

Highway Asset Management Quick Start Guidance Note

Risk Assessment

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1 Scope

This note is intended to assist those authorities who have not yet commenced this central aspect of asset management planning but who are familiar with the principles of managing risk and may have applied risk management techniques to other parts of their business. It does not go into detail nor does it describe how a more advanced application of risk management may be applied using either manual or automated tools.

Figure 1 gives an overview of the asset management process. This guidance note focuses on risk management (box 4) and further notes are available covering an introduction to asset management, and the technical aspects covered in boxes 2 and 3.

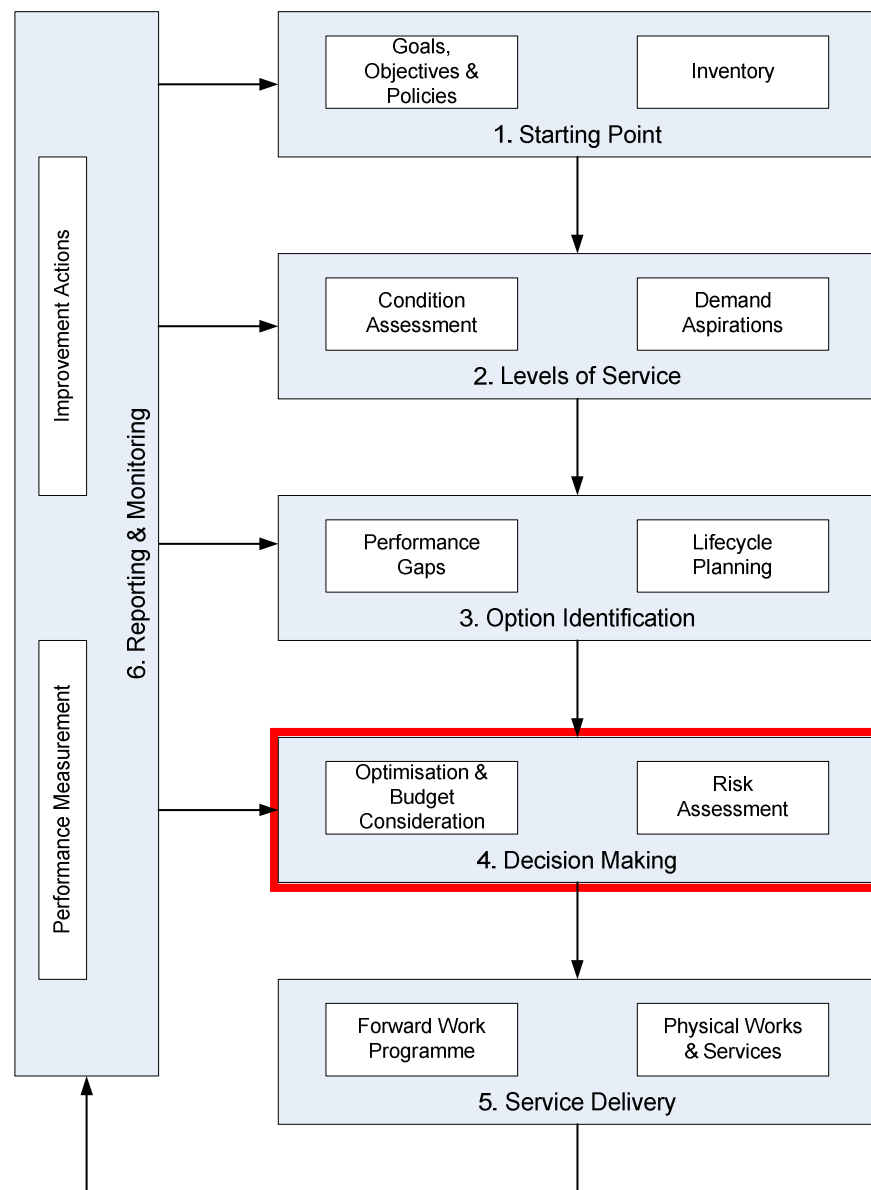


Figure 1 Overview of the Asset Management Process

2 Introduction

The evaluation of risks and the adoption of appropriate mitigation measures associated with management of the highway infrastructure is a critical element of a developed approach to asset management.

Working methods which rely on experienced individuals to make critical decisions, without leaving an appropriate audit trail, are no longer appropriate and accepted practice. An authority that cannot demonstrate the rationale behind when and why it chooses to act and when it chooses not to act, places itself in a weak position should an adverse event occur and the council has to defend its position in court.

A properly documented approach to highway risk management should form part of any council's approach to asset management and will assist Highway Managers to, for example:

- Ensure that risks are managed properly by making sound auditable judgements about the level of the risk an authority is prepared to accept through its chosen levels of mitigation.
- Manage risks at an appropriate level, for example cost of programme/project overrun, network unavailability or congestion, community concerns or environmental impact.
- Assign risk ownership at an appropriate level where chosen mitigation can best be managed.
- Demonstrate that levels of service have been established by assessing the risk associated with providing different levels of provision.
- Demonstrate the implications of reduced investment on the highway infrastructure.
- Demonstrate the case for continued or enhanced investment and the prioritisation of investment to highway infrastructure.
- Demonstrate that budget allocations appropriately take account of risk.
- Enable a defence against potential litigation.
- Provide appropriate planning and allocation of resources.

3 Existing Guidance

The CSS Framework for Highway Asset Management provides guidance on how risk management could be applied for a UK road network and defines risk identification as “the formal recognition and documenting of events that have the potential to adversely affect the delivery of the service to the customer”. The type and relative importance of different risks will vary from authority to authority. It is recommended that highway authorities carry out a risk identification exercise with an appropriate and experienced group of highway asset practitioners considering the areas detailed in the framework.

In particular table 2.4.4 of the document sets out a framework for decision making recommendations and shows where a risk management process fits in to the overall decision making process.

Decision Making Recommendations

Needs Based Funding	Establish a process for identifying the total funding
Resource Allocation Process	Establish a process of resource allocation that utilises the asset information available, and evaluate the benefit delivered for each pound invested
Explicitly evaluate and document the risk profile	Carry out a risk assessment and management exercise and document its findings
Project Evaluation Process	Establish a process for evaluating improvement projects including a review of outcomes in comparison with anticipated benefits

Well Maintained Highways provides guidance on risk management and sets out an example of a risk matrix. For further details about the process please refer to the COP.

Additional guidance is available from many other sources, a brief list of the main documents that apply to highway assets and local authority standards and examples of asset risk registers are available in the appendices.

4 Simple Steps to get Started

The following are steps which can be taken to commence risk management:

- Ensure that there are the appropriate skills within the business to commence and continue with risk management.
- Read the corporate risk strategy and determine if and how this strategy is applied at a highway asset level.
- Contact your property asset management colleagues and study their risk management process.
- Ensure that the risk management process being developed for highway asset management is compatible with both the Corporate Risk Strategy and the property asset management risk management process, for example scoring techniques and mitigation levels.
- Identify any risk registers that have already been produced for highway related assets.
- Determine whether existing risk registers relate to all asset groups within your asset management plan, are equivalent in their format and treatment of risk, are adequately owned and are appropriately reviewed.
- Carry out a risk assessment and assess the likelihood and impact of any risks not covered by existing risk registers.
- Determine how highway infrastructure risks are currently managed and check whether this is in line with any existing risk registers.
- Use risk as one of the criteria for prioritising work and investment options.
- Determine how any additional risks could be mitigated and how they should be documented and reported.
- From the above steps, create a transparent hierarchy of risks and registers to ensure that no risk is duplicated and that risks are treated consistently.
- Ensure all risks are allocated to risk owners, these are the people best placed to and responsible for managing the particular risk, for example the risk associated with substandard parapets will be owned and managed by the bridge manager.
- Ensure that the risk register is available to all relevant people, has an owner, and is a living document periodically reviewed according to the current risk profile, with high risks being reviewed more frequently.

Appendix A – References

- Well Maintained Highways Code of Practice for Highways Maintenance Management – July 2005
- Well Lit Highways Code of Practice for Highway Lighting Management – November 2004
- Code of Practice for Structures Management – September 2005
- Highway Risk and Liability Claims -
- A Practical Guide to Appendix C of “Well Maintained Highways - Code of Practice for Highway Maintenance Management”
- Chance or Choice? Risk Management and Internal Control – SOLACE (Society of Local Authority Chief Executives)
- ALARM (Association of Local Authority Risk Managers) www.alarm-uk.org
- Risk Management – Making a Difference
- Risk Management Standard
- The Possibilities for Risk Management
- Benchmarking Risk Management
- Risk Management Process Manual – Transit, New Zealand

Appendix B – Definitions

“TRANSIT - NEW ZEALAND” has produced a Risk Management Process Manual with some useful definitions below

The chance of something happening that will have an impact on objectives. It is measured in terms of a combination of the likelihood of an event and its consequence.

A systematic use of available information to determine the magnitude of the consequence of events and their likelihood, to establish the level of risk.

The environment within which risk evaluations (judgements) are made. Includes determination of activity objectives, stated or inferred obligations and stakeholder expectations and risk tolerance

Process used to determine the acceptability or otherwise of risk, by establishing and comparing the level of risk against predetermined standards, target risk levels or other criteria.

- Risk Identification

The process of determining what can happen when carrying out an activity; where, when, why and how.

- Risk Management

The cultures, processes and structures that are directed towards the effective management of potential opportunities and threats

- Risk Management Process

The systematic application of management policies, procedures and practices to the tasks of, establishing the context, identifying, analysing, evaluating, treating, monitoring and communicating risk.

- Significant Risk

Having the potential to result in substantial permanent environmental change, large cost changes, extensive programme changes, considerably modified functional performance, death/injury, legal proceedings, or generating a major impact on Transit’s image.

Appendix C – Examples from Risk Registers

Solihull Metropolitan Borough Council example.

Transport Asset Management Plan

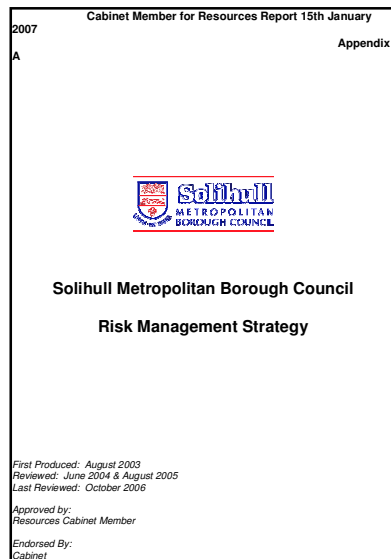
Current Risks and Mitigating Actions

<u>Risk Ref</u>	<u>Risk Title</u>	<u>Leads to</u>	<u>Gross Like</u>	<u>Gross Imp</u>	<u>Gross Risk Level</u>	<u>Action Title</u>	<u>Action Status</u>	<u>Net Like</u>	<u>Net Imp</u>	<u>Net Risk Level</u>	<u>Risk Owner</u>
TAMP4	Lack of available internal staff time/resources	Delay in production of asset plan Impact on bidding for funding	M	M	5	Asset plan time line to be set Populating data base with current assets	Planned Ongoing	L	M	3	

Newcastle City Council example.

Risk No.	Strategic or Operational	Risk	Contributory Factors	Possible Impacts	Impact Score				Total Score (S+F+D+I)	Likelihood (1-5)	Risk Rating (SxL)	Mitigation
					Safety (2-10)	Financial (1-5)	Disruption (1-5)	Image (1-5)				
		Network										
1	Operational	Road traffic accidents	Road Geometry, poor skid resistance, poor signage and/or carriageway markings,	Loss of life, serious injury, damage to adjacent property & services, environmental damage, prolonged disruption, compensation claims, cost of repairs, emergency services charges, provision of alternative route, environmental clean up, poor public image, economic loss to businesses, hardship for disadvantaged	10	5	3	5	23	3	69	Regular safety inspections & condition assessments, identification and carrying out of routine & adhoc maintenance
2	Strategic	Inability to maintain demand requirements	Increase in traffic volumes, change in traffic make up, change in traffic routes, inadequate inspection regime, inadequate preventative maintenance regime	Traffic disruption, environmental damage, cost of traffic management, alteration of bus routes, poor public image, economic loss to local businesses, hardship for disadvantaged	2	3	3	3	11	2	22	Regular monitoring of demand requirements and current usage, proactive route management, introduce measures to reduce traffic flows
3	Strategic	Change in public expectations		Insufficient budget to meet new demands / levels of service	2	4	2	3	11	2	22	Regular liaison with public, service related customer satisfaction surveys, scheme related satisfaction surveys

Appendix D – Background Information



Corporate Risk Strategy

Most authorities have documented corporate risk management strategies. Such a strategy will set out the overarching principles that the authority requires to be embedded across the organisation for the management of risk. It is typical for this strategy to be owned by the relevant Cabinet Member and the corporate management team and to have been promulgated down through the organisational structure of the organisation.

In many authorities the application of the corporate risk strategy has been organisationally focused i.e. the risks to the authority as a corporate body are identified and evaluated. The result of this approach can be that only minimal attention is paid to the assessment of the latent risks associated with the ongoing management of the highway infrastructure and the various associated resources and processes.

Many Authorities use criteria to assess whether risk likelihood and impact/severity are high, medium or low and a typical approach is detailed below as an example. It will be necessary to check that the matrix proposed for highway risk assessments is compatible with the Corporate risk matrix.

Where the likelihood and impact/severity cross on the matrix determines whether a risk is green, amber or red. For example, a risk assessed as High Likelihood and High Impact is a Red risk. A risk assessed as Medium Likelihood and Low Impact is a Green risk.

The following table shows a typical simple 3 by 3 risk matrix. While this can be a useful starting point it sometimes does not provide sufficient granularity of risk priority and a larger matrix may be considered more appropriate. Larger matrices often tend to return risks within a limited central bracket of scores; this can be combated by the use of even number grids (eg 4x4 or 6x6) which do not give the option of a 'middle answer'.

IMPACT	High	Amber	Red	Red
	Medium	Green	Amber	Red
	Low	Green	Green	Amber
		Low	Medium	High
	LIKELIHOOD			

There will probably already be measures or mitigation in place to minimise any identified risks. However, it is important to bear in mind that in the first instance, risks are assessed on the basis that there are no precautions in place or on the basis that any existing precautions are not operating effectively.

In other words we are seeking to ascertain the worst case scenario if the risk were to occur. This is known as the “gross” or pre-mitigated risk. This “gross” risk level is recorded in the Risk Assessment template.

Existing Controls

Current precautions in place to control the risk need to be recorded. Reference can be made to other documents such as manuals, instructions and other safety arrangements.

Each identified precaution / mitigating action must be allocated an Action Owner who is responsible for confirming the existence and effectiveness of the current precautions and is best placed to manage them. Such accountability helps to ensure “ownership” of the mitigating action.

The title and/or name of the Action Owner are recorded in a Risk Assessment template.

Net Risk Rating

In reality the measures or mitigation in place should help to minimise the likelihood or impact/severity of the identified risks. Therefore, the likelihood and impact/severity of the identified risks is also assessed in light of any existing precautions. In other words we are seeking to ascertain the “net” risk.

If a decision is made not to implement additional control measures, the relevant Manager must be able to show that the cost of implementing the measure is *grossly disproportionate* to the benefit of the risk reduction it would achieve.

Where a net risk has been rated as **HIGH / RED RISK** then Managers need to consider further action to reduce the risk rating as low as is possible and to at least amber. This is sometimes referred to as the ALARP principle (as low as reasonably practicable).

Similarly when an aspect of the activity is ranked as **MEDIUM / AMBER RISK** then Managers should again consider whether risks could be reduced further by other measures.

There is no need to do the above for **LOW / GREEN RISK** issues but there is still a responsibility to reduce risks to the lowest level reasonably practicable and monitor periodically.

The following table provides a summary of the responses available to Managers, depending on the seriousness of the identified net risk rating.

Net Risk	Action and Timescale
Green	No further preventive action is necessary but consideration should be given to solutions or improvements that impose no additional cost burden or detriment to asset performance. Monitoring is required to ensure controls / precautions remain effective and review annually or sooner if there are changes.
Amber	Action should be taken within 6 months to reduce the risk as low as is reasonably practicable. A consideration of costs versus effectiveness / asset performance should be considered. Where an amber risk is associated with a harmful impact/severity further risk assessment may be necessary to establish more precisely the likelihood of harm as a basis for determining the need for improved control measures.
Red	Action must be taken immediately / as soon as possible. Work should stop or not commence until adequate control measures have been implemented. While the control measures should be cost-effective or not be detrimental to asset performance, there may legally be an absolute duty to reduce the risk. This means that if it is not possible to reduce the risk, even with unlimited resources, then work must remain prohibited.

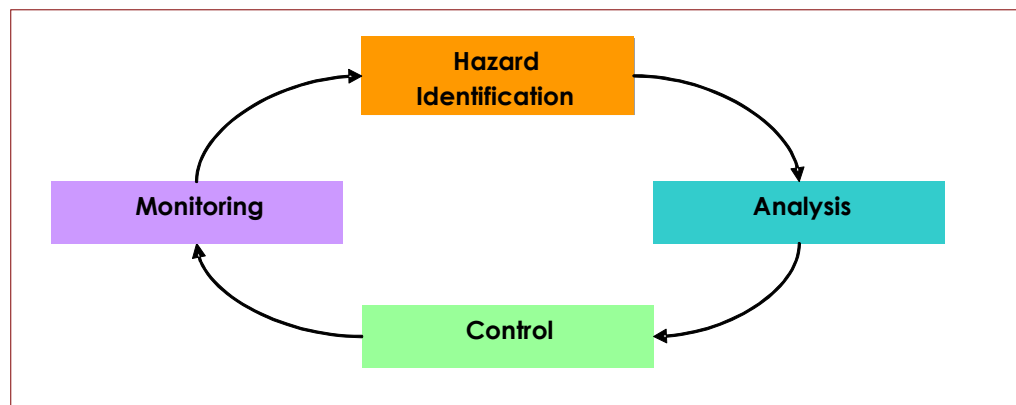
Operational Risk Management

At the other end of the spectrum it is typical for there to be a range of operational risk management practices in place, some of which are explicitly documented, for example inspection regimes and defect response times and some of which are not. There are often a myriad of individual risk assessment processes that are applied, for example individual site risk assessments. It is important that operational asset risks are managed and controlled in the same way as other activities within the whole life or 'end to end' consideration of asset management.

Determine how Corporate Strategy can be applied at an asset level

As noted above many authorities' application of risk management leads to departmental risk registers and the identification of risks to the organisation from risk of safety, loss of key staff and damage to the council's reputation.

Whilst individual approaches to risk management will vary from authority to authority they will almost all be built around the following generic steps.



Applying the Risk Management Process to the Highway Asset

Applying the principles of the strategy to the highway network requires a subtle change of focus to consider risks that exist as a result of the council's duty to manage the local road network i.e.

Risk Identification: Identifying the risks associated with the council's ownership of a road network and the duties of the council as highway authority (principally to maintain the network in a safe condition) and the risks that could prevent the council delivering an acceptable or target level of service to the road users/customers that use the network.

Risk Assessment: The overall process of risk identification, risk analysis, and risk evaluation. For the purposes of assessing highway asset risks a series of risk categories should be defined. The categories represent the area of potential impact from an adverse occurrence. They will typically include safety, availability, Financial / Economic, political, image, Corporate / Strategic and increasingly environment/sustainability.

Risk Control: Identifies what actions are applied to treat risks including mitigation treatments, do nothing and monitor, insure against etc.

Risk Monitoring: How risks are monitored, by whom and in what way, this is likely to involve establishing a risk register, ascribing each risk to a risk "owner", regular review of risk registers and treatments, and also how risks are reported, to whom, by whom, when and how often.

Create a Risk Register

Typical risk registers are shown in Appendix 3.

Risk Reduction

The CSS Framework for Highway Asset Management provides guidance how risk management enables authorities to weigh the cost of acceptance of a risk or to plan appropriate risk reduction actions. The guidance indicates actions likely to be available to reduce risk as:

- Capital or maintenance expenditure to reduce the probability of failure
- Production of contingency plans to reduce the impact of a failure
- Insure against the consequential loss
- A combination of the above

In addition, confirming the appropriate ownership of each risk can itself lead to the reduced likelihood of an event occurring. Alternatively the risk can be accepted and the consequential cost met should the event occur. However, the effort of evaluating and managing risks must be proportionate to the risk exposure.

Risk Management – escalation and reporting

The strategy should set out how risks are escalated to the appropriate level of responsibility. In some Councils, the approach is to escalate any red risks to management teams and then to the Cabinet Member along with the options to mitigate those risks. A protocol that regularly reviews high priority risks should be adopted in order to effect adequate highway asset risk management.