwork structures by patrol gangers and other inspection staff;
Action/s taken / in progress	Vegetation management processes are being reviewed. A standard on vegetation management is currently being developed in 2011.
Status	In progress
Recommendation 2	Iarnród Éireann should review the effectiveness of their standards in relation to conducting earthworks inspections during periods of heavy rainfall, ensuring that earthworks vulnerable to failure are inspected during these periods by appropriately trained patrol gangers or inspectors;
Action/s taken / in progress	IÉ have revised their Track Patrolling Standard. Training and subsequent assessment for Track Patrollers has been developed and is underway.
Status	In progress
Recommendation 3	Iarnród Éireann should review their Standard for Track Patrolling, I-PWY-1307, for its effectiveness in identifying any third party activities that occur inside and outside the railway boundaries that could affect safety and where any deficiencies are found, Iarnród Éireann should develop an alternative process for the identification of these third party activities.
Action/s taken / in progress	The Track Patrolling Standard requires that Patrol Gangers note any activities outside the Railway boundary that could affect the safety of Operations. The use of aerial photography is also included as part of the Cuttings and embankments asset plan.
Status	Complete

2010-R006 - Derailment of empty train due to collision with landslip debris outside Wicklow Station, 16th of November 2009 continued	
Recommendation 4	Iarnród Éireann should review their structures list and ensure that all earthworks are identified and included on this list. Upon updating this list, a programme for the inspection of earthworks is to be developed and adopted at the frequency requirements set out by the Structural Inspections Standard, I-STR-6510;
Action/s taken / in progress	
Status	In progress
Recommendation 5	Iarnród Éireann and the Railway Safety Commission should review their process for the issuing of guidance documents, to ensure that the third parties affected by these guidance documents are made aware of their existence.
Action/s taken / in progress	IÉ have a number of guidance publications which are available through its own website. IÉ have also used the Ploughing Championships as a way of engaging 3rd parties. The RSC has written guidance for third parties and this is available on our website. The RSC and IÉ through the road Rail Safety Working Group have undertaken a road-show event briefing local authorities on rail way risks.
Status	In progress
Recommendation 6	Iarnród Éireann should review the effectiveness of their Structural Inspections Standard, I-STR-6510, with consideration for the possibility of more thorough inspections being carried out on cuttings to establish the topography and geotechnical properties of cuttings; and from this information identify any cuttings that are vulnerable to failure.
Action/s taken / in progress	Structural Inspections standard has been revised and re-issued. Cuttings are being managed on a risk basis. Aerial photography has also been undertaken and the information gathered from this is being reviewed.
Status	Complete

5.3.1 RAIU Recommendations Summary

Table 8 below confirms the current status of all RAIU recommendations made by year up to and including 31st December 2010.

Year	No. of Reports	No. Of Recommendations			
		Open	Complete	Closed	Total
2006*	**1**	3	1	10	14
2007	**0**	0	0	0	0
2008	**1**	1	3	3	7
2009	**5**	3	2	8	13
2010	**6**	13	6	7	26
Totals	**13**	**20**	**12**	**28**	**60**
				Total Recommendations made to date	**60**

Table 8: RAIU Recommendations Summary

*RSC Recommendations made prior establishment of RAIU

By way of reminder the recommendation status definitions are repeated.

Open (In progress) - Feedback from implementer is awaited or actions have not yet been completed.

Complete - Implementer has advised that it has taken measures to effect the recommendation and the RSC is considering whether to close the recommendation.

Closed - Implementer has advised that it has taken measures to effect the recommendation and the RSC is satisfied that the work has been completed or it has confidence that the work is being completed and has closed the recommendation.

6 Conclusions

In the main, the safety performance of both Iarnród Éireann and Veolia remained similar to that of 2009. The major negative from 2010 was the fact that there were 2 fatalities at user worked level crossings, i.e., the gates are opened and closed by the level crossing user. The significant accidents that occurred in 2009, most notably the partial collapse of the Malahide viaduct, are still in everyone's minds and to that end IÉ have completely revised their Safety Management System (SMS). Their SMS has been approved by the RSC in-line with European regulations and the continued application of this SMS will be the focus of the RSC's supervision activities in the years ahead.

Apart from the above mentioned incidents, the available data indicates that Iarnród Éireann's safety performance generally remained static in 2010. While there was a increase in the number of persons falling between a train and a platform and broken rails there were reductions in the number of Signals Passed at Danger and derailments. There were no passenger fatalities or serious injuries in 2010 and the number of bridge strikes again remained the same as that in 2009 (114).
In the European context, Iarnród Éireann has a good safety record and compares well against other countries in the vast majority of categories. However work can be done to reduce further the number of SPADs.

The LUAS safety performance was largely similar to that in 2009. There were no fatalities in 2010, however there were increases in the number of road-traffic accidents, pedestrian contact and derailments, which is disappointing.

The RSC, in its role as safety regulator, will continue to work closely with the railway companies to strive for safer railways in Ireland with an ultimate goal of zero harm.

7 References

RSC (2010), “Annual Report”, Railway Safety Commission, Dublin.

(ERA, 2011), “Railway Safety performance in the EU” , European Railway Agency, Valenciennes