



# Whakatane District Council Safety Deficiency Assessment & Prioritisation Policy




November 2009



# WHAKATANE DISTRICT COUNCIL SAFETY DEFICIENCY ASSESSMENT AND PRIORITISATION POLICY

NOVEMBER 2009

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Reference:

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30 November 2009

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## 1 INTRODUCTION

The Whakatane District Council (WDC) has a total roading network of 901.50 kilometres within the district, including 80.48 kilometres designated Special Purpose Road (SPR) and 821.02 kilometres designated Local Road (LR).

Minor improvements works/ projects are an integral part of roading network management.

## 2 PURPOSE AND APPLICATION OF THE SAFETY DEFICIENCY ASSESSMENT AND PRIORITISATION POLICY

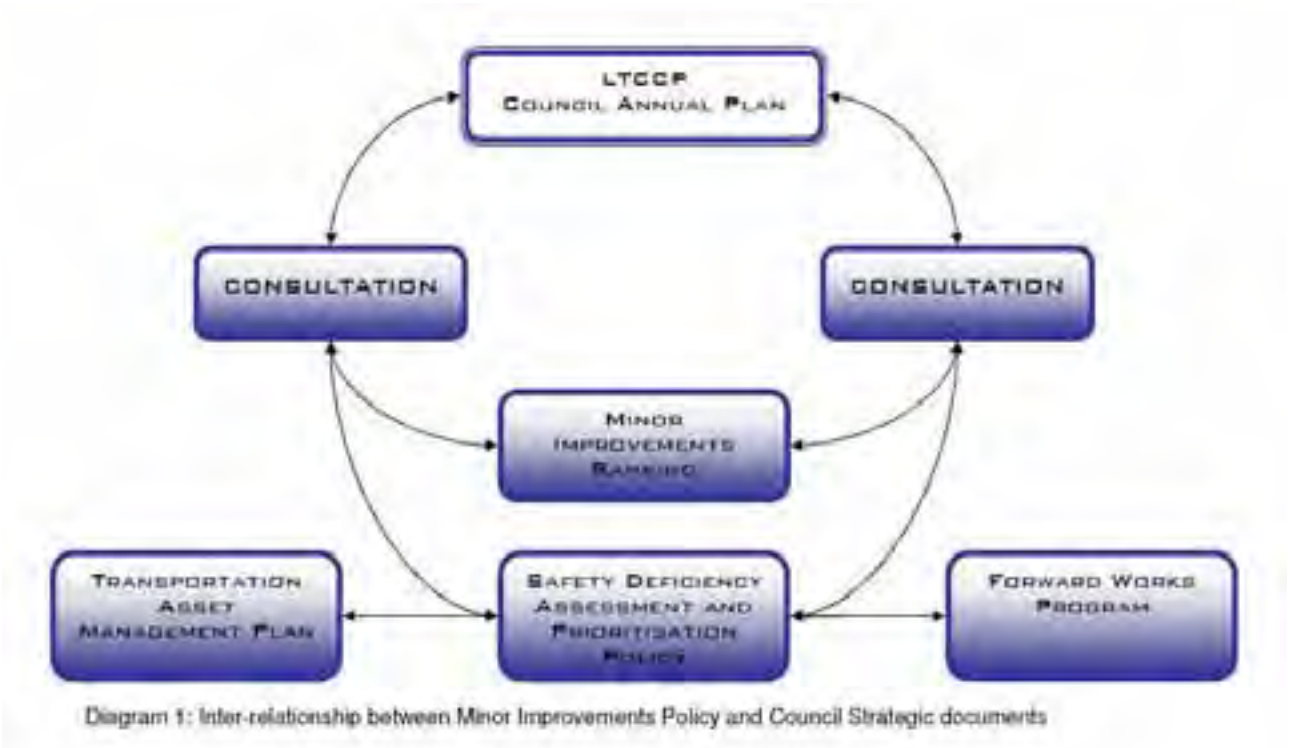
The purpose of the Safety Deficiency Assessment and Prioritisation Policy is to outline how WDC will identify safety deficiencies and prioritise minor improvements projects.

The WDC has developed the Safety Deficiency Assessment and Prioritisation Policy (SDAP) as a decision-making and management tool to:

- Assist in the assessment and prioritisation of safety deficiencies identified on it's roading network;
- Assist in the prioritisation of the Annual Minor Improvements works (the value of the work required to address the deficiencies on the roading network far exceeds the available annual budget);
- Assist in prioritising minor improvements projects requested as part of the annual plan or LTCCP submission process;
- Assist in the development of the Council's Forward Works Programme (FWP) to remedy deficiencies and address hazards on the roading network.

The following diagram illustrates the inter relationship between the Minor Improvements Policy and Councils Strategic documents.





## 2.1 New Zealand Transport Authority (NZTA) Funding Formula and Minor Improvements Criteria

Minor improvements works/projects are completed as Financially Assisted (FA) works. The NZTA funding for FA works on the Special Purpose Road network and the Local Road network is eight percent of the value of the annual maintenance and renewals budget.

Minor improvements works/projects are approved by NZTA and based on the following criteria:

- All works/projects must meet the NZTA criteria as described in the NZTA Funding and Programming Manual.
- All works/projects must be approved by the local NZTA Representative.
- The total budget allowed for any single project is a maximum of \$250,000.



Examples of qualifying Minor Improvement activities includes:

- Small, isolated geometric road and intersection improvements.
- Traffic calming measures.
- Lighting improvements for safety.
- Installation of new traffic signs and pavement markings, or upgrading these to current standard, costing in excess of \$10,000.
- Provision of guardrail.
- Sight benching to improve visibility.
- Pedestrian facilities that comply with the definition for work category 451: Pedestrian Facilities.
- Cycling facilities that comply with the definition for work category 452: Cycling Facilities.
- Stock access structures.
- Formation of trailer parks.
- Minor engineering works associated with community programmes.



### 3 DEFINITIONS FOR DEFICIENCY, HAZARD AND TREATMENT

All safety issues are classified as either a safety deficiency or a safety hazard. Deficiencies/hazards are described by the NZTA (source *NZTA Deficiency Database Prioritisation Workbook V2*) as follows:

*“Hazard – is a deficiency for which there is no reasonable fix. Hazards are managed to limit their effects.”*

*“Deficiencies are fixable.”*

The following table describes the differences between a deficiency, a hazard and a possible treatment.

HAZARD	DEFICIENCY	POSSIBLE TREATMENT
Flooding event		Ensure appropriate measures are in place during flood events.
Water course close to the road		Ensure high standard of pavement marking and delineation.
Power poles close to the road		Paint white and hazard mark.
	Poor alignment	<ol style="list-style-type: none"> <li>1. Improve signage and delineation.</li> <li>2. Road realignment.</li> </ol>
	Detritus	<ol style="list-style-type: none"> <li>1. Regular sweeping.</li> <li>2. Address stormwater ponding issue/cause of detritus.</li> </ol>
	Low visibility at intersections	<ol style="list-style-type: none"> <li>1. Vegetation trimming.</li> <li>2. Intersection improvements.</li> </ol>
	Narrow bridge	<ol style="list-style-type: none"> <li>1. Improve approaches and ensure appropriate signage and delineation.</li> <li>2. Widen bridge.</li> </ol>





HAZARD	DEFICIENCY	POSSIBLE TREATMENT
	No footpath	Construct footpath.

### 3.1 Identification and Recording of Deficiencies and Hazards

The following table details the process of updating the Council's *Safety Deficiency Database* (SDD):

Source of Data	Frequency of Updating
Road Day/Night Inspections	Annual
Contractor/ Consultants / Council Observation	On occurrence
Request for Services	On occurrence
Crash Incidents	On occurrence



## 4 The Safety Deficiency Database (SDD)

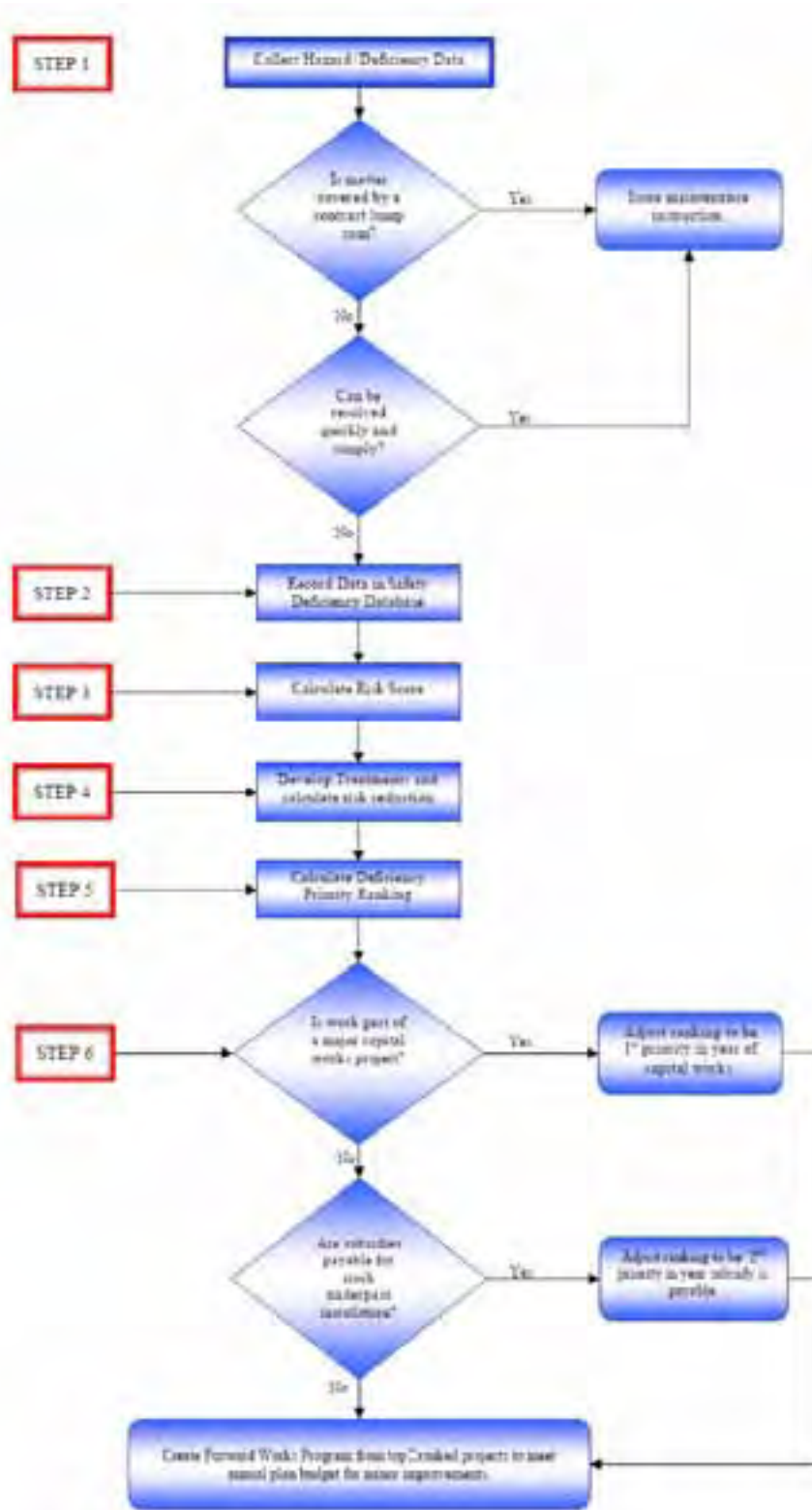
In 2008, NZTA developed a Safety Deficiency Database (SDD) for the recording and prioritising of deficiencies and hazards on roading networks. The SDD is a management tool used by the WDC Asset Manager and professional services provider in the management and prioritisation of the Council's Minor Improvements works on Local and Special Purpose Road networks in the District. The SDD was first implemented by the Council for the recording and prioritising of the 2009 road day and night safety inspections.

The prioritisation of the annual Minor Improvement works involves a number of steps managed through the SDD process. These steps are detailed in the following table:

Step	Component
One	Site Inspection and Data Collection
Two	Recording the Data in the Safety Deficiency Database
Three	Calculating the Risk Score
Four	Developing Treatments
Five	Calculating the Deficiency Priority
Six	Confirming the Forward Works Programme



The following flowchart details the process in which Minor Improvements are identified, ranked and implemented.



#### 4.1 STEP ONE - Site Inspection and Data Collection

This step involves undertaking a survey of the entire roading network through the annual day/night safety inspections. Data is also sourced and input into the SDD on an 'on occurrence' basis through contractor/consultant/staff observations, requests for services and crash incidents.

#### 4.2 STEP TWO - Recording the Data in the Safety Deficiency Database

This step involves capturing and recording information about the hazard or deficiency into the SDD. The information recorded includes:

- Road name
- Location
- Operating speed
- Traffic volume
- Deficiency type
- Crash history
- A description of the problem.

Examples of deficiencies include:

- Both horizontal and vertical geometry
- Delineation
- Drainage
- Drop
- Horizontal geometry
- Inadequate width
- Intersection controls
- Lighting
- Narrow bridge
- Obstacle
- Sealed surfacing
- Signage
- Unsealed surfacing
- Vegetation
- Vulnerable road users.



### 4.3 STEP THREE – Calculating the Risk Score

This step involves calculating the Risk Score by multiplying the likelihood/probability of a crash occurring now and the consequences of that crash occurring.

The likelihood/probability and the consequence ratings are detailed in the following tables:

Likelihood	Meaning and Description
Likelihood/probability of a crash occurring now (based on previous crash data)	Very Likely (Crashes occur more than 3 times per annum. Frequent crashes (>3) likely each year)
	Likely (Crashes occur more than 1-2 times per annum. Several crashes likely in the next year)
	Possible (Crashes occur more than 1-5 times in the past 5 years. 1-5 crashes possible in the next 5 years)
	Unlikely (There have been no crashes in the last 10 years but not in the last 5 years. A crash may occur in the next 10 years)
	Highly unlikely (No crashes recorded or no crashes in the last 10 years or likely in the next 10 years)

Consequence	Meaning and Description
Consequence of that crash occurring now.  Treatment types (assessed during annual audit inspection)	Severe (Will cause multiple fatalities. Widespread external safety impacts)
	Major (Likely to cause a fatality or several fatalities, extensive injuries or significant external safety impacts)
	Significant (Could possibly cause a fatality. Serious external safety impact on a number or minor impact on a large number of people.
	Minor (Could cause serious injury. Minor external safety impact on a small number of people)
	Insignificant (Not likely to cause serious injury. No external health or safety impact)



### Applying the Risk Matrix

The total Risk Score is calculated from the assessments of likelihood and consequence by entering the values into the Risk Matrix is below:

	CONSEQUENCE				
LIKELIHOOD	Insignificant 2	Minor 4	Significant 8	Major 32	Severe 64
Highly unlikely 2	Low 4	Low 8	Low 16	Moderate 64	High 128
Unlikely 4	Low 8	Low 16	Moderate 32	High 128	High 256
Possible 8	Low 16	Moderate 32	Moderate 64	High 256	Extreme 512
Likely 16	Moderate 32	Moderate 64	High 128	Extreme 512	Extreme 1024
Very Likely 32	Moderate 64	High 128	High 256	Extreme 1024	Extreme 2048

#### 4.4 STEP FOUR - Developing Treatment

This step involves developing treatments and cost estimates to address each deficiency and calculate the reduction in risk provided by the treatment.

Risk Reduction is calculated in one of two ways.

1. Assessing the likelihood and consequence of each crash after the treatment and calculating a post treatment risk score.
2. Applying a percentage reduction to the existing risk score. The percentage reduction comes from published research into crash statistics before and after various treatment types. For example constructing flag lighting to a rural intersection has been shown to reduce the number of night time crashes by 50%.

The database allows for multiple treatment types to be entered for a single deficiency and will provide a recommendation on which treatment provides the greatest risk reduction per dollar spent.



#### 4.5 STEP FIVE - Calculating the Deficiency Priority

This step involves the calculation of the Deficiency Priority by applying the four factors detailed in the table below:

No	Factor	Calculation
1	Estimated Cost of Treatment	The cost of the physical works including design and project management.
2	Risk Reduction	The Risk Score before the treatment less the Risk Score after the treatment
3	Benefit Cost Ratio	The Risk score divided by the cost (\$) of the treatment.
4	Cost per vehicle per year	The current cost of the project is divided by the annual traffic volume

The SDD then calculates the four factors and prioritises the Minor Improvement projects in order of importance.

#### 4.6 STEP SIX – Confirming the Forward Works Programme

The final step in the process is confirming the Forward Works Programme for the financial year. This process and funding allocation is undertaken as per the following priorities:

- Priority 1: Adjust the ranking to include all projects that collectively are a part of a single major project.
- Priority 2: Allocate funds to stock underpass projects with approved NZTA funding.  
(Priority 1 and 2 shall have priority on the annual Minor Improvement funding allocation)
- Priority 3: Create a Forward Works Programme from top ranked projects to meet the annual budget for minor improvements.
- The Forward Works Programme may be adjusted and reprioritised throughout the year if an urgent project is identified for example as a result of a crash incident occurring during the year or; where the works are expected to be delayed due to a requirement to obtain resource consent or the purchase of land.



## 5 DEFINITIONS

The following definitions are applicable to this policy.

- NZTA – New Zealand Transport Agency.
- Special Purpose Road – Special Purpose Roads are those roads that were accepted as such under Section 104 of the Transit New Zealand Act 1989 (now renamed as the Government Powers Act 2008).
- Local Road – Road owned and administered by a Local Authority.
- Minor Improvement – works or projects initiated to address a safety deficiency or hazard on a road.
- Safety Deficiency Database – Database developed by NZTA used to record and prioritise safety deficiencies on roads.





## References

- LTNZ – Deficiency database and prioritisation Workbook Version 2.0 - February 2008
- NZTA – Planning, Programming and Funding Manual - August 2008.

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WHAKATANE DISTRICT COUNCIL – SAFETY DEFICIENCY ASSESSMENT AND PRIORITISATION  
POLICY

Improvement Policy\Safety Deficiency Assessment And Prioritisation Policy\Wdcsafety Deficiency Assessment.Final  
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