Welcome to this e-learning course on

Standard for safety risk assessment on the strategic road network (GD04/12)

Click the Forward button to continue.
Course objective

Introduction

Course topics:
1. Aims and objectives of GD04/12
2. Duty of care
3. Collective risk versus individual risk
4. Reasonably required
5. The safety risk management process
6. Safety risk decision making

Summary

Links

Glossary

Contacts
The objective of this e-learning course is to:

- Remind you about the main content of document GD04/12
- Indicate what the HA wants to realise through more widespread application of the standard
- Discuss the HA's Duty of Care for safety risk management
- Remind you about the level of quantitative safety risk data that the Highways Agency has available through the Safety Risk Model
Topic 1
Aims and objectives of GD04/12
GD 04/12 was published on 28 November 2012

This Standard sets the approach which must be applied in all administrative and technical aspects when designing, operating and constructing for the strategic road network, where safety should be a consideration. It updates, and clarifies, requirements and guidance for addressing safety risks.

This includes planning, preparing, designing and constructing highway works, maintenance, demolition and improvements, projects and schemes, and when revising Agency technical standards, specifications and requirements.

This Standard sets the PA requirements for managing safety and as such it does not provide legal advice or guidance. This document only applies to England's Strategic Road Network.
GD 04/12 has two main sections

1. Introduction and Use of this Document
2. Defining the People at Risk
3. Duties and Responsibilities
4. General Principles

A specific safety risk decision making framework for safety risk assessment:

5. Principles of Safety Risk Assessment and Control
6. Technical Requirements
7. Roles, Responsibilities and Competence
8. Glossary, abbreviations
Chapter 1 of the standard sets out key requirements, of particular importance are sections 1.7, 1.11 and 1.13.

*1.7* A key requirement of this standard is that appropriate safety risk assessment, evaluation and management is undertaken to inform all activities, projects and decisions. This includes ensuring that the safety risk impacts for different populations that the Agency has a responsibility for, along with their safety risk exposure and safety risk tolerance, are taken into account. It also requires that documentation is kept which evidences the decision making process.

- appropriate safety risk assessment, one size does not fit all
- safety risk impacts for different populations: you have to consider all those that may be affected
- documentation is kept which evidences the decision making process: provides an audit trail
Chapter 1 of the standard sets out key requirements, of particular importance are sections 1.7, 1.11 and 1.12 (contd)

"1.11 Sections of this document containing mandatory requirements are identified by highlighted boxes. These requirements are mandatory and no departures from this standard will be accepted. Appropriate safety risk assessment, evaluation and management must be undertaken so that a decision can be made on the basis of what is reasonably required. In circumstances where reliable data is limited or not available the principles of the standard must still be applied, in those instances the professional judgment of a competent person will be required. The text outside boxes contains advice and explanation, which is commented to users for consideration."

Applying the principles contained within the 'black boxes' in the standard is mandatory. Competence is discussed in chapters six and seven of the standard.
Chapter 1 of the standard sets out key requirements, of particular importance are sections 1.7, 1.11 and 1.13 (contd)

1.7 Application of this standard will ensure that safety risk and investment decisions affecting the SRN are made:

- Consistently so that similar decisions, made by different people at different times, in different locations result in comparable outputs.
- Aligned so that full account is taken of Agency targets, objectives, duties, responsibilities and policies.
- Robustly so that decisions are demonstrable by evidence or expert advice and are acceptable.
- Value so that decisions made represent value for money (VFM).
- Transparency so it is clear why and how a particular decision was taken.

Documenting all decisions provides an auditable trail for every interested party including HSE, National Audit Office and our own Audit & Assurance, it ensures that any reviewer is able to understand how, why, when and in what context decisions were made.
If you are faced with a problem or issue and you are not sure how GD04/12 applies to it, consider the following mnemonic:

**SENSE**

**CHECK**

**ANALYSE**

**LOGICALLY**

**EVERY**

**SITUATION**

Do not let unconscious bias or emotion guide your thinking. Evidence-led decision making is the key.
Topic 2
Duty of care
There are three groups of people that the HA has a ‘duty of care’ to:

**People directly employed** by the Agency and who work on the SRN, e.g. Traffic Officers.

People in a contractual relationship with the Agency, including Agency National Vehicle Recovery Contract operatives, all workers engaged in traffic management activities and incident support services, and any other activities where the traffic is present, (such as personnel carrying out survey and inspection work).

**Other parties (on the SRN)**, including road users, the police and emergency services and non-motorised users such as equestrians, cyclists and pedestrians, as well as those otherwise not in a contractual relationship with the Agency, e.g. privately contracted vehicles recovery and vehicle repair providers.

**Third parties** includes any person or persons who could be affected by the SRN, but who are neither using it, nor working on it, i.e. living or working adjacent to the SRN, using other (non-Agency) transport networks that intersect with the SRN (e.g. local roads, railways) and those who are living or working in properties owned by the Agency.

1. **Road workers**
2. **Road users**
3. **Other (third) parties**
The Highways Agency’s ‘duty of care’

- The Highways Agency has specific legal duties and responsibilities.
- These duties and responsibilities differ according to which group is being considered and under what circumstances:
  - As an employer, the HA has regulatory obligations.
  - As a Highway Authority, it has statutory obligations.
- This requires a balanced approach to account for all these demands.
- The safety risk decision-making framework described in this standard will support demonstrable compliance with these duties and responsibilities.

Understanding the different obligations that apply to whom and when is key to striking the right balance.
Statutory versus regulatory obligations

What is the difference between statutory and regulatory obligations?

- Regulation is developed normally by the legal office of the relevant government department given power through statute.
- Regulatory requirements are mandatory, and are objective.
- The HA has regulatory obligations as an employer.
- Statute defines the law as well as the powers and responsibilities of those agencies charged with enforcing the Statute.
- Statutory obligations can be interpreted / subjective.
- The HA has statutory obligations as a Highway Authority.

For Acts of Parliament without provision for delegated legislation, or regulations, the main source of interpretation is through judicial decisions made in individual cases on the application of the law.
Under normal operational circumstances, the basis for the 'duty of care' to each group is based on the following obligations:

- **Road workers**: Safety governed by employer responsibility under H&S legislation (e.g., HSWA etc). 74.

- **Road users**: Safety governed by statute (apart from road works), e.g., The Highways Act 1980.

- **Other parties**: Safety governed by statute (apart from road works), e.g., The Highways Act 1980.

**Regulatory obligation**

**Statutory obligation**
When the Highways Agency has an extended undertaking on the strategic road network (e.g. road works), then the regulatory obligations extend beyond road workers to include road users and other parties.

ROAD WORKERS

Safety governed by employer responsibility under H&S legislation (HSWA etc 74)

In the case where the HA is undertaking an activity on the SBIN, then there is an enhanced regulatory Duty of Care to road users and other parties.

Road users

Safety governed by membership of a professional body

Other parties

Safety governed by reference to the ROH

When the Highways Agency returns the highway to normal operations, the obligations revert to regulatory for employees and statutory for road users and other parties.
To complete topic 2 please answer the following questions.

**Question 1**

How many groups of people does the HA have a 'Duty of Care' to?

Select one option for each question and click the submit button.

- a) 1
- b) 2
- c) 3

Correct: Click anywhere to continue
Question 2

Regulatory vs Statutory obligations

Under normal operations, for which of the following groups does the HA have a regulatory obligation?

Select one option for each question and click the submit button.

- a) Road workers
- b) Road users
- c) Other (third) parties

Correct - Click anywhere to continue

Clear  Back  Submit
Question 3

Regulatory vs Statutory obligations

Under which of these circumstances does the HA have a regulatory obligation to road users and other (third) parties?

Select one option for each question and click the submit button

- a) All the time
- b) Never
- c) When the HA is maintaining the road

Correct - Click anywhere to continue

Clear  Back  Submit
Topic 3

Collective risk versus individual risk
Collective risk versus individual risk

We routinely measure collective risk:

- e.g. annual number of fatalities on GB roads
- Individual risk takes into account some level of exposure to the risk:
- e.g. annual number of fatalities per billion vehicle-kilometres on motorways
- Can be converted to individual risk if we know average vehicle-kilometres driven by typical road users
- We need to convert to individual risk because the HAs regulatory obligations with respect to safety risk are expressed in terms of individual risk for certain groups of people on the SRN.

When you are being presented with any safety risk metric or statistic, always assess it with a critical eye and be cognizant of the fact that it needs to be appropriate to the question in hand.
Risk Metrics

The following examples show how the same metric can be determined in different ways, and will result in different values.

- Collective risk: What is the right population?
  - Total population OR Registered licence holders?
- Individual risk: How to normalise?
  - Vehicle kilometres driven OR Number of vehicle journeys?

**Individual**

The safety risk to an individual person is used to represent the risk of all those named the risk, and a specified outcome.

- The risk measure is the probability of a typical worker being killed or injured during a year whilst undertaking a particular activity.

**Collective**

This is the safety risk, for a group of people or a population, associated with a particular scenario, control measure or hazardous event.

- Quantified as the average number of fatalities, or fatalities and weighted injuries, per year that would be expected to occur.
To complete topic 3 please answer the following questions:

**Question 1**

Which of the following is an individual risk metric?

- Number of fatalities on Dual 'A' roads in 2012
- Number of serious injuries per billion vehicle miles
- Number of road worker fatalities per 1,000 workers per year

Select one option for each question and click the submit button.
Question 2

Why do we need to distinguish between ‘collective risk’ and ‘individual risk’?

Select one option for each question and click the submit button.

- a) The DfT requires this information
- b) Our regulatory obligations are expressed in individual risk terms
- c) So we can set safety risk targets

Clear  Back  Submit
Topic 4
Reasonably required
Getting the right balance

When considering safety risk control measures, the balance of benefits and safety risks needs to be considered.

Also, may need to test if the proposed safety risk controls are 'reasonably required'.

In applying the principles of GD04/12 the term reasonably required encompasses reasonable practicability for coal workers and in other circumstances where ALARP applies.
4. Reasonably required

'Reasonably required'?

- The tests for whether a safety risk control is 'reasonably required' are effectively the same as those for 'reasonable practicability'.

- The latter term is not used in GD04/12 to avoid confusion with the HSE's Tolerability of Risk framework where safety risks should be managed to be 'As Low As Reasonably Practicable (ALARP)'. Because under normal operations, this does not apply to the IIA's responsibilities for road users.

As discussed earlier this only when the IIA has an undertaking on the SRN (e.g. road works), that the regulatory obligations extend beyond road workers to include road users and other parties.
Defining “Reasonably Practicable”

Edwards vs National Coal Board (1949)

This was an important case in English case law. It revolved around whether it was “reasonably practicable” to prevent even the smallest possibility of a rock fall in a coal mine.

Mr Edwards died in an accident after the supporting structure for the mine roadway gave way. The National Coal Board argued that it was too expensive to shore up every roadway in all of the mines.

The case turned when it was determined that not all of the roadways needed shoring up; just the ones that required it.

This established the need to carry out a risk assessment to establish the cost, time and trouble to mitigate a risk associated with the risk and the severity of any harm it might cause.

Lord Justice Asquith stated in his judgement:

“Reasonably practicable” is narrower than “physically possible” and means to me to imply that a computation must be made by the owner in which the quantum of risk is placed in one scale and the sacrifice involved in the measures necessary for averting the risk (whether in money time or trouble) is placed in the other; and that if it be shown that there is a great disproportion between them - the risk being insignificant in relation to the sacrifice - the defendants discharge the onus on them.

This judgement has been tested subsequently but the Court of Appeal have supported it and declared that:

“Reasonably practicable” is a more narrowly defined phrase than “physically possible.” This allows for the creation of equations that mitigate the risk present in a given situation against the reasonable practicability of mitigating that risk.
Defining “Reasonably Required”

As defined in the Highways Act 1980 a Highway Authority has a statutory duty to maintain the highway. Under Section 44 of the Highways Act 1980, it may be exposed to the possibility of actions for breach of statutory duty if it fails to maintain a highway.

Any policy of regular inspections and subsequent actions to repair any defects identified should be designed to meet that duty.

Regular inspection / recording / retrieval system and the consequent actions provide both a formal record of the condition of the highway and the defence for the Highway Authority under Section 51 of the Highways Act 1980. The recording of inspections & investigations made following notification of a possible hazard by members of the public, the Police etc. or on the receipt of a Third Party Claim is essential in establishing a comprehensive defence.

In order to provide a defence against a claim there must be written standards of maintenance, strictly followed which are in accordance with nationally accepted criteria. The Highway Authority needs to show that it has effective policies and that they were adhered to.
Defining “Reasonably Required” (cont’d)

Section 56 of the Highways Act (1980) provides for a “special defence in action against a highway authority for damages for non-reci pale infliction”:

1. In an action against a highway authority in respect of damage resulting from their failure to maintain a highway maintained at the public expense in a condition which renders it a deficiency (whether subject to any other deficiency or the application of the law relating to contributory negligence), to prove that the authority had taken care as in all the circumstances of the manner in which the highway was maintained for generally dangerous to traffic.

2. For the purposes of the defence under subsection (1) above, the court shall in particular have regard to the following matter:
   a. the character of the highway, and the traffic which would reasonably be expected to use it;
   b. the standard of maintenance appropriate for a highway of that character and used by such traffic;
   c. the state of repair in which a reasonable person would reasonably be expected to find the highway;
   d. whether the highway authority knew, or could have reasonably been expected to know, that the condition of the part of the highway to which the action relates, was likely to cause danger to users of the highway;
   e. whether the highway authority could not reasonably have been expected to repair that part of the highway before the cause of action arose, but whether such notice of its condition had been displayed;

   but for the purposes of such a defence it is not relevant to prove that the highway authority had arranged for a competent person to carry out or supervise the maintenance of the part of the highway to which the action relates unless it is also proved that the authority had given him proper instructions with regard to the maintenance of the highway and that he had carried out the instructions
Defining “Reasonably Required” (cont’d)

Defence under Section 39 of the Highways Act (1991) requires the Highway Authority to demonstrate that it has a robust, risk-based approach to managing road condition.

- A National Code of Practice (COP) exists:
  - COP is non-mandatory, but Section 58 defences have fallen down when a Highway Authority has failed to justify why it has adopted practices that differ from COP recommendations (e.g. Wilkinson vs. City of York Council, [2011] ENCA Ckr 267)

As with any legal challenge there are no guarantees but, if a Section 58 defence is not to fall down it will require that the justification for a decision is fully documented, and demonstrates that it was evidence led and reasonably required.
'Reasonably required considerations'

- Safety risk benefits (or penalties) associated with the issue under consideration?
- How long is the anticipated change from current safety risk levels?
- For which road populations are there changes in safety risk levels?
- Are any residual safety risk levels within relevant safety risk criteria?
- Whole life cycle costs of the proposed intervention?
- Benefit cost ratios (BCRs) of the proposed safety risk intervention
  + Must be > 1.0
  + Preferable schemes with largest BCRs
- Overall budgets
  + Programme level + regional level
Benefit-cost analysis - Notes (1)

- Where the data supports it, safety risk benefits should be quantified and monetised using appropriate methods, e.g.
  - Fatalities and Weighted Injuries (FWI)
  - Cost of Preventing a Fatally (CPF)
  - Cost of Personal Injury Accidents (PIA)
- Benefits and costs should be quantified over the relevant period and monetary values discounted to present values
- The RCP threshold for funding will go up or down with increases or decreases in annual budgets
  - i.e. just because all schemes with a RCP > X were progressed five years ago, it does not mean that all schemes with a RCP > X are reasonably required this year.
Benefit-cost analysis - Notes (2)

BCRs are helpful 'rules of thumb' as they can be used to demonstrate consistency in approach.

However, this does not mean that this is the only approach:

- Where data is sparse, or highly uncertain, expert engineering or specialist technical knowledge can be used.
- In this case, the critical thing is that the approach is documented, the skills and competences of those involved in taking any decision in demonstration, any source data or research, any assumptions made and the safety-related decision are all recorded.

A fully evidenced and documented decision will provide a robust basis for any reply should the decision ever be challenged.
Relationship to Highways Agency value management

- GD04/12 prescribes the approach to be used to support safety risk related decision making
- The vast majority of schemes on the network at present are to relieve congestion or improve journey time reliability
- As a result, there may be schemes which do not pass the value management tests on safety grounds (on the basis of the GD04/12 approach, but which will still be approved for other business reasons
- There are different VM processes for LMMs, cells and major projects. The intention is that safety risks will be assessed on the same basis (using the GD04/12 approach) going forward
- Alignment of the HAs’s processes for assessing and valuing safety risk will take time. Publication of GD04/12 is the first step in this direction
- Both LMM and VM processes are being reviewed.
To complete topic 4 please answer the following questions:

**Question 1**

Benefit-cost analysis – Nokes (1)

Which section of the Highways Act 1980 provides for a special defence to actions for damage caused by non-repair of the highway?

Select one option for each question and click the submit button.

- a) Section 41
- b) Section 58

Clear  Back  Submit
Question 2

Benefit cost analysis - Abilities [1]

Which of the following are legitimate tests for 'reasonably required'?

Select one option for each question and click the 'Submit' button.

- a) This solution was used on a similar scheme on the M5 three years ago
- b) All schemes with safety risk benefits > 2.5 were funded last year so we should apply the same threshold
- c) If it can be done then we should do it
- d) All of the above
- e) None
Topic 5
The safety risk management process
5. The safety risk management process

The safety risk decision making framework

- GD04/12 describes a safety risk management process which, if followed when making a safety risk related decision, will pretty much guarantee that the requirements of GD04/12 are being met.

- The process has not been invented specifically for GD04/12; it builds on good practice already being used elsewhere within the Highways Agency.

- In particular, it builds on the approach developed for the project safety risk work instructions (see AN 130/11) which came out of the work undertaken in support of the M25 Active Traffic Management pilot study.

- The following slide step through this process and provides key pointers as to what is expected at each stage in the process.
5. The safety risk management process

Safety risk management process

1. Determine the scope
2. Identify the hazards
3. Identify relevant criteria for population
4. Consider existing risk exposure for each population
5. Risk analysis, assessment and evaluation
6. Risk control decisions
7. Document safety risk decision in a safety report
8. Handover of safety risk report to operators
9. Update and refresh the safety risk report when change proposed
10. Monitor and review safety risk report assumptions
3. The safety risk management process

Safety risk management process - key principles

1. Determine the scope
   - Clearly articulated (geographical location or boundaries of decision)
   - Being absolutely clear at the onset about the nature of the problem being assessed and the limits of what will be included in the assessment is always one well spent. This will minimise effort later addressing "I have you considered X?" type questions.

2. Identify the hazards
   - Comprehensive identification, all modes of operation, using appropriate methods
   - The HA has a plethora of tools available to inform this stage in the process. These include the Hazard Log for managed motorways and the Safety Risk Model

3. Identify relevant criteria for population
   - All populations, Agency's risk tolerances
   - This is addressed in more detail the following slides.
Establishing safety risk criteria

The HSE are charged with ensuring that employing organisations comply with the requirements of the 'Health and Safety at Work etc. Act 1974'.

The regulatory stagnation on all employing organisations is that, within certain constraints, they should manage the safety risks to employees and members of the public affected by their undertakings to be 'As Low As Reasonably Practicable'.

The following slide presents the HSE's 'Tolerability of Risk' framework which is used by HSE inspectors to guide their workplace inspection and assessment activities.

The HSE 'Tolerability of Risk' framework does not affect the Agency's 'Aiming for Zero' policy which aims to achieve a higher standard of safety than the legislation requires.
Health & Safety Executive’s ‘Tolerability of Risk’ framework

1 in 1,000 per annum for workers
1 in 10,000 per annum for the public
who have a risk imposed on them
‘in the wider interest of society’

Unacceptable

Thresholds based on individual risk of death

Tolerable (ALARP)

Broadly acceptable

Note: the rationale for different upper limits of tolerability for workers and the public is that workers enjoy a benefit associated with being employed and so should tolerate a higher risk than members of the public who get no benefit from the undertakings of the employing organisation.

1 in 1,000,000 per annum for both workers and the public

If HSE judge that the risks to employees or the public are in free argues, they will show you down at a minimum and will likely prosecute you.

If HSE judge that the risks to employees or the public are in free argues, they will show you down at a minimum and will likely prosecute you.

Judgement weighing risk reduction vs. practicability
Establishing safety risk criteria

The framework in the previous slide describes the regulatory obligations for road workers.

There is no equivalent for road users.

In the absence of any regulatory framework for road users, the HA has adopted a framework that is developed along similar principles – but informed by historical experience.

This is shown in the following slides.

The first of the two slides provides a combined view of the HSE tolerability of risk framework and the HA’s adopted tolerability of risk framework for road users.

The second shows a summary of the data, taken from Transport Statistics Great Britain, used to determine the limits of tolerability for the adopted framework.
3. The safety risk management process

Establishing safety risk criteria (cont'd)

- 'Road workers': Less than 1 in 1,000
- 'Road Users': Less than 1 in 10,000
- 'Unacceptable': Greater than 1 in 1,000
- 'Tolerable': Greater than 1 in 1,000,000
- 'Broadly acceptable': Greater than 1 in 1,000,000
HA adopted framework for 'Road users' estimated safety risk

- **Uncategorised**
- **Unacceptable**
- **Tolerable**

- **Road user risk of fatality**
  - 1 in 1 in 10,000
  - Rural roads: 1 in 50,000
  - Urban A roads: 1 in 100,000
  - Motorways: 1 in 300,000

- **Road user tolerability criteria**
  - 1 in 1,000,000

*Figures based on GB data from TRGD 2011"
Highways Agency safety decision making

These frameworks provide the regulatory background and context for safety risk decision making in the Highways Agency.

They do not define policy which is determined by the Secretary of State:

- the HA has determined the decision making framework, informed by this context
- they provide the context within which the HA will target its resources more effectively
- in order to realise an overall improvement in safety risk.
Safety risk management process - key principles

Consider existing risk exposure for each population:
What are the current safety risk levels?

This stage is all about getting an understanding of the safety risk baseline, your starting point. The change in safety risk associated with the intervention under consideration will be measured from this starting point.

In an ideal world, the safety risk baseline will be established from national safety risk data. However, we know from experience that because the overall safety risk levels on the SRN are good, there is usually no sufficient local data. In this case it is entirely legitimate to take the starting baseline to be the same as the national average level of safety risk for a similar type of road.

Of course, there is good local data, this should be used. In addition, the existence of good local data probably means there is a higher incidence of events in this location than the national average (i.e. a 'hot spot') and probably justifies the need for a safety risk intervention at this location.
5. The safety risk management process

National average safety risk levels

The HRA Safety Risk Model is updated annually with validated STAXEY, vehicle mileage, ARS and IRS data.

Summary graphs and tables are issued in:
- Information for managing safety on the HAnetbook - which is available from the portal on the Safety Risk & Governance team page.
- It is recommended that three year rolling average statistics are used as a minimum. This will smooth out peaks and troughs between individual years.

Regional average and road average data is also being made available in spreadsheets provided to annex the national report.
### Safety Risk Model - outputs

#### Standard Outputs

- Casualty Year
- Casualty from STATS-19 accidents (by road type and user type)
- Fatalities per year
- Severely injured per year
- Slight injuries per year
- Fatalities per vehicle mile
- Severely injured per vehicle mile
- Slight injuries per vehicle mile
- Casualties from ANPR/RSI accidents (by road type and user type)
- Fatalities per year
- Severely injured per year
- Slight injuries per year
- Fatalities per vehicle mile
- Severely injured per vehicle mile
- Slight injuries per vehicle mile
- Fatalities per 100,000 vehicle miles
- Severely injured per 100,000 vehicle miles
- Slight injuries per 100,000 vehicle miles

#### STATS-19 accidents

- Total STATS-19 accidents
- Total STATS-19 accidents by road type
- Total STATS-19 accidents by user type
- Total STATS-19 accidents by contributing factor

#### ANPR/RSI accidents

- Total ANPR/RSI accidents
- Total ANPR/RSI accidents by road type
- Total ANPR/RSI accidents by user type
- Total ANPR/RSI accidents by contributing factor

#### Safety Risk Model

Each box in this schematic describes a set of safety risk data that can be generated as output from the HAR Safety Risk Model.
The following table is an example of actual data generated by the HAd’s Safety risk model:

<table>
<thead>
<tr>
<th>Fatalities and weighted injuries per billion vehicle miles</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Collective Risk (Motorways)</strong></td>
</tr>
<tr>
<td>Car occupants</td>
</tr>
<tr>
<td>HGV occupants</td>
</tr>
<tr>
<td>LGV occupants</td>
</tr>
<tr>
<td>Bus/coach occupants</td>
</tr>
<tr>
<td>PTW riders/passengers</td>
</tr>
<tr>
<td>2007</td>
</tr>
<tr>
<td>7.9</td>
</tr>
<tr>
<td>6.9</td>
</tr>
<tr>
<td>3.9</td>
</tr>
<tr>
<td>61.8</td>
</tr>
<tr>
<td>169.0</td>
</tr>
</tbody>
</table>

The table shows how the data can change from year to year. The random nature of road accidents means that, in some cases, the risk metric can increase between one year and the next without necessarily implying an increasing problem (i.e., the variability is not statistically significant).
Safety risk management process - key principles

5. The safety risk management process

Risk analysis, assessment and evaluation
- Safety risk analysis, assessment and evaluation
  - The level of detail considered should be commensurate with the knowledge of the safety risks being considered
  - Can be qualitative, semi-quantitative or quantitative

Qualitative
- HIGH
- MEDIUM
- LOW

Qualitative techniques are good if you want to undertake a comparative or relative risk assessment between various options.
They do not answer the question: "How high is a high risk?"
Semi-quantitative (see Annex C of GD 04/12)

<table>
<thead>
<tr>
<th>Probability that harm will occur</th>
<th>Most common potential severity of harm, e.g.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1: Extremely unlikely, highly improbable, never known to occur</td>
<td>1: Minor harm, minor damage or loss of life</td>
</tr>
<tr>
<td>2: Unlikely</td>
<td>2: Moderate harm, slight injury or illness, moderate damage or loss</td>
</tr>
<tr>
<td>3: Likely</td>
<td>3: Severe harm, serious injury or illness, substantial damage or loss</td>
</tr>
<tr>
<td>4: Extremely likely</td>
<td>4: Major harm, total injury, major damage or loss</td>
</tr>
<tr>
<td>5: Almost certain, once a year</td>
<td>5: Catastrophic harm, multiple fatalities, catastrophic loss or damage</td>
</tr>
</tbody>
</table>

These are the most commonly used techniques for assessing risk. They are widely used to populate risk registers and the scores assigned to each risk are often plotted on risk matrices with red, amber, green regions used to inform management action / decision making.

These are also the most commonly abused form of risk assessment. There is good research evidence to suggest that we tend to use this approach in a conservative manner, i.e. we tend to overstate how serious the risks are. This means that the safety risk benefits associated with particular interventions are also overstated.
## Quantitative (see Safety Risk Model outputs)

### Casualties from STATS19 accidents recorded in STATS19 for 2010 network

<table>
<thead>
<tr>
<th>Casualties per year</th>
<th>Motorway</th>
<th>Dual A Road</th>
<th>Single A Road</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Car occupants</td>
<td>56</td>
<td>40</td>
<td>27</td>
<td>123</td>
</tr>
<tr>
<td>HGV occupants</td>
<td>12</td>
<td>6</td>
<td>1</td>
<td>19</td>
</tr>
<tr>
<td>LGV occupants</td>
<td>7</td>
<td>4</td>
<td>-</td>
<td>11</td>
</tr>
<tr>
<td>Bus/coach occupants</td>
<td>1</td>
<td>-</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>PTW riders/passengers</td>
<td>12</td>
<td>10</td>
<td>6</td>
<td>38</td>
</tr>
<tr>
<td>Cyclists</td>
<td>-</td>
<td>10</td>
<td>2</td>
<td>12</td>
</tr>
<tr>
<td>Pedestrians (inc. workers on foot)</td>
<td>22</td>
<td>13</td>
<td>7</td>
<td>42</td>
</tr>
<tr>
<td>Other and unknown</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>110</strong></td>
<td><strong>92</strong></td>
<td><strong>47</strong></td>
<td><strong>249</strong></td>
</tr>
</tbody>
</table>

The table shows a snapshot of the road accident safety risk data for 2010. Note: these are ‘objective risk measures’.
Safety risk management process - key principles

Risk control decisions:
- should consider a range of possible options
- selected risk controls $\rightarrow$ maximum collective benefit across all populations

In determining whether or not to implement a safety risk control, always bear the following hierarchy for addressing the hazard in mind:

1. Eliminate
2. Reduce
3. Isolate
4. Control

ERIC
3. The safety risk management process

Consider the impact on all these groups and ensure the balance is right.
5. The safety risk management process

### Key Principles

1. **Document safety risk decision in safety risk report**
   - Completeness/detail in report to be communicated with issue being considered (Type A, B, C - see next 3 slides)

2. **Handover of safety report to operators**
   - A ‘living’ document
   - Design → construct → operate → decommission

3. **Update safety report to reflect proposed changes**
   - E.g., operations, knowledge, legislation

4. **Continuously monitor and review assumptions**
   - E.g., data used in risk analysis/assessment, effectiveness of controls, tolerable levels?

---

More detailed guidance on the expectations from GD04/12 with respect to these stages can be found in IAR 13/11.
Topic 6
Safety risk decision making
Safety risk decision making

The approach to be adopted should:

- Reflect the complexity of the decision
- Consider all parties that may be affected by the decision
- Use appropriate safety risk assessment tools and techniques

The HA has been using a project typology to help guide thinking in this area (see IAN 135/11 and IAN 155/11)

Project typology refers to Type A, B, or C decisions. Guidance can be found in IHAIs 135/11 & 155/11 (which should be used in conjunction with GD04/12) as it is only outlined here.

It is intended as a guide to inform thinking about the type of project or issue being considered (i.e., Type A, B or C).

Table 3 in part 3 of GD04/12 gives characteristics of rules
Project Types

Type A
- Relatively routine, familiar, no operational implications
- Increasing levels of effort and detail in safety risk management
- Visit majority of HR decreases

Type B
- Could have significant operational implications

Type C
- Complex, unfamiliar, and major implications for the SRM

Summary
### Table 3: Characterisation

<table>
<thead>
<tr>
<th>Scheme Feature</th>
<th>Type A</th>
<th>Type B</th>
<th>Type C</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Stakeholder Interest</td>
<td>Single or few</td>
<td>Limited or None</td>
<td>Limited or None</td>
</tr>
<tr>
<td>2. Operational Experience</td>
<td>Widespread</td>
<td>Limited or None</td>
<td>None or Not significant</td>
</tr>
<tr>
<td>3. Technology</td>
<td>Widespread</td>
<td>Limited or None</td>
<td>None or Not significant</td>
</tr>
<tr>
<td>4. Standards and Legislation</td>
<td>All</td>
<td>Limited or None</td>
<td>None or Not significant</td>
</tr>
<tr>
<td>5. Impact on Organisation</td>
<td>None</td>
<td>Limited or None</td>
<td>None or Not significant</td>
</tr>
<tr>
<td>6. Project Scope</td>
<td>Single or small</td>
<td>Limited or None</td>
<td>Limited or None</td>
</tr>
</tbody>
</table>

**Overall: Type B**
Roles and responsibilities

What does all this mean to our day jobs?

- Chapter 7 of GD04/12 describes the expectations with respect to interactions between different roles and responsibilities for the various tasks that make up the safety risk management process.
- It details differences in decision making / approval responsibilities.
- For all safety risk related decisions, a RAG matrix shall be produced.

GD04/12 provides a framework for safety risk assessment which captures existing best practice and was developed to ensure appropriate safety risk assessment, evaluation and management is undertaken.
Accountability, responsibility and competence

Chapter 7 provides an example of a RACI matrix to show who is accountable for particular decision types at various stages in the general project lifecycle. It also shows WHO is or should be:

- Responsible
- Accountable
- Consulted
- Informed

The RACI in GGD4/12 is only an example and each project or scheme should have its own chart created to cover its scope.

Note: Accountability cannot be delegated for any activity, although responsibility can.

Chapter 7 also provides guidance on how safety risk management competency can be assessed.
This e-learning was designed to act as a reminder for delegates who completed the GD04/12 Standard for Safety Risk Assessment training workshops in 2013 who do not apply the standard on a very regular basis.

The principal points that it has covered are:

1. The main sections and purpose of GD04/12.
2. The road populations defined in GD04/12.
3. The Highway Agency's statutory and regulatory duties and how they impact safety risk management.
4. The safety risk decision making framework described in GD04/12.
Thank you for completing this course.

This is your score. You need to score 10% or more. If you have not achieved this mark please revisit the e-learning from the start.

You Scored: 7
Correct Questions: 7
Total Questions: 7

Congratulations, you passed the quiz!