

# **Flood Map Modernization**

## **Business Plan For Oregon**

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### **Executive Summary**

Oregon's state agencies and local governments rely on flood hazard data and maps produced by the Federal Emergency Management Agency (FEMA) for floodplain management. The FEMA flood hazard maps establish floodplain boundaries and flood depths for regulatory purposes and provide information that helps state agencies, local governments, and citizens to mitigate for potential flood losses. Of the two hundred fifty seven (257) Oregon cities and counties that participate in the National Flood Insurance Program (NFIP), over seventy percent of these NFIP communities have FEMA maps that are outdated. Some of the more significant problems associated with using outdated flood maps are:

- Flood depths and impact areas shown on old maps are potentially inaccurate, particularly where Oregon has experienced population increases and resulting changes in development patterns;
- During major flood events in 1996 & 1997, some Oregon communities experienced flooding in areas not delineated on FEMA maps as floodplain;
- Older FEMA maps were prepared using manual cartographic techniques, which make the maps difficult for state and local customers to use and expensive to maintain;
- Difficulties with the use of older maps can result in inconsistencies determining if properties are within or outside of floodplains, resulting in a lack of credibility with the public and challenges for providing good customer service
- The base data used to develop the flood hazard maps, where still accessible, are not in an easy-to-use format by today's mapping standards and in some cases are inadequate or inaccurate.

Although the majority of Oregon's flood maps are considerably out-of-date, six populous counties will have up-to-date, digital flood hazard maps in 2004. Four additional counties are scheduled by FEMA for map updates in 2005. DLCD wants to see the number of NFIP communities with similarly updated maps increased. The long-term goal must be to digitize (and update as necessary) all FEMA flood hazard maps for Oregon.

FEMA has embarked on a nationwide program called the Map Modernization initiative to address mapping problems like those described above. As part of the national initiative, FEMA provided state floodplain programs with the opportunity to develop business plans describing potential state involvement in the Map Modernization initiative. The Department of Land Conservation and Development (DLCD), as the state's lead agency for administration of the NFIP in Oregon, has developed this business plan to identify how Oregon could participate in and further the objectives of FEMA's Map Modernization initiative.

Oregon's business plan describes potential state contributions to the FEMA mapping initiative and identifies the essentials of a funding and staffing package that is necessary for implementation of the business plan. The business plan will serve as a basis for any

future state requests for FEMA map modernization funds. DLCD envisions completing the flood map updating and conversion to digital flood maps within 5 years. This goal is, of course, dependent on the future availability of federal funding and other federal support for state participation. Full implementation of this business plan will result in more accurate flood maps and a method of delivery and maintenance that facilitates effective floodplain management across the state.

DLCD proposes to lead the state effort to implement the Map Modernization initiative. This will be accomplished through partnerships with FEMA, other federal agencies as appropriate, key state agencies, and local communities. These partnerships will be used to leverage contributions (e.g. data, labor, etc.) and to produce better maps at a lower cost.

The state will manage the map modernization process to facilitate various floodplain management needs and uses for flood hazard data and maps, while constantly seeking out efficiencies in the development, use and maintenance of flood hazard data. The state will have an increased role in the distribution and maintenance of flood hazard data and maps. Local government participation in map modernization would be strongly encouraged and supported to the maximum extent possible by the state. The goal would be to work together across agencies and levels of government to share resources and knowledge related to mapping and map use. This would allow the state to maximize resources at the state level and better ensure that funding for mapping work is distributed across Oregon to assist the maximum number of NFIP communities.

**Table of Contents**

**1. Problem Statement..... 1**

**2. Purpose and Scope of Business Plan ..... 2**

**3. State of Oregon Vision for Supporting Flood Map Modernization ..... 3**

**3.1. Overarching State Vision for Map Modernization ..... 3**

**4. Potential Mapping Partners..... 4**

**4.1. State Agencies ..... 4**

**4.2. Regional and Local ..... 4**

**4.3. Federal Agencies..... 4**

**5. Existing Resources ..... 5**

**5.1. Programs ..... 5**

**5.2. Flood Maps..... 6**

**6. Support of FEMA Map Modernization Objectives ..... 8**

**6.1. Objective I – Establish/ maintain a premier data collection/delivery system. . 8**

**6.2. Objective II – Achieve effective program management..... 9**

**6.3. Objective III – Build and maintain mutually beneficial partnerships..... 10**

**6.4. Objective IV - Expand and better inform the user community. .... 10**

**7. State Participation in Map Modernization..... 11**

**7.1. FEMA Cooperating Technical Partners (CTP) Program..... 12**

**7.2. “CAP MAP” and Related Activities ..... 12**

**7.2.1. Annual State Business Plan Updates..... 13**

**7.2.2. Inventory of Digital Base Map Layers for NFIP Communities..... 13**

**7.2.3. Community Mapping Needs Assessment..... 14**

**7.2.4. Outreach Program..... 15**

**7.2.5. Information Technology Systems ..... 17**

**7.2.6. DFIRM Maintenance..... 18**

**7.2.7. Base Layers..... 19**

**7.2.8. Floodplain Layer ..... 20**

**7.2.9. LOMCs..... 21**

**7.2.10. Technical Standard/Process Agreements ..... 22**

**7.2.11. Other Map Modernization Activities ..... 22**

Flood Map Modernization Business Plan for Oregon

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**7.3. Floodplain Mapping Activities ..... 22**  
    **7.3.1. Project Scoping..... 23**  
    **7.3.2. Project Outreach..... 24**

**8. State Contributions To Map Modernization..... 24**

**9. State Resource/Staffing Needs, Justification for Future Funding Requests ..... 25**

**10. Business Risk Factors/Requirements for Success ..... 28**

**11. Flood Mapping Priorities ..... 31**

**Appendix A: Flood Map Modernization Plan for Oregon, August 2002**

**Appendix B: DLCD/State Authorities for Floodplain Management**

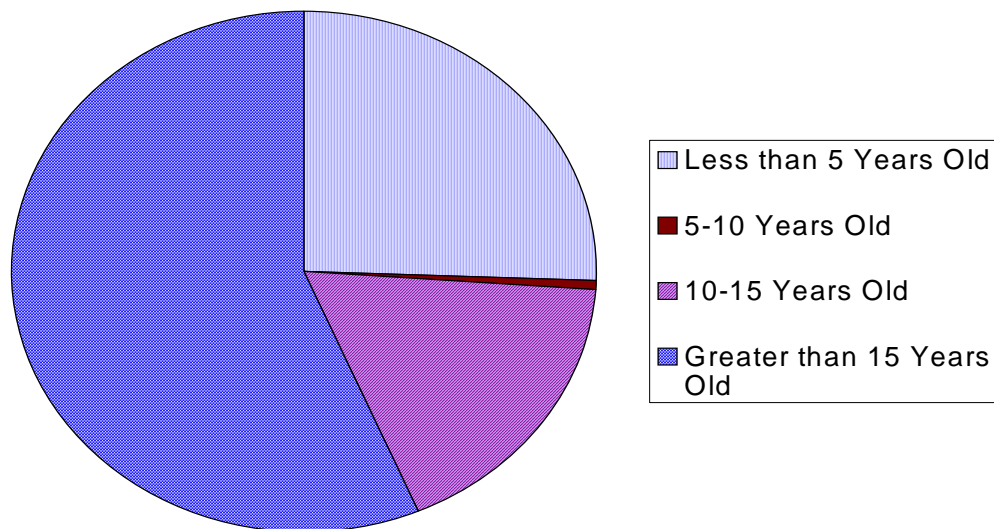
**Appendix C: Description of FEMA Mapping Process**

**Appendix D: DLCD Organization Chart**

**Appendix E: Survey for Inventory of Digital Base Map Layers**

### 1. Problem Statement

Flood hazard maps produced by the Federal Emergency Management Agency (FEMA) are one of the essential tools for flood hazard mitigation in Oregon and in the United States in general. Oregon's local governments and state agencies rely on FEMA flood hazard maps to regulate floodplain development and otherwise mitigate for flood losses. The private sector also uses FEMA maps for development and insurance purposes. As shown in Figure 1, the majority of flood hazard maps produced for Oregon's communities are more than 15 years old. Many of these maps were originally produced in the 1970s or early 1980s. Since then, Oregon's population has increased significantly, particularly in the flood-prone Willamette Valley and in some coastal communities. Flooding levels and impact areas are potentially altered by these population increases and changes in development patterns.



*Figure 1 - Age of Oregon's Flood Hazard Maps*

*Data Source: Oregon State Mapping Data from FEMA Region X – May 10, 2002*

Additionally, the state suffered significant flood losses in 1996 and 1997 when 27 of the state's 36 counties were declared federal disaster areas. Among the lessons learned during the 1996 and 1997 floods was that flooding in Oregon communities was not always limited to areas shown on FEMA flood hazard maps. In many cases, flooding occurred in areas not mapped as having significant flood hazards. This demonstrates the problem of older FEMA maps sometimes reflecting outdated flood hazard information, thereby limiting map utility for floodplain management purposes.

Even where the flood hazard information represented on FEMA's flood hazard maps remains accurate, FEMA's traditional map format generates numerous challenges for Oregon communities charged with regulating floodplain development and state agencies

working to mitigate flood hazards. We provide some examples here of these challenges for illustrative purposes.

- Most of the FEMA maps were prepared using road network information that is now outdated.
- The original maps were prepared using manual cartographic techniques, which make the maps difficult for state and local customers to use and expensive to maintain.
- Changes in political boundaries, such as annexations by cities, are not readily addressed on older maps.
- City and county maps were not produced in a seamless method making it difficult to use the maps for locations near jurisdiction boundaries.
- The base data used to develop the flood hazard maps, where still accessible, is not in an easy-to-use format by today's mapping standards.
- Local floodplain administrators must document by hand onto the paper maps all the site-by-site administrative changes made routinely by FEMA.
- The submission and acceptance process for updating flood maps can appear slow and complicated to potential participants.

The state of Oregon also has a relatively high number of stream miles subject to mapping for flood hazards. The Association of State Floodplain Managers (ASFPM) reports that Oregon has 107,039 total stream miles to address. ASFPM lists only nine states with more stream miles subject to flood hazard mapping, and only one of those states (Alaska) is located within Region X. This highlights the extent of flood hazards across Oregon and the potential scope of updates needed to modernize existing flood hazard maps.

FEMA has embarked on a nationwide program called the Map Modernization initiative to address the mapping problems described above. The objectives for the Map Modernization initiative are listed here and discussed in more details later in this document.

Objective I – Establish and maintain a premier data collection and delivery system.

Objective II – Achieve effective program management

Objective III – Build and maintain mutually beneficial partnerships

Objective IV - Expand and better inform the user community

## **2. Purpose and Scope of Business Plan**

The purpose of this business plan is to present a proposal to FEMA for how the State of Oregon could participate in and further the Map Modernization initiative. The business plan describes potential state contributions to the mapping process and identifies the essentials of a proposed funding and staffing package that is necessary for implementation of the business plan. The state contributions and work proposed in this

plan are dependent on federal funding and leveraging of partnerships to reduce mapping costs and increase efficiencies.

Oregon's business plan proposes that the Oregon Department of Land Conservation and Development (DLCD) act as the lead agency for the state but work cooperatively with multiple mapping partners to carry out map modernization activities. A funding and staffing package that would allow for state participation is outlined within this business plan. The plan also specifies where FEMA Region X would need to carry out mapping activities directly, by contract, or through local partners. Oregon is not proposing to become a "full" mapping state due to limitations in state capacity that could not be readily overcome even with the proposed funding and staffing package.

This business plan addresses a 5-year period (Federal fiscal years 2005 through 2009). The timeframe for implementation of this business plan would, of course, lengthen if the funding and staffing package proposed herein cannot be achieved. The implementation timeframe would also be extended if FEMA Region X were not sufficiently funded to support state and local government mapping efforts.

### **3. State of Oregon Vision for Supporting Multi-Hazard Flood Map Modernization**

Given the importance of flood hazard mapping to Oregon communities and the state of Oregon and the need for flood hazard maps that are accurate, easy to use, and readily available to all users, DLCD is very encouraged by FEMA's Map Modernization initiative. This business plan reflects the importance of the Map Modernization initiative to Oregon and the current vision for realizing FEMA's map modernization objectives in a reasonable, predictable and cost-effective manner.

DLCD proposes to establish the framework for evaluating and prioritizing the flood map modernization needs of all thirty-six Oregon counties consistently through this business plan. DLCD would lead the state effort to implement the Map Modernization initiative through partnerships with FEMA, other federal agencies as appropriate, key state agencies, and local communities. Partnerships would be used to leverage contributions (e.g. data, labor, etc.) and to produce better maps at a lower cost. These partnerships would also facilitate local community participation in the mapping process at a level that we have not seen in the past. The state will strive to manage the map modernization process to facilitate various floodplain management needs and uses for flood hazard data and maps, while constantly seeking out efficiencies in the development, use and maintenance of flood hazard data. The goal would be to work together across agencies and levels of government to share resources and knowledge related to mapping and map use. This would allow the state to maximize resources at the state level and better ensure that funding for mapping work is distributed across Oregon to assist the maximum number of NFIP communities.

#### **3.1. Overarching State Vision for Map Modernization**

- Work toward a seamless floodplain layer for the entire state supported by a geospatial database.

- Increase effectiveness and efficiency of the floodplain mapping process.
- Ensure public access, particularly for local governments and state agencies, to the best available data in order to support floodplain management.
- Develop and maintain capacity at the state-level to provide high quality customer service to local mapping partners and FEMA.
- Empower Oregon's NFIP communities to participate in the Map Modernization initiative.
- Produce all maps for Oregon's NFIP communities in Digital Flood Insurance Rate Map (DFIRM) format (with paper option).

#### **4. Potential Mapping Partners**

DLCD believes that there is a unique opportunity for having a number of state, local, and federal partners involved in the Map Modernization initiative in Oregon. Key agencies that DLCD anticipates would be key mapping partners are listed below. Additional partners may be identified as map modernization activities move forward:

##### **4.1. State Agencies**

Department of Administrative Services (DAS), Geospatial Enterprise Office (GEO)  
Oregon Office of Emergency Management (OEM)  
Department of Forestry (ODF)  
Department of Geology and Mineral Industries (DOGAMI)  
Division of State Lands (DSL)  
Department of Transportation (ODOT)  
Water Resources Department (WRD)  
Other members of the Interagency Hazard Mitigation Team (Appendix B for listing)

##### **4.2. Regional and Local**

Oregon Natural Hazards Workgroup – University of Oregon  
Metro Regional Government  
Regional Councils of Governments (Western Oregon)  
County Planning, Building, Public Works, other appropriate departments  
City Planning, Building, Public Works, other appropriate departments

##### **4.3. Federal Agencies**

U.S. Army Corps of Engineers  
U.S. Bureau of Land Management  
U.S. Forest Service  
U.S. Geological Survey  
Natural Resource Conservation Service  
Office of Ocean & Coastal Resource Management\*\*  
Coastal Services Center\*\*

\*\* For coastal zone mapping only

## 5. Existing Resources (See also Section 8, Appendices A & B)

### 5.1. State Agency Programs

The Statewide Land Use Planning Program provides an overarching framework for state-local partnerships. State land use regulations also require local land use programs to incorporate natural hazard inventories, policies, and implementing regulations (e.g. floodplain zoning ordinances.). (See also the more detailed discussion of land use authorities, including statewide planning Goal 7 found in Appendix B.)

DLCD's Floodplain/Natural Hazards Program provides assistance to Oregon communities in various ways. One, key program goal is to ensure that Oregon communities remain eligible to participate in the NFIP. Another key goal is to work with FEMA and other parties to provide technical assistance and improved flood hazard information in various forms to Oregon's local governments to facilitate effective floodplain management.

DLCD also administers the Oregon Ocean Coastal Management Program (OCMP), the state's federally-approved coastal zone management program. The OCMP provides planning and technical assistance to local governments within Oregon's coastal zone. The OCMP efforts include a focus on natural hazards management, including but not limited to coastal erosion and flooding.

Oregon's Geospatial Enterprise Office (GEO) assists state agencies with the coordinated development, application, and use of Geographic Information Systems (GIS) technologies and is responsible for the operation of the Oregon Geospatial Data Clearinghouse (OGDC). OGDC provides Oregon agencies with the infrastructure and support staff to distribute and maintain geospatial data for the public consumption. Fundamental to OGDC is the development, distribution and maintenance of statewide base map layers. OGDC has procedures in place and is currently implementing programs that address the creation, maintenance, and distribution of base map layers FEMA requires for the DFIRM product.

Other State Agency Programs: Each of the other, above-listed agencies has certain expertise with natural hazards management, hazards mapping, or specific geospatial data/data applications. DLCD will coordinate with these agencies with the goal of maximizing cooperative and mutually beneficial partnerships with respect to map modernization. As one example, DOGAMI has expertise that would be key for v-zone and landslide modeling and mapping efforts. DOGAMI also would be a source for hazards data that is not currently available in a digital format. As another example, DSL has expertise regarding the state's waterways and likely can assist with questions or data regarding those waterways.

## 5.2. Flood Maps

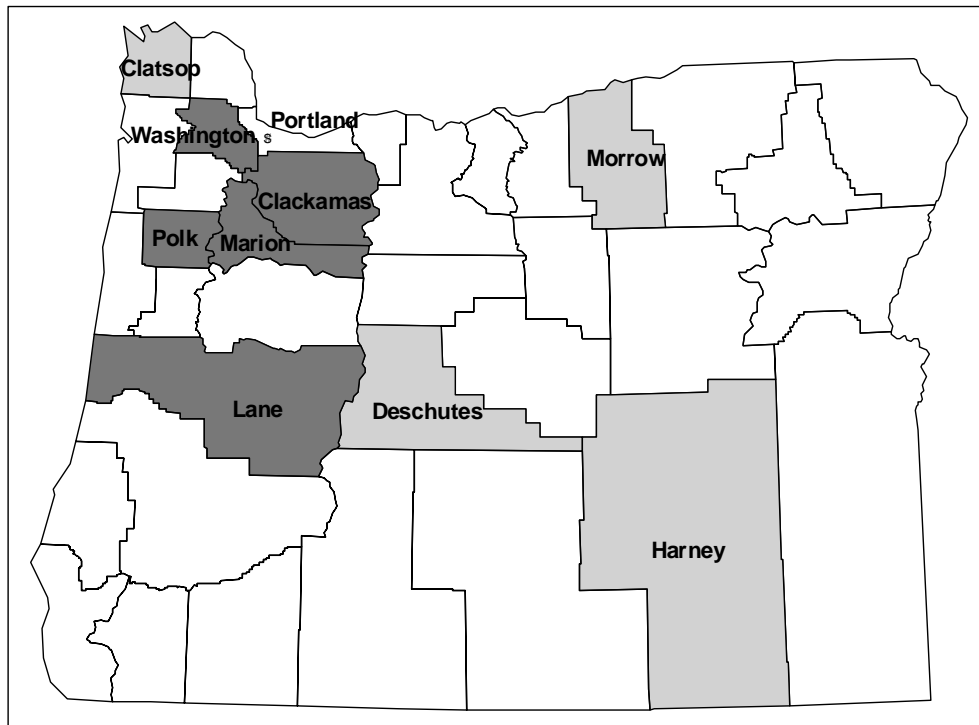
The status of flood maps in Oregon is as follows.

By October 2004, FEMA's Cooperating Technical Partners and National Service Provider (NSP) will complete DFIRMs for the following communities (shown shaded in Figure 2):

- Clackamas County – limited restudy
- Washington County - restudy
- Lane County – straight conversion
- Marion County – straight conversion
- Polk County - straight conversion
- City of Portland – straight conversion

Work planned for 2005 is as follows (shown shaded in Figure 2):

- Morrow County – limited restudy
- Harney County – New topography/conversion
- Deschutes County – straight conversion
- Clatsop County – limited restudy Seaside, otherwise straight conversion



**Figure 2 – DFIRM Production By County**

The current, total numbers of FIRM panels by county, either digital or hard copy, are shown in Table 1. Many Oregon communities still only have hard copy maps. (See also Appendix A for more information about existing maps.)

| <b>County</b> | <b>Number of FIRM Panels</b> |
|---------------|------------------------------|
| Baker         | 38                           |
| Benton        | 45                           |
| Clackamas     | 100                          |
| Clatsop       | 36                           |
| Columbia      | 48                           |
| Coos          | 66                           |
| Crook         | 21                           |
| Curry         | 41                           |
| Deschutes     | 24                           |
| Douglas       | 67                           |
| Gilliam       | 33                           |
| Grant         | 33                           |
| Harney        | 39                           |
| Hood River    | 14                           |
| Jackson       | 203                          |
| Jefferson     | 44                           |
| Josephine     | 83                           |
| Klamath       | 113                          |
| Lake          | 45                           |
| Lane          | 168                          |
| Lincoln       | 41                           |
| Linn          | 90                           |
| Malheur       | 69                           |
| Marion        | 85                           |
| Morrow        | 80                           |
| Multnomah     | 107                          |
| Polk          | 50                           |
| Sherman       | 27                           |
| Tillamook     | 38                           |
| Umatilla      | 54                           |
| Union         | 93                           |
| Wallowa       | 29                           |
| Wasco         | 47                           |
| Washington    | 182                          |
| Wheeler       | 30                           |
| Yamhill       | 123                          |
| <b>Total</b>  | <b>2470</b>                  |

*Table 1 - FIRM Panels By County*

Like other coastal states, Oregon's coastal floodplain studies are based on outdated floodplain mapping conducted in 1976-1978. Updates to coastal floodplain mapping have been delayed until new methodology is developed and adopted by FEMA.

When the new coastal mapping methodology is available for use, DLCDC will need to reassess priorities and begin to schedule re-mapping in coastal communities. It is likely that some and perhaps all coastal communities will become high priority areas for remapping. FEMA currently anticipates that an updated coastal methodology will be available late in 2004.

## **6. Support of FEMA Map Modernization Objectives**

Oregon's business plan proposal has been developed to support FEMA's objectives for the Map Modernization initiative. The following tasks would support FEMA's objectives and would be accomplished as "CAP-MAP" and/or floodplain mapping project activities as described later in this document.

### **6.1. Objective I – Establish and maintain a premier data collection and delivery system.**

Oregon strongly believes that to establish and maintain a premier data collection and delivery system the following must be accomplished:

- New flood maps be developed digitally in a county-wide, seamless format to set specifications
- Flood maps be made accessible to the public via the Internet, thus reducing the need for hard copy flood maps
- Flood maps be available for printing on demand via the Internet for areas needed by any potential user
- Mechanisms be in place to keep floodplain and base map data up-to-date

The state of Oregon, under the leadership of DLCDC, proposes the following tasks to address Objective I. These tasks are not listed in sequential order and are likely to be carried out concurrently:

1. Participate in the development and management of data standards for Oregon projects, working with FEMA to promote appropriate product specifications and quality in a way that minimizes the complexity of the standards and assures data and systems are compatible
2. Provide technical assistance to educate and enable local governments and others to create and use digital flood data
3. Develop an inventory of existing digital DFIRM base map data
4. Prioritize the development of digital base map data and make the data available to users
5. Secure necessary permissions from communities or base map sources to allow FEMA's use and distribution of hardcopy and digital map products using the digital base map, free of charge
6. Identify strategies to motivate local communities and other mapping partners to actively participate in data sharing, development and maintenance
7. Make digital flood map data available to users and stakeholders in the public domain environment of the Oregon Geospatial Data Clearinghouse

8. Lead the community-by-community assessment of flood mapping needs for NFIP communities within the state.
9. Work with FEMA to adopt specific technical standards or processes appropriate for local conditions for flood mapping purposes. Flood-related hazards unique to Oregon and other coastal Pacific Northwest states include coastal erosion, winter storm surges, tsunamis and landslides.
10. Influence the DFIRM development and adoption process to maximize efficiencies, local control, and transparency

## **6.2. Objective II – Achieve effective program management.**

DLCD's intent for program management is not to replace or usurp other state or local programs for natural hazards mapping and management. The intent, instead, is to provide additional capacity at the state-level to coordinate map modernization efforts with such state and local programs while being able to maintain a specific focus on mapping for floodplain management purposes.

Under the leadership of DLCD, the state proposes to establish the Oregon Map Modernization Coordinating Workgroup. The workgroup would assist DLCD in developing and continually improving program management. The workgroup would help DLCD in efforts to motivate partners to share responsibilities and to work cooperatively to reduce Oregon's vulnerability to flood and other related hazards. The workgroup would consist of appropriate state and local partners and other interested parties. (See also Section 7.2.11.)

The workgroup would specifically assist DLCD with tasks that address Objective II such as:

- Establish Map Modernization performance goals and measures.
- Ensure the completion of the Oregon Map Modernization program by 2009.
- Increase state legislative and local elected officials support for the Map Modernization initiative.
- Reduce the state's cost by developing partners that will develop, contribute, or accept ownership of the data.
- Broaden the management scope from a single hazard focus to a multi-hazard focus whenever possible.

The floodplain mapping organization (see Section 10) proposes in this business plan would provide DLCD with the ability to lead and manage the "CAP-MAP" and other map modernization activities. While DLCD must continue to rely on FEMA for floodplain studies and mapping, the proposed organization should provide sufficient state resources to coordinate activities with communities, perform outreach, conduct mapping needs assessments and participate with FEMA in project-specific scoping and outreach.

GEO provides an important element of the proposed program management by ensuring that base map layers are available and up-to-date. GEO also oversees the operation of the state clearinghouse to distribute geospatial information to users. In addition, GEO is knowledgeable of mapping activities occurring throughout the state and will provide DLCD and FEMA with the assurance that the best available data is being incorporated into flood studies in the most cost effective manner. GEO would also provide guidance to DLCD on data steward responsibilities and other similar functions.

### **6.3. Objective III – Build and maintain mutually beneficial partnerships.**

Developing and maintaining effective partnerships and leveraging resources will be fundamental to the success of Oregon’s proposal for participation in the Map Modernization initiative. The state intends to encourage greater and broader community participation in the development and maintenance of the data needed to meet mandates of the NFIP.

Oregon will foster collaborative approaches to data gathering and distribution to encourage direct management of the data collection, analysis, product delivery and data maintenance at the regional and local level. DLCD, taking the lead for the State, would address Objective III as follows:

1. Develop strategies for motivating partnerships and partner assumption of responsibilities for mapping activities
2. Enter into an overarching Cooperating Technical Partners (CTP) agreement (FEMA Region X and DLCD)
3. Promote increased partner involvement through mentoring and assistance that ensures flood-mapping data is reliable, usable, and widely accessible.
4. Increase the number of local governments that will undertake mapping efforts through CTP agreements with FEMA or independently using their own resources.
5. Reflect the importance of partnerships in how the state sets mapping priorities, while allowing for the continued addition of partners and partners’ contributions to flood mapping efforts.
6. Identify possible incentives to strengthen partnerships, links, and commonalities to other state and regional programs that could contribute data to the flood mapping process.
7. Address coordination with other flood hazard mitigation efforts, including mitigation planning under the Disaster Mitigation Act of 2000, Oregon Showcase State initiatives, USGS National Map, etc.

### **6.4. Objective IV - Expand and better inform the user community.**

Oregon’s outreach program would be aimed at helping to ensure the success of the Map Modernization initiative overall as well as the success of individual community mapping projects. The outreach program would be developed to foster better public and stakeholder understanding of the importance of flood hazard mapping and map

modernization. Ideas for outreach are discussed in more detail later in this plan. The primary goals of Oregon's outreach program would be to:

- Communicate the benefits of map modernization to Oregon communities, state agencies, and elected officials
- Maximize stakeholder involvement in and contributions to the map modernization process
- Enhance map accuracy and lower mapping costs by facilitating data sharing
- Minimize formal appeals and protests to map changes
- Ensure the use of best available data and updated flood maps for local and state floodplain management and hazard mitigation efforts

Outreach initiatives led by DLCD could include:

1. Identify users and target audiences for specific outreach activities, e.g. local governments, realtors, etc.
2. Implement innovative solutions/mechanisms for the presentation of flood mapping data that are meaningful for various users.
3. Develop/present state/local education efforts for citizens regarding flood hazards, floodplain management, and the importance of map modernization efforts.
4. Develop/present methods to receive, share, and respond to flood mapping product user evaluations/feedback.

## **7. State Participation in Map Modernization**

The state's proposal for involvement in "CAP-MAP" Phase II Activities and FEMA Flood Mapping project activities is described below. "CAP MAP" activities are those that are not linked to specific mapping projects but instead provide overall support to the Map Modernization initiative. Floodplain mapping activities are those activities that occur as part of specific DFIRM conversion or restudy mapping projects. For more information about "CAP-MAP" and mapping project activities, see Sections 7.2 and 7.3 respectively.

The extent to which DLCD can lead state participation in CAP-MAP and mapping project activities and the timeframe for reaching FEMA's objectives for the Map Modernization initiative are dependent on several key factors. These factors are: adequate federal funding (FEMA Region X and to states), pulling together a stable funding/staffing package at the state-level, and successful creation of intergovernmental partnerships to accomplish map modernization work.

DLCD expresses in this business plan its intent for supporting FEMA's Map Modernization program. The uncertainty of federal funding for map modernization work and budgetary constraints at the state level make it difficult for DLCD to be confident about the proposed level of state participation. (See discussion at Section 10.) Nonetheless, we believe that the state's business plan outlines an approach meeting FEMA's overarching objectives for the Map Modernization initiative while providing solid support for mapping efforts in Region X. This business plan proposal leverages

existing state programs and infrastructure into the approach for state participation in mapping activities. The approach laid out in this business plan would be a cost effective and efficient approach for both the state and FEMA. In addition, the approach described herein will result in engagement of and quality customer service to Oregon's local governments and other flood map users.

### **7.1. FEMA Cooperating Technical Partners (CTP) Program**

DLCD, as the lead state agency for map modernization activities, proposes to pursue a CTP agreement with FEMA Region X. The DLCD-FEMA CTP agreement would establish the overall basis for cooperation and coordination between the state of Oregon and FEMA. This CTP agreement would support the state efforts described in this plan and memorialize DLCD's commitment to the Map Modernization initiative.

One of DLCD's "CTP" goals would be to work toward expanding the number of local CTP's within the state to:

- facilitate more efficient floodplain management;
- pool resources and extend the productivity of limited public funds; and
- move ownership of flood map maintenance and distribution to local communities

Oregon communities that are currently CTPs or considering the CTP program include:

- Clean Water Services, Washington County
- Clackamas County Service District #1
- Harney County
- City of Eugene
- City Stanfield
- City of Sutherlin

With a combined DLCD and GEO focused effort, we will identify other likely CTP candidates and encourage them to become participants. DLCD would work with FEMA to direct local CTP candidates to FEMA CTP training.

### **7.2. "CAP MAP" and Related Activities**

"CAP MAP" activities would not be linked to specific mapping projects but instead would provide overall support to the Map Modernization initiative. In other words, "CAP-MAP" activities are programmatic activities. Some "CAP-MAP" activities would be conducted prior to specific mapping projects while others would be more or less continuous throughout the implementation period. "CAP-MAP" activities would be supportive of individual mapping projects.

“CAP-MAP” activities are listed in Table 2 along with an indication of the state’s interest in leading or otherwise participating in these activities. Each activity is then discussed in turn within this subsection of the business plan.

| <b>Activity – Program Administration &amp; Management<br/>25% State Match Required</b> | <b>Initial State Interest*<br/>(Y=yes, N=No)</b> |
|--|--|
| Annual State Business Plan Updates   | Y (state lead)                                   |
| Inventory of Digital Base Map Layers   | Y (state lead)                                   |
| Community Mapping Needs Assessment   | Y (state partner)                                |
| Outreach (Regarding NFIP/Mapping)  | Y (state partner)                                |
| Hydrologic and Hydraulic Reviews   | N  |
| Information Technology Systems (Maintain/Disseminate Maps)                             | Y (state lead)                                   |
| DFIRM Maintenance (Floodplain/Base Layers, LOMCs)                                      | Y (state lead)                                   |
| Technical Standards/Process Agreements   | Y (state partner)                                |
| Other Map Modernization Activities   | ? (To be determined on as needed basis)          |

*\*Subject to the availability of federal funds*

**Table 2 – “CAP-MAP” & Related Activities**

### **7.2.1. Annual State Business Plan Updates**

As the community mapping needs assessment process becomes more robust, flood-mapping priorities will change. DLCD will provide FEMA Region X with an updated list of recommended mapping priorities for Oregon on an annual basis. These recommendations will rank potential projects and suggest whether straight FIRM to DFIRM conversions, conversions incorporating better topographic information, or hydrologic/hydraulic restudies are required. DLCD will also enter this updated information into the FEMA MNUSS database on an annual basis.

DLCD will also update this business plan on an annual basis to address developing information about new data sources, state in-kind contributions, and newly emerging or strengthened partnerships with local, state, or federal agencies.

### **7.2.2. Inventory of Digital Base Map Layers for NFIP Communities**

DLCD and DAS-GEO will lead the effort to provide an inventory of base map data meeting FEMA specifications for NFIP communities. The digital base map inventory will be useful during the mapping needs assessment and scoping. DLCD will supplement the information found in the August 2002 *Flood Map Modernization Plan for Oregon* (Appendix A) with additional information obtained from communities through a survey, phone conversations and site visits where necessary. The data layers inventoried will include county and municipal boundaries, publicly owned lands, transportation features, hydrography, benchmarks and geodetic control, topography, and digital orthophotography. In order to determine if the data meets FEMA specifications, the survey will gather

information on the scale, attributes, time of last update, aerial coverage, accuracy, coordinate system, and metadata availability for each of the data layers. The communities identified in this plan as mapping priorities will be given a high priority in the survey process. Please see Appendix E for a copy of the survey that will be used to aid in development of the inventory.

### **7.2.3. Community Mapping Needs Assessment**

The purpose of mapping needs assessment is to evaluate whether flood hazard and other data on a community's existing FIRM maps are adequate for floodplain management purposes and to establish flood-mapping priorities. The flood mapping priorities shown in this business plan (Section 11) are based on information contained in the August 2002 *Flood Map Modernization Plan for Oregon* (Appendix A). No further assessment work has been completed to date because DLCD does not currently have the staffing or funding necessary to expand upon the 2002 analysis. (The information collected and assessed previously is described on page 13 of the 2002 plan.)

DLCD views mapping needs assessment as a process that will have to be front-loaded into the implementation period but continually enhanced over the 5-year period as necessary. The assessment process will entail: gathering information from NFIP communities, evaluating that information and analyzing it based on a set of mapping criteria, and providing recommendations to FEMA Region X about mapping priorities for Oregon.

DLCD will develop a systematic approach to assess and document mapping needs information. A tiered assessment process is proposed. Tier 1 will be a general assessment of all Oregon NFIP communities accomplished through surveying. Tier 2 will focus in on those communities that are red-flagged in Tier 1 and will involve more detailed discussions with local floodplain administrators. Tier 3 will include communities investigated in Tier 2 but requiring additional review and documentation of data gaps or other issues done in conjunction with local floodplain administrators.

DLCD will determine key local contacts for providing assessment information from each NFIP community. DLCD will also formulate and use a standard list of questions for discussion with these local contacts. At a minimum, DLCD would investigate:

- Accuracy/adequacy of flood hazard data (for specific flooding sources/areas)
- Accuracy/adequacy of base map information
- Number of stream/shoreline miles mapped and requiring updates/not requiring updates
- Identified changes in local flooding conditions
- Comparison of any recent flood hazard events to the flood hazard information shown on FIRMs

- Significant changes in land use patterns within the watersheds or community
- Potential for future changes in land use patterns
- Noted problems with base flood elevations and 100 year event boundaries shown on FIRMs
- New/altered bridges/culverts, including performance during flood events
- Other factors potentially affecting stream morphology and hydraulics (e.g. flood control projects, stream bank stabilization, etc.)
- Development occurring within Approximate A zones (i.e., areas without established base flood elevations)
- Changes in jurisdiction boundaries (e.g. annexation of lands into city limits, responsibilities within urban growth boundaries, changes in urban growth boundaries)
- Extent of digital capabilities that are available at the local level

DLCD will analyze the information obtained through the first stage of the needs assessment to develop recommendations on mapping priorities. DLCD, in cooperation with FEMA, will then develop and employ a list of criteria for prioritizing mapping needs that will be used to rank potential mapping projects.

Like other coastal states, Oregon's coastal floodplain studies are based on outdated floodplain mapping conducted in 1976-1978. Updates to coastal floodplain mapping have been delayed until new methodology is developed and adopted by FEMA. When the new coastal mapping methodology is available for use, DLCD will need to reassess priorities and begin to schedule re-mapping in coastal communities. It is likely that some and perhaps all coastal communities will become high priority areas for remapping. FEMA currently anticipates that an updated coastal methodology will be available late in 2004.

### **7.2.4. Outreach Program**

DLCD views implementation of an outreach strategy that integrates community outreach into all phases of the FEMA mapping process as critical to the ultimate success of mapping projects. DLCD in partnership with FEMA, FEMA contractors and other mapping partners must educate community members, local and state officials, and other interested parties about:

- floodplain management in general, including hazard mitigation and floodplain insurance
- the importance of floodplain mapping to communities and the state
- regulatory uses of floodplain maps
- reasons for updating floodplain maps, including the benefits of using digital maps and
- the FEMA mapping process
- the Oregon map modernization program

Outreach must encourage information exchange along a “two-way” street. Therefore, Oregon’s outreach strategy also will provide for DLCD, FEMA, and other mapping partners to obtain information and understand the floodplain hazards and floodplain mapping issues from the standpoint of community members and officials. In this context, community members would include local residents, businesses, insurance agents, representatives of lending institutions, realtors, surveyors/engineers serving the area, special interest groups, local educators, local government staff working outside the planning department, and elected officials. Elected officials would include mayors, city planning commission members, city council members, county board members, state legislators, and congressional offices serving the community. Input from community members and officials will be necessary for program success.

DLCD will take the lead for the state on outreach efforts. The state NFIP coordinator and DLCD Map Modernization staff (see Section 9) would lead the outreach efforts. Outreach would be conducted in partnership with GEO, FEMA Region X and other mapping partners. DLCD anticipates that the Oregon Natural Hazards Workgroup (ONHW) in particular would be a key partner in outreach activities. ONHW defines as one of its key functions the coordination of community outreach, workshops, public education and information dissemination with respect to natural hazards. (For more information on ONHW, see <http://darkwing.uoregon.edu/~onhw/>)

Potential outreach activities include:

- Participating in and/or conducting meetings, trainings, or workshops designed to encourage community participation in map modernization and the CTP program.
- Assisting FEMA Region X with the distribution of map modernization materials, such as map modernization publications, mapping guidelines and specifications, mapping procedure manuals, CTP information/draft agreements, etc.
- Responding to community, public, or other requests for technical assistance regarding floodplain mapping.
- Empowering local communities to get involved in the mapping process by:
  - Addressing issues regarding integration of local and state data.
  - Communicating why local governments should provide data for mapping.
  - Providing GIS technical assistance to those communities without GIS resources or specialists.
  - Providing other resources to ensure that local governments can respond to state or FEMA requests for data and involvement in the mapping process.

A key assumption with respect to outreach is that FEMA will produce and make available federal publications that address the Map Modernization initiative.

DLCD may need to tailor FEMA products for use in Oregon but is not anticipating a need to produce publications from scratch.

This business plan also recognizes the critical importance of local information technology shops to the success of map modernization. Part of the NFIP community inventory (see Section 7.2.2.) seeks to document local capacities in this regard, and this inventory will inform the local shops support that the state hopes to provide support.

#### **7.2.5. Information Technology Systems (maintain and disseminate flood maps)**

The state of Oregon proposes to take the lead on the maintenance and dissemination of flood hazard data and maps. Key goals for the proposed information technology systems are as follows:

- Develop a statewide floodplain coverage supported by a geospatial database that is maintained at the state-level via partnerships among DLCD, DAS-GEO/OGDC, and others.
- Allow the state to distribute flood maps, through web-based printing and from in-house at DLCD's Floodplain/Natural Hazards program.
- Continually incorporate improved base layer data into the geospatial database.
- Routinely incorporate Letters of Map Change (LOMCs) into the system instead of waiting for a new mapping project.
- Work with FEMA and NFIP communities to address digital map use for regulatory purposes.
- Flag changes in base flood elevations and 100-year floodplain boundaries suggested by new, upgraded data.

DLCD is confident that the state of Oregon can reach these goals, if adequate federal funding is provided, due largely to the existence of the GEO and an established state clearinghouse for GIS information. A statewide GIS coordinator located within the Oregon Department of Administrative Services manages the GEO. The DAS coordinator coordinates the GIS activities of all state agencies, local governments, and academic institutions in Oregon.

The GEO works with and staffs the Oregon Geographic Information Council, created by Executive Order and composed of representatives from twenty-two (22) state agencies, four (4) local governments, and two (2) federal agencies. The Council discusses and approves resources and standards for development of shared information and tools that prevent duplication of data and save millions of tax dollars every year.

The Council developed the *Oregon Strategic Plan for Geographic Information Management*, adopted in June 2001. The *Strategic Plan* calls for the establishment of a Framework Implementation Team (FIT) and the design of an inclusive data standards development process. The Framework Implementation

Team has been established and is composed of representatives from all levels of government, utilities, academia, and the private sector. The Team has identified and prioritized fourteen (14) primary Framework data themes, containing over one hundred (100) individual data elements. There are Framework Working Groups working concurrently on thirteen (13) of these themes, with over three hundred (300) people in the various groups. Oregon Department of Administrative Services, through its GEO, serves as the state of Oregon's coordinating agency for all geospatial activities in state and local governments. The GEO could support DLCD with map modernization activities in several different ways. They have a staff of GIS specialists and are responsible for the ongoing State Framework data development that includes the base map layers required for a DFIRM.

One of the key components of GEO is the Oregon Geospatial Data Clearinghouse, an Internet library of location/map information that receives approximately 300,000 visitors and 200,000 data downloads each month. The Clearinghouse includes many functions designed to support the Oregon GIS Community:

- Communication mechanisms that help to develop and build a sense of community among the users of GIS technology and geospatial data
- Metadata repository to ensure that all Framework data sets shared by multiple agencies are properly documented according to accepted standards
- Geospatial data access and distribution to ensure the easiest possible access to Framework data needed for decision-making
- Geospatial data archive, coordinated through the Oregon University System library system
- Internet mapping services to enable all users to view and manipulate data holdings without specialized GIS software or knowledge
- Data integration, coordinated through identified data stewards for each Framework dataset

The Oregon Geospatial Data Clearinghouse contains the base map layers required by FEMA and has the infrastructure that is needed for storage and distribution of DFIRMs.

#### **7.2.6. DFIRM Maintenance**

The state of Oregon proposes to maintain DFIRMs and the associated geospatial database. The state role in maintenance would be a continual, evolving process. The state's intent is to manage the maintenance process such that FEMA's involvement is minimized over time. However, notification to FEMA would always be provided to address any updates that indicate problems with established base flood elevations. The state would also work with NFIP communities to develop local capacity for DFIRM maintenance.

The DAS GIS Coordinator identifies funding mechanisms that pass state and federal funds through local governments and state agencies to develop standardized data and to establish ongoing maintenance agreements that ensure a steady stream of updated data. Collaboration among the entire enterprise of government in Oregon makes this possible. The appropriate data steward(s) is identified as part of the collaborative process of data development. Many agencies at all levels of government and the private sector may be Framework data contributors, adhering to agreed upon standards in exchange for financial and other incentives.

**7.2.7. Base Layers**

Oregon’s Geographic Data Framework is comprised of 13 data themes as shown in the table below and includes the key base map layers required by FEMA. The Oregon Geographic Data Framework will help data producers locate their information in its correct position and provide a means of integrating this information with other geospatial data. Benefits from the development of a statewide geographic data Framework include reduced expenditures for data, increased ease of obtaining and using data collected by others, accelerated development of critical applications, increased number of customers for data products linked to the Framework, and improved recognition of programs. All existing, statewide data layers at OGDC conform to state of Oregon projection standards.

| <b>Data Theme</b>    | <b>Data Steward</b> | <b>Required by FEMA</b> |
|----------------------|---------------------|-------------------------|
| Hydrography          | OWRD                | ●                       |
| Transportation       | ODOT                | ●                       |
| Geodetic Control     | BLM                 | ●                       |
| Land Cover/Use       | OSU                 |                         |
| Bioscience           | OWEB                |                         |
| Elevation            | ODF                 |                         |
| Geoscience           | DOGAMI              |                         |
| Orthoimagery         | OGDC                | ●                       |
| Ownership            | DOR                 |                         |
| Political Boundaries | OGDC                | ●                       |
| Hazards              | OSU                 |                         |
| Utilities            | OGDC                |                         |
| Climate              | OSU                 |                         |

**Table 3 – Oregon Geographic Data Framework Layers**

Table 4 lists the additional base map layers required by FEMA that are not currently part of the Oregon Geographic Framework. As shown in the table

below, the required data is attainable and will be installed on the OGDC system as necessary.

| Data Layer                        | Status  |
|-----------------------------------|---|
| Bench Marks/<br>Control Points    | Control points being developed for statewide tax lot layer, additional data will be acquired from governmental agencies as needed |
| Public Land Survey                | Data will be acquired from Bureau of Land Management's Geographic Coordinate Data Base as needed                                  |
| US Geol. Survey 7½<br>Quadrangles | Some data is available and on file at OGDC, other data will be required as needed   |

**Table 4 – Status of Additional Layers Required by FEMA**

One of the most important tasks in developing a geographic data Framework for Oregon is to develop data standards for the various data themes that are most commonly needed and shared by users. When data standards are clearly defined, useful data can and will be developed and shared by multiple data producers and users across the state.

Ongoing maintenance of these data sets to ensure their continued availability for all agencies and organizations is critical to prevent the loss of the initial investment. GEO provides the leadership to provide for continuous maintenance and is currently recruiting and training data stewards. The data steward is most often an identified state or federal agency that has agreed to modify internal business processes to produce an integrated Framework data set by incorporating contributions from data producers into a centralized data model. Constant integration by the data steward of updated Framework data from local, state, and federal data contributors is an essential component of the Framework process.

The state understands that there may be additional data conversion efforts required for FEMA or other mapping participants to be able to use geographic data framework layers developed and maintained in OGDC. The state will work with data providers and FEMA to address any issues associated with different data projections, datums, units of measurement, or data conversions.

**7.2.8. Floodplain Layer**

DLCD would be the state's designated data steward for the floodplain layer. GEO would help establish DLCD as the data steward. Data stewards receive or collect data from various, often widely distributed sources, such as local and regional governments, universities, state agencies, and federal agencies. They ensure that the data from these various data providers have been created in adherence with existing and applicable state and federal data content standards. They perform quality control procedures on the data to ensure that the data is

accurate, complete, and consistent and that all appropriate metadata documentation accompanies each data submission. The data steward develops and maintains a close working relationship with the various data providers. This relationship is formalized with at least a memorandum of understanding, and in some cases requires an interagency agreement or contract when payment is involved. Data stewards use available and authoritative Framework data as a reference or base map for integrating the various data submissions. This integration follows agreed upon procedures that make the resulting statewide data set useful for all government agencies, including the original data providers.

GEO will work with DLCD to assist them in becoming a data steward for floodplain data and maps. To the extent necessary, GEO will work with DLCD staff to redirect resources and modify internal business processes to accommodate the data stewardship role. GEO has the technical expertise to assist DLCD with incorporating the appropriate technology in to the agency to accomplish the stewardship tasks, including data integration of standardized data provided by local governments, re-projection of that data to match all other Framework data sets, etc. GEO will further assist DLCD in drafting and implementing agreements with all data providers to ensure a continuous flow of data to the data steward and to ensure that properly formatted metadata accompanies each submittal of data from each data provider. GEO will provide DLCD access to all necessary Framework data from the Clearinghouse to form the base for integration of the locally provided floodplain data and updates. GEO will also provide technical assistance to DLCD staff as needed to assist with issues and problems as they arise related to data integration and the stewardship role. The Clearinghouse is available to serve as the repository of the statewide floodplain data and will make that data accessible to all government agencies and the public.

#### **7.2.9. Letters of Map Change (LOMCs)**

A critical part of DFIRM maintenance is incorporating LOMC revisions to floodplain maps and records with the aim to eliminate the current problem that communities and DLCD have in tracking LOMCs. DLCD's vision is to incorporate approved LOMCs onto the DFIRM as soon as possible after the change is approved. We intend to revise the DFIRM such that the excluded area is visible digitally. If FEMA requires linking the LOMC records to the map, even if the LOMC is visibly excluded from the floodplain, we will provide the link so the LOMC data can be brought onto the screen by clicking on the excluded area. Our approach installs all the information on the digital map needed to determine if a property requires flood insurance and eliminates the need to refer to the hard copy LOMCs.

The LOMC process needs to be enhanced by FEMA to facilitate incorporating changes onto the DFIRM map and records. Additional information such as the coordinates of the center of the property, the parcel boundaries and elevation of the property is needed in order to update DFIRMs and to eliminate the need to

refer to hard copy LOMCs. DLCD will work with FEMA to test the approach for incorporating LOMC revisions on DFIRM maps and records.

The state is currently working on a project to digitize tax lot data across the state. This tax lot data would facilitate work to incorporate LOMCs into DFIRMs.

#### **7.2.10. Technical Standard/Process Agreements**

DLCD and its mapping partners will likely run into situations where full adherence to FEMA guidelines and specifications for base layer data or certain steps in FEMA's standard mapping process would neither be cost effective nor otherwise justified based on local flood risks. In such cases, DLCD would work with FEMA Region X, affected communities, and other mapping partners to develop agreements on appropriate standards and process steps. The state expects any such agreements to be carried forward to specific mapping projects.

DLCD will also strive to work with FEMA and other mapping partners to develop agreements on how to address local conditions and unique hazards. This could include coastal erosion, winter storm surges, tsunamis, and landslides.

#### **7.2.11. Other Map Modernization Activities**

As discussed in Section 6.2, DLCD proposes to establish a Map Modernization Coordinating Workgroup to provide a high-level structure to ensure effective program management. The primary activities of the workgroup would include:

- Develop a 5-year plan, updated annually, for bringing all Oregon NFIP Community maps into the digital format
- Assist DLCD with performance goals and measures for map modernization
- Set priorities for mapping projects based on the results of the community mapping needs assessment
- Identify roles and responsibilities for all entities contributing to map modernization
- Monitor and track progress of mapping projects and partner contributions to mapping projects
- Evaluate overall DLCD/program performance and recommend improvements
- Propose training for local governments about the FEMA mapping process emphasizing the benefits of local government contributions, ownership of data, and approval of final maps within a timely manner
- Encourage communication across governmental agencies related to floodplain management issues

### **7.3. Floodplain Mapping Activities**

Floodplain mapping activities are those activities that occur as part of specific DFIRM conversion or restudy mapping projects. (A straight DFIRM conversion is

where the existing FEMA floodplain boundaries and base flood elevations are not re-examined or altered but the paper map is converted to digital format. A restudy involves gathering updated hydraulic and hydrologic information to assess the accuracy of floodplain boundaries and base flood elevations, with necessary map changes made and reflected in the digital map.) These activities would occur after or concurrent with the “CAP-MAP” activities discussed previously.

At this time, DLCD does not envision the state of Oregon being able to acquire sufficient technical engineering staff to perform all flood mapping studies or to administer all flood mapping contracts at the state level. State budgetary and organizational constraints preclude DLCD from recommending that the state of Oregon become a “full” mapping state. DLCD views the funding and staffing package that would be required for Oregon to be a full mapping partner as highly unrealistic. Instead, DLCD is proposing that floodplain-mapping activities specific to individual mapping projects will generally need to be conducted by FEMA, a FEMA study contractor, or a local CTP.

The DOGAMI has expressed interest in possibly conducting or overseeing certain flood mapping projects, particularly for coastal areas. The possibilities for DOGAMI involvement need to be discussed further by DLCD, DOGAMI, and FEMA. DOGAMI should be given the opportunity to actively participate in specific mapping projects, acting as a direct “contractor” to FEMA, where there is potential to draw upon that Department’s expertise and realize efficiencies in the mapping process. Alternatively, DLCD could work with FEMA and DOGAMI to further address a DOGAMI roll in specific mapping projects in an annual update to this business plan.

Notwithstanding the above, DLCD can foresee having limited ability to participate in specific mapping projects as follows.

### **7.3.1. Project Scoping**

DLCD could develop the capacity to participate in the scoping process for individual mapping projects as a full partner along with FEMA and FEMA Study Contractors. DLCD also welcomes GEO participation in the scoping because of their knowledge of existing base map data availability throughout the state and their capability to help determine the most cost effective approach to acquiring suitable topography data. And DLCD will encourage other state agencies to be involved with project scoping, specifically to determine if any state agency has data, technical expertise, or staff time to participate in mapping.

The state’s proposed level of participation in scoping is as follows:

- Participate in FEMA’s initial contact with the community once a decision to move forward with a mapping project has been made
- Be a member of the project management team; work with FEMA and the community to identify other members for the management team (This could include other state agencies that want to participate in specific projects.)

- Encourage community participation as a CTP where appropriate
- Contact/meet with the community to discuss and plan for community outreach, including how to incorporate public input into the project
- Participate as needed in the community's more detailed data needs assessment, specifically identifying data that can be transferred without change, data that must be updated, available data, data gaps, and how to merge state/local data
- Work with the community and FEMA on assignment of project tasks, including determination of capabilities of various partners to perform tasks and the need for contracts/other agreements to accomplish tasks
- Ensure that technical standards/process agreements are carried forward into mapping projects to ensure that state and local knowledge is utilized to the maximum extent

### **7.3.2. Project Outreach**

DLCD also anticipates that the general outreach activities proposed under the CAP-MAP section could blend with and support outreach conducted as part of specific mapping projects. DLCD may also be able to participate in project-specific outreach as follows:

- Work with FEMA and local mapping partners to identify community audiences and determine outreach needs/methods appropriate for those audiences
- Provide input to FEMA and local mapping partners regarding proposed outreach strategies and schedules
- Participate in outreach meetings conducted by FEMA and local mapping partners when feasible (dependent on staffing/workload/travel budget constraints)

## **8. State Contributions To Map Modernization**

The state of Oregon has significant, in-kind contributions that it can provide relative to the Map Modernization initiative, particularly with respect to FEMA's objective to "establish and maintain a premier data collection and delivery system." In-kind contributions would include data, other technical resources, and staff time of state employees in various agencies. DLCD has not attempted as part of business plan development to determine exact fiscal values for state in-kind contributions. This decision was partially based on time constraints set by FEMA for development of the business plan. But more importantly, DLCD believes that determination of in-kind contributions is a process that should be conducted openly and cooperatively with FEMA Region X and other state agencies. One source of guidance on in-kind contributions is "Estimating the Value of Partner Contributions to Flood Mapping Projects: A "Blue Book" by FEMA, October 2002. DLCD and FEMA will also need to assess local and regional pricing factors. Also, DLCD expects to identify additional in-kind contributions as coordination efforts with other state agencies continue.

As described previously, the DAS GEO developed and operates the Oregon Geospatial Data Clearinghouse (OGDC) that serves as the state's geospatial data repository and delivery system. OGDC is well established as the source for geospatial data in the state of Oregon. The OGDC was designed to readily incorporate various agency applications, such as storing and distributing NFIP floodplain mapping information. GEO also leads Oregon's State Framework Program. The Framework Program produces various statewide base map layers, including the layers required for DFIRMs. Oregon can contribute base map layers that meet or exceed FEMA base map specifications.

Maintenance of the base map layers and of floodplain maps is another important in-kind contribution of GEO. GEO is providing the leadership to establish procedures that will ensure base map layers and floodplain maps are kept up-to-date. GEO aims to develop agreements with state agencies, such as ODOT for transportation data, the Department of Water Resources for hydrology and DLCD for floodplain maps, that outline data stewards responsibilities for the agencies' respective datasets. In addition to negotiating the data steward agreements, GEO provides agencies the training in GIS procedures and tools necessary to become data stewards.

Lastly, GEO participation in mapping need assessments, scoping and outreach activities will reduce the time and effort required of FEMA Study Contractors to determine the availability and suitability of data needed for flood studies. GEO has comprehensive knowledge of ongoing state, local and federal government mapping and data acquisition activities throughout Oregon and has the authority and opportunities to develop cost sharing agreements across a wide range of partners. GEO knowledge of existing data and planned data acquisitions will be especially helpful in developing cost effective approaches for new topography data.

Numerous other state agencies (See Section 5.1) have certain expertise with natural hazards management, hazards mapping, or specific geospatial data/data applications. DLCD will coordinate with these agencies with the goal of maximizing cooperative and mutually beneficial partnerships with respect to map modernization. The Department anticipates that additional, in-kind contributions will result from these partnerships with other state agencies. DLCD will keep FEMA Region X informed of these developing partnerships and involve FEMA in discussions with other state agencies as necessary.

### **9. State Resource/Staffing Needs, Justification for Future Funding Requests**

DLCD supports the need for flood hazard maps that are accurate, easy to use, and readily available to all users. However, the Department does not currently have an organization dedicated or available to support the FEMA Map Modernization Program. At present, DLCD receives annual FEMA funding under the Community Assistance Program-State Support Services Element (CAP-SSSE) program. The CAP-SSSE funding supports DLCD's work as Oregon's NFIP coordinating agency but is not sufficient to also support the needed Map Modernization work. The CAP-SSSE funding has historically covered salary costs of the NFIP coordinator, basic technical assistance and outreach efforts, and the occasional small, special project. If the NFIP coordinator were to focus on Map Modernization, then fundamental tasks such as community assistance visits and contacts,

publication of newsletters, training sessions for NFIP participants, local ordinance review and assistance, and other important NFIP tasks could not be accomplished by DLCD.

DLCD is proposing a minimal organization to:

- conduct “CAP-MAP” activities,
- ensure limited participation in mapping projects (i.e., scoping, outreach),
- maintain floodplain data and maps

The following organizational chart shows DLCD’s anticipated staffing needs for supporting the Map Modernization initiative. Again, these are minimum estimates. The Department may need to adjust resource and staffing estimates as it becomes more familiar with map modernization work or should the state involvement in specific mapping projects increase (See also Section 7.3).

The organization chart shows the proposed location of the new Map Modernization positions within the Department and how the new positions would relate to the existing NFIP coordinator position. (A DLCD organization chart is found as Appendix D.) The map modernization positions would be placed in the same division as the NFIP coordinator allowing for close coordination between CAP-SSSE funded work and map modernization activities. The proposed organization would allow DLCD to closely link efforts such as community needs assessment, public outreach, and local ordinance review and assistance.

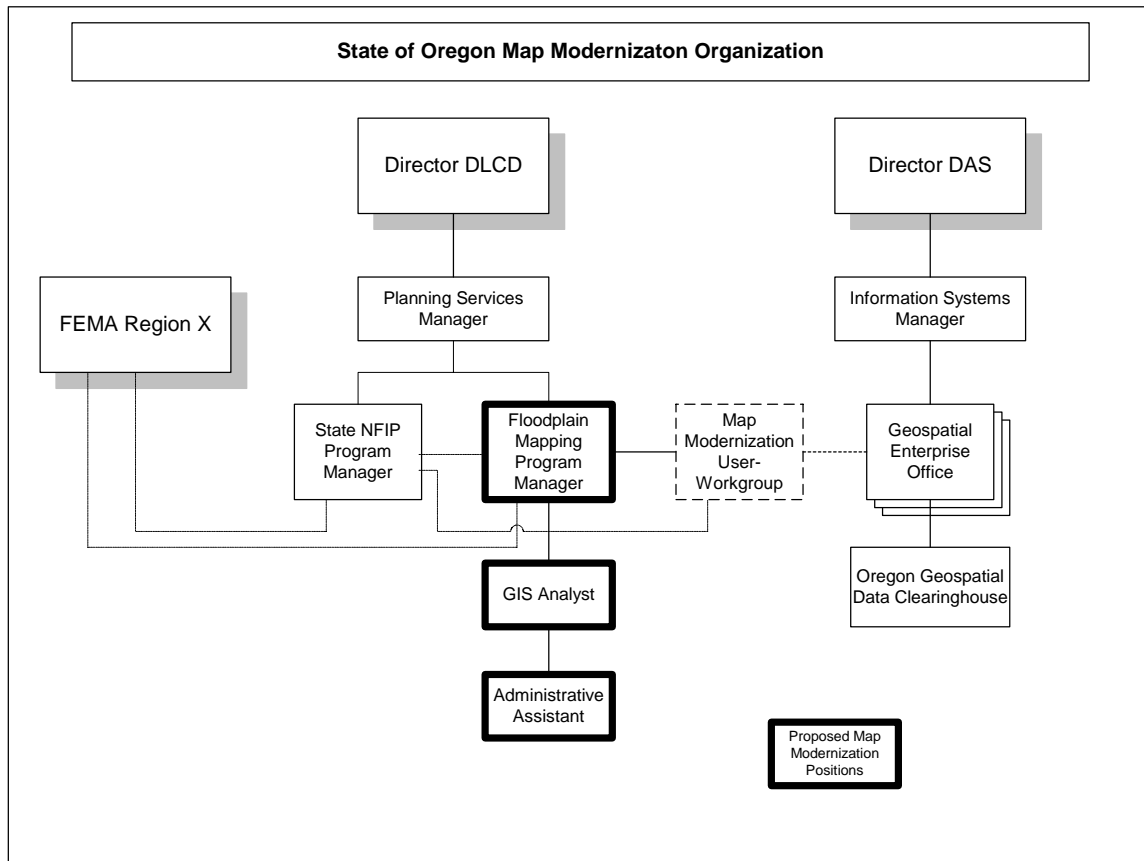


Figure 3 – State of Oregon Map Modernization Organization

Staffing: Staff costs for the proposed map modernization organization are estimated as follows [state salary range/class title], all being 1 Full Time Equivalent (FTE):

- Flood. Map. Program Manager [31 I/IS 7]: 7,527/month salary & OPE = 90,324/year
- GIS Analyst [28 I/IS 5]: 6,675/month salary & OPE = 80,100/year
- Administrative Assistant [17/AS 1]: 3,965/month salary & OPE = 47,580/year

The above FTE costs are based upon the specific state job classifications potentially appropriate for the needed Map Modernization FTE. Final decisions on appropriate classifications will be made dependent on the work tasks ultimately assigned. Salary rates listed here are based on DLCDC's labor contract for the 03-05 biennium; salary rates could change in the future. OPE (Other Payroll Expense) costs, which apply to permanent or limited duration positions, are estimated here using the statewide OPE average of 42% of salary.

Travel: Travel costs for the floodplain mapping program manager and GIS analyst are also estimated below. DLCDC assumes that map modernization staff will need to visit local communities prior to and during mapping projects. Outreach efforts would also involve travel around the state. Travel costs are estimated based on current rates and experience from past years under the CAP-SSSE program. Vehicle, per diem and lodging allowances could, of course, increase within the implementation period.

Training: A modest training budget has been included in the table below. This is to cover training that will be needed by DLCDC map modernization staff. DLCDC may need to ultimately increase the training budget to cover local training costs. DLCDC would need to determine through community needs assessment and other efforts just how much training NFIP communities need to participate effectively in map modernization activities.

Hardware/Software: DLCDC currently does not have the GIS software and hardware required to work with floodplain maps and has no surplus computer capability. Therefore, the map modernization staff will need to be supplied with GIS software and GIS workstations. A laptop computer and projector are needed in order to conduct outreach activities.

Indirect: The proposed budget also accounts for various indirect costs associated with the proposed map modernization organization.

Tables 5 and 6 summarize the minimum needs and estimated costs of the proposed state organization for supporting the Map Modernization initiative. Total costs are given; DLCDC understands that FEMA "CAP-MAP" funds will likely require a 75/25% cost share. All cost figures, except hardware/software, are listed on an annual basis. Costs for hardware and software are projected as a one-time expense. Costs are given in 2004 dollars.

Flood Map Modernization Business Plan for Oregon

| Item           | Description  | Cost   |
|----------------|--|--|
| DLCD Staffing* | 3 FTE's  | \$218,000/year                                     |
| Travel         | Program Manager<br>GIS Analyst   | 7,000/year   |
| Training       | NFIP-related Training<br>GIS-related Training                              | \$1,500/year<br>\$2,100/year                       |
| Hardware       | 2 Workstations<br>1 Laptop Computer<br>Projector                           | \$3,000 year 1<br>\$3,000 year 1<br>\$1,500 year 1 |
| Software       | GIS (ArcGIS 8.x – ArcInfo)<br>Office SW                                    | \$7,100 year 1                                     |
| Indirect       | Phone, fax, photocopy, mail charges, office space, services/supplies, etc. | \$12,000/year                                      |

*\*DLCD believes that there may be a need for an additional, limited duration GIS analyst (IS 5) during the first and second years of implementation. This would add \$80,100/year to the minimum FTE costs shown above for a total of \$298,100/year for years 1 and 2.*

**Table 5 – Staffing/Resource Needs Summary**

| YEAR    | 2 GIS Analysts (Years 1 & 2) | 1 GIS Analyst (Year 1 & 2) |
|---------|------------------------------|----------------------------|
| 1       | 335,300                      | 255,200                    |
| 2       | 320,700                      | 240,600                    |
| 3       | 240,600                      | 240,600                    |
| 4       | 240,600                      | 240,600                    |
| 5       | 240,600                      | 240,600                    |
| TOTALS: | 1,377,800                    | 1,217,600                  |

**Table 6 – Summary of Map Modernization Organization Costs for 5-Year Implementation**

**10. Business Risk Factors/Requirements for Success**

Participation in FEMA’s Map Modernization initiative raises numerous budget issues for DLCD. Section 9 identifies the minimum anticipated FTE and other costs for the state to actively participate in the Map Modernization initiative. Additional federal funding will be required for the state to effectively participate in the Map Modernization initiative. This section describes budget process issues, including challenges that may be faced by DLCD in applying for and accepting federal funds and obtaining state dollars (if needed above and beyond in-kind contributions) and FTE.

One clear challenge has been the need to prepare this business plan without knowing the short- or long-term potential for federal funding and other federal support for the Map Modernization initiative. DLCD does not know the likely amount of federal funding available to the state or what other forms of support will be available under FEMA’s Map Modernization initiative. The state’s role in the Map Modernization initiative and the

timeframe for achieving project objectives could increase or decrease depending on the level of funding and other support ultimately provided by FEMA. Therefore, this business plan will need to be re-evaluated when FEMA provides additional guidance regarding these issues.

Another challenge is to ensure that DLCD has the necessary budget authority to apply for and accept federal funds and to secure necessary FTE or state dollars. To explain these potential budget challenges, a brief explanation of the state budget process is required. The state budget covers two fiscal years (a biennium). A biennium runs from July 1 of an odd-numbered year to June 30 of the next odd-numbered year. For example, the 03-05 and 05-07 bienniums run from July 1, 2003 to June 30, 2005 and July 1, 2005 to June 30, 2007, respectively. The state's budget development process has the following phases: Agency Request, Governor's Recommended, Legislatively Adopted, and Legislatively Approved budgets. DLCD begins the budget development process in the spring of even-numbered years. For example, the Department will begin work on the 05-07 budget in April 2004.

Changes to DLCD's Legislatively Adopted Budget can be made through two mechanisms during a biennium. The Oregon Emergency Board, a legislative body, can, at the request of the Governor, DLCD, or others, make some changes to the budget between legislative sessions. The Department's budget could also be changed during a special legislative session called by the Governor or Legislative leadership.

DLCD's approved budget defines how much money the Department has to expend over the biennium and how that money is to be expended. For example, the approved budget identifies funding sources, program budgets, and sets personnel (i.e. FTE) as well as expenditure limitations for the Department.

In order to apply for and accept additional federal funds and to secure necessary state dollars and FTE authority, DLCD will need to address the following budget issues:

- 1) Obtain legislative authority to apply for federal funds
- 2) Obtain sufficient expenditure limitation and authority to accept additional federal funds.
- 3) Obtain legislative authority to establish new "Map Modernization" positions and/or investigate limited duration positions.
- 4) Seek any state dollars needed to achieve sufficient state match
- 5) Educate the Governor's office and Oregon Legislature about the Map Modernization initiative, with emphasis on anticipated benefits for Oregon and its NFIP communities.

*Budget Issue 1) and 2):* DLCD's Legislatively Approved Budget for the 03-05 biennium does not provide the Department with sufficient expenditure limitation to accept additional FEMA funds for Map Modernization. Furthermore, the budget does not specifically authorize the Department to participate in the implementation of FEMA's Map Modernization initiative. Depending on FEMA's timing for Map Modernization funding and other variables, DLCD will need to determine which of the following three options is appropriate:

- *Option A: DLCD Request to the Oregon Emergency Board (E-Board) To Apply For and Accept Federal Funds*  
DLCD would develop a written proposal for consideration by the E-Board. The proposal would need to address at a minimum: (1) staff needs, (2) funding source, (3) funding/position duration, and (4) purpose. DLCD would then ask to be placed on the E-Board schedule and would present the proposal at the allotted time. Note that this option will be the only available option if application for federal map modernization funds is required during the 03-05 biennium. The Department would first need to obtain E-Board approval to apply for the new federal funds and then would need to go back to the E-Board for approval to accept any new federal funds offered by FEMA and establish new FTE.
- *Option B: DLCD Policy Package in Agency Request Budget for 05-07 Biennium*  
DLCD has already prepared a placeholder policy package for consideration by the Governor's office and DAS. The package will be updated as necessary during the budget development process. The package addresses: (1) what is proposed, (2) what would be accomplished if the proposal were funded, (3) how the work would be accomplished, (4) what resources would be needed, and (5) why the proposal is a priority for the Department. DLCD would need to request that the policy package be carried forward into the Governor's Recommended Budget. If the policy package were then placed in the Governor's Recommended Budget, DLCD would work with the Governor's office and key legislative contacts to support the package throughout the legislative budget process.
- *Option C: Combination of DLCD E-Board Request and Policy Package*  
The Department may need to look at a combination of an E-Board Request and budget policy package. The E-Board request may be necessary to pursue federal funds available during the 03-05 biennium and the budget policy package to address longer-term funding for the Map Modernization Initiative.

A key point that applies to all three budget options is the need for DLCD to have sufficient time to work through the budget process. FEMA must provide sufficient notice about funding opportunities. Should FEMA not provide sufficient notice, then DLCD may be forced to forgo the opportunity to apply for or otherwise capitalize on federal funding. The inability to apply for or accept federal funds would jeopardize implementation of the Map Modernization initiative within Oregon. In addition, if FEMA funding opportunities change unexpectedly (e.g., increased funding or new requirements), then DLCD may not have sufficient time to address such changes through the necessary budget process(es).

Budget Issue 3) and 4): Neither DLCD nor key state agency partners have sufficient FTE at this time to implement this business plan. In association with the federal funding issues discussed under Budget Issue 1) and 2), DLCD would need to pursue legislative authority to create new, permanent positions and then would need to retain personnel to work on the Map Modernization initiative. DLCD would also need to work with FEMA

to determine the fiscal value of state in-kind contributions so that the Department can determine if state dollars must be requested to cover match requirements.

*Budget Issue 5*): Education of the Governor's office and key legislators is essential if DLCD is to find success obtaining the legislative approvals needed to implement this business plan. DLCD will develop a strategy for the timing and content of educational contacts with Oregon's executive and legislative leadership. However, DLCD finds that it is difficult to have effective conversations at these levels when so little is known about future FEMA funding or other federal support for the Map Modernization initiative.

### **11. Flood Mapping Priorities**

We know from experience that priorities are very dynamic and will change over time. Also, DLCD intends to complete a more rigorous mapping needs assessment to ensure that priorities accurately reflect the needs of the state and NFIP communities (See Section 7.2.3). The following criteria for establishing flood-mapping priorities are a compilation of FEMA's "Atlanta" factors and DLCD experience gained from community assistance visits and outreach activities:

- High population density
- History of repetitive losses/flood claims/flood disaster
- High growth areas
- Relative NFIP policy base
- Age of FEMA flood hazard maps
- Number of stream/shoreline miles
- Ability to leverage other federal, state, and local agency work
- Availability of cost sharing with state and regional/local entities
- Congressional mandate
- Community willingness and readiness to participate
- Large or increasing number of LOMC's
- Findings of Community Assistance Visits

Priorities for Map Modernization activities are shown in the Table 7. This table is based upon the data documented in the August 2002 *Flood Map Modernization Plan for Oregon* (Appendix A). Due to time and resource constraints, DLCD was not able to conduct any further needs assessment as part of business plan development. High priority projects identified in the 2002 plan but already completed or underway are not listed here. These are listed in alphabetical order by county name; the order does not reflect a ranking of priorities.

As stated previously, updates to coastal floodplain mapping have been delayed until new methodology is developed and adopted by FEMA. When the new coastal mapping methodology is available for use, DLCD will need to reassess priorities and begin to schedule re-mapping in coastal communities. It is likely that some and perhaps all coastal communities will be placed high on the priority list for remapping. FEMA currently anticipates that an updated coastal methodology will be available late in 2004.

| <b>Oregon Floodplain Mapping Priorities*</b>                           |   |
|--|---|
| Clackamas County (Damascus)  | unmapped community                          |
| Clatsop County   | restudy coastal v-zones+                    |
| Coos County  | conversion inland, restudy coastal v-zones+ |
| Curry County   | conversion inland, restudy coastal v-zones+ |
| Douglas County   | limited restudy, (include coastal v-zones)+ |
| Gilliam County   | conversion                                  |
| Jackson County   | combination conversion/restudy              |
| Josephine County   | conversion                                  |
| Lane County (Eugene area)  | limited restudy                             |
| Lane County (Springfield area)   | limited restudy (McKenzie area)             |
| Lincoln County   | conversion inland, restudy coastal v-zones+ |
| Marion County  | limited restudy                             |
| Morrow County  | combination conversion/restudy              |
| Multnomah County   | combination conversion/restudy              |
| Sherman County   | conversion                                  |
| Tillamook County   | conversion inland, restudy coastal v-zones+ |
| Umatilla County  | combination conversion/restudy              |
| Union County   | combination conversion/restudy              |
| Wallowa County   | conversion                                  |
| Washington County (Banks)  | unmapped community                          |
| Yamhill County   | conversion                                  |
| +Pending completion of updated coastal mapping methodology for Pacific |   |

*\*DLCD will need to update this priority list after more detailed mapping needs assessment work has been completed.*

**Table 7 - Oregon Floodplain Mapping Priorities**

DLCD anticipates a need to review the priority list on an annual basis to account for changing circumstances and new information. Possible steps for updating the priority list are:

- Obtain updated information, where applicable, on population, growth, other basic land use data needed to assess criteria
- Come to agreement with FEMA and affected communities about flood prone areas that already have sufficient source materials, or that will not be re-studied
- Identify flood prone areas near and within municipalities and other population concentrations and determine with FEMA and affected communities which specific areas require detailed floodplain mapping
- Identify any other flood prone areas outside municipalities and other population concentrations and determine with FEMA and affected communities which of these areas may, for reasons besides population, require detailed floodplain mapping

- Estimate the costs of utilizing the existing source material
- Using appropriate unit costs, estimate the cost of detailed mapping for all of the initially identified detailed study areas
- Identify all remaining flood prone areas to be studied, apply appropriate unit costs for less than detailed floodplain mapping, and add those estimated costs to the estimated costs for detailed mapping