



What is it?

The Common Safety Method for Risk Evaluation and Assessment defines three risk acceptance principles, which can be used, either individually or in combination, to demonstrate that the risk arising from identified hazards has been controlled to an acceptable level.

Explicit risk estimation tends to be the most time consuming and resource intensive of the risk acceptance principles to apply. It requires a more bespoke approach, based on qualitative or quantitative analysis. When explicit risk estimation is applied the risk acceptance criterion that is generally used in GB is to ensure safety so far as is reasonably practicable (SFAIRP), as defined in general legislation.



In a quantified cost benefit analysis (CBA), the different elements – which might include financial costs, performance and safety – need to be expressed in the same units and it is usually most convenient to use a financial measure. The rail industry converts safety consequences to an equivalent monetary value using the Value of Preventing a Fatality, which is published by the Department for Transport and updated annually by RSSB.

Why is it important?

A quantitative approach using formal cost benefit analysis can be useful when a decision cannot be based on good practice or qualitative reasoning. This is often the case for decisions where there is technical or operational complexity, uncertainty in risks, and probably trade-offs of risk and cost associated with the various options being considered.

What we do

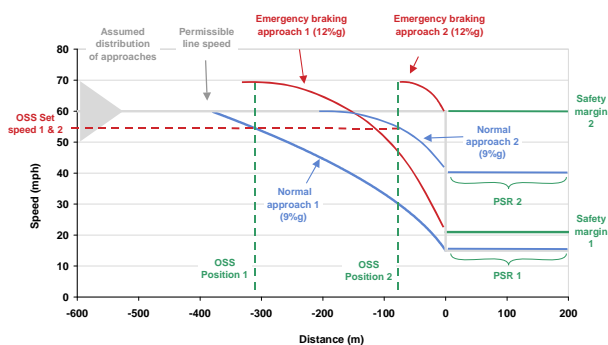
- 1 Conduct workshops to arrive at consensus understanding of technical complexity and options
- 2 Prepare risk profile, Create Fault Trees/Event Trees, undertake Probabilistic Safety Analysis
- 3 Rail System risk modelling
- 4 Prepare SFAIRP argument supported by cost benefit analysis
- 5 Communicate decision making intelligence to stakeholders

Our work

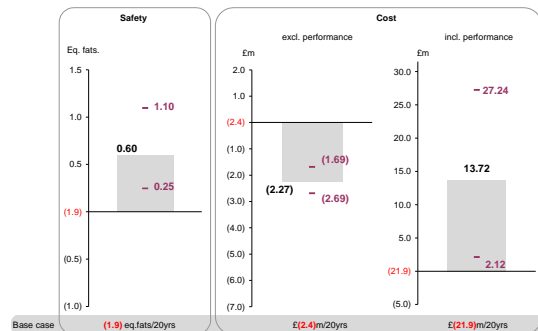
CRA has a wealth of experience in conducting quantitative risk analyses. Some examples are:

- Prepared and submitted request for exemption from the UK Rail Safety Regulations: 1999 to allow removal of Train Protection Warning System from Permanent Speed Restrictions where it provides no material safety benefit. Fully quantified risk assessment and complex cost benefit underpinning robust safety argument. Exemption granted by the Office of the Rail Regulator;

Design assumptions related to the fitment of TPWS to two example speed restrictions

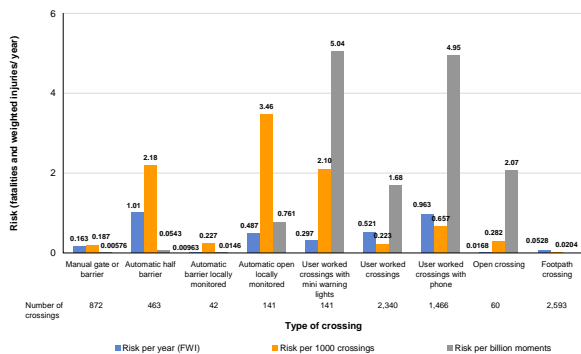


Cost benefit of proposed strategy

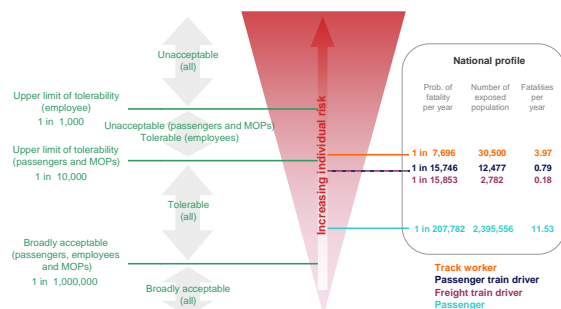


- Delivered SFAIRP review of worksite protection and conducted quantified cost benefit analysis of improvement options. Position on reasonable practicability of improvement options was accepted, the options were implemented and delivered real safety improvement;
- Maintained and developed the GB Safety Risk Model versions 3, 4 and 5 and created the associated Risk Profile Bulletins;

Risk profile for collisions between trains and road vehicles at level crossings



Individual Risk



- Created and refined many of the fault and event trees that underpin the Safety Risk Model for the GB rail industry;
- Designed and implemented both the GB Safety Risk Model Templates and the On-Track Plant Risk Assessment Tool, enabling industry members to create their own defensible risk profiles, benchmark themselves across the industry, and create valuable inputs into their own safety related decision making.