

Report to the Seventy-first Legislative Assembly on the Implementation of 1999 Senate Bill 12 Relating to Public Safety and Rapidly Moving Landslides



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Department of Land Conservation and Development
Department of Forestry**

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INTRODUCTION

Senate Bill 12,¹ enacted in 1999, establishes Oregon's policy for protecting the public from rapidly moving landslide hazards. The legislation was adopted in the wake of the catastrophic landslide events that occurred in Oregon in 1996. Storms produced record rainfall levels and triggered landslides and debris flows throughout Oregon. Five fatalities and many injuries occurred during a November 1996 storm.

As a result of these landslides, legislation was passed in 1997 (Senate Bill 1211) that addressed rapidly moving landslides in steep, forested areas. Specifically, Senate Bill 1211 authorized the State Forester to prohibit forest operations in certain landslide-prone locations. Senate Bill 1211 also created the interim Task Force on Landslides and Public Safety and directed the Task Force to develop a comprehensive, practicable, and equitable solution to the problem of risks associated with landslides." The Task Force recommendations provided the basis for the legislative concept that resulted in Senate Bill 12 in the 1999 Session.

Senate Bill 12 directs state and local governments to protect people from "rapidly moving" landslides or debris flows. These are defined as landslides that "people cannot outrun" and are the type that were responsible for the Douglas County fatalities. Senate Bill 12:

- directs the Department of Geology and Mineral Industries to identify areas potentially prone to debris flows on "further review area" maps.
- directs the Department of Land Conservation and Development to take steps under its existing authority to assist local governments in implementing Senate Bill 12.
- requires the Oregon Board of Forestry to adopt regulations that reduce the risks associated with rapidly moving landslides to replace the interim prohibition of certain forest operations in landslide hazard areas.
- requires the Departments of Forestry and Geology to provide technical assistance to local governments.
- requires the Oregon Department of Transportation to provide warnings to motorists during periods determined to be of the highest risk of rapidly moving landslides along areas of state highways with a history of being most vulnerable to rapidly moving landslides; and
- directs the Office of Emergency Management of the Department of State Police to coordinate state resources for rapid and effective response to landslide-related emergencies.

¹ Senate Bill 12 is codified as ORS 195.250-195.275, ORS 527.630-527.710.

Senate Bill 12 also establishes responsibilities for local governments. Perhaps most importantly, the law requires local governments to "...regulate through mitigation measures and site development standards the siting of dwellings and other structures designed for human occupancy...in further review areas where there is evidence of substantial risk for rapidly moving landslides." Local governments are limited in the restrictions they can apply to development in "further review areas" unless they offer property owners an opportunity to participate in a "transfer of development rights" program.

Senate Bill 12 appropriated funds to implement the legislation. It also requires the Department of Geology and Mineral Industries, the Department of Land Conservation and the Department of Forestry to report to the Seventy-first Legislative Assembly by January 1, 2001, on the implementation of sections 1 to 9 of Senate Bill 12. Specifically, the agencies are required to report on:

1. The status of the work at the Department of Geology and Mineral Industries to identify and map further review areas;
2. The pilot project to develop a model program for the mitigation of hazards and transfer of development rights pursuant to section 9 of Senate Bill 12; and
3. Recommendations for specific changes necessary to the programs established pursuant to sections 1-7. Sections 1-7 include definitions, the legislative intent and the roles and responsibilities of state and local governments in reducing the risk to public safety from rapidly moving landslides.

The Department of Geology and Mineral Industries, the Department of Land Conservation and Development, and the Department of Forestry collaborated on this report. The report discusses the Department of Geology's efforts to map landslide hazards, provides a summary of the Department of Land Conservation and Development's grant to develop a model program and describes the Department of Forestry's activities relating to rapidly moving landslides. A list of issues that have surfaced during initial implementation of Senate Bill 12 is included as part of the report.

Five appendices are attached. Appendix A summarizes complementary activities each of the departments has undertaken to mitigate landslide hazards. Appendix B describes the findings the Board of Forestry must make in adopting administrative rules relating to rapidly moving landslides. Appendix C is a list of "guiding principles" approved by the Board of Forestry. Appendix D lists the members of the Department of Forestry's Landslides and Public Safety project team. Finally, Appendix E provides a copy of Senate Bill 12.

DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES MAPPING ACTIVITIES

Senate Bill 12 directs the Department of Geology and Mineral Industries to identify and map “further review areas” in coordination with the Department of Forestry. It also directs the Department of Geology to provide technical assistance to local governments to facilitate the use and application of the mapping information.

Status of Senate Bill 12 Mapping of Debris Flows in Western Oregon

The Departments of Geology and Forestry have teamed in the effort to develop rapidly moving landslide hazard maps. These maps integrate the state-of-the-art in landslide hazard identification. While the details of the nature and distribution of debris flows are strikingly complex, there are common factors that characterize the majority of debris flow locations. These characteristics are key to identifying future impact zones and allow the development of relative hazard maps on a regional basis. The regional hazard maps will provide basic information that will help in making more informed mitigation decisions. While it is generally not possible to keep debris flows from occurring, there is the potential in many cases to avoid the devastating impacts that landslides can have on people and property.

The specific mapping approach that the Departments of Geology and Forestry are utilizing involves iterative combinations of Geographic Information Systems (GIS) and field investigations. The key advantages of the iterative methodology include: comprehensive and consistent coverage, the ability to focus resources early in project coordination, and the ease of implementation and future refinement. The sources of information being utilized include field reconnaissance maps, Geographic Information System (GIS) topographic data, aerial photographs, and landslide inventory information. The overall mapping objective is to maximize the strengths and minimize the weaknesses of each of these tools to produce the most useful and accurate maps possible.

The following are general descriptions of the iterative steps being used in the development of the Senate Bill 12 maps:

A) Initial Department of Forestry Geographic Information System Modeling of Landslide Initiation Areas in Western Oregon.

The Governor's "Debris Avalanche Action Plan" (1997) requested mapping of debris flow hazards in western Oregon. The Department of Forestry developed maps providing a preliminary indication of debris flow (rapidly moving landslide) hazards in western Oregon. These maps were completed in 1999. The maps evaluate locations subject to naturally occurring debris flows, including slide initiation sites and locations along the paths of potential debris flows (e.g., confined stream channels and locations below steep slopes). The maps are generally good for steep slope areas, where landslides typically initiate, but are less accurate for identifying the downslope impacts of these landslides. These maps may not capture many of the areas that are of a public safety concern and are not the final "further review areas" as defined by Senate Bill 12 (1999). The Department of Forestry maps were completed in December 1999. They have been made available to local governments in western Oregon to provide an initial indication of debris flow hazards.

B) Selective Department of Geology Field Investigations of Landslide Travel Paths.

Following the initial Department of Forestry mapping in western Oregon, the Department of Geology has been refining the mapping of "rapidly moving landslide" hazards. This effort has focused primarily on improving the delineation of the downslope "runout" areas – the most critical areas in terms of public safety. The Department of Geology approach has included selective field investigations of known historical slide areas and other high hazard runout areas. The Department of Forestry maps are extremely valuable for focusing these efforts. Targeting areas identified as "high" and "extreme" hazard areas on the Department of Forestry maps, the Department of Geology has performed preliminary field investigations throughout western Oregon. Thus far, the department has conducted field investigations in 59 U.S. Geological Survey 7.5-minute quadrangles (a common map area of ~55 square miles). Additional quadrangles are targeted for field and Geographic Information System (GIS) evaluations within the next several months.

C) Refinement of the Geographic Information System Model, Incorporating Department of Geology Field Findings

The Department of Geology is utilizing the initial findings from field investigations to develop more refined methods for Geographic Information System (GIS) modeling of debris flow hazards. GIS modeling is uniquely suited for expedient regional hazard evaluations and is a critical tool in the Senate Bill 12 mapping

effort. Working with state of the science models and the wealth of field data that has been collected, the Department of Geology is working to find the most appropriate methods for delineating hazard zone boundaries. Several appropriate models have been identified and are currently being tested.

D) Departments of Geology and Forestry Field Refinement of Geographic Information System Output

Geographic Information System modeling is uniquely suited for regional evaluations. However, due to inherent limitations in digital data and modeling, complementary "field checking" of output is always critical. Some of the initial Department of Geology field data will be applicable for evaluating the improved Geographic Information System models. Other, potentially critical areas should be field evaluated following the Geographic Information System refinements. The ability to field verify the Geographic Information System maps is currently limited by resource constraints. Some "field checking" will be conducted following the Geographic Information System model development, but the current funding allocation does not provide for the beneficial second field season (summer 2001) that was emphasized in 1999 legislative discussions.

E) DOGAMI and ODF Joint Publication and Documentation of Digital Hazard Maps

The Departments of Geology and Forestry are working together to ensure the consistency of mapping procedures and final map products. The mapping is on schedule to be completed by the end of the biennium. Given the aforementioned resource limitations, the product will not be substantially field checked. Publication of the "further review area" maps is anticipated in spring 2002.

The Departments of Geology, Land Conservation and Development and Forestry have developed complementary public outreach products that will facilitate implementation of Senate Bill 12. Some of these products are described in Appendix A.

DEPARTMENT OF LAND CONSERVATION AND DEVELOPMENT – MODEL PROGRAM TO MITIGATE RAPIDLY MOVING LANDSLIDES

The Legislature appropriated funds to the Department of Land Conservation and Development (DLCD) to award to a local government to develop a model program for the mitigation of rapidly moving landslide hazards. The project is intended help other local governments implement Senate Bill 12 by providing examples that can be modified or adopted directly. The project will include a model for a transfer of development rights program.

The Department of Land Conservation and Development sent application materials to local planning departments in October 1999. The department received only one application. In November 1999, the department awarded the grant to Douglas County. Douglas County began work on the grant in January 2000.

Under the terms of the grant agreement, Douglas County will provide four main products that can be used by other communities. A brief description of the products and the status of these products follows:

A) Model Ordinance

Douglas County has developed a draft model ordinance that will help local governments implement Senate Bill 12. The model ordinance is designed to be adopted by other local governments with few modifications. Douglas County has based the model on ordinances used to address development in other hazards areas such as floodplains. It is designed to be easy for other local governments to administer.

The draft model ordinance provides for a two-tier review process. If a property is identified as being in a Senate Bill 12 “further review area,” the property owner must complete a site assessment prepared by a licensed professional. The property owner funds this assessment. This assessment would be required before a community accepts an application for a development permit.

The initial geotechnical assessment could determine that the property is not in an area with potential for rapidly moving landslides. On the other hand, if the assessment finds that there is a potential hazard, a more detailed analysis (i.e., a geotechnical report) would be necessary. The model ordinance also includes language that will link it to a transfer of development rights program if a local government chooses that option.

DLCD has provided comments on Douglas County's drafts. The draft will be reviewed by county planning directors and others prior to being finalized in the spring of 2001.

B) Model Documents to Support Implementation of Senate Bill 12

Douglas County has prepared several other model documents to assist local governments in implementing Senate Bill 12. They have prepared a draft "recognition covenant" for a property owner to sign acknowledging that the property is in an area with the potential for "rapidly moving" landslides. A covenant waiving a property owner's ability to bring a suit against adjacent landowners when the property owner has built in a "further review area" has also been developed. A site assessment form certifying that geotechnical assessment has been completed for a property is being reviewed.

C) Transfer of Development Rights Program

Douglas County will develop a model "transfer of development rights" program that reflects the requirements of sections 5 and 6 of Senate Bill 12. Transfer of development rights are used to help move development away from some areas (e.g., areas with rapidly moving landslide potential) to other areas. Senate Bill 12 limits the areas that development can be transferred to (consistent with existing state laws for the protection of farm and forestland). According to Douglas County's analysis, the Senate Bill 12 provision will typically involve providing for increased density in areas where dwellings can be sited under current Oregon law. The provisions in Senate Bill 12 will facilitate the transfer of a dwelling to a "receiving area" in which the receiving location would benefit by an increased density that wouldn't otherwise be allowed.

Douglas County has begun their review of existing transfer of development rights programs and authorities under existing Oregon law. The following section summarizes some of Douglas County's early findings on transfer of development rights programs:

- ORS 94.531 currently authorizes the transfer of development rights. To date, transfer of development rights have has not been implemented by any Oregon community. However, Deschutes County has conducted extensive work through the Regional Problem Solving Program and is in the process of developing a transfer of development rights program for the area around LaPine in an effort to address concerns about ground water quality and other problems.

- Douglas County has surveyed the application of transfer of development rights programs in jurisdictions outside Oregon. Unlike the Senate Bill 12 provision, many of the successful transfer of development rights programs include local government funds to purchase development rights. According to Douglas County's initial research, transfer of development rights in rural areas face a number of challenges. Perhaps the major challenge is that of market demand. There is currently little market for development rights in the form of the "density transfers" provided under Senate Bill 12.

D) Use of Mapping Products by Local Governments

Douglas County is working to establish procedures to integrate Department of Geology and Mineral Industries "further review area" maps into local tax parcel maps. The "further review area" maps provide the basis for local governments to determine whether mitigation or site development standards apply to a property. Thus, the format of Department of Geology maps and the ability of local governments to use these maps are of critical importance in Senate Bill 12 implementation.

Based on preliminary discussions, it is expected that local governments will be able to integrate the Department of Geology maps into a Geographic Information System (GIS), thus enabling the overlay of Geology's landslide maps on to tax lot maps. In order to ensure that local governments can make efficient and effective use of map information, Douglas County has: 1) surveyed local governments to determine if they have Geographic Information System capability; and 2) conducted several tests using the Department of Forestry debris flow maps to see how they can be used to make decisions on individual tax lots. Douglas County surveyed the 18 counties in western Oregon where mapping of landslide hazards will be conducted. Fifteen of the 18 counties have Geographic Information System capability. Douglas County has provided this information to the Department of Geology to ensure that maps will be in a format that can be used by those communities with Geographic Information Systems (GIS).

DEPARTMENT OF FORESTRY ACTIVITIES

Since 1997, the Department of Forestry has assumed several new obligations for protection of the public from rapidly moving landslides. As originally authorized by Senate Bill 1211 (1997), the department continues to administer the interim prohibition of affected forest operations on steep, landslide-prone sites above homes and busy roads. The department has taken steps to develop more permanent forest practices requirements as required by Senate Bill 12. The department has also worked with state and local governments and private landowners on many other actions to help protect the public from rapidly moving landslides. These actions are summarized in the following sections.

A) Interim Prohibition of Certain Forest Operations

As discussed in the introduction, Senate Bill 1211 (1997) gave the State Forester authority to prohibit timber harvest or road construction operations to prevent the risk to human life from landslides or debris torrents. Senate Bill 1211 specifically established the following requirements for the Department of Forestry regarding landslides and public safety:²

- 1) Notwithstanding any other provision of the Oregon Forest Practices Act, the State Forester may prohibit timber harvest or road construction operations to prevent risk to human life from landslides or debris torrents by denying the approval required for those operations pursuant to ORS 527.710 when the State Forester determines that all of the following conditions exist:
 - (a) The operation location includes high risk sites, as defined by the State Board of Forestry pursuant to ORS 527.710;
 - (b) Residences and other buildings where people are likely to be present during periods of intense rainfall or where paved county or state highways are in such close proximity to the potential path of a landslide or debris torrent that there is significant risk to human life; and
 - (c) The farthest expected extent of a potential landslide or debris torrent that might originate in the operation area, based on physical features of the landslide or debris torrent path, will reach the residences, buildings or highways referred to in paragraph (b) of this subsection.

As of April 2000, the department has been notified of 74 operations meeting the three statutory conditions described in (1)(a)(b) and (c) on all, or a portion, of these operations. The interim prohibition has completely precluded harvesting one of these operations. Seventy operations were modified so that some of the area was precluded from timber harvest. Total land area excluded from harvest

² Notes proceeding Oregon Forest Practices Act, ORS 527.610 et seq.

was 644 acres. Finally, three operations have been granted deferral exceptions because the danger of windthrow to a nearby residence was greater than the landslide risk at those sites. The Department of Forestry has advised landowners to obtain the services of geotechnical professionals (engineering geologists or geotechnical engineers) for operations where a portion of the proposed logging unit was subject to the interim prohibition of operations.

It is worth noting that most landowners have screened their lands using the department's guidance and are not presently proposing forest operations in areas meeting the above criteria in Senate Bill 1211. Therefore, the actual number of operations affected by the interim prohibition is significantly greater than 74. As required by Senate Bill 12, administration of the interim prohibition of operations on certain high risk sites will continue until rules are adopted by the Board of Forestry and then promulgated.

B) Development of Forest Practices Requirements

Senate Bill 12 requires the Department of Forestry to adopt and enforce forest practice rules to reduce the risk of serious bodily injury or death from a rapidly moving landslide (ORS 527.630). The statute (ORS 527.710(11)) sets forth the criteria the Board of Forestry should consider in adopting such rules including the exposure of the public to these safety risks and appropriate practices to reduce the occurrence timing or effects of rapidly moving landslides. Senate Bill 12 also provides for the repeal of Sections 1 and 2 of chapter 565 of Oregon Laws 1997 (Senate Bill 1211).

Senate Bill 12 requires the Board to adopt new rules, and to make findings that support these rules. The Board must determine specific facts and standards listed in ORS 527.714 (1)(c). The findings required by the statute are summarized in Appendix B. At its April 21, 2000 meeting, the Board of Forestry approved and directed the department to follow six guiding principles in developing administrative rules to respond to Senate Bill 12. Appendix C includes the Board of Forestry's guiding principles.

C) Project Team and Issue Paper

A project team has been formed to help the department develop alternatives for consideration by the Board of Forestry. To help the team in this effort, eight policy considerations have been identified for review and discussion. The team has been asked to develop alternatives as appropriate. Recommendations will be based on project team input, the requirements of Senate Bill 12, and the guiding principles. More specific rule concepts will also be developed in collaboration with the project team. Input from potentially affected parties will be

solicited and incorporated into these concepts. A list of project team members is included as Appendix D.

The Department of Forestry has drafted a Landslides and Public Safety issue paper. This issue paper has been reviewed by a number of landslide experts, and also by members of the project team. The department has hired a geotechnical assistant to help perform the detailed analyses required by statute (ORS 527.714), and to better provide information on specific landslide hazards to local governments. The department is currently working on development of alternatives, with project team input.

ISSUES ASSOCIATED WITH IMPLEMENTATION OF SENATE BILL 12

- **Local Governments Geographic Information System Capabilities**

According to a survey of local governments in western Oregon conducted by Douglas County, fifteen of the eighteen counties with areas identified as having the potential for rapidly moving landslides, have Geographic Information Systems. These systems will allow counties to incorporate the Department of Geology's "further review area" maps into their existing mapping programs, allowing them to address landslide issues on a tax lot or parcel basis. Three Counties – Coos, Curry, and Hood River – currently do not have Geologic Information Systems. These communities will be at a distinct disadvantage when beginning to implement Senate Bill 12.

- **Funding for Mapping Effort**

Funding is currently unavailable to field verify all of the Department of Geology's maps of "Further Review Areas." No funding is available to map areas of rapidly moving landslides in eastern and central Oregon.

- **Local Government Concerns**

Local governments have expressed concerns about implementation of Senate Bill 12. If local governments seek a legislative remedy, the Departments of Geology, Land Conservation and Development and Forestry will be pleased to provide additional information to the legislature, as needed.

- **Ballot Measure 7**

The three departments are not aware of any changes required to implement Senate Bill 12 at this time. However, the potential effect of Ballot Measure 7 on the implementation of Senate Bill 12 is unknown.

CONCLUSION

The combined Department of Geology and Forestry mapping of rapidly moving landslides is on schedule to be completed by summer 2001. Land Conservation and Development is expecting final delivery of model ordinance materials in spring 2001 as well. Department of Forestry is also on schedule with rule making and other ongoing Senate Bill 12 activities. All three departments have been actively involved in many complementary efforts to address rapidly moving landslide hazards in western Oregon. (See Appendix A).

The Departments of Geology, Forestry, and Land Conservation and Development are individually and jointly committed to developing useful products and disseminating information to mitigate landslide hazards in Oregon. With the eventual completion of the hazard maps and supporting programs, Oregonians will be served with extremely valuable landslide hazard mitigation tools. State and local planners, transportation officials, foresters, ecologists, and many others can benefit from the existence of consistent and comprehensive methods for identifying rapidly moving landslide hazard zones. The existence of these valuable hazard identification tools, coupled with public involvement and outreach, can lead to more informed resource allocation, increased public safety and effective landslide hazard mitigation in Oregon.