Tillamook County Public Works

‘Core’ Infrastructure Risk Management Plan

ROAD ASSETS

Version 1.3

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Document Control

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1.0	Aug. 28, 2008	Draft Document	Patricia Bugas-Schramm PBS Consulting		
	Sept. 3, 2008	Review Draft Document		Liane Welch, Director, TCPW	
1.1	Sept. 5, 2008	Revise Draft Risk Document	Patricia Bugas-Schramm PBS Consulting		
1.1	Sept. 8, 2008	Review Risk Document		Liane Welch, Director, TCPW	
	Sept. 15, 2008	Present Final Draft Risk Plan to County Road Advisory Committee (CRAC)		Liane Welch, Director, TCPW	
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1.2	Sept. 30, 2008	Present Final Draft Risk Plan to Citizens for Sustainable Roads Committee		Liane Welch, Director, TCPW	
1.2	January 23, 2008	Edit/Review Final Draft Risk Plan	Patricia Bugas-Schramm PBS Consulting	Liane Welch, Director TCPW	
1.3	January	Revise Final Risk Plan	Patricia Bugas-Schramm PBS Consulting		
1.3	January 30, 2008	Deliver Final 2008 Risk Plan			Liane Welch, Director, TCPW

TABLE OF CONTENTS

1. INTRODUCTION

1.1 Aim

The purpose of this core infrastructure risk management plan is to document the results and recommendations resulting from periodic identification, assessment and treatment of risks associated with providing road services to Tillamook County. [1]

Risk Management is defined in as: "the organizational culture, business practices and tools that are directed towards realizing potential opportunities while managing adverse effects." [2]

1.2 Objectives

The objectives of the plan are:

- to identify risks to Tillamook County that may impact the delivery of road services,
- to select credible risks for detailed analysis,
- to analyse and evaluate risks in accordance with AS/NZS 4360:2004,
- to prioritize 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 Core and Advanced Risk Management

This core risk management plan has been designed to be read as a supporting document to the road asset management plan. It has been prepared using the fundamentals of international best practice as defined in the Australian Standard for Risk Management, AS/NZS 4360:2004.

1.4 Scope

This plan considers risks associated with delivery of county services for transportation infrastructure.

1.5 The Risk Management Context

The Board of County Commissioners (BOCC) has implemented many management practices and procedures to identify and manage risks associated with providing services from transportation 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;
- closing and disposing of assets not providing the required service level; and
- acquiring or constructing new assets to provide new and improved services.

Currently, Tillamook County Public Works (TCPW) is primarily providing reactive maintenance on the County's $311 million road network. The network is comprised of County road assets include paved and gravel roads, right of way, bridges, guardrails, levees, culverts, ditches, a traffic signal, street signs and posts, pavement markings, two quarries, the equipment and vehicles used to maintain road assets, and buildings used by TCPW.

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[1] This document based on the Australian Standard for Risk Management, AS/NZS 4360; 2004.

[2] p4

Over the last 25 years, the county road budget has stayed approximately the same, $4 million while the number of employees has dropped from 51 to 18. Drainage programs (ditch maintenance) have been eliminated and inventories (culverts) have not been maintained. Condition is not known on key assets (culverts, buildings).

Tillamook's Board of County Commissioners (BOCC) has assigned responsibilities for managing risks associated with road assets and service delivery to Tillamook County Public Works. TCPW is responsible for the following managing county:

- Roads (paved and gravel)
- Structures (bridges, levees and guardrails)
- Drainage (culverts and ditches)
- Traffic Safety (road signs, road markings, traffic signals)
- Equipment management
- Facilities (buildings) management
- Quarries
- Operational programs that support the above (Vegetation Management, Emergency Management, Engineering and Administrative Services, Materials and Stockpiling)

1.6 Risk Management Model

The risk management process used in this project is shown in Fig 1.6 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 fundamentals of Australian Standard AS/NZS 4360:2004, Risk Management.

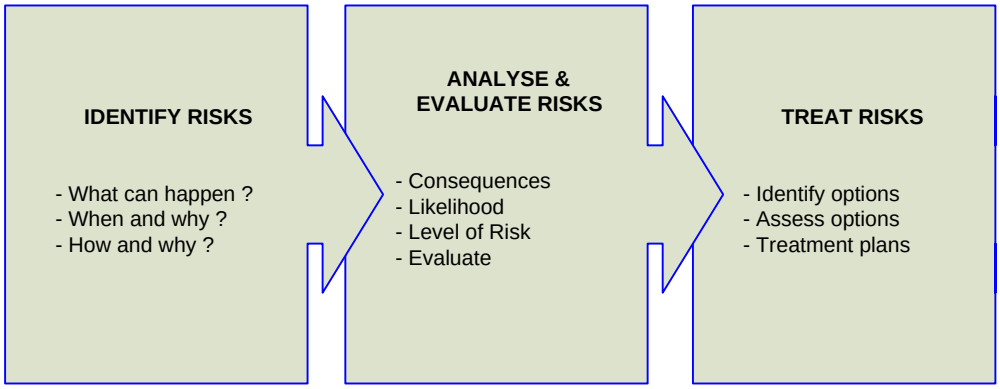

Fig 1.6. Risk Management Process – Abridged
Source: Adapted from AS/NZS 4360:2004, Fig 3.1 p 13

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'. [3]

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 used 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 roles and responsibilities in risk treatment plans.

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

- Tillamook County BOCC
- County Road Advisory Committee (CRAC) Members
- Tillamook County Public Works Director and Management Staff
- County Community Development Director
- Tillamook County Costal Resource Planner
- Tillamook County Treasurer

3. RISK IDENTIFICATION

3.1 General

Potential risks associated with providing services from infrastructure were identified at meetings of Tillamook County Public Works (TCPW) and then refined by a Risk Workshop. This June 2008 workshop was attended by BOCC and CRAC, TCPW director, engineer, foremen, cost accounting and customer service managers, and County directors from human resources, community development, the County treasurer and coastal resource planner.

Workshop attendees were asked to review preliminary asset information and risk assessments prepared by TCPW and their consultant. Attendees were asked to identify "What can happen, where and when" to the various county road services, and then to identify possible "Why and how can it happen" as causes for each potential event.

Each risk was then tested for credibility to ensure that available resources were applied to those risks that needed a more detailed risk analysis,

The assets at risk, what can happen, when, possible cause(s), existing controls and credibility are shown in Appendix A – Risk Register.

Credible risks are subjected to risk analysis in Section 4.4.5. Risks assessed as non-credible were not considered further and will be managed by routine procedures.

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[3] HB 436:2004, Sec 3.1, p 20

4. RISK ANALYSIS

4.1 General

Credible risks which have been identified during the risk identification stage were analyzed. 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 consider the development of risk treatment options and plans.

4.2 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 with history or experience. Where possible it is based on past records, relevant experience, industry practice and experience, published literature or expert judgement.

4.3 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.

4.4 Method

The rating of consequence and likelihood identifies the combined relative risk the community faces.

Likelihood of failure x Consequence of failure = Risk

The risk analysis method relied on expert knowledge of the transportation network based on experience, documented history along with information on asset inventory, condition and known demands on transportation network assets and services. Road programs and risks are listed including a list of how assets or services fail. A score from 1 to 5, or Very Unlikely to Almost Certain, is assigned as risks are considered. This score assesses the likelihood or probability of an event. Then a score is given considering if the risk event were to occur, and the consequence or impact. A variety of economic, social and environmental criteria are used to estimate the severity of consequences and a 1 to 5 score assigned, from Insignificant to Catastrophic. Placed on the same matrix the two scores derive a relative risk rating, from Low to Extreme. See Tables 4.4.1, 4.4.2 and 4.4.3, below.

4.4.1 Likelihood

Likelihood	Probability	Frequency	Description	Rating
Almost Certain	90%	9 out of every 10 years	The threat can be expected to occur Or A very poor state of knowledge has been established on the threat.	5
Likely	70%	7 out of every 10 years	The threat will quite commonly occur Or A poor state of knowledge has been established on the threat.	4
Moderate	50%	Every 5 out of every 10 years	The threat may occur occasionally Or A moderate state of knowledge has been established on the threat.	3
Unlikely	20-30%	Once per 2-3 out of 10 years	The threat could infrequently occur Or A good state of knowledge has been established on the threat.	2
Rare	10%	Once per 10 years +	The threat may occur in exceptional circumstances Or A very good state of knowledge has been established on the threat.	1

4.4.2 Consequences

Factor	Score				
	Insignificant	Minor	Moderate	Major	Catastrophic
	1	2	3	4	5
Economic (damages to community, losses, additional expenditures)	Less than $5,000	$5,000-$50,000	$50,000 -$100,000	$100,000 - $500,000	Greater than $500,000 (or 25% of budget).
Legal compliance	County fully complies and is on course with regulators to anticipate mandates	County agrees to compliance schedule, and avoids lawsuits and fines.	County warned of compliance issues and adopts corrective action	County sued or fined for missing mandates. Expects to comply in 1 year.	County sued or fined for missing mandates. No viable plan to comply.
Community impact	Community complaints	Unplanned disruption to multiple households, firms or community services/structures	Simultaneous unplanned disruption to multiple households, firms, or community services/structures	Unplanned disruption to large number of households	Unplanned disruption to essential service (e.g., lifeline route)
Human health and safety	No injuries	Minor injuries	Serious injuries	Single fatality or multiple serious injuries	Multiple fatalities
Reputation	No adverse media (all week)	Local media criticize county for 1 week	Regional media criticizes County for 2 days	National media criticizes County for 2 days	National media criticizes County for 1 week
Environment	Short-term damage	Limited but medium-term negative effect	Major but recoverable ecological damage	Heavy ecological damage, costly restoration	Permanent, widespread ecological damage
Human Resources	Permanent staff turnover 0% to 10% per year	Permanent staff turnover 10% to 15% per year	Permanent staff turnover 15% to 20% per year	Permanent staff turnover 20% to 30% per year	Permanent staff turnover exceeds 30% per year

4.4.3 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 'Likely' and a consequence of 'Moderate' has a risk rating of 'High'. This rating is used to develop a typical risk treatment in Section 5.3.

Table 4.4.3 Relative Risk Rating

Likelihood	Consequence				
	1 Insignificant	2 Minor	3 Moderate	4 Major	5 Catastrophic
5 Almost Certain	M	H	H	E	E
4 Likely	M	M	H	H	E
3 Moderate	L	M	H	H	H
2 Unlikely	L	L	M	M	H
1 Rare	L	L	M	M	H

4.4.4 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 'Extreme' risks to managing 'Low' risks using routine procedures.

An event with a 'High Risk' rating will require 'Management attention'. 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 organization against the risk). .

Risk Rating		Action Required
E	Extreme Risk	Immediate action required to reduce risk
H	High Risk	Management attention required to manage risk
M	Medium Risk	Management responsibilities specified and risk controls reviewed
L	Low Risk	Manage by routine procedures

4.4.5 Analysis of Risk

The team conducted an analysis of credible risks identified in section 3.1 using the method described above to determine a risk rating for each credible risk.

The credible risks and risk ratings are shown in Appendix A – Risk Register

4.5 Risk Evaluation

Once potential risks were listed by the risk management team, each risk was evaluated by asking "is the risk acceptable?" based on the following criteria.

Criterion	Risk Evaluation Notes
Operational	Risks that have the potential to reduce services for a period of time unacceptable to the community and/or adversely affect the County's public image.
Technical	Risks that cannot be treated by County's existing and/or readily available technical resources.
Financial	Risks that cannot be treated within County's normal maintenance budgets or by reallocation of an annual capital works program.
Legal	Risks that have the potential to generate unacceptable exposure to litigation.
Social	Risks that have the potential to: - cause personal injury or death and/or - cause significant social/political disruption in the community.
Environmental	Risks that have the potential to cause environmental harm.

The evaluation criteria are to provide guidance to evaluate whether the risks are acceptable to the County and its stakeholders in providing services to the community. Risks that are deemed to be unacceptable require a risk treatment plans and documentation in this Tillamook County Road Risk Management Plan.

5. RISK TREATMENT PLANS

5.1 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 United State standards and Oregon legislation and regulations. These include the American Association of State Highway and Transportation Officials (AASHTO) standards, National Bridge Inspection Standards (NBIS), the Manual of Uniform Traffic Control Devices (MUTCD) and County Road Construction Standards.

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. A planned response is then adopted.

5.2 Risk Treatment Process

The risk treatment process comprises 5 steps.

Step 1. Review causes and controls

The risk identification process documented in Section 3 included identifying possible causes and documenting existing controls.

Step 2. Develop treatment options

Treatment options can either eliminate risk, reduce the likelihood of the risk event occurring, reduce the consequences should the risk event occur, transfer or share the risk with others, or accept the risk.

Treatment options include:

- Avoiding or removing the risk completely by discontinuing the provision of the service.
- Mitigating or risk reduction by taking action that reduces the likelihood and/or the consequences of the risk.
- Transferring the risk to another public or private entity for management.
- 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. Tillamook County has chosen a two-step process: 1) General risk identification by the risk team assembled at the June 2008 workshop; then 2) Tillamook County Public Works directed resources to develop more detailed Risk Treatment strategies for Extreme and High risks, given available resources.

Step 4. Select optimum risk treatment

Step 5. Develop risk treatment plans

5.3 Risk Treatments

The risk treatments identified for non-acceptable risks are more detailed and reported in a Risk Register for annual consideration by the Board of County Commissioners.

5.4 Risk Treatment Plans

Non-accepted risks are addressed through more detailed strategies and action plans. These 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 Appendix A – Risk Register.

6. MONITORING AND REVIEW

The plan will be monitored and reviewed as follows.

Activity	Review Process
Review of new risks and changes to existing risks	Annual review by team with stakeholders and report to Board of County Commissioners
Review of Risk Management Plan	3 yearly review and re-write by team and report to Board of County Commissioners
Performance review of Risk Treatment Plan	Action plan tasks incorporated in Board of County Commissioners staff performance criteria with annual performance review. Action plan tasks for other organizations reviewed at annual team review meeting

7. REFERENCES

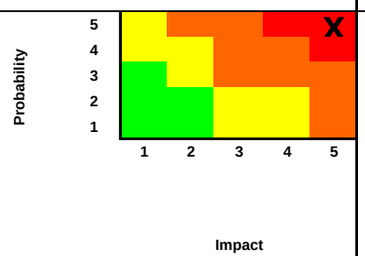
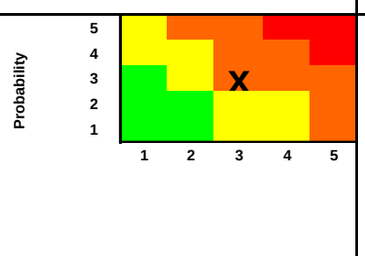
AS/NZS 4360:2004, Australian/New Zealand Standard, Risk Management, Standards Australia, Sydney.

City of Portland Asset Status & Condition Report, City of Portland December 2007

HB 436:2004, Risk Management Guidelines, Companion to AS/NZS 4360:2004, Standards Australia, Sydney.

International Infrastructure Management Manual, 2006, Institute of Public Works Engineering Australia, Sydney, 2006 www.ipwea.org.au

APPENDIX A. RISK REGISTER

	A	B	C	D	E	F	H	I	J	K	L	M	N	O	P	V	W	X	Y	Z	AA
14	**Risk Management Plan for Tillamook County Public Works Department**																				
15	**Risk Identification**						**Qualitative Risk Assessment**									**Management Plan**					
16	**#**	**Program**	**Risk Category**	**Failure Cause**	**Effect**	**Threat or Opportunity**	**Probability**	**Impact**	**Risk Matrix**							**Response**	**Risk Contingency Response Plan**	**Residual Risk**	Actions	Responsibility	Resources
17–23	1	Roads	Paved roads	Lack of timely maintenance Insufficient funding Poor design Wet climate/storm damage Poor drainage Utility work Traffic loads Lack of enforcement Lack of staff	Pot holes, shoulder deterioration, poor public image, base deterioration, overgrown vegetation, detracting from property value, increase maintenance cost, increased congestion, increase property damage, hurts industrial development tourism	Threat	5	5								**Mitigate**	Fill pot holes and pave what we can on high volume streets (collectors & arterials)	Risk remains.	1.1 Report to board on risk and funding need. 1.2 Implement increased program if funds approved. 1.3 Develop Pavement Management Strategies	TCPW Director	1.1 TCPW Director 1.2 TCPWDirector & foremen & contract inspection
24–30	2	Roads	Gravel roads-county maintained	Lack of county maintenance Poor design Wet climate Poor drainage	Pot holes, shoulder deterioration, poor public image, base deterioration, overgrown vegetation, detracting from property value, increase maintenance cost, increased congestion, increase property damage, hurts industrial development tourism	Threat	3	3								**Mitigate**	Grade gravel roads Focus on higher volume roads with more residents	Risk remains.	2.1 Define gravel road priority based on connectivity and emergency routing. 2.2 Identify roads to transfer to other jurisdictions based on above. 2.3 Review/approve Board to transfer to partner based on above. 2.4 Proceed as possible based on available resources.	TCPW Director	2.1 TCPW Director 2.2 TCPWDirector & foremen & contract inspection

	A	B	C	D	E	F	H	I	J	K	L	M	N	O	P	V	W	X	Y	Z	AA
162	**Risk Management Plan for Tillamook County Public Works Department**																				
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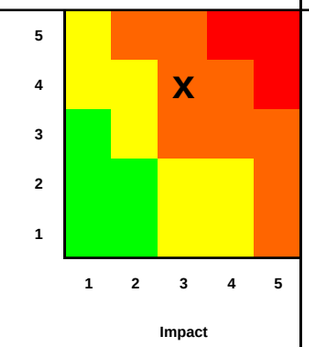
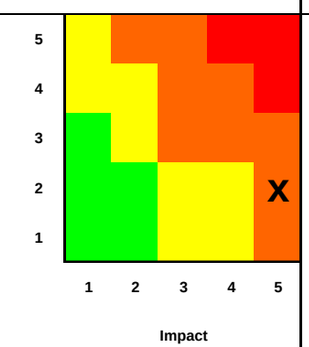
164	**#**	**Program**	**Risk Category**	**Failure Cause**	**Effect**	**Threat or Opportunity**	**Probability**	**Impact**	**Risk Matrix**							**Response**	**Risk Contingency Response Plan**	**Residual Risk**	Actions	Responsibility	Resources
165	3	Roads	Local Access Roads	Lack of private maintenance lack of county communication	Citizen complaints, higher maintenance, drainage issues, vegetation, past practice expectation, no mail service, no school bus service, emergency vehicles?	Threat	4	3								**Transfer**	Clarify County and private responsibility County: fix signs, fix landslides, abandon routine maintenance, maintain bridges Private: routine road maintenance	Risk remains for citizens; reduced work on private roads	3.1 Draft notice for local paper re: County road responsibilities vs. private. 3.2 Continue to answer citizen calls and answer acknowledge with letters.	TCPW Director and Board	3.1 TCPW Director & Board member 3.2 Staff & Director
172	4	Structures	Bridges	Condition deteriorates to point of asset failure under normal traffic loading Lifeline failure during natural disaster event or restricted use Restrictions on load/dimensions of use	loss of life, isolation of people, liability, emergency response, maintenance costs, economic impact, lack of accessibility, detours,	Threat	2	5								**Mitigate**	Pursue federal and state money for bridges in poor condition Inspect and post weight limits. Manage life line routes.	Risk remains if funding not found to address bridges in poor condition or load limit signs are ignored or another major storm causes	4.1 Conduct every other year inspection 4.2 Post weight limited bridges 4.3 Notify industry of routes with posted bridges	Bridge Technician, consulting services and Director	4.1 Bridge testing consultant 4.2 Train staff 4.3 TCPWD Direcotr

	A	B	C	D	E	F	H	I	J	K	L	M	N	O	P	V	W	X	Y	Z	AA
179	**Risk Management Plan for Tillamook County Public Works Department**																				
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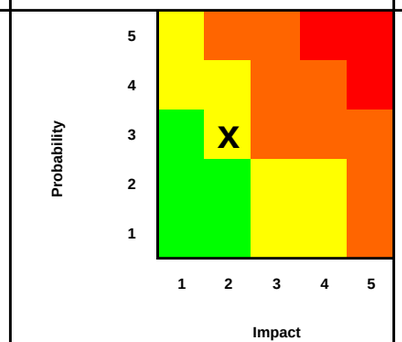
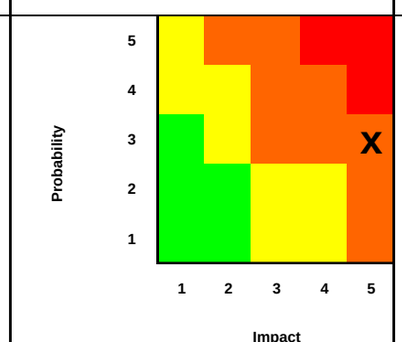
181	**#**	**Program**	**Risk Category**	**Failure Cause**	**Effect**	**Threat or Opportunity**	**Probability**	**Impact**	**Risk Matrix**							**Response**	**Risk Contingency Response Plan**	**Residual Risk**	Actions	Responsibility	Resources
182	5	Structures	Guardrails	Condition deteriorates to point of asset failure Asset fails during natural disaster Asset fails due to failure of roadside slope Guardrail failure caused by poor design, landslide and vehicle impact, storm damage	guard rails sunk below road, more serious injuries, fatalities, negative image	Threat	3	2								**Accept**	Remove dangerous guardrails	Risk remains.	5.1 Identify guardrail in poor condition and remove. 5.2 Notify public in newspaper article of actions	Bridge technician	5.1 Bridge technician 5.2 Bridge technician drafts notice & TCPWD Director reviews & submits to board for approval prior to publishing
189	6	Structures	Levees	Natural disaster (wind/rain, flooding, erosion) causes erosion and embankment failure and flooding	major flooding, economic impacts, fatalities, property damage, road closure	Threat	3	5								**Mitigate**	Inspect levees, repair within budget capabilites Look for hazard mitigation funds Access past inspection reports and develop annual inspection program Develop funding partnerships, and seek disaster	Low when action plan done.	6.1 Develop inspection methodology and program 6.2 Institute practice of inspecting prior to and following storm events. 6.3 Report to board on progam needs.	TCPW Engineering staff and foremen	6.1 Engineering staff 6.2 Foremen 6.3 TCPW Director

	A	B	C	D	E	F	H	I	J	V	W	X	Y	Z	AA
196	**Risk Management Plan for Tillamook County Public Works Department**														
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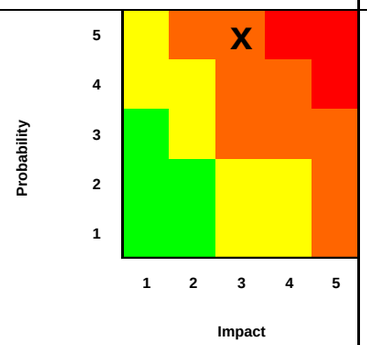
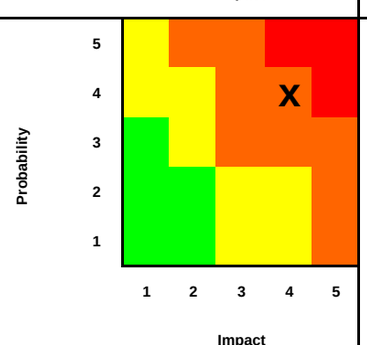
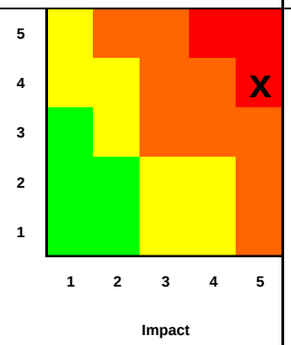
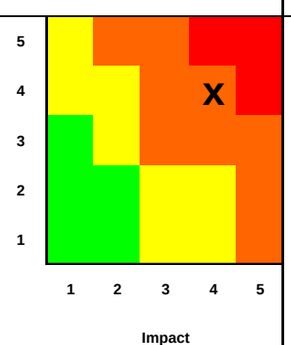
199 200 201 202 203 204 205	7	Drainage	Culverts	Outdated inventory & condition assessment Lack of mapped culverts Low lying roads inundated by plugged or deteriorated culverts Inappropriately sized outfalls beavers, undersized culverts, storm water	road washouts, flood property, road closures, traffic delays, property damage, emergency response issues, ecological impacts, negetive impact on road integrity	Threat	5	3		**Mitigate**	Scope plan for storm water managemenbnt program: inventory and map assets, inspect, rate condition. Develop preventive maintenance program	Reduced when plan done.	7.1 Develop inventory & planned inspection and cleaning program 7.2 Reduce failed culverts as budget allows 7.3 Report to board on program costs & needs.	TCPW Director & foremen	7.1 Director and consulting services & foremen 7.2 Director
206 207 208 209 210 211 212	8	Drainage	Ditches and Shoulders	No inventory or condition assessment Eliminated program over 20 years ago, vegetation up to road	road washouts, flood property, road closures, traffic delays, property damage, emergency response issues, ecological impacts, negetive impact on road integrity, premature road deterioration, shoulder buildup of debris	Threat	4	4		**Mitigate**	Develop inventory and map ditches; inspect, rate condition	Reduced when plan done.	8.1 Develop inventory & planned inspection and cleaning program as budget allows 8.2 Report to board on program costs & needs.	TCPW Director & foremen	8.1 Director and consulting services & foremen 8.2 Director

	A	B	C	D	E	F	H	I	J	K	L	M	N	O	P	V	W	X	Y	Z	AA
214	**Risk Identification**						**Qualitative Risk Assessment**									**Management Plan**					
215	**#**	**Program**	**Risk Category**	**Failure Cause**	**Effect**	**Threat or Opportunity**	**Probability**	**Impact**	**Risk Matrix**							**Response**	**Risk Contingency Response Plan**	**Residual Risk**	Actions	Responsibility	Resources
216	9	Veg.Mgmt	Spraying & Mowing	Lack of sight distance Obstructs traffic signs	builds shoulders, accidents, loss of sight distance, road deterioration, property damage, user costs, black ice, complaint volume increase	Threat & Opportunity	4	5								**Mitigate & Transfer**	Communicate change in policy on LARs to public Request public help maintaining private roads/LARs	Short term increased risk until public notified	9.1 Spray vegetation and report in accordance with DOA. 9.2 Mow vegetation as budget allows. 9.3 Provide public notice in local paper of changed policy 9.2 Board rescinds LAR Board Order	Staff and Dirctor; Board approval required	9.1 Jeanette drafts for Director's approval; review with Board & send to local paper 9.2 Director & Board
223	10	Traffic Safety	Signs-Regulatory (stop signs) red/white	Loss of sign in key locations Condition (reflectivity) falls below threshold Vandalism or graffiti Posts knocked over from storm age deterioration	incrased fatalities, accidents, complaints, speeding, etc. and overtime costs due to reactive maintenance	Threat	4	4								**Avoid**	Continue regulatory sign maintenance	Low risk when plan executed/	10.1 Continue sign maintenance program on regulatory signs only 10.2 Report sign need based on inspection	Foremen & Bridge technician	10.1 Foremen 10.2 Bridge technician

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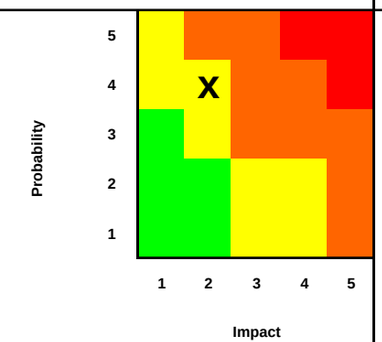
230	**Risk Management Plan for Tillamook County Public Works Department**																				
231	**Risk Identification**						**Qualitative Risk Assessment**									**Management Plan**					
232	**#**	**Program**	**Risk Category**	**Failure Cause**	**Effect**	**Threat or Opportunity**	**Probability**	**Impact**	**Risk Matrix**							**Response**	**Risk Contingency Response Plan**	**Residual Risk**	Actions	Responsibility	Resources
233	11	Traffic Safety	Signs-Other	Loss or lack of sign in key locations Condition falls below threshold Vandalism or graffiti Posts knocked over from storm	increased emergency response to down and vandalized signs, increased citizen complaints, increased overtime costs due to reactive maintenance	Threat	4	2								**Accept**	No overtime response for requests to replace non-regulatory signs down	Risk remains	11.1 Communicate decision to defer non-regulatory sign maintenance & overtime	Director & foremen	11.1 Director & foremen
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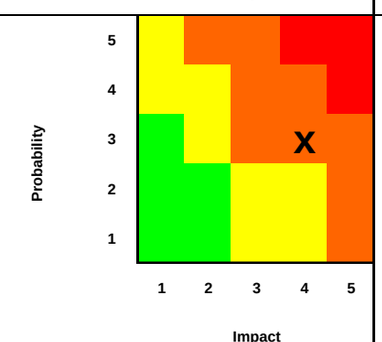
240	12	Traffic Safety	Pavement markings	Markings not replaced annually Poor or no visible markings	accidents		3	4								**Mitigate**	Reduce pavement marking service by providing fog lines on high traffic roads only	Risk remains	12.1 Communicate decision to staff managing painting contract 12.2 Include clarificationon reduced pavement marking service so public is aware of change	Bridge technician & Director	12.1 Bridge technician 12.2 Director
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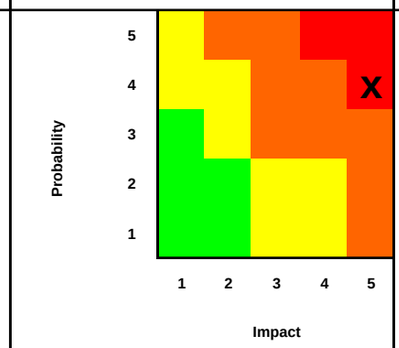
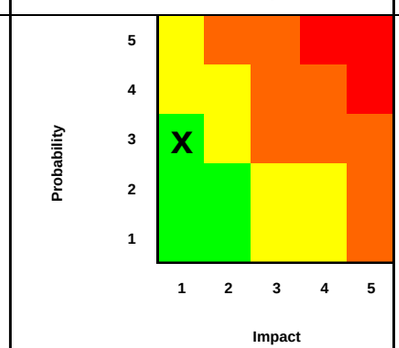
247	**Risk Management Plan for Tillamook County Public Works Department**																				
248	**Risk Identification**						**Qualitative Risk Assessment**									**Management Plan**					
249	**#**	**Program**	**Risk Category**	**Failure Cause**	**Effect**	**Threat or Opportunity**	**Probability**	**Impact**	**Risk Matrix**							**Response**	**Risk Contingency Response Plan**	**Residual Risk**	Actions	Responsibility	Resources
250	13	Equipment	Fleet & Equipment	Inadequate preventive maintenance Vehicles exceed useful life/ performance Vehicles outdated or unsafe for job	accidents, time loss at work		4	5								**Mitigate**	Support set aside for vehicle replacement fund	Reduced over long term when action plan followed.	13.1 Continue annual equipment replacement fund set aside 13.2 Continue tracking time and hours of performance & maintenance cost per vehicle 13.3 Report on need	TCPW Director & Equipment Supervisor	13.1 Director 13.2 Equipment Supervisor
257	14	Facilities	TCPWD Buildings	Buildings not to code Buildings functionally inadequate Buildings in poor condition	Worker safety Poor employee Costly reactive maintenance	threat	3	1								**Mitigate**	Annual inspection program Pursue consultative inspection Provide minimal maintenance	Risk remains	14.1 Conduct annual inspeciton of buildings 14.2 Provide reactive building maintenance 14.3 Report on need	County staff & TCPWD Director	14.1 County building inspectors 14.2 TCPW staff 14.3 TCPW Director

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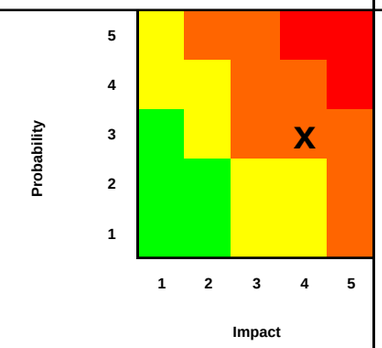
264	**Risk Management Plan for Tillamook County Public Works Department**																				
265	**Risk Identification**						**Qualitative Risk Assessment**									**Management Plan**					
266	**#**	**Program**	**Risk Category**	**Failure Cause**	**Effect**	**Threat or Opportunity**	**Probability**	**Impact**	**Risk Matrix**							**Response**	**Risk Contingency Response Plan**	**Residual Risk**	Actions	Responsibility	Resources
267	15	Materials Mgmt.	Quarries	Inadequate crushed rock Threat of selling quarries	Buy more costly materials that don't meet job needs Slower delivery of materials	threat	4	3								**Mitigate**	Do not sell County quarries Continue to get rock from County quarries	Low risk when plan executed/quarries retained.	15.1 Review decision with Board to elevate understanding of risk & strategy	TCPW Director	15.1 TCPW Director & Board
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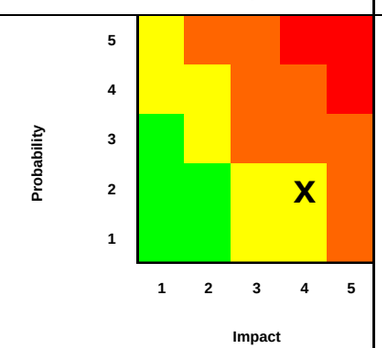
274	16	Engineering	Engineering Staff	Staff inadquate for volume of permits Qualified staff resigns or retires	Slow permit review Threat that mandated review cycle not met Higher costs to developers, utilities and citizens	threat	2	4								**Mitigate**	Increase permit fees, review fees	Risk remains until fees increased and additional staff hired	16.1 Review current permit fees and compare to adjoining counties 16.2 Report to Board and identify if increase fees	Staff and Dirctor	16.1 Engineering staff 16.2 TCPW Director
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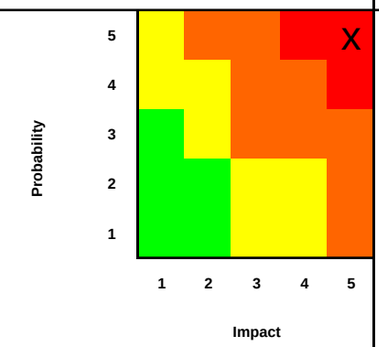
281	**Risk Management Plan for Tillamook County Public Works Department**																				
282	**Risk Identification**						**Qualitative Risk Assessment**									**Management Plan**					
283	**#**	**Program**	**Risk Category**	**Failure Cause**	**Effect**	**Threat or Opportunity**	**Probability**	**Impact**	**Risk Matrix**							**Response**	**Risk Contingency Response Plan**	**Residual Risk**	Actions	Responsibility	Resources
284	17	Admin. Services	Department Employees	Inadquate staffing Inadequate compensation Inadquate technical training Insufficient funding to hire, train employees	Poor employee morale Poor public image Slower response to public requests for service Accelerated employee turnover & loss of corporate knowledge	threat	5	5								**Accept & Mitigate**	Provide information for citizens revenue initiative, as requested Implement layoffs October 2008 Implement reduced services focused on Extreme and High risk services (see above)	Risk remains	17.1 Provide information to citizen revenue initiative 17.2 Implement layoffs in October 2008 17.3 Continue performance reviews & ensure market rate compensation for staff 17.4 Communicate	TCPW Director & County Board	17.1-3 TCPW Director 17.4 County Board 17.5 TCPW Director and Board
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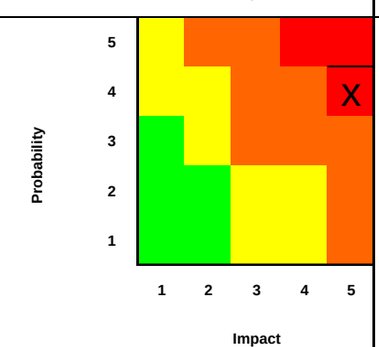
291	18	Emrgcy. Mgmt.	Roads Bridges Culverts Ditches Signs Levees Department Employees	Natural disasters Extreme weather events Failed roads, bridges, drainage systems and levees	Closed routes for emergency services Increased demands and risk to private property and life Flooding due to failed levees or culverts or flooded roads	threat	4	5								**Mitigate**	Provide information for citizens revenue initiative, as requested Implement layoffs October 2008 Implement reduced services focused on Extreme and High risk services (see above)	Risk remains	18.1 Participate in emergency drills 18.2 Buy emergency generators 18.3 Check and mitigate known high risk assets (culverts) at hot spots before events 18.4 Ensure TCPWD staff have	TCPW Director	18.1 Director and staff 18.2 Shop Supervisor 18.3 TCPWD staff 18.4 Director and staff
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