This plan is an update of the 2004 City of Redmond Hazard Mitigation Plan (HMP). Although it is an update, this document has been redesigned so that it looks, feels, and reads differently than the original. This is due to several factors: new hazard information has become available that drives new definitions of risk, the City has matured and new capabilities are now available, and the new format will allow readers to more easily understand the content. In addition, the 2004 HMP included several action items that have been completed, creating an opportunity for developing new mitigation strategies.

The two main arenas for outside input in updating the Redmond Hazards Mitigation Plan were the Mitigation Implementation Committee (MIC) and public participation. The MIC process afforded the Project Team access to the knowledge of relevant professionals in Redmond. The public participation component used a public meeting, surveys, and public review to gain firsthand knowledge of local communities and get feedback throughout the process.

Planning Process FEMA Requirements

Requirement §201.6(b): In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include:
(1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;
(2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and non-profit interests to be involved in the planning process; and
(3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.

Requirement §201.6(c)(1): The plan shall document the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.

3.1 Mitigation Implementation Committee Process

The purpose of the Mitigation Implementation Committee (MIC) is to guide the Hazards Mitigation Plan update process. The Committee was comprised of one or more representatives from the Redmond Police and Fire Departments, the Planning Department, Redmond Parks and Recreation, and municipal agents charged with ensuring small business resilience in the community. There were three MIC meetings, held between March and May 2009.

The first meeting followed the initial phase of research. The Project Team presented data on potential hazards, Redmond's built environment, demographics, municipal capabilities, and the process of hazard mitigation planning. The main goal of the first meeting was to set the scope for the remainder of the project. Based on their experience and local knowledge, the MIC members narrowed the scope of research to the topics of greatest relevance to Redmond. This included ranking the particular hazards that should receive most attention during the update process.

The second MIC meeting was used as a forum for the Project Team to present ranked risk assessments of potential hazards. The process enabled MIC members to make informed decisions about selecting hazards for mitigation. The MIC feedback provided the Project Team with direction for one of its final phase tasks – the development of probable, worst-case hazard scenarios. Through a group participation exercise (a forced choice dot exercise), the Project Team discovered which mitigation strategies the MIC considered highest priority. The MIC also offered initial feedback on strategies

that may yield the greatest benefits for mitigation efforts.

During the final MIC meeting, the Project Team presented the final disaster scenarios and recommended mitigation strategies. Prior to this meeting, the proposed strategies had been presented to the public and amended, to reflect the public input. Following the final MIC meeting, suggested amendments from MIC members were incorporated. The resulting strategies were then used in the Hazards Plan update.

3.2 Public Process

In order to maximize the effectiveness of this HMP, the Project Team sought continual public engagement. The team reviewed the public engagement efforts of other jurisdictions and concluded that an aggressive and varied outreach strategy would be necessary to involve the public. The strategy aimed to solicit ideas and feedback from Redmond residents, employees, and business owners through multiple avenues.

Public input was encouraged during three phases of the document development. An online survey was available through the City of Redmond's web page from April 18th until June 15th, 2009. The web survey provided the Project Team with information about the community knowledge and perception of threats to the City. The second opportunity for involvement was at the public meeting, held in the City Hall on May 14, 2009. The public meeting provided more information about community knowledge and the existing vulnerabilities and capabilities. Finally, after the City of Redmond reviewed the HMP update, the document was available for public comment. The document was posted on the City's web page and at several locations with opportunities for anonymous feedback. Public input from all phases of the Plan developement were incorporated into the final document.

3.2.1 Public Process Goals

The goal of the public process was to solicit "ground-level" information about Redmond. The intent was to gauge household and business preparedness and awareness of personal mitigation techniques, identify areas where people were particularly vulnerable, and get feedback on potential mitigation strategies. When possible, we provided respondents with information that would be useful in personal preparedness activities.

3.2.2 Questionnaire & Public Meeting Promotion

Several methods were used to inform the public about the opportunity to participate in the HMP update process. Utility mailer inserts were included in the May billing cycle (see Appendix A, Item 1). These mailers were included in all city-billed utilities, including water and wastewater treatment; therefore nearly all residents received the notification.

Similar fliers were passed out at the Redmond Saturday Market and the Redmond

Town Center on May 2, 2009. Fliers were also distributed at the Redmond Police & Fire Community Outreach Center. Targeted outreach was directed at identified stakeholders, particularly groups representing vulnerable populations, such as seniors and children. An email announcement was sent to the Redmond City email list.

Given the continuity challenges businesses face during hazardous events, the Project Team contacted the Redmond Chamber of Commerce CEO & President, and Director of Communications, Media and Events. We worked with those contacts to inform their members of the questionnaire and public meeting.

In consideration of the increased vulnerability of children and the potential for geographic isolation, administrators at many of the City's schools were contacted (see Appendix A, Item 2). In addition to the Lake Washington School District Director of Communications and the Lake Washington School District Community Relations & Communications Coordinator, the Project Team also contacted principals from:

- Louisa May Alcott Elementary School
- Emily Dickinson Elementary School
- Explorer Community School
- Benjamin Rush Elementary School
- Redmond Elementary School
- Rosa Parks Elementary School
- Albert Einstein Elementary School
- Norman Rockwell Elementary School
- Redmond High School
- Horace Mann Elementary School
- Redmond Jr. High School
- Faith Lutheran School
- Stella Schola Jr. High School
- John James Audubon Elementary School

Additional emails were sent to City of Redmond Neighborhood Liaisons, civic and community organizations, places of worship, and housing organizations. A variety of organizations were contacted including:

- Places of Worship: Overlake Christian Church, Meadowbrook Church, Faith Lutheran, and ten other faith based groups in the City
- Vulnerable Populations: Eastside Retirement Association, Redmond Senior Center
- Service Groups: Redmond Rotary, Redmond Lions, and Redmond Kiwanis
- Non-Profit Organizations: Including Habitat for Humanity of the Eastside, Hopelink, and Hopebuilders International
- Community Groups: Friends of Marymoor Park, Friends of the Redmond Library, Redmond Historical Society, and other general interest groups

Outreach messaging was sent to local area blogs, including:

- Experience Redmond (http://www.experienceredmond.com/blog/)
- Redmond Neighborhood Blog (http://redmondcity.blogspot.com/)
- Thinkspace (http://www.thinkspace.com/blog/)
- The East Side Life (http://blog.theeastsidelife.com/wordpress/)
- West Redmond Real Estate Buzz (http://westredmondrealestatebuzz.com/)

The blog Thinkspace posted a notice about the meeting and several questionnaire respondents reported that they found the questionnaire via the City of Redmond's list of online surveys, available at redmondcity.blogspot.com.

The questionnaire itself concluded with a reminder to attend the public meeting to receive and provide more information in the planning process. The meeting was also promoted via notice in The Redmond Reporter, the local weekly newspaper.

3.2.3 Public Meeting Activities

The Hazards Mitigation Public Meeting was held May 14, 2009 at the Redmond City Hall Bytes Café from 7:00 pm to 9:30pm. Tables were set up with information specific to the hazards faced by Redmond. Each table featured a simplified hazard map to allow residents to identify the risks faced by the homes, businesses, and transportation routes. Each table was staffed by a team "topic expert" to answer questions from participants. To help guide participants through the hazards information and encourage interaction with the displays, a meeting "passport" was created. See the Appendices for sample meeting materials and the agenda (see Appendix A, Items 3 - 5).

For review of the hazards displays, the presentation team delivered a brief summary of the hazards data, the relative risk rankings, and the purpose of hazards mitigation planning. The presentation was followed by a facilitated scenario exercise, in which participants were asked to review the anticipated effects of a crustal earthquake, and provide feedback on selected earthquake-related mitigation measures. Participants were asked to identify usually overlooked impacts and unidentified strategies, and select their preferred strategies. Scenario presentation materials are included in Appendix A, Item 3. Participant feedback was incorporated into the analysis of the mitigation strategies discussed below.

Despite comprehensive public outreach efforts, the meeting was sparsely attended; three residents attended the meeting, and only one was able to attend the presentation and scenario exercise.

3.2.4 Questionnaire Results

The questionnaire was developed using the University of Washington's Catalyst software. The City of Redmond posted a link to the questionnaire on the City's website, which remained active until June 15, 2009. Complete tables of results are available in Appendix A, Item 6.

Demographics
In total, 85 people responded to the Redmond Hazards Mitigation Questionnaire. Of these, 45 live in Redmond, 9 work in the city, and 31 both live and work in the City. The majority of respondents (82%) were between the ages of 30 and 59. Fifty-nine percent of respondents reported an annual income of $90,000 or more.

Ranked Concerns of Hazards
Respondents were asked to rank the five potential hazards that most concerned them. A simple weighting technique produced the following results, in order of most concerned to least concerned:

1. Earthquake
2. Winter storm
3. Pandemic
4. Flood
5. Terrorism
6. Hazardous material spill/exposure
7. Wildfire
8. Drought
9. Landslide
10. Other hazards
11. Heat wave

Concern for earthquakes and winter storms far exceeded concerns for the other hazards listed.

Resident information sources and preparedness
Residents were asked questions about where they learned to prepare for hazards. The most common response was local government, television and radio broadcasts, newspapers, and through the Red Cross or similar agencies.

When asked to identify the most effective source of hazards information, 15% of respondents chose local government, followed by newspapers (12%), and television and radio broadcasts (12%). Other sources identified by respondents as the most effective included internet resources and common sense.

Residents were also asked to list the steps they had taken to prepare for disasters. Responses were as follows:

Steps taken	Number of responses	Percentage
Smoke detectors	73	96.1%
Flashlights	73	96.1%
Battery-powered radio	62	81.6%
Fire extinguisher	65	85.5%
Spare batteries	63	82.9%
Secured water heater	56	73.7%
Stored extra food	57	75.0%
Stored extra water	54	71.1%
Located utility shut-offs	51	67.1%
Stocking extra medical supplies/prescriptions	38	50.0%
Fastened home to foundation	32	42.1%
First Aid/CPR certification	30	39.5%
Supply kit	31	40.8%
Fire escape plan	21	27.6%
Family communication plan	24	31.6%
Secured tall furniture	21	27.6%
Moved heavy objects	15	19.7%
Other	5	6.6%
None	0	0.0%

Table 5: Redmond Resident Disaster Preparation Steps

Respondents described their preparedness as follows:

Level of preparedness	Number of responses	Percentage
Highly prepared	12	14.1%
Somewhat prepared	52	61.2%
Somewhat unprepared	17	20.0%
Highly unprepared	4	4.7%
Not sure	0	0.0%

Table 6: Redmond Resident Disaster Preparedness Levels

Residents and special needs

Nearly half of the residential respondents indicated they had children at home. Fifteen percent reported living with a senior citizen. One in twelve lives with people for whom English is a second language, and 3% live with someone with a physical disability.

Work-in-Redmond preparedness information

Respondents who work in Redmond were asked to identify steps their employers have taken to prepare or mitigate for hazards. The results are as follows:

Preparation	Number of responses	Percentage
Trained employees in preparedness and response	21	52.5%
Conducted emergency drills	20	50.0%
Created evacuation plans	20	50.0%
Identified vital records and protected computer data and equipment	15	37.5%
Established communication plans to communicate with employees, vendors, customers, and the media.	15	37.5%
Offsite/out of area back up of computer files and physical papers	12	30.0%
Prepared sources of emergency power to support critical operations and secure records	12	30.0%
Provided employees with information to prepare for disasters at their homes to enable them to return to work sooner	11	27.5%
Conducted hazard vulnerability analyses of all buildings	10	25.0%
Encouraged and tracked annual influenza vaccination for employees	10	25.0%
Made sure insurance covers business equipment and supplies	8	20.0%
Other	6	15.0%
Set up an emergency cash reserve	5	12.5%
Created an emergency supply kit with food, first aid, and other supplies.	5	12.5%
Developed and planned for scenarios likely to result in an increase or decrease in demand for your products and/or services during a pandemic	5	12.5%
Determined potential impact of a pandemic on company business financials	4	10.0%
Purchased business interruption insurance	4	10.0%
Shared best practices with other businesses in your communities, chambers of commerce, and associations to improve community response efforts	4	10.0%
None	3	7.5%
Stored enough drinking water for employees and customers	3	7.5%
Anchored office equipment, production equipment, and warehousing facilities	3	7.5%
Practiced table-top exercises	2	5.0%
Replaced windows with shatterproof glass	2	5.0%
Trained and prepared ancillary workforce (e.g. contractors, employees in other job titles/descriptions, retirees)	1	2.5%

Table 7: Disaster Preparedness of Redmond Businesses

It is difficult to determine from these numbers whether or not employers have taken steps to mitigate hazards at their workplaces, or whether the lower numbers reflect a lack of respondent knowledge of the steps their employers have taken.

When asked to identify strategies for helping their employer prepare for or mitigate hazards, respondents answered as follows:

Strategy	Number of responses	Percentage
Business-oriented disaster planning	17	42.5%
None	12	30.0%
Mitigation incentives	9	22.5%
Tax breaks	9	22.5%
Recovery grants	6	15.0%
Flood risk info	8	20.0%
Recovery loans	3	7.5%
Business helpline	3	7.5%
Flood repair info	5	12.5%
Financial literacy	2	5.0%
Other	3	7.5%

Table 8: Business Preparedness Strategies

Overall, about half of respondents who work in Redmond (53%) believe their employer is prepared for hazards the City could experience. Seventeen percent believe their employer is unprepared, and the remaining 30% are not sure.

Businesses and special needs

Two-thirds of respondents indicated they share a workspace with a person with physical disabilities. Two-thirds also indicated working with people for whom English is not their primary language. Forty-five percent indicate sharing a workspace with a senior citizen.

Overall strategies

Respondents were asked to point to the relative value, in terms of the city's time and resources, of six broad categories of mitigation strategies. A simple weighting system assigned a score to each category that could be used to compare their relative value to the public.

The most popular category of mitigation strategies was emergency services, followed by mitigation actions on future development, public education and awareness strategies, protection of natural processes, structural projects, and mitigation actions on existing development.

Outreach

Respondents were asked to explain where they first heard about the questionnaire. Fifty-two percent of respondents had received a flyer in their utility bill, 18% had seen the link on the city's website, 9% had heard of the questionnaire from members of the Project Team, and 4% from word-of-mouth. The remaining 18% described other means by which they had heard of the questionnaire, including blogs and a homeowners' association newsletter.

3.2.5 Document Review

After the Project Team completed the final draft of this HMP update, it was sent through several review phases. The public was given the opportunity to comment on the HMP, prior to sending it to the State and FEMA for approval. The document was available on the City of Redmond's web page and at public locations. Physical copies of the document were available at City Hall and the Public Library. Residents were able to give anonymous feedback through a survey. The comments from the survey were incorporated in the final document.

The document review process followed the schedule below:

July 15th, 2009 - August 13th, 2009: City of Redmond Department Review
August 14th, 2009 - September 14th, 2009: Public Review and Washington State Review
September 15th, 2009: FEMA Approval

3.3 History of Hazards in Redmond

Storm history, evidenced by the Winter Storms of 1993 and 1996-97, the Columbus Day Storm of 1993, and the Inaugural Day Storms of 1962 and 1993, suggests a high probability of repeat occurrence in the City of Redmond and the Puget Sound region. The potential exists for damage from falling trees, hillside slippage and storm water related flooding, to name a few possibilities.

Although the 2001 Nisqually earthquake could be felt as far south as Oregon and as far north as Vancouver B.C., Redmond did not suffer extensive damage but minor liquefaction did occur to the north and south of the City limits.

There is no history of serious epidemic disease in Redmond in recent times. Nonetheless, the King County Health Services Communicable Disease Center warns that in the presence of a growing population, there is more opportunity for infectious disease to occur and spread. In the last ten years, the population of Redmond has increased 26.4%. As such, there is reason to believe that the probability of an epidemic in Redmond is proportional to the increase in population. The probability of epidemic from a mild form of influenza virus is high, while the probability of a severe form of the influenza virus is low.

In the case of Redmond, the elevation of the 100-year flood plain is approximately 12 inches higher in elevation than those areas outside of the flood plain. Few locations along the Sammamish River are vulnerable to flooding, except in the instances of backwater flooding. The area most commonly affected by backwater flooding is beneath the railroad tracks along Redmond Way. This area flooded during the heavy snows and subsequent melt-off related to the winter storm of 1997. At that time, four lanes of Redmond Way were closed, and traffic through the area was diverted to other streets.

The January 1997 storm also shut down five streets because of flooding. A hazard associated with that storm was a 200-foot-long mudslide that forced the evacuation of 35 residents along 180th Avenue Northeast. The slide cut off the only road to seven houses in the area and prompted the evacuation of nearby condominiums. (For more information on this storm see Landslides, Chapter 8).

In February of 1996, Patterson Creek east of Redmond cut a new path, spilling over its shallow banks and roaring across the Redmond-Fall City Road. In November of 1998, East Lake Sammamish Parkway Northeast, south of Redmond, remained closed after rainfall and a broken water main caused part of the road to drop into a 25-foot sink hole on Friday. King County transportation crews worked through the night to stabilize the road so it could be repaired. While there is a history of flooding and other hazards associated with severe precipitation, these events are not anticipated on an annual basis. Indeed, they are due to exceptional weather conditions (except in the case of Bear Creek, where annual flooding is anticipated). As such, the probability of flooding in Redmond can be assigned the following values: a low probability of flooding on the Sammamish River, a high probability of flooding for Bear Creek, and a low probability of flooding for Lake Sammamish.

Each of these storms has led to a thorough investigation of response and mitigation procedures in Redmond. Some of the changes implemented as a result of these reviews include site location and storm debris collection and disposal, traffic signal monitoring and backup power supply, tree trimming and removal, storm drain maintenance and street clearing procedures, and rehabilitation of existing stream corridors.

Presidential Disaster Declarations in Redmond

Storms are not uncommon to the City of Redmond due to the City's proximity to the Puget Sound, Pacific Coast, and Cascade Mountains. All the storms listed below received presidential declarations with the exception of the January, 1993 event. This storm consisted of high winds, rain, and small amounts of snow. It knocked out power to more than 600,000 residents within the region causing former governor Lowry to declare a state of emergency.

- November, 1990 – Severe Storm
- January, 1990 – Severe Storm
- March, 1991 – Severe Storm
- January, 1993 – Inaugural Day Wind Storm
- March, 1993 – Severe storm, High Winds
- October, 1993 – Columbus Day Wind Storm
- January, 1997 – 1159-DR-WA (Flood, Landslide)
- February, 2001 – 1361-DR-WA (Earthquake)
- December, 2006 – 1682-DR-WA (Windstorm)
- December, 2008 – 1825-DR-WA (Snowstorm)
- January, 2009 – 1817-DR-WA (Flood)

In addition, Redmond was struck by a landslide in December 2001, as a result of substantial rainfall that caused a hillside to slough.

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