

Natural Hazards Observer

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## The Impact of Project Impact on the Nisqually Earthquake

*--an invited comment*

On February 28, a magnitude 6.8 earthquake occurred 32 miles below the Nisqually wetland north of Olympia, the Washington state capitol. Ironically, the quake occurred as the Seattle Project Impact Steering Committee was preparing to celebrate the initiative's third anniversary with several hundred of its partners. Had the quake occurred one hour later, all of the region's emergency managers would have been gathered at the Phinney Ridge Neighborhood Center in Seattle. Instead, committee members and a few early birds guided children from the center's two daycare programs to safety.

Members of the response and recovery community were not fully tested by the earthquake, largely because it was deep and drought conditions in the Puget Sound region reduced the number of landslides and amount of liquefaction that would normally be caused by a quake of that magnitude. There was only one significant aftershock and few secondary impacts (one fire and several major landslides). However, the quake did interrupt business operations and damaged numerous building components, such as chimneys, facades, water pipes, and equipment.

Many historic, commercial, and manufacturing facilities were damaged, including key government structures such as the state legislative building and the regional airport control tower. Additional damage is being uncovered as engineering teams complete their inspections, although structural losses (i.e., damage to components essential to a building's structural integrity) will undoubtedly be a fraction of non-structural losses (i.e., damage to nonessential building structural elements, such as architectural features and heating and electrical systems, and losses due to lost productivity, etc.).

What effect did the Federal Emergency Management Agency's Project Impact have, if any, in reducing damage from the Nisqually earthquake? In short, the program has transformed the way residents deal with disasters and established an organizational structure that takes advantage of this change.

Project Impact has the broad goal of reducing risks by changing the way communities think about and deal with disasters. More importantly, it asks communities to be farsighted, to assess hazards rather than just respond to them, to protect themselves, and to become disaster-resistant.

The program is based on three simple principles:

- Preventive actions must be decided at the local level and must be responsive to local hazards.
- Private sector participation is vital.
- Long-term efforts and investments in prevention are essential.

The Seattle/Tacoma metropolitan area, which includes King, Pierce, and Kitsap counties, has been heavily involved in Project Impact, and Seattle is a pilot participant in the program. It is useful to examine Project Impact's effectiveness by assessing how well its stated goals were met in the context of the Nisqually earthquake.

### **Change in the Way We Think About and Deal with Disasters**

Perhaps the most significant (and most difficult to measure) effect the initiative had is in demystifying and personalizing earthquake risk reduction for thousands of individuals, small businesses, and corporate partners.

### **Preventive Actions Must be Decided at the Local Level**

The Seattle and King, Pierce, and Kitsap County Project Impact programs were essentially collective actions taken by hundreds of partners. Seven programs can be linked directly to Project Impact, including efforts in home and school retrofitting, hazard mapping, transportation corridor vulnerability mitigation, office and home nonstructural retrofitting, and small business resumption planning. It is too early to assess the full impact of these programs; however, here are some very early conclusions. (For a description of individual programs, see the FEMA web site: <http://www.fema.gov/impact>.)

- The most significant benefit of Project Impact might be the reduction (or minimalization) of structural damage in retrofitted buildings.
- Project Impact decommissioned very heavy and hazardous water tanks located in the attics of seven Seattle schools, and one of these schools was damaged significantly by the quake. Had the water tank been in use, the building would have suffered even more damage, and the ceilings above several classrooms most likely would have failed. The school program also included extensive nonstructural retrofitting. No losses were reported in participating schools, and, more importantly, evacuation was not impeded. Other schools were not so fortunate.
- Over 1,000 homeowners attended home retrofitting workshops, and over 300 had retrofitted their homes before the quake. None of these retrofitted residences were damaged.
- Each of the four Project Impact jurisdictions had implemented long-range transportation corridor and hazard mapping programs. Information generated through these programs is greatly aiding the inspection process and helping to jump-start discussion on mitigation alternatives. In addition, these projects brought together public road managers who created "tool kits" for contingency routing that will be useful in other kinds of disasters. The quake elevated the priority of these initiatives and funding is expected.

### **Private Sector Participation is Vital**

- All four Project Impact jurisdictions and their private sector partners had developed aggressive business resumption programs. Over 100 large businesses and more than 500 small businesses were involved in Project Impact, and tens of thousands of earthquake safety products were in their offices. Business hazard reduction programs had been created by partners such as Washington Mutual, Bank of America, PEMCO, SAFECO, the Boeing Company, Bartell, the Russell Corporation, the King County Labor Council, and Home Depot, and early indications are that employees of these partners had implemented earthquake safety measures in their homes as well.
- Project Impact communities and their partners ambitiously pursued risk-reduction outreach prior to the earthquake. Home Depot stores displayed home retrofitting techniques. Grocery and drug stores displayed earthquake safety products. Informational flyers accompanied utility bills, paychecks, and insurance renewal forms. A computer tie-down campaign attracted funding partners and garnered donations of computer tie-downs for area schools. The Project Impact logo was prominently displayed along with the message "Creating Disaster Resistant Communities" during hundreds of newscasts.

### **Effects Not Directly Related to Specific Programs**

- During and immediately following the earthquake, participating news organizations provided a consistent message about the earthquake hazard and described methods for preventing damage. Since its inception, Project Impact has worked regularly with the press, and the ABC and CBS local affiliates are formal Project Impact partners.
- Shortly after the quake, homeowners were able to obtain lists of area contractors trained in seismic retrofitting. This information is particularly useful immediately after a disaster, when unscrupulous contractors can prey on disaster victims.

## **Long-Term Efforts and Investments in Prevention are Essential**

Research is currently underway to assess the more indirect long-term impacts of the Nisqually quake. FEMA and the University of Washington have established a clearinghouse to facilitate research, but an examination of efforts that are directly attributable to Project Impact indicates that Puget Sound residents are accepting responsibility for their hazard vulnerability and focusing on protecting themselves. Here are three examples:

- "SecureIt" was a Pierce and King County Project Impact program; however, all four project participant areas have noted increased availability of computer tie-downs and other office-related items that were difficult to obtain when the programs began. Following the earthquake, every contacted vendor saw a very dramatic increase in orders for these products.
- Home retrofitting activities have increased substantially. Roger Faris of the Phinney Ridge Neighborhood Center Home Improvement program indicated that the program cannot keep up with the demand for the Project Impact home retrofitting course. Before the quake, he scheduled one course per month with 20 to 30 attendees. He has now scheduled four per month with 60 participants per class. Similarly, private contractors cannot keep up with the substantially increased demand for retrofitting services. Homeowners are having difficulty hiring the 60 contractors who have taken the University of Washington (a Project Impact Partner) earthquake retrofitting course. Moreover, due to increased interest among contractors, additional courses have been scheduled.
- The Project Impact coordinator for the Seattle school district received the following comment by a school principal:

Just wanted to let you know the good news on how well the building did during the earthquake-- and a big thanks for the retrofitting. We did not even have a single light cover come down, a computer fall over, a book come off a shelf. Now, ... how do we get more straps to do the new things we have installed since retrofitting was done here? Thank you. You made believers out of us!

### **Performance Measures**

Were there fewer property losses, lower costs for repairs, and less time lost from productive activity as a result of Project Impact? It depends on how one measures the costs of repairing a school that did not decommission a water tank to prevent damage, the injuries or deaths of children in classrooms directly under such a tank, the loss of homes that were not retrofitted, and the closure of firms that had not implemented business resumption measures. Whatever the savings, it looks like we will be even better prepared when the next quake occurs, and isn't that, after all, the goal of Project Impact?

**Robert Freitag, Director, Institute for Hazard Mitigation Planning and Research,  
University of Washington**

For more information on the earthquake in Seattle, view the Clearinghouse on the Nisqually Earthquake web site: <http://maximus.ce.washington.edu/~nisqually>.

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## Project Impact News

### Project Impact Communities Unite

At the Federal Emergency Management Agency (FEMA) Project Impact Summit last November, representatives from over 100 communities involved in this national program to curb disaster losses established a "Disaster Resistant Communities Association (DRCA)." The Project Impact coordinators from these communities work to create local programs that mobilize public-private partnerships to reduce losses due to earthquakes, floods, storms, and other disasters.

The DRCA's goals are to ensure that Project Impact becomes a sustainable effort; to strengthen the project nationally and locally; to share experiences among, learn from, and aid one another; to create a forum in which the collective voice of Project Impact communities can be heard; and to build bridges to other organizations that share Project Impact goals.

The DRCA's interim web site is <http://www.hazmit.net/PIAssoc/PIHome.htm>. To be added to the group's mailing list or to request more information about DRCA, contact *Ann Patton, City of Tulsa Project Impact Coordinator, City of Tulsa Public Works, City Hall, Tulsa, OK 74103; (918)596-7808; fax: (918) 596-7265; e-mail: [projectimpact@ci.tulsa.ok.us](mailto:projectimpact@ci.tulsa.ok.us)*.

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### FEMA Plans Project Impact "Make an Impact" Week

FEMA's Project Impact "Make an Impact" Week is a national campaign encouraging regional and local Project Impact representatives to conduct media outreach in their communities. Make an Impact Week will be conducted May 20-26 with the theme "Planting the Seeds of Prevention."

FEMA is inviting all communities participating in Project Impact to work with the agency to contact local print, radio, and TV outlets and actively work to make local citizens more aware of the hazards they face and the steps they can take to avoid them. More information about Make an Impact Week is available from the Project Impact web site: <http://www.fema.gov/impact>.

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## An Open Letter to the Natural Hazards Community

Dear Readers,

Below is an advertisement soliciting applications to be Director of the Natural Hazards Research and Applications Information Center. Please know that I am NOT leaving the center.

From its inception over a quarter century ago, only one of the University of Colorado's faculty, the center's director--first Gilbert White, then Bill Travis (Riebsame), and, for the last eight years, me--has formally participated in the center. When I became the director, I was committed to generating more faculty participation in the center without increasing our operating costs. There is now an opportunity to significantly further that goal.

The faculty of the Department of Sociology at the University of Colorado has voted unanimously to make environmental sociology--with a track in hazards--an area of specialization. Two new assistant professors have already been hired--Lori Hunter and David Pellow--who have a committed interest in risk and hazard-related topics. Additionally, Barbara Farhar from the Department of Energy will join us next academic year. Moreover, the University's central administration has agreed to let the department hire a new faculty member, at the full professor level, to replace me as director of the Natural Hazards Center if I remain as chair for another term.

I will remain a permanent fixture at the Natural Hazards Center when the new director is hired and will work with that person in whatever capacity is most appropriate to further the center's mission.

One final word--directing the Natural Hazards Center here at the University of Colorado is the best job in the country for a social scientist interested in hazards. Please read the job description below, and if you are interested and a hazards sociologist, be sure to apply.

**Dennis S. Mileti, Director, Natural Hazards Research and Applications Information Center, University of Colorado**

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Response to FREITAG article by the Bush administration, (November 2001).

*A Letter to the Editor*

## **Project Impact is Only One Step in a Long Process**

What saved Seattle during the February 28, 2001, Nisqually earthquake? About 30 miles of dirt and rock, a bit of luck, a decades-long practice of building code adoption and enforcement, and significant community involvement.

While the 1994 Northridge, California, and 2001 Nisqually, Washington, earthquakes had similar magnitudes (6.7 and 6.8, respectively), the greater depth of the Washington shock (52

km) resulted in more moderate surface intensities over a wider area than the shallower (18 km) California event. Had an event of similar magnitude occurred on a shallower fault, closer to Seattle, the consequences would have been an order of magnitude greater than the approximately \$2 billion currently estimated. Had the historic Pioneer Square and Sodo districts (sites of many pre-1950 unreinforced masonry parapet collapses) not been cordoned off following the Mardi Gras riots that had occurred just days earlier, casualties would have been significantly higher as well.

In many ways, Seattle was already a leading example of community earthquake mitigation. Prior to the 1949 magnitude 7.2 Olympia earthquake, few structures had been built to resist strong seismic forces. The 1949 shock resulted in the strengthening of building ordinances and the adoption of the Pacific Coast Building Officials Code (later replaced by the Uniform Building Code) by the state legislature in 1950. It is important to note that until the 1970s, both California and Washington were classified in the same seismic zone (UBC Zone 3). Changes to the building code brought about by experience in the California earthquakes affected construction practice in both Washington and California. As a result, newer construction performed within the life-safety design specifications given the moderate levels of ground motion experienced last February. Many older, nonresidential structures benefitted from requirements enacted 30 years ago for substantial renovations to include seismic upgrades. Stricter seismic standards for post-1980 bridges, and an active upgrade and repair program by the Washington Department of Transportation, limited the majority of significant damage to a few pre-1980 structures that were scheduled for replacement at the time of the earthquake. All of these examples represent the successes of long-term incremental changes toward seismic safety in the Puget Sound area.

The Nisqually earthquake was both a confirmation and a wake up call. While it served to reinforce many of the lessons learned from prior earthquakes, both here and abroad, and demonstrated the value of mitigation, it also raised some questions. Are we better prepared for the next earthquake? While the building structures performed well given the levels of ground shaking, significant nonstructural damage occurred in buildings of all types and ages—demonstrating our continued vulnerability to these kinds of losses, which run three to four times the structural losses and pose a threat to life safety. What is clearly needed is design, engineering, and construction practices that take into account all aspects of a building's performance, especially the nonstructural elements.

There is no doubt that the Project Impact prototype raised awareness about the earthquake problem in the Puget Sound area, and that many activities, as described in Bob Freitag's article in the [\*May Observer\*](#) (Vol. XXV, No. 5, p. 1) will limit future losses. Community participation is essential in creating an enduring culture of hazards awareness and responsibility. But it is important to remember that Project Impact represents one more step in a long-term process, represented by significant state and local investment in building codes and retrofits.

**Robert F. Shea, Acting Administrator, Federal Insurance and Mitigation Administration,  
Federal Emergency Management Agency**