Using Risk to Set Road Service Priorities

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Patricia Bugas-Schramm, PBS Consulting, Inc.

NWPMA Fall Conference
Portland, Oregon
October 21, 2011

Presentation Overview

- Risk Management Principles, Framework and Process
- Tillamook County
  - Challenges
  - Process
  - Risk-based Service Priorities & Management Strategy
- Next Steps

Risk Management Purpose

Identify County strategic transportation service priorities based on community values, understanding of the cumulative consequences of past decisions and likelihood of future performance, costs and risk.

Risk Management Principles

- Establishes values of organization & community
- Integral part of organizational processes
- Explicitly addresses uncertainty
- Systematic, structured & timely
- Based on the best available information
- Tailored to agency/organization
- Takes human & cultural factors into account
- Transparent and inclusive
- Dynamic, iterative and responsive to change
- Facilitates continual improvement and enhancement of organization

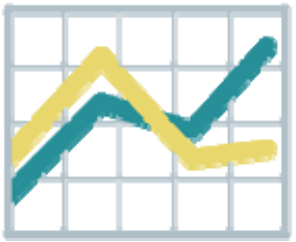
AS/NZS ISO 31000:2009

Applies to any positive or negative risk related to

- Organization
- Services and assets
- Activities
- Strategies & decisions
- Operations
- Processes
- Functions
- Projects
- Products

Risk management is at the core of Asset Management

- Policy driven
- Performance based
- Options evaluated (performance, cost & risk)
- Decisions based on quality information
- Clear accountability



Risk-based Asset Management provides stability

Classify

- Develop inventory of assets, their attributes
- Identify parent-child relationships
- Put in network

Analyze

- Perform failure/risk analysis & what is critical or extreme risk
- Identify current actions to control risk (resources, timing)

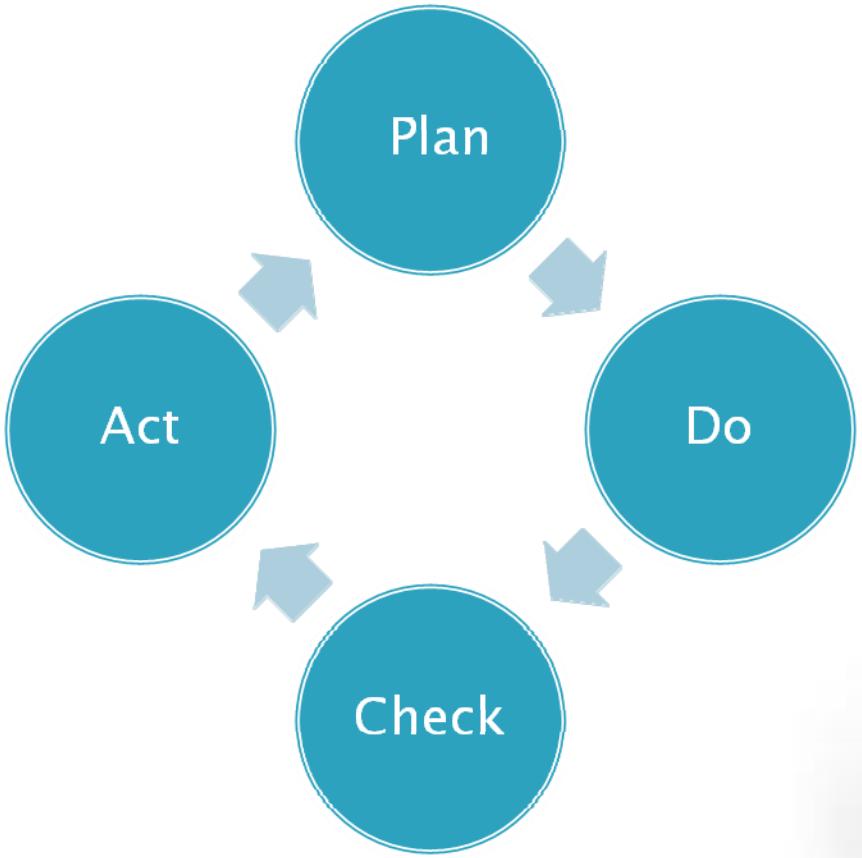
Control

- Identify appropriate actions to control risk (predictive modeling, monitoring, preventive maintenance, functional redesign, operational activities, redundancy)

Measure

- Evaluate performance of assets that provide Key Performance metrics to identify where greatest impact, based on values of community & agency
- Use information to further analyze & manage risks

Continuous Improvement



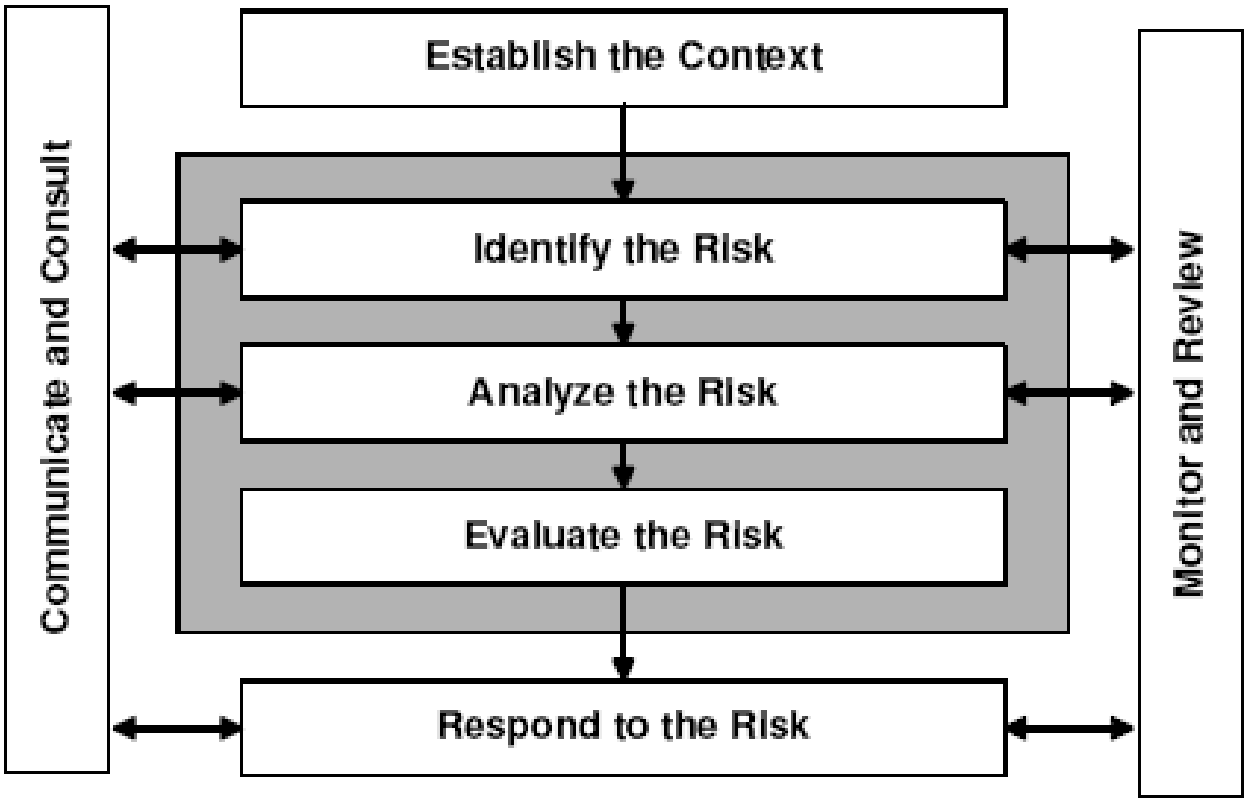
Benefit of Risk Assessment – Better Decisions

- Minimize costs and risks
- Improve transparency of decisions and benchmarking
- Improved services and customer satisfaction
- Consistent approach & criteria for assessing risks
- Improved financial efficiency
- More sustainable decisions – link asset planning to long term financial plan

"What are the critical risks & how do we minimize them?"

Risk Assessment Framework

A formal process to identify, evaluate and manage risks



Risk Management Principles & Guidelines ISO 31000:2009

Presentation Overview

- ❑ Risk Management Principles, Framework and Process
- ✓ Tillamook County
  - o Challenges
  - o Process used in 2008 & 2010
  - o Risk-based Service Priorities in 2010 & Management Strategy
- ❑ Next Steps

Step 1 – Set the Context of Risk

- Establish
  - the objectives,
  - stakeholders,
  - key issues and
  - criteria against which risk will be evaluated.
- These are directly related Tillamook County goals and road service delivery objectives.

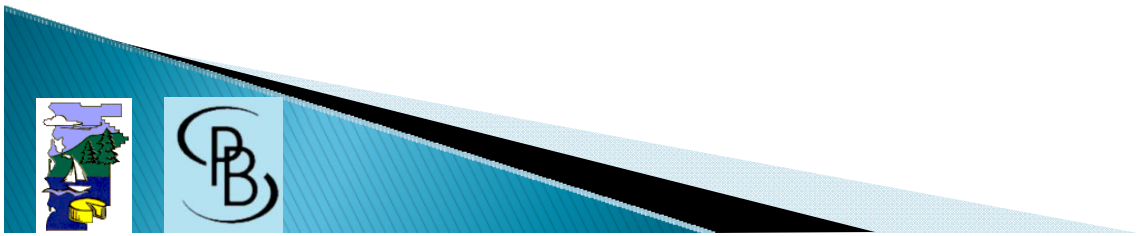
County Public Works Mission

We take pride in serving the public by

- providing, maintaining, and **preserving** a safe and efficient county road network, and
- quickly responding to weather events and hazards.

We protect the public's investment by

- working with our **partners** and
- targeting resources to minimize **long term costs** while
- providing the best possible service.



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2009

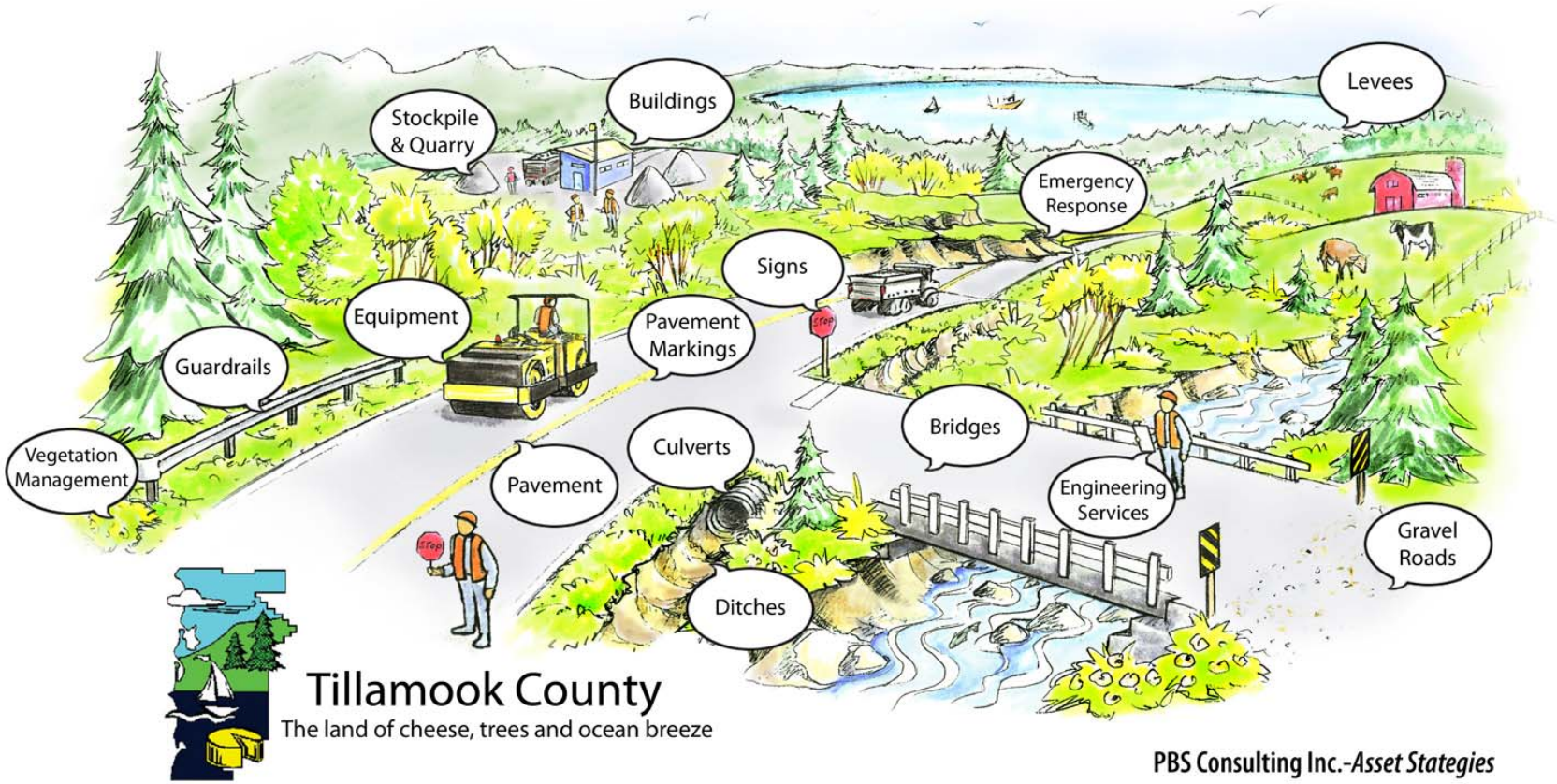
Key Issues

- Severe & frequent weather events
- Aging and inadequate infrastructure
- Economy generates heavy vehicles (dairy & logging trucks), and vehicle volume doubles in the summer (tourism)
- Rural, aging population
- High construction costs & environmental standards
- Decreasing number of Road Dept. employees

County Road Programs

Your County Road Dollars At Work

$393 Million Replacement Value



PBS Consulting Inc.-*Asset Stategies*

Current State of County Transportation Assets

- Inventory
- Value
- Condition & "remaining useful life"

TILLAMOOK COUNTY ROAD NETWORK
INVENTORY, CONDITION, AND VALUE
JULY 2011

FACILITY	GASB34	STATUS	REPLACEMENT VALUE	CONDITION*						TOTAL UNMET NEED**
				VG	G	F	P	VP	TBD	
PAVEMENT										
Paved	X	269 centerline miles	$261,600,000		27%	15%	24%	34%		$57,000,000
Gravel		65 centerline miles	$2,405,670						X	N/A
			$264,005,670							$57,000,000
STRUCTURES										
Bridges	X	99	$100,211,496		67%	20%	13%			TBD
Guardrails		10.1 miles	$1,152,385	39%	8%	8%	33%	10%	2%	$495,526
Levees		7	TBD						X	TBD
			$101,363,881							$495,526
DRAINAGE										
Culverts	X	3,210	$17,866,808						X	TBD
Ditches		198 miles	TBD	1%	6%	63%	22%	8%		TBD
TRAFFIC SIGNALS		1	$45,000						X	TBD
STREET SIGNS										
Signs (Condition for Stop Signs only)	X	5,426	$173,632						X	TBD
Delineators	X	456	$10,032						X	TBD
Posts	X	4,173	$91,806						X	TBD
			$275,470							
PAVEMENT MARKINGS										
Painted center lines miles		299	N/A							N/A
Painted Stop Bars		TBD	N/A							N/A
VEHICLES & EQUIPMENT* **	X	118	$3,966,527						TBD	TBD
MAINTENANCE YARDS	X	3	$4,000,000						X	
RIGHT-OF-WAY* **		2,367 acres	$1,475,557							
TOTAL			$392,998,913							

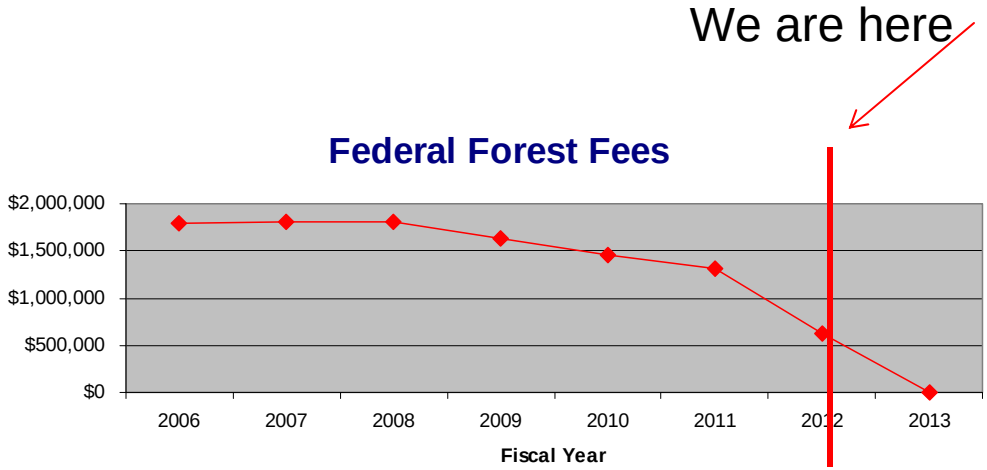
*Asset condition categories vary using 3, 4 and 5-level condition assessment categories.
**Unmet need varies by asset class; the level of service is defined specific to the asset class' highest performance for the least cost, or can simply be the elimination of assets in poor condition (e.g., signs).

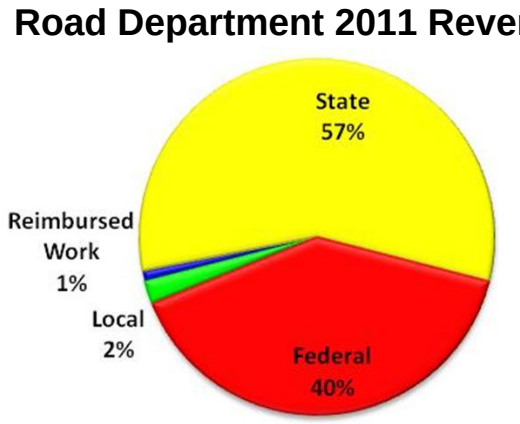
****Tillamook County Comprehensive Financial Annual Report*, June 30, 2010. ROW width: minor arterials & major collector: 60 feet; minor collector width is 60 feet; locals 45 feet.

Notes: VG = Very Good, G = Good, F = Fair, P = Poor, VP = Very Poor, TBD = To Be Determined, N/A = Not Applicable

Significant Decline in County Road Funding

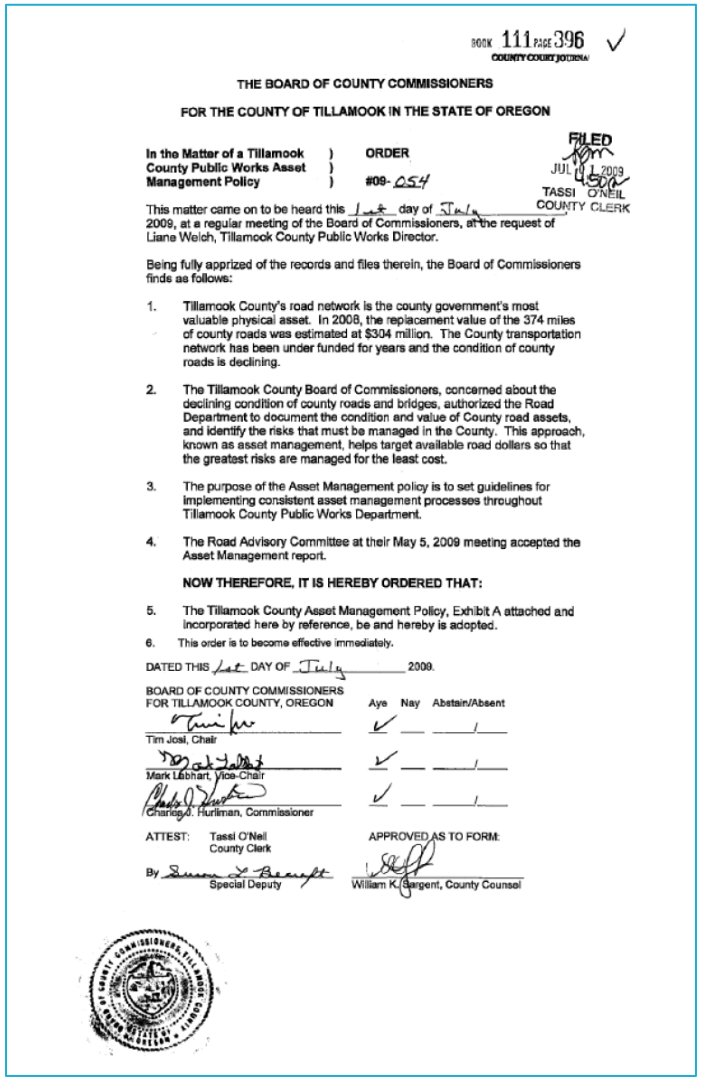
- Elimination of Federal funds July 1, 2012
- Slight increase in State gas tax
- No Local property tax support





County Asset Management Policy

- Strategy-based service delivery
- Manage lifecycle cost to minimize risk and costs
- Meet regulatory mandates
- Manage social, economic & environmental impacts
- Culture change – all embrace principles in day to day
- Deliver agreed level of service given resources
- Link financial plan with road services
- Communicate results



BOOK 111 PAGE 396
COUNTY COURT JOURNAL

THE BOARD OF COUNTY COMMISSIONERS

FOR THE COUNTY OF TILLAMOOK IN THE STATE OF OREGON

FILED
JUL 01 2009
TASSI O'NEIL
COUNTY CLERK

In the Matter of a Tillamook County Public Works Asset Management Policy) ORDER #09-054

This matter came on to be heard this 1st day of July 2009, at a regular meeting of the Board of Commissioners, at the request of Liane Welch, Tillamook County Public Works Director.

Being fully apprized of the records and files therein, the Board of Commissioners finds as follows:

1. Tillamook County's road network is the county government's most valuable physical asset. In 2008, the replacement value of the 374 miles of county roads was estimated at $304 million. The County transportation network has been under funded for years and the condition of county roads is declining.
2. The Tillamook County Board of Commissioners, concerned about the declining condition of county roads and bridges, authorized the Road Department to document the condition and value of County road assets, and identify the risks that must be managed in the County. This approach, known as asset management, helps target available road dollars so that the greatest risks are managed for the least cost.
3. The purpose of the Asset Management policy is to set guidelines for implementing consistent asset management processes throughout Tillamook County Public Works Department.
4. The Road Advisory Committee at their May 5, 2009 meeting accepted the Asset Management report.

NOW THEREFORE, IT IS HEREBY ORDERED THAT:

5. The Tillamook County Asset Management Policy, Exhibit A attached and incorporated here by reference, be and hereby is adopted.
6. This order is to become effective immediately.

DATED THIS 1st DAY OF July 2009.

BOARD OF COUNTY COMMISSIONERS FOR TILLAMOOK COUNTY, OREGON — Aye Nay Abstain/Absent

Tim Josi, Chair — ✓

Mark Labhart, Vice-Chair — ✓

Charles J. Hurliman, Commissioner — ✓

ATTEST: Tassi O'Neil, County Clerk — By Special Deputy

APPROVED AS TO FORM: William K. Sargent, County Counsel

2009

Step 2 – Identify Risk

Risk Identification				
#	Program	Risk Category	Failure Cause	Effect
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

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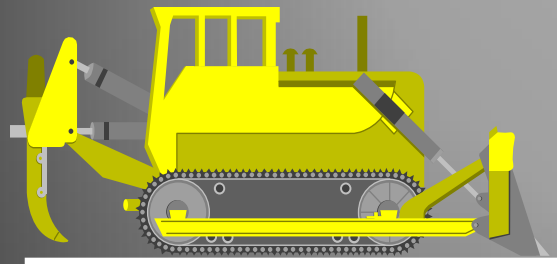
How Things Fail

- Natural events – floods or windstorms
- Physical failure – bridge or levee failure
- Operation risk – lack of staff to inspect and maintain assets adequately
- External impacts – loss of federal forest receipts
- Opportunity risk – grant or partner-funded project that adds to long term maintenance needs

Perceived Road Costs



Construction Costs

Design Costs

Site costs

Finance Costs

Maintenance Costs

Operations Costs

Depreciation Expense

Management Costs

What are my best minimum costs to operate/maintain/renew?

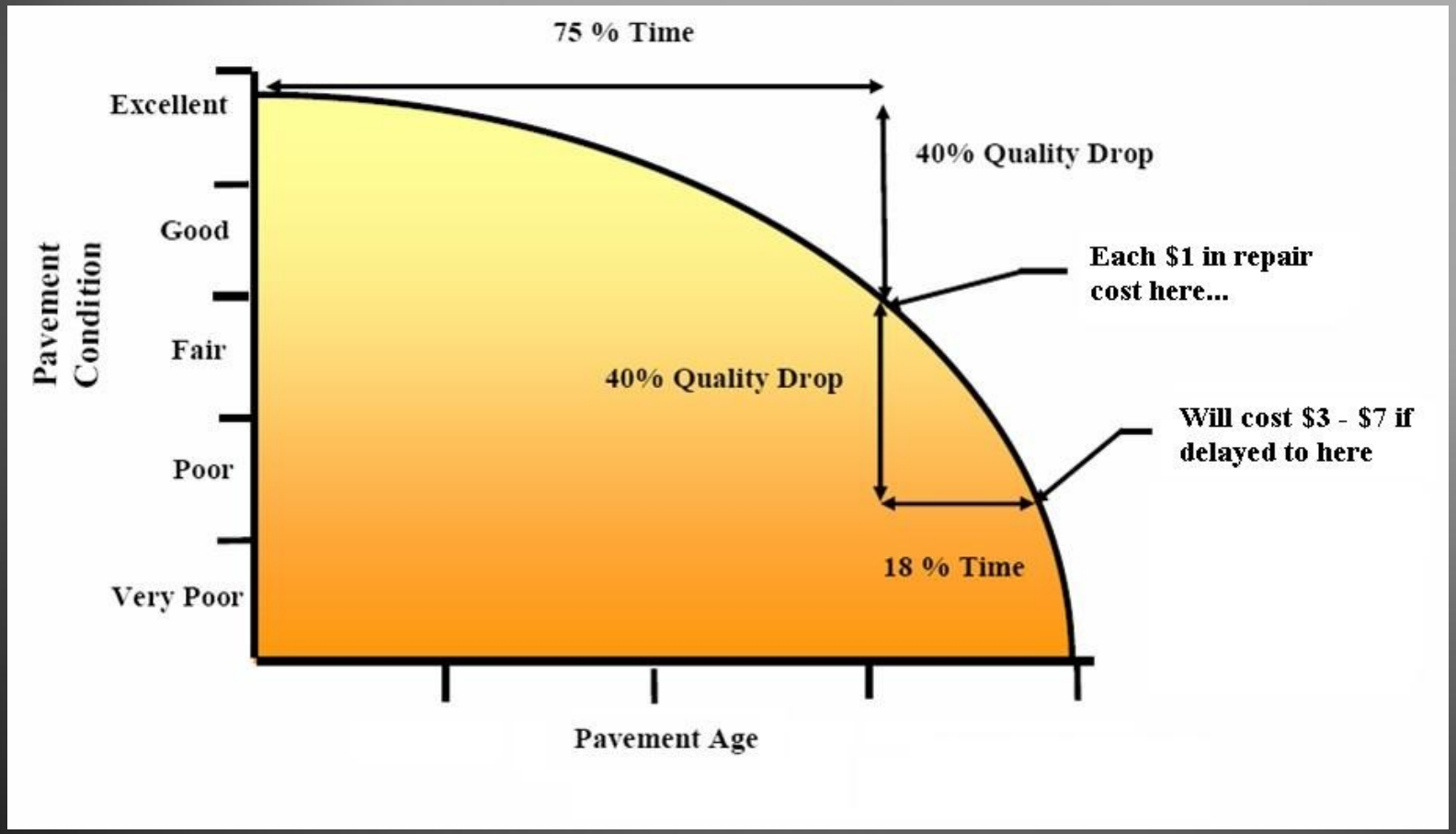


Table 1: Likelihood of Failure

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

Consequences of Failure

- Economic (damages to community, losses, additional expenditures)
- Legal compliance
- Community impact (service reduction or elimination)
- Human health and safety (community)
- Reputation
- Environment
- Human resources (reduction in staff; employee safety, overtime & workload; emergency response)

Table 2: Consequences of Failure to reflect current business risks*

- Changed Human Resource Impact in 2010

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-$25,000	$25,000 -$100,000	$100,000 - $250,000	Greater than $250,000
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 (Reduction in staff; Employee safety, overtime & workload; Emergency response)	0	0	1	1	2

*updated and reviewed by CRAC, November 2010

Step 3 – Analyze Risk

Risk = Likelihood x Consequence

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

Step 4 – Rate risk

Risk = Likelihood x Consequence of failure

2. Qualitative Risk Assessment																
Likelihood	Consequence	Risk Rating											BRE	Required Action	Is risk acceptable ?	Risk Response
low	high	Likelihood	5										M	Management responsibilities specified and risk controls reviewed	No	Mitigate
			4													
			3													
			2							X						
			1													
				1		2		3		4		5				
				Consequence												

Step 5 – Risk Treatment

Business Rule: Treatment actions must manage Risk level.

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

Step 6 – Select Management Strategy

Risk Management Strategies	
Avoid	Changing activity or asset management plan to eliminate the threat posed by an adverse risk; to avoid risk by clarifying requirements, obtaining information, improving communications, or acquiring expertise.
Transfer	Risk transference requires shifting the negative impact of a threat, along with the ownership of the response to a third party (e.g. insurance, or transfer responsibility to private or other public entity). This doesn't eliminate the risk.
Mitigate	Implies a reduction in the probability and/or impact of an adverse risk event to an acceptable threshold.
Accept	Retain the risk; Indicates decision to deal with a risk, or recognition of inability to identify any other suitable response strategy.

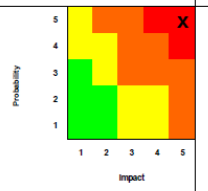
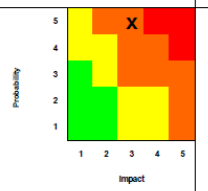
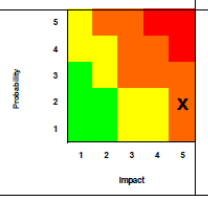
Step 7 – Develop Treatment Plan

Management Plan					
Response	Risk Contingency Response Plan	Residual Risk	Actions	Responsibility	Resources
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

Step 8 Manage, Monitor & Report Risk Treatment Plan

- Failure Cause
- Effect
- Likelihood
- Consequence
- Rating
- Response
- Mitigation Plan

Risk Management Plan for Tillamook County Public Works Department

Risk Identification						Qualitative Risk Assessment			Management Plan	
#	Program	Risk Category	Failure Cause	Effect	Threat or Opportunity	Probability	Impact	Risk Matrix	Response	Risk Contingency Response Plan
1	Roads	Arterial & collector paved roads	Lack of timely maintenance Insufficient funding Poor design Wet climate/storm damage Poor drainage, utility work traffic loads, lack of enforcement, environmental regulations, inappropriate vehicle loading, vegetation impact, poor construction, implements o f husbandry, inadequate contract supervision	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, impacts public safety	Threat	5	5		Mitigate & Transfer	Communicate reduced level of service; Fill pot holes and pave based on road classification and available revenues; Transfer County roads to others as possible; Evaluate on case basis the cost/benefit of turning paved roads to gravel & consider speed signs
2	Roads	Gravel roads	Lack of maintenance; Poor design; Wet climate; Poor drainage; Poor rock quality proocessing; Well-meaning public with unintentional consequences;	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	3		Accept & Mitigate	Grade gravel roads; Focus on higher volume roads with more residents; Transfer jurisdiction to other agencies; Consider no maintenance & signing "Limited maintenance"
3	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, scour; Wet climate; Age; Material deterioration; Tide/salt/environmental impacts	Loss of life; Isolation of people; Liability, emergency response/life safety due to detours; Maintenance costs; Economic impact; Lack of accessibility, detours; County-wide, utility & intrastate communication lines interrupted; Failure of bridge shifts traffic to others inventory	Threat	2	5		Mitigate & Transfer	Consider abandoning or transfer bridges (Whalen Island Bridge); Pursue federal and state money for bridges in poor condition; Inspect and post weight limits; Manage life line routes; Post poor bridges; Inform public of alternate routes

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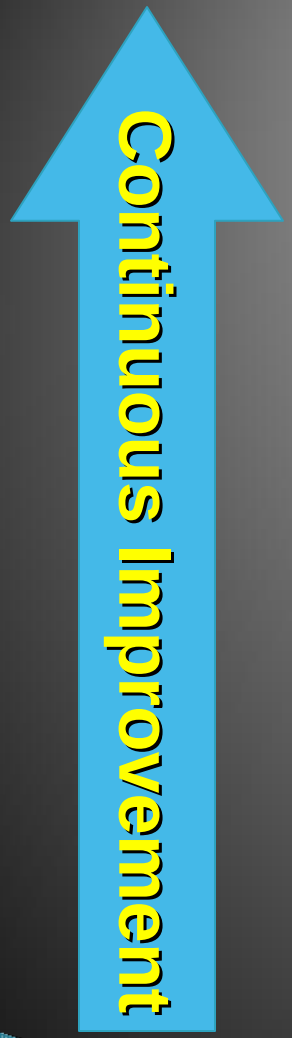
Risk Assessment Process 2010

- **Fall** – Updated Road Performance Report
- November 8, December 1 – PW Risk-rating services and assets
- **November 8** – CRAC review/update of Risk Criteria
- **December 6** – CRAC/BOCC/PW/Public Risk-rating road services and assets
- **December 16** –PW develops delivery strategy

December 6 Public Workshop

- Director & Board of County Commissioners reviews changes in Risk, Performance and Cost of Service with community now and projected
- Clarify road service priorities for Fiscal Year 2011-2012 (what services keep/what services eliminate)
- Objective: We are all on board moving together, on the same page as a County team

Confidence Levels in Information



#5 Optimal — inventory complete, condition inspected and tested by trained personnel on regular schedule, well documented.

#4 High — inventory complete, condition visually inspected by trained personnel on regular schedule, partially documented.

#3 Moderate — inventory complete, condition estimated and certain % tested on regular schedule, verbally documented.

#2 Low — partial inventory, condition based on manufacturer's estimate or other reliable source, process not documented.

#1 No — no inventory, no assessment method, no process.

Confidence Levels in 2010

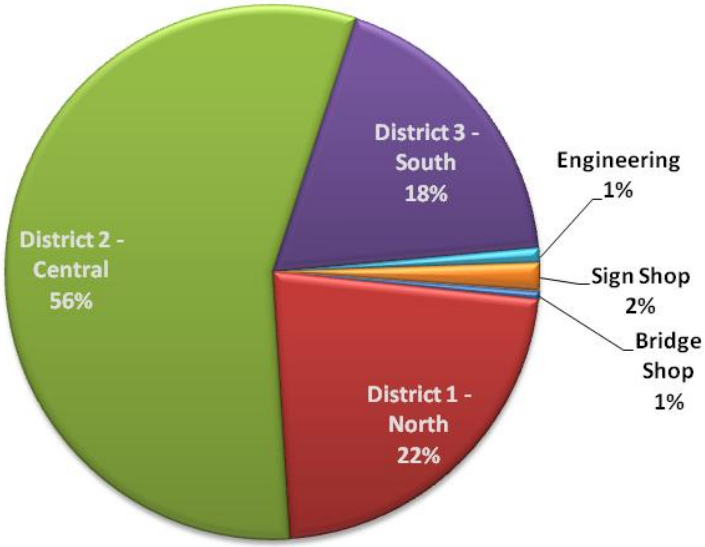
Asset Information	Confidence
Pavement	**Optimal** for the first 3 years and Moderate in years 4-10.
Bridge	**Optimal**
Culverts	**Low;** inventory estimated and condition unknown.
Guardrails	**Moderate**; inventory and condition assessment as of 2007; no inspection cycle established.
Signs	**Moderate**; inventory and condition managed by trained staff through 2008; condition not entered in IRIS
Equipment & Levees	**Optimal;** inventory documented; inspection conducted annually by trained professionals on regular schedule
Remaining assets (Levees, buildings, quarries, ditches)	**Low**; better inventory and condition information, and inspection processes needed
Pavement Markings	**Not applicable**; repainted each year based on inventory

County Road Business Practices

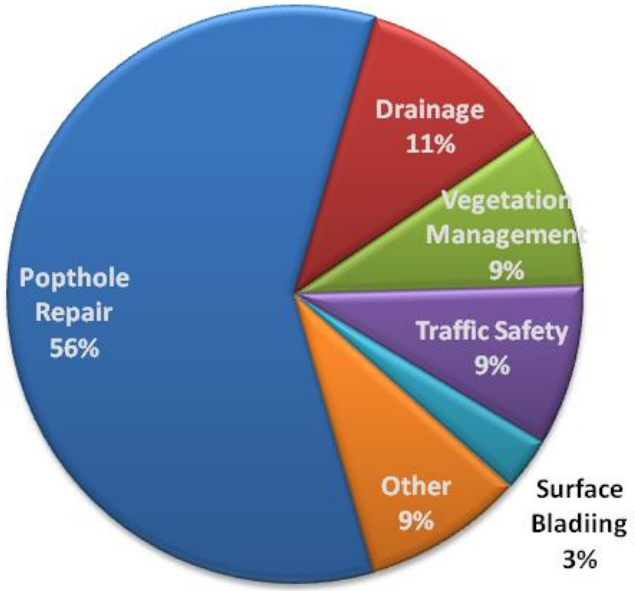
Asset Inventories	Process				
	Inventory?	Documented Condition?	Documented inspection process?	Established inspection schedule?	If yes, frequency?
Roads	Yes IRIS-SS	Yes	Yes	Yes	Every 2 years
Bridges	Yes PONTIS & Excel Spreadsheet	Yes	Yes	Yes	Every 2 years
Traffic Signs -reflectivity	Yes IRIS-RI	Partial IRIS-RI	Yes	Yes	Every 2 year night time inspection
Traffic Signs -maintenance	-	Yes IRIS-RI	Yes Report	No	As resources allow
Guardrail	Yes IRIS-RI	Yes	Yes	No	-
Culverts	Yes (partial)	Yes (2006)	No	No	-
Ditches	Yes (2008)	Yes	Yes	No	As resources allow
Pavement Markings	No	N/A	N/A	N/A	N/A
Levees	Yes (2009)	Yes	No	Yes	Annually
Maintenance Yards	No	No	No	No	-
Vehicles & Equipment	Yes IRIS-EM	Per preventive maintenance	Yes	Yes	Continuous
Quarry sites	No	No	No	No	No
Vegetation Management	-	No	Yes	Yes	Annually

511 Service Requests in 2011

56% in Central District



56% Pothole Related



Service Trends – 2008 vs. 2010

- Risk Rating
- Confidence in Information
- Trend (Good, No Change, Changes Not Favorable)
- Service Requests
- Legal Mandate
- Comments

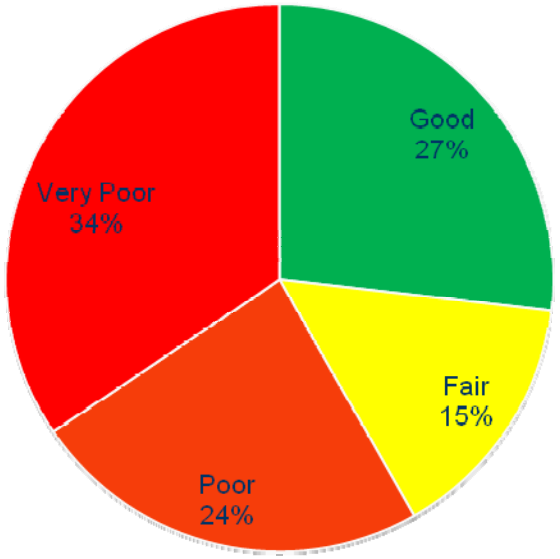
	Subprogram	Risk Rating 2008	Risk Rating 2010	Information	Trend	Comments	2010 Service Requests	Legally Required	Regulation Category
Roads	Arterial & collector paved roads	Extreme	Extreme	5-Optimal	↓	Average network condition stabilized at Poor condition (PCI 46); Inadequate funds to achieve Good condition or prevent future decline.	59%	No	
Veg.Mgmt	Spraying & mowing roadsides	Extreme	Extreme	N/A	↓	Inadequate resources to maintain regular maintenance; not meeting customer expectations	9%	No	
Emergency Management	Roads, Structures, Drainage, Traffic Safety, Department Employees	Extreme	Extreme	N/A	↓	Significant reduction in expenses (5%). No federally declared storms in Fiscal 2010.	1%	No	
Equipment	Fleet & Equipment	Extreme	Extreme	5-Optimal	↓	68% Level A (Preventive Maintenance) performed as needed, based on use; crew & shop performed 100% safety check; replaced spray truck	N/A	No	
Admin. Services	Staffing for cost accounting, budgeting service request & work management, Director, shop supervisor, foremen, equipment operators, work zone flaggers)	Extreme	Extreme	N/A	↓	Currently 23 (44% decline over 12 years). Employees are crucial to providing legally mandated road services, and emergency response. Training required to comply with OSHA and traffic safety requirements.	N/A	No	
Drainage	Culverts, ditches & shoulders	High	Extreme	2-Low	↓	Unknown condition & some catastrophic failures; replaced several culverts; No ditching program; 2008 inventory & condition assessment; 93% require some maintenance & 30% in Poor or Very Poor condition	11%	No	
Traffic Safety	Signs-Regulatory (stop signs)	High	Extreme	3-Moderate	↓	99% stop signs in Good condition; nighttime visibility signs deferred in 2010; inventory & condition not assessed annually	9%	Yes	MUTCD traffic sign and pavement marking safety
Structures	Bridges	High	High	5-Optimal	↓	2 bridges added to inventory in 2010; 13 bridges in Poor condition in 2009, up from 7 in 2008; OTIA funding ended in FY 2010	0%	Yes	National Bridge Inspection Standards (NBIS) every other year to receive federal funds

Paved Roads	**Extreme Risk**
Gravel Roads	**High Risk**

County Road Condition

- PCI 46 or Poor
- 58% in Poor or Very Poor condition

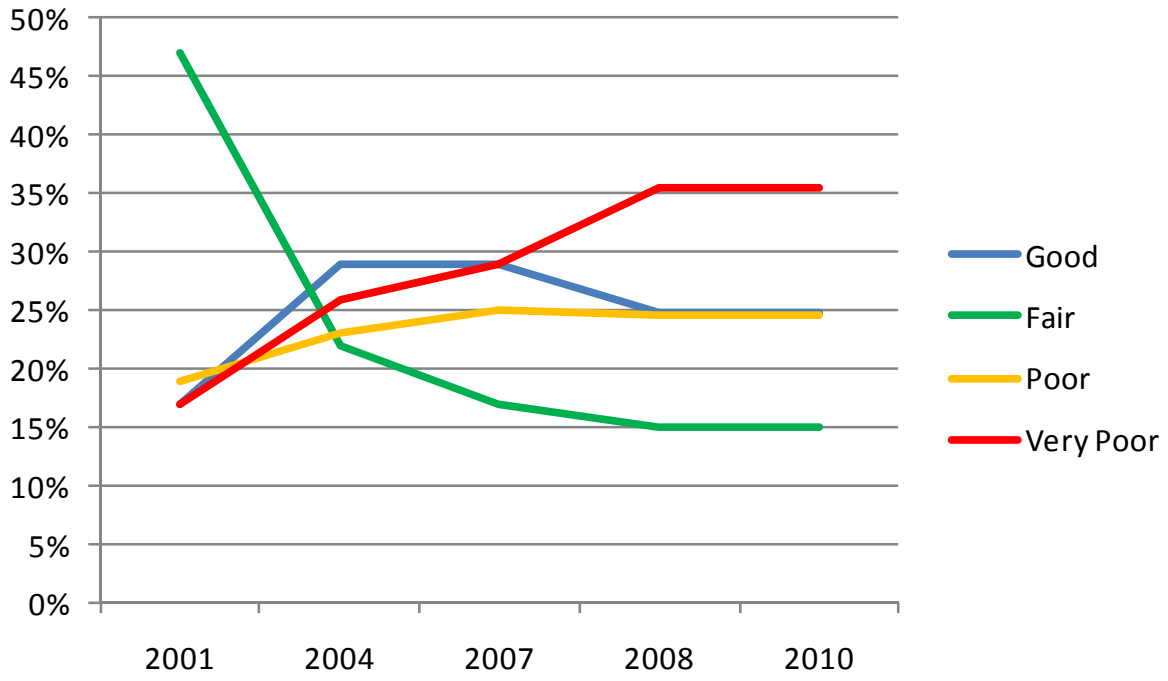
2010 County Paved Road Condition – 46 PCI



Pavement Condition	PCI Range
Good	70-100
Fair	50-69
Poor	25-49
Very Poor	0-24

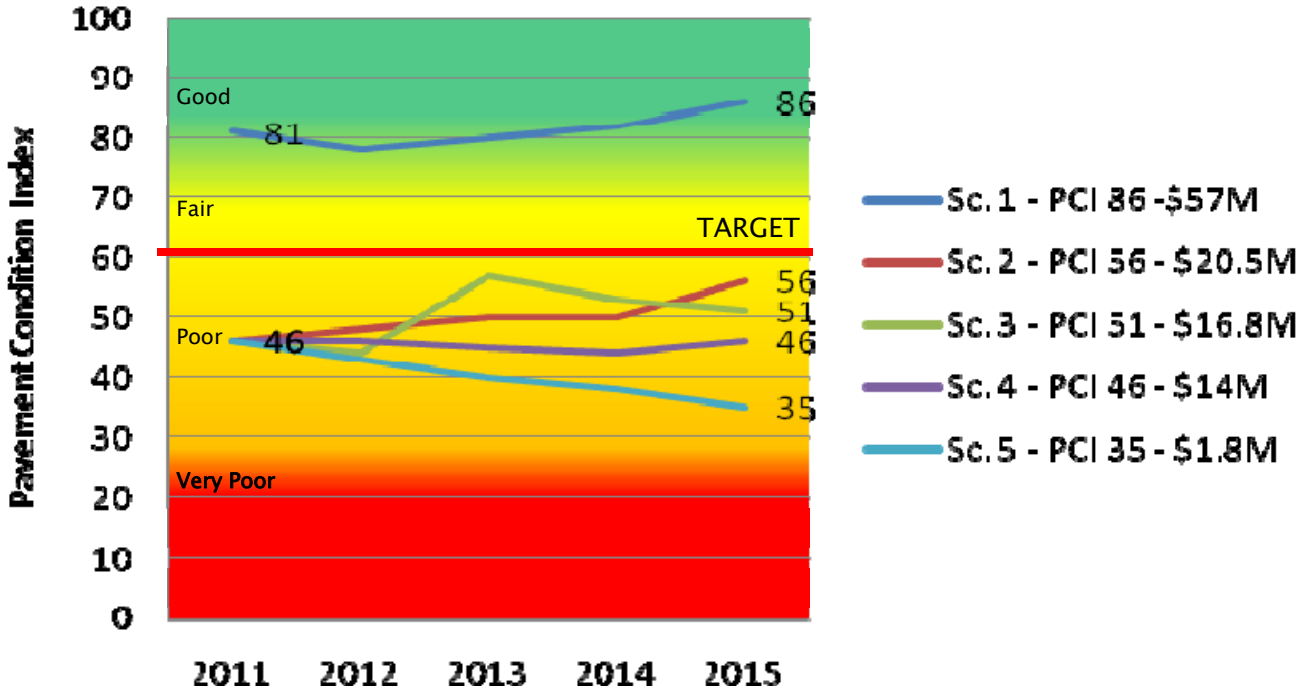
Pavement Condition History

- Since 2004 more in Poor than Good
- Stabilized road condition in 2010



Future Pavement Performance

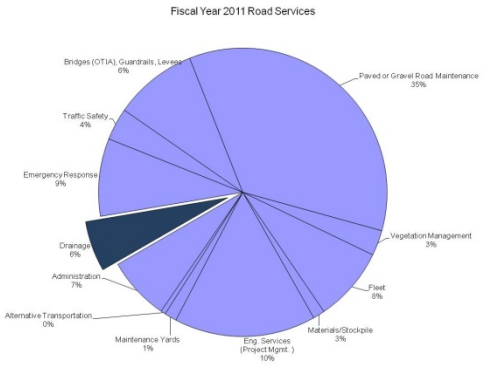
Pavement Condition	PCI Range
Good	70-100
Fair	50-69
Poor	25-49
Very Poor	0-24



Pavement Management Program Budget Options Report, Capitol Asset & Pavement Services, 2010

Extreme Risk

Drainage

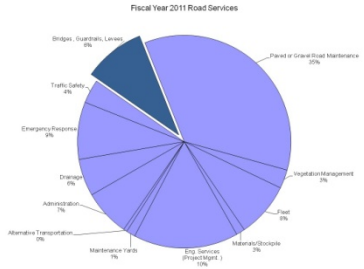


- 11% of Service Requests
- Low confidence in drainage information
- Imminent failure
  - Average age exceeds 50-60 design life
  - Replaced 12 culverts in 2011
  - Replaced culvert with temporary one-lane bridge


Neskowin Trace
Winter Storm 2011

Farmer Creek Road

Bridges	High Risk
Guardrails	Medium Risk



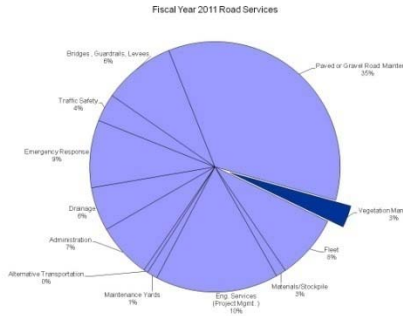
Bridges & Guardrails

- 33% of bridges in Fair or Poor condition
- Bridges in poor condition has increased from 7 to 13 since 2008
- OTIA program ended in 2010
- No guardrail repair program in 15 years


Lommen Bridge


Failed Guardrail

Extreme Risk

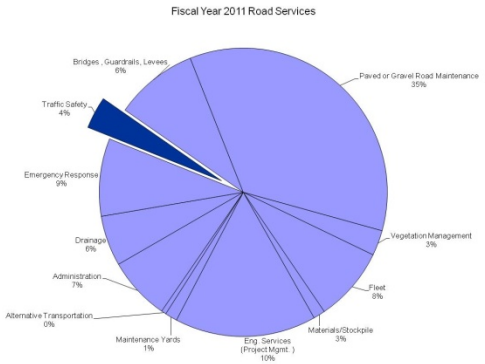


Vegetation Management

- Wet spring
- 3% of Road Fund expenditures
- 44% less than 2010
- Not meeting our mowing & brush cutting service levels
- Source of 9% of service requests

Cape Lookout Road

Regulatory signs & Pavement Markings	High Risk
Non-Reg. Signs	Medium Risk

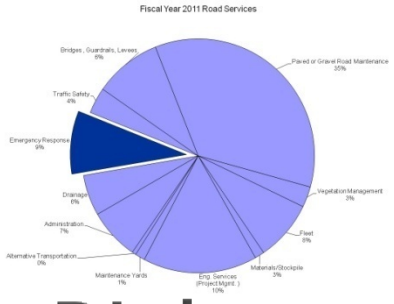


Traffic Safety

- Sign maintenance focuses on stop signs
- Loss of staff has reduced sign condition
- Upcoming changes in sign night time visibility standards (federal mandate)
- 9% of service requests

Bay Ocean Road

Extreme Risk



Emergency Response – Extreme Risk

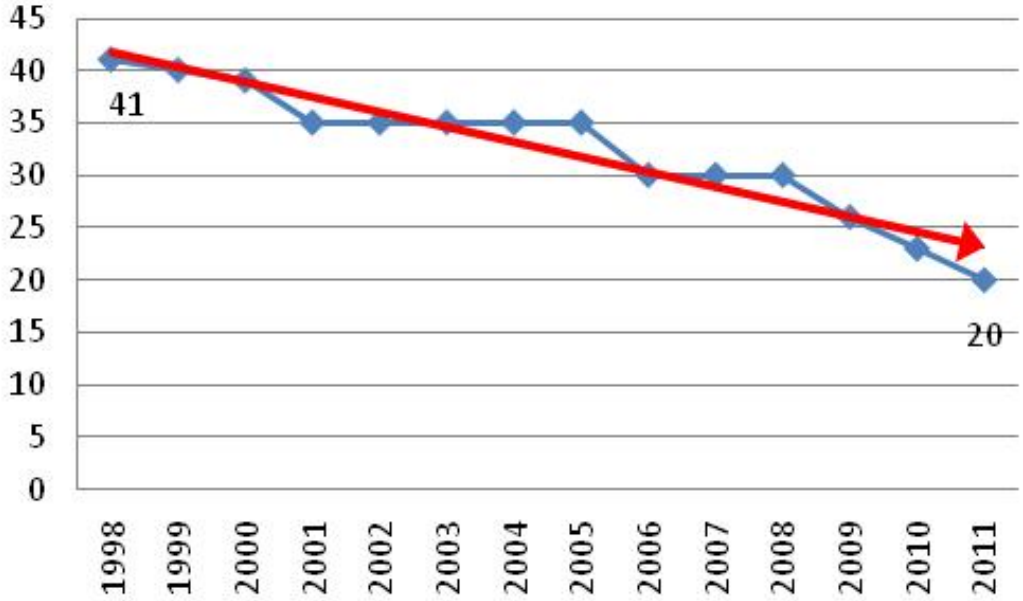
- Extreme La Nina winter
- January 2011 federally declared winter storm
- Experienced staff makes storm response possible
- Takes away from routine maintenance
- 9% of 2011 expenses
- 9% of service requests

Foss Road, January 2011 Storm

Extreme Risk

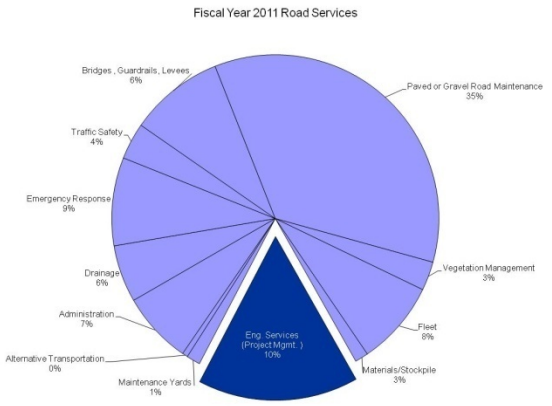
Employees – 44% decline since 1998

Road Dept. Employees 2011



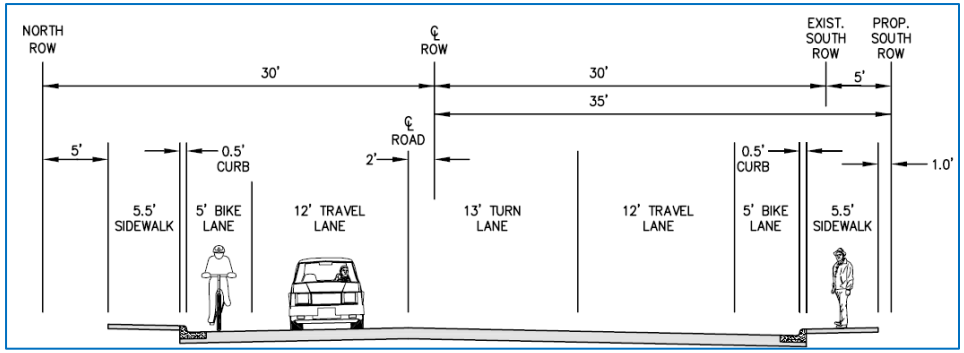
High Risk

Engineering Services



- Dramatically reduced engineering staff

Boulder Creek Bridge



3rd Street Cross-Section

Road Service Tradeoffs

Service	Average Costs	Service Level Impacts	Performance Target Impact ?
Pavement Overlay	$175,000-225,000/mile	Pavement condition continues to decline to PCI 34 in 5 years	Negligible
Vegetation Management (mowing, spraying & brush cutting)	$750/mile or $250,000/334 miles	Significantly improves traffic safety, improves roadway drainage, reduces roadway deterioration, reduction of "danger" trees	Achieves 50% of target (Target: twice a year)
Shoulders & Ditching	$25,000/mile or $500k/198 miles of ditches	Significantly improves traffic safety, improves roadway drainage, reduces roadway deterioration & localized flooding	Would need $1.5M to address Poor/Very Poor (60 miles)
Culverts	Varies by size, fish passage issues, size of waterway	Allows water flow through the transportation system, prevents roadway flooding, improves public safety	Unknown; catastrophic failures & potential public safety risks

L

Director's Recommended Service Level Changes

- $250k per year on pavement overlays (STP)
- Grind Poor paved roads into gravel
- Increase
  - vegetation management
  - ditching
  - shoulder maintenance
  - sign maintenance
- Inventory and assess culvert condition & develop priority list
- Inspect & maintain bridges & seek money to replace bridges

December 16 Workshop
How do we make this happen?

- Set Targets
- Assign resources
- Monitor & report progress

Program	When	FY 2012 Target
Emergency response	Winter-Spring	As needed
Sign maintenance	Winter-Spring	100% assessment (5,406 signs)
Night time sign visibility assessment	Winter-Spring	100% assessment (334 miles)
Rock shoulders	Winter	6 miles
Prepare to Pave	Spring	1 mile
Veg. Mgmt.-Mowing	Spring	50% target (once per year)
Veg. Mgmt.-Brush cutting	Spring	50% target (once per year)
Veg.Mgmt.-Spraying	Spring	As needed
Ditching & Shoulder Maint.	Spring	5 miles ($125k)
Levee inspection	Spring	100% assessment
Pave	Summer -Fall	1 mile
Pothole patching	On-going	As needed
Culvert inventory & condition	August-Fall	100% assessment
Striping	Summer	

December 6 Workshop Conclusions

- Revenues are insufficient to meet need ($800k less)
- Do not fill vacancies (21staff after 1/1)
- Reduce paving to $250k
- Increase “Bang for the Buck” operational activities (vegetation management, ditching, shoulder maintenance, sign maintenance)
- Inspect culvert condition and set priority
- Inspect & maintain bridges & look for outside resources to replace bridges
- Communicate road service risks, accomplishments and tradeoffs

3-Year Planned Improvements

- Significant increase in activities with no materials costs
- Assess & manage drainage & vegetation (culverts, ditching, mowing, spraying)
- Identify activity targets
- Collect data on work accomplished
  - Use DMI
  - Develop data collection forms (signs, culverts)
  - Improve link between time cards, service requests/work completed

Presentation Overview

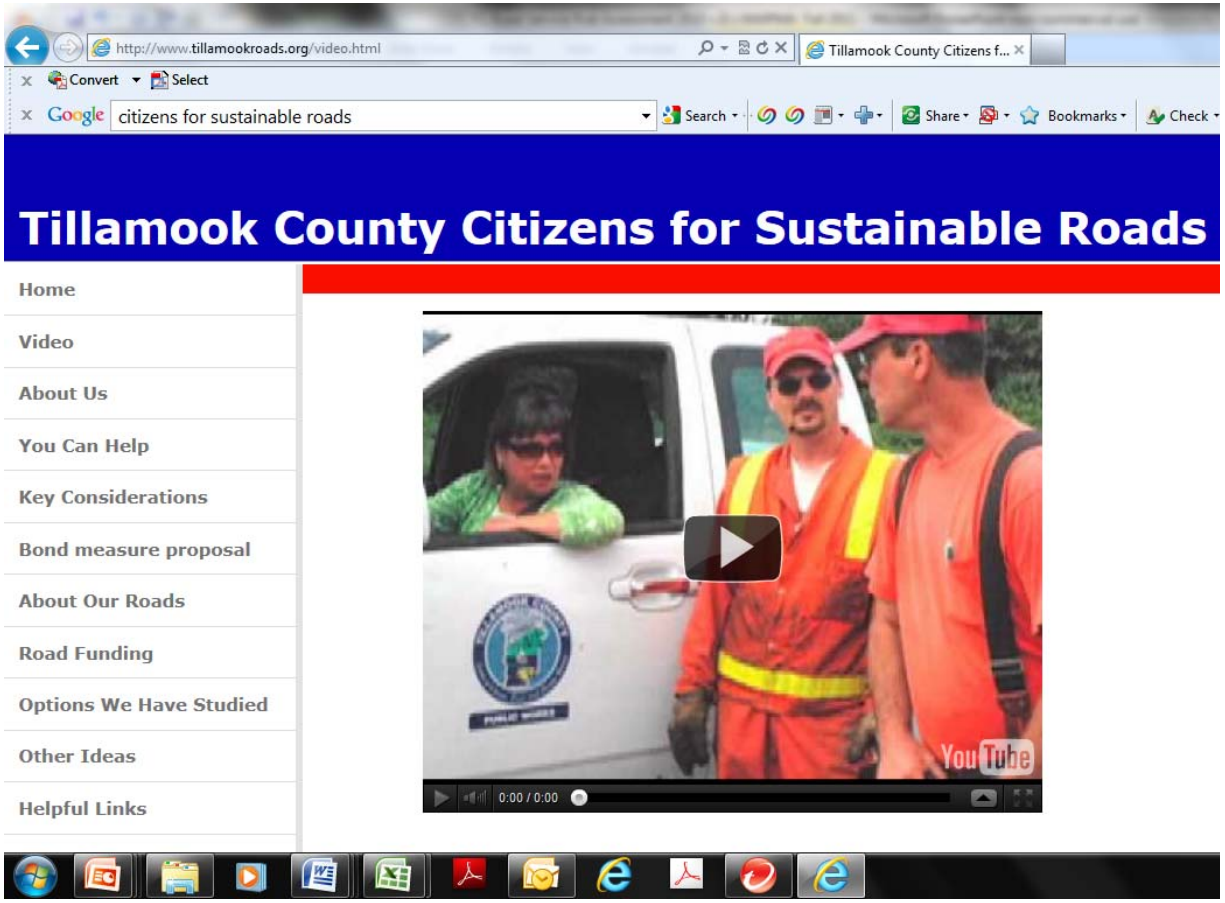
- ❑ Risk Management Principles, Framework and Process
- ❑ Tillamook County
  - o Challenges
  - o Process used in 2008 & 2010
- ❑ Risk-based Service Priorities in 2010 & Management Strategy
- ✓ Next Steps

Drainage Risk Management Strategy: Mitigate Risk

- Partner to fund culvert replacements
- Inspect pre-storm, rate condition
- Develop drainage asset management plan
  - Improve inventory and remaining life assumptions
    - Partner with TEP to conduct partial inventory, condition assessment & map assets
    - Improve replacement cost estimates using County costs
    - Develop low confidence future performance estimates
  - Evaluate 3 Service Level Options
    - Sustained performance over asset live (Desired)
    - Current Service Level
    - If further cuts to revenues
- Communicate road service risks, accomplishments and tradeoffs

Grassroots Citizen Effort to "Fix Our Roads"

- $15M property tax bond
- on November 8, 2011 ballot for road maintenance



http://www.tillamookroads.org/video.html