

Appendix C

Business Preparedness Survey

ONHW conducted a business preparedness survey in Beaverton with funding provided by the City. The survey asked Beaverton businesses to consider natural hazards; what impacts hazards have on businesses, what they have done to prepare, and what services are critical to business operations. This survey allowed businesses to become better informed on what the city is doing to reduce risks within the community and what actions it could still undertake. This helped satisfy public participation requirements while also allowing for public values to be incorporated into the planning process. Understanding how the business community views natural hazards is an important part of the natural hazard mitigation process. Businesses play an important role in the local economy; therefore, examining potential impact on businesses as well as essential business services may help to identify gaps in preparedness, and ways in which public/private coordination could be improved within the City.

Methods

ONHW adapted this survey from one previously implemented in Jackson County, Oregon as part of the development of a natural hazard Mitigation Plan. The survey went through multiple review processes and was field-tested for readability and content. Input from the field test and the project steering committee refined the survey further before its distribution. The survey addressed the following topics:

- General information and background;
- Natural hazard business impacts;
- Preparedness activities;
- Essential business services; and
- Essential business mitigation activities.

ONHW distributed 1,500 surveys by mail to randomly selected businesses located in Beaverton. The sample list was provided by the City of Beaverton's Finance Department. ONHW received 363 valid responses, which yielded a 24% response rate.

A total of three mailings were made to survey recipients during the months of January and February 2003. The first mailing included a cover letter, a survey, and a business reply envelope. Ten days later, a reminder postcard was sent to all businesses asking them to return the survey if they had not yet done so and thanking them if they already had. Three weeks after the initial survey mailing, a second mailing was sent to those who had not yet responded to the survey. This particular methodology was chosen to help maximize responses.

Limitations of Sampling Methodology

This survey identifies key issues about how businesses perceive their risk from natural hazards in Beaverton. Moreover, it is a snapshot of perceptions at a single point in time. As such, survey responses may reflect external issues, such as terrorism threats or recent occurrences of natural hazards. The survey was not intended to be representative of the perceptions of all Beaverton businesses.

Another limitation of the study's methodology is potential non-response bias from the mailed survey. If one were to assume that the sample was perfectly random and that there was no response bias, then the survey would have a margin of error of $\pm 5\%$ at the 95% confidence level. This means that if the survey were conducted 100 times, the results would end up within $\pm 5\%$ of those presented in this report.

Non-response bias is an issue in all surveys, but is particularly important in mailed surveys due to response rates. The Business Preparedness Questionnaire had a 24% response rate. The question that we cannot answer with 100% confidence is whether those 24% are representative of the entire population, or of some portion of the population that holds a different set of opinions.

Organization of Survey Findings

The report is organized into the following sections:

General Information and Background: This section describes the characteristics of survey respondents and compares the survey results with selected business characteristics outlined in the Economic Development Strategic Plan.

Natural Hazard Business Impacts: This section creates a profile of survey respondents and identifies:

- The level of impact of hazards on the business;
- The importance of business services in operations;
- The length of time in which the business would be impacted by a disaster;
- The transportation modes on which the business depends; and
- The methods in which businesses prefer to receive natural hazard mitigation information in the future.

Preparedness Activities: This section provides an overview of businesses' natural hazard preparedness activities in Beaverton.

Essential Business Services: This section provides information on how important certain business related services are to operations. The services include: electrical power, telecommunications, water, sewage disposal, and natural gas.

Essential Business Mitigation Activities: This section provides an overview of how useful certain mitigation activities are to business operations. The mitigation activities in this question are related to: facility and road access, utilities, businesses helping businesses, training and public outreach, risk reduction incentives, and community-wide activities.

Survey Results: Included at the end of this appendix are the results from the Business Preparedness Survey. A listing of written general comments is also included.

General Information and Background

General information and background questions provide a statistical overview of the characteristics of respondents. This section of the survey asked respondents about the type of business, number of years the business has been in operation, type of structure the business occupies, the number of employees, and average commute times. Where appropriate, the results are compared with the City's Economic Development Strategic Plan to illustrate differences in the sample population and the overall City business population.

Business Characteristics

In 1998, the City of Beaverton had approximately 4,500 firms with covered employees for a total of 63,700 workers. This survey represents 363 of those employers and 3,626 current jobs. The first five questions of the survey requested general business information: years of operation, type of business, ownership status, and employees – how many and average commute time to work.

Key findings from the City of Beaverton respondents related to business age, business type, and ownership include:

- 45% of business owners have been in operation for 1 to 10 years; 38% have been in operation for 11 to 25 years; and 3% have been in operation between 51 and 100 years.
- 76% owned/operated individual firms, while 8% owned/operated a chain of businesses.
- 61% lease the building their business occupies, while 27% own the building their business occupies.

Key findings from the City of Beaverton respondents related to business size and distance from business location and employees:

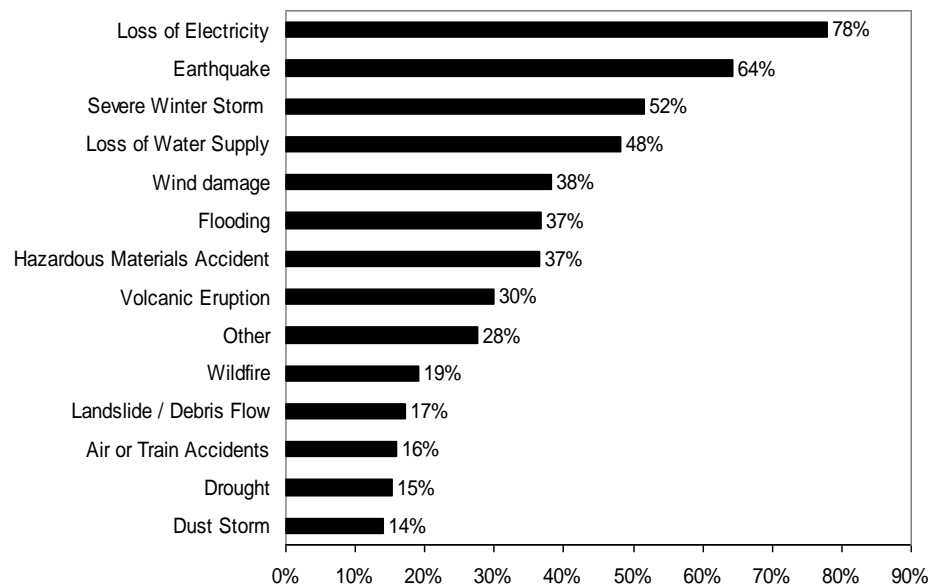
- 72% of respondents had less than 20 employees; only 11% had over 20 employees. According to the City of Beaverton Economic Development Strategic Plan, 88% of businesses in Beaverton have less than 20 employees; while 12% have more than 20 employees.
- 37% report that their employees typically commute between 15 and 29 minutes, while 20% indicated that the average employee commute was between 5 and 14 minutes.

Natural Hazard Business Impacts

Impact on Business

The survey asked respondents to indicate how severe an impact 13 different natural hazards would inflict on their businesses. Figure C-1 illustrates the hazards with the greatest impact – percentages are reflective of combining the serious and moderate impact responses. Respondents indicated that loss of electricity (78%), earthquake (64%), and severe winter storm (52%) had the potential to cause both serious and moderate impact. Air or train accident, drought, and dust storm were ranked the lowest with combined ratings of serious and moderate at 16%, 15%, and 14% respectively.

Figure C-1. Severity of impact for natural disasters on business operations



Source: ONHW/CPW, Beaverton Business Perception Survey, (January 2003)

Table C-1 lists the potential hazard events and indicates the potential levels of impact the respondents identified that each hazard event might have on their business.

Table C-1. Potential Impacts

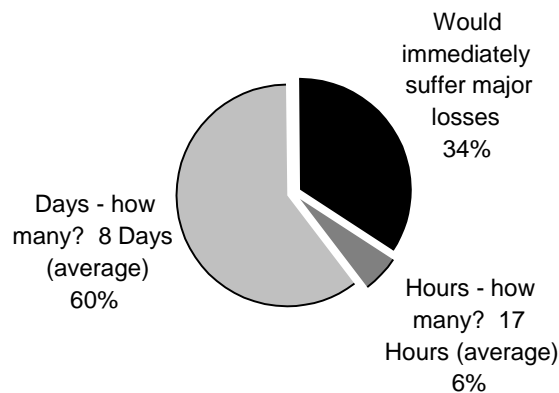
Hazard	Serious	Moderate	Slight	None	No need to address now
Loss of Electricity	53.0%	24.9%	12.8%	4.9%	4.3%
Earthquake	33.3%	31.0%	22.5%	7.3%	5.8%
Loss of Water Supply	26.2%	21.9%	30.9%	14.9%	6.1%
Other	25.0%	2.5%	5.0%	32.5%	35.0%
Severe Winter Storm	19.1%	32.4%	30.0%	13.2%	5.3%
Hazardous Materials Accident	18.1%	18.4%	27.0%	26.4%	10.1%
Flooding	17.6%	19.1%	27.1%	29.1%	7.1%
Volcanic Eruption	17.4%	12.6%	28.1%	28.1%	13.8%
Wind damage	12.0%	26.3%	40.9%	14.9%	5.8%
Wildfire	11.0%	8.1%	26.6%	41.2%	13.1%
Landslide / Debris Flow	8.3%	8.9%	26.8%	46.1%	9.8%
Air or Train Accidents	7.4%	8.6%	26.8%	44.8%	12.4%
Drought	5.4%	9.9%	24.0%	50.5%	10.2%
Dust Storm	5.3%	8.8%	28.3%	44.2%	13.3%

Source: ONHW/CPW, Beaverton Business Perception Survey, (January 2003)

Business Closure

The survey asked respondents to indicate how long they could afford to close their business without suffering major financial loss. The majority of respondents (60%) indicated that they could be closed for a period of days with eight days being the average number of days they could afford to be closed. Thirty-four percent of respondents indicated that they would immediately suffer major losses, while 6% indicated that they would suffer losses within hours. The average number of hours before significant losses was 17 hours. Figure C-2 illustrates the percentage of respondents who would suffer loss immediately, within hours, or within days

Figure C-2. Length of time before suffering major financial losses

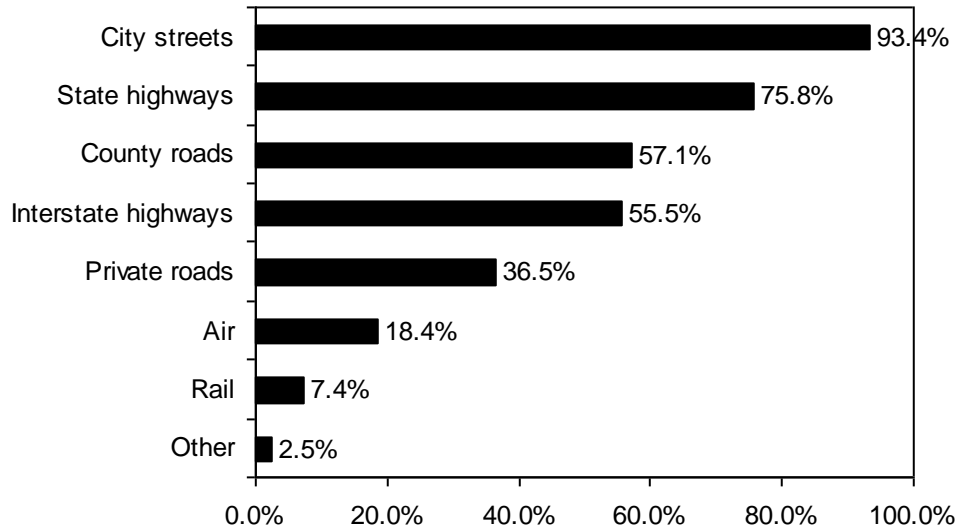


Source: ONHW/CPW, Beaverton Business Perception Survey, (January 2003)

Transportation Systems

Respondents were asked to indicate all of the segments of the transportation system their business relies on. The most used means of transportation included: city streets (93%), state highways (76%), and county roads (57%). Figure C-3 illustrates the percentage of respondents whose business relies on the segments of the transportation system.

Figure C-3. Transportation System

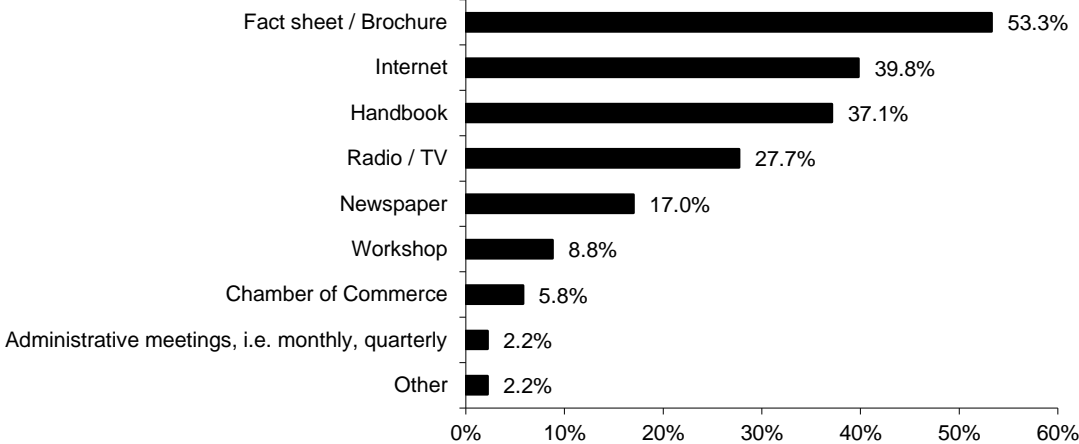


Source: ONHW/CPW, Beaverton Business Perception Survey, (January 2003)

Effective Information Formats

The survey also asked respondents to indicate their preferred format for receiving information about mitigation and preparedness activities. Just over half the respondents, 53% indicated that fact sheets or brochures were effective means of receiving information. The Internet (40%) and handbooks (37%) were the second and third selected formats. "Other" responses included mailings and newsletters. Figure C-4 illustrates the respondent's preferred formats for receiving information.

Figure C-4. Effective Information Formats [eliminate white space; % axis title]



Source: ONHW/CPW, Beaverton Business Perception Survey, (January 2003)

Preparedness Activities

There are many things a business can do to prepare for a natural disaster or emergency event. Basic services, such as electricity, gas, water, and telephones, may be cut off, or there may be an immediate evacuation. The Business Preparedness Survey asked respondents to provide information that could help inform decision-makers of preparedness activities that are taking place in the business community in Beaverton.

Natural Hazard Event Planning

The survey asked respondents to indicate whether they have done, plan to do, have not done, or are unable to do certain all-hazard preparedness activities. The activity that most businesses have already done was to purchase insurance (54%). Only 10% of respondents have conducted disaster drills or exercises to prepare their employees for a natural hazard event. Table C-2 presents the respondents' responses to this question.

Table C-2. Natural Hazard Event Preparedness Activities

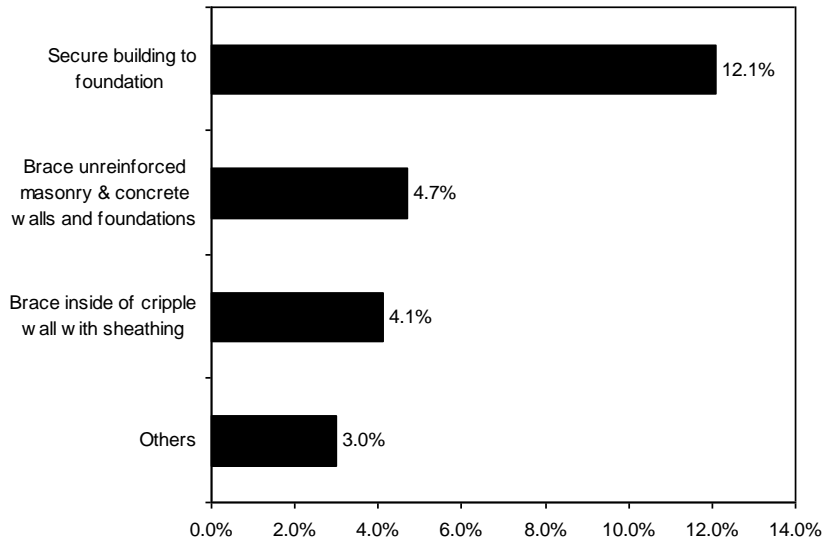
At your business, have you or your employees:	Have Done	Plan To Do	Not Done	Unable To Do	N/A
A. Talked with employees about what to do in case of a natural disaster?	27.9%	12.8%	39.2%	0.3%	19.8%
B. Developed a plan to notify employees?	29.1%	12.6%	34.4%	0.9%	22.9%
C. Purchased insurance for your business? (e.g. flood, earthquake)	54.3%	2.7%	27.6%	3.0%	12.5%
D. Purchased business interruption insurance?	30.1%	5.7%	45.1%	3.3%	15.8%
E. Stored extra fuel, batteries or other emergency supplies?	30.3%	10.2%	45.8%	2.9%	10.8%
F. Developed a business emergency response plan?	20.2%	15.0%	50.7%	0.3%	13.8%
G. Developed a business emergency recovery plan?	14.4%	14.4%	58.7%	0.6%	12.0%
H. Conducted any disaster drills or exercises?	9.6%	9.0%	64.5%	--	16.9%
I. Made arrangements to move the business to another location in case of disaster damage?	10.6%	5.6%	51.3%	14.4%	18.2%

Source: ONHW/CPW, Beaverton Business Perception Survey, (January 2003)

Structural and Non-structural Modifications

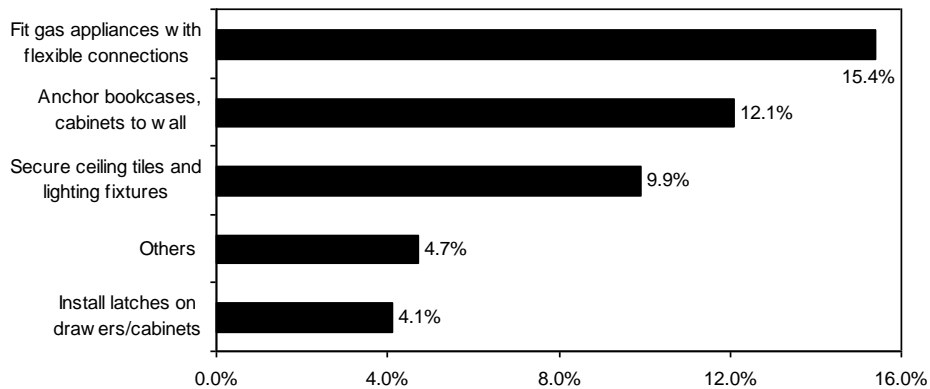
Structural modifications strengthen a structure so it can better withstand the force of an earthquake, while non-structural modifications reduce the potential of loss of building contents.¹ Survey respondents were asked to indicate which structural and non-structural modifications they had made at their business. Twelve percent of respondents indicated that they had secured the building to its foundation. Overall, very few respondents had implemented structural mitigation activities at their businesses. Figures C-5 and C-6 illustrate the structural and non-structural modifications that respondents have undertaken.

Figure C-5. Structural Modifications



Source: ONHW/CPW, Beaverton Business Perception Survey, (January 2003)

Figure C-6. Non-structural Modifications



Source: ONHW/CPW, Beaverton Business Perception Survey, (January 2003)

Essential Business Services

The survey specifically addressed the importance of lifeline services for business operations (See Table C-3). Respondents were asked to rate the level of importance of each critical service for business operations. Five types of service were covered including: electrical power, telecommunications, water, sewage disposal, and natural gas. For each service category, an “other” category was provided to capture answers that were not listed in the questionnaire.

Table C-3 illustrates the level of importance of certain services for continuity of business operations. Survey respondents indicated that electricity (71%) and phone/internet (58%) were the most important critical services to their businesses. Respondents indicated that natural gas was the least important of the services listed.

Table C-3. Essential Business Services

Service	Critical	Very Important	Important	Not Very Important	Not Important At All
Electricity	71.3%	21.1%	5.3%	2.0%	0.3%
Phone/Internet	57.5%	24.1%	13.3%	2.8%	2.3%
Transportation, e.g. roads, rail	30.4%	27.5%	26.0%	11.1%	5.0%
Water	29.5%	25.5%	22.4%	19.8%	2.8%
Sewer and waste water treatment	23.1%	25.9%	30.5%	15.0%	5.5%
Postal	19.6%	27.7%	32.3%	16.7%	3.7%
Natural gas	18.7%	21.3%	26.1%	15.2%	18.7%

Source: ONHW/CPW, Beaverton Business Perception Survey, (January 2003)

Electrical Power

The survey asked respondents how important electrical services is for four basic business operations: computers/cash registers; machinery; lights/office; and heating/ventilation/air conditioning.

- 46% of survey respondents considered electricity critical to power computers and cash registers.
- 43% indicated that electricity was critical for powering lights and the office.
- 19% of respondents noted that electricity to power machinery was not very important.

The “other” responses for this category indicated that electricity was also important for refrigeration and dental equipment.

Telecommunications

Telecommunications in the form of telephones, fax machines, computer modems, and credit card machines are important to many businesses.

- 82% of respondents indicated that phones were either critical or very important for telecommunication.
- 41% indicated that computers and modems were critical to telecommunications as well.

The “other” responses for this category indicated that telecommunications was also important for cell phones.

Water

Water for drinking, cooking, bathroom and sanitary use, industrial use, and HVAC systems, is considered a critical service for many survey respondents.

- 58% of respondents do not use water for industrial use.
- 67% indicated that water for drinking or cooking was important, very important or critical.
- 89% of respondents indicated that water for bathrooms and sanitary use was important, very important or critical.

The “other responses for this category indicated that water was also important for dental use and making ice.

Sewage Disposal

For the purpose of this survey, two uses of sewage disposal were identified: bathrooms – sanitary and industrial wastewater.

- 33% of respondents considered bathroom use and sanitary sewers as critical to business operations.
- 62% indicated that sewage disposal was not used for industrial wastewater purposes.

No “other” responses were provided for this category.

Natural Gas

Natural gas is used in industrial processes and HVAC systems for many businesses.

- Nearly 70% of respondents indicated that they did not use natural gas for industrial processes.
- 62% of respondents considered natural gas for heating, ventilation, or air conditioning either important, very important, or critical.

The “other” responses for this category indicated that natural gas was also important in cooking, powering water heaters and powering generators.

Essential Business Mitigation Activities

The survey asked respondents to identify how important various mitigation activities would be to their business and to gauge their level of preparedness.

Survey respondents evaluated the potential importance of specific mitigation activities for their business by rating the activities as very useful, somewhat useful, not useful, or already addressed. Five categories of mitigation activities were listed in the questionnaire including: facility and road access; data and equipment; utilities; businesses helping businesses; training and public outreach; risk reduction incentives, and community wide activities.

Facility and Road Access

Table C-4 indicates how respondents rated potential activities, and also shows whether a particular mitigation activity is considered not useful (“very” and “somewhat” useful) or has already been addressed. Both

activities (Activities 1: Road access issues and debris removal and 2: Alternate route availability) were considered very useful by between 57% and 46% of survey respondents. The activities had only been addressed by approximately 2.5% of the respondents.

Table C-4. Respondent Rating of Facility and Road Access Mitigation Activities (Numbered as Noted on Survey)

Activity	Very Useful	Somewhat Useful	Not Useful	Already Addressed
1 Road access issues and debris removal	56.8%	30.9%	10.0%	2.4%
2 Alternate route availability	45.8%	40.7%	10.8%	2.7%

Source: ONHW/CPW, Beaverton Business Perception Survey, (January 2003)

Data and Equipment

Table C-5 shows which data and equipment related mitigation activities respondents considered to be either useful (“very” and “somewhat” useful) or not useful. Half of the respondents considered protecting data and equipment (Activity 3) a very useful mitigation activity, while 40% indicated that the retrieval of critical data (Activity 4) was very useful.

Table C-5. Respondent Ratings of Data and Equipment Mitigation Activities (Numbered as Noted on Survey)

Activity	Very Useful	Somewhat Useful	Not Useful	Already Addressed
3 Data and equipment protection	50.0%	28.5%	16.4%	5.2%
4 Retrieval of critical data from storage	40.1%	31.8%	22.3%	5.8%

Source: ONHW/CPW, Beaverton Business Perception Survey, (January 2003)

Utilities

Table C-6 shows which utility-related mitigation activities survey respondents considered to be very useful and somewhat useful. Back-up power sources (Activity 6) were considered the most potentially useful activity at 91%, followed by forming single points of contact to report utility failure (Activity 7) (88%) and making information “one phone call away” for businesses (Activity 5) (87%). A very small percentage, between two and five percent had already addressed these issues.

TableC-6. Respondent Ratings of Utility Mitigation Activities

Activity	Very Useful	Somewhat Useful	Not Useful	Already Addressed
5 Making information “one phone call away” for businesses	45.0%	41.5%	11.0%	2.5%
6 Back-up sources of power	56.5%	34.8%	6.6%	2.1%
7 Single point of contact for reporting any utility failures	49.1%	39.0%	10.4%	1.5%
8 Alternate communications	38.2%	46.8%	11.4%	3.7%
9 Alternate shipping/transportation	16.4%	42.3%	36.3%	4.7%
10 Wastewater treatment	19.6%	41.4%	33.6%	4.7%
11 Water supply	41.7%	43.5%	10.5%	3.6%

Source: ONHW/CPW, Beaverton Business Perception Survey, (January 2003)

Businesses Helping Businesses

Businesses helping businesses refers to reaching out and forming partnerships before a disaster strikes and mutually increasing business resilience after a disaster. Table C-7 shows that over 76% of respondents considered developing a central contact office to quickly disseminate information as potentially beneficial (Activity 18). Approximately half (51%) of respondents indicated that mentoring programs between more and less prepared businesses (Activity 14) was useful and 50% indicated that availability of food vendors to supply large facilities, which could in turn host smaller businesses (Activity 16) was not a useful mitigation activity. Only about two percent of respondents have implemented any of the activities listed in this category.

Table C-7. Respondent Ratings of Businesses Helping Businesses Mitigation Activities

Activity	Very Useful	Somewhat Useful	Not Useful	Already Addressed
12 Share resources among businesses in an emergency situation	32.8%	42.1%	22.6%	2.2%
13 Work with "like" businesses on mitigation projects	19.5%	41.2%	36.5%	2.5%
14 Mentoring program between more and less prepared businesses	11.2%	39.4%	46.5%	2.6%
15 Mutual aid networks for emergency shelter and food	22.8%	44.6%	30.1%	2.2%
16 Food vendors able to supply large facilities, which could in turn host smaller businesses	13.1%	33.3%	50.3%	2.9%
17 Developing a plan for direct notification to vulnerable businesses	18.8%	44.4%	33.5%	2.9%
18 Developing a central contact office to quickly disseminate information	34.2%	42.0%	21.0%	2.5%

Source: ONHW/CPW, Beaverton Business Perception Survey, (January 2003)

Training and Public Outreach

Table C-8 indicates that planning and publicizing alternate commute routes was considered to be either very or somewhat useful, at 75%. The activity with the highest percentage of not useful responses was alternate schools/day care sites so employees can leave home for work. Less than two percent of respondents had implemented any of the training and public outreach mitigation activities.

Table C-8. Respondent Ratings of Training and Public Outreach Mitigation Activities

Activity	Very Useful	Somewhat Useful	Not Useful	Already Addressed
19 Need for communication with City of Beaverton Emergency Management Office	27.1%	46.7%	24.6%	1.2%
20 Planning and publicizing alternate commute routes	31.6%	43.8%	23.1%	1.3%
21 Alternate schools/day care sites so employees can leave home for work	13.1%	38.2%	47.5%	1.0%
22 Help employees make plans to protect themselves and their home	19.2%	51.7%	27.1%	1.6%
23 Develop a website for business & community to report damages and recovery after a disaster	25.3%	46.2%	27.5%	0.6%

Source: ONHW/CPW, Beaverton Business Perception Survey, (January 2003)

Risk Reduction Incentives

Three quarters of respondents, 75%, indicated that information emphasizing disaster preparedness and recovery as part of business operations would be either very or somewhat useful. Seventy-four percent of respondents considered expediting the permit process for mitigation projects to be useful, and 69% considered loans and grants for structural mitigation useful mitigation activities. Very few respondents had implemented any of the mitigation activities in this category.

Table C-9. Respondent Ratings of Risk Reduction Incentives

Activity	Very Useful	Somewhat Useful	Not Useful	Already Addressed
24 Loans and grants for structural retrofits and other disaster preparedness measures	29.3%	39.5%	29.9%	1.3%
25. Expedite permit process for mitigation projects	37.3%	36.4%	25.3%	1.0%
26 Information that emphasizes disaster preparedness and recovery as part of business operations	27.3%	47.4%	24.0%	1.3%

Source: ONHW/CPW, Beaverton Business Perception Survey, (January 2003)

Community-wide Activities

Respondents were asked to rate the usefulness of certain community-wide mitigation activities as well as activities that they could implement themselves. Respondents considered the most useful activity (either very or somewhat useful) to be cooperation among agencies, citizens, non-profit organizations, business and industry (80%). Fifty-nine percent of respondents indicated that the use of local tax dollars to reduce risk was either very or somewhat beneficial. The use of federal and/or local tax dollars to compensate land owners for not developing in areas subject of natural hazards was considered by 47% of respondents to be not useful.

Table C-10. Respondent Ratings of Community-wide Mitigation Activities

Activity	Very Useful	Somewhat Useful	Not Useful	Already Addressed
27 Regulatory approaches for reducing risk (e.g. policies limiting development in hazard areas)	23.3%	46.0%	29.4%	1.0%
28 Non-regulatory approaches to reducing risk (e.g. site specific mitigation activities)	14.3%	55.5%	28.6%	1.3%
29 Mix of regulatory and non-regulatory approaches to reducing risk	17.3%	51.5%	30.2%	0.7%
30 Use of federal and/or local tax dollars to compensate land owners for not developing in areas subject to natural hazards	16.4%	35.5%	46.5%	1.3%
31 Use of local tax dollars to reduce risk	13.3%	45.5%	39.5%	1.3%
32 Cooperation among agencies, citizens, non-profit organizations, business and industry	32.1%	47.5%	19.0%	1.0%
33 Inventories of at-risk buildings and infrastructure	23.1%	42.9%	32.7%	1.0%

Source: ONHW/CPW, Beaverton Business Perception Survey, (January 2003)

Appendix C Endnotes

¹ Institute for Business and Home Safety.1999. Is Your Home Protected From Earthquake Disaster?