

## The SR 530 Landslide Commission

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December 15, 2014

Governor Jay Inslee  
Office of the Governor  
PO Box 40002  
Olympia, WA 98504-0002

Executive John Lovick  
Snohomish County  
3000 Rockefeller Ave. M/S 407  
Everett, WA 98201

**Re: The SR 530 Landslide Commission Final Report**

Dear Governor Inslee and Executive Lovick,

The members of the SR 530 Landslide Commission are pleased to submit this final report to you, your staff, and to the people of Washington State. The Commission has endeavored to meet the underlying intent of its charter: to better understand the collective response and inform recommendations for the future that will guide policy makers as well as to improve planning and response for similar events. The Commission spoke and listened to survivors, victims' families, professional and volunteer first responders, local volunteers including loggers, contractors, mill workers and others, formal and informal community representatives, and representatives of the broad array of emergency management professionals. By no means "all inclusive", the Commission reviewed the myriad and sometimes conflicting information and perspectives to better understand the complexity of this disaster and the response. Through transparent and committed efforts, the Commission identified key lessons learned and has translated those lessons into 17 recommendations. Key among these recommendations are three critical first steps: *Support a Statewide Landslide Hazard and Risk Mapping Program; Integrate and Sustainably Fund Washington's Emergency Management System; and Clarify State Fire Service Mobilization Laws to Support Front Line Responders at Non-Fire Emergencies.*

Since one of government's key roles is to promote public safety, it is critical for the public to understand the risks posed by potential natural disasters and to mitigate or minimize their impact. Our preparedness for future catastrophic or unimaginable disasters depends largely on the lessons learned from this and other disasters, and the shared willingness to plan, prepare, and budget for natural disasters. The profound lessons learned from the SR 530 Landslide must be swiftly leveraged into meaningful and practical actions if we hope to make the people of Washington State safer. In a future catastrophic event, our emergency management systems will require the skills and innovation witnessed during this disaster and it would be important to proactively embed these assets into our statewide response capabilities.

The SR 530 Landslide had a far-reaching and lasting impact on the lives of many. The Commission salutes the courage and perseverance of the Stillaguamish Valley communities and others that came together, against the odds, to respond to the event, rescue those who could be rescued, and ultimately recover the 43 people that died in this catastrophe. It is on their behalf and on behalf of all of the people of Washington State that the SR 530 Landslide Commission submits to you our final report.

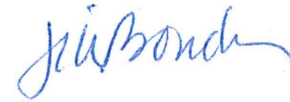
Sincerely,



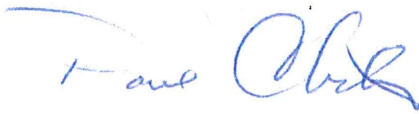
**Kathy Lombardo**  
Director, SR 530 Landslide Commission



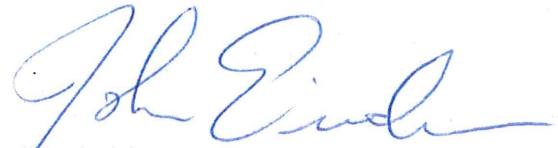
**JoAnn Boggs**  
Deputy Director, Pend Oreille County Emergency Management  
Past-President, Washington State Emergency Management Association



**Hon. Jill Boudreau**  
Mayor, City of Mount Vernon



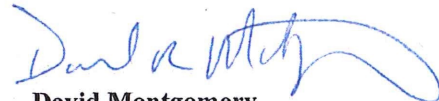
**Paul Chiles**  
Owner/President, Chiles & Company, Inc Real Estate  
Former Chair, Urban League of Metropolitan Seattle



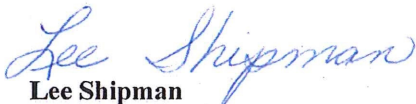
**John Erickson**  
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**David Montgomery**  
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**Lee Shipman**  
Emergency Management Director, Shoalwater Bay Tribe



**Renee Radcliff-Sinclair**  
Former State Representative  
Former Snohomish County Planning Commissioner



**Chief Steve Strachan**  
City of Bremerton Police Chief  
Former King County Sheriff



**Diane Sugimura**  
Director, Department of Planning and Development, City of  
Seattle



**Bill Trimm**  
Owner/Bill Trimm, FAICP - Town Planning and Economic Development



# SR 530 LANDSLIDE COMMISSION FINAL REPORT

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*December 15, 2014*

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# The SR 530 Landslide Commission

## Final Report

December 15, 2014

The members of the SR 530 Landslide Commission are pleased to submit this final report to Governor Jay Inslee and Snohomish County Executive John Lovick. The Commission has endeavored to understand the multitude of perspectives regarding the collective response to the SR 530 Landslide, identify lessons to be learned, and to translate those lessons into recommendations. Each Commissioner expresses his or her heartfelt sadness for the 43 family members whose lives were lost in this catastrophic event. The Commission also salutes the courage and perseverance of the Stillaguamish Valley communities and others that came together, against the odds, to respond to the event, rescue those who could be rescued, and ultimately recover all 43 fatalities.

**Cover Photo: Search and rescue teams on site**

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<https://www.flickr.com/photos/govinslee/13572341165/in/set-72157642811787053>

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# Table of Contents

ACKNOWLEDGMENTS .....	i
EXECUTIVE SUMMARY .....	ii
I. INTRODUCTION .....	1
II. THE SR 530 LANDSLIDE .....	3
Emergency Response Timeline .....	3
Community Impact .....	3
III. LESSONS LEARNED & RECOMMENDATIONS .....	9
IV. CALL TO ACTION .....	34
Critical First Steps .....	34
Leadership & Action .....	35
Responsible lead Entity Matrix .....	36
V. APPENDICES .....	38
Commission Charter .....	38
Emergency Response Timeline .....	40

## Acknowledgments

This report presents lessons learned and recommendations derived by the SR 530 Landslide Commission from a review of existing reports and presentations, and from a broad range of people, each with a unique perspective on the incident and events which followed. Their input was obtained either through one-on-one interviews, in small groups or because they were presenters at eight of the eleven Commission meetings. The Commission spoke with and listened to: survivors, victims' families, professional and volunteer first responders, local volunteers including loggers, contractors, mill workers and others, formal and informal community representatives, and representatives of the broad array of emergency management professionals. Contributors to this effort include:

The survivors of the landslide, their families, and the families of the 43 individuals who perished in the landslide

Governor Jay Inslee and Snohomish County Executive John Lovick

The Communities of Arlington, Darrington, and Oso

Community Volunteers and Volunteer Organizations

The Darrington Community Center

The Everett Community Resources Center, Operated by the Everett School District

The Everett Herald

Federal, Tribal, State, and Local Emergency Management, Fire, Search, Rescue & Recovery Personnel

Local Leaders and Representatives

The Oso Fire Station

Participants, Speakers, and Public Commenters at the Commission's Meetings

The Sauk-Suiattle Indian Tribe

The Stillaguamish Tribe of Indians

The Tulalip Tribes

The William D. Ruckelshaus Center, University of Washington and Washington State University

## Executive Summary

In July 2014, Washington State Governor Jay Inslee and Snohomish County Executive John Lovick appointed a joint commission in response to the SR 530 Landslide. The SR 530 Landslide Commission (Commission) was tasked with reviewing the landslide and the collective response to it, including the initial emergency search and rescue, recovery of victims, community efforts, incident management, and coordination among local, county, state, tribal and federal governments. By no means 'all inclusive', the Commission has reviewed the myriad and sometimes conflicting information and perspectives to identify lessons to be learned and translate those lessons into the recommendations provided in this report. Preparedness for future catastrophic or unimaginable disasters depends largely on the lessons learned from this and other disasters, and the shared willingness to plan, prepare, and budget for emergency events. These lessons must be swiftly leveraged into meaningful and practical actions if we hope to make the people of Washington State safer.

The state of Washington contains some of the most rugged, beautiful, and dynamic landscapes in the United States. However, those same landscapes present hazards from natural disasters, including earthquakes, small and larger landslides, annual flooding, and wild land fires. On February 28, 2001, the Nisqually Earthquake, registering 6.8 on the Richter scale, triggered a number of landslides in King County, toppled and damaged brick masonry buildings in Seattle's Pioneer Square, and caused considerable damage to the Alaskan Way Viaduct. That earthquake triggered many more landslides in Pierce, Thurston, and Mason counties. A 9.0 earthquake off the Washington coast will cause significant and widespread damage to people, communities, and infrastructure. Such a catastrophe will demand a much broader emergency response than the one experienced in the Stillaguamish Valley.

### Lessons Learned

There are profound lessons to be learned from the SR 530 Landslide that must be acted upon to enhance public safety statewide. The formal emergency response, while hampered by both logistics and the need for unique skillsets, was remarkable. There were many successes associated with the response that can be attributed both to the professional responders who applied their skills and training under the most difficult circumstances, and to the many skilled loggers, contractors, scientists, and community volunteers who filled resource gaps through innovation, adaptation, and sheer willpower. In a catastrophic event, our emergency management systems will require the skills and innovations witnessed during this disaster and it would be prudent to proactively embed these assets into response capabilities.

The initial stages of an emergency event are often the most chaotic. Clarity of leadership and rapid reinforcement of the front line command and control elements is critical. It was an extraordinary confluence of regional capacity and coincidental operations that made reinforcements from the air available within one hour of the initial landslide. These airborne responders teamed with first responders and local volunteers to rescue fifteen people by helicopter. Airborne capacities cannot be relied on in future incidents without attention to the availability and mechanisms to deploy such resources.

Each after action report and presentation given to the Commission highlighted the power of the bonds that exist within specific responder communities, between individuals, and across jurisdictions. These bonds are often informal and ad-hoc, and in this case, were at least as important as formal linkages. Small, rural communities depend on volunteer local fire districts and law enforcement to respond immediately to disasters. These front-line entities need robust mutual aid agreements, strong relationships with county and regional assets, and joint training to adequately respond to overwhelming needs during a disaster.

In the state of Washington, knowledge and understanding of landslide hazards is not well developed and there is a need to refine and expand geologic and geohazard mapping throughout the state. This knowledge coupled with increased public understanding will benefit public policy decisions and the ability to plan for these hazards.

The magnitude of the SR530 Landslide was not fully comprehended for several hours. Even with helicopters in the air within an hour, those 'eyes in the sky' were immediately dedicated to rescuing survivors and could not communicate to others the gravity of the situation. Flooding of the Stillaguamish River and efforts to mitigate the risk of flooding up- and downstream of the landslide also detracted from the rapid development of overall situational awareness. Improved mechanisms to quickly establish and communicate situational awareness regarding the magnitude and resource demands of emergency events need to be identified and deployed.

An important take-away is that because not all landslides behave the same, it should not be assumed that all of the rescues and recoveries from future landslides will be found in distal or far end areas, as was the case with the SR 530 Landslide. Therefore, it is critical that geologic experts be brought in as soon as possible to characterize a landslide and predict where rescues and recoveries are likely to be located.

If one of government's preeminent roles is to promote public safety then it is imperative to understand the risks posed by potential natural disasters, mitigate or minimize their impact, and to employ a robust and sustainably funded emergency response system when catastrophic events do occur. To better understand the risks posed from potential natural disasters and to enhance capacity across the state to respond to such events, the SR 530 Commission provides both lessons learned and recommendations, summarized in the table below. Key among these recommendations are the following critical first steps towards making the people of Washington safer in the future.

## **Critical First Steps**

### ***Support a Statewide Landslide Hazard and Risk Mapping Program***

The Commission recommends that the Legislature significantly expand data collection and landslide mapping efforts, which will provide the foundation for sound public and private land-use planning and decision-making. The SR 530 Landslide highlights the need to incorporate landslide hazard, risk, and vulnerability assessments into land-use planning, and to expand and refine geologic and geohazard mapping throughout the State. The lack of current, high-quality data seriously hampers efforts under the Growth Management Act



(RCW 36.70A) and other regulatory programs to account and plan for these hazards. Use lidar (Light Detection and Ranging) mapping to target high priority areas hazardous to people or property. Ensure that landslide hazard and risk mapping occur in the highest priority areas first, including transportation corridors, such as the Everett-Seattle rail line and the trans-Cascades highways, residential areas, urban growth areas, emergency evacuation routes, and forest lands where the State has regulatory authority over forest practices (i.e., RCW 76.09..020(15)).

### ***Integrate and Sustainably Fund Washington's Emergency Management System***

The Commission recognizes the need for further study of the State's emergency management system. The SR 530 Landslide involved all levels of government in multiple jurisdictions and disciplines. The Commission recommends the Governor convene a funded task force, charged with affecting change and include participation from the Governor's office, the Legislature, tribes, county and municipal government, first responders, transportation agencies, non-government support agencies, the private sector, and members of the public.

The task force, at a minimum, should understand and evaluate: regional and statewide threats and hazards; existing State emergency management programs including funding and statutory authority; other examples of nationwide emergency management innovations including Emergency Management Accreditation Standards; integration of the emergency management principles and practice into government across the state; and strategies to implement state-sponsored cross-jurisdictional joint training and exercises.

The task force should report to the Governor by December 2016 with recommendations to build a more robust and innovative system of response and to secure an adequate, sustainably funded emergency management system across the state.

### ***Clarify State Fire Service Mobilization Laws to Support Front Line Responders at Non-Fire Emergencies***

The Commission recommends the State Legislature clarify the definition of "all-hazards" mobilization and establish adequate funding in the disaster response account. Fire service mobilization was requested in response to the landslide, but refused because it was a non-fire emergency. The Commission concludes that state fire service mobilization is a significant tool to use in emergency incidents such as the SR 530 Landslide. State fire service mobilization is the only intrastate plan that has been used and exercised many times, and is a well-tested plan that has earned the faith and confidence of fire emergency responders. An all-hazard state mobilization would have provided improved command and control by allowing for a Type 2 Incident Management Team to arrive sooner and provide resources for first responders – technical rescue relief teams and equipment.

Lessons Learned	Recommendations
<i>There were many successes associated with the response</i>	
<i>Sufficient, sustainable funding and cross-jurisdictional coordination for emergency management efforts is vital</i>	<ul style="list-style-type: none"> <li>❖ Integrate and Fund Washington’s Emergency Management System</li> </ul>
<i>Washington State has few adequate landslide hazard, risk, or vulnerability maps</i>	<ul style="list-style-type: none"> <li>❖ Support a Statewide Landslide Hazard and Risk Mapping Program</li> <li>❖ Establish a Geologic Hazards Resilience Institute</li> </ul>
<i>Clear parameters are needed for activating all-hazards mobilization</i>	<ul style="list-style-type: none"> <li>❖ Provide Legislative Clarity for the Definition of “All-Hazards” Mobilization</li> <li>❖ Establish Adequate Funding in the Disaster Response Account</li> <li>❖ Pro-Active Preparations</li> </ul>
<i>Command and control must operate and transition smoothly from one phase of the response to the next – so that leadership and management are seamless among and across responding organizations</i>	<ul style="list-style-type: none"> <li>❖ Activate Washington’s Command and Control Structure for Catastrophic Events</li> <li>❖ Develop a Standardized Process for Requesting, Tracking, Mobilizing, and Demobilizing Resources</li> </ul>
<i>Continue to study and monitor the SR 530 landslide and adjacent landslides</i>	<ul style="list-style-type: none"> <li>❖ Conduct Landslide Investigations</li> </ul>
<i>Large incidents with multiple fatalities can overwhelm the capacity of local coroners and medical examiners</i>	<ul style="list-style-type: none"> <li>❖ Prioritize Mass Fatality Management Planning Statewide</li> </ul>
<i>Local residents, loggers, contractors, business owners, officials, and many more were invaluable to the rescue effort</i>	<ul style="list-style-type: none"> <li>❖ Improve Volunteer Process</li> </ul>
<i>It is important to coordinate with tribes prior to and during an emergency</i>	<ul style="list-style-type: none"> <li>❖ Deploy Liaisons to Coordinate with Each Impacted Tribe</li> </ul>
<i>In emergency events, effective communication is challenging. Issues fall into the categories of infrastructure, interoperability, content, and strategy</i>	<ul style="list-style-type: none"> <li>❖ Activate the First Responder Network Authority</li> <li>❖ Update the State Communication Interoperability Plan</li> </ul>
<i>Washington Administrative Code guidelines for designating geological hazard areas and assessing risk are permissive, due in part to the lack of statewide geologic and geohazard mapping</i>	<ul style="list-style-type: none"> <li>❖ Update the WACs Related to Critical Area Regulations</li> </ul>
<i>Disaster assistance after an event needs a “one stop shop” in order to help families navigate the various aid systems</i>	<ul style="list-style-type: none"> <li>❖ Develop a Navigator Program for Emergency Management</li> </ul>
<i>Public awareness of the potential negative impacts to property caused by the existence of geologic hazards is important in ensuring the protection of the general public</i>	<ul style="list-style-type: none"> <li>❖ Advance Public Awareness of Geologic Hazards</li> </ul>