

# Vermont DOT

**Rich Tetreault**

Peer Exchange - Integrating Risk Management in Transportation Asset Management Programs

# TAM, RISK MANAGEMENT AND EXTREME WEATHER

Peer Exchange – Integrating Risk  
Management in TAM Programs  
August 25-26, 2015

**Rich Tetreault, Chief Engineer**





# Commitment to Asset Management is changing how the Vermont Agency of Transportation conducts its business!



# VTRANS TAM POLICY STATEMENT



## VTrans Asset Management

## Policy Statement

### VTrans' Mission, Vision & Goals

**Mission:** Provide for the safe and efficient movement of people and goods.

**Vision:** A safe, reliable and multimodal transportation system that promotes Vermont's quality of life and economic wellbeing.

**Goals:**

1. Provide a safe and resilient transportation system in an environmentally responsible manner.
2. Preserve, maintain and operate the transportation system in the most cost effective and efficient manner.
3. Provide Vermonters energy efficient, travel choices/options.
4. Provide quality customer service.
5. Develop a workforce to meet the strategic needs of the Agency.

### Who are our Customers?

VTrans' customers are our Vermont residents, businesses and visitors who rely on VTrans to manage transportation assets in a cost-effective, efficient and sustainable manner. They depend on us to be good stewards of the resources entrusted to us. As good stewards, we do more than account for our assets, we minimize operating costs while ensuring proper use, maintenance and performance. These actions form the foundation of our commitment to provide quality customer service.

### Overview & Purpose

Asset Management is an Agency-wide commitment to excellence and applies to all departments and divisions within VTrans; Finance & Administration, Motor Vehicles, Operations, Policy, Planning & Intermodal Development and Program Development.

As of February 2014, VTrans has begun developing a Transportation Asset Management Plan (TAMP) to comply with both State and Federal (MAP-21) legislation. VTrans is developing the TAMP through an intra-Agency work group (TAMP-WG) committed to improving how the Agency conducts its business.

The purpose of this policy statement is to memorialize the commitment of VTrans' executive leadership to;

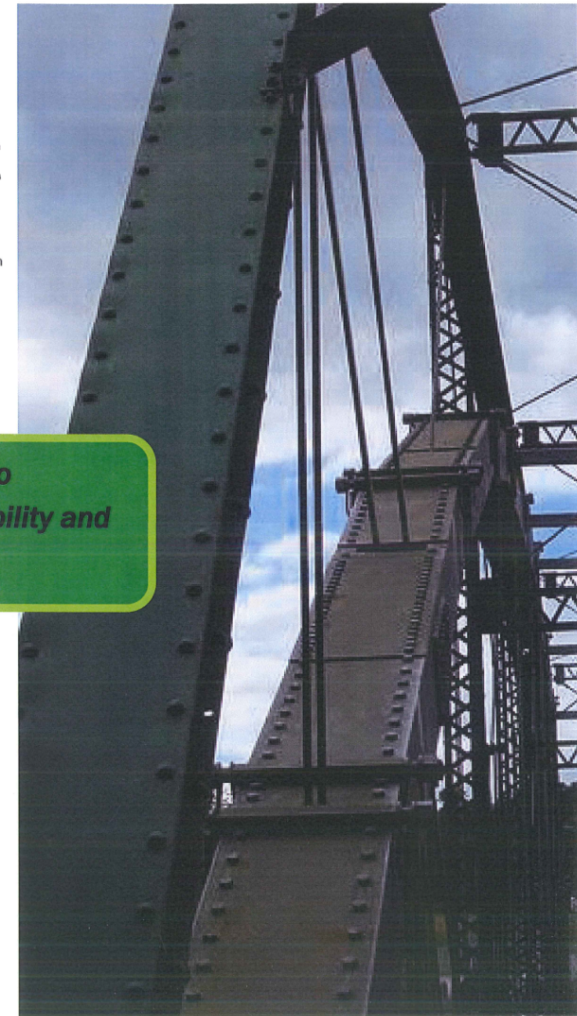
- support the development and implementation of the TAMP,
- support the TAMP-WG in its quest to develop and implement the TAMP.
- institutionalize asset management processes so it is sustained through future organizational changes in leadership, and
- utilize continuous improvement strategies to optimize asset performance in a cost-effective manner while providing excellent customer service.

**Asset Management is a commitment to sustainability, transparency, accountability and customer service.**

### Challenges

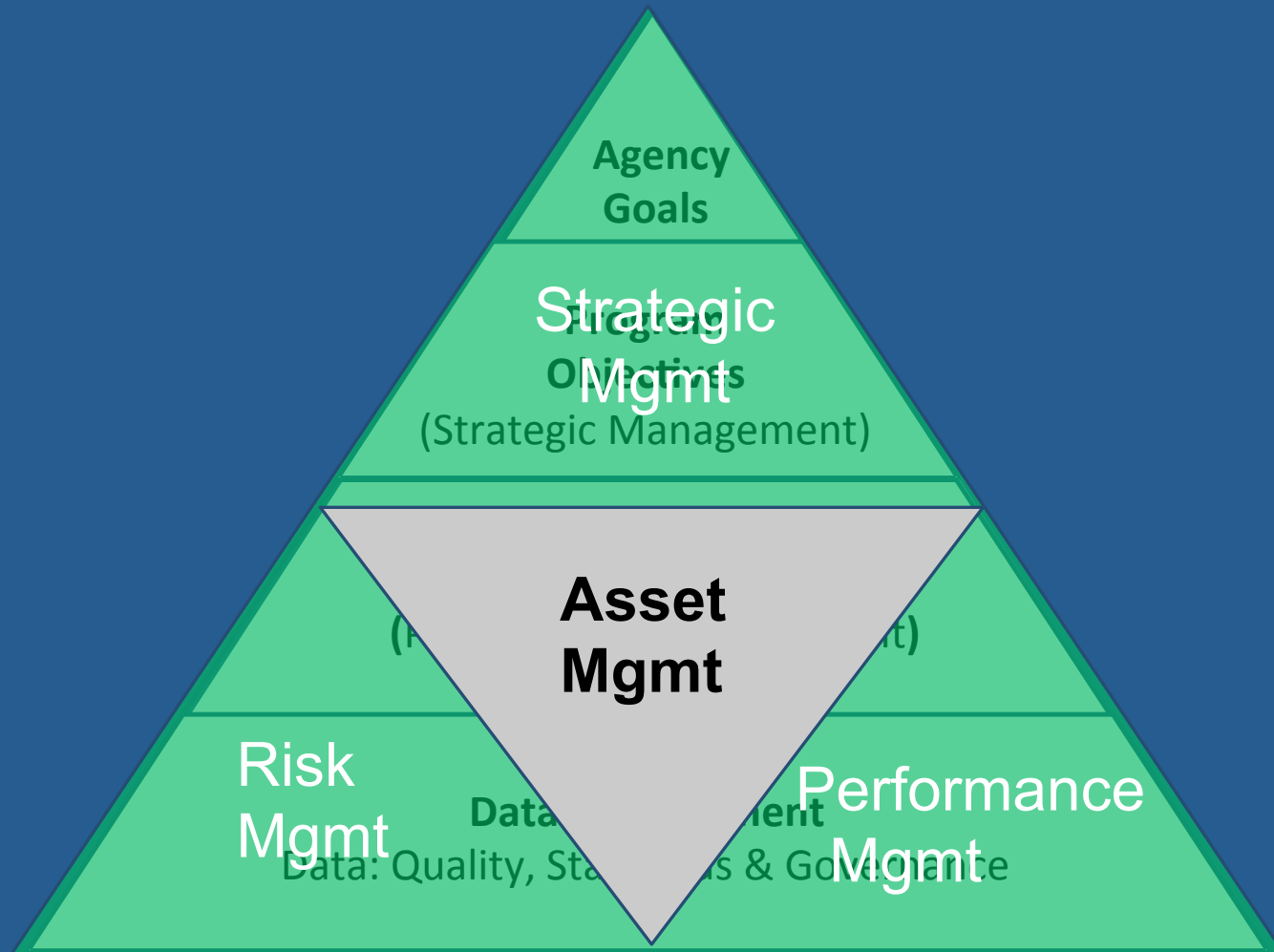
Transportation infrastructure managers nationwide are facing many challenges, including aging assets and tighter budgets. The complexity is increased due to limited infrastructure information, the need to satisfy multiple stakeholders' expectations and the demand for more sustainable transportation solutions.

VTrans is committed to responding proactively to these needs and is responsible for ensuring that Vermont's transportation system remains in good working order regardless of its age. Therefore, the challenge to manage transportation infrastructure assets has led VTrans to emphasize an asset management policy as a business process that drives quality decisions based on accurate data and analysis. The primary purpose of Asset Management is to use available funding strategically and efficiently.

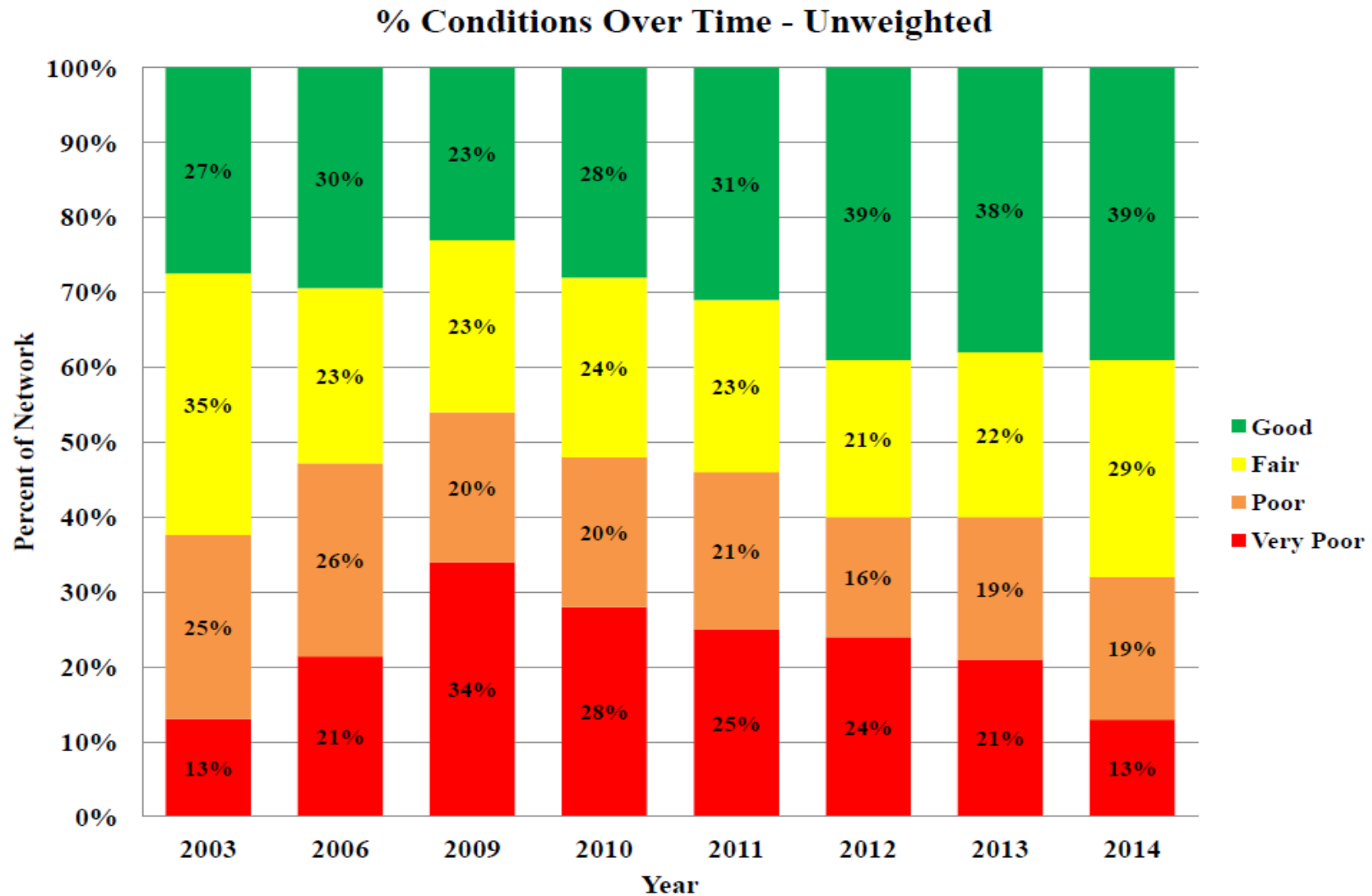


<http://vtrans.vermont.gov/sites/aot/files/documents/other/ExecPolicyStatementsigned042114.pdf>

# VTRANS TAM SIMPLIFIED



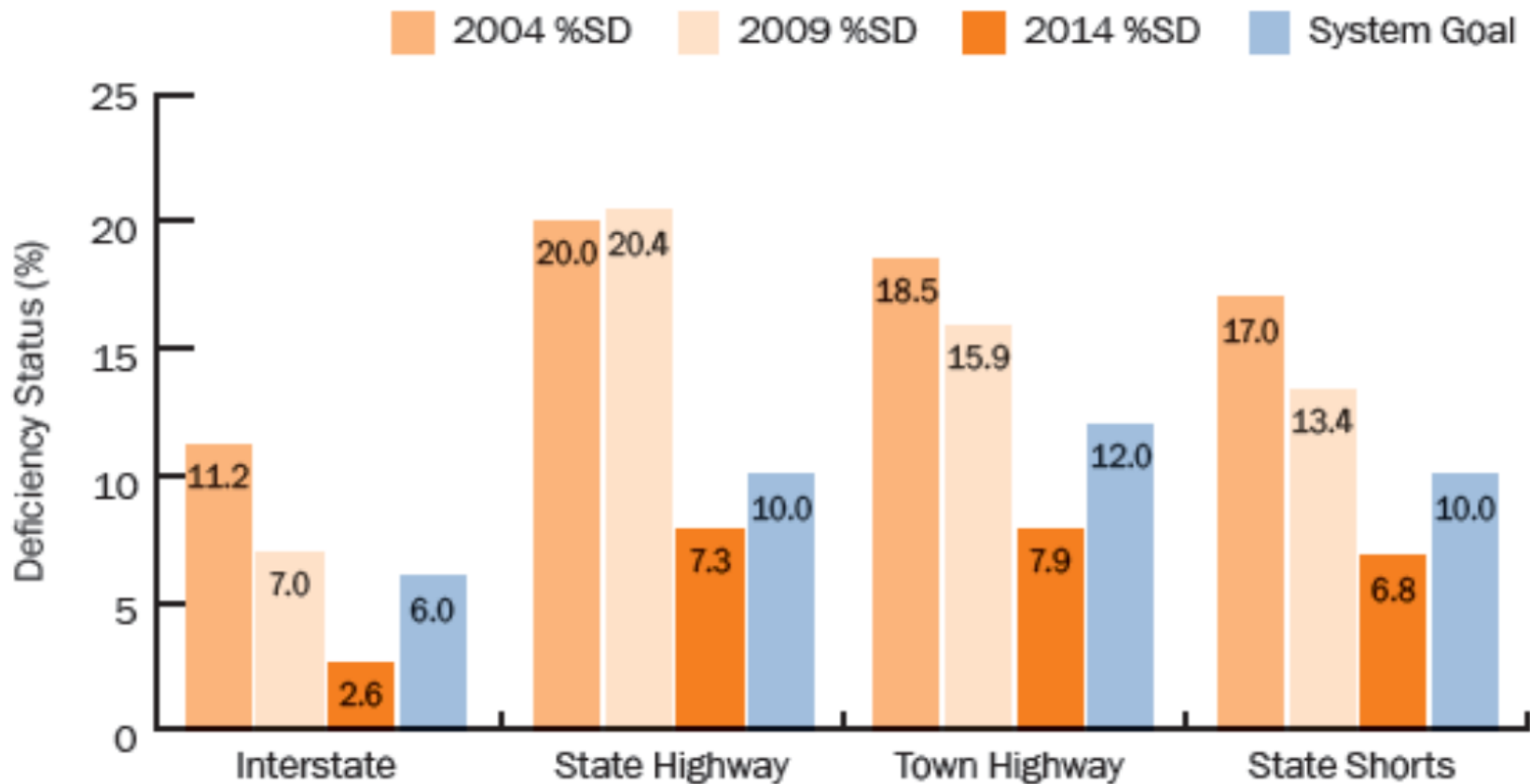
# PAVEMENT CONDITION – 10YR HISTORY



# BRIDGE CONDITION – 10 YR HISTORY

## Structural Deficiency Over Time by System

\* 2004, 2009 and 2014 represent year data submitted to FHWA



# BENEFITS OF AM



- ▣ Asset Sustainability
- ▣ Fiscal Accountability
- ▣ Organizational Alignment
- ▣ Credible Programming



# VTRANS ENTERPRISE RISK MANAGEMENT PHILOSOPHY

Develop Risk Management to:

- ▣ Support the Agency's Strategic Plan
- ▣ Perform risk analysis processes that are both proactive and reactive
- ▣ Identify risks to support resiliency effort
- ▣ Determine how to bridge performance gaps

# VTRANS ERM ACCOMPLISHMENTS

- ▣ Risk Management Engineer position created and filled
- ▣ Risk Management Task Force created to support the development of VTrans' Transportation Asset Management Plan (TAMP)
- ▣ Six focus groups convened for risk identification to compile an initial risk register: Bridges, Pavements, Ancillary Assets, Data, Traffic & Safety, and Budget & Programming

# INITIAL RISK REGISTER BREAKDOWN

	Total Number	Number Critical
Ancillary Assets	51	1
Bridges	36	6
Budget & Programming	79	2
Data	27	6
Pavement	21	2
Traffic & Safety	84	9
Management/Misc	2	2
Total:	300	28




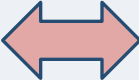




- A total of 298 risk statements were produced, with two more added from management thereafter

# CRITICAL RISKS BY FUNCTION

	Ancillary	Bridges	B & P	Data	Pavement	Traffic	Misc.	Total
Asset Mgmt	1		1		1		1	4
Data		1		3		4		8
Enforcement		1				1		2
Finance		2		1			1	4
Leadership		2		1				3
Planning						4		4
Materials					1			1
Schedule			1					1
Workforce				1				1

- Each critical risk was placed into one of 14 identified risk areas from our draft RM plan

# KRI DASHBOARD AND KPI

Key Risk Indicator	Status	Trend
KRI 1		
KRI 2		
KRI 3		
KRI 4		

## Possible Key Performance Indicators:

- Number of systemic risks identified
- % of program and process areas involved in risk registers/assessments
- % of key risks monitored
- % of key risks mitigated

# RIVERS LONG BEFORE ROADS

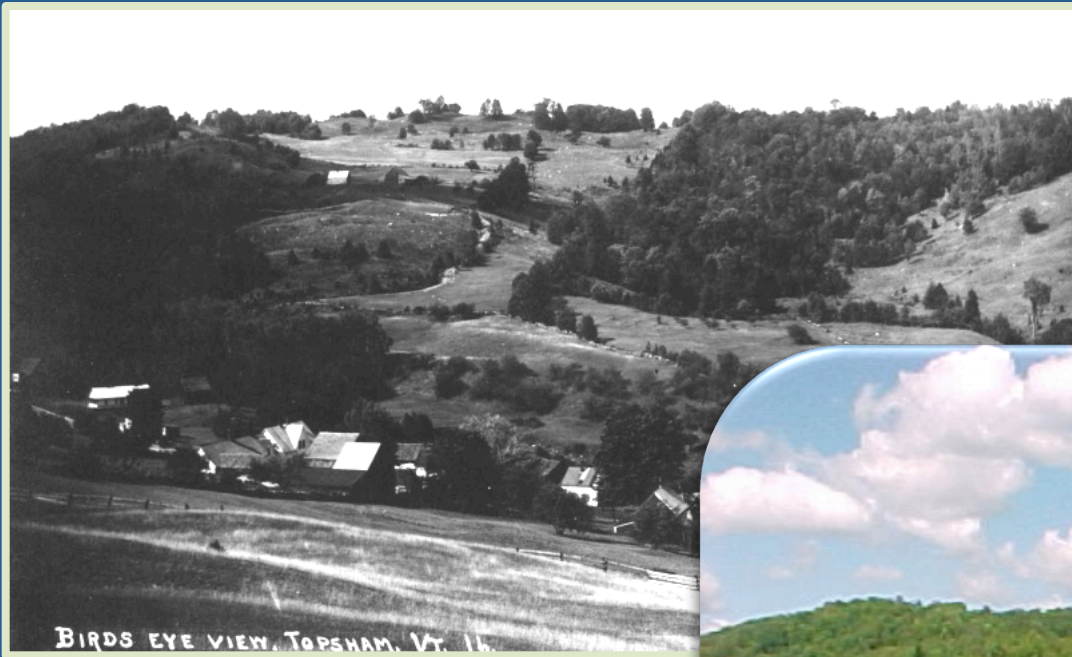


Rivers



Roads

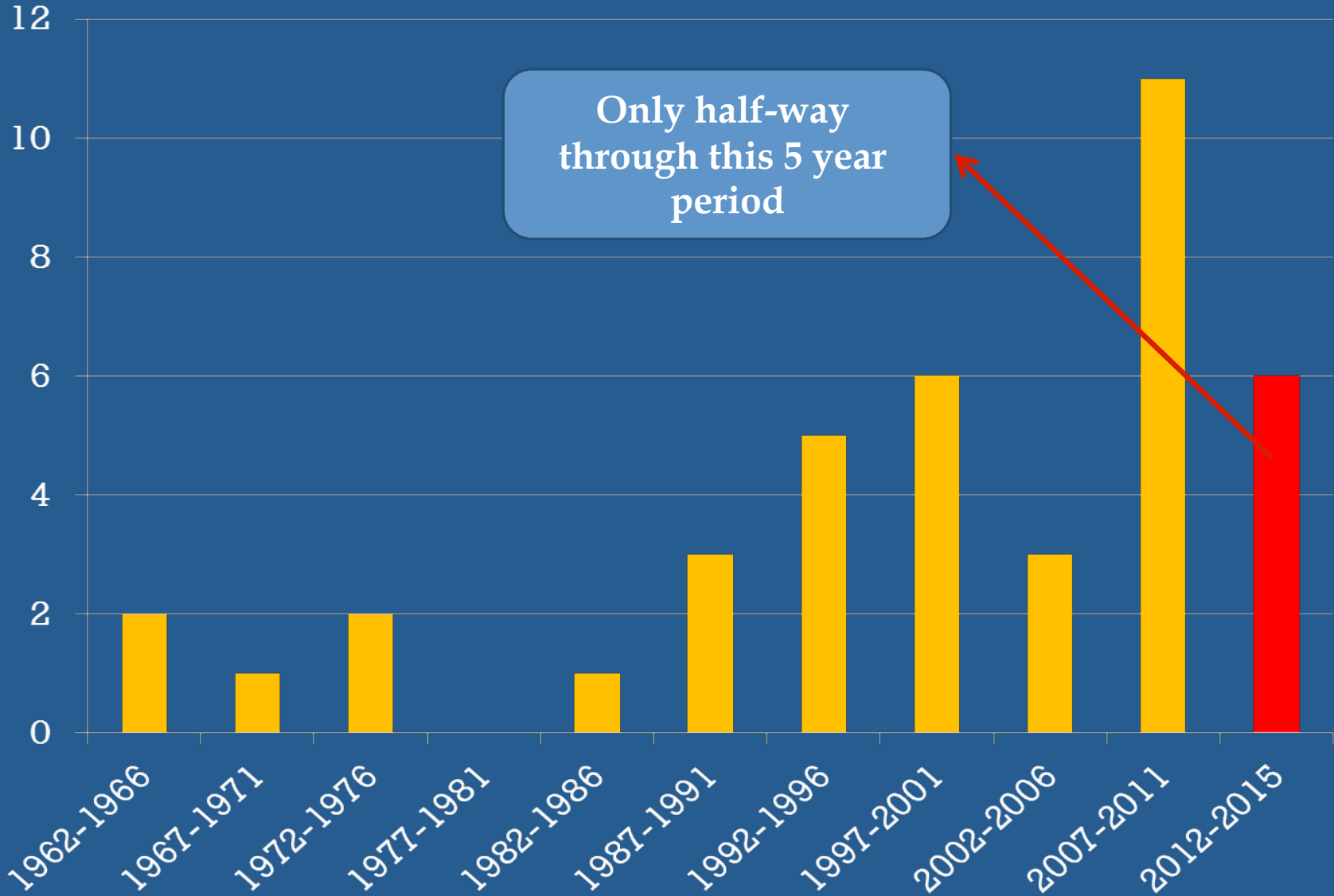
# VERMONT'S LANDSCAPE HAS REFORESTED OVER THE PAST 100 YEARS



Topsham, VT  
1907 vs. 2007



## Major Disaster Declarations in Vermont

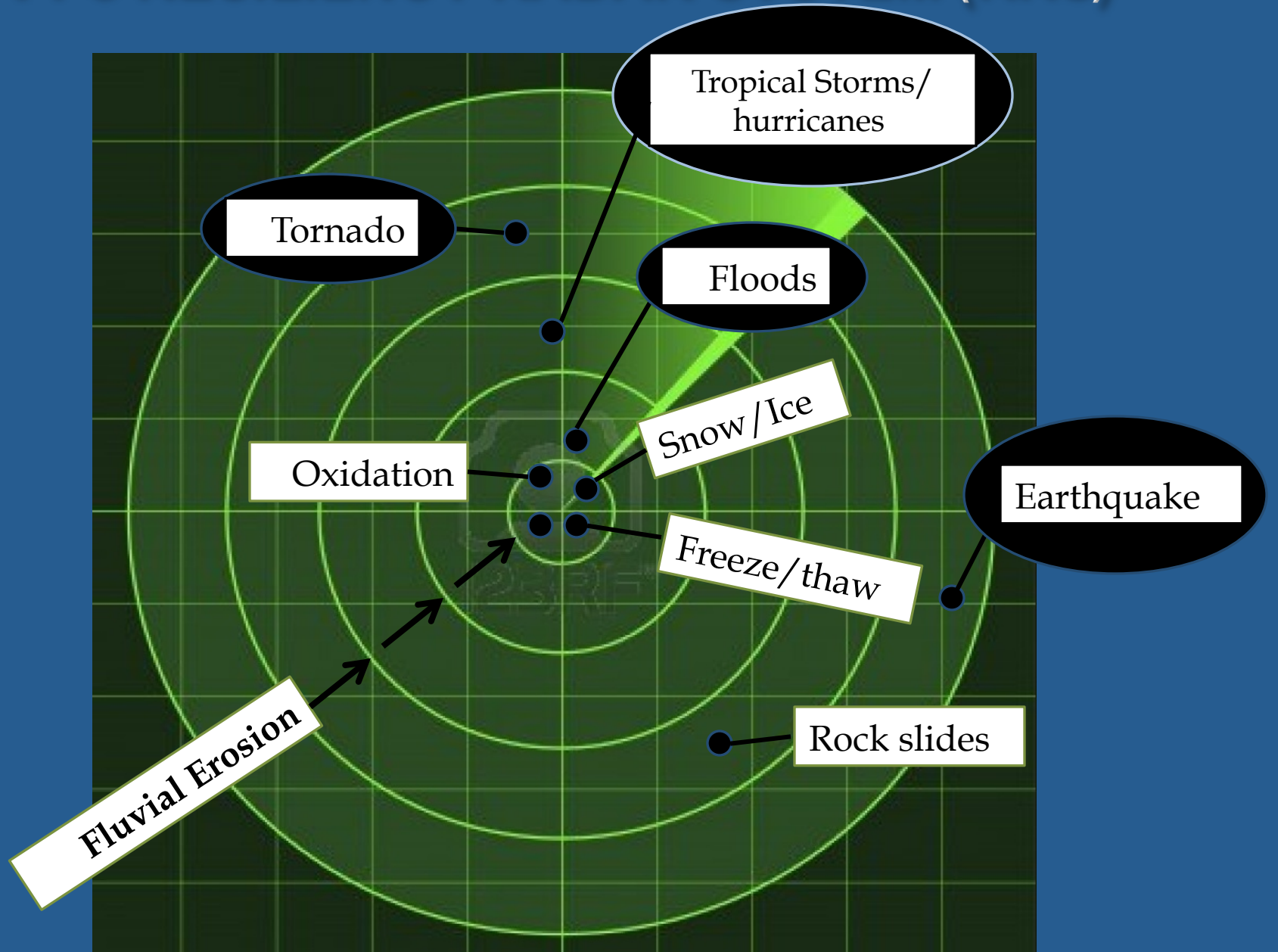




# VT US 4 IRENE 2011



# VT's RESILIENCY RADAR SYSTEM (RRS)



# ICS-100 TRAINING PROGRAM

- ▣ The Tier One training module can be accessed through the following link:  
<https://training.fema.gov/is/courseoverview.aspx?code=IS-100.b>
- ▣ The class is expected to take approximately 2.5 to 3 hours to complete, and it is free of charge.
- ▣ This training is required for ALL employees and is expected to be completed within the first 30-days of hire.

# ROADS AND RIVERS TRAINING PROGRAM

- ▣ The Tier One training module can be accessed through the following link: <http://wsmd.vt.gov/rivers/roadstraining/>
- ▣ The class is expected to take approximately 1.5 to 2 hours to complete, and it is free of charge.
- ▣ This training is required for engineers, technicians, equipment operators, highway foreman and others. It is also available to any others who might be interested in learning more about how river systems work.

# VTRANS HYDRAULICS MANUAL UPDATES

- Vermont's old manual focused on hydraulic capacity of structure (water only). The new manual will employ a "river science" approach and consider hydraulic capacity, sediment and debris.
- The new manual will likely allow for more risk based design in terms of roadway safety and stream stability. A structure on a town road with an ADT of 2000 over an unstable channel will be designed differently than a town road structure with an ADT of 20 over a stable channel.
- The new manual will parallel language in the latest stream alteration permit. This will make the process clearer to people unfamiliar with the design and permitting process (FEMA).

# CHITTENDEN COUNTY, VT



2003

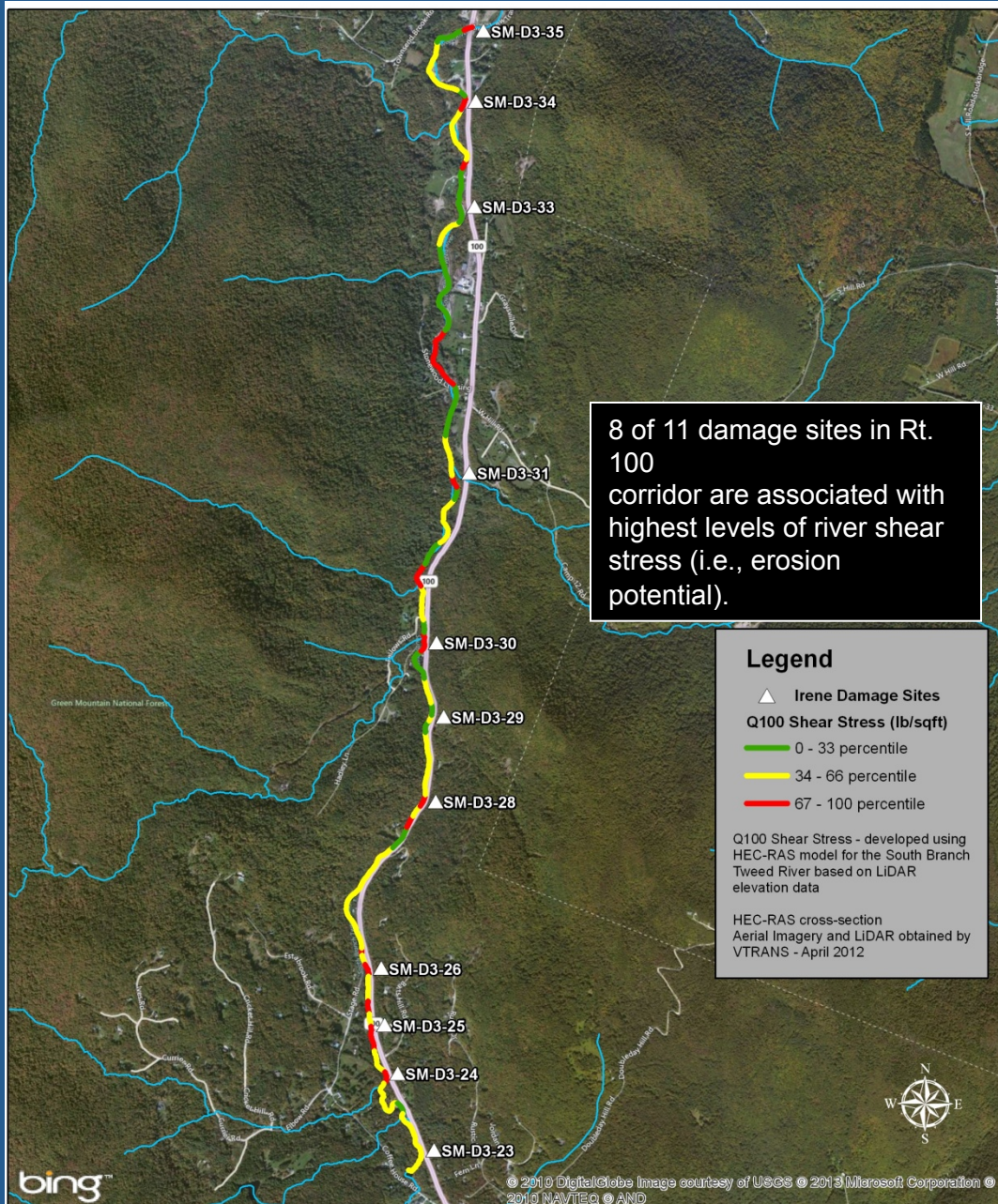
2007



# FORECASTING FLOOD VULNERABILITY MAPPING USING LiDAR DATA

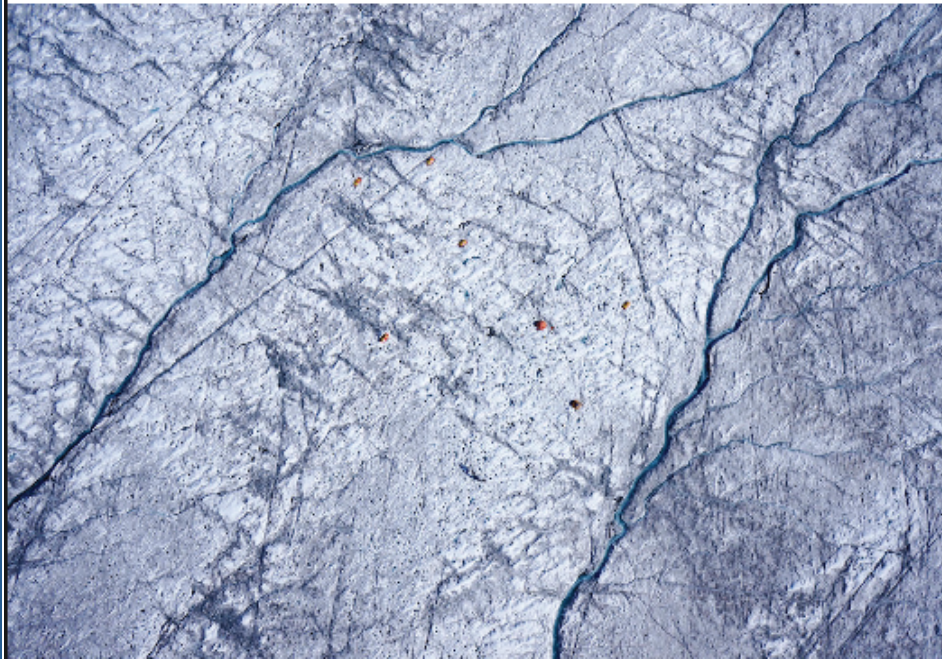
Process-based approach to identify and prioritize risk in river-roadway corridors:

1. Hydrologic and hydraulic modeling (HEC-RAS) to quantify river and floodplain erosion potential.
2. LiDAR slope mapping to identify slopes >100% in between roadway and river.
3. Identify areas of roadway with limited relief from river that are susceptible to erosion during flood events.



<p>Fitzgerald Environmental Associates, LLC 18 Severance Green, Suite 203 Colchester, VT 05446 Telephone: 802.876.7778 www.fitzgeraldenvironmental.com</p>	<p><b>Flood Vulnerability Mapping</b> VT 100, Pittsfield - Killington VT</p>		<p>0 2,000 4,000 Feet 1 inch = 2,000 Feet</p>	
	<p><b>VTrans Tropical Storm Irene</b> PDD Corridor Project</p>	<p>VT 100 Overview</p>	<p>Drawn by: EPF Date: May 7, 2013</p>	

# UAV TECHNOLOGY



Images of the Greenland Ice Sheet near Kangerlugssuaq in west-central Greenland taken by a drone (UAV) used to evaluate the evolving albedo of the ice sheet surface during the summer melt season.

Credit: Photos courtesy of Johnny Ryan, Aberystwyth University, Jason Box, GEUS, and the Dark Snow Project.



# QUESTIONS ??



*Agency of  
Transportation*

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