"[ Click here & type Council name ]"

INSERT COUNCIL LOGO

"[ Click here & type ASSET CATEGORY ]"

INFRASTRUCTURE
RISK MANAGEMENT PLAN

Insert photo of asset at risk

Version 6.0  DRAFT FOR PILOT COUNCIL REVIEW

"[ Click here & type Month and Year ]"
This Infrastructure Risk Management Plan template was prepared for the Local Government Association of South Australia by the Institute of Public Works Engineering Australia, (IPWEA), Jeff Roorda & Associates (JRA) and Skilmar Systems for the use of South Australian councils under the LGA’s Sustainable Asset Management initiative.
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1. INTRODUCTION

1.1 Aim

The purpose of this infrastructure risk management plan is to document the results and recommendations resulting from periodic identification, assessment and treatment of risks associated with providing services to the community from infrastructure, using the Australian Standard for Risk Management, AS/NZS 4360; 2004.

Risk Management is defined in AS/NZS 4360; 2004 as: “the culture, processes and structures that are directed towards realising potential opportunities whilst managing adverse effects”\(^1\).

1.2 Objectives

The objectives of the plan are:

- to identify risks to the "[Click here & type council name]" that may impact on the delivery of services from infrastructure
- to select credible risks for detailed analysis,
- to analyse and evaluate risks in accordance with AS/NZS 4360,
- to prioritise risks,
- to identify risks requiring treatment by management action,
- to develop risk treatment plans identifying the tasks required to manage the risks, the person responsible for each task, the resources required and the due completion date.

1.3 Scope

This plan considers risks to services delivery from infrastructure.

1.4 Risk Management Model

The risk management process used in this project is shown in Fig 1.4 below.

It is an analysis and problem solving technique designed to provide a logical process for the selection of treatment plans and management actions to protect the community against unacceptable risks.

The process is based on the New Zealand / Australian Standard AS/NZS 4360:2004, Risk Management.

---

\(^1\) p4
1.5.1 Establish the Context

The context is established in three stages, external, internal and risk management.

The first is the external context. This stage involves:

- identifying the relationship between the council and its environment, identifying the council’s strengths, weaknesses, opportunities and threats. The context includes the financial, operational, competitive, political (public perception/image), social, client and legal aspects of the council’s functions; and
- identifying the stakeholders.

This is to determine the crucial elements which might support or impair its ability to manage the risks associated with its operation.

The second stage is the internal context.

The purpose of this stage is to develop an understanding of the council and its capabilities, as well as its goals and objectives and the strategies that are in place to achieve them.

The final stage of context development is the risk management context. This stage includes setting the goals, objectives, strategies, scope and parameters of the services to which the risk management process is being applied, should be established. The process should be undertaken with the need to balance costs, benefits and opportunities. The resources required and records to be kept should also be required.

Setting the scope and boundaries of an application of the risk management process involves:

(a) Defining the project or activity and establishing its goals and objectives;
(b) Defining the extent of the project in time and location;
(c) Identifying any studies needed and their scope, objectives and resources required;
(d) Defining the extent and comprehensiveness of the risk management activities to be carried out.

1.5.2 Develop risk evaluation criteria

The purpose of this stage is to develop the criteria against which risk is to be evaluated. This may depend on operational, technical, financial, legal, social, humanitarian, or other criteria. This may depend on the council’s goals, objectives, and the interests of stakeholders.

1.5.3 Risk Identification

Risk identification seeks to identify the risks to be managed. A well structured systematic process is crucial, because a potential risk not identified at this stage is excluded from further analysis. All risks should be identified, whether or not they are under the control of the council.

The risks are identified in three stages:

- What can happen? The aim is to generate an comprehensive list of events which might affect each element of the City.
- How and why it can happen? It is necessary to consider possible causes and scenarios. There are many ways and event can be initiated. It is important that no significant causes are omitted.
- Are risks credible? An assessment of credibility of all risk is undertaken to ensure that credible risks receive proper and due consideration.

1.5.4 Risk Analysis

Risk is analysed by combining estimates of likelihood and consequences in the context of existing control measures. The objective of a risk analysis is to separate the minor acceptable risks from the major risks and to provide data to assist in assessment and treatment of risk.

The level of risk is determined by considering two aspects against existing controls:

- how likely it is that things may happen (likelihood, frequency of probability); and
- the possible consequences (impact or magnitude of the effect) if they do occur.

The risk analysis process is to:

- identify the existing management controls, technical systems and procedures to control risk;
- evaluate the likelihood of events occurring and their consequences in the context of these existing controls;
- combine the evaluation of likelihood and consequences to produce a level of risk.

1.5.5 Risk Evaluation

Risk evaluation involves comparing the level of risk found during the analysis process with previously established risk evaluation criteria and deciding whether the risks can be accepted.

Options should be evaluated on the basis of the extent of risk reduction and the extent of benefits or opportunities created, taking into account the criteria developed in Section 3.

In general, the adverse impact of risks should be made as low as reasonably practicable irrespective of any absolute criteria. A combination of options may give the optimum risk reduction outcome.
If the risks fall into the acceptable or low categories, they may be accepted with minimal further treatment. Acceptable or low risks should be monitored and periodically reviewed to ensure they remain acceptable.

If the risks do not fall into the acceptable or low category, they should be managed using one of the options below.

The output of risk evaluation is a prioritised list of risks for further action.

1.5.6 Manage the Risks

Risks need to be managed appropriately to the significance of the risk and importance of the affected item/asset to the council’s service delivery. As a general guide:

- **Avoid the risk** by deciding not to proceed with the activity that would incur the risk, or choose an alternative course of action that achieves the same outcome,
- **Reduce the level of risk** by reducing the likelihood of occurrence or the consequences, or both;
  - the likelihood may be reduced through management controls, organisational or other arrangements which reduce the frequency of, or opportunity for errors, such as alternative procedures, quality assurance, testing, training, supervision, review, documented policy and procedures, research and development.
  - the consequences may be reduced by ensuring that management or other controls, or physical barriers, are in place to minimise any adverse consequences, such as contingency planning, contract conditions or other arrangements.
- **Transfer the risk** by shifting the responsibility to another party (such as an insurer), who ultimately bears the consequences if the event occurs. Risks should be allocated to the party which can exercise the most effective control over those risks.
- **Accept and retain the risks** within the organisation where they cannot be avoided, reduced or reduced or transferred, or where the cost to avoid or transfer the risk is not justified, usually because the risk is acceptable or low. Risks can be retained by default, i.e. Where there is a failure to identify and/or appropriately transfer or otherwise manage risks

The cost of managing risks needs to be commensurate with the benefits obtained, the significance of the event and the risks involved.

1.5.7 Risk Treatment Plans

Plans should document how the chosen options are to be implemented. The plan should identify responsibilities, schedules, the expected outcomes of treatment, budgeting, performance measures and the review process to be set in place.

The successful implementation of the risk treatment plan requires an effective management system which specifies the methods chosen, assigns responsibilities and individual accountabilities for actions and monitors them against specified criteria.

1.5.8 Monitoring and Review

Monitoring and review is an essential and integral step in the process of managing risk. It is necessary to monitor risks, the effectiveness of any plans, strategies and management systems that have been established to control implementation of risk management actions.

Risks need to be monitored periodically to ensure changing circumstances do not alter the risk priorities.
2. COMMUNICATION AND CONSULTATION

Risk communication is ‘the interactive process of exchange of information and opinion involving multiple messages about the nature of risk and risk management’. ²

‘Appropriate communication and consultation seeks to:

• Improve people’s understanding of risks and the risk management processes;
• Ensure that the varied views of stakeholders are considered; and
• Ensure that all participants are aware of their roles and responsibilities.’

The development of this infrastructure risk management plan was undertaken using a consultative team approach to:-

• Identify stakeholders and specialist advisors who need to be involved in the risk management process;
• Discuss and take into account the views of stakeholder and specialist advisors; and
• Communicate the results of the risk management process to ensure that all stakeholders are aware of and understand their and roles and responsibilities in risk treatment plans.

Members of the team responsible for preparation of this risk management plan are:

• “[Click here & type team member]”
• “[Click here & type team member]”
• “[Click here & type team member]”
• “[Click here & type team member]”
• “[Click here & type team member]”
• “[Click here & type team member]”

Copies of this risk management plan are provided to team members and those stakeholders identified as having an interest in the risk management plan. Stakeholders are invited to advise the team leader, “[Click here & type title of team leader]” of any new risks or changes to existing circumstances that may affect risks or level of risk identified in the plan.

The plan is to be reviewed in accordance with the monitoring and review plan in Section 8.

² HB 436:2004, Sec 3.1, p 20
3 ESTABLISHING THE CONTEXT

This step aims to understand the background of the organisation and its risks, scoping the risk management activities being undertaken and developing a structure for the risk management tasks to follow.

The output is a concise statement of the organisation’s objectives, and specific criteria for success, the objectives and scope for risk management and a set of key elements for structuring the risk identification activity.

3.1 The External Context

This section defines the relationship between the organisation and its external environment.

“[ Click here & type brief history of the area ]”
“[ Click here & type commentary on population and trends ]”
“[ Click here & type commentary on topography ]”
“[ Click here & type commentary on climate ]”
“[ Click here & type commentary on transport links ]”
“[ Click here & type commentary on industry base ]”
“[ Click here & type commentary on service centre ]”
“[ Click here & type commentary on government services ]”

The council’s strengths, weaknesses, opportunities and threats in the provision of services to the community are shown below.

“[ Click here & type comment on organisation’s strengths ]”
“[ Click & type comment on weaknesses ]”
“[ Click & type comment on opportunities ]”
“[ Click here & type comment on threats ]”

Stakeholders involved with council in providing services from infrastructure to the community and their objectives are shown in Table 2.1.

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>[ Type stakeholder ]</td>
<td>[ Click &amp; type their objective ]</td>
</tr>
<tr>
<td>[ Type stakeholder ]</td>
<td>[ Click &amp; type their objective ]</td>
</tr>
<tr>
<td>[ Type stakeholder ]</td>
<td>[ Click &amp; type their objective ]</td>
</tr>
</tbody>
</table>

[NOTE: THIS MAY INCLUDE SUPPORTING AND FACILITATING KEY ECONOMIC ACTIVITIES AND COMMUNITY SERVICES]

2.2 The Internal Context

The purpose of this section is to gain an understanding of the council organisation.

Council’s vision for the council area is “[ Click here & type council vision statement ]”.

“[ Click here & type commentary on culture ]”
“[ Click here & type commentary on internal stakeholders ]”
“[ Click here & type commentary on services structure ]”
“[ Click & type commentary on capabilities, resources, etc. ]”
“[ Click & type comment on goals/objectives & strategies ]”

2.3 The Risk Management Context

Council has implemented many management practices and procedures to identify and manage risks associated with providing services from infrastructure assets. These include:

- operating a reactive maintenance service for all assets and services;
- operating a planned maintenance system for key assets;
- monitoring condition and remaining service life of assets nearing the end of their service life;
- renewing and upgrading assets to maintain service delivery; and
- acquiring or constructing new assets to provide new and improved services.

“[ Click here & type comment on service delivery practices ]”
“[ Click here & type comment on service delivery practices ]”

Council has assigned responsibilities for managing risks associated with assets and service delivery to the following departments.
3. RISK EVALUATION CRITERIA

The following criteria are used by council to evaluate whether risk treatment is required. Council will evaluate the need for risk treatment plans using the following evaluation methodology.

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Risk Evaluation Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operational</td>
<td>Risks that have the potential to reduce services for more than 2 hours</td>
</tr>
<tr>
<td>Technical</td>
<td>Risks that cannot be managed by council’s normal technical resources.</td>
</tr>
<tr>
<td>Financial</td>
<td>Risks that cannot be treated within council’s normal maintenance budgets or by reallocation of an annual capital works program.</td>
</tr>
<tr>
<td>Legal</td>
<td>Risks that exist where council does not comply with its ‘duty of care’.</td>
</tr>
<tr>
<td>Social</td>
<td>Risks that have the potential to cause significant social disruption in the community</td>
</tr>
<tr>
<td>Environmental</td>
<td>Risks that have the potential to cause environmental harm.</td>
</tr>
</tbody>
</table>

The evaluation criteria are to provide guidance to evaluate whether the risks are acceptable to the council and its stakeholders in providing services to the community. Risks that do not meet the evaluation criteria above are deemed to be unacceptable and risk management plans are required to be developed and documented in this Infrastructure Risk Management Plan.

4. RISK IDENTIFICATION

4.1 GENERAL

Potential risks associated with providing services from infrastructure were identified at a meeting of the council’s infrastructure risk management team on [Click here & type date of meeting(s)].

Team members were asked to identify “What can happen, where and when” to the various council services and then to identify possible “Why and how can it happen” as causes for each potential event.

The credibility of each risk and cause was then assessed by the Committee to ensure that realistic risks were being analysed.

The assets at risk, what can happen, when, possible cause(s), existing controls and assessment of credibility of the risk by the Committee are shown in Table 4.1.

Credible risks are subjected to risk analysis in Section 5.4.5.
## Table 4.1  Potential Risks, Causes and Credibility

INSERT ROWS WITH DATA FROM WORKSHEET ‘RISK IDENTIFICATION’ OF ‘RISK REGISTER’ SPREADSHEET

<table>
<thead>
<tr>
<th>Risk No.</th>
<th>Asset at Risk</th>
<th>What can happen?</th>
<th>When can it occur?</th>
<th>Possible cause</th>
<th>Existing controls</th>
<th>Is risk credible?</th>
<th>Is Risk Analysis required?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Brown Creek bridge</td>
<td>Bridge collapse</td>
<td>Within 5 years</td>
<td>Ageing of timber girders and loss of load carrying capacity</td>
<td>None</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>2</td>
<td>Brown Creek bridge</td>
<td>Damage by heavy vehicle hitting bridge</td>
<td>Anytime in the future</td>
<td>Poor alignment on southern approach</td>
<td>Curve warning sign with advisory speed of 65 km/h</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>3</td>
<td>Brown Creek bridge</td>
<td>Damage by heavy vehicle hitting bridge</td>
<td>Anytime now</td>
<td>Speed of approaching vehicles</td>
<td>Curve warning sign with advisory speed of 65 km/h</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>4</td>
<td>Creek Road</td>
<td>Road closure for 12 hours due to flooding</td>
<td>Within 5 years</td>
<td>Inadequate hydraulic capacity and low level approach roads</td>
<td>Road subject to flooding signs and depth markers. Road serves 5 dwellings and has alternate access.</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
5. RISK ANALYSIS

5.1 GENERAL

Credible risks which have been identified during the risk identification stage are required to be analysed. This process takes into account the ‘likelihood’ and the ‘consequences’ of the event. The objective of the analysis is to separate the minor acceptable risks from the major risks and to provide data to assist in the assessment and management of risks.

The risk analysis process is applied to all credible risks to determine levels of risk. The process acts as a filter by applying a reasoned and consistent process, minor risks can be eliminated from further consideration and dealt with within standard operating procedures.

The remaining risks will therefore be of such significance as to require evaluation against the risk evaluation criteria determined in Section 3 and risk treatment options developed.

5.2 Likelihood

Likelihood is a qualitative description of probability of an event occurring. The process of determining likelihood involves combining information about estimated or calculated probability, history or experience. Where possible it is based on past records, relevant experience, industry practice and experience, published literature or expert judgement.

5.3 Consequences

Consequences are a qualitative description of the effect of the event. The process of determining consequences involved combining information about estimated or calculated effects, history and experience.

5.4 Method

The risk analysis method used the risk rating chart shown in Section 5.4.3. This process uses a qualitative assessment of likelihood/probability and history/experience compared against a qualitative assessment of severity of consequences to derive a risk rating.

The qualitative descriptors for each assessment are shown below.

5.4.1 Likelihood

<table>
<thead>
<tr>
<th>Likelihood</th>
<th>Descriptor</th>
<th>Probability of occurrence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rare</td>
<td>May occur only in exceptional circumstances</td>
<td>More than 20 years</td>
</tr>
<tr>
<td>Unlikely</td>
<td>Could occur at some time</td>
<td>Within 10-20 years</td>
</tr>
<tr>
<td>Possible</td>
<td>Might occur at some time</td>
<td>Within 3-5 years</td>
</tr>
<tr>
<td>Likely</td>
<td>Will probably occur in most circumstances</td>
<td>Within 2 years</td>
</tr>
<tr>
<td>Almost certain</td>
<td>Expected to occur in most circumstances</td>
<td>Within 1 year</td>
</tr>
</tbody>
</table>

5.4.2 Consequences

<table>
<thead>
<tr>
<th>Consequences</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insignificant</td>
<td>No injuries, low financial loss (less than $10,000)</td>
</tr>
<tr>
<td>Minor</td>
<td>First aid treatment, on-site release immediately contained, medium financial loss ($10,000 - $50,000)</td>
</tr>
<tr>
<td>Moderate</td>
<td>Medical treatment required, on-site release contained with outside assistance, high financial loss ($50,000 - $200,000)</td>
</tr>
<tr>
<td>Major</td>
<td>Extensive injuries, loss of production capacity, off-site release with no detrimental effects, major financial loss ($200,000 - $1,000,000)</td>
</tr>
<tr>
<td>Catastrophic</td>
<td>Deaths, toxic release off-site with detrimental effect, huge financial loss (more than $1M)</td>
</tr>
</tbody>
</table>
5.4.3 Risk Assessment

The risk assessment process compares the likelihood of a risk event occurring against the consequences of the event occurring. In the risk rating table below, a risk event with a likelihood of ‘Possible’ and a consequences of ‘Major’ has a risk rating of ‘High’. This rating is used to develop a typical risk treatment in Section 5.4.4.

<table>
<thead>
<tr>
<th>Likelihood</th>
<th>Insignificant</th>
<th>Minor</th>
<th>Moderate</th>
<th>Major</th>
<th>Catastrophic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rare</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>M</td>
<td>H</td>
</tr>
<tr>
<td>Unlikely</td>
<td>L</td>
<td>L</td>
<td>M</td>
<td>H</td>
<td>H</td>
</tr>
<tr>
<td>Possible</td>
<td>L</td>
<td>M</td>
<td>M</td>
<td>H</td>
<td>VH</td>
</tr>
<tr>
<td>Unlikely</td>
<td>M</td>
<td>M</td>
<td>H</td>
<td>H</td>
<td>VH</td>
</tr>
<tr>
<td>Almost Certain</td>
<td>M</td>
<td>H</td>
<td>H</td>
<td>VH</td>
<td>VH</td>
</tr>
</tbody>
</table>

5.4.4 Indicator of Risk Treatment

The risk rating is used to determine risk treatments. Risk treatments can range from immediate corrective action (such as stop work or prevent use of the asset) for ‘Very High’ risks to manage by routine procedures for ‘Low’ risks.

Using the example from Section 5.4.3, an event with a ‘High Risk’ rating will require ‘Prioritised action’. This may include actions such as reducing the likelihood of the event occurring by physical methods (limiting usage to within the asset’s capacity, increasing monitoring and maintenance practices, etc), reducing consequences (limiting speed of use, preparing response plans, etc) and/or sharing the risk with others (insuring the councils against the risk).

<table>
<thead>
<tr>
<th>Risk Rating</th>
<th>Action Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>VH</td>
<td>Very High Risk</td>
</tr>
<tr>
<td></td>
<td>Immediate corrective action</td>
</tr>
<tr>
<td>H</td>
<td>High Risk</td>
</tr>
<tr>
<td></td>
<td>Prioritised action required</td>
</tr>
<tr>
<td>M</td>
<td>Moderate Risk</td>
</tr>
<tr>
<td></td>
<td>Planned action required</td>
</tr>
<tr>
<td>L</td>
<td>Low Risk</td>
</tr>
<tr>
<td></td>
<td>Manage by routine procedures</td>
</tr>
</tbody>
</table>

5.4.5 Analysis of Risk

The team conducted an analysis of credible risks identified in Table 4.1 using the method described above to determine a risk rating for each credible risk.

The credible risks and risk ratings are shown in Table 5.4.5.
<table>
<thead>
<tr>
<th>Risk No.</th>
<th>Asset at Risk</th>
<th>What can happen</th>
<th>When</th>
<th>Possible cause</th>
<th>Existing controls</th>
<th>Likelihood</th>
<th>Consequences</th>
<th>Risk rating</th>
<th>Action required</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Brown Creek bridge</td>
<td>Bridge collapse</td>
<td>Within 5 years</td>
<td>Ageing of timber girders and loss of load carrying capacity</td>
<td>None</td>
<td>Possible</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Planned action required</td>
</tr>
<tr>
<td>2</td>
<td>Brown Creek bridge</td>
<td>Damage by heavy vehicle hitting bridge</td>
<td>Anytime in the future</td>
<td>Poor alignment on southern approach</td>
<td>Curve warning sign with advisory speed of 65 km/h</td>
<td>Possible</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Planned action required</td>
</tr>
<tr>
<td>3</td>
<td>Brown Creek bridge</td>
<td>Damage by heavy vehicle hitting bridge</td>
<td>Anytime now</td>
<td>Speed of approaching vehicles</td>
<td>Curve warning sign with advisory speed of 65 km/h</td>
<td>Possible</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Planned action required</td>
</tr>
<tr>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Table 5.4.5  Risk Ratings

INSERT ROWS WITH DATA FROM WORKSHEET 'RISK ANALYSIS' OF 'RISK REGISTER' SPREADSHEET
6. RISK EVALUATION

6.1 General

This step is about deciding whether the risks are acceptable or unacceptable.

This is done by comparing the level of risk found during the risk analysis process documented in Section 5, Risk Analysis with the level of acceptable risk determined in Section 3 and deciding whether the risk can be accepted.

6.2 Risk Evaluation

Table 6.2 shows the evaluation of risks using the criteria determined in Section 3.

6.3 Risks Requiring Further Action

Table 6.2 identified risks that are considered as not acceptable to meet the organisation’s objectives and for which, risk treatment plans are required.

Risk treatment plans are developed in Section 7.
### Table 6.2  Risk Evaluation

<table>
<thead>
<tr>
<th>Risk No.</th>
<th>Asset at Risk</th>
<th>What can happen</th>
<th>Possible cause</th>
<th>Existing controls</th>
<th>Risk rating</th>
<th>Action required</th>
<th>Risk evaluation criteria</th>
<th>Is risk acceptable?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Brown Creek bridge</td>
<td>Bridge collapse</td>
<td>Ageing of timber girders and loss of load carrying capacity</td>
<td>None</td>
<td>Moderate</td>
<td>Planned action required</td>
<td>Operational: No, Technical: Maybe, Financial: No, Legal: No, Social: No, Environmental: Maybe</td>
<td>No</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Brown Creek bridge</td>
<td>Damage by heavy vehicle hitting bridge</td>
<td>Poor alignment on southern approach</td>
<td>Curve warning sign with advisory speed of 65 km/h</td>
<td>Moderate</td>
<td>Planned action required</td>
<td>Operational: No, Technical: Maybe, Financial: No, Legal: No, Social: No, Environmental: Maybe</td>
<td>No</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Brown Creek bridge</td>
<td>Damage by heavy vehicle hitting bridge</td>
<td>Speed of approaching vehicles</td>
<td>Curve warning sign with advisory speed of 65 km/h</td>
<td>Moderate</td>
<td>Planned action required</td>
<td>Operational: No, Technical: Maybe, Financial: No, Legal: No, Social: No, Environmental: No</td>
<td>No</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
7. RISK TREATMENT PLANS

7.1 General

The treatment of risk involves identifying the range of options for treating risk, evaluating those options, preparing risk treatment plans and implementing those plans.

This includes reviewing existing guides for treating that particular risk, such as Australian and State legislation and regulations, Australian Standards and Best Practise Guides.

Developing risk treatment options starts with understanding how risks arise, understanding the immediate causes and the underlying factors that influence whether the proposed treatment will be effective.

One treatment option is to remove the risk completely by discontinuing the provision of the service.

Other options include risk reduction by reducing the likelihood and/or the consequences of the risk.

7.2 Risk Treatment Process

The risk treatment process comprises 5 steps.

Step 1. Review causes and controls

The risk identification process documented in Section 4 included identifying possible causes and documenting existing controls.

Step 2. Develop treatment options

Treatment options include those that eliminate risk, reduce the likelihood or the risk event occurring, reducing the consequences should the risk event occur, sharing of the risk with others and accepting the risk.

Step 3. Assess risk treatment options against costs and residual risk

The method of assessment of risk treatment options can range from an assessment by a local group of stakeholders and practitioners experienced in operation and management of the assets/service to detailed risk cost and risk reduction cost/benefit analysis.

Step 4. Select optimum risk treatment

Step 5. Develop risk treatment plans

7.3 Risk Treatments

The risk treatments identified for non-acceptable risks shown in Table 6.2 are detailed in Table 7.3.

7.4 Risk Treatment Plans

From each of the risk treatments identified in Table 7.3, risk treatment plans were developed.

The risk treatment plans identify for each non-acceptable risk:-

1. Proposed action
2. Responsibility
3. Resource requirement/budget
4. Timing
5. Reporting and monitoring required

The risk treatment plan is shown in Table 7.4.
### Table 7.3 Risk Treatments

Insert rows with data from worksheet 'RISK TREATMENT' of 'RISK REGISTER' spreadsheet

<table>
<thead>
<tr>
<th>Risk No.</th>
<th>Asset at Risk</th>
<th>What can happen</th>
<th>Possible cause</th>
<th>Existing controls</th>
<th>Risk rating</th>
<th>Action required</th>
<th>Is risk acceptable?</th>
<th>Treatment option(s)</th>
<th>Residual risk</th>
<th>Risk Treatment Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Brown Creek bridge</td>
<td>Bridge collapse</td>
<td>Ageing of timber girders and loss of load carrying capacity</td>
<td>None</td>
<td>Moderate</td>
<td>Planned action required</td>
<td>No</td>
<td>Introduce load limit</td>
<td>Risk remains if load limit is ignored</td>
<td>Assess load capacity &amp; introduce load limit if required. Inspect bridge condition 3 monthly</td>
</tr>
<tr>
<td>2</td>
<td>Brown Creek bridge</td>
<td>Damage by heavy vehicle hitting bridge</td>
<td>Poor alignment on southern approach</td>
<td>Curve warning sign with advisory speed of 65 km/h</td>
<td>Moderate</td>
<td>Planned action required</td>
<td>No</td>
<td>- realign approaches - improve existing signage - install advance warning signage</td>
<td>- low - risk remains if signs are ignored</td>
<td>Replace existing advisory signs with larger signs</td>
</tr>
<tr>
<td>3</td>
<td>Brown Creek bridge</td>
<td>Damage by heavy vehicle hitting bridge</td>
<td>Speed of approaching vehicles</td>
<td>Curve warning sign with advisory speed of 65 km/h</td>
<td>Moderate</td>
<td>Planned action required</td>
<td>No</td>
<td>- realign approaches - reduce advisory speed - install advance warning signage</td>
<td>- as above</td>
<td>Replace existing advisory signs with 35 km/h signs Install advance warning signage</td>
</tr>
</tbody>
</table>
### Table 7.4  Risk Treatment Plan

<table>
<thead>
<tr>
<th>Risk No.</th>
<th>Asset at Risk</th>
<th>What can happen</th>
<th>Risk rating</th>
<th>Action required</th>
<th>Risk Treatment Plan</th>
<th>Actions</th>
<th>Responsibility</th>
<th>Resources required</th>
<th>Budget</th>
<th>Date due</th>
</tr>
</thead>
</table>
| 1        | Brown Creek bridge | Bridge collapse | Moderate    | Planned action required | Assess load capacity & introduce load limit if required. Inspect bridge condition 3 monthly | 1.1 Implement 3 monthly condition inspection  
1.2 Commission bridge load capacity report  
1.3 report to council on recommendations  
1.4 Install load limits if required | Dir Tech Services | 1.1 Council staff training  
1.2 Bridge testing consultant  
1.3 Council staff  
1.4 Council staff | 1.1 $2000  
1.2 $5000 | 1.2 Aug 06  
1.2 Dec 06 |
| 2        | Brown Creek bridge | Damage by heavy vehicle hitting bridge | Moderate | Planned action required | Replace existing advisory signs with larger signs | 2.1 Report to Council  
2.2 Replace signage | Dir Tech Services | 2.1 Council staff  
2.2 Council staff | $300 | Sep-06 |
| 3        | Brown Creek bridge | Damage by heavy vehicle hitting bridge | Moderate | Planned action required | Replace existing advisory signs with 35 km/h signs  
Install advance warning signage | 3.1 Report to TSA  
3.2 Replace signs when approved by TSA | Dir Tech Services & TSA | Council staff | $200 | Sep-06 |
8. MONITORING AND REVIEW

The plan will be monitored and reviewed as follows.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Review Process</th>
</tr>
</thead>
<tbody>
<tr>
<td>Review of new risks and changes to existing risks</td>
<td>Annual review by team with stakeholders and report to council</td>
</tr>
<tr>
<td>Review of Risk Management Plan</td>
<td>3 yearly review and re-write by team and report to council</td>
</tr>
<tr>
<td>Performance review of Risk Treatment Plan</td>
<td>Action plan tasks incorporated in council staff performance criteria with 6 monthly performance review. Action plan tasks for other organisations reviewed at annual team review meeting</td>
</tr>
</tbody>
</table>

9. REFERENCES


INSERT OTHER APPLICABLE REFERENCES IN ALPHABETICAL ORDER