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Introduction

The Northridge earthquake of January 17, 1994 killed 57 people and injured an estimated 10,000. When all the claims are finally processed, the costs of repairing earthquake damage and providing relief to victims will probably exceed \$30 billion, including \$12-15 billion in insured losses, making that event the most costly disaster in U. S. history. The number of households and businesses that suffered losses in the Northridge earthquake far exceeded the size of the victim population in other recent major disasters in the U. S., including Hurricane Hugo in 1989 and Hurricane Andrew in 1992. The assistance effort launched after the earthquake was the largest ever undertaken for a U. S. disaster. Applications to the Federal Emergency Management Agency for various forms of housing assistance totaled well over half a million. In the year following the earthquake, over 50,000 businesses applied to the U. S. Small Business Administration for disaster loans, and over \$1.3 billion in loans had been paid out.

This paper focuses on the immediate and longer-term impacts the earthquake had on businesses in the Greater Los Angeles region. The data reported here are based on a survey that the Disaster Research Center conducted with a representative, randomly-selected sample of businesses in the cities of Los Angeles and Santa Monica,

two jurisdictions that were particularly hard-hit in the earthquake. The paper discusses the direct impacts and losses businesses experienced in the earthquake; the ways in which the disaster affected the operations of the businesses studied, including patterns of business interruption; earthquake preparedness measures undertaken by businesses, both prior to and after the disaster; and business recovery one-and-a-half years after the event.

Background

The literature in the field of disaster research has concentrated largely on documenting the ways in which disasters affect individuals, households, communities, and public sector organizations such as fire and police departments and local emergency management agencies. Very little work has looked at how private sector entities prepare for, respond to, and recover from disasters. Studies on businesses have generally been descriptive, using data from single cases or a small number of firms, rather than large-scale surveys, and employing purposive or convenience samples, rather than systematically selected ones. More systematic studies have still tended to focus on particular kinds of organizations, such as chemical manufacturers (Quarantelli, et al., 1979; Gabor, 1981), organizations belonging to local emergency planning committees for chemical disasters (Solyst and St. Amand, 1991; 1993; Lindell, 1994), or tourism-oriented firms (Drabek, 1991; 1994a; 1994b), rather than on the entire range of business enterprises.

Recently, however, studies on business disaster preparedness and response have been expanding in both number and scope. Mileti, et al., (1993) studied the adoption of earthquake preparedness measures among a sample of 54 businesses in eight Northern California counties as part of a larger study on how the communication of earthquake risk information affects preparedness behavior. Durkin (1984) and French, et al. (1984) focused on problems businesses experienced after the 1983 Coalinga earthquake. Kroll, et al. (1991) analyzed the short-term impacts of the Loma Prieta earthquake on businesses in Oakland and Santa Cruz, California. Gordon and Richardson (1995) and Boarnet (1995), whose work will be discussed in more detail later, studied the business interruption effects of the Northridge earthquake. Alesch, et al. (1993) analyzed problems of small businesses, which they identify as especially vulnerable to disasters.

In the past few years, the Disaster Research Center has conducted a series of studies on business disaster preparedness, response, and recovery. Dahlhamer (1992) identified factors that affected SBA loan decision-making for business applicants from four cities that were affected by the 1987 Whittier Narrows Earthquake. Recent projects have focused on earthquake vulnerability and business earthquake preparedness in Memphis and Shelby County, Tennessee and on the business impacts of the 1993 Midwest floods. These projects have resulted in publications and papers on business disaster preparedness (Dahlhamer and D'Souza, forthcoming, 1996); physical damage, lifeline loss, and business interruption resulting

from the Midwest floods (Tierney, Nigg, and Dahlhamer, forthcoming, 1996; Tierney, 1995); and business vulnerability to disaster-induced lifeline service interruption (Nigg, 1995; Tierney and Nigg, 1995).

Study Methodology

The current study on businesses in the Northridge earthquake, which continues that line of research, is one of the largest studies conducted to date on how disasters affect businesses. The Northridge survey employed a three-stage sampling methodology in which the stratifying variables were Modified Mercalli shaking intensity (MMI), business type, and business size. The sampling universe included all businesses in the cities of Los Angeles and Santa Monica. Los Angeles, by far the largest city in the impact region, accounted for a very high proportion of the losses that occurred in the earthquake. Santa Monica, located west of Los Angeles on the Pacific coast, is another jurisdiction that sustained particularly high damage.

In the first stage of the sampling design, businesses in those cities were classified into high (MMI VIII and IX) and low (MMI VI and VII) shaking intensity zones, based on shaking intensities recorded for the zip codes in which the businesses were located.¹ Businesses were then aggregated by Standard Industrial Codes into five major sectors: wholesale and retail sales; manufacturing, construction, and contracting; business and professional services;

¹ Shaking intensity measures were provided by the Governor's Office of Emergency Services and EQE, Inc. of Irvine, CA.

finance, insurance, and real estate (FIRE); and "other" businesses, which included firms involved in agriculture, forestry and fishing, mining, transportation, and communications. In the final stage of sampling, businesses were randomly selected from among small (fewer than twenty employees) and large (twenty or more employees) firms in each sector.

The data were collected through a mail survey, using a modified version of Dillman's total design method (1978). Mailings were begun in May, 1995, sixteen months after the earthquake. The initial mailing of questionnaires was followed up by telephone calls to business owners after a reasonable amount of time for questionnaire completion had passed. The initial sample size for the Northridge survey was 4,752, which included both Los Angeles and Santa Monica businesses. Of this number, 1,110 completed questionnaires were returned, for a response rate of just over 23%.

The mail survey contained items on the following topics: (1) business characteristics, including the age of the business, length of time under current ownership, whether the firm owns or leases the business property, the construction type and age of the building housing the business, and the current number of employees; (2) the nature and extent of the physical damage (including structural and nonstructural damage and damage to contents and inventory) the business sustained as a result of the earthquake; (3) the extent and duration of earthquake induced lifeline service (electricity, phone, water, natural gas, and waste water treatment) interruptions; (4) business closure, including why businesses were

forced to close and how closure affected the business financially; (5) business relocation, including why the business moved and satisfaction with the new business location; (6) use of and satisfaction with insurance and governmental disaster assistance programs, including the SBA loan program; (7) disaster preparedness measures that were carried out at the business both before the earthquake occurred and following the earthquake; and (8) owners' assessments of the current state of their business operations, compared to how well the business had been doing prior to the earthquake. After briefly characterizing the sample, the remainder of the paper presents selected findings on direct earthquake impacts, business interruption, preparedness levels prior to and after the earthquake, and the extent of business recovery.

The Northridge Sample

General information on the Northridge sample is included in Table 1. Because the vast majority of businesses are small ones, the sample was stratified to ensure that a sufficient number of large businesses were surveyed. The mean number of employees for businesses in the sample was just under 21, but the median was only 6--indicating that the small businesses in our sample were really quite small. Reflecting the Los Angeles area and the economy in the U. S. generally, service firms were the largest group surveyed, accounting for just over one-third of the sample. Businesses in the wholesale and retail trade sector were the next largest group (25%), followed by manufacturing and construction (about 14%) the FIRE sector (about 13%) and "other" businesses (12%). Overall, the

businesses in the sample had substantial tenure in the community, with a median age of about fifteen years.

Businesses that lease their space, as opposed to owning the building in which they are housed, typically have a lower financial investment in the business property and may be less able than building owners to undertake mitigation and preparedness measures. In the Northridge sample, just over 72% of the businesses leased, rather than owned, their business property. Other things being equal, businesses with multiple locations, including businesses that are part of chains, are probably in a better position to spread their risks and to cope with problems if disaster strikes, while firms that do business in a single location risk their entire investment should disaster strike. Nearly 80% of the sample were in the latter situation.

Physical Damage and Lifeline Disruption

The survey obtained information on both direct physical damage to the business property and the disruption of utility services at the business site. With respect to physical damage, as shown in Table 2, about 57% of the businesses suffered some degree of physical damage in the earthquake. This percentage represents a very large number when extrapolated to businesses in the study area, indicating that the impact of the earthquake was very widespread. The most common type of physical damage reported was damage to non-structural elements in the building, such as windows, overhead light fixtures, and office partitions; almost 70% of businesses with damage indicated the damage was non-structural.

Also common were damage to furnishings (about 56%), equipment (about 51%), and stock or inventory at the business (about 50%). In approximately 39% of the cases, the building housing the business sustained structural damage.

To assess the severity of building damage, we asked whether the building in which the business was located was inspected by building officials and assigned either a red tag, indicating that the building was rendered so unsafe by the earthquake that it could not be entered,² or a yellow-tag, indicating damage severe enough to warrant restricted entry. Just over 13% of the businesses in the sample reported that their buildings had been red- or yellow-tagged. (Of this number, three-quarters were yellow-tagged.) Thus, in about one-third of the cases involving structural damage to the building, that damage was severe enough to render the building unsafe for occupancy.

The median dollar loss to businesses due to physical damage was \$5,000.00 overall; the largest dollar losses were reported by large manufacturing and construction firms and large firms in the FIRE sector. These relatively low median dollar losses for physical damage probably reflect several factors. First, minor damage was very widespread. Second, like the business population as a whole, the businesses in the sample tended to be quite small; this suggests that most businesses didn't have great deal of costly

² Red-tagged buildings are typically condemned and slated for demolition. Twenty-one businesses in our sample, or about 2% of the total, were in buildings that were red-tagged following the earthquake. Five business properties had been inspected more than once and given red and yellow tags at different times.

inventory on hand. And as noted earlier, nearly three-quarters of the businesses in the sample leased rather than owned their business space, so their losses were confined to building contents and leasehold improvements.

The mean or average dollar loss from physical damage was \$156,273; this discrepancy between the median and mean loss figures is attributable to the fact that a number of businesses in the sample reported very high physical losses. The highest reported dollar loss from physical damage was \$14,000,000.00. These numbers are, again, quite substantial when extrapolated to businesses in the entire study area.

In addition to producing physical damage, disasters also cause losses through the impacts they have on lifeline services. Even if they remain undamaged, businesses that are left without critical lifelines may be forced to close. In our recent study on the business impacts of the 1993 Midwest floods, which involved businesses in Des Moines, Iowa, we found that the loss of lifelines was a much more widespread source of business interruption than direct physical flood damage (Tierney, 1995; Tierney, Nigg, and Dahlhamer, forthcoming).

Our data on Northridge indicate that the earthquake produced extensive lifeline service interruption (see Table 3). Approximately 60% of all businesses lost electricity, and just over half lost phone service. Nearly one business in five reported losing water services for at least some time following the earthquake. A smaller but still significant number (about 17%)

lost natural gas service. Businesses were least likely to experience problems with sewer and waste water treatment services.

Forty-seven percent of businesses in the sample suffered both physical damage and the loss of at least one utility as a result of the earthquake.

Fortunately for businesses in the impact region, the lifeline services that were most disrupted by the earthquake, electricity and phones, were restored relatively quickly, typically within twenty-four hours. Median restoration times for water and natural gas were about two days; restoring sewage services took an additional day for affected businesses.

Despite the comparatively short time businesses found themselves without utility services, business owners considered lifeline loss to be quite disruptive. For example, of those businesses that lost phones and electricity, nearly 80% and 75%, respectively, considered the loss of those lifelines disruptive or very disruptive to their operations.

Operational Problems and Business Closure

In addition to direct physical impacts and the interruption of critical utility services, disasters cause business losses by affecting productivity in other ways, for example by disrupting customer traffic and causing problems for employees. In the Northridge survey, we asked a series of questions to determine how common various kinds of operational problems were following the earthquake. Again, our data indicate that Los Angeles and Santa Monica businesses experienced a number of other kinds of disruption

(see Table 4). Nearly 60% of businesses reported that their employees were unable to get to work for a time as a result of the earthquake. In about half the cases, the business owner or manager also had to deal with damage to his or her private residence or other properties. Nearly 40% reported a reduction in customer traffic to the business, and nearly one business in four had problems with the delivery of goods and services following the earthquake. A smaller number of respondents reported problems obtaining materials and supplies for the business (16.3%) and paying employees (7.7%).

These kinds of barriers to smooth business operations contribute significantly to the economic toll that earthquakes and other disasters take. Losses escalate when employees cannot come to work or arrive late because of transportation and other problems, when owners must suddenly cope with losses both at home and at the business, when customers cannot purchase goods and services, and when the flow of supplies and materials is disrupted. The more severe and persistent these kinds of problems are, the more businesses are likely to suffer.

The extent to which businesses are forced to close is yet another indicator of disaster severity. Fifty-six percent of the businesses in our sample reported that they were closed or inactive for some period of time as a result of the earthquake. On average, the businesses in the Northridge sample were closed for about two days. In general, small businesses were more likely to close than larger ones; the one exception is large firms in the FIRE sector,

63% of which had to shut down for at least some period of time after the earthquake.

Owners and managers of businesses that closed were asked to indicate the types of damage, operational difficulties, and other problems that led to closure, and they were free to give multiple reasons for closing. As shown in Table 5, responses on this question revealed a range of reasons for closing. Most common, mentioned by nearly two-thirds of respondents, was the need to clean up damage at the business. Loss of electricity (58.7%) and the inability of employees to get to the business (56.4) were the second and third most-frequently mentioned reasons for closing. Other common problems that led to closure included the need to deal with damage at the owner's home (44.4%), loss of customers (about 40%), and the need to have the building structurally assessed because of earthquake damage (about 31%). When asked to select the most important among their various reasons for closing, respondents cited the need to clean up damage, the loss of electricity, too few employees to operate the business, and the need to shut down while waiting to have the building's structural safety assessed.

In a related study, Gordon and Richardson (1995) estimated that approximately 23% of the total losses resulting from the Northridge earthquake were attributable business interruption.³ Our data suggest how and why those losses occurred. Structural and

³ In their analysis, Gordon and Richardson estimated that the losses resulting from the earthquake totaled just over \$26 billion, of which about \$5.9 billion were attributable to business interruption.

non-structural earthquake damage, particularly the need to clean up damage at the business site before resuming operations, contributed significantly to business disruption and closure. A substantial share of business interruption losses were also due not to direct physical damage but rather to lifeline damage and other off-site problems such as disruption of the transportation system, which restricted the movement of goods and supplies, and the inability of employees to come to work.

These findings are generally consistent with Boarnet's recent study on the business impacts of the Northridge earthquake (1995). That study, which was primarily concerned with how damage to the transportation system affected businesses, found that shipping delays to and from business locations in the impact region contributed substantially to business losses, as did the loss of utilities, the need to clean up and repair earthquake damage, and other problems similar to the ones our survey identified. What our study and other research on the Northridge earthquake show clearly is that a business can manage to avoid direct physical damage to its property and yet still experience interruption and losses because of lifeline problems and off-site impacts that affect its operations. Although obviously an important source of business losses, physical damage is only one of many problems businesses must deal with following disasters, and for many firms it may not be the most significant one.

Business Preparedness Before and After the Northridge Event

The survey provided an opportunity to find out about the mitigation and preparedness measures businesses had undertaken prior to the earthquake and the extent to which the earthquake stimulated additional actions to reduce earthquake hazards. Survey respondents were asked whether their businesses had been involved in each of sixteen different preparedness activities before the earthquake, since the earthquake occurred, and at both points in time--that is, both before and again after the earthquake. The sixteen measures encompassed a range of actions, including emergency response and recovery planning and training, efforts to modify the business property and its contents to make them more earthquake-resistant, obtaining resources such as first aid kits and electrical generators for emergency power. Table 6 shows the proportion of businesses in the sample that took those actions either before the earthquake, after the earthquake, or at both points in time.⁴ The measures undertaken most frequently before the earthquake were obtaining first aid supplies (60.5%), learning first aid (48.7%), attending meetings or obtaining preparedness information (38.8%), storing water (35.8%), and talking to employees about earthquake preparedness (35.3%). After the earthquake, the preparedness activities that the greatest percentage of businesses performed were talking to employees about earthquake preparedness (51%), bracing shelves and equipment

⁴ Businesses that reported carrying out preparedness measures both before and after the earthquake were also included in the "before" and "after" groups.

(48.4%), and attending meetings or obtaining earthquake preparedness information (44.4%). Relatively few businesses reported undertaking preparedness measures at both points in time--that is, both before and after the earthquake. Those that did were most likely to attend meetings and receive earthquake information (19.1%) and to talk to their employees about preparedness (18.4%).

Perhaps the most striking thing the data on preparedness reveal is how little businesses had actually done to prepare for earthquakes, either before or since the event. While the proportion of businesses that took particular steps to prepare (for example, bracing shelves and equipment) were relatively high, businesses were very selective about what they did. Although they were concerned about some aspects of preparedness, these businesses evidently weren't addressing preparedness comprehensively. The mean number of preparedness measures that businesses undertook was 3.9 out of a possible 16 prior to the earthquake; that number rose imperceptibly to 4 in the period of time after the earthquake occurred.

Dahlhamer and Reshaur (1996) have begun work to identify the factors that were associated with levels of business preparedness in the Northridge sample. The strongest predictor of preparedness prior to the earthquake was business size; businesses with a larger number of employees were generally better prepared. Older and more financially stable firms were also more likely to engage in preparedness activities prior to the earthquake, as were businesses with previous disaster experience. Businesses in the

manufacturing, service, and FIRE sectors were more likely to prepare prior to the earthquake than were other businesses.

Size of business also had a significant positive effect on preparedness after the earthquake occurred. With respect to business age, younger businesses were more likely than older ones to increase their preparedness levels following the Northridge event. Businesses that had already been preparing before the earthquake struck tended to also do more after the earthquake; in other words, the occurrence of the earthquake provided more of a stimulus to better-prepared firms than to their less-well-prepared counterparts.

Experiencing certain kinds of damage and disruption in the earthquake does seem to have stimulated firms to do more to prepare. The more different types of physical damage businesses experienced in the earthquake, the more likely they were to subsequently step up their preparedness activities. Similarly, the longer businesses were closed as a result of the earthquake, the more likely they were to increase their levels of preparedness.

Business Recovery

To assess the extent to which the earthquake had lasting effects on businesses, owners were asked to indicate whether their businesses were worse off, better off, or about the same as they had been just before the earthquake. As seen in Table 7, 52% of the businesses in the survey rated their well-being as comparable to what it had been before the earthquake. The remaining businesses were about evenly split between those that were worse

off and those that were better off. Small businesses, particularly those in the FIRE sector, were more likely than their larger counterparts to report being worse off; large businesses in the "other" category were more likely to report being better off.

Businesses that were worse off than before the earthquake attributed their problems to the loss of customers and the impact of the recession that had been affecting the region. The most common reason given for business improvement was the stimulus provided by the earthquake itself, but many respondents also pointed to a general upturn in the economy as an important factor in recovery.

We have recently begun conducting analyses to identify the factors that predict business recovery in the Northridge sample. These preliminary analyses suggest that larger firms had a higher probability of recovering than smaller ones. This may be due to the fact that larger firms tended to be better prepared and also tended to be in better financial condition prior to the earthquake.

The more disruptions in their operations businesses experienced following the earthquake--that is, the more they experienced the kinds of problems listed in Table 4--the more likely they were to report that they were worse off at the time of the survey. A somewhat surprising finding is that physical damage and business closure, per se, were not related to recovery.

Interestingly, businesses that were located in areas of high shaking intensity were also less likely to recover. In other words, businesses located in areas where damage and disruption were

widespread had more problems getting back on their feet, suggesting that ecological factors play an important role in the ability of businesses to spring back from disaster. Irrespective of individual levels of damage and disruption, firms had more difficulty if they were located in high-impact, high-damage sections of the community. (For a more detailed discussion on business recovery following Northridge, see Dahlhamer and Tierney, 1996).

Concluding Comments

The damage and disruption that businesses sustained following the Northridge earthquake were quite extensive. Earthquake-induced problems included direct physical damage to structures housing businesses, ranging from relatively minor damage to complete destruction; damage to business inventories and equipment and other types of nonstructural damage; loss of lifeline services; problems with business operations; and forced closure. The data from the Northridge survey suggest that it is important to broaden our conception of disaster-related business vulnerability to encompass both physical damage at the business site and a range of off-site impacts, such as damage to lifelines and disruption of the flow of goods and supplies, that become problematic for business owners in the aftermath of disasters.

Currently, hazard mitigation and disaster preparedness programs for businesses tend to emphasize the need to prevent and deal with direct physical damage. However, as the data from Northridge and other recent events such as the 1993 Midwest floods

show (c.f., Tierney, 1995; Tierney, Nigg, and Dahlhamer, forthcoming), business properties may escape direct damage and yet suffer extensive disruption as a result of other disaster-induced problems, such as lifeline service interruption and the loss of customers. Other research (Gordon and Richardson, 1995, Boarnet, 1995) indicates that a substantial share of the economic losses suffered following the earthquake were incurred because of business interruption, and that utility and transportation disruption are major factors in business closure. Strategies to reduce disaster losses must not only concentrate on making individual firms resistant to disaster impacts; they must also focus on enhancing the resiliency of lifelines, infrastructural systems, and the flow of goods and services generally.

At the time our survey was conducted (one and a half years after the Northridge event), about half the businesses indicated their operations had returned to pre-earthquake levels; about a quarter had failed to recover, while the same proportion were doing better than before the earthquake. In ongoing analyses, we have begun to focus on the factors that are associated with business recovery; further work is planned that will focus specifically on which types of businesses were most likely to decline and to improve following the earthquake.

To provide more detailed information on how businesses cope with disaster-related damage, disruption, and other losses over time, DRC is currently conducting a follow-up study with a subsample of the businesses that were included in the 1995 survey.

In this phase, we have identified a group of approximately 150 businesses that were particularly hard-hit in the earthquake, and we are interviewing owners to learn how well those businesses are currently faring. The interviews should yield additional insights into how long problems of various kinds persist after disasters, what aspects of the recovery process business owners find most challenging, and what can be done to enhance the ability of businesses to avoid disaster losses and to cope with them when they do occur.

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Table 1
Los Angeles Sample Characteristics

Mean Number Employees	20.8
Median Number Employees	6.0
Industrial Sector (Percent)	
Business & Prof. Services	36.2
Wholesale & Retail Trade	25.0
Manufacturing & Construction	13.8
FIRE	12.9
Other	12.1
Median Age of Businesses (Years)	15.0
Percent Leasing Space	72.5
Percent in Single Location	79.7

Table 2
Direct Physical Damage

Percent with Physical Damage	57.2
Of Business with Physical Damage, Percent with	
Structural Damage	38.8
Non-Structural Damage	67.9
Damage to Furnishings	55.9
Damage to Equipment	51.5
Damage to Stock	49.6
Percent Declared Unsafe	13.5
Median Dollar Loss from Physical Damage	\$5,000.00
Mean Dollar Loss From Physical Damage	\$156,273.00

Table 3

Other Earthquake Impacts

Lifeline Disruption: Percent of Businesses that Lost	
Electricity	61.0
Telephones	54.1
Water	19.0
Sewer or Waste Water Treatment	4.4
Natural Gas (Asked Only of Those Using Gas)	16.7
Combined Physical Damage and Disruption of One or More Lifelines	47.0

Table 4

Earthquake-Related Operational Problems

Employees Unable to Get to Work	57.5%
Damage to Owner's Other Property	49.2
Few or No Customers	39.0
Unable to Deliver Products/Services	23.5
Unable to Obtain Needed Materials/Supplies	16.3
Couldn't Afford to Pay Employees	7.7

Table 5
Reasons for Business Closure

Needed to Clean Up Damage	65.2%
Loss of Electricity	58.7
Employees Unable to Get to Work	56.4
Loss of Telephones	49.8
Damage to Owner or Manager's Home	44.4
Few or No Customers	39.9
Building Needed Structural Assessment	31.5
Could Not Deliver Products or Services	24.0
Loss of Machinery or Office Equipment	23.7
Building Needed Repair	23.4
Loss of Inventory or Stock	21.9
Loss of Water	18.2
Could Not Get Supplies or Materials	14.9
Building Declared Unsafe	10.1
Could Not Afford to Pay Employees	9.5
Loss of Natural Gas	8.7
Loss of Sewer or Waste Water	5.3
Other	15.8

Number of Businesses That Closed: 617

Table 6

Preparedness Actions Taken by Businesses
Before and After the Earthquake

	% Before EQ	% After EQ	% Before & After EQ
Attended Meetings/ Received Info.	38.8	44.4	19.1
Talked to Employees About Preparedness	35.3	51.0	18.4
Purchased EQ Insurance	18.2	8.3	3.5
Purchased Business Interruption Insurance	24.3	8.4	3.2
Stored Fuel or Batteries	28.9	32.6	11.5
Learned First Aid	48.7	21.6	10.8
Obtained First Aid Supplies	60.5	33.5	15.0
Developed Business Emergency Plan	29.1	30.5	9.7
Developed Business Recovery Plan	13.5	16.0	3.9
Conducted EQ Drills	16.7	19.0	7.3
Involved in EQ Prep. or Response Training for Employees	18.2	19.5	7.2
Arranged to Move Business to Other Location	5.2	8.1	1.8
Obtained Generator	13.1	7.2	2.4
Braced Shelves and Equipment	25.8	48.4	9.1
Stored Water	35.8	32.3	12.3
Had Building Structurally Assessed	13.7	33.9	6.3

Table 7

Present State of Business by Sector and Size (Los Angeles)

Sector and Size of Business	Worse Off	Better Off	Same
Wholesale and Retail Trade:			
Small (N=202)	32.7% 18.9	22.8%	44.6%
Large (N=53)		22.6	58.5
Manufacturing and Construction:			
Small (N=35)	14.3	25.7	60.0
Large (N=74)	13.5	24.3	62.2
Business and Professional Services:			
Small (N=322)	24.5	21.7	53.7
Large (N=57)	7.0	22.8	70.2
Finance, Insurance, and Real Estate:			
Small (N=80)	35.0	23.8	41.3
Large (N=46)	26.1	28.3	45.7
Other:			
Small (N=83)	19.3	24.1	56.6
Large (N=74)	13.5	41.9	54.6
All Businesses: (N=1073)	23.1	24.4	52.5