Collaborating to manage risk on the GB Mainline Railway

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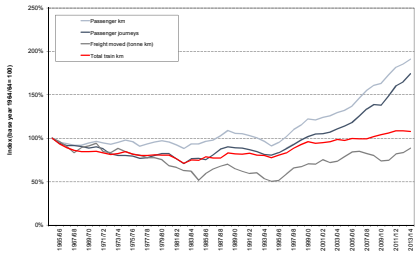
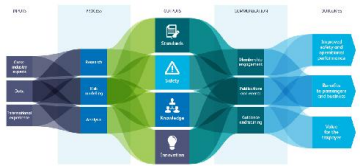
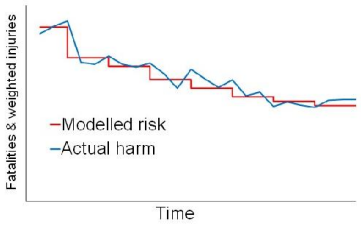
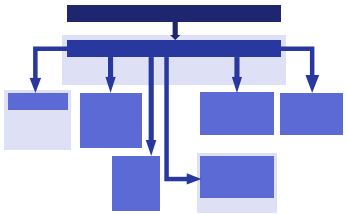
Contents









GB Railway
- Overview

RSSB
- Overview
- Decision making

Understanding Risk
- Definitions
- Safety Risk Model (SRM)

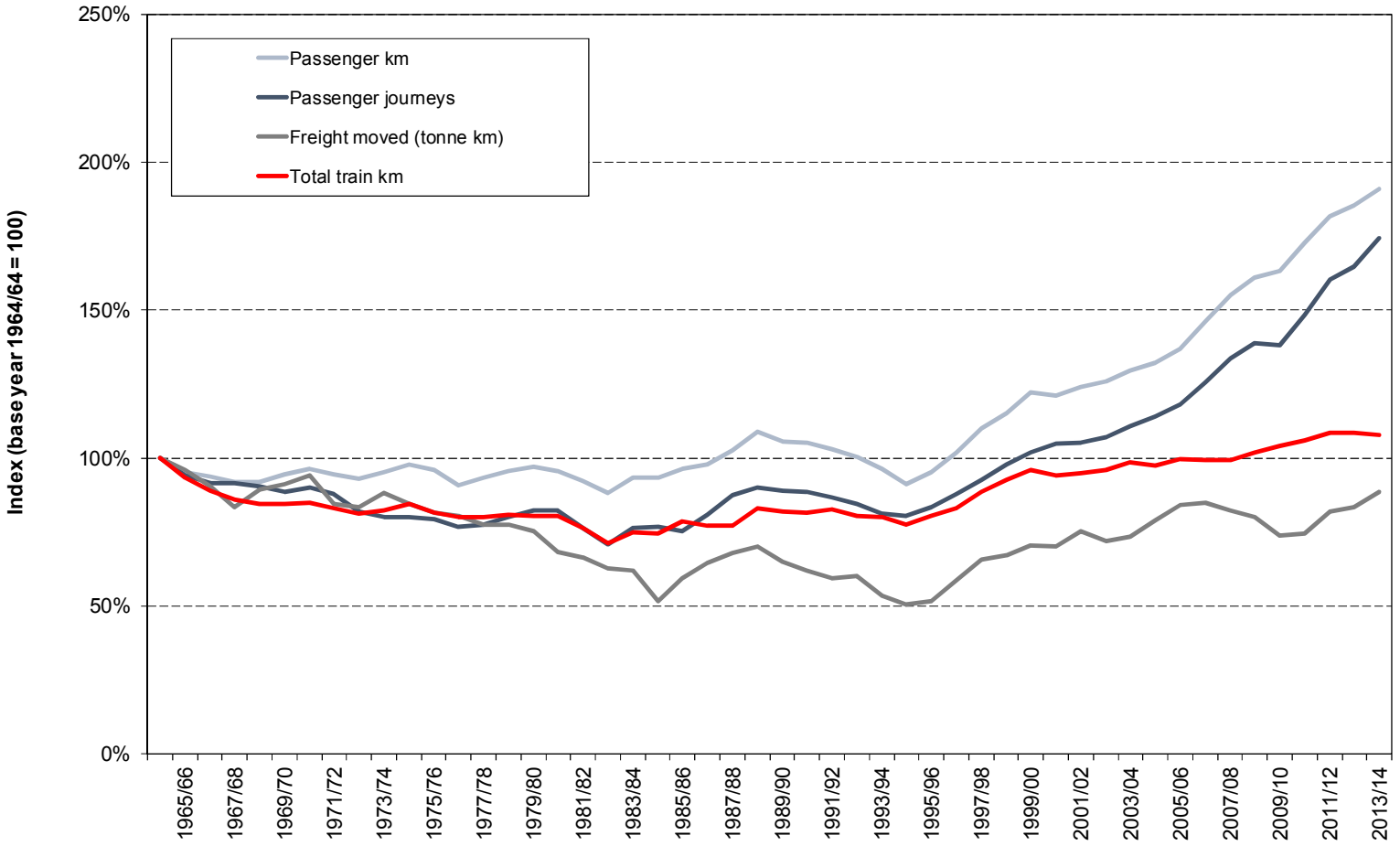
Collaboration
- Overview of system
- Benefits

Overview of the GB mainline Railway

- 15,753 route km
- 522 million passenger train km
- 47 million freight train km
- 63 billion passenger km
- 2,550 passenger stations
- 23 train operating companies
- 7 freight operating companies

A growing railway

Trends in rail usage over the past 50 years



Legal requirements

Transposing of the Safety Directive into UK Law through the introduction of ROGS (Railways and Other Guided Transport Systems (Safety) Regulations 2006).

This changed the relationship between infrastructure managers and those who operate trains.

It imposed a duty of cooperation equally on all transport operators.

RSSB

RSSB

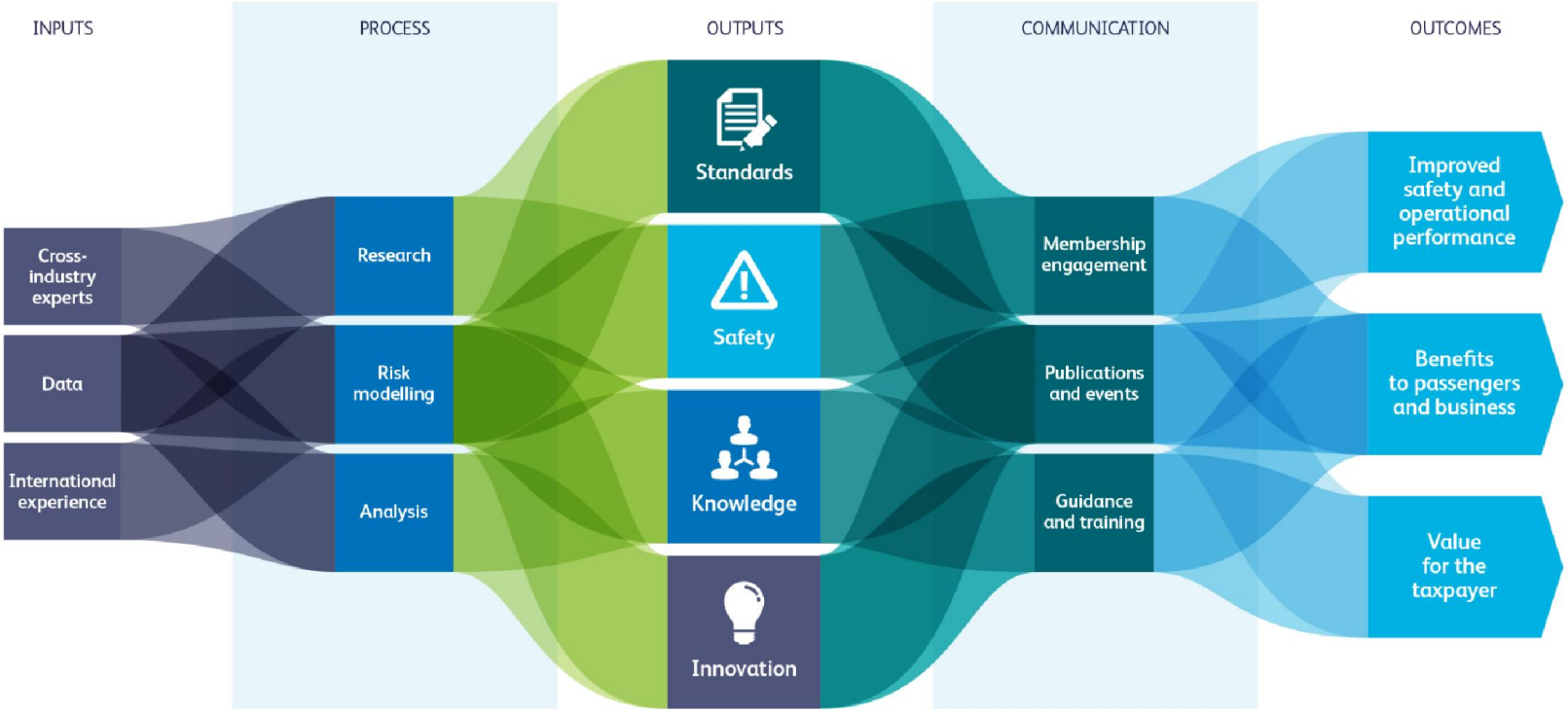
The railway is a complex system with multiple **interfaces** delivered by many different organisations. At RSSB we bring these different organisations together to make collective decisions.

Through research, risk modelling and analysis we help the rail industry in the areas of **safety, standards, knowledge, and innovation**. We support the railway across a wide range of cross-industry topics requiring our knowledge and **independence**.

RSSB

- Established in April 2003
- Independent “not for profit” company
- Owned and funded by our members
- Formal constitution
- Board - industry members plus independents plus NSA and Government
- Expertise in all rail disciplines plus business support activities

RSSB - Our key priorities

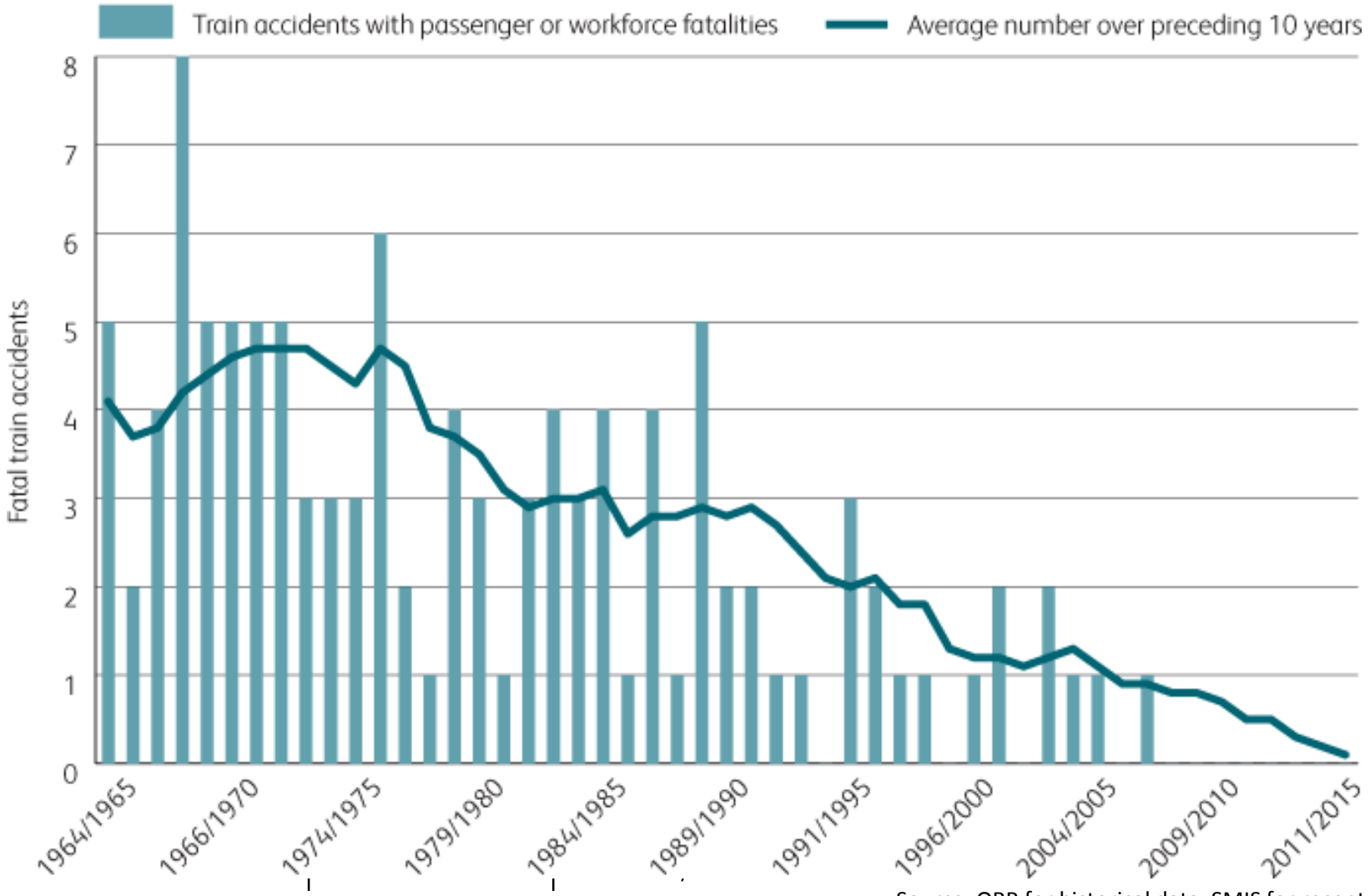


Safety Overview

Safety performance 2014/5

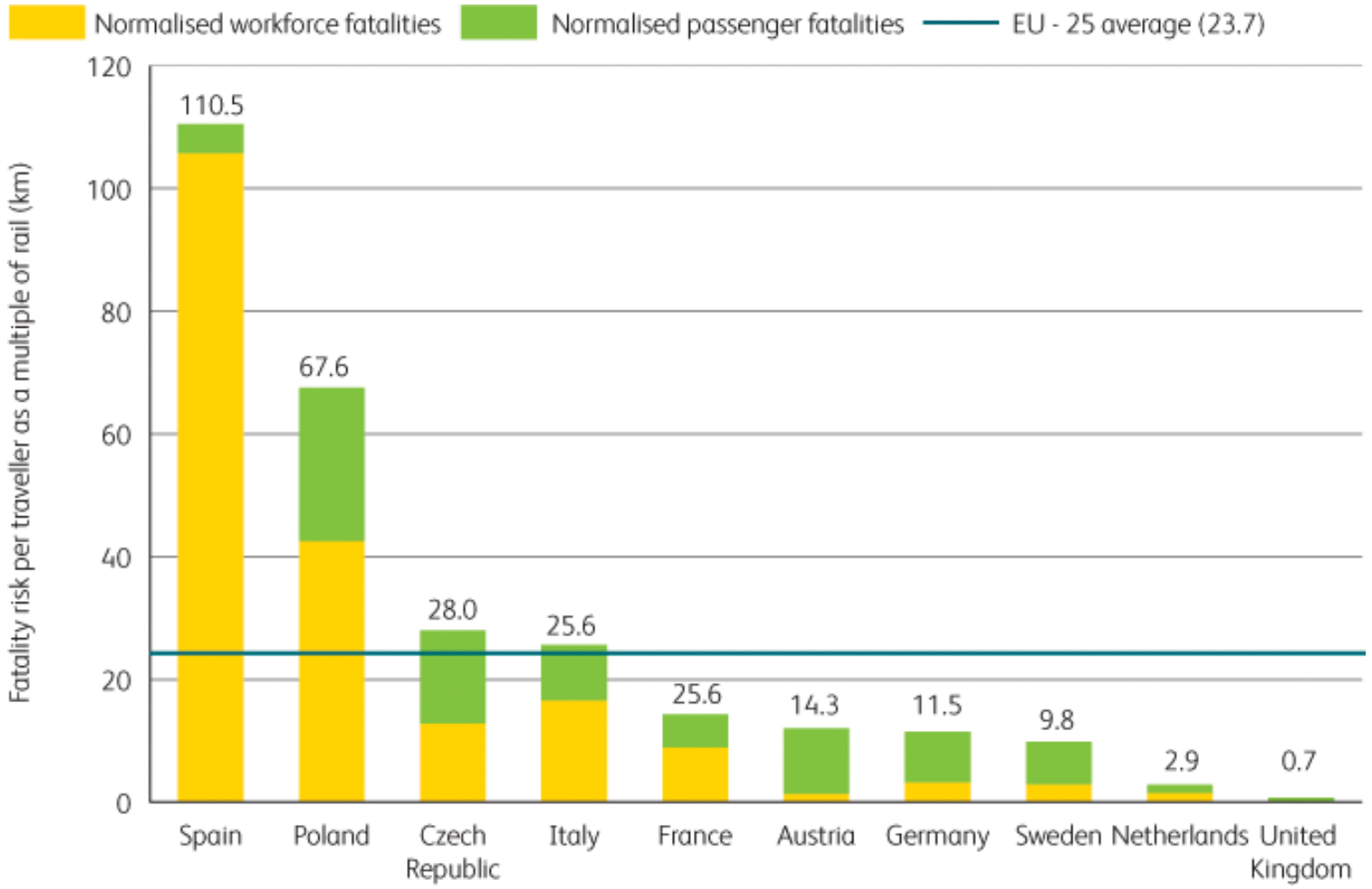
- 3 passenger fatalities & 296 major injuries
- 3 workforce fatalities & 173 major injuries
- 293 public fatalities due to suicide
- 22 public fatalities due to trespass
- 10 public fatalities due to level crossing collisions
- 16 derailments, all freight trains
- 7 collisions between trains and road vehicles at level crossings
- 299 Signals Passed at Danger (SPADs)

Train accidents with passenger and workforce fatalities



Source: ORR for historical data; SMIS for recent statistics.

Passenger and workforce fatality rates on the largest EU railways



Source: Eurostat data 2009-2013. The chart shows the ten largest EU railways in terms of train km

How do we make industry decisions that affect safety?

Taking Safe Decisions (2008)

- States the principles applied by the GB railway in making decisions that impact upon safety
- Published following an extensive programme of research and consultation
- Industry consensus

(Legal/business) drivers for monitoring

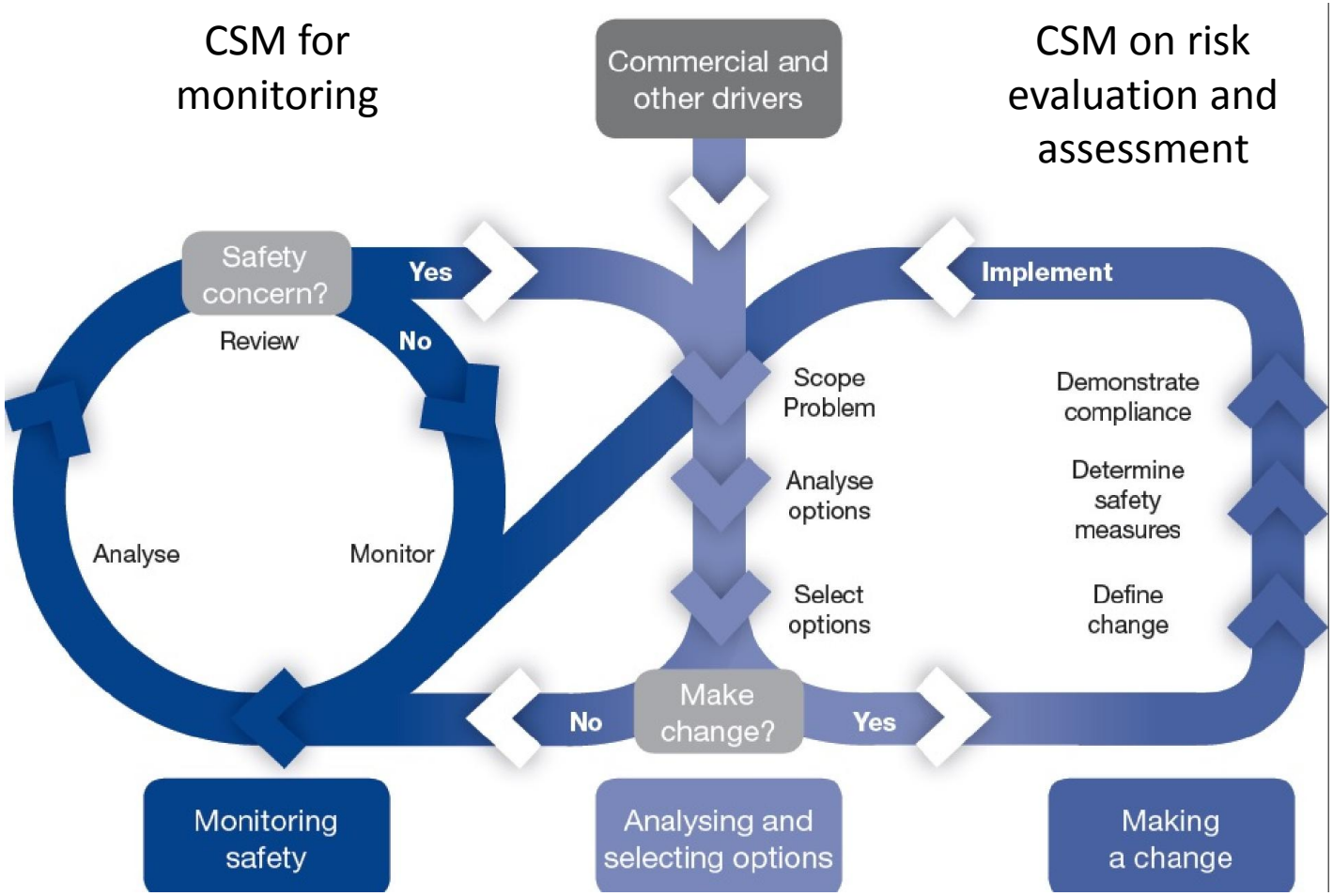
The CSM for monitoring

- A documented strategy, which is prioritised based on risk, and a plan/s for monitoring
- Analysis of information collected
- Implementing an action plan to address unacceptable non-compliances
- Evaluation of the effectiveness of the action plan implementation

The CSM – Risk Assessment

- Is my operation safe or might I need to make a change?

Taking Safe Decisions (2014)



Understanding risk

The Safety Risk Model (SRM)

- A mature model – first version completed in 2001
- Well established in GB and internationally acclaimed
- Updated every 18-36 months
- Results published in the Risk Profile Bulletin
- Version 8 completed in March 2014

Scope of the Safety Risk Model

Safety risk arising from the operation and maintenance of the mainline railway in Great Britain

Includes:

- Train accidents
- Accidents in stations
- Accidents on or about the track
- Accidents in yards, depots and sidings
- Trespass and suicide

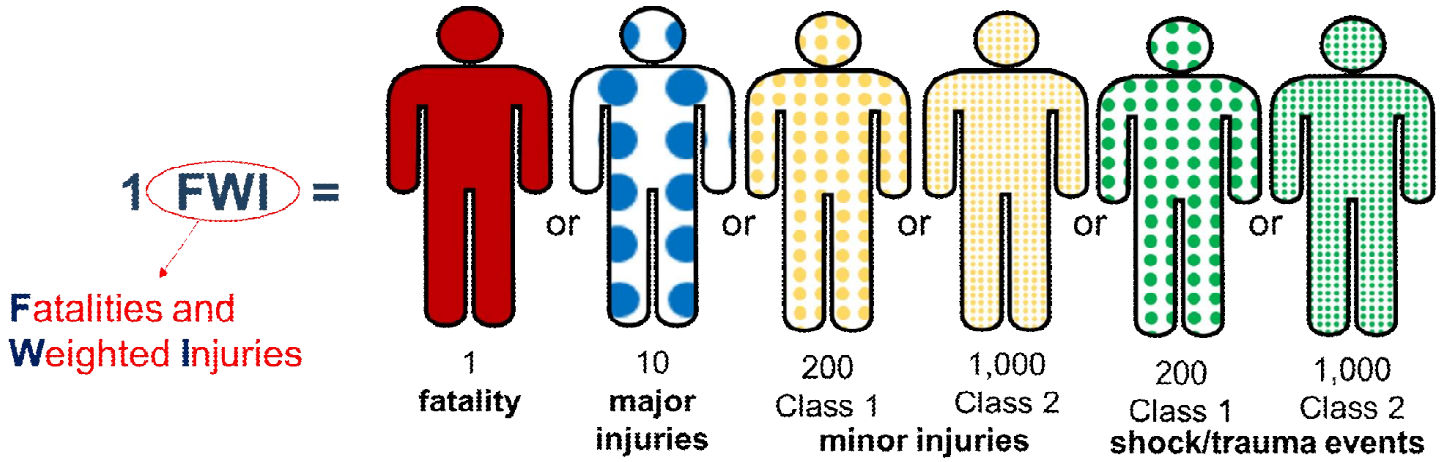
Risk = Frequency x Consequence

Frequency

Events per year

(and events per normaliser, e.g. per passenger journey or per train mile)

Consequence



Definitions

Hazardous Event and Precursor

Passenger slip, trip or fall due to running on stairs

Derailment of passenger train due to broken rail

People affected

Passengers

Workforce

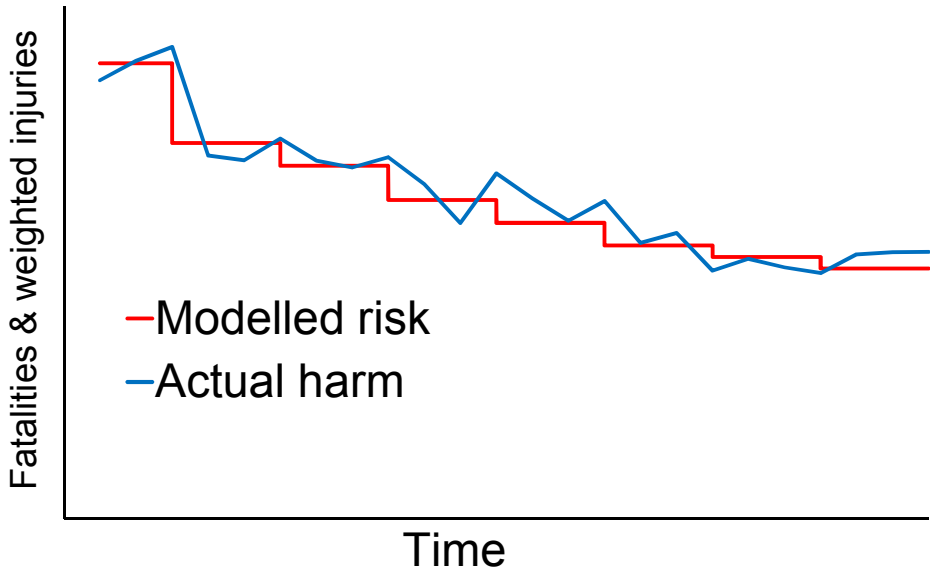
Public

Analysis

High frequency, low consequence events

eg - slips, trips and falls

Based on analysis of incident data

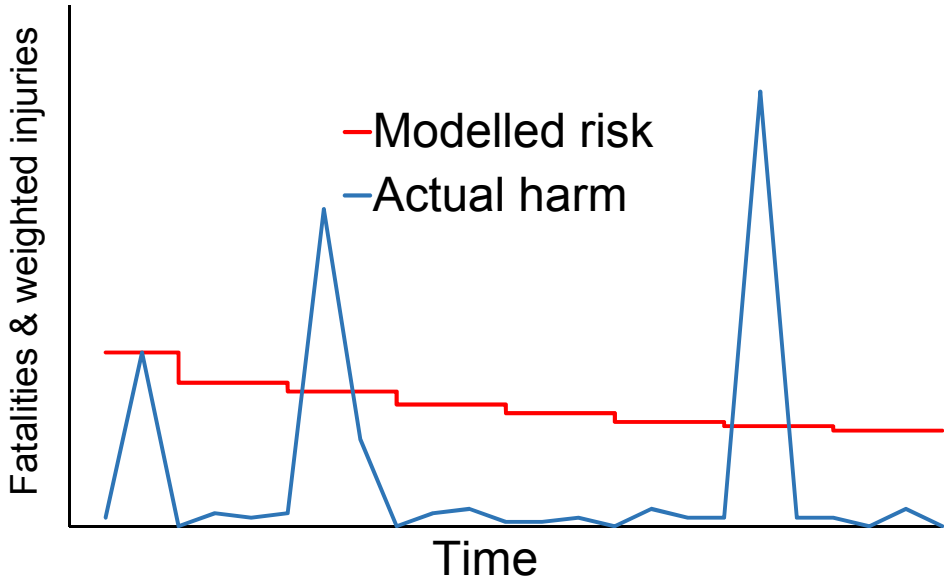


Analysis

Low frequency, high consequence events

eg - train collisions and derailments

Based on fault and event tree modelling informed by incident data, other data, structured judgement from technical specialists and statistical methods

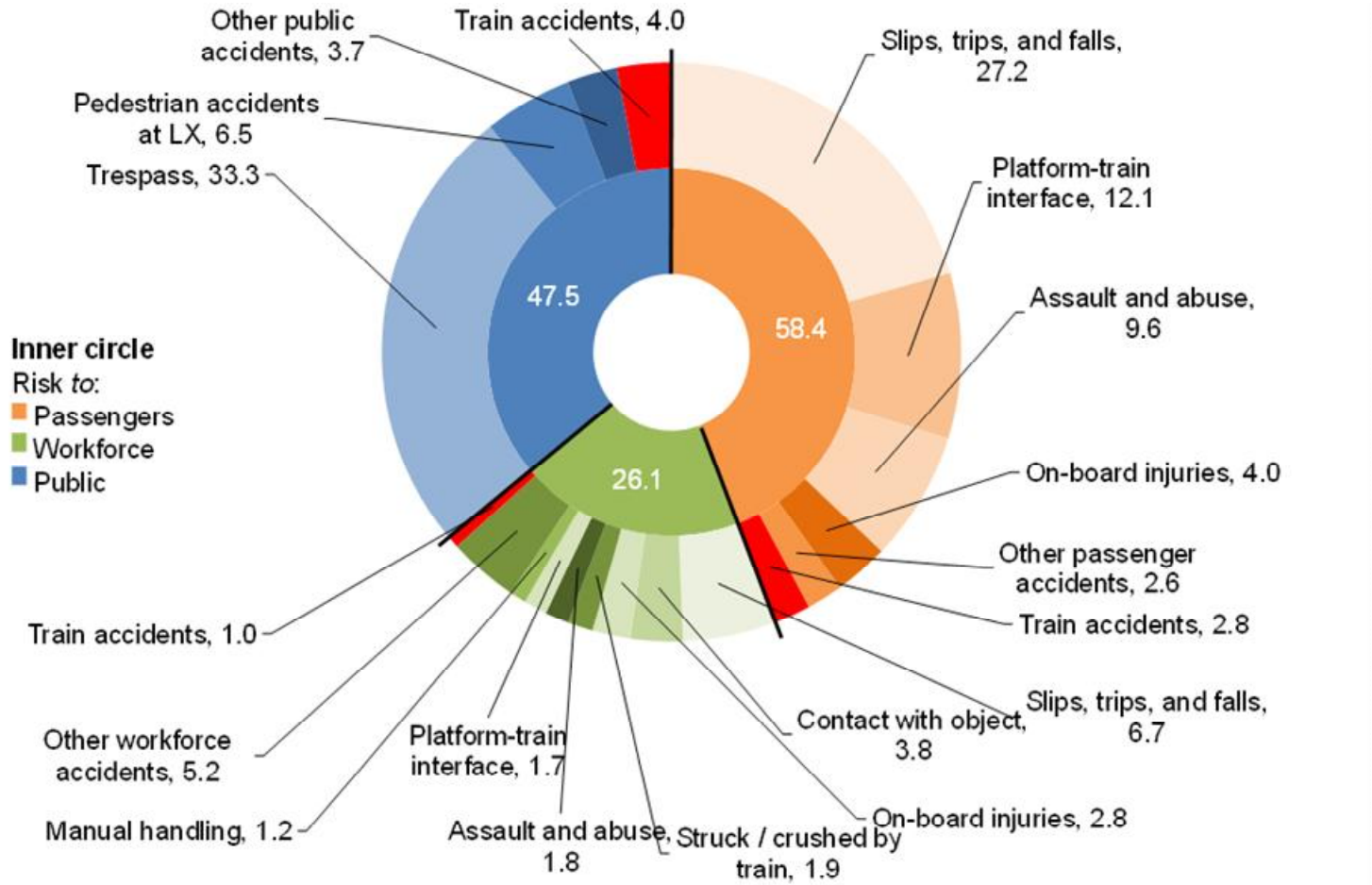


Safety Risk Model Outputs

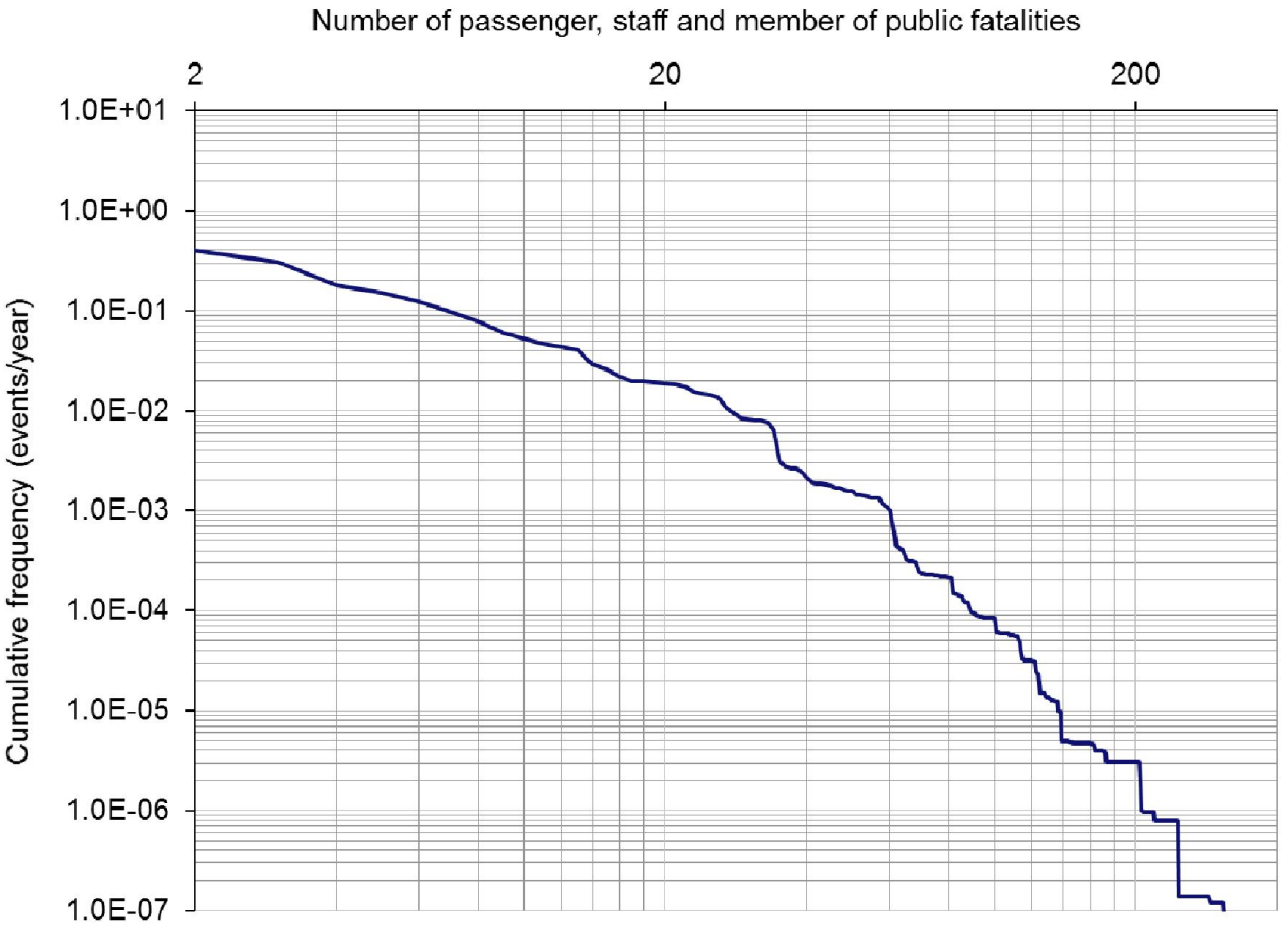
How is the Safety Risk Model used?

- To improve understanding of risk at the national level
  - The Risk Profile Bulletin provides a summary of the risk
- To generate company risk profiles
  - The Risk Profiling Tool allows companies to scale risk to their operations
- As the basis for quantified risk assessments
- To calibrate other industry risk models

Safety Risk Model breakdown by person type

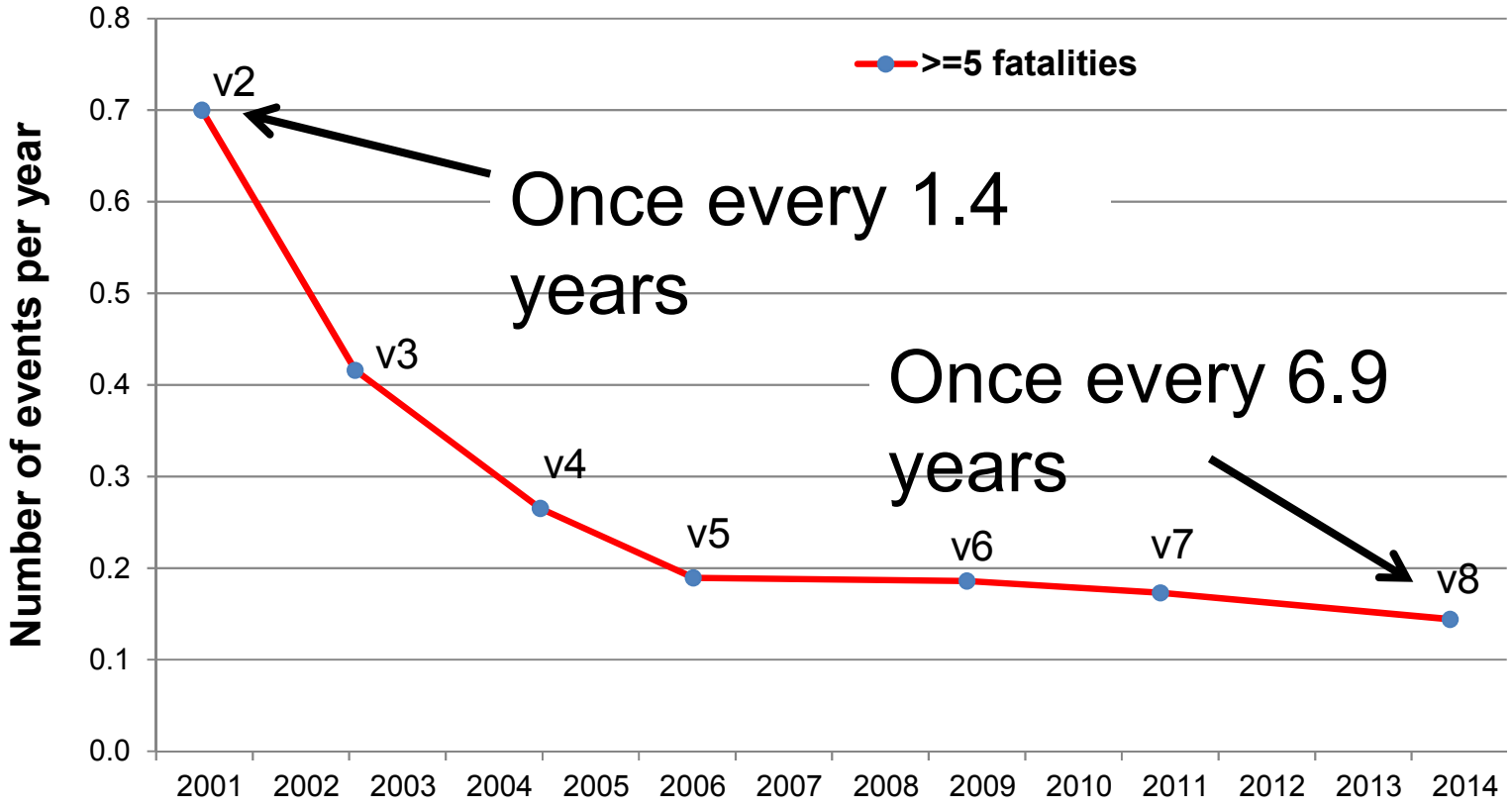


FN Curve

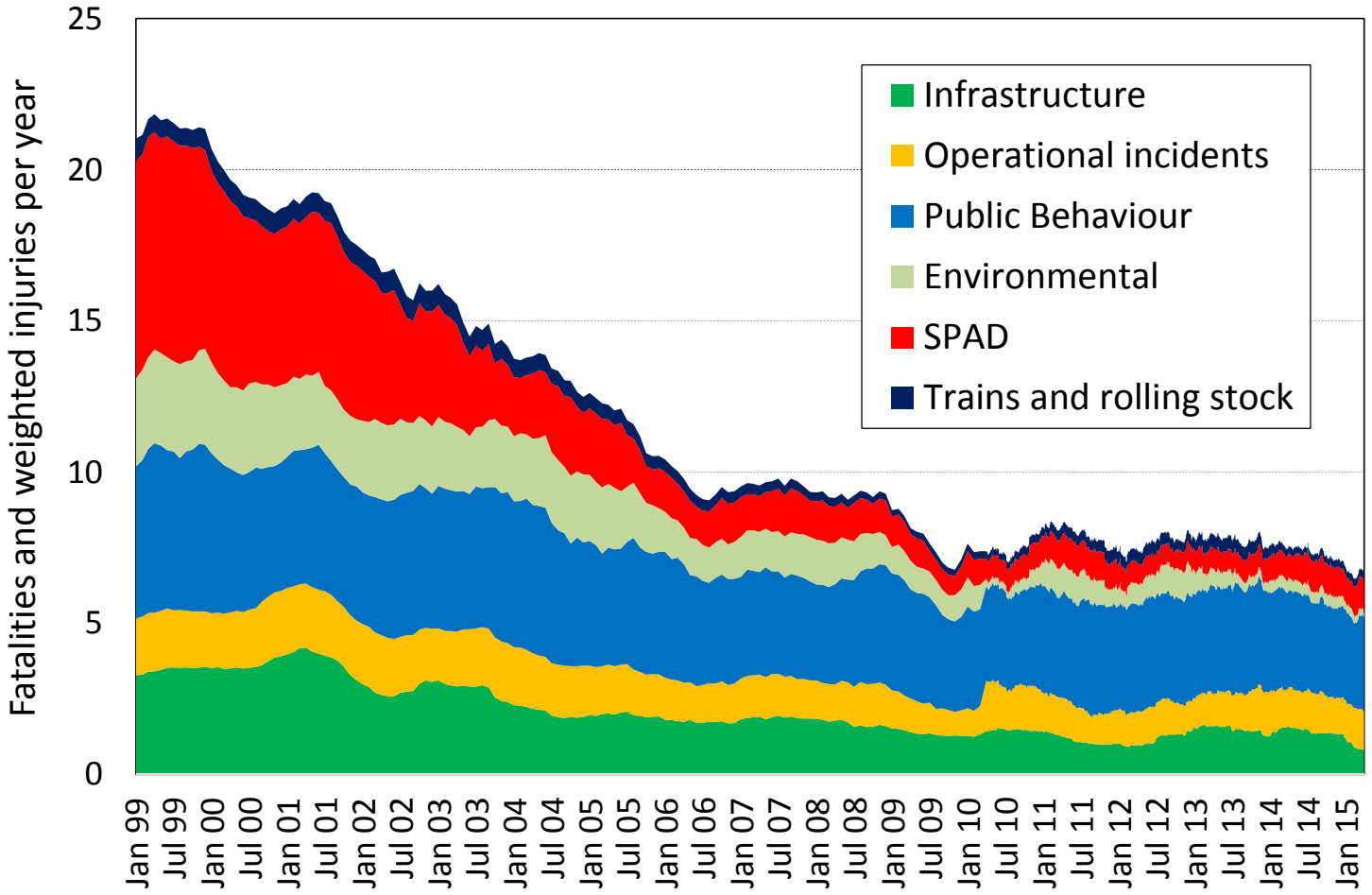

Number of passenger, staff and member of public fatalities
2
20
200
1.0E+01
1.0E+00
1.0E-01
1.0E-02
1.0E-03
1.0E-04
1.0E-05
1.0E-06
1.0E-07
Cumulative frequency (events/year)

FN Curve

Risk reduced but remains finite



Precursor risk: train accidents



Source: Precursor Indicator Model, RSSB

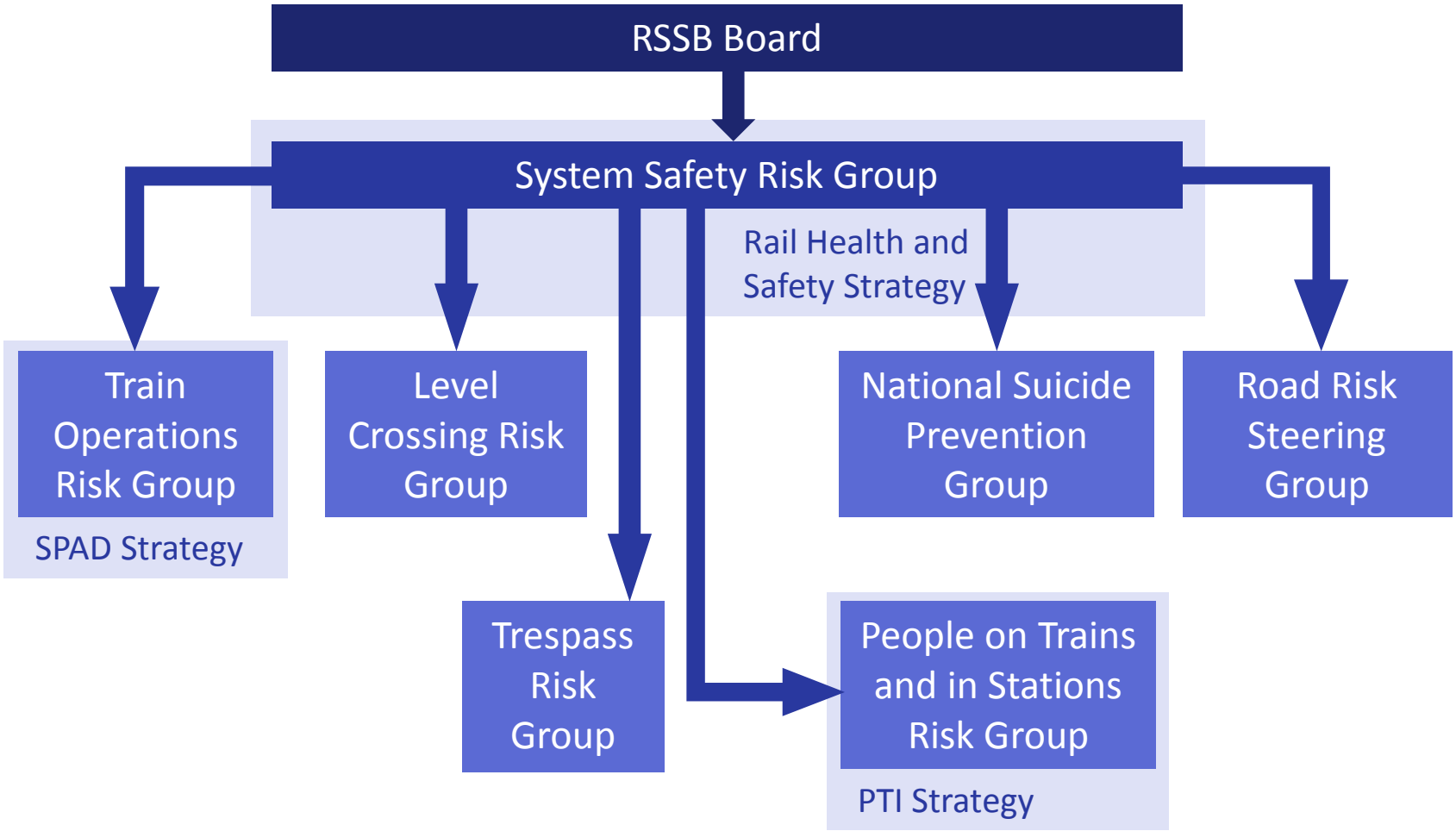
Collaboration

Collaboration

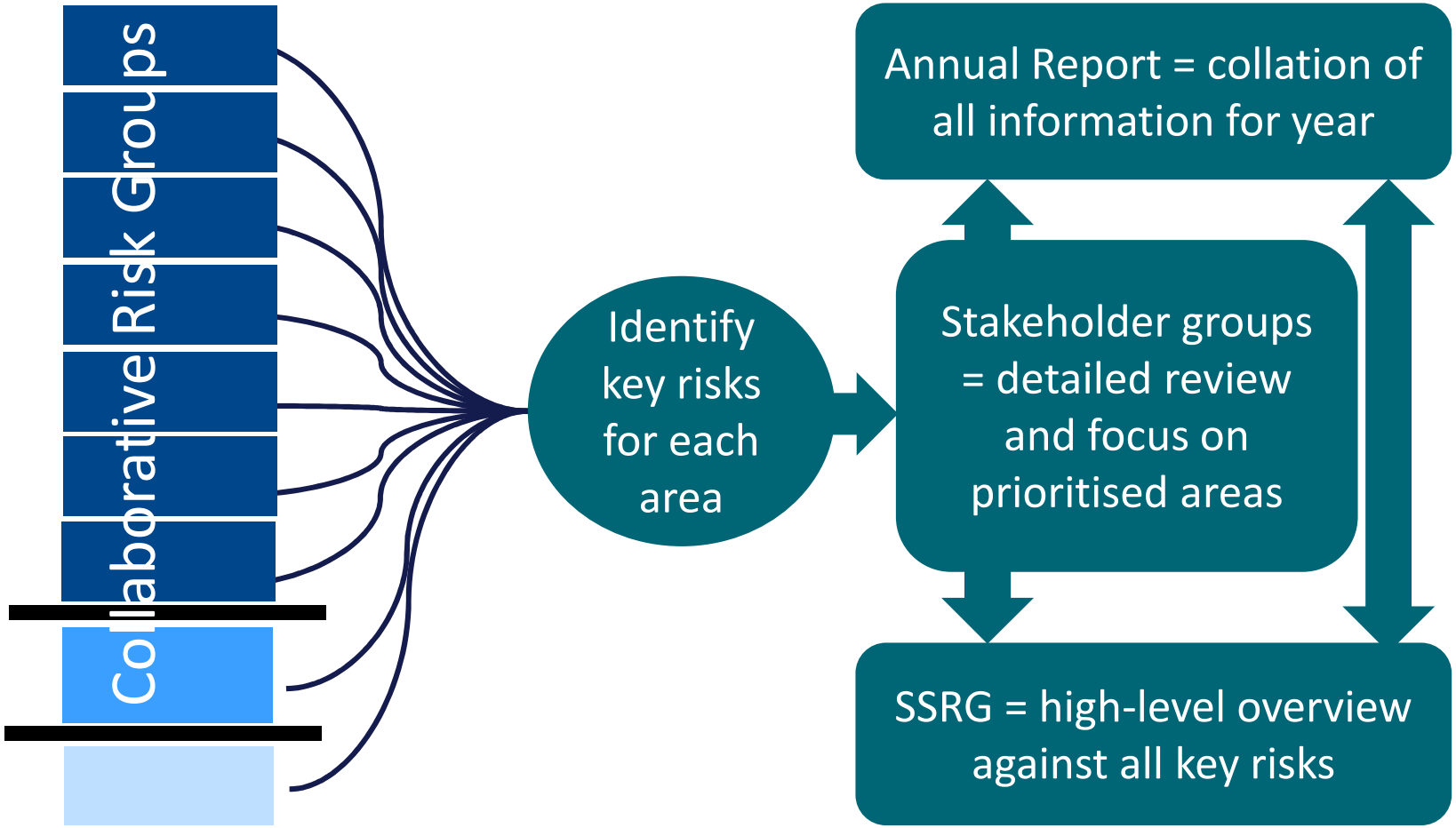
IM and RU activities have to be integrated, they deliver their safety responsibilities more efficiently and effectively through collaboration in certain areas, for example:

- Having common elements to their safety management systems
- Having common reporting systems
- Using common safety methods, techniques and tools
- Having common standards
- Meeting together to identify needs and opportunities
- Sharing learning from operational experience
- Developing a strategic approach to improving the safety of the railway

Industry groups focussing on key risk areas



Efficiency and coherence



Summary

- Railways are complex with multiple interfaces requiring IMs and RUs to cooperate and collaborate to manage safety
- Consistency in decision making is vital – Taking Safe Decisions
- Robust risk assessments inform the decision making process
- A cross-industry collaborative approach to safety management should improve efficiency and effectiveness
- However - managing risk remains the responsibility of the duty holders ie the IMs and RUs