

# **Supports and Barriers to the Integration of Hazard Mitigation Plans Into Local Comprehensive Plans**

By  
Stacy G. Ludington

Project Committee Members  
Rich Margerum, PPPM Department Head – Committee Chair  
Josh Bruce, OPDR Director

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## Abstract

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In 2000, the U.S. federal government passed the Disaster Mitigation Act, which required local governments to adopt hazard mitigation plans (HMPs) to address natural and man-made hazards. Most HMPs are developed as unenforceable, stand-alone documents that have little or no connections with other local plans. The Federal Emergency Management Agency (FEMA) encourages localities with a HMP to link and integrate it with other local plans that do have legal standing, such as local comprehensive plans. Lewis (2011) asked to what extent county HMPs were being integrated into county comprehensive plans and found that little was being done. This study assesses why this might be the case through the identification and analysis of the supporting and barrier factors counties face during integration of these two plans. Six county planners were interviewed in this process; three resided in counties Lewis identified as having a higher integration score, and three resided in counties Lewis identified as having a lower integration score. The results reveal little to no difference between higher and lower scoring counties in regards to their perception of supports and barriers. However, strong staff and political leadership, strong community awareness of hazards, and a history of hazard events affecting the community were consistent supporting factors, while a poor understanding of what integration looks like, pushback against over-regulation, and a question of responsibility for integration were consistent barrier factors. These results led to suggestions for improving the integration between HMPs and county-level comprehensive plans for government agencies, county governments, and assistance organizations.

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## Chapter 1: Introduction

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Due to the frequency and scale of geologic and climate-related natural hazards that have occurred over the past few years, people are becoming increasingly aware of their vulnerability to these events. The United States has witnessed a number of catastrophic hurricanes, including Hurricane Katrina in 2005, which caused over 1,800 deaths, and Superstorm Sandy in 2012, which was the second most economically destructive hurricane in US history. The Joplin, Missouri tornado in 2011 caused the death of at least 117 people and destroyed over 1,000 houses. Worldwide, a number of recent and devastating earthquakes and tsunamis have also created greater natural hazard awareness, and spurred dialogue and action regarding the steps necessary to mitigate the process that natural hazards take to become natural disasters.

A natural hazard becomes a natural disaster when life, livelihoods, and property are threatened or destroyed. The risk of natural disasters is rising worldwide. For example, “about 100 disasters were reported per year in 1980, and since 2000, more than 300 disasters have been reported per year,” (Bloom & Khanna, 2007; Kousky, 2012). According to the International Disaster Database, all natural disasters have increased in frequency in five-year intervals since 1985 (the only decrease being insect outbreaks) (Gaiha, Hill, & Thapa, 2012). This increase could be due to several factors, such as the increase in the reporting of disasters (Burton, Kates, & White, 1993), as well as climate change and the amplification of climate-related hazards, such as droughts, floods, hurricanes, snowstorms, tornados, and wildfires.

However, risk is also on the rise due to response-oriented planning of communities vulnerable to natural hazards, and the allocation of funds to hazard response as opposed to mitigation (Basher, 2008). This leads to land uses that allow communities to develop in unsustainable, vulnerable areas that increase the risk of loss of life and property. This practice is also causing an increase in damage costs from natural hazards. Globally, the average annual cost of natural hazards has increased at an exponential rate, “from less than \$20 billion in the 1950s and 1960s to well over \$70 billion in the 2000s” (Smolka, 2006). In the US, the annual average losses due to natural hazards has increased from under \$5 billion in the 1960s to near \$15 billion by the 2000s (Cutter & Emrich, 2005). In the U.S., on a county level, statistics have shown the relative impact of a disaster event is, on average, over 10% of a given county’s GDP, meaning that local capacity to deal with natural disasters is largely unmet (Ash, Cutter, & Emrich, 2013). These studies both indicate the importance of resilience to our built environment and stress the importance of hazard mitigation.

The Federal Emergency Management Agency (FEMA) defines hazard mitigation as “any sustained action to reduce or eliminate the long-term risk to human life and property from hazards” (FEMA, 2008). Thus, hazard mitigation seeks to address the root cause of why a natural hazard becomes a natural disaster, and in

doing so, strives to make communities less vulnerable. Identifying and demonstrating the importance of hazard mitigation, the federal government passed the Disaster Mitigation Act (DMA) in 2000. This act declared that mitigation planning should be accomplished through coordination between local, state, and tribal governments, and established a number of requirements that must be met. By meeting these requirements, local, state, and tribal governments could become eligible to apply for new, federal pre-disaster mitigation funds ("*Disaster Mitigation Act of 2000*", 2000). In order to receive funds under the Hazard mitigation Grant Program, the Severe Repetitive Loss Program, and the Flood Mitigation Assistance Program, local, state, and tribal governments must have a FEMA approved local Hazards Mitigation Plan, or HMP (also known as a Natural Hazards Mitigation Plan, NHMP, when the plan focuses exclusively on natural hazards) ("Title 44...", CFR 201.6, 2002).

Local HMPs are documents put together by local communities that address several FEMA requirements. This includes identifying and profiling hazards that the community faces, as well as identifying local assets that are vulnerable to those hazards. Together, these elements create a risk assessment, comparing the probability of the hazard occurring to the level of vulnerability the community has to that hazard. This risk assessment helps the community identify and develop mitigation goals to strive toward, as well as mitigation action items, or strategies, which upon implementation, will reduce the community's vulnerability. These action items should be prioritized and have a plan for implementation and administration. In addition, the HMP should include a plan for how it will be maintained and updated over time. The government the HMP represents must adopt the plan, and the plan must be approved by FEMA. Every five years, the plan must be reviewed, updated, and reapproved and adopted by FEMA and the local government it represents. By doing so, the government it represents remains eligible for federal, pre-disaster mitigation funds ("Title 44...", CFR 201.6, 2002).

Studies show the benefits that hazard mitigation planning has over hazard response planning. A three year study conducted by the National Institute of Building Science's Multi-hazard Mitigation Council in 2005, showed that, on average, every dollar spent on hazard mitigation saves four dollars in future disaster losses (Ganderton et al., 2005). Communities all over the U.S. are realizing the benefits of hazard mitigation. All fifty states in the U.S. have a FEMA approved HMP. As of April 2012, over 20,200 communities and 105 Indian Tribal Governments have FEMA approved HMPs. This is an increase from 2009 when approximately 19,000 communities had local HMPs. The trend for communities adopting HMPs is on the rise and more communities are looking to adopt HMPs in the near future, or plan on updating their current one (J. Schwab, 2011).

## **Purpose**

Though local communities recognize the safety and economic benefits of HMPs, and adoption of HMPs is on the rise, there is a great difference between the adoption of a plan and the implementation of a plan. Most HMPs are developed as stand-alone documents that have little or no connections with other local plans. This

can be troublesome for several reasons. HMPs do not have legal status and thus can only serve as guidance and recommendation decision-making. FEMA encourages localities with a HMP to link and integrate it with other local plans that do have legal standing, such as local comprehensive plans. The Oregon Department of Land Conservation and Development (DLCD) define integration as “uniting the two documents in a holistic way, so that the background information, policies, implementation measures, and maps of the NHMP are consistent with and become fundamental constituents of the comprehensive plan,”(DLCD, 2014). There are ranges of integration, from cross-referencing to full plan integration where the two documents become one, and counties can fall within that range. Linking and integrating plans can help to avoid duplicate efforts or conflicting outcomes. In addition, studies have shown that integration of these two plans can lead to reduced hazard risk. Therefore, it is critical to know how well communities are integrating their local HMP into their local comprehensive plans.

Lewis, (2011) asked how, and to what extent the desired outcomes of hazard mitigation plans had been integrated, both overall and under different state mandates, with local comprehensive plans since the DMA. For his research, he analyzed over a hundred HMPs and comprehensive and general plans from California, Oregon, and Washington for integrated action items, as well as the level of integration (from fully, directly and prescriptively integrated to partially/indirectly and exhortatively integrated or not at all). His findings showed that all counties had a poor level of integration (only a 33% integration of some kind, and a mere 9.4% integration of fully, directly and prescriptively integrated action item integration). Of all the states, however, California had the most integration of some kind (52% compared to 20% in Oregon, and 28% in Washington) and the most fully, directly and prescriptively integrated action items (21% compared to 4% in Oregon and Washington). Lewis concluded that there is a low level of HMP integration into comprehensive plans, and that it is possible that California is doing slightly better (though he explained that this could be due to variations in data collection and presentation from state to state), but he did not concretely identify why this may be the case.

Therefore, the purpose of this study is to ask: Why are Oregon communities not integrating after research has shown that integration helps lead to a reduced risk of hazard impacts? What is preventing plan integration, and what is helping to support it for counties that are adopting integration? By answering these questions, I hope that strategies can be adopted to help communities overcome the challenges of integration.

## **The Oregon Planning Context**

All comprehensive planning in Oregon takes place under the context of a strong land use planning system. Comprehensive plans are mandated by the state and all counties and cities are required to adopt a comprehensive plan and supporting zoning ordinance. Comprehensive plans are “a statement crafted deliberately by the locality that articulates citizens’ shared vision for the development of their landscapes over time,” that “identifies policies and regulations

to be adopted,” and “justifies both the reasoning behind the plan’s goals and the reasonableness and efficacy of the means selected to achieve those goals.” (Norton, 2008).

Comprehensive plans differ from other county and local plans because they seek to be fully comprehensive. Rather than focusing on a single topic such as zoning or flood mitigation, these plans attempt to look at the planning of future growth and land development holistically. Due to this holistic approach, the comprehensive plan is an ideal document in which to implement HMP’s. In addition, comprehensive plans have legal backing and thus greater influence over development compared to HMPs, which are non-regulatory.

Oregon also has the Oregon Statewide Planning Goals. This includes Goal 7 “Areas Subject to Natural Hazards,” which requires cities and counties to do several things, including:

- Address the protection of people and property from natural hazards within their comprehensive plans.
- Inventory new hazard information within their comprehensive plans.

## **Project Overview**

Through research and interviews of county planners, this study seeks to compile the supporting and barrier factors identified in the literature that could be influencing the integration of HMPs into comprehensive plans, and compare it to what county planners view as the supporting and barrier factors to integration. The research questions this study aims to address are:

1. Why are communities not integrating their Hazard Mitigation Plans into their local comprehensive plan?
  - a. What are the factors that lead to greater integration success?
  - b. What are the challenges that are preventing or deterring communities from integration?

I answer these questions through interviews with county planners for six selected counties in Oregon. In my literature review, I compile supporting and barrier factors from across the literature and from integration experts. In my methodology, I describe the interview process, as well as how counties and participants were selected. I then end with an analysis of the interview findings and compile implications and future policy recommendations.



## Chapter 2: Literature Review

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This section discusses the literature thus far on the subject of integrating HMP's and comprehensive plans. It explores: 1) The evidence of comprehensive plans being an effective tool for HMP integration and how it can actually lead to reduced risks from natural hazards, 2) The research of Evan Lewis, who discovered that though there is evidence pointing to the benefits of integration, counties are doing a poor job of integration, & 3) Research on why this might be the case through the exploration of supporting and barrier factors to plan integration.

### **The Comprehensive Plan as a Mitigation Planning Mechanism**

Studies have shown that when hazard mitigation is incorporated into comprehensive plans, the loss associated with disasters is reduced (Burby et al, 1988; Burby 2006; Nelson & French, 2002). Burby et al (1988) states that cities that took to managing flood-prone hazards saw a 25% reduction in hazardous floodplain development than those areas that did not have such local planning programs. This led to a saving of \$11 million in potential property damage per year compared to the \$1.3 million cost of administering the policies. Nelson & French (2002) showed that there was a significant positive correlation between comprehensive plans with quality seismic safety standards and reduced earthquake damage after the 1994 Northridge Earthquake. Burby (2006) says states that enforce their code and have comprehensive planning have statistically significant lower per-capita flood insurance claims than those states that do not. In his paper, Burby states that though the DMA has helped communities consider and mitigate against potential hazards, it remains a document without much teeth and he suggest that the DMA "be amended to require that regular mitigation plan updates mandated by the legislation be integrated into local comprehensive plans" (184).

An important part of the integration topic is that comprehensive plans and HMP's rely on one another in order to be most effective. Comprehensive plans in and of themselves can actually lead to more hazardous development due to urban containment strategies, which purposefully create a shortage of buildable land and an increase in land prices. Without considering hazards, urban containment strategies can lead to development in hazardous areas such as floodplains, upon or below unstable slopes, or along fault lines (Burby et al., 2001). HMP's can rely a wealth of technical information about local hazards, but by themselves, tend to be overlooked, lack legal backing, and only serve as guidance and recommendations for decision-makers. Furthermore, "by focusing solely on the areas exposed to hazards, [HMP's] can inadvertently promote increased occupancy of those areas by making them safer for development (and by ignoring opportunities to steer development to hazard-free sites)," (Burby et al., 1999). Thus, one plan without the other can actually lead to more hazardous development rather than hazard reduction.

Several associations and agencies have recognized this problem and are working to spread awareness of the importance of integration. The American Planning Association (APA) is promoting an idea called "Safe Growth" which is the

consideration of hazards while planning for future growth. Safe Growth also seeks to review comprehensive plans among other plans for hazard mitigation efforts (Godschalk et al., 2009). The APA published "*Hazard Mitigation: Integrating Best Practices into Planning*" - a three-year study and report which has a heavy focus on the importance of HMP integration into comprehensive plans (J. C. Schwab, 2010). FEMA is not only stressing the importance of plan integration in their HMP guide "*Bringing the Plan to Life*," but is also stating that integration into comprehensive plans is required for mitigation planning (Bringing the Plan to Life..., 2003).

### **Lack of Integration Between Comprehensive Plans and Hazard Mitigation Plans**

Lewis (2011) studied the importance of hazard mitigation plan integration into comprehensive plans, and asked the question "How, and to what extent have the desired outcomes of hazard mitigation plans been integrated with local comprehensive plans since the DMA, both overall and under different state mandates for natural hazards planning?" (Lewis, 2011). To answer his question, he obtained the hazard mitigation plans and the most recent local comprehensive plans from 40 counties in the states of California, Oregon and Washington. Each of these states have strong state planning relative to other states in the U.S. (Institute for Building and Home Safety, 2009). He then conducted content analysis on the comprehensive plans for 812 appropriate action items identified in the first approved HMP's. Using a scoring system influenced by Norton (2008), Lewis scored the action items in each county's plan on the following scale:

- 0:** If the object of the action, in context, was not mentioned in a comprehensive plan policy or implementation measure
- 1:** If the object of an action, in context, was partially or indirectly mentioned in an exhortatory way in a comprehensive plan policy or implementation measure
- 2:** If the object of an action, in context, was partially or indirectly mentioned in a prescriptive way in a comprehensive plan policy or implementation measure
- 3:** If the object of an action, in context, was fully and directly mentioned in an exhortatory way in a comprehensive plan policy or implementation measure
- 4:** If the object of an action, in context, was fully and directly mentioned in a prescriptive way in a comprehensive plan policy or implementation measure

The results of the scoring system are below:

**Table 1: Level of HMP Integration with Comprehensive Plans, by State**

Types of Action Item Integration with Comprehensive Plans	% of CA Actions	% of OR Actions	% of WA Actions	% of All Actions
Fully, Directly and Prescriptively Integrated (score = 4)	20.9%	3.8%	3.5%	9.4%
Fully, Directly and Exhortatively Integrated (score = 3)	5.2%	0.6%	4.5%	3.1%
Partially/Indirectly and Prescriptively Integrated (score = 2)	22.8%	14.2%	15.6%	17.4%
Partially/Indirectly and Exhortatively Integrated (score = 1)	3.4%	1.7%	4.0%	2.8%
Not Integrated at all (score = 0)	47.8%	79.7%	72.4%	67.4%

Source: Lewis, 2011

The results of this scoring process showed a range of integration scores, from a high of .89 in Tuolumne, CA to a low of 0.44 in Skagit, WA. Oregon county scores had a much tighter range from 0.50 to 0.67. Table X shows the average county's integration score per state.

**Table 2: State Average Integration Scores for Actions with Some Level of Integration**

State	Score
CA	0.69
OR	0.58
WA	0.53

Source: Lewis, 2011

Using the county's final integration score, Lewis concluded that "overall, most HMP action items are not being integrated into existing local planning mechanisms," however, some counties scored much higher than others. Interestingly enough, "California counties showed the highest level of integration between HMP's and comprehensive plans—more than twice as much as for Washington counties, and over three times as much as for Oregon counties," (Lewis, 2011).

### **Supporting and Barrier Factors to Plan Integration**

The results of Lewis' study raise as many questions as they solve. In particular, one might ask why counties are not integrating their HMP action items into their comprehensive plans, particularly when it is shown that this is the most effective plan for mitigation. I reviewed the literature on several topics, including plan integration, hazard mitigation, comprehensive hazard planning, and state and federal mandates related to hazards. I also interviewed Josh Bruce, a local expert on hazard mitigation, who works for the Oregon Partnership for Disaster Resilience (OPDR). He has an insider's perspective on the possible issues that counties face, as he is currently exploring this topic within several counties. Through both these processes, I was able to identify some of the potential barriers to plan integration, starting with the literature Lewis identified in his literature review, then additional literature relating to integration barriers. Between the literature and the insight of a local expert, I identified several categories of supporting and barrier factors or influences:

### Community Context

Studies have shown that a county's population, budget, median home value, and median income can have an impact on how proactive the county is in regards to hazard mitigation (Berke, 1996).

### Leadership and Support

Sometimes, in order for integration to happen, there needs to be strong staff and/or political support for the effort. Lack of support from one group or another can stall or make integration very difficult (Deyle & Smith, 1998; Bruce, 2014). In addition, a lack of state mandate or encouragement could greatly influence how much a county integrates their plans (Burby et al, 1988; Bruce, 2014).

### Resources and/or Funding

Issues related to resources and funding include an imbalance of funding for hazard response as opposed to hazard mitigation (Berke, 1996a), or the fact that federal funds through programs like the National Flood Insurance Program are inadvertently encouraging development in hazardous areas (R. J. Burby, 2006). The delayed payoff for risk reduction can also deter some municipalities from stressing hazard mitigation, and thus would be less likely to integrate the plans (Basher, 2008). In addition, a lack of technical expertise on plan integration, or a plain lack of funding can be a challenge for communities that would like to integrate their plans (Deyle et al., 2008; Bruce, 2014).

### Awareness

Integration of the two plans can be a challenge if there is poor community awareness about their hazard risk (Berke, 1996) or a mistaken perception of the hazard risk by property owners (Martin et al., 2009; Zhang et al., 2009). In addition, if a community has never or has not recently experienced hazards affecting their community, they would be less concern about plan integration (Beller-Simms, 2004; Deyle et al., 1998), and a lack of interaction between staff working on the HMP and staff working on the Comprehensive/General plan could lead to a lack of awareness that these other plans exist (Bruce, 2014).

### Recognition

Research has also known that the amount of recognition of mitigation in the media can influence efforts, including plan integration (Sparks, 2007), or that lopsided public recognition and reward for hazard response compared to hazard mitigation can be a barrier to proper hazard mitigation and thus plan integration (Basher, 2008).

### Other

In addition, communities that feel they are at such high-risk to hazards may feel immobilized or that it is impossible to mitigate hazards and thus don't do so (Berke, 1998).

Though the list above mostly focuses on barriers, many of these points can actually be supporting factors when reversed. For example, poor community awareness can be a barrier to plan integration, but if a community is largely aware of hazards, their local leaders might be urged to be more proactive. The next page lays out these themes and their factors in an easy to comprehend table.

**Table 3: Supporting and Barrier Factors from the Literature and Experts**

<b>Supporting Factors</b>	<b>Barrier Factors</b>
<p><u>Leadership and Support</u></p> <ol style="list-style-type: none"> <li>1. Strong staff leadership on this issue</li> <li>2. Strong political leadership on this issue</li> </ol>	<p><u>Leadership and Support</u></p> <ol style="list-style-type: none"> <li>1. Lack of staff leadership on this issue</li> <li>2. Lack of political leadership on this issue</li> <li>3. The State does not encourage/mandate us to integrate the two plans.</li> </ol>
<p><u>Resources/Funding</u></p> <ol style="list-style-type: none"> <li>3. Our county has the technical expertise to integrate the plans.</li> <li>4. Funding is available</li> </ol>	<p><u>Resources/Funding</u></p> <ol style="list-style-type: none"> <li>4. Our county lacks the technical expertise to integrate the plans.</li> <li>5. Lack of funding</li> <li>6. More funding for hazard response rather than hazard mitigation (Berke, 1996)</li> <li>7. Federal funding has historically incentivized development in hazardous areas (Burby, 2006)</li> <li>8. Absence of immediate payoff for risk reduction (Basher, 2008)</li> </ol>
<p><u>Awareness</u></p> <ol style="list-style-type: none"> <li>5. Strong community awareness of hazards (Berke, 1996)</li> <li>6. There is a history of hazard events affecting the community</li> <li>7. Interaction between staff working on the HMP and staff working on the Comprehensive/General plan.</li> </ol>	<p><u>Awareness</u></p> <ol style="list-style-type: none"> <li>9. Poor community awareness of hazards (Berke, 1996)</li> <li>10. There is little or no history of hazard events affecting the community</li> <li>11. Mistaken perception of hazard risk by property owners (Martin et al., 2009; Zhang et al., 2009)</li> <li>12. Lack of interaction between staff working on the HMP and staff working on the Comprehensive/General plan.</li> </ol>
<p><u>Recognition</u></p> <ol style="list-style-type: none"> <li>8. Strong recognition of mitigation efforts in the media (Sparks, 2007)</li> </ol>	<p><u>Recognition</u></p> <ol style="list-style-type: none"> <li>13. Poor recognition of mitigation efforts in the media (Sparks, 2007)</li> <li>14. Greater public reward for disaster response as opposed to disaster mitigation (Basher, 2008)</li> </ol>
	<p><u>Other</u></p> <ol style="list-style-type: none"> <li>15. A feeling that the community is at such high-risk that it is impossible to mitigate hazards (Berke, 1998)</li> </ol>

## **Literature Conclusions**

The research by Burby (2006), Godschalk et al., (2009), Nelson & French (2002), Schwab (2010), the APA and IBHS, and Lewis (2011), has demonstrated that the integration of HMPs and comprehensive plans are important to effective hazard mitigation. As discovered, this integration between HMPs and comprehensive plans is not happening well. Though Basher (2008), Berke (1996, 1998), Burby (2006), Martin et al., (2009), Sparks (2007), and Zhang et al., (2009) have identified possible reasons for lack of plan integration, no one has asked why HMPs specifically are having difficulty being integrated into comprehensive plans. It would thus be prudent to survey actual county planners and emergency managers as they are responsible for such integration. This research seeks to answer and address this gap in the literature.

## Chapter 3: Methodology

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This study aims to add to the research on natural hazard planning by studying the integration of HMPs with comprehensive plans. Specifically, my research question is: What are the factors supporting and deterring communities from integrating Hazard Mitigation Plans into their local comprehensive plan?

By interviewing professionals in the field of plan integration, I will develop a deeper understanding of the supporting and barrier factors affecting plan integration. Building off of Lewis' research, I will be able to compare results of the surveys and interviews with their integration scores and see which factors are important to communities listed as "high integration" and which factors are important to communities listed as "low integration."

In order to answer this research question, I selected twelve Oregon counties from Lewis' research that had some level of integration of their HMP into their local comprehensive plan. I paired two counties that Lewis identified as having relatively "high integration" scores with two counties Lewis identified as having a relatively "low integration scores."

### **Case Selection**

Due to time and resource limitations, I focused on Oregon rather than California, Oregon, and Washington. To control for different planning contexts between the various counties, all counties have a population ranging roughly from 45,000 to 280,000 people, as per Lewis' research. His reasoning for this population bracket was the sharp upward jump in population beyond 280,000, and the lack of available data for counties with a population lower than 45,000. Each county was given a code name to protect the identity of the county and the interviewees.

Berke (1996) identified that a county's population, budget, median home value, and median household income can impact how proactive a county is regarding hazard mitigation. County characteristics such as population, per capita household income, the mean home value, and the county FY 2012-2013 adopted budget were gathered to identify if Berke's identified characteristics were distinguishing factors in differentiating high integration counties from low integration counties. The results are displayed below in Table 4.



**Table 4: County Characteristics**

State	Integration			Population	Per Capita Household Income	County 2012-2013 Revenues	Mean Home Value
	Integration	County	Score				
Oregon	High	OR-H-1	0.67	82,636	\$21,028	\$68,000,000	\$231,800
		OR-H-2	0.63	116,871	\$55,984	\$79,800,000	\$176,800
		OR-H-3	0.60	107,391	\$51,391	\$93,789,015	\$179,500
	Low	OR-L-1	0.50	49,317	\$26,123	\$34,700,000	\$220,400
		OR-L-2	0.50	45,992	\$25,177	\$89,800,000	\$242,600
		OR-L-3	0.50	158,884	\$67,568	\$202,648,656	\$271,600

Source: Lewis, 2011; U.S. Census Bureau, 2008-2012 American Community Survey; County Financial and Administrative Websites

**Figure 1: County Characteristics**



Source: Lewis, 2011; U.S. Census Bureau; 2008-2012 American Community Survey; County Financial and Administrative Websites

As seen in Table 4 and illustrated in Figure 1, the characteristics of population, per capita household income, mean home value, and county revenues were not always an indicator of how well a county integrated their HMP and comprehensive plans. This could be because of my small sample size, but it could also be showing that there is something else at work that is influencing integration beyond county characteristics.

## **Interviews**

Interviews were determined to be the best way to develop an in-depth understanding of integration in counties. I contacted a county planner and emergency manager from each county for an interview during the spring of 2014. An effort was made to identify county planners and emergency managers who were involved in the latest HMP or comprehensive plan amendments for each county. In cases where this was not possible, the planner or emergency manager with the most in-house experience was selected. Participants were recruited via phone, the project was described to them, and their participation was requested.

If they agreed to participate, an interview informing survey was sent via email. The interview informing survey was based on the results of the literature and the experience of local experts in hazard mitigation and comprehensive planning. The purpose of the survey was not for statistical analysis, as the sample population was too low, but rather to expose the participant to all the supporting and barrier factors identified in the literature. The survey asked the participants to rank these various factors and their importance to their county's integration successes or challenges. The online survey consisted of 4 questions, which included multiple selection and populated ranking from the chosen factors in the multiple selection section. It took, on average, five minutes to complete. Participants were given code names to protect the county and their identity. The survey can be found in Appendix A.

Once participants finished the survey, they were asked to participate in a 30-minute phone interview. These interviews helped me to gain an in-depth understanding of why the participants selected the supporting and barrier factors they did, or to identify supporting and barrier factors they identified in the interview, but not within the survey. The interviews also helped me understand the culture of comprehensive plan amendments in each participant's community. These interviews typically happened 24 hours after the informing survey. I then identified and analyzed themes and trends from the interviews. The interview questions can be found in Appendix B.

## **Limitations**

Though this research allowed for a more in-depth understanding of the supporting and barrier factors to HMP and comprehensive plan integration, there are limitations to this study. The original intent for the study was to select counties from California, Oregon, and Washington to cross-compare states as Lewis did, but due to time constraints, only 6 of the 11 counties Lewis studied in Oregon were

selected. This meant I was only able to analyze one of the states that Lewis researched, and that a small sample was used to make inferences about other similar counties.

Despite the attempt to find a county planner and emergency manager who was involved in the latest HMP or comprehensive plan amendments, no such person was found for any of the selected counties. In fact, some of the county planners were unsure their county had a HMP.

Also, despite a great number of attempts to reach county emergency managers via both phone and email, only two were reached. The first emergency manager was confused as to why they were involved in this research. I sent the survey and we scheduled a time to conduct the interview, but the emergency manager never filled it out and had to cancel the interview. I was also unsuccessful at getting back in touch with the emergency manager. The second emergency manager was new to the position and felt uncomfortable participating. Thus, due to the difficulty of reaching out to emergency managers, their questioning of their involvement, and limited time, I decided to drop them from the research.

## Chapter 4: Findings

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In total, six county planners were interviewed, representing six counties. Three of the counties received a comparatively “high” integration score in Lewis’ research, while three of the counties received a comparatively “low” integration score. In this chapter, I discuss the overall findings, and then take a deeper look at the supporting and barrier factors. During the course of interviewing, five factors that were not addressed within the literature appeared, and are discussed in the more detailed sections below.

### Overall Findings

Supporting factors that lead to greater integration success include:

- Strong staff leadership (4)
- Strong community awareness of hazards (4)
- A history of hazard events affecting the community (4)
- Strong political leadership (3)
- An understanding of what integration looks like (3)

Strong staff leadership and strong political leadership were often correlated, with counties stating that they were intertwined and it was difficult for one group to have support for integration without the other supporting it as well. Counties also identified a history of hazard events affecting the community and a strong community awareness of hazards as strongly linked, stating that a strong history of hazard events leads to community awareness of hazards. Thus, it is good to foster the themes of Leadership and Support and Awareness in order to improve integration success.

Challenges that are preventing or deterring communities from integration include:

- Pushback against over-regulation (4)
- The state does not encourage/mandate us to integrate these two plans (3)
- A poor understanding of what integration looks like (3)
- Lack of capacity (3)
- A question of responsibility for integration (2)

The issues of the state do not encourage/mandate us to integrate these two plans. That, coupled with a poor understanding of what integration looks like, a question of responsibility for integration, and pushback against over-regulation leads to lack of integration.

It is important to note that pushback against over-regulation, a poor understanding of what integration looks like, lack of capacity, and a question of responsibility for integration were all factors that came out of the interviews, not the literature review, and thus were not factors that were presented to every county for selection during the survey. This means that there is the possibility that other counties are experiencing these barriers too, but the topic did not arise during our interview.

## Supporting Factors

Of all the supporting themes identified in the literature review, “Leadership and Support” and “Awareness” both had strong representation, followed by “Resources and Funding”. Only one theme was not selected by any of the county planners, which was “Recognition,” which also included the only factor that was not selected: “strong recognition of mitigation efforts in the media.” Every other factor was selected at least once. Table 5 below shows which counties selected which supporting factors.

**Table 5: Supporting Factors Findings**

Theme	Supporting Factor	High			Low			Total
		OR-H-1	OR-H-2	OR-H-3	OR-L-1	OR-L-2	OR-L-3	
Leadership and Support	Strong staff leadership on this issue	X		X		X	X	4
	Strong political leadership on this issue			X		X	X	3
	An understanding of what integration looks like			X	X		X	3
Resources and Funding	Our county has the technical expertise to integrate the plans			X			X	2
	Funding is available			X			X	2
Awareness	Strong community awareness of hazards	X		X	X		X	4
	There is a history of hazard events affecting the community	X		X	X		X	4
	Interaction between staff working on the HMP and staff working on the comprehensive plan				X		X	2
Recognition	Strong recognition of mitigation efforts in the media							

### Leadership and Support

Strong staff and political leadership was identified in the literature review by Burby et al, 1988 and Bruce, 2014 as important to plan integration success. Factors in this theme include: Strong staff leadership on this issue and strong political leadership on this issue.

The interviewed counties agreed and the findings support that these two factors are absolutely necessary for integration. Participants often stated that there needed to be political will to address the issue, and staff leadership to carry it through, and further acknowledged that without political support from the Board of Commissioners, it was impossible to push any changes to the comprehensive plan forward. In describing how vital political support was to integration, one participant stated, "if there had been no or little support from the board of commissioners, I can't envision the kind of success that we've had with this program." Strong staff leadership was selected 4 times and strong political leadership was selected 3 times.

An understanding of what integration looks like was not an option listed on my survey, but it came through as a theme in my interviews. I identified three counties that had an understanding of what integration looked like. OR-H-3 had the most comprehensive understanding of integration, and was able to describe what integration looked like to them by acknowledging two types of integration: integration by reference and direct integration by integrating findings and policies. One county seemed to have an understanding of what integration was, but also stated that they lacked the capacity to actually do it. Another county had an

understanding of integration, but instead of integrating their NHMP, was integrating a local wildfire plan into the comprehensive plan.

### Resources and Funding

Resources and funding were identified in the literature review by Berke, 1996, Burby, 2006, Basher 2008, Deyle et al., 2008, and Bruce, 2014 as possible supporting factors to plan integration. The two factors in this theme include: Our county has the technical expertise to integrate the plans, and funding is available.

Only two counties selected factors in this theme, citing that they had the technical expertise to integrate the plans. One described how hiring planners with a strong resource management background, and helping them with continued education, certification, and permit education helped their county tremendously in this topic. This county also discussed how their staff had technical expertise; however, the planner discussed the integration of a Community Wildfire Protection Plan into the comprehensive plan, as opposed to their NHMP, but these skills are transferable.

OR-H-3 stated the importance of funding and how their ability to receive grant funding, tap into the general fund, and implement and utilize fees helped tremendously to improve their integration. OR-L-3 also said they had funding. The county commissioners set aside the funding to create a new position in the county government in which a liaison could work on the hazard planning efforts and spearhead the technical expertise, and provide the information the county planners needed for integration.

### Awareness

Berke, 1996 identified awareness as a possible supporting factor to plan integration. The three factors in this theme include: A strong community awareness of hazards, a history of hazard events affecting the community, and interaction between staff working on the HMP and staff working on the comprehensive plan.

Strong community awareness of hazards and a history of hazard events affecting the community were correlated. Four counties selected these together, each saying though hazard events are often tragic, they keep hazards on the mind of community members.

Through the interviews, I also identified an understanding of what integration looks like as a supporting theme of awareness. Three counties had an understanding of integration and were able to explain to me several levels and methods to do so.

### Recognition

Sparks, 2007 identified recognition of mitigation efforts in the media as a possible supporting factor to plan integration. No counties identified a strong recognition of mitigation efforts in the media as a supporting factor.

## Barrier Factors Findings

Overall, there was less agreement among counties regarding what acted as a barrier as opposed to supporting factors. Of all the barrier themes identified in the literature review, “Leadership and Support” had the strongest representation, followed by “Resources and Funding” and “Other.” “Awareness” had a few selections. Yet again, “Recognition” was the only theme not selected by any of the county planners. Some factors that were not selected at all include more “funding for hazard response rather than hazard mitigation,” “federal funding has historically incentivized development in hazardous areas,” “absence of immediate payoff for risk reduction,” “poor community awareness of hazards,” and “little or no history of hazard events affecting the community.” Table 6 below shows which counties selected which barrier factors.

**Table 6: Barrier Factors Findings**

Theme	Barrier Factor	High			Low			Total
		OR-H-1	OR-H-2	OR-H-3	OR-L-1	OR-L-2	OR-L-3	
Leadership and Support	Lack of staff leadership on this issue		X					1
	Lack of political leadership on this issue		X					3
	The State does not encourage/mandate us to integrate the two plans.		X		X	X		3
	Poor understanding of what integration looks like	X	X			X		3
Resources and Funding	Our county lacks the technical expertise to integrate the plans	X						1
	Lack of funding			X	X			2
	More funding for hazard response rather than hazard mitigation							
	Federal funding has historically incentivized development in hazardous areas							
	Absence of immediate payoff for risk reduction							
Lack of capacity	X		X	X			3	
Awareness	Poor community awareness of hazards							
	There is little or no history of hazard events affecting the community							
	Mistaken perception of hazard risk by property owners	X						1
	Lack of interaction between staff working on the HMP and staff working on the comprehensive plan				X	X		2
Recognition	Poor recognition of mitigation efforts in the media							
	Greater public reward for disaster response as opposed to disaster mitigation							
Other	A feeling that the community is at such high risk that it is impossible to mitigate hazards					X		1
	Question of responsibility for integration		X			X		2
	Pushback against over-regulation	X	X	X		X		4

### Leadership and Support

A lack of strong staff and political leadership was identified in the literature review by Burby et al, 1988 and Bruce, 2014 as a possible limitation to plan integration success. Factors in this theme include: lack of staff leadership on this issue, lack of political leadership on this issue, and that the state does not encourage or mandate us to integrate the two plans. A poor understanding of integration was added as a factor after hearing the responses from interviews.

Though OR-H-2 did not identify a lack of political leadership, the participant made it very clear that there was a lack of political will on the issue, stating that the county commissioners are "not really excited about outside regulatory directives from outside agencies such as federal agencies or state agencies or other agencies telling the county what to do or what not to do."

An interesting but different view came from two other counties who stated that a lack of mandate or encouragement from the state to integrate the plans was a barrier. Though OR-L-2 did not identify this, during the interview this became apparent as the participant stated that they don't make amendments unless absolutely necessary and that there was an unwillingness to amend the code to make a large swath of land undevelopable.

The interviews revealed that a poor understanding of integration was a barrier. Three counties all had a poor understanding of what integration meant and stated that by complying with the NFIP, they had integrated the two plans, when that is only a portion of addressing integration addressing, as it's only addressing one hazard. The integration of the NHMP is more than just the integration of flood measures. It also includes all the other hazards identified in the NHMP, such as wildfire, earthquake, and snowstorms, to name a few common ones.

### Resources and Funding

A lack of resources and funding was identified in the literature review by Basher, 2008; Berke, 1996; Burby, 2006 as a possible limitation to plan integration success. Factors in this theme include: 1.) Counties lack the technical expertise to integrate the plans, 2.) Lack of funding, 3.) More funding for hazard response rather than hazard mitigation, 4.) Federal funding has historically incentivized development in hazardous areas, and 5.) The absence of immediate payoff for risk reduction. A lack of capacity was added as a factor after it was discussed in two interviews. It arose from descriptions of how county departments were hit hard with layoffs and shortened hours, and were forced to deal with more pressing issues, such as processing permits, despite their desire to work on long range planning. Lack of capacity differs from lack of technical expertise because it revolves around a lack of funding or manpower, as opposed to a lack of understanding and education on the topic.

OR-H-1 was the only county to identify a lack of technical expertise to integrate the plans. They tied this to a lack of capacity. OR-L-1 stated that there was a lack of funding to integrate the plans, which was creating a barrier, yet stated that "we're going to be doing some amendments even with the lack of funding situation... funding enters into it when you get into a serious effort of focusing on integrating your plan to be more comprehensive than case-by-case integration." OR-H-3 stated that they currently had the funds due to the county prioritizing hazard integration and their success at receiving grant funds, but during times when they did not it was very difficult. When asked about funding, OR-H-3 stated, "you cannot be proactive... you cannot be doing the things that make your program better for the public if you can hardly operate." Both OR-H-1 and OR-L-1 identified a lack of capacity being a limiting factor for integration, with each stating "we need the right number of staff to handle these kinds of things," and "there are obviously so many tasks that need to be done, including integration of plans, that just can't be done with staff levels at they are." OR-H-1 stated that they accomplished most of their integration back when they had higher staff levels, but since undergoing major cutbacks, were unable to do more than just processing permits. OR-H-3 discussed how between 2008 and 2012 the county laid off over half of the planning staff, and linked lack of capacity to lack



of funding. Now that they are prioritizing hazard integration, staff numbers are rising.

### Awareness

A lack of awareness was identified in the literature review by Berke, 1996b; Martin et al., 2009; Zhang et al., 2009 as a possible limitation to plan integration success. Factors in this theme include: poor community awareness of hazards, little or no history of hazard events affecting the community, mistaken perception of hazard risk by property owners, and lack of interaction between staff working on the HMP and staff working on the comprehensive plan.

While a strong community awareness of hazards and a history of hazard events affecting the community went hand in hand as a supporting factor, no county identified a lack of community awareness of hazards or a lack of historical hazards as a barrier factor. One county, OR-H-1, stated that they did occasionally run into problems with a mistaken perception of hazard risk by property owners, and these property owners often pushed back or questioned mitigation efforts. OR-L-1 identified a lack of interaction between staff working on the HMP and staff working on the comprehensive plan. However, from the interview discussion he stated how they were in the process of updating the NHMP and were invited to participate in the process. The participant said that up until this point, there had been no interaction up until "the rush was on to...get the updated hazard mitigation plan to the state and federal emergency planning... before that time there really wasn't a lot of interaction between the two planning efforts."

### Recognition

A lack of recognition was identified in the literature review by Basher, 2008 and Sparks, 2007 as a possible limitation to plan integration success. Factors in this theme include: poor recognition of mitigation efforts in the media, and a greater public reward for disaster response as opposed to disaster mitigation.

One county did identify in the survey that poor recognition of mitigation efforts in the media and a greater public reward for disaster response as opposed to disaster mitigation were barrier factors. When asked to elaborate on these two factors, the participant said that the county has actually not experienced these issues, but imagined that they could cause a problem elsewhere. Due to this distinction, I chose to not include this in my findings. Thus, no counties identified these two factors as barrier factors.

### Other

The other factor identified in the literature review by Berke, 1998 is a feeling that the community is at such high-risk that it is impossible to mitigate hazards. A question of responsibility for integration and pushback against over-regulation were added as factors after hearing the responses from interviews.

Though no county specifically identified a feeling that the community is at such high risk that it is impossible to mitigate hazards, OR-L-2 did discuss during the interview how there was really nothing that planning or emergency management could do to truly mitigate Cascadia.

I identified both OR-H-2 and OR-L-2 as questioning who had responsibility for integration. When I asked if there had been any discussion about community planners looking at the HMP and identifying areas for integration into the comprehensive plan, I received statements like “The emergency manager is the one who ought to be responsible for coordinating the natural hazards plan with the other emergency operation plans for the county,” and “even though our land use plan does not necessarily have something on that... our emergency management folks are developing contingency plans... that’s better than our land use development code.” Another manager stated that “there is this strong side, not in the development code, but over in the emergency management folks and our public works department that have all these contingency plans, and...if there is an event, they’re not necessarily being handled in the land use code.”

OR-H-1, OR-H-3, OR-H-2, and OR-L-2 all expressed pushback against over-regulation. County planners stated that by incorporating the documents, they would be legally bound to address the issues and they were not interested in “outside regulatory directives from outside agencies... telling the county what to do or what not to do.” It was stated “putting this plan in the comprehensive plan would be akin to saying you shall do these items. The board is not interested in that... they’re okay going along with FEMA making us.... do this plan every five years and updating it... as long as it isn’t obligating the county to do certain things.” In addition, there was concern about the possibility of how integration would affect land use, demonstrated in statements like “We’re not going to turn around and amend the land use code to make a whole bunch of property undevelopable because we think there might be a risk there.” OR-H-3 summed up the issue very nicely, stating how Oregon had a strong history of the Oregon land use system and a strong history of private property rights. A balance needs to be struck between the two. OR-H-3 stated that “in Oregon, the statewide planning program’s answer to most issues is a limitation of property rights” such as the restriction of building in a floodplain, which can become a takings issue. Thus far, “we have good tools to regulate and limit, but we don’t have very good tools to mitigate the impacts of those regulations.”

## **Discussion**

Every factor that was identified as a supporting factor for one county was also identified as a barrier by another county. This suggests that these supporting factors are vital.

### Higher Integration vs. Lower Integration

It is important to note that I used Lewis’ “high” and “low” integration scoring counties as a means of comparing counties. However, there was little difference between the two groups, suggesting that perhaps viewing these counties as high and low is not the appropriate method. In Lewis’ research these high and low counties had only had a 10-point difference for integration. There was not a single factor that strongly stood out as more true for higher score counties or lower score counties. The greatest difference between high and low counties was “a lack of interaction

between staff working on the HMP and staff working on the comprehensive plan” and “pushback against over-regulation.” Every other factor only had a one-point difference between higher and lower score counties; however, this could change if more interviews were conducted.

For “a lack of interaction between staff working on the HMP and staff working on the comprehensive plan”, no higher score counties stated this as a barrier, while two lower score counties did. OR-L-1 identified a lack of interaction between staff, but during the interview, I identified a recent interaction between staff. Even if I had not done so, the results would not change dramatically. This suggests that a lack of interaction between the two planning efforts is a major sign of a community that has poor integration. However, no higher scoring county identified interaction between these two planning efforts as a supporting factor.

Regarding “pushback against over-regulation,” three of the counties that selected this barrier were higher scoring counties, while only one lower scoring county identified this as a barrier. This is a finding opposite of what I would have expected, and suggests that this barrier may not be an unsurpassable issue.

Themes that proved to be consistently represented by both lower and higher scoring counties include awareness, leadership and support, and resources and funding in that order for supporting factors, and leadership and support, other, resources and funding, and awareness in that order for barriers (keeping in mind no county selected recognition).

Lower scoring counties identified fewer barriers and more supporting factors than high scoring counties, while high scoring counties identified more barriers and fewer supporting factors than lower scoring counties. Lower scoring counties agreed more on what were supporting factors and higher scoring counties agreed less on supporting factors.

## Chapter 5: Implications

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The findings provide some very interesting feedback, not only for next steps moving forward for government agencies, county governments, and support organizations, but also for literature on this topic. As stated, many of the supporting or barrier factors came interviews or from experts that help Oregon counties with integration, while a large amount of the factors identified in the literature review were either secondary or not selected by counties at all. No county selected a single factor in Recognition, which the literature identified as having influence on plan integration.

What the findings also suggest is that counties are still struggling with basic issues of capacity (which is largely related to funding), and are unable to move on to the best practices of integration. As one county put it “there are obviously so many tasks that need to be done, including integration of plans, that just can’t be done with staff levels at what they are.” Thus, if integration is not made a priority by staff and political leaders, it takes a back seat to more pressing issues or daily obligations such as possessing permits. If integration is something that FEMA or other government agencies desire, then they will need to find a way to address these basic issues that counties are facing, either through addressing the capacity problem, or through making integration a priority through mandating it.

There were several interesting findings I came across during the interviews that did not relate to supporting or barrier factors. One was the fact that many of the counties I interviewed are approaching the update of their NHMP and discussed with me how they gave more thought to this issue while invited to participate. Another was that some counties are doing similar integration with other plans, such as Community Wildfire Protection Plans, but not with the NHMP. In these communities, wildfire was the greatest hazard of concern. Also, just because there might not be integration of HMPs and comprehensive plans does not mean that the mitigation efforts identified in the HMP are not being implemented. It is the implementation of these mitigation efforts that help to make a county more resilient, not the fact that it is referenced or integrated into another plan, even one that is legally binding. As one county said, the update process FEMA requires of the NHMP keep these issues fresh in people’s minds, which increases the likelihood that they get done at some point or another.

Due to the nature of these findings being behavioral, many of these supporting and barrier factors can be transferred to other states that have similar land use policies and hazard mitigation plans, such as Washington and California. Recommendations for improving integration, however, were developed with Oregon specifically in mind.

### **Recommendations for Improving Integration**

The findings identified in this study provide some guided feedback and ideas for improvement for the various organizations that are working to improve integration between HMPs and comprehensive plans. These organizations include government agencies such as FEMA on the federal level and the Department of Land

Conservation and Development (DLCD) on the state level, county governments working towards integration or thinking of making it a priority, and organizations that are assisting counties with integration, such as the Oregon Partnership for Disaster Resilience, or consulting companies that are helping counties to minimize their hazard risks. These options are derived from my research and would require more work to be fully investigated and possibly developed into successful programs.

#### Government Agencies

Government agencies include state agencies like DLCD and possibly FEMA that oversee and regulate comprehensive plans and NHMPs.

- **DLCD needs to develop a set of implementation steps, model examples, or conduct a needs assessment of what kind of information would help local planners.** Many counties are confused about what integration is and looks like. For example, many counties believed that by complying with the NFIP, they were integrating the two plans, when this is only a portion of integration. This confusion about the definition of integration was highlighted during a project undertaken by the University of Oregon's Community Planning Workshop (CPW). DLCD staff indicated to the research team that there are two ways of coordination between comprehensive plans and NHMPs: adoption by reference or appending them to the comprehensive plan. They stated that integration takes this a step further by "uniting the two documents in a holistic way, so that the background information, policies, implementation measures, and maps of the NHMP are consistent with and become fundamental constituents of the comprehensive plan," (DLCD, 2014). This would create a single document, rather than two. Confusion remains among counties as to how this would be done and what the stages to full integration look. By providing guidance on what this process looks like through a set of implementation steps with examples, counties could develop a better sense of full integration. Also see the section **OPDR and DLCD should develop a needs assessment to further assess technical assistance needs at the local level** below.
- **DLCD should conduct interviews with county political and staff leaders to identify how they can build support for integration.** Integration is unlikely to be prioritized without the support of political and staff leaders, and DLCD should start a conversation with these people to identify how to best build this support and to learn of barriers. The greatest resistance identified among political and staff leaders was pushback against over-regulation. DLCD should identify methods and techniques through these interviews to educate political and staff leaders about the benefits and importance of integration, and alleviate concerns about integration. They could do so by looking into this resistance more, pinpointing the base of this concern, and seeing what, if anything, can be done to address it.

- **Rather than suggest counties integrate their HMPs into their local comprehensive plans, mandate that they do so.** This is similar to a recommendation that Lewis, (2011) identified: “the DMA should require communities to show that HMP actions were incorporated into local comprehensive plans prior to HMP-approval.” This is very close to mandating integration by saying counties HMPs won’t be approved if they don’t show evidence of integration. Lewis stated that his findings are “evidence that HMP outcomes are not driving local governments to amend their comprehensive plans with new hazard mitigation priorities.” Though the state of Oregon does mandate that hazards be addressed in the comprehensive plan through Goal 7, it does not specifically mandate integration between the two plans. The mandate is currently too vague and more needs to be done to address how and when counties will adjust under the mandate with changes in science and information regarding hazards. The literature has shown that if something is not specifically mandated, then it is unlikely to be incorporated (Berke, 1996; Burby & Dalton, 1994; Burby & Nelson, 2001). The same is true if something is not specifically stated. Mandating integration would be the most effective way to ensure that it is done. However, mandates come with their own drawbacks. Some studies have shown that mandates only have a marginal effect when it comes to plan integration (Berke et al, 2006). To avoid a mandate, DLCDC could provide a more streamlined process for comprehensive plan updates for integration. See the **County governments should update their comprehensive plans on a regular basis** section below for further information.

### County Governments

County governments include planning and emergency management staff, as well as the county Board of Commissioners.

- **Oregon counties should consider designating staff to serve as a liaison between the comprehensive plan and HNMP planning efforts.** Counties that have interaction between staff working on the HMP and staff working on the comprehensive plan are more likely to have an understanding of integration. One county hired a liaison to coordinate planning efforts, with great success. This could be difficult given that many counties are strapped for funds and lack capacity, but when integration and hazard mitigation is made a priority, this becomes possible.
- **County governments should allocate more funding to hazard mitigation measures, including integration.** In the interviews, counties identified a lack of capacity as a great barrier, and a lack of capacity is often linked to a lack of funding. Efforts should be made to either make hazards, planning, and integration a funding priority, or local governments should become more creative in their search for funding support. If capacity still remains an issue,

seeking out the help from supporting agencies, such as the Community Planning Workshop and OPDR can be an option.

- **Counties should continue promoting education among planning staff.** Supporting the planning staff through continued education, certifications, permit education, and sessions on resources management and land use can help increase the technical ability of planners to tackle integration issues. Counties in the study who did this were more likely to work on integration and thus reduce risks from natural hazards.
- **County governments should update their comprehensive plans on a regular basis.** One county described how they were proactive in updating the comprehensive plan on an annual basis. This helped them greatly in their integration efforts. Many counties are reluctant to go through comprehensive plan changes or extensive rewrites due to the time, resources, and energy required to do so. It could prove very beneficial to update the comprehensive plan on a regular basis. However, there are drawbacks associated with the costs associated of doing so. Still, it could help avoid a mandated process.

#### Supporting Organizations Recommendations

Supporting organizations include organizations like OPDR and DLCDC that provide resources and support to counties.

- **OPDR and DLCDC should develop a needs assessment to further assess technical assistance needs at the local level.** OPDR and other supporting organizations like DLCDC should continue to offer services, support, and resources to the integration efforts of counties. However, a more targeted method could be developed through a needs assessment to identify what county planners need most when it comes to technical assistance, and OPDR and DLCDC should identify their own roles in supplying this.
- **OPDR and DLCDC should develop education materials.** There needs to be more education for planners and emergency managers on the importance of integration, the roles of each department in integration, and methods and levels of integration. More research would need to be conducted to see what this educational material would look like.
- **OPDR and other supporting organizations should develop proof of concepts for ideal plan integration.** There are few examples or case studies that describe the various levels of integration that DLCDC is looking for. Supporting organizations, like OPDR, have the ability to develop proof of concepts, such as the work that is being done by CWP in the city of Madras. Supporting organizations can develop a path to integration success and can show counties what this looks like on various levels, as well as the strategies and approaches to take.

All the points above mention tasks that should be done to help with integration of these two plans. It is important to note, however, that there are many things currently going on that help with integration, and should continue to be supported and encouraged. These include the current leadership and support of county governments having greater success with integration, and continuing to keep awareness up, particularly for hazards that occur on a less frequent basis. Counties that are finding the integration path for themselves should be encouraged, held up as model examples, and should spread their knowledge of the integration process and the supporting and barrier factors they have faced with counties that are having more difficulties finding a way. As one county put it, hazard mitigation planning in Oregon is “simply complicated, but our job is to make it work.”

### **Suggestions for Future Research**

This study opens the door to many other areas of research on the integration of hazard mitigation plans into comprehensive plans. Some possible research questions and opportunities are identified below.

1. A similar study can be conducted looking at the integration of city comprehensive plans and NHMPs to determine if they are having similar experiences integrating these two plans.
2. This study could be continued with more counties to see if the findings hold over a larger sample size, or be expanded to include similar counties in California and Washington to see if those states have similar or different supporting and barrier factors.
3. There could be research into what would make a high-quality educational series on plan integration for planners and emergency managers.
4. There could be research compiling a proof of concept for ideal integration from among the country.

### **Conclusions**

This study investigated the supporting and barrier factors of hazard mitigation plan integration into comprehensive plans. Through a series of six interviews with county planners in different counties, I was able to identify a set of vital supporting and barrier factors, along with some factors that were influential, and identify some factors that were not addressed in the literature. The results show that strong staff leadership, strong political leadership, strong community awareness of hazards, a history of hazard events affecting the community, and an understanding of what integration looks like are all supporting factors. Strong barrier factors include pushback against over-regulation, the state not encouraging/mandating integration between these two plans, a poor understanding of what integration looks like, a lack of capacity, and a question of responsibility for integration. The outcome of this research leads to a variety of possible steps that government agencies, county governments, and support organizations can take to help improve integration between these two plans, overcome the barriers these counties face, and capitalize on the supporting factors that are already at work.



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## Supporting and Barrier Factors to HMP and Comprehensive/General Plan Integration

Thank you for taking this survey.

It is important to stress that this research is focused on the integration of hazard mitigation plan action items into local comprehensive/general plans, NOT the implementation of mitigation action items on the ground. Please answer the following questions keeping this in mind.

Please provide the following information.

Name	<input type="text"/>
Phone Number	<input type="text"/>
Position	<input type="text"/>

While updating your latest comprehensive/general plan, which of the following factors were important supporting factors to

hazard mitigation plan integration? Please select all that apply. (You will be given an opportunity to rank your selections on the next page).

- |  |  |
|--|--|
| <input type="checkbox"/> Strong staff leadership on this issue                         | <input type="checkbox"/> Strong community awareness of hazards                       |
| <input type="checkbox"/> Strong political leadership on this issue                     | <input type="checkbox"/> There is a history of hazard events affecting the community |
| <input type="checkbox"/> Our county has the technical expertise to integrate the plans | <input type="checkbox"/> Strong recognition of mitigation efforts in the media       |
| <input type="checkbox"/> Funding is available  | <input type="checkbox"/> Other<br><input type="text"/>                               |

While updating your latest comprehensive/general plan, which of the following factors were important barriers to hazard mitigation plan integration? Please select all that apply. (You will be given an opportunity to rank your selections on the next page).

- |  |   |
|--|---|
| <input type="checkbox"/> Lack of staff leadership on this issue                                | <input type="checkbox"/> Poor community awareness of hazards  |
| <input type="checkbox"/> Lack of political leadership on this issue                            | <input type="checkbox"/> There is little or no history of hazard events affecting the community                                   |
| <input type="checkbox"/> The State does not encourage or mandate us to integrate the two plans | <input type="checkbox"/> Mistaken perception of hazard risk by property owners  |
| <input type="checkbox"/> Our county lacks the technical expertise to integrate the plans       | <input type="checkbox"/> Lack of interaction between staff working on the HMP and staff working on the Comprehensive/General plan |
| <input type="checkbox"/> Lack of funding   | <input type="checkbox"/> Poor recognition of mitigation efforts in the media  |

- More funding for hazard response rather than hazard mitigation
- Federal funding has historically incentivized development in hazardous areas
- Absence of immediate payoff for risk reduction
- Greater public reward (appreciation) for disaster response as opposed to disaster mitigation
- A feeling that the community is at such high-risk that it is impossible to mitigate hazards
- Other

Please rank the supporting factors you chose in order of importance by dragging and dropping them in order (1 = most important).

- » Strong staff leadership on this issue

---

- » Strong political leadership on this issue

---

- » Our county has the technical expertise to integrate the plans

---

- » Funding is available

---

- » Strong community awareness of hazards

---

- » There is a history of hazard events affecting the community

---

- » Strong recognition of mitigation efforts in the media

---

- » Other

---

Please rank the barrier factors you chose in order of importance by dragging and dropping them in order (1 = most important).

- » Lack of staff leadership on this issue

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- » Lack of political leadership on this issue

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- » The State does not encourage or mandate us to integrate the two plans

---

- » Our county lacks the technical expertise to integrate the plans

---

- » Lack of funding

---

- » More funding for hazard response rather than hazard mitigation

---

- » Federal funding has historically incentivized development in hazardous areas

---

- » Absence of immediate payoff for risk reduction

---

- » Poor community awareness of hazards

---

- » There is little or no history of hazard events affecting the community

---

- » Mistaken perception of hazard risk by property owners

---

- » Lack of interaction between staff working on the HMP and staff working on the Comprehensive/General plan

---

- » Poor recognition of mitigation efforts in the media

---

- » Greater public reward (appreciation) for disaster response as opposed to disaster mitigation

---

- » A feeling that the community is at such high-risk that it is impossible to mitigate hazards

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- » Other

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## Appendix B: Interview Questions

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- 1) Tell me about your latest comprehensive plan update process.
  - a. Was it conducted in house or contracted out?
  - b. What was the timeline like?
  - c. When was integrating the HMP discussed (if at all)?
- 2) I see you answered (top supporting factor). Can you tell me why?
- 3) Tell me why you selected (second and third supporting factor).
- 4) Anything else you would like to tell me about supporting factors or factors that have helped your community to integrate these two documents?
- 5) I see you answered (top barrier factor). Can you tell me why?
- 6) Tell me why you selected (second and third barrier factor).
- 7) Anything else you would like to tell me about barrier factors or factors that have hindered your community from integrating these two documents?
- 8) How well do you feel that these two plans are integrated in your community?