CONNECTIONS

The EERI Oral History Series

Mary C. Comerio

Lucy A. Arendt
Interviewer

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The EERI Oral History Series

This is the twenty-seventh volume in the Earthquake Engineering Research Institute's series, *Connections: The EERI Oral History Series*. EERI began this series to preserve the recollections of some of those who have had pioneering careers in the field of earthquake engineering. Significant, even revolutionary, changes have occurred in earthquake engineering since individuals first began thinking in modern, scientific ways about how to protect construction and society from earthquakes. The *Connections* series helps document this important history.

Connections is a vehicle for transmitting the fascinating accounts of individuals who were present at the beginning of important developments in the field, documenting sometimes little-known facts about this history, and recording their impressions, judgments, and experiences from a personal standpoint. These reminiscences are themselves a vital contribution to our understanding of where our current state of knowledge came from and how the overall goal of reducing earthquake losses has been advanced. The Earthquake Engineering Research Institute, incorporated in 1948 as a nonprofit organization to provide an institutional base for the then-young field of earthquake engineering, is proud to help tell the story of the development of earthquake engineering through the *Connections* series. EERI has grown from a few dozen individuals in a field that lacked any significant research funding to an organization with nearly 3,000 members. It is still devoted to its original goal of investigating the effects of destructive earthquakes and publishing the results through its reconnaissance report series. EERI brings researchers and practitioners together to exchange information at its annual meetings and, via a now-extensive calendar of conferences and workshops, provides a forum through which individuals and organizations of various disciplinary backgrounds can work together for increased seismic safety.

The EERI oral history program was initiated by Stanley Scott (1921–2002). The first nine volumes were published during his lifetime, and manuscripts and interview transcripts he left to EERI are resulting in the publication of other volumes for which he is being posthumously credited. In addition, the Oral History Committee is including further

interviewees within the program's scope, following the Committee's charge to include subjects who: 1) have made an outstanding career-long contribution to earthquake engineering, 2) have valuable first-person accounts to offer concerning the history of earthquake engineering, and 3) whose backgrounds, considering the series as a whole, appropriately span the various disciplines that are included in the field of earthquake engineering.

Scott's work, which he began in 1984, summed to hundreds of hours of taped interview sessions and thousands of pages of transcripts. Were it not for him, valuable facts and recollections would already have been lost.

Scott was a research political scientist at the Institute of Governmental Studies at the University of California, Berkeley. He was active in developing seismic safety policy for many years and was a member of the California Seismic Safety Commission from 1975 to 1993. Partly for that work, he received the Alfred E. Alquist Award from the Earthquake Safety Foundation in 1990.

Scott was assisted in formulating his oral history plans by Willa Baum, Director of the University of California at Berkeley Regional Oral History Office, a division of the Bancroft Library. An unfunded interview project on earthquake engineering and seismic safety was approved, and Scott was encouraged to proceed. Following his retirement from the university in 1989, Scott continued the oral history project. For a time, some expenses were paid by a small grant from the National Science Foundation, but Scott did most of the work pro bono. This work included not only the obvious effort of preparing for and conducting the interviews themselves, but also the more time-consuming tasks of reviewing transcripts and editing the manuscripts to flow smoothly.

The *Connections* oral history series presents a selection of individuals who have made a significant contribution to the field of earthquake engineering. The term "earthquake engineering" as used here has the same meaning as in the name of EERI—the broadly construed set of disciplines, including geosciences and social sciences as well as engineering itself, that together form a related body of knowledge and collection of individuals that revolve around the subject of earthquakes. The events described in these oral histories span many kinds of activities: research, design projects, public policy, broad social aspects, and education, as well as interesting personal aspects of the subjects' lives.

Published volumes in *Connections: The EERI Oral History Series*

Henry J. Degenkolb 1994
John A. Blume 1994
Michael V. Pregnoff and John E. Rinne 1996
George W. Housner. 1997
William W. Moore 1998
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William J. Hall, Nathan M. Newmark appendix . 2015
Edward L. Wilson, Ray W. Clough appendix . . . 2016
John F. Meehan 2017
Mete A. Sozen 2018
Mary C. Comerio 2020

EERI Oral History Committee

Foreword

Every so often, opportunities present themselves that we dare not pass by. Such was the case with conducting these interviews of a leader esteemed by so many in the EERI and broader seismic safety community. My interviews with Mary Comerio began in June 2018 at the 11NCEE in Los Angeles. We continued to talk via Skype over many calls and did the final face-to-face interview in December 2018 at Mary's home in San Francisco, California. Email exchanges between Mary and me yielded a version of the manuscript ready for others' consideration. Oral History Committee member and current EERI President Laurie Johnson graciously invited me to serve as the lead interviewer on this project after I mentioned to Mary how much I would love to eavesdrop on the interviews and get the inside scoop on her amazing life and career. I was right; every aspect of this interviewing experience has been wonderful. I owe a debt of gratitude to these two inspirational leaders, both of whom have given me many opportunities to grow personally and professionally. Interviewing Mary has been one of my most satisfying and enlightening professional experiences. Of her many virtues, her courage, passion, empathy, humility, and sense of humor have influenced me the most. EERI is a better organization for having had her among its members and leaders.

Lucy A. Arendt
EERI board member
November 2019

Oral History Committee member Laurie Johnson served as our coach and adviser throughout the project. She and Oral History Committee member Robert Reitherman reviewed the manuscript. Sarah Nathe edited the manuscript. Leonard Rosenbaum created the index. The page layout was accomplished by George Mattingly. Rita Ortiz, former EERI Membership and Communications Manager, and Vida Samardžić, EERI Membership and Publications Coordinator, managed the production process.

Ayse Hortacsu
EERI Oral History Committee Chair
February 2020

Personal Introduction

In February of 2005, at a breezy hotel (appropriately named *Las Brisas*) in Ixtapa, Mexico, a graduate student overheard two professors trade humorous stories during a break at the EERI annual meeting. Their lively exchange ended with one of them joking, "One day I need to write a book about my life with the engineers." While not exactly the book Professor Mary Comerio had in mind during that conversation 15 years ago, this oral history documents the contributions that she has made professionally, the impact she continues to make in the international earthquake engineering community, and the essential role she quietly plays as the *de facto* mentor for women in our field.

I first met Mary when I was a student in the Pacific Earthquake Engineering Research (PEER) Center. I was in the first year of my PhD studies when my advisor asked me if I wanted to join a multidisciplinary research project funded by the PEER Center. The center was in the second half of its NSF funding cycle, and our project (a collaboration among Caltech, Stanford, UCLA, and later, UC Berkeley) applied numerous research findings to design a benchmark building using a performance-based approach. The methodologies for probabilistic seismic-hazard, structural, damage, and loss analyses employed in this project defined PEER's overarching framework and its application to the design of reinforced-concrete moment-frame buildings. My work focused on furthering the probabilistic damage and loss modeling, and my hope to improve the algorithms for loss of building functions with empirical data led me to THE expert on downtime, Mary Comerio.

In my dissertation, I was trying to model the disastrous social impacts of strong ground shaking, yet I had never experienced a major earthquake, or witnessed the physical destruction and social disruption caused by one. Mary was my portal into these post-disaster worlds that she knew too well. My advisor encouraged my growing enthusiasm to work on modeling the loss of building functions and supported my frequent trips to the Bay Area to meet with Mary. In those meetings, on the south side of the UC Berkeley campus, I peppered her with questions that I thought might help me tweak my models. I would return to Pasadena with heaps of handwritten notes to begin the process of parsing out the pieces from our conversations that could be incorporated into my algorithms. Sometimes these gems were introductions to key databases that only Mary, and a few others, knew about

because she had worked so closely with the Cities of San Francisco and Los Angeles after the Loma Prieta and Northridge earthquakes, respectively. Other times, the nuggets were philosophical but no less valuable.

When Mary first introduced her theory for characterizing building downtime— including the *rational* and *irrational* components—it probably did make many engineers feel uncomfortable. But I had already embraced her point of view that building downtime modeling should not be limited to physical damage repair times and repair schemes. Mary clearly saw the bigger picture that came into focus years later for the rest of the research community: building downtime is difficult to model because it is highly dependent on irrational components (those not easily modeled by engineers) that include financing, relocation of functions, human resources, and economic and regulatory uncertainty.

In her 2006 *Spectra* paper on downtime, Mary proposed a model for the irrational factors that is a function of the percentage of damaged building stock. Specifically, the paper included a summary of historical building closures and repair efforts at a university, where Mary found that repair times for the closed campus buildings ranged from 0.4 to 2.6 years, and that the total downtime for these ranged between 0.9 and 9.3 years. This gap between repair time and total downtime suggested that the irrational components of downtime require serious consideration and that buildings fell into three categories: the quickly repaired (three years or less), the medium-term repaired (four to eight years), and the permanently closed or demolished. The longer durations were often caused by externalities, such as securing funding and complicated negotiations regarding the repair schemes for these buildings.

These findings and others from Mary's career are incorporated explicitly or implicitly in existing foundational seismic engineering guides like FEMA's P-58 (*Guidelines for Performance-Based Seismic Design of Buildings*) as well as important policy and planning guidance such as SPUR's *The Resilient City*. Her work has also directly influenced NIST's recent efforts on re-occupancy (*Research Needs to Support Immediate Occupancy Building Performance Objective Following Natural Hazard Events*) and functional recovery as alternative performance objectives to life safety,

which have been driven by the 2018 reauthorization of NEHRP (National Earthquake Hazards Reduction Program).

Mary's personal experiences in school and her early professional design work influenced her humanistic approach to design and the use of architecture as an agent of social change. She is able to immerse herself in a community and make deep connections with individuals to understand the fundamental issues that need to be addressed. I saw this most clearly in Mary's efforts on earthquake reconnaissance trips. I first deployed with Mary after the 2010–2011 Christchurch earthquakes. Mary was the co-leader of a large multidisciplinary LFE (Learning from Earthquakes) team that EERI sent to Christchurch just two weeks after a M_w 6.3 earthquake struck on February 22, 2011. Mary rose early every morning to inspect buildings in the cordoned-off area of the Central Business District (CBD) to help identify structurally unsound buildings and to document seismic damage. This effort was physically draining, yet Mary still found energy to host impromptu meetings at the Christchurch Art Gallery (which became the Emergency Operations Centre) to support her LFE team or to brief local stakeholders. She held clearinghouse meetings at a hotel in the evenings, traversed the city to establish contacts for her team, and frequented a McCafé (McDonald's was the most reliable internet connection in Christchurch after the earthquake) to keep those who remained stateside informed of our activities. She did all this with laser focus on the mission and with her typical unflappable demeanor.

She even found the time to gather the team to share stories at restaurants or over a glass of local pinot noir. In a social team meeting in Mary's hotel room I first met Professors Lori Peek and Jeannette Sutton, who later became close collaborators via the Natural Hazards Center at the University of Colorado in Boulder and the National Construction Safety Team Federal Advisory Committee at NIST. Additionally, the relationships that Mary built with New Zealand's GNS (Geological and Nuclear Sciences) and the UK's EEFIT (Earthquake Engineering Field Investigation Team) on this reconnaissance trip have continued for almost a decade and have facilitated collaborative earthquake reconnaissance missions around the world. My early experiences in disaster fieldwork with a leader who valued the role of engineers and social scientists equally influenced my academic research

as well as the way I tackled my first job as Director of Disaster and Failure Studies at the National Institute of Standards and Technology (NIST), overseeing all disaster field studies and investigations.

I had the pleasure of working with Mary on a second reconnaissance project focused on creating an LFE travel study program. This program first germinated in an EERI IDC (Initiatives Development Committee) meeting where EERI Board Member, Dr. Sissy Nikolaou, offered an idea for directly engaging practicing engineers in the LFE Program. After many months of discussing this new educational program, Professor Thalia Anagnos (also a former EERI President) led the two cohorts of participants into the field in Chile (2017) and New Zealand (2019). Mary and I worked together with a small group to identify the goals of the first cohort, who conducted their field study in Chile immediately following the 16th World Conference on Earthquake Engineering. The travel study was successful thanks to a strong local collaboration with CIGIDEN (Chile's Research Center for Integrated Disaster Risk Management). I lectured on hospital functional impacts and Mary lectured on housing dislocation. Mary discussed her work on housing recovery and taught the participants how to engage with local communities. Mary's participation fostered interactions amongst members in various disciplines and the host country. Moreover, she served as a role-model for the young scientists and engineers.

One of the most significant contributions that Mary has made to our field is not one you can find in a technical paper or a book, but her quiet mentoring of other women in earthquake engineering has helped diversify our field over the past few decades. Historically, the number of women in tenure/tenure-track positions in colleges of engineering has been low (data from the American Society of Engineering Education indicates that, on average, it is still below 20%). To put this in context of my own experience, I never had a female professor in any of my structural engineering courses over 11 years of higher education and across three different universities. Like me, there are many women that lack examples of accomplished female academics, including those that are also balancing motherhood and other family obligations. Mary always made herself available by phone or during a coffee break at a conference to chat about the challenges I was facing in academia. She was

generous with her time, and open about her experiences juggling competing priorities in her life. From discussions with colleagues, I learned that Mary was advising many women on how to maneuver and stay relevant in a crowded research area. As Department Chair, Mary took a great interest in helping women to advance their careers and in changing department policies to be more egalitarian across the faculty. Mary's efforts to change the status quo as a leader in PEER, her department, and EERI gained her genuine respect from all those she interacted with, both women and men.

My career benefitted from my early collaborations with Mary and built upon her foundational work on housing recovery, disaster-resistant universities, and building downtime. Mary served as a model to me, and so many others, for cross-disciplinary research and comfort in navigating research spaces on the boundaries of traditional fields. I am grateful to Mary for demonstrating how to interweave family and work. I smile every time I share the story of the two professors in Ixtapa, but my heart swells with pride that this book about an architect's "life with the engineers" has finally been written.

Judith Mitrani-Reiser
November 2019

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Mary C. Comerio

Chapter 1

Early Life: 1950–1968

Lucy Arendt: Let's start at your beginning. When and where were you born?

Mary Comerio: I was born on December 30th, 1950 in St. Louis, Missouri and named Mary Catherine Comerio. I was supposed to be Maria Caterina in classic Italian fashion, after my two Italian grandmothers, but it was after World War II and my parents thought they should Anglicize my name, even though my brother was named Mario. When I was younger, I wanted to know, "Why wasn't I named Maria Caterina?" It didn't make any sense to me. Ironically, I was the one who liked *being* Italian and my brother *wanted* to be "American." My brother just wanted to be called Mike.

Parents
Mario Augustus Comerio | Rosa Maria Ruggeri

Grandparents
Paternal (Buscate, Italia)
Paulo Comerio | Maria Algarda
Maternal (Cuggione, Italia)
Luigi Ruggeri | Caterina Baroli

I was interested in our Italian heritage and families even though I didn't know them personally as both my parents came as kids with their families from Italy. They were from villages in the

Lombardy region near Lago Maggiore. Their towns were just a few kilometers apart. The families did not know each other. In the United States, my mother's family lived on a farm quite far outside St. Louis. My father's family moved around several places, but landed ultimately in St. Louis. They lived in the Italian neighborhood, called The Hill. My parents met as young adults on a blind double date. My parents weren't originally matched up with each other; the story went that halfway through the date they traded. Both couples ended up getting married.

Arendt: That's a great story.

Comerio: My family was somewhat fragmented, in part by large age gaps, and in part by the realities of immigration. I was eight years younger than my brother. My mother was the second youngest of a very large family. My mother's parents died when I was quite young, between one and two years old. Of course, I don't really remember them. We only knew a sub-set of my mother's siblings. There were more, but they were a lot older than my mom so perhaps they went somewhere else or didn't all come together.

We never knew exactly how old my father was, because he had multiple birth certificates. My grandfather came first, to begin work. For whatever reason, my father and his mother's travel was delayed two or three times. Each time, he needed different documents, or perhaps they changed his birthdate to get a cheaper ticket. The result was that nobody ever knew his actual date of birth.

Arendt: People's interest in genealogy has evolved and perhaps people are more likely to keep track of family members now than in the past.

Comerio: We never knew much about either family's history. Of course, no one of that generation talked much about the past. When I was quite small, my grandfather—my dad's father—was run over by a car. He survived as an invalid. My grandmother lived a bit longer, but I was small and they were very old. We saw very little of the extended family from about the time I was age 10 or 12 onward.

Arendt: Tell us about moving out into the country.

Comerio: We didn't live in the city proper. We always lived outside of St. Louis in a quasi-rural area in three different houses until ultimately my parents moved to the Ozarks—Osage Beach, Missouri. We never lived in the Italian community in St. Louis. I didn't experience that until I went to college. In fact, I had a somewhat peculiar 1950s immigrant childhood. As one of my colleagues used to say, "You know, back then Italians were a minority." Although I didn't experience the racism that others felt in immigrant communities, I knew we were different. At the time, my father would sometimes say, "We can't act Italian now."

Arendt: What did that mean?

Comerio: It meant we spoke English. You weren't allowed to speak Italian outside your house. Italian was a language for secrets. You ate American food when you went out, but at home we cooked Italian food. We made ravioli, fresh pasta and tomato sauce. We made risotto and chicken cacciatore. We always ate high-quality Italian food at home and it was wonderful.

If you lived in the city, you could go to an Italian restaurant, but if you lived in a relatively rural community, like I did, you went out to HOJO's [Howard Johnson's].

Arendt: That's a classic.

Comerio: It was one of the chain restaurants—"Diners, Drive-Ins, and Dives"—all across America. Now, I would think those places were awful, but back then they were new and shiny and very different from our early "farm to table" way of life.

Arendt: I'm really curious to hear a little bit about what it was like for you growing up. What are some memories that stand out?

Comerio: I don't have a huge number of childhood memories. It all seems rather ordinary. I went to Catholic school.

Arendt: And wore the uniforms?

Comerio: Of course, we wore the uniforms!

Arendt: Did you go to mass every day?

Comerio: Every day; it was required then. School was pretty difficult. The nuns were very old fashioned. They would hit us with rulers and make us kneel on the cold floor with our arms held out. This was normal punishment! We followed all the Catholic Church requirements, including the multiple services for saint's days and holidays and Easter and Christmas. I remember they said they would allow us to choose whether or not we wanted to go to mass, but if we chose not to go to mass we had to write a penance. So it didn't seem like much of a choice!

Arendt: These experiences must have had a tremendous influence on you.

Comerio: For better or worse.

Arendt: When did you first start thinking about architecture?

Comerio: I remember at about age 12 announcing that I wanted to be an architect and everyone laughed. That's what I remember: they all just laughed. I don't know where the idea came from other than I was fairly artistic. I did not go to Catholic high school; I'd had enough. Instead, I insisted on going to the public high school. Rural public high schools aren't necessarily wonderful either, but the art teacher was fabulous. I loved to paint and draw and I also really liked to make things. I think I got some of that from my father. He could do anything. He was a pastry chef, but he got flour in his lungs and he had to quit baking. So he did all kinds of odd jobs. He could make anything; fix anything; build anything.

Arendt: Sounds inspiring!

Comerio: I wanted to build things. I think somewhere along the line in high school it must have occurred to me that typically famous artists died penniless and hungry, and they only got famous later. I thought, "Hmm, being an artist might not work. I'm a poor kid. I actually have to earn a living!" And somehow art, science, and math came together in my mind as, "Go be an architect." I knew what I didn't want: I did not want to be an Italian housewife.

Arendt: Talk more about that.

Comerio: Women didn't fare very well in the world that I knew. They worked really hard at home—they cooked, washed, cleaned, and

didn't get to do any of the fun stuff. It seemed to me that men got to have the interesting conversations and women got to go to the kitchen and wash dishes. I did not want to do that.

Arendt: Somewhere along the line you must have decided that college was in your future.

Comerio: That was in high school. There were students who were smart and who were interested in college. It was a very small group. Like in many high schools in America in the early 1960s, most students were not expected to go to university and there were practical, job-oriented classes such as auto shop or carpentry for boys and home economics and typing for girls.

I wanted to take woodshop and they wouldn't let me. Girls were not allowed to take woodshop. My father actually went to the high school and protested. Unfortunately, I never got to take the class, so my father just taught me what he knew. I did have to take typing and home economics, and I think I probably got my worst high school grades in those two classes.

Arendt: It seems like both your father and mother were supportive, at least in the sense of knowing what wasn't of interest to you.

Comerio: My father in particular was very supportive of my aspirations. He never went past the second grade. He basically went to work in the bakery. My dad really believed in learning. He always had a book or magazine. He never stopped learning. He was interested in the world, and I think that he passed that passion on to me.

My mother went to school through eighth grade. She apparently won a scholarship to high school, but wasn't allowed to go because she had to earn money to support her parents. By then all her older siblings were gone and no one was supporting her parents. I think that my parents certainly believed in education, but my mother was very traditional and old fashioned, so she didn't see the point for me. My mother just thought women should follow rules and do what they are supposed to do. I wasn't a very good kid in that traditional sense. I always wanted to do what the guys were doing. I always wanted to hang around with my father and do whatever he was doing, and my father was just fine with that. My brother wasn't interested in school. He wanted to play sports and go out on dates, have a new car. He was a 1950s teen. He wanted all the conventional American things, while I was trying to be different. Perhaps, mostly I didn't want to do what the girls were doing.

In high school, the small group of students who were interested in college really helped each other. A boyfriend who was older than I went off to Pratt Institute in New York for Art. That was a very big deal. He was a really talented guy. He'd come home for the holidays and he would talk about what college was like. There was another guy a year ahead of me who went to a program at Washington University in St. Louis called the "American Freedom Summer Institute." He would have gone in 1967 because I went in 1968. This was a pretty amazing thing.

Arendt: What exactly was the "American Freedom Summer Institute"?

Comerio: It was a program for high school juniors that prepared them for college and

also increased their political awareness. I don't think I understood that at the time. I saw it as an opportunity to experience college and get a feel for it, but the program was a very "left" political thing. Apparently even the title was supposed to be a counterpoint to another much more conservative program for high school students. The classes were taught by faculty in history, economics, and political science, and were focused on American laws, values, and political and economic systems. We read all of the contemporary political economic literature of the 1960s. The classes were very intensive and the students were from all over the United States. I am sure it was a good recruiting tool for Washington University and it really helped students make the transition to college. Doing this the summer before I actually had to apply to college was enormously helpful in terms of feeling comfortable to do something non-traditional.

Arendt: Was it also the case that being with other college-bound folks helped you to see that you could fit in?

Comerio: I could see where we were similar and I could see where we were different. Most of them came from fairly wealthy families. I was there on a scholarship, but it didn't bother me. I think they had more advantages: better high schools, more experience with traveling and seeing the world, and with doing things. I never felt inferior or scared to be with them. In a sense, I attribute that capacity to be comfortable with anyone to my father. He really didn't care about social status or class or even political parties. He was much more of a populist or perhaps an anarchist. He basically thought that all human beings were equal. Just because someone had more money than you didn't mean that they were smarter or better, they just had a different kind of experience.

My father was a craftsman and he made things with his hands. He believed in the quality of craftsmanship. What a craftsperson knew was really important.

Knowing this made me appreciate the working person, whether it was somebody making clay pipes for sewers or somebody making wedding cakes. That craftsperson had skills and knowledge, and those skills and knowledge meant something in the world.

Learning that lesson in my youth was important to my future as an architect; I never felt like I was not competitive. I knew there were things other people knew that I didn't know, and I knew that they had experiences I didn't have, but knowing that didn't give me an inferiority complex. I knew my own skills and I felt comfortable in my own skin.

Arendt: You would have still been their equal in terms of intellectual curiosity.

Comerio: Yes, but I was a "hick" back then. I had a funny southern Missouri accent and I had to lose it in college. Otherwise people laughed at me when I talked.

I have a really good friend in San Francisco who was from Mississippi and she no longer has an accent. I once said to her, "Anna, what did you do with your accent" and she said, with a twang, "Honey, I left it in a mason jar on the kitchen sink."

Arendt: That's a fabulous line.

Comerio: I never had such a great line, but

I certainly know that feeling. I had to re-learn how to talk in college. I had to learn not to sound like a hillbilly.

Arendt: In addition to this amazing experience as a junior, did you have any other particular activities or achievements in high school?

Comerio: I did: I was on a television program. Those were the days when television was still more local or regional. Little kids in the 1950s went with their Girl Scout troops to be on "Howdy Doody Time" or another local program. They would show some cartoons and say a few words to a bunch of kids sitting on benches. The high school version was a TV program called "Scholar Quiz." Local high schools competed on it. My three-student team won a few rounds, and competed regionally, but never got as far as the national competition. It was kind of fun, especially when I was able to name the classical orders. No one else knew those three column types.

Arendt: What was happening in the world while you were in high school?

Comerio: It was such an intense time. The Vietnam War and the civil rights protests dominated the Sixties. We also saw the assassinations of President John F. Kennedy, Robert Kennedy, and Martin Luther King. At the same time, there was the hippie movement and flower power in San Francisco. We knew about all of it, but it seemed really remote until I went to Washington University that summer. It had felt very far away from my small corner of the world, but then in college the protests and the rebellion seemed totally normal.

Chapter 2

Off to College: 1969–1973

Arendt: Talk a bit about the decision to go to college, and where you went.

Comerio: Part of my decision had to do with my living somewhere that felt far from the center of the universe; getting "out" seemed like a good idea. College seemed like the ticket out of both family traditions and a narrow-minded community. Those days you only applied to four or five schools and since I'd attended the program at Washington University, I applied there. For some reason, I also applied to the University of Wisconsin–Madison and to the University of Missouri in Columbia. I didn't know very much about those places, but one of my friends from the summer program was applying there. I thought they were all really good schools. Those were the only three I remember; there might have been one or two others. I really had no idea how I was going to pay for this because I didn't have any money. My parents didn't have any money. But Washington University gave me a four-year, fully funded scholarship and I took it.

Arendt: You knew college was the right choice for you.

Comerio: Yes, and I knew with certainty that I wanted to be an architect. Washington U. was actually the only one with an architecture school. So, that seemed logical and the scholarship made a huge difference. It made going to school possible. I also worked and was able to support myself.

Arendt: Did you live on campus?

Comerio: I never lived on campus. I had an apartment. My father rented me an apartment in the Italian neighborhood. He reached out to whomever he knew for help. I don't remember how I found my roommate, but I assume I advertised. She was a girl from a small town in Southern Illinois. We were freshmen and, somehow, we were allowed to live off campus. I don't think I could have lived on campus since the dorms were expensive.

Arendt: An expense you didn't need.

Comerio: Housing wasn't covered by my scholarship, and it was much cheaper to live off campus. I lived—for the first time in my life!—in an Italian neighborhood, for better or for worse. The landlady was a real "busybody" that drove everyone crazy. My roommate had a brother who was a junior and sometimes he and his friends would eat dinner at our house. Because we lived in an upstairs flat above where this woman lived, they would take their shoes off to go quietly down the steps. She would call my father and say, "There are men in the apartment". "Yeah," I said, "my roommate's brother!" We got out of there after not too long because she was a little…

Arendt: Too involved?

Comerio: Yes! [laughter]

Setting all that aside, architecture school was like dying and going to heaven. In design studio I was in my world. I couldn't have been happier. It was as if suddenly everything made sense. My world made sense. This, I realized, was how I thought. The freshman studio instructor was an artist named Sheldon Helfman and he was the most wonderful teacher on earth.

There was a strong relationship between Washington University and the whole Chicago *Bauhaus* movement [see text insert]. The faculty at that time was very *Bauhaus*-influenced, which meant that there was a combination of art and craft exercises. We had to build things in the shop. We drew things. We were given graphic mind puzzles that we solved by creating something artistic. It was intellectually engaging; it was fun, and it suited me perfectly. In those days, we went to design studios four afternoons a week from 1 to 5 p.m. We took our other courses in the morning. It was still the days of general education where we had to study western civilization and calculus and physics and all the humanities requirements, but we did that in the morning and then we spent the rest of the day, and often night, living in the studio.

Arendt: Any notable awards?

Comerio: Yes. In 1970, I was inducted into the Alpha Lambda Delta Honorary Society for top grade point average and also received the Freshman Award from the School of Architecture for the Outstanding Student in Freshman Design.

Arendt: Were you working also? What did you do for work?

Comerio: I always worked. My freshman year I got a job at a furniture store. I did everything and anything. Sometimes I sold things, but mostly I was secretarial help. I worked a fair number of hours there during the academic year. In the summers, I took a different job.

The Bauhaus was a German art school (1919–1933) founded by Walter Gropius in Weimar that combined crafts and the fine arts. The term *Bauhaus*—literally, "building house"—was understood to mean School of Building. Its goal was to combine architecture, sculpture, and painting into a single creative expression. Gropius created a craft-based curriculum that turned out artisans and designers capable of creating beautiful objects and buildings. The *Bauhaus* style became one of the most influential in Modernist architecture and art, design, and architectural education. The school was closed by its own leadership under pressure from the Nazi regime, having been portrayed as a hub for communist intellectualism.

After it closed, the school's staff continued to spread their ideas as they left Germany and emigrated all over the world. Many came to the U.S. to practice and to teach at such places as Harvard, Columbia, the Illinois Institute of Technology, Washington University, and the New Bauhaus in Chicago. The influence on design education in the U.S. was significant and the integration of theory and application, art and technology, was part of the design training at Washington University.

Source:
www.metmuseum.org/toah/hd/bauh/hd_bauh.htm

Source:
www.bauhaus-movement.com/en/

Lake of the Ozarks,[1] where my parents had one of the many "mom and pop" fishing resorts, also had two larger resort developments. I went to work for one of them called "The Four Seasons" the summer after my freshman year. They had an architectural office. The development had a large hotel and they were also building and selling vacation homes and golf courses and other recreational amenities for the hotel. It was a perfectly okay job, but it wasn't great because the owners of that property were doing a lot more marketing than actual building. We produced many nice drawings of things they never actually planned to complete. I figured that out pretty quickly and I didn't want to go back to work there the next year.

The next year, I was desperate for a full-time summer job. The other large resort-hotel advertised a job for a switchboard operator. Those were the days when there were still plug-in switchboards. Since I really needed the job, I lied and said that I knew how to run a switchboard. The woman who was the head operator figured out in about the first ten minutes that I didn't know anything and she said, "You don't know how to do this, do you?" I said, "No, but I will learn really fast." I was a really terrible switchboard operator. During busy times, an operator answered multiple calls, holding each wire in one hand while continuing to answer others, and had to listen to each caller and remember where to connect each one on an enormous board. When I was answering multiple calls, I don't think many went to the correct place. I was quickly put

1 The lake was created by a hydro-electric power plant on the Osage River between 1929 and 1931.

on the nightshift where it wasn't so busy. [laughter]

At night, I had to run the switchboard and work at the front desk of the hotel. We all worked a lot of hours in those days. This was before minimum wage, or overtime after 40 hours a week. Everybody worked 80 hours a week in the summer because that was just how it was in high season.

Arendt: I imagine it was a good chance to make a fair amount of money.

Comerio: It was! So everyone worked lots of hours, double shifts and more.

One night the general manager of the hotel, the top manager, came in and said, "Hey kid, I hear you can draw," and I said, "Yeah, way better than I answer the phone." He said, "Come to the executive office tomorrow." So, after the night shift, I went to the executive office and met the owner. The hotel was called Tan-Tar-A Resort. It's still there, now as a Marriott. The St. Louis–based builder-developer, Burton Duenke, owned it. Although I didn't know this at that time, he was famous for hiring young architects and giving them creative license.

When I went to the office, this older gentleman said, "I need some drawings for a house we are building. I need them really fast because there are people who want to buy the property, but the bank won't lend to them unless they have drawings." The house was already under construction. So, I said, "Okay" and went out and looked at it and measured it and drew it like an architecture student's rendering, or a school presentation drawing. It didn't look like working drawings, but it had the furniture and the landscaping and they loved it. So he said, "Okay, design five more houses for me, but we need you to keep working nights at the front desk and the switchboard."

So, I was working two shifts: in the day time, designing houses for the owner at a drawing board in the executive office, and at night at the hotel front desk and switchboard. I was paid the same salary of seventy-five cents an hour for both shifts. It was a wonderful experience.

That was also the summer when my mother had a massive aneurysm and needed multiple brain surgeries. She was in a coma for six months. My parents lost everything, including their property. Still, I continued to work for Burton Duenke and went back to school. This was a huge decision for me.

Arendt: I can't imagine how difficult that time was.

Comerio: There was a lot of pressure for me to drop out of school. I could not do it. It was just too important to me. So I worked, a lot. I had a very difficult routine, although it was simply what I had to do. During the week, I would go to classes in St. Louis while also doing drawings for my job. On Friday evenings, I would drive to the hospital in Columbia, Missouri, to see my mom, then work all weekend in the Ozarks, help my dad at home, then drive back to the hospital and back to St. Louis on Sunday evenings. Repeating that routine for my entire junior year. I don't think I slept much that year and I'm sure my grades suffered. Usually I was a straight-A student, but not that year, because it was just too stressful.

Arendt: So much for you to manage.

Comerio: There was a lot to manage. Amazingly enough, my mother didn't die, but she emerged from a coma to a minimally conscious state. Once she was at home, my dad took care of her and, over time, she regained some memory and speech, but life changed dramatically for them. I continued to work in the Ozarks, which kept me looping back and forth between there and home and school.

Arendt: I suspect you came out of this experience even more strongly committed to what mattered to you.

Comerio: I was very deeply committed to being an architect.

Arendt: Having to juggle so much, both physically and emotionally, had to affect you.

Comerio: I didn't socialize as much as some did. I still am close to my friends from architecture school, they're some of my best friends, but I didn't socialize in the same way that everybody else did. I just didn't have time.

Arendt: Thinking more about your time as an undergraduate student, were there many opportunities to collaborate with other students, perhaps in the design studios?

Comerio: Design studio really was our life. We spent as much time as possible there. The positive side of that was the sheer joy of doing design. Our class became very well known. We were very collaborative. We were not hypercompetitive. People excelled at different things. Everyone loved that.

Washington University was a well-known and influential school of architecture in that period. The architecture students at Harvard made T-shirts that said "Harvard: the Washington U. of the East. The architecture school was a powerhouse led by its Dean, George Anselevicius. He was a Lithuanian by birth, educated in England and he began his career working for Skidmore Owings and Merrill [SOM] and teaching at Illinois Institute of Technology [IIT] in Chicago. He joined the faculty at Washington University in 1957 and left to become chair at Harvard in 1973. It seemed like he knew every architect in Europe and they all came to Washington University. Many famous architects from around the world visited the school during my time there.

Arendt: What a great opportunity for all of you.

Comerio: Buckminster Fuller, an American architect, well known for geodesic domes, was always around because he was a close friend with one of our faculty. Frei Otto came from Germany and experimented with tensile structures on the lawn. We had Giancarlo De Carlo from Italy and Dolf Schnebli from Switzerland, both young members of the famous *Congrès International d'Architecture Moderne* [CIAM]. Fumihiko Maki came from Japan. There was a flood of well-known international architects around us, teaching and experimenting with new ideas. They were hugely influential. I don't know if other schools had an equivalent influx of visitors, but it seemed normal for us.

Arendt: It sounds really exciting.

Comerio: My class took all of these influences and did things with them. As an example, people sometimes ask me, "Were you protesting? What were you doing when

all that was happening?" In 1969, 1970, we were the architects for the protests. SDS [Students for a Democratic Society] would call us up and say, "We are going to do a protest two weeks from Saturday and it's going to be in the campus quadrangle and we really want to get the media there. So, will you guys build something?" "Sure," we'd say, "why not?"

Arendt: What did you build, for example?

Comerio: Once we built an inflatable structure that filled the entire quadrangle. Every TV crew came out to film. It was a huge thing with tubes and fans filling it up. Anyway, there was a weird mix of SDS speeches and protest information and people smoking marijuana and taking their clothes off. It was quite a spectacle. It certainly got everyone the media attention that they wanted!

I remember building a huge geodesic dome in homage to Bucky Fuller and other tensile structures when Frei Otto was there. We just built things all the time; that was a key part of the larger experience. We also gave the best parties on campus. I think they were quite famous.

Arendt: What made them so great?

Comerio: A classmate created the moniker, "The Eggplant Nation," for our class. I don't know why, but it was part of the fun. We felt we had to have fun in the midst of all the craziness that came with the Vietnam War and politics and racial issues. There were parties with formal invitations and formal dress. People wore tuxedos and gowns. There were parades and elaborate food. Another classmate from a French family, with cordon-bleu skills, and I usually cooked. Students from other years didn't quite know what to make of us. They couldn't work out how this cohort of people could be serious about architecture and so silly.

The mind-set carried over into school politics. We threw out the usual officer titles for our student government. Instead of normal officers, presidents and vice presidents, etc., we had four Henrys. The Henrys were named after the Oh Henry! candy bar, the most popular item in the school vending machine. The dean loved and supported ALL of our activities, from the Henrys to the student–faculty baseball games to the serious advocacy for bringing architecture to underprivileged communities.

Arendt: While you were making your way through college, were there any notable achievements or activities that were interesting?

Comerio: There were positives and negatives. I won several design awards, despite being one of a small number of women in the school. I think there were three or four of us in a group of 70.

I should say, it started out as 70. As freshman, the dean told us, "Look to your right and look to your left and do not expect everyone to make it in architecture." In a private university, they had the flexibility to push students out of the major if they didn't think those students had any talent. By the time we made it to our junior year, we were a much smaller group in the design studios.

On the topic of being one of only a few women in my class, there was a faculty member who said to me, "You know, you deserve an A, but I am going to give you a B because you're a

woman and you're not going to make it in this field."

Arendt: The joke's on him.

Comerio: Who were we going to complain to? There wasn't anything to be done. We just dealt with it; we moved along. We used it as a motivator. We didn't do anything about it except work harder. We might say something under our breath, but then we'd walk away.

It all feels like a blur. One of the things I remember well, though, is the lecture by our structures professor, Irving Engel, after the San Fernando earthquake. To this day, I don't know if he went on a reconnaissance team or how he got the slides so fast. It wasn't long after the earthquake that we had a couple of sessions about earthquakes and the San Fernando damage. I will never forget them. At the time, it wasn't as though I thought I would ever go to work in California or deal with earthquakes. Not even the New Madrid fault seemed entirely real. We didn't really think about it or the threat it presented.

But the faculty member made it very real. It's odd, now, to look back and think about what a powerful impact that series of lectures had on me.

Arendt: Especially in the context you're describing. You're in school, you're in design studio and you're seeing knowledge transfer, and now there is this real event, with devastating consequences.

Comerio: I was looking through my files from that era and discovered a newspaper clipping with a quote. I can't believe I saved this all these years. It says, "In nature there are neither rewards nor punishments; there are only consequences." And I thought, "Wow! That's earthquake engineering. There are consequences that go along with our decisions."

For me, everything in my life was fitting together and made sense; there was a strong relationship, a symbiosis, between school and work. And not just in terms of knowledge transfer.

My boss, Burton Duenke, was a close friend with the previous dean, Joseph Passonneau, so he knew the school and the staff quite well. He also liked big toys. [laughter] He flew his own plane and he had several big boats. He knew that I didn't usually have the time to drive back and forth between school and work in the Ozarks so he would call the school secretary and say, "Tell Mary to meet me at the airport at a specified time. I am coming in with the plane." [laughter]

I'm not sure that went over really well with the faculty, some of whom may have wished that it had been their client calling about their job, and not mine.

Chapter 3

On to Graduate School: 1974–1977

Arendt: After you finished your undergraduate degree, what was next?

Comerio: I continued working for a year for the Burton Duenke Development Company and its property, the Tan-Tar-A Resort, in the Ozarks. I didn't go straight to graduate school, but took a year to work because there was a huge project that I was going to manage. I worked on the design and construction of a conference center building at the resort, and went to graduate school the next year.

Arendt: What prompted your decision to go to graduate school at Washington University?

Comerio: I never "applied" to graduate school, but I was offered an opportunity to participate in the joint Master's degree in Architecture and Master's degree in Social Work program. Prior to my finishing my undergraduate degree, the Dean of the School of Architecture and the Dean of the School of Social Work had written a grant proposal to the National Institute of Mental Health to "humanize the technical professions." That resulted in Washington University receiving an enormous grant that funded a new joint degree program in Architecture and Social Work. It was essentially for architects; there weren't any social work applicants in this program. The grant provided funding to hire faculty; it supported four new students a year, in five years of admission cycles, to participate in the program. It very much reflected

thinking in the late 1960s to early 1970s that we needed to approach the teaching and practice of architecture with a focus on urban communities and social issues.

I was in the second cohort. The first cohort started in fall of 1973, the year I was working at Burton Duenke. Somewhere in the middle of that year, I received a call from the dean, who said, "Do you want to start graduate school next year? We would like to have you in the joint program." And I said, "Why not?" I had a full fellowship, which was the only way I could have possibly afforded to go to graduate school. This program and the way it worked intrigued me. The building project I was working on was winding up, so it made sense to go back to school.

Of course, I never actually stopped working. I just continued part-time during graduate school even though, as a student on a full fellowship, I don't think I was supposed to be employed otherwise. But, after all, I had had this job since I was a sophomore and I couldn't imagine why I would stop doing buildings.

Arendt: The "forgiveness rather than permission" model?

Comerio: Everyone understood my financial situation so nobody was too officious about the whole thing. I went back to school in a new and interesting program. With four students per cohort, there was a definite sense of what the balance should look like. There were two white males, one African-American male, and one woman. That was the cohort each year.

Arendt: I don't know how many other technical professions were thinking about the social context at that time. Many still don't.

Comerio: It was the period in which community design and advocacy planning had emerged at Pratt in New York. They were working in Bedford-Stuyvesant, their own backyard. There were community design centers being created all over the country in the late 1960s; they represented a kind of rebelliousness against modernism and against the sometimes-harsh principles of top-down planning. You know, the Robert Moses kind of mindset in New York of "I will just run this freeway through these neighborhoods." All that rebellion was happening in the professions in the 1960s. It was fascinating to hear faculty say, "We can train students to do this [architecture] in a way that is different and unique." I don't think there were any other programs like it.

Many schools had started community design centers, but no others had a graduate program like this one. The program was set up so that it fulfilled all the requirements for both programs: architecture and social work. With some overlap of units, it was essentially three and a half years of full time graduate study.

Arendt: That's an incredibly robust graduate program.

Comerio: We came out with two master's degrees. My thesis was the equivalent of a dissertation, and they treated us like Ph.D. students. There were no Ph.D.s in architecture at the time. Berkeley was the first school to pioneer Ph.D.s in architecture and those were initially in architectural history, not in architecture *per se*. At that time, the master's degree was the terminal degree.

Arendt: As is the case with many

professional degrees, and degrees in the arts. Talk a bit more about the program.

Comerio: Because the joint program was being designed as we moved through it, and because it was a private university, there weren't the typical border walls around departments. We had the flexibility to take anything we wanted anywhere in the university. There were social work requirements; they obviously wanted us to know about social work. Some of the students in the cohort actually spent more time in the social work area. I spent my time in sociology working with people who were doing conflict resolution and in anthropology looking at how humans behave.

Arendt: What was it about those courses that interested you? What drove you in that direction?

Comerio: It was the faculty. There was a famous sociologist named Robert Boguslaw, who worked on systems design and social change. He was a significant influence and I was really impressed with him and his classes. I also worked closely with Jim [James] Laue, who established conflict resolution as a distinct academic discipline. He called it a link between scholarship and action. He pioneered the focus on public dispute mediation with Larry [Lawrence] Susskind, who is at MIT in the Department of Urban Studies and Planning. They worked in places like Gary, Indiana, mediating worker strikes and dealing with the strife between industrial workers, government and companies. The approach to manage conflict overlapped with planning and aligned with what we were learning about the central role of architecture in communities. We received very strong training in the social sciences.

Charles Leven, in Economics, a founding member of the Regional Science Association, was also part of our orbit. Somehow, everyone knew each other at Washington University because it was a relatively small institution. Students would get recommendations from each other about which classes to take from which faculty members. If one was interested in urban affairs, in cities and in social conflict, then there was a network of people that one took courses from. Of course, we were doing all of this at the same time that we were doing our regular design studios. We still did the full load of architectural work as well as the social science component.

Arendt: It sounds like a fascinating variety of learning activities.

Comerio: Earlier, I said how I found my intellectual home in design studio. Well, I found my second intellectual home in graduate school because it actually put the meat on the bones of what had been started in that pre-college summer program of thinking about broader issues in society. Here were a group of amazing people from different disciplines with whom I could develop a base of intellectual understanding in the social sciences that didn't exist in architectural education. This allowed those of us in the program to better frame ideas around the things that architects were worried and upset about.

Architects interested in social issues were frustrated with the narrow focus of traditional design: that of just working for the client, just doing the house or the office building that the

client wanted. All those clients were wealthy and/or corporate and we lived in cities that were torn by inequality; by a demand for civil rights; by white flight and out-migration; by blight; by freeways shoved through impoverished neighborhoods, breaking up social fabrics. We were there saying, "What's wrong with this picture? How do we fix this?" We knew that we needed to be community designers and advocacy planners, but how could we do that without some intellectual framework to understand where we were working and how we were working? This graduate program addressed that need.

Arendt: I know that was a period of time in which more interdisciplinary studies were being introduced by some cutting-edge institutions. It sounds like you were at one of them.

Comerio: I don't think we fully appreciated how great it was until later. We appreciated the courses we took and the people we worked with, but now we can stand back and think, "Wow, what a gift that was!"

Arendt: You talked about a few of the faculty in the other areas that really had an impact on you. What about in the architecture area?

Comerio: Well Dean George Anselevicius was one. He was a significant architect and a brilliant educator. One faculty member hired as part of this program was Hanno Weber. He was a fantastic studio instructor and he ran the whole community design program. He was both an intellectual and a practicing architect; he involved us in a number of actual projects in the community with community-based clients. He was also built linkages to the brightest people across the campus. There were a number of others, including the visiting faculty such as Giancarlo De Carlo, and Charles Moore. Charles taught a summer studio for 15 students in San Miguel Allende, Mexico, organized by Dean Anselevicius, with Dolf Schnebli and Ricardo Legorreta. It was a star-studded faculty. I developed a close working relationship with Moore and continued to work with him after I came to Berkeley.

Then there were two engineers: one was a structural engineer, Irving Engel, who introduced earthquakes to us as undergraduates, and for whom I worked as teaching assistant when I was a graduate student. The other was a faculty member in Engineering, Art [Arthur] Monsey, who owned a large civil engineering company in St. Louis that designed public infrastructure. At some point, he had completed a Ph.D. in seismic design. He taught a class to architects about project development and the economics of project finance; in other words, how development really happened. I don't know why he was teaching this class, but since I had worked for a developer, the class made perfect sense to me.

I saw Art Monsey as a perfect model for how one's life should be. What I mean is, one should never stop thinking. One should never stop learning. One should be open to all the components of the intellectual part of one's life, the professional part of one's life, the business part of one's life. Art was a role model for me, someone that I respected enormously.

Arendt: Related to this, did you have a person or maybe a couple of people that you saw as a mentor?

Comerio: Jim Laue, the faculty member from sociology who worked on conflict resolution, was very much an intellectual mentor. There were several people who were role models more than they were mentors. It was a time when one was expected to "make your own way." I actually remember having a professor in Social Work say, "You folks are kind of on your own, aren't you? You are really navigating this on your own." What we didn't have was the formal structure of a Ph.D. advisor and committee. We were putting our program together ourselves using the network across the university. In some ways that was pretty fabulous training, in and of itself; it gave us a lot of freedom and responsibility. It also meant that we didn't have the kinds of relationship that I certainly have now with Ph.D. students or that one would expect as a graduate student. We also didn't know any better because we were architecture students.

Arendt: I think it's probably a certain kind of person who is comfortable with that degree of ambiguity. As you made your way through graduate school, what were some of your major or notable activities or achievements?

Comerio: As part of the social work requirement, we had to do things called practicums. In social work, a practicum is where one goes out and works with an organization, in a community. In traditional social work it was often casework, but most of us weren't involved in that. We did not do the person-to-person kind of activity. What we were doing was finding projects or programs where we could become a piece of it, in a summer or over the course of the semester. There were some crazy ones. Manpower, for example, was a national program to enhance job skills with disadvantaged youth. One summer, four of us students were asked to teach carpentry and painting in north St. Louis, the neighborhood surrounding Pruitt–Igoe, the well-known public housing project.

We had to deal with all the government officialdom of the Manpower Program, which was completely inept. We never got tools, we never got materials, we never got anything. It was the four of us working with a bunch of teenagers, in the heat of a St. Louis summer. We were given a basement as a workspace. We asked ourselves, "What do we do?" So we did what resourceful architecture students had always done.

Arendt: You borrowed what you needed.

Comerio: Late at night we would appropriate a little scrap wood here and there. Two of us who used to paint murals got local paint companies to donate paint. Mostly what we did was take these kids around the neighborhood and paint the doors and windows of houses that belonged to little old ladies. We also did some work for people who needed minor repairs on their houses. We would teach the kids about architecture when it got really hot in the late afternoon. No one wanted to be outside then. We made it work. It was a one-of-a-kind, strange and wonderful practicum where we learned about the lives of these young African-American teens. They had never been more than six blocks away from their neighborhood; they hadn't seen much outside of Pruitt–Igoe. They had never been to the suburbs or downtown. They had never been to any other part of St. Louis. They had no idea that everything didn't look just like it looked there. They had

really tough lives. It was shocking to hear a 16-year-old kid say, "What does it matter if I get in trouble? Tomorrow I could be dead or in jail."

I wasn't a privileged kid, but I felt very privileged compared to these kids. For all of us, it was a huge lesson about having to function in another kind of community; and to understand where people were coming from and what their values were; or what they knew and didn't know. To realize that the expectations they had for their lives were so limited by who they were and where they lived. That was a significant lesson that I learned. I am sure we learned so much more from them than they did from us. They were difficult and wonderful kids.

Arendt: What other activities from that time stand out in your memory?

Comerio: I worked with a community group in North St. Louis called Jeff-Vander-Lou [named after the streets that bordered the area]. This was when government was looking to close public housing and Pruitt–Igoe was in the process of being closed and torn down. Nixon and others wanted to use Pruitt-Igoe to make the political case that public housing was a failure in America. We knew that wasn't actually true.

What this community group understood better than many others was that the loss of almost half a million or more people, who had moved out of St. Louis to the suburbs in the 1950s and 1960s, meant that St. Louis as a city was dying. The city had lost its population base. It also lost some of its economic base: factories moved, jobs left. There was a glut of underused property and people living in the city didn't need public housing anymore.

Pruitt–Igoe was a very successful project when it opened in the 1950s. The community group saw that there was nothing wrong with the buildings, *per se.* They wanted to know, "Why are we throwing these buildings away?" Basically, the housing authority officials had been putting intact families into some of the smaller housing projects and using Pruitt–Igoe—which included 33 eleven-story buildings with a total of 2,868 apartments—as the dumping ground for single mothers with several children and for everybody who had drug problems. It became a kind of "no man's land" because of the social disorder created by the absolute absence of residential management. The community group said, "There is nothing physically wrong with these buildings. They are big, strong, modern buildings. We don't need to throw these away. We don't want these blown up. Give us four of them, and we will make an elderly housing complex that will work."

I worked with Jeff-Vander-Lou on that proposal. At the time [the 1970s] I was working with the group, they were quite well known as activists. I helped them make the case for the buildings by doing the drawings and showing how we could convert the buildings into elderly housing. Obviously, we lost that battle and the buildings were closed. The group came very close to almost getting their proposal approved by HUD, but that would have ruined the political value of blowing up those buildings, which is what happened. We watched them implode and we cried.

Arendt: At that time, did you have the same

sensibility that what you were observing was so much politics?

Comerio: I don't think I understood the politics as well at that moment, but I later wrote a paper called "Pruitt–Igoe and Other Stories." At the time, I documented all that happened. I recorded interviews with all the leaders of Jeff-Vander-Lou. I had all of the proposals and application materials in addition to the interviews. That paper continues to be quoted, even today. I think I figured out the politics of it all eventually. Obviously, I understood that that administration wanted to make a point and that we were fighting our little battle.[2]

Arendt: You mentioned there were two notable activities from your time as a graduate student. What was the second?

Comerio: The second one was an important, almost extracurricular, activity. There was another faculty member, Rudd [J.P.R.] Falconer, who had worked in Africa for much of his career and raised his family there. He came to Washington University as a senior faculty member. He was someone who thought that we could use construction technology to help improve people's lives. He and another faculty member, Don Royce, a planner, were working in Puerto Rico on the Island of Culebra. They may have initially visited there on a vacation, and were surprised to find that this beautiful place was being used by the U.S. for bombing practice.[3]

The islanders were living in one little corner of the horseshoe-shaped island. They had to deal with unexploded ordinance on the beaches and couldn't have any tourist development; they were quite impoverished. The locals protested against the Navy. Rudd and Don got the idea that they could build houses on Culebra using the system that Falconer had developed and patented called Plyframe. The idea was to build some houses for locals and some vacation rentals, to provide some income and help them get a little economic development going. They also hoped that building houses there would shed some light on the protest to the bombing practice. So one year, over one winter break, a whole crew of us went to Culebra to build these houses.

Arendt: What an experience!

Comerio: I had worked on and off on various parts of this project and I was part of the cohort of about 15 students that went to Culebra and built five houses. To make this happen, the faculty had to deal with the logistics of getting us and all the materials needed there. We students just brought our tents. Not all the students knew about construction. I had some skills, and there were two or three

2 There was a documentary made in 2011 called, *The Pruitt-Igoe Myth*. The film-makers used my recorded interviews. One of the people involved in the documentary was a German Ph.D. student who came and borrowed all my tapes, digitized and used them. Her boyfriend made the documentary.

3 The U. S. military began using Culebra as a gunnery and bombing practice site in 1939. This was done in preparation for the United States' involvement in World War II. The local protests to remove the Navy from the Island that began in 1971 continued until operations ceased in about 1975.

students who were carpenters. Fortunately, it was a somewhat simplified construction system. Meanwhile, they were teaching us about the politics of the situation. It was quite confrontational, immediately so.

The Navy did not want us there. They threatened to bring ships and surround us. As students, we didn't understand all of the politics, but we knew it wasn't pretty. When they decided that we really weren't going to leave, they tried to force us out by stopping our food supply. The mail boat came once a week. That was how we got our food. The military stopped the mail boat. So I would fly to the British Virgin Islands once a week to buy groceries. We basically lived on rice and beans.

Arendt: How long were you there?

Comerio: Six weeks. Every week after we lost the mail boat supplies, I would take an island hopper flight and I would come back with grocery bags. I was traveling from a British territory to an American territory and the Culebra locals who worked in customs would say, "You don't have any food in those bags, do you?" And I would say, "Of course not." Everyone local knew what I was doing. [laughter] Finally, the Navy decided to play nice and show us movies on the side of a building one night a week. The whole episode eventually got coverage in the *New York Times*, and the harassment stopped [and the locals won their battle with the Navy].

Activities like this were seen as a normal part of what we were doing in the Architecture/Social Work program and the School of Architecture. Not everybody did the same things I did, but everyone did equally interesting things.

We also did some more "conventional" projects such as designing a daycare center, and we worked on a variety of projects with other community groups. We did a lot of other work in our design studios as well, but the Jeff-Vander-Lou and the Culebra Plyframe projects really stand out.

Arendt: Anything else that you want to share about your graduate work?

Comerio: I was fortunate to be awarded an Honorary Student Membership in the Society of Architectural Historians and received the Women's Award from the St. Louis Chapter of the AIA for the Outstanding Woman in the Graduate Program, both in 1976. In 1977, I also received the Frederick Widmann Prize for the Outstanding Student in the School of Architecture two years in a row.

I was also a teaching assistant, and taught every semester, mostly in design studios, but occasionally in structures. Doing so was also valuable to me although at that time I did not think of myself as an academic. I thought of teaching as part of changing the profession, of changing the way the profession worked and thought. But I didn't imagine that I would be an academic.

Arendt: You were immersed in the doing rather than in the teaching.

Comerio: I was immersed in the doing and that was where I thought I was going to be.

Chapter 4

The Grad Thesis: 1976–1977

Arendt: Another major activity in graduate school was your thesis. What can you tell us about that?

Comerio: I mentioned earlier, when talking about my undergraduate years, how significant Washington University was in bringing a number of important architects and foreign visitors and lecturers. That continued while I was in graduate school; we had an ongoing variety of visitors. Some of them were really important to my thesis. These included the internationally known architect Giancarlo De Carlo from Italy, whose work in Urbino was a model for practice. Similarly, Professor Sandy Hirshen, from UC Berkeley, an architect who built his architectural practice doing community design, was another influential visitor. Another Berkeley professor, Jean-Pierre Protzen, was an architect who had developed a research area called "design theory and methods." His work was very significant to making the theoretical case for community participation. Finally, there was another visitor, John [Juan] Borrego, a professor of community studies at UC Santa Cruz. Some thought he was too radical even for Santa Cruz!

Arendt: He sounds like an intriguing person to have known.

Comerio: He gave public lectures as well as seminars. In a seminar during my final year of school, he said to me, "You must be getting bored. You've probably done everything there is to do in Saint Louis. Why don't you come to California?" I said, "That

sounds fun," and he replied, "We'll figure it out."

I had to do a thesis, which was a joint project for both departments. It had to include a practicum component from the social work side. With that in mind, I developed a plan to work with Professor Borrego. He was going to help me arrange to work with members of the United Farm Workers of America (UFW). We discussed two or three different project options and he was to talk with the groups and figure out which one might work best.

I don't think I was supposed to go somewhere else to work on my thesis. I was supposed to be working on it in St. Louis in order to collect my fellowship. But my immediate supervisor, Hanno Weber, was supportive of the opportunity and everyone was flexible.

In those days, we were supposed to pick up our monthly stipend in person, but the secretary mailed it to me in California. It all worked out fine.

Arendt: How long were you in California?

Comerio: I was in California about eight months. I went there in the summer and stayed through the fall semester. I arrived and stayed in the Borrego family's garage in Watsonville for a while. I did not stay there for very long because the one project on the coast wasn't going to work out during my time there.

I went instead to the Central Valley to work with a small organization called *Colegio de la Tierra*, a school created by people associated with the farm workers union for *campesinos*—farm workers. It was effectively a junior college; the leaders were working on getting accreditation. The students were a combination of children of migrants and older students. It was very inclusive in the way it was organized. The school continued to operate for quite a long time.

The backstory on this school was that it came into being right after the 1965–70 UFW and Delano Grape labor strike against the grape growers. At the time that I was involved, the union was having national aspirations, but they recognized that there was still interest in the union's initial reason for being. The union came about, in part, to provide service and support to people in the community; and this need was still fundamentally there. The *Colegio* helped fill a need for "on the ground" social services. While the union was working to improve wages and working conditions, and to raise a national profile, they also supported community-based services and thought those were important.

Arendt: The UFW of that time was not what most people think about when they think about a union, was it?

Comerio: No, though it later became a more conventional union. At that time, it was very much a community of people working together to better their collective situation. There was a community organization aspect and there were other social service components. For example, there was a subgroup that owned 60 acres of tomatoes as a collective. Everybody went out and worked in the field and picked. When the crop was sold, everyone made a share of the money. When I arrived in the valley, the school operated out of an empty building in a town called Del Rey, south of Fresno.

I went there and there was very little housing available. Typically, town residents sheltered seasonal workers. Everyone was a farm worker of some sort. If a local had a house (or apartment) at the time when the migrants came through during picking season, they would have 20 or 30 people sleeping on the floor. These were the ones they knew, the ones who came regularly. This was conventional practice in every farmworker household everywhere on the coast or in the valley; this way of life was the norm.

The head of the school, Tomás Gonzales, lived in public housing. He was married and had several small children. His house also had a lot of people sleeping on the floor. I was part of that group! I had a tendency to live in my car, a 1966 Rambler. The seats went down, so I could sleep fairly comfortably in the back. It was spacious enough.

Arendt: Aren't you a resilient person!

Comerio: Well, sometimes I didn't really want to sleep on the floor with 20 people. I needed a little more alone time!

We wanted to build a permanent school so we needed to figure out how we were going to do that. I discovered that there was an empty community center in a town called Goshen, just outside of Visalia. I managed to get the town of Goshen to give the community center to the school and then we renovated it.

The Central Valley was full of people who came from the Midwest and the South in the dust bowl. When I went to talk to the town fathers, I naturally slid into my Southern Missouri accent. I fit right in; nobody had any problems with me.

Arendt: You were establishing trust, right?

Comerio: Some trust was established by my accent. I lost it again as soon as I left town, but it worked in that setting.

We renovated the building with donated materials. All of this, from initial conversations to renovation, happened over the course of three or four months.

I was also fortunate in that I had worked as an architect, where the projects I designed, I also built (or supervised the construction). Of course, there were plenty of talented people in the farm community who knew how to do construction, so the actual renovation was not hard for us to pull off.

Something else important happened while I was there. As a nice Italian girl who valued good food, I couldn't believe that farm workers were eating bologna sandwiches and potato chips. I was horrified, so I started a lunch program.

I didn't want anyone to have to eat so poorly. I thought, "We can eat rice and beans. I made rice and beans in Culebra. I can make rice and beans here."

So we started buying rice and beans and tortillas. The union occasionally provided some meat that we added to the meal. By the time we moved into the newly renovated school, we were feeding 70 people a day for lunch, for only $2 a week per person.

Arendt: What a fantastic combination of your skill sets and knowledge.

Comerio: I am as proud of that lunch program as I am of anything I've ever done. It

was personal and important to me. And I didn't want to eat bologna sandwiches!

I also asked everyone in the school to take a turn doing a lunch-related job. A lot of the guys had never had to clean the floor; never had to stir a pot in the kitchen. Now they all had to chip in and they did not like it. I encouraged the women to bond together and we stuck to our principles. It was very empowering for some of those women to be able to do this.

Once we reached the point where the building was done, I thought, "I had better start writing my thesis." I went to Santa Cruz and rented a room in an apartment occupied by two Chicana undergraduate women from the Central Valley. I stayed there for the fall term. I met with John Borrego once a week every Wednesday. I would write, he would read, we would discuss. It was a cycle.

Back then we didn't email drafts. When we met, I handed over the next chapter and we talked about the previous week's chapter. I was writing about the architect as an agent of social change. I said there are three models. There's a scientific model where we think about being an architect as a technical profession where one does certain things and solves particular problems. There's a design methodology approach in which we realize that design problems are hard and therefore we need input from many groups to solve them. The third model or approach is what might be called the advocate model. I said that really none of these models is adequate. Instead, we need a humanistic approach to problem solving that includes one's design expertise.

Recently, one of my students, Marcy Monroe, did a thesis in which she said we have to "deploy ourselves." I thought that was a great way of articulating this principle, which I never defined quite as well as she did.

The idea is that if we're going to effect change, there are problems that will need solving, but we cannot solve those problems without being immersed in the situation. We can't just tinker around the edge as an advocate and expect that whatever we might propose will work.

I did some chapters on the case study. I did some chapters on the theory of social change, from my sociology side. Finally, I did some writing on how the model applies to professional practice and wrapped it up. It was very long.

Arendt: For a master's thesis; that's dissertation-level work.

Comerio: I felt like that was what was expected of me. I returned to St. Louis in the winter with the draft that had evolved through the iterative process with John Borrego, and then spent a semester reviewing and editing it with the rest of my committee.

To produce the document, I typed my drafts on a typewriter and finally pasted up the final draft on blueline boards and took it to the printer and had it printed. We didn't have computers.

If I made a mistake, I typed that whole page all over again. It was a fairly time-consuming effort. I had to do all the drawings by hand to make them to the right scale for printing. All of that took a full semester and then I graduated.

Arendt: What an opportunity for you to pull

together so much of what you had learned and experienced in the field with that community of farm workers.

Comerio: It was a great set of experiences, something unique for a graduate student. Beyond that, I was able to produce a thoughtful document and develop some journal articles as well.

Arendt: Still, if one is going to be a champion for a community of people, one has to have credibility with those people.

Comerio: I was in the *Colegio* with a lot of interesting people who knew a great deal, but whose experience was somewhat limited. People would say to my friend Yolanda, "She is not Mexican," to which Yolanda would reply, "It's okay, she is Italian." I wasn't a *regular* white person; I was someone who had some immigrant understanding. I was also a female so that made it possible to develop close relationships with the women, and sometimes be forgiven my brashness by the men.

Arendt: It's hard for me to imagine much success had you been a man in that time suggesting they start a lunch program.

Comerio: I don't think it would've have happened.

Years later, in the early 1990s, long after I came to Berkeley, I met someone who told me the lunch program was still going. How great is that? Just last year I received an email from one of the guys at the *Colegio*. He really hated to cook and clean and always protested loudly. He found my name and he said he wanted to reconnect with me because that period of his life was one of the most important things that ever happened and he wondered what had happened to me. It was a very lovely thing to hear from him.

Chapter 5

Early Employment Experience: 1972–1977

Arendt: I know you've talked some about your employment during college. Can you tell us more about that?

Comerio: One of the first big projects that I did for Burton Duenke's company was a house for him, a large-scale project of about 6,800 square feet. The house consisted of seven individual peak-roofed buildings connected by an interior garden with a swimming pool. It sat on a magnificent site and was designed to preserve the trees while opening the views. It was built with large cedar beams and telephone poles. They started construction in the spring and it was finished in the summer after my senior year. I continued to work for Duenke's firm during my year off after graduating because they were building a very large addition—a conference center, parking garage, and more hotel rooms—to the resort hotel. My job was to complete all the drawings, do construction supervision, and design and purchase all the interiors. That seemed like a phenomenal opportunity.

Arendt: Did you create any notable designs for them while you were in graduate school?

Comerio: The hotel wasn't finished until I was in graduate

school. I produced all the drawings and went back and forth between school and this project. It was an amazing learning experience to be the architect on site, the architect making all decisions on just about everything down to the furniture and finishes. No one my age was getting that kind of responsibility. Half the time I was terrified and half the time I was exuberant because it was so exciting to do this work.

At the same time, I started to see the difference between working as a professional doing high-end, high-visibility projects for clients who could afford it and all of the issues surrounding poor communities. The project I was working on was so different from what my family could access or anything that anyone in a low-income, migrant, minority neighborhood might access. It was a dichotomy that was hard to square. I was doing the higher-end projects because I needed to work and I loved doing design, but I became increasingly frustrated with single-family home clients who wanted very elaborate and expensive things just to show off. I continued to do the work, but I knew it wasn't what I wanted to do when I graduated.

By the time I finished graduate school, I had ended my formal relationship with that company, although I did continue to do a variety of projects for them on the side. It wasn't a harsh breakup; it was more that I needed to go out on my own.

Arendt: So you started your own firm?

Comerio: I started my own firm, called Southside Design, in St. Louis. At the time, I had a contractor license, not an architectural one. This was the 1970s and there was a recession. The only way to get architectural work was to be self-employed in design-build; none of the architecture firms was hiring anyone. A couple of my friends started a firm called Westminster Builders. They renovated housing in what was called the Central West End of St. Louis. At that time, the Central West End was not the chic, beautiful, fashionable inner-city neighborhood that it has become. We worked together; I did much of the design work and they managed the construction. I was also doing other design work for different individuals: houses, interior designs, and a variety of different things. I also continued as a design consultant to Burton Duenke on some projects in New Mexico, in the Bahamas, and in other places as well.

During that transitional phase, it occurred to me that it was very hard to support myself and do the kind of work that that I really wanted to do. First, there wasn't the ability to be easily engaged in communities in the way that my volunteer activity as a student had provided. Second, it was very hard for a woman to get work on just about anything except residential work. No one wanted me to design anything more sophisticated than houses. It was a very discriminatory period. During that period, the light bulb went on in my head that if I wanted to be much more socially and politically engaged, and advocacy-oriented, then I probably needed to look for a job in academia where I would have that kind of flexibility.

Chapter 6

Into Academe and The Beginning of a Seismic Safety Career: 1978

Arendt: Tell us a little bit more about why you decided to pursue an academic career and move out of the Midwest to California.

Comerio: I was feeling frustrated with the quality and the level of architectural work that I could do independently or with other firms. I felt that it wasn't interesting enough; I wanted broader scale and more intellectual engagement. I also wanted to be involved in larger community and social planning issues.

I began searching for job postings. I applied to about ten different universities. I basically only applied to universities that were in big cities and that were on the coast. Either coast, I didn't care. I just wanted to be out of the Midwest. I thought that I needed to get to a coast to be in a more progressive place, to be in a place where maybe women weren't going to be so discriminated against. I don't know why I thought that that might be better on the coast, but I did.

So I applied to academic jobs. I didn't apply initially to the University of California, Berkeley. They had a job posting and it

was in community development and design, but by the time I had looked, it was already past the application deadline. Public universities were usually very rigid about those application deadlines. I was applying other places and had interviews at several schools. Then I got a phone call from UC Berkeley asking me to apply. They were unhappy with the pool of candidates they had received and they were reopening the application window.

Arendt: How did they know to reach out to you?

Comerio: I was told they found me because I was a graduate of the Architecture–Social Work program at Washington University. Someone thought that would be an appropriate background for the position they were advertising. Honestly, it never occurred to me that I would get an interview at Berkeley. It's a great university with a fabulous architecture school. In my relatively cynical thinking, I thought, "Oh well, I'm just the token woman candidate that they need to interview." At this point I had been on several interviews and had felt like the token woman candidate on several of them because in every single case I was the only woman interviewed and I would have been the first woman on the faculty. That was a little scary to ponder.

Arendt: How did the interview at Berkeley go?

Comerio: When I came to Berkeley for the interview, I was completely surprised to learn that there were seven women on the faculty. Some of them were senior and they were architects. That was fabulous. Because I still thought I was the token woman being interviewed, I was quite brutally honest in my responses to their questions. For example, during my talk, I showed many of the buildings that I designed. Dan Solomon, a faculty member and well-known architect said, "What do these have to do with community design?" I said, "Absolutely nothing! It has to do with knowing how to put a building together." I think that no one had ever been that direct in an interview.

I was hired, but I was also told that there were some faculty who supported a different candidate, someone who was a protégé of another famous colleague at Berkeley. I was told that I might have some people who didn't like me, but that I shouldn't worry about that, and come anyway. That was a very strange way to get a job offer, but I wasn't going to turn it down! I was very excited to be coming to Berkeley and to be part of this amazing school, in this amazing place.

I arrived in the fall of 1978. Joseph Esherick was the department chair and founder of the firm Esherick Homsey Dodge and Davis [EHDD Architecture]. Joe and a number of the senior faculty who were well-known architects were all really good to me. They liked that I had had multiple years of experience of actually building things. They thought that that was an important part of the whole community design effort. It turned out that in that particular moment, there was a competitive grant program through the VISTA and Community Action Programs.[4] The funding

4 The centerpiece of Lyndon Johnson's Great Society Program was the "War on Poverty." This legislation, called "The Economic

was administered through the Association of Collegiate Schools of Architecture (ACSA) and provided multi-year funding to five universities to run community design centers (CDCs). I applied and received one of those grants; by January of 1979, I had funding for a community design center that we opened in East Oakland on East 14th Avenue.

Arendt: That is a tremendous accomplishment considering you were early in your academic career.

Comerio: I think it was a good proposal and maybe it helped that it came from Berkeley. There were two schools on the West Coast that received the grants; the other was the University of Washington. Because part of my teaching job was to develop a curriculum in community development and design, I was thinking about this even before my feet hit the ground in California.

On the airplane, on route to my job interview, I met a pastor from East Oakland. I was telling him that I was coming to Berkeley for a job interview in community design. He said, "You can come work in East Oakland. We'll fix you up." So, in the fall of 1978, as a newcomer to the Bay Area, I drove around with a map pasted on my steering wheel. East Oakland had an African-American community. I felt comfortable there. It reminded me of neighborhoods in St. Louis. The pastor and the churches were great. There were lots of community-based organizations and a lot of activity. It seemed an obvious place to start.

The funding provided money for jobs for six students a year, both during the year and in the summer. We also taught design studios every semester at the Community Design Center. There was the opportunity to work with a larger group of students through the studio, and then continue that work in the community with the students who were being paid, and who could provide some continuity between the center and the community. I immediately asked the Chancellor for money to help support this effort and I asked the City of Oakland for matching money. I received most of what I asked for. Then the City of Berkeley called me and said, "We want you to do this here too and will give you some money."

We opened another storefront in West Berkeley. At that point, I had money to hire some part-time staff, a more senior architect who could help keep things moving at the community level. I thought it was important to have an African-American architect in that role, and Jim Vann became the center director. We had a part-time bookkeeper to keep track of all the grants. This was happening in addition to my teaching a regular course load of more conventional studios, lecture classes and seminars. I continued to get grant funding for the Community Design Center through the middle 1980s.

Opportunity Act" of 1965, consisted of several programs such as Job Corps and a student Work-Study Program called Volunteers in Service to America program, better known as VISTA. VISTA was a domestic version of the popular Peace Corps program. The 1979 funding for five architecture schools to develop community outreach programs was a combination of VISTA and the "Community Action Programs". (https://socialwelfare.library.vcu.edu/war-on-poverty/american-social-policy-in-the-60s-and-70s/)

Arendt: This is quite extraordinary, knowing what life is like for typical assistant professors. They're usually caught up teaching the courses they've been assigned and trying to get their research agenda moving.

Comerio: I thought of the Community Design Center as my research. That was where I was focusing my research interests. We were publishing some things. I was also writing journal articles, but publication wasn't easy. There was an ongoing conversation in architecture at that time about what is practice, what is research, and what is publication. For architects, this is always muddy. Universities never know quite what to do with architects. That became more complicated with tenure later. Obviously one has to write more. It was eight years before I was reviewed for tenure, the maximum.

We architects all needed more time to get papers and research reports and other design products out there. Since then, the College of Environmental Design has written a guide for how to evaluate architects, landscape architects, and city planners that has become a national standard. I wasn't the only faculty member in this situation; we all had had tenure struggles. Anybody who was doing architecture and trying to figure out how to get his or her work recognized and evaluated had a hard time around tenure.

Arendt: How popular were your courses? The topics that you were covering, were these of interest to students? Were they engaged with this idea of being in a community and wanting to present architectural solutions that made sense for the people there?

Comerio: There was a significant number in the late 1970s and early 1980s that were very engaged. It was also the beginning of the end of that level of interest. The 1960s had been such a huge period of political foment and advocacy that there was a kind of a pendulum swing the other direction. By the early to middle 1980s, there was a renewal of interest in architectural form for form's sake.

By the mid-1980s, Postmodernism had exploded.[5] Architects were designing pink and blue buildings with funny tops on them. While that was happening, there was no trouble filling a studio with people interested in community design. There was no trouble hiring students to work on community projects. It was still part of the 1960s to 1970s carryover of interest in the more social side of architecture. Still, there were huge debates within the school about whether this was the right thing for architects to be doing. It was Berkeley. We argued about everything in public. Nobody shied away from a good debate.

Arendt: This is a good thing, right?

Comerio: We had meetings and forums and discussions. It did not always make cordial relationships among faculty, but it did give the students a lot to pay attention to. At Berkeley, the attitude for many years—and probably

5 Postmodernism really began in the 1960s with Robert Venturi and Denise Scott Brown's rebellion against the uniformity, the lack of ornament, and the lack of social and urban context in modern architecture. However, the designs of notable buildings by Michael Graves and Phillip Johnson and others in the 1980s made postmodernism mainstream.

still today—is that students come to Berkeley to get exposed to radically diverse points of view. Our students have to listen to a diversity of opinion within the field, and figure out for themselves the right approach to design. I found that enormously refreshing and very different from our chief rival, Harvard, where there is a set of agreed values and design approaches in the Graduate School of Design.

Arendt: Sounds like it was a great fit for you.

Comerio: It was a great fit for me even if the department was tumultuous at times. It was a fascinating time to be in the Bay Area because my work paralleled things that were happening in the larger community. There were a number of nonprofits that were emerging out of the community political activism of the 1970s around design and around housing production. It was happening at the neighborhood level. In San Francisco's Chinatown, there were several community service agencies, including some focused on housing, such as the Chinatown Neighborhood Improvement Center [CNIRC], the Chinatown Community Housing Corporation [CCHC], and Asian Neighborhood Design [AND]. Many of their staff had been our students both from architecture and planning. It wasn't surprising that we had a relationship with them. There were similar organizations in each neighborhood in San Francisco and many in the East Bay. For example, some important groups in San Francisco included Tenderloin Neighborhood Development Corporation and Mission Housing; and in Oakland there was East Bay Asian Local Development Corporation. Asian Neighborhood Design was literally down the street, a few blocks from my apartment. I knew them very well and became involved with some of their projects in addition to the projects we were doing through UC Berkeley at the Community Design Center.

Initially, some of these groups were not sure what this new university entity was doing. Was it going to compete with them? I felt it was really important to assure them that I would never compete with a neighborhood-based entity. We were there with funding to provide assistance to them. We would not go after the same kind of grant money they went after. We would compete for different pots of money. We built a very good relationship between UC Berkeley and all of these other organizations. Many of them were just beginning to figure out how to get financing to buy buildings and renovate them, and maintain them for affordable housing. This was very new in the late 1970s and early 1980s.

It was very exciting to be in the Bay Area at that time, because so much was happening and it was mirroring things that were happening in New York. We were learning a lot from people in community organizations in New York. Our students often went out and worked for these different organizations. I would estimate that most of the staffs of the nonprofit housing organizations in the Bay Region are made up from our students, to this day.

Arendt: That's extraordinary.

Related to this, can you talk about the Center for Environmental Change and its relationship to the Community Design Center?

Comerio: Sandy Hirshen was a faculty member in architecture who had been involved in community design. Before I arrived in

Berkeley, he and others had established the nonprofit 501(c)(3) Center for Environmental Change [CEC]. It was set up this way to keep community project funding in the community, without extracting a large university overhead charge typical on conventional research grants.

The CEC existed on paper, but it had been dormant for several years. When I was in the process of creating the community design centers, we did the paperwork needed with the State of California to revitalize the nonprofit entity so that we could use it to manage the funding for the community design centers. I served as President of the Board and Executive Director from 1981–1989. Most of the money came from the cities of Oakland and Berkeley. Any other funding went through the CEC so that all the money could go into the program. The logic was that we were operating in off-campus centers and therefore we weren't using any campus facilities or space. At the same time, the university decided our work was important and they were going to enable it. They recognized that the sums of money we received were relatively small and they liked what the CEC stood for.

Arendt: You also did some pretty important consulting and outside project work in the early years of your academic career. What can you tell us about that?

Comerio: I did some work for the Mott Foundation on models for community development assistance and I did some work in Grenada in the early 1980s with another nonprofit group from the Bay Area on indigenous housing program development. But probably the most significant of the projects I worked on were the ones that got me involved with earthquake engineering.

Arendt: How did you get involved with that?

Comerio: Since I came to California from the Midwest, earthquakes were really scary to me. I was trying to understand the seismic code, and given what we were doing, how do we make the existing housing that we were renovating for poor people safer? I was particularly worried about that on two projects we were doing in East Oakland. One was new construction of self-help housing with a neighborhood group. The second was working with a community organization to repair and retrofit vacant units. East Oakland had approximately 1,300 vacant units at that time. They were mostly located next to infill public housing projects. But people needed housing, so there was a process of getting the owners to do something to upgrade the property or sell it to a nonprofit group. The Community Design Center was working with both of these groups on the design drawings and planning for the work.

But there were seismic issues: how do we make sure that these bungalows in East Oakland with cripple walls and no ties to the foundation were safe? There was no guidance out there, nothing to help us figure out how to do that. With Sandy Hirshen, my colleague in the architecture department, we received some funding from the National Science Foundation [NSF] to do an "Earthquake Advisors Handbook," published in 1981. For years it was a kind of go-to document for how to retrofit a house—until the State Seismic Safety Commission actually prepared a more formal guideline.

At the same time, because I was working with Asian Neighborhood Design, I was involved with the retrofit of three- to six-story brick buildings in San Francisco; in Chinatown they often had ground-floor commercial, which meant they had soft stories. Those were an earthquake hazard! But at that time in San Francisco, if the value of the retrofit was greater than 50% of the value of the building, the code triggered a full seismic retrofit to current code. If the retrofit was less than 50% of the value, nothing seismic was required. I was flabbergasted. I kept saying, "What's wrong with this picture? This makes no sense. What can we do to make these buildings safer, even if it's not required by code? What's technically correct?"

This is when I got into what became a "famous argument" with Dan Shapiro, the structural engineer working on one of these projects, who said, "I have to sign the drawings, Mary. I can't give you a seismic scheme because it would not be up to code." But at AND we went ahead and put some X-bracing in and tried to do a few things that we thought might be logical during construction. These additions were not on the drawings. We couldn't get an engineering opinion about this.

Around the same time, I was involved in a couple of different conferences. One was a FEMA-USGS conference at UC Berkeley in 1982. A second regional meeting on seismic risks was in St. Louis in 1984. The paper I presented in St. Louis at the ASCE AIA seminar on "Aspects of Seismic Risk in the New Madrid Fault Region" was called, "Seismic Sanity: Somebody Else's Problem." This paper came out of my absolute frustration with this inability to figure out how make affordable housing safer without killing the project with the cost of a "full-code" retrofit. I wasn't able to get any funding to figure it out because NSF would look at my proposals and say, "Oh, that's way too social. We're not touching that." Then, if I applied to a foundation here in the Bay area, they'd say, "Oh, that's way too technical. We're not touching that."

I wrote what was perhaps a polemic paper, suggesting that we really did have to think differently about the integration of seismic safety and housing, because poor people would be inordinately affected, since they were living in vulnerable buildings and no one was paying attention. That was my entrée into seismic research, but it was always as someone who was thinking about housing. I saw myself as a community designer, not as somebody who was branching out into another field. I saw myself as a frustrated architect, who couldn't work out why the engineers wouldn't figure this out. Why didn't they think it was important?

I wasn't super popular with the San Francisco Building Department then because I was showing slides and giving talks about the quality of life inside residential hotels in Chinatown and the Tenderloin, which wasn't very high. Plus there were six code violations in every slide. It was a little bit embarrassing for the city. At the same time, the "Seismic Sanity" paper got some notice. It was after I gave that talk in St. Louis that I received a call from Dean Macris, the director of the planning department of the City of San Francisco. He said, "We want to fund you to do some

work on this earthquake safety and housing issue." Of course I was thrilled! That was the beginning of a very large research program that was, I think, one of the really important projects in my career. This was happening in the same time frame as other seismic policy developments. In 1981, Los Angeles had created a seismic retrofit ordinance for masonry buildings. In 1985, the State of California passed S.B. 547, requiring local jurisdictions to inventory their unreinforced masonry. The issue was in the ether thanks to the 1971 San Fernando earthquake and the 1983 Coalinga earthquake, in which a number of masonry buildings collapsed.

I knew very little about all of the other earthquake events at that time. I wasn't fully engaged with EERI or the rest of the earthquake engineering community, but I was going to meetings in San Francisco and trying to figure out what some of the issues were. I was probably the only architect in the room. No one quite knew what to do with me. There were mostly seismologists and engineers. I was trying to make the housing case, which hadn't gone over particularly well with people who liked to think about the technical side of the problem rather than the social side of the problem. I was arguing that it does not help community safety to apply the standard of a new building code to existing buildings, where the cost of the requirement would result in the demolition of many buildings, displacing thousands of people. That was a hard case to make in the early 1980s to the engineering community. Their role was to work on the code. Their role was to get the best seismic regulations into the code that they could. If that applied to existing buildings, so be it. Safety mattered and I understood that, but I was worried about the unintended consequences.

Arendt: That's a key phrase! Sometimes people in pursuit of a particular objective can lose sight of the practicalities of daily life, especially for folks whose socioeconomic status is not particularly high.

We've definitely witnessed an important evolution, right?

Comerio: It has evolved enormously, but at that time, that wasn't where earthquake engineering was. The focus was primarily on new construction and existing buildings were a new problem.

At the same time, this was just one of many things I was involved in. We were still doing work in many low-income neighborhoods. I was also doing work with groups in Chinatown. I was continuing to teach all my regular courses and was also involved with the International Laboratory for Architecture and Urban Design (ILAUD), which was run by Giancarlo De Carlo in Italy. ILAUD was a consortium of ten schools of architecture, with UC Berkeley, MIT and UCLA from the United States, along with seven European schools. I was teaching there over two different summers in 1983 and 1984. All of these things were happening simultaneously.

Arendt: You had a lot going on!

Comerio: Well, I was just an average assistant professor.

Arendt: Indeed. [laughter]

Since Google wasn't a thing at that point, how did you learn what you needed to know in

order to have conversations with earthquake engineers? How did you acquaint yourself with what they knew so that you could have those conversations?

Comerio: I was always pretty comfortable with the technical side. I just relied on the friendlier engineers to help me. Dan Shapiro, Peter Cully, Eric Elsesser, Bill Holmes, and Bob Preece were engineers that I knew. Some of them were involved with my research and/or professional projects. Because we saw each other on projects, we had lots of good conversations. They were all willing to talk to an architect who was willing to learn their perspective on seismic issues. They all had opinions about the state of the codes and what should be done, but they could not change the law.

Arendt: It strikes me that you were learning and building networks of experts, people in the know, who could continue to help you in your education about seismic issues.

Comerio: At the same time, between 1978 and 1985, when architects were renewing their interest in the formal aspects of design, the housing nonprofits, established in the early 1970s, got their feet on the ground. They developed fundraising skills and built several projects. Real buildings were being built (or renovated) in communities by nonprofits. The experience changed their need for the community design services. Also, right around that time, the federal government changed its funding models.

Previously, the nonprofit housing organizations could only get money for the construction portion of a project from the federal agencies. When the feds changed the community development funding formula, it meant that the non-profits could get money for soft costs, such as architecture and engineering. Whereas previously, they relied on community design services, under the new regulations, they could pay for professional services. This created a major transition in community design as well. I wrote an article about this called, "Community Design: Idealism and Entrepreneurship," because everything changed and the nonprofit housing developers no longer needed free design services (from the university or other pro-bono entities) in the same way.

By the mid-1980s we were essentially closing the community design centers. The group of faculty that were involved—Randy Hester from Landscape Architecture, Ed Blakely from City and Regional Planning, and others who were helpful at various different times—felt that we needed to concentrate more on research and less on service delivery, because that was where we as academics could continue to be useful to our community colleagues. They were developing a track record and becoming well-established. They had funding. They didn't need the services we were providing in the same way.

Arendt: It sounds like that transition, the evolution in how community design was funded, aligned well with where you needed to head next in your career, which was getting tenure and continuing to move on.

Comerio: That time brought to a close some of the on-the-ground work with the community design centers. I continued the relationships with many of the other

community organizations. My work with those groups led to a major research project on earthquake hazards and housing, and also led to my return to professional practice. All of these things happened around 1984–85, when I was also going up for tenure.

Chapter 7

Juggling Academe and Practice: 1985–1990

Arendt: Related to professional practice, why don't you tell us about your work with George Miers?

Comerio: George Miers and I were classmates at Washington University. He was from San Francisco. He was a year ahead of me, but we were in studios together. He returned to San Francisco and finished his last year of graduate school at UC Berkeley because he got married, had a child, and decided to stay in the Bay Area.

When I came to Berkeley, we re-met. He worked for a large architectural firm, Kaplan Mclaughlin Diaz [KMD]. He kept saying, "I want to go out on my own. I don't want to work for a big firm anymore. You were the best person in school, why don't you join me?" And I kept saying, "I have to get tenure, leave me alone." [laughter]

But he kept bugging me about it. About 18 months before the whole tenure decision was to be made, he said to me, "There's a design competition for a civic center. Let's do it! And if we win, you have to join me." He had just set up his own firm, working mostly for developers. He wanted to find a way to break into public work. We worked on the competition at night, on our own time, not on the firm's time. All the people involved worked with the understanding that if we won, we would all be part of the next phase. And we won!

The design competition was for a city hall in Novato, which to this day is not built. Despite the city's need for space, and their sponsorship of the competition, there was a movement by a group of older women in town called "Novatons against Goliath" who were against building anything. The city hall was housed in a tiny historic church with no room to grow. Our plan, which incorporated the church and was just a modest two-story building, was unacceptable to them and they invested a great deal of energy to stop the project!

It was remarkable. There were, perhaps 40 or 50 public hearings, each of which went late into the night. Dan Iacofano, who was well known for his participatory design work as a landscape architect, was hired as the facilitator. By the time we were half way through this process, Dan was so frustrated with the politics. It didn't matter what he did or what we said. The women were relentless, and ultimately, the City Council decided not to go forward with the redesign.

Even though the design competition didn't end as expected, George and I did win three other public building design jobs. So it was inevitable that I became part of the firm. I was juggling the usual professor load — teaching, research, and practice — meaning that I was only in the firm two days a week. Of course, the staff seemed to think I was on vacation the rest of the time. It was amazing how hard it was to be a practitioner when the rest of your firm had zero respect for what you did in the university.

Arendt: So many people think that university faculty have infinite amounts of time.

Comerio: Because our classes only meet a few hours a week, we must have vast amounts of free time. What else are we doing? [laughter]

Actually, it was fun to be back designing buildings again. Because of all the community work I'd done, I was very good at the front-end planning on our public projects. They included city halls, libraries, police stations, and community centers. The projects were part of urban growth and the incorporation of new cities in Contra Costa County that coincided with the big developments of back-office space for what was then called "pink collar" jobs, in those same areas.

We grew to be a firm of 25.

Arendt: Where was the firm located?

Comerio: Our first office space was in an old warehouse that was literally under the Bay Bridge on Bryant Street in San Francisco. I still look at that building with some amusement since I washed every window on our floor when we first moved in, because it was a filthy, dirty warehouse. Now, of course, the building hosts some super posh office space. Then we moved to a space near Union Square that was a mezzanine floor of a single-room occupancy [SRO] residential hotel. However, the hotel entry was around the corner and we entered through a hallway in a commercial building on Sutter Street. Only *we* knew about the upstairs neighbors in the residential hotel.

The space must have been a large restaurant at some point. It was a 5,000 square foot open area, perfect for architects. We were doing a number of public projects. Being an academic, I turned them into research studies. Because our clients were newly incorporated cities,

they didn't know what kind of buildings they needed or how much they were going to grow. I did an extensive review of other cities in California and developed a genre of research on public building types in cities of various sizes and published it. The comparative data made our firm very attractive to other cities.

Arendt: You're good at finding synergies in your work, aren't you?

Comerio: It seemed like the natural thing to do. I always liked to base decisions on empirical data. At the same time, my office was also working on multi-family housing projects, some with developers and some with the San Francisco nonprofits that were developing affordable housing. One project we designed was in Bernal Heights in the "air rights"[6] over a commercial space. In this case, the nonprofit housing corporation was partnering with a chain store to build affordable housing in the space above the store. It was initially planned as family housing, but ultimately became a senior housing development. Because the ground floor was to house a paint store, we had numerous technical and code issues to deal with.

I was the person dealing with the Building Department, trying to get them to understand that the code didn't cover these kinds of situations because they simply didn't exist before. There were no clear rules about what happened between the ceiling of the paint store (with a high level of fire protection required) and the housing above.

Luckily, we had the politicians on our side. Senator Dianne Feinstein really wanted this project to happen, as did Mayor Art Agnos. It was built, but not without a great deal of wrangling with the Building Department and the fire department. The housing is called Coleridge Park Homes. There have been many changes in the commercial space usage, but none in the housing.

Arendt: What else were you doing at that time?

Comerio: I continued working with the nonprofits on renovations of single-room occupancy hotels, especially in Chinatown and the Tenderloin, and trying to sort out some of the seismic issues and how they related to housing.

After one of my talks in 1984,[7] the San Francisco Planning Department funded a research project on the problem of "earthquake safety and housing." At that point I was very burned out because I had been trying to fund research on this topic for three years. Suddenly, here was the city offering me money. I said, "Okay, but funding is not going to make me shut up about this problem." Dean Macris said, "Fine, fine, we really want you to do this work."

The easiest thing to do was run that contract through the Center for Environmental Change

6 Air rights are the property interest in the "space" above a parcel of land or a building. In the 1980s the idea of selling or leasing the development rights to the "air" above a building was introduced.

7 See description on page 39 of this document. The conference was the ASCE AIA seminar on "Aspects of Seismic Risk in the New Madrid Fault Region," and the paper was called "Seismic Sanity: Somebody Else's Problem."

at the university. I hired students, involved consultants both academic and professional, and ran it like a traditional research project. That said, much of the work by my students took place at night in my professional office, George Miers and Associates.

We had two computers in our office and a fax machine! The students thought that was better technology than what they could use at school.

We often worked late at night. I still think of that project as one of the most significant of my career because in many ways it shaped much of my future research. Here I was, bridging professional practice and the academic world, and I knew enough about construction and about buildings to know where the problems were. I also had a history, before coming to Berkeley, of working with a developer and knowing all about costs and development financing and the real estate side of it.

The work plan for that project, "Earthquake Hazards and Housing," really had two parts. One part was technical and included an inventory of all the residential buildings. We did an inventory of every unreinforced masonry residential building, 1,800 to 2,000 of them, in San Francisco. They represented the majority of the unreinforced masonry stock. We classified them by height, by number of units, by dimensions, by aspect ratio, and shape. We found many buildings that were small three-story boxes located mid-block and a few that were six-story L- or E-shapes or six-story rectangles with long street facades and soft stories. The latter types were clearly more vulnerable.

At that time there wasn't a protocol for the retrofits of URM buildings. The San Francisco code was based on a value-of-improvements trigger, which is essentially "all or nothing." Upgrading to current code was virtually impossible in terms of the cost impact on low-income housing. Los Angeles implemented a URM [unreinforced masonry] retrofit ordinance in 1981, but the majority of buildings cited by 1984 were commercial buildings. Los Angeles had not begun to cite or upgrade any residential buildings at that time. I looked at the few that had been completed. These included multiple shear walls parallel to the facades together with bolting of the exterior walls. For relatively small two and three-story buildings, it seemed like a heavy-handed solution.

In the research project we convinced five engineering firms, representing a range of design philosophies from conservative to maverick, to test alternate design solutions. Kit Wong, a Master's and later Ph.D. student in the joint Architecture-Engineering Program, worked with me on this project. We prepared a matrix of the different buildings and all the different possible ways one could retrofit them: steel K-braces, plywood shear walls, bolting the floors and walls together, etc. We assigned each of the five firms a subset of these to analyze and to design a retrofit scheme for a set of prototype buildings. When their work was complete, we had them all come together in the Berkeley Architecture School for a day and present their schemes to each other. Bill Holmes said to me, "Engineers don't do this." And I said…

Arendt: "Architects do!"

Comerio: Exactly. In addition, I invited Lee Saylor, the author of one of the nationally used

construction cost guides.[8] Lee Saylor lived in the Bay Area, and he personally came to this meeting and assigned costs to every scheme while people were talking.

Arendt: I'm imagining a *charrette*. Is that what you're describing?

Comerio: It was the presentation component of a *charrette* because the firms did the engineering work in their offices. However, Lee's adding machine whirred all throughout the presentations and by the end of the meeting, it became absolutely clear that the only thing any nonprofit could afford was what was later called "bolts plus." This was a scheme that was applicable to the smaller three- story mid-block buildings, where the first effort was to bolt the floors and the walls together. The need for a brace for a soft story, or perhaps one sheer wall was the "plus" and the design would be evaluated building by building. Almost everyone agreed that it was overkill to insert numerous shear walls in three- story square buildings located between other buildings in the middle of the block. Corner buildings or those with soft stories might need additional bracing, but the group agreed that should be decided building by building. It was a very important kind of understanding the group reached that day: what was technically reasonable for a code and what it cost to implement it.

That was the first part of the study. At the same time, two additional student research assistants worked on financial prototypes of the same buildings. One of the students, Jim Buckley, was an architectural historian who was very good at detailed building information research. The second student, Sue Bloch, was a planning student who later became a land use lawyer, and she ran the real estate financial *proformas* on the buildings. We evaluated the ownership patterns, the financing, the income, the operating costs and created prototypes to describe typical patterns. The financial status of the building owners would help us understand what they could afford in terms of retrofit financing.

Arendt: This sounds like a good mix of disciplines being brought to bear on this complex problem.

Comerio: I just saw what was needed. The historian is still my friend, but he probably will never forgive me for that assignment. In those days, if a person wanted to look up property records, they had to go into the dusty old file cabinets in the basement of City Hall. The poor guy spent weeks looking up the records on every one of those buildings. Then, we had a very good break thanks to my relationship with the Chinatown nonprofits. Ed Lee [later San Francisco's mayor, who passed away in 2017] was a young lawyer with the Chinatown Community Housing Corporation and Ed and some others said, "We know what you are doing. We think it's good. We will get people to open the books."

There was one property management company that probably managed 70% of this housing. They provided all the information needed: their financing, their mortgages, their rents, their operating expenses, everything.

8 There are three major construction cost guides: two are by companies called Dodge and Means; the third is by Lee Saylor.

So we developed the real estate *proforma*s on the prototype buildings by ownership types. What we found was that the Chinatown owners who were located on Grant Avenue or nearby, and who had commercial ground floors, were easily able to finance any retrofits because they were making good money from the ground floor rents. At that time, the ground floor rents on Grant Avenue were the same as the ground floor rents on Union Square. There was this perfect economic map of how the rents fell-off as one got further away. On the parallel Stockton Street and also on the streets perpendicular to Grant, the rents fell off in a perfect pattern.

At one point I said in a meeting with the community groups, "Well, the owners are essentially subsidizing the families upstairs." They said, "Yes, but don't ever say that word out loud. Just say that it makes housing rent more economically feasible." In the Tenderloin and South of Market, for the most part, the buildings did not have ground floor commercial space. It was the 1980s, and the Tenderloin was transitioning from being home to prostitutes and drug dealers to housing Southeast Asian immigrants. It was also when Reagan had passed the tax laws that made real estate a really good investment, so those buildings were bought for tax shelters. Consortiums of doctors and dentists and other professional groups who were taking the tax write-offs from these buildings were the primary owners. But they were mortgaged to the hilt. The rents were nowhere even close to paying the mortgages, much less any other expenses, but the owners wanted the properties for the tax deduction, so they didn't care. Unfortunately, there was no way any bank was going to give them any loan to do a seismic retrofit.

So we had two very different conditions. When we wrote the report, I suggested that we propose a limited requirement to bolt the floors and the walls together for the small three-story boxes, which represented a large percentage of the buildings. Then the city could develop a higher standard for the others that were more challenging structurally, that is, buildings that were taller, with re-entrant corners, and other conditions, which needed more of an intervention.

We knew we would need a loan program because even the Chinatown owners would prefer a city loan over the difficulties in obtaining a private one. At that time, it was virtually impossible to get a conventional loan from a bank for a seismic retrofit for housing. In 1984–85 there was no bank willing to give anybody a loan for this type of upgrade.

It took until 1991 for the city to pass that as an ordinance. In order to have a loan program, there had to be a bond issue, which meant it took from the mid- 1980s until the early 1990s, and it required two ballot measures. It was after Loma Prieta when Measure A passed finally. By then, I had made a lot of enemies in the professional engineering community who thought that it was wrong to have a so-called "lower standard" that was not up to full code for any retrofit. My argument was that we could either retrofit these buildings in order to keep them as affordable housing, or we could tear them down and make all those people homeless. What's the right choice here?

I was frustrated with them; they were

frustrated with me. Over time, I think people came to see the value of the approach. Also with the experience after Loma Prieta of the demolition of almost all of the Pacific Garden Mall, the historic preservation community started to pay attention to these issues, because they suddenly realized that the codes were not their friend either. What's really important about that project for me was the blending of the technical and the social with the economic/real estate pieces. We needed to say, "The research doesn't work unless we can accommodate both of these concerns." And we did.

Arendt: Mary, I think this is a theme that runs throughout your career. Your ability to be a bridge.

Comerio: Later, probably after Loma Prieta and Northridge, at an EERI meeting in which I was giving one of the plenary talks, Chris Poland said something like, "We don't have to pay attention to housing, since wood buildings performed well." I said, "I beg to differ with you. Here are 5,000 records that will show that's not the case." Chris responded, "You know what, you're right."

Many in the engineering community didn't take housing seriously because wood frame houses weren't usually engineered buildings, so it wasn't in their world of work. It wasn't their fault. It just wasn't in their job description. When they thought of housing, many people thought of housing as single-story American suburban housing. They did not think about urban centers like in San Francisco, where 75% consists of apartments and many of those wood frame buildings have problems.

Housing was seen as part of a different category. It had a separate code. After Northridge, for example, it was astounding to learn that when the engineers started looking at the housing code, it had not been changed since 1950. They were blown away by the fact that no one had looked at it in 40 years. So Jim Russell and others rewrote the housing code.

Arendt: People weren't intentionally ignoring this part of the built environment so much as dealing with what was more typically on their radar, that is, commercial buildings and so on.

Comerio: When we think about commercial buildings or offices or retail or whatever, we can't think about them as just steel and concrete. We have to think about these structures as part of the urban environment, as part of an economic environment. We have to recognize the context in which these buildings exist. That was really important for me.

Having this research project at this moment, as I was transitioning away from the community design work, mixing that research with practice and then adding the earthquake-related work created the kind of research that I always thought I was supposed to be doing. All of this was very exciting. However, it is important to recognize that this work happened because of a very committed multi-disciplinary team. The collaborative effort made the project what it was. The team included the following individuals and benefited from the cooperation of many staff members of the San Francisco Building and Planning Departments, as well as the help of numerous community organizations.

Earthquake Hazards and Housing Project Team

Engineering Consultants:	Peter Culley Eric Elsesser William Holmes Robert Preece Daniel Shapiro
Cost Consultants:	John Robertson Lee Saylor
Policy Consultant:	Richard H. Cowart
Real Estate Consultant:	David Dowall
Research Assistants:	Susan Bloch James Buckley Elizabeth Newman Ann Winchester Kit Wong

Arendt: It strikes me that if you hadn't had all the experiences that you'd had before this, and if you hadn't been developing relationships along the way, this project could not have happened the way it did.

Comerio: So often I have heard students say, "I want to be you. What should I do in school?" My answer: school is only a very small part of what a person needs to be successful. You have to work! It's not as if there's a class you can take and suddenly you are qualified. You have to develop expertise. In my case, I was an architect with social science training in graduate school, economic and development training from my professional experience, and a willingness to learn some engineering.

Arendt: You had clearly built up the necessary social capital. People trusted you to be a credible source of information.

Comerio: I was a known commodity both on the academic side, from Berkeley, but also on the professional side from my experience and also through my community design work. At the time, it seemed like I knew everybody in the housing nonprofits in the Bay Area.

Arendt: As you continue thinking back to your years practicing architecture, were there any other major projects that should be brought to our attention?

Comerio: The interesting thing is that in the course of doing the "Earthquake Hazards and Housing" project, the 1985 Mexico City

earthquake happened. Since I didn't join EERI until 1988, I didn't go to Mexico City as part of an EERI reconnaissance team. But I went to Mexico City after the earthquake because a man named Manuel Perlo, currently a professor at UNAM [*Universidad Nacional Autónoma de México*] in Mexico City, had been a Ph.D. student in the Department of City and Regional Planning. He was actually my husband's student. Manuel had finished his Ph.D. and was in Mexico City at the time of the earthquake, and he organized a number of planning and architectural research projects. He invited me and David Dowall, another faculty member from the planning department at Berkeley, to a series of big meetings in Mexico City on the recovery.

That earthquake enhanced my interest in what happens to housing after a major urban earthquake. At around the same time, because of my work in San Francisco, I got a call from the Rent Stabilization Division of the Community Development Department in the City of Los Angeles. Both the Housing and the Rent Stabilization Divisions had separate directors, but were part of the larger Community Development Department. They said, "We have a large number of residential buildings. The Department of Building and Safety is scheduled to begin issuing retrofit notifications to the owners. Because of the Mexico City earthquake, the City Council wants to speed up the notification process. We are worried that doing so is going to freak out the owners and they're going to tear down the buildings. Can you come and be a consultant for us?"

The result was that for much of 1985 to 1989, before Loma Prieta, I was working as a consultant for the City of Los Angeles through my professional firm, George Miers and Associates. Kit Wong, who had gone from being a Masters student to a Ph.D. student, worked with me again. He was fantastic.

Kit and I did a great deal of work in Los Angeles bringing an academic mindset to the issues faced by the city. Again, we looked at the development issues, specifically the characteristics of the owners, and the characteristics of the buildings. We persuaded the city to pace the enforcement for the residential owners, 95% of whom had received their notices in 1986. We were trying to understand the costs for the residential buildings, because no one had reviewed the retrofit costs. It turns out that large numbers of the commercial buildings were torn down because the retrofit costs were uneconomic.

In 1992, I published a paper in *Earthquake Spectra*[9] on this. Los Angeles had 8,100 URM buildings, of which 1,582 were residential with 46,000 housing units concentrated in four neighborhoods. Given that many commercial buildings had been demolished and turned into parking lots, the Community Development Department was concerned about losing residential structures. And they were not sure how retrofits could be financed or what would happen to rents.

In order for the Community Development Department to design a low-interest loan program, they needed to understand retrofit

9 Comerio, Mary C. "Impacts of the Los Angeles Retrofit Ordinance on Residential Buildings," *Earthquake Spectra,* vol. 8, no. 1, 1992, pp. 79–94.

costs. We found that the seismic portion of the work ranged from $7 to $12 dollars per square foot, but the rehab costs could balloon to $45 dollars per square foot. Part of the cost differential was due to prevailing wage and fire safety requirements in government loans. However we also found owners who were intent on raising rents and using the seismic requirements to do substantial upgrades to the units. Bathrooms and kitchens became ideal locations for shear walls. Our detailed data helped to limit some of the more egregious practices. Ultimately, I believe our work with the City of Los Angeles helped to limit residential demolitions, limit retrofit costs, and limit rent increases.

After this work was complete, I became involved in other projects in Los Angeles that were not about seismic retrofits. One of them was a review of a retrofit program for fire sprinklers in high-rise housing. The city found it very useful to have an outsider—a professor from UC Berkeley as opposed to somebody local— do the review. Local engineering and sprinkler firms often had close ties to the Fire Department. I didn't have ties to anyone there. When there were disagreements at City Council meetings, I could take the flak. Ultimately what these sorts of projects meant was that I was doing a limited amount of traditional architecture. These projects were running through my firm and they were supporting people, but I didn't need a lot of architects on the projects.

That said, I did work on a number of interesting multi-family housing projects. Two were in what is now Mission Bay in San Francisco. At the time, development had only just started in that neighborhood, and mostly, it was all empty land. There was one nonprofit project and one market-rate project that we worked on. These were incredibly complicated projects because the designs had to be approved by the city and the Redevelopment Agency. They had complex financing and were located in an industrial zone. As early developments, there were few precedents and agencies didn't know what to do. It's hard to believe that now! I can barely see these projects today, as they're surrounded by other developments. At that time, they were the first things on the block. They were interesting and complicated. I was working with the clients, working with the city, working with the Redevelopment Agency, going before the Planning Commission, going before the Redevelopment Commission—what architects call the front end of a project.

I was the public voice and the planning voice of most of those projects. When we received approvals and moved on to construction drawings, I was less involved. I was not sitting at a drafting table. That wouldn't have been a realistic use of my time.

As principals in a firm, George and I had to do things like manage our insurance and pay the rent. At one point in our open-plan office, Kit Wong was sitting next to me and, after I'd been on the phone for hours one day, he looked at me and said, "Is this what the principals of firms actually do?" And I said, "Yeah, welcome to the real world! This is what happens. This is how we spend our time."

Probably three-quarters of my time by the late 1980s was spent on the earthquake-related consulting and one-quarter was spent on

buildings. I was flying to Los Angeles almost every week.

That was in the good old days before we had the TSA. Flying on a plane then was like getting on the bus. I could show up ten minutes before my flight and get on. If I missed my scheduled flight, I just got on the next one.

Chapter 8

Advocating for Housing in Havana: 1988

Arendt: I suspect it'll surprise some folks to know that you once met Fidel Castro, the now-deceased Prime Minister and President of Cuba. What can you tell us about this experience?

Comerio: In 1988 I was invited to be part of a U.S. Cultural Exchange on a team of academics and professionals in architecture and planning. We were invited because we had expertise in urban housing and urban development. We were selected to work with a parallel group of planners and architects in Cuba who were concerned about the changing character of old Havana, not only the historic core, but also the larger center of Havana. The Cuban team members were appointed to a strategic planning group. They understood the need for new housing as national priority, but they were afraid that existing housing would be torn down in order to build high-rise residential buildings.

Fidel Castro shared their concern. He felt that somehow the demolition of central Havana for high-rise construction was wrong, but he didn't quite know what to do about it. So, a planning group was created to address the issue. The commission, called *El Grupo para el Desarrollo Integral de la Ciudad de la Habana*, had been appointed by President Castro in 1987. We were invited to work with that group. Our U. S. team went to Havana twice, in 1988 and in 1989.

Arendt: What did you do while you were there?

Comerio: We met with the Cuban group extensively. The group was headed by Gina Rey, an architect and planner, and Mario Coyula, an architect and ardent preservationist.[10] They were both very well-known people. I still see their names in journals and they are quoted in newspaper articles about design and planning in Havana. Some of the key people in our group were Janice Perlman from UC Berkeley's Department of City and Regional Planning; Lisa Peattie from MIT's Department of Urban Studies and Planning [deceased December 13, 2018, at the age of 94]; Michael Cohen, then head of Urban Projects at the World Bank; and a couple of others with other environmental engineering specializations.

We looked at a lot of the housing in and around Havana, both the old housing and modern construction. We talked to residents. We looked at how architecture was done, how buildings were built in Havana, how architecture students went from school to government ministries of architecture, to producing projects. One of the things we realized was that part of the reason they were tearing down residential buildings was that the architectural establishment viewed renovation as useful only for historic resources. As such, their standard for renovating an existing building was high: the equivalent of what in the U.S. would be the Department of Interior's Historic Building Standards. Well, that's a very expensive proposition, which clearly did not make economic sense, at least in terms of preserving housing. They didn't have any experience, like we had in the U.S., of having historic preservation standards for important buildings and a different set of attitudes and approaches for conventional buildings, particularly affordable housing.

In the U.S. affordable housing world, it was quite normal to repair the roof, repair the plumbing, clean it up, paint it, and make it more habitable, all at a very modest cost per square foot. We tried to introduce the concept of "conservation of housing" and engagement with citizen groups—"community design"—to our Cuban colleagues for input into broader policy thinking.

During our first visit, in addition to looking at a lot of buildings and talking to architects and community people, another meeting was arranged for us, and our Cuban counterparts with Fidel Castro. He was famous for holding meetings in middle of the night, which meant the meeting started at 11 p.m. or 12 midnight and went until he wanted it to end.

Arendt: How did the meeting go?

Comerio: We were at our hotel and told the meeting was going to be that evening. We waited until we were called and then we were put in cars and taken to the meeting. There were photographers and translators there, although President Castro's English was just fine. He understood every word I said, even if he occasionally pretended he did not. It lasted from about 11 until 5 in the morning, concluding with building inspections at 5 a.m., so that he could see what we were talking about. It was quite an experience, needless to say,

10 Other members of the group were also architects and planners: Mario Gonzalez, Mayda Perez, Roger Diago, and Eusebio Azcue.

especially since I got into an argument with him.

Arendt: Let's hear it!

Comerio: He had two conflicting values. He liked the beauty of Havana, the way it was, and he was worried about the fact that the plan to significantly increase the housing supply would destroy some of these neighborhoods when a new high-rise building was built. At the same time, he absolutely believed in the communist rationale that everyone should have the same housing. He wanted every family to have a two-bedroom modern apartment, so demolition of existing stock, new construction, and densification seemed the right solution. To counter this, I argued with three points: first, the insertion of high-rise buildings would certainly destroy the quality of the neighborhoods he loved; second, that affordable housing could be done in a different, more cost-effective way, with a different kind of mindset from the one espoused by the bureaucratic establishment of architects, engineers, builders, and regulatory agencies.

Most important, my third point was that giving everybody the same house didn't make any sense. There were elderly, who didn't need two bedrooms. There were people with disabilities, who might need a leveled place to get in and out or an elevator. There were others who had large families and needed more than two bedrooms, or who needed to have apartments next to other relatives so that the grandparents could help take care of the children while the parents worked.

Essentially, I argued that these social conditions affected how people made housing and neighborhood choices and that not everyone wanted that brand-new apartment. Many might prefer to stay in two rooms in an older building in order to be next to their relatives and their grandchildren. This was a very hard concept for someone who believed that every family should be treated the same. Eventually, I won him over, but he held his ground and I held mine.

Arendt: How long was this conversation?

Comerio: Maybe 45 minutes somewhere in the middle of the longer group discussion of housing policy. I did my best to persuade him that they really could satisfy the housing need with different sort of projects, including infill projects on vacant plots, infill projects in underutilized sites, and by a community design approach to modest renovations and improvements. That way, the quality of housing would be better; people wouldn't have roofs and windows that leaked. They would have plumbing that worked and basic electrical services. They would have sanitation. Those things could be done very efficiently *and* they could preserve the social fabric of the communities and the beautiful neighborhoods of central Havana.

We went back in 1989 for a follow-up and, in between, two critical things happened. One was that legislation was passed disallowing any high-rises to be built in the center of Havana. Across the board, there was a limit placed on story heights.

Second, the Cuban group published a housing strategy, which was ultimately adopted as planning policy. It included five principles acknowledging the variability of housing

options by neighborhood conditions, limiting demolition, promoting low-cost renovation methods, and re-tooling new construction as low-rise and high density, and finally making the *barrio* [neighborhood] the fundamental unit of planning. The last point led to a program where several architects with the Ministry of Architecture—basically, the government-owned entity where architects worked—were put into four demonstration *talleres* [community workshops] and asked to work on renovating buildings in those neighborhoods. When we went back a year later, we saw both successes and mistakes, all part of the process. What mattered was that it had a lasting impact on the whole mindset of development and re-development in Havana.

Unfortunately, in 1991 they experienced a sugar crisis when exports declined as a result of the breakup of the Soviet Union. When Russia stopped buying sugar, the Cuban economy went in the tank. It became very hard to focus on housing, since food was the number one issue for the next five to seven years. We didn't go back because, honestly, it felt like it would be focusing on the wrong issue. Overall, though, it was an amazing experience.

Arendt: Well, I think not only for the experience perhaps, but also because it seems that you and the team made a difference.

Comerio: Of course, I'm telling my piece of the story, but clearly everyone in the group made significant contributions. The U.S. team members were all people with enormous experience in urban development around the globe. This was a group of people with experience in action and advocacy for urban poor in Latin America and other international settings. Yes, I made one part of the case but, honestly, my contribution was one part of a much larger discussion and debate.

My experience with community design work influenced my thinking. I had worked with people living in six by eight-foot rooms in Chinatown and the Tenderloin. People living in the single-room occupancy hotels were absolutely unwilling to leave their neighborhood. They would rather stay there, with shops and friends nearby, than move into their children's lonely suburban house. They wanted no part of those suburban houses. They didn't want the social isolation. They didn't want to be away from their community. That experience certainly helped to shape my views.

There is a principle about equal access to housing, and then there is a practical solution. Basically, housing doesn't need to be identical to meet community needs. That "fair access" to housing could be defined in community terms was the fundamental basis of the conversation I had with President Castro.

Chapter 9

A Couple of Major Earthquakes Later: 1989–early 1990s

Arendt: You made a significant change in the latter part of the 1980s and early 1990s in terms of your career, especially regarding your consulting practice. What led to that change?

Comerio: It's pretty straightforward: Loma Prieta happened, my daughter was born, and Northridge happened, in that order.

At that point, every time there was a meeting in California about the post–Loma Prieta research, and I would say something about housing, someone would say, "Well, you have to do that research because nobody else can do it." And I'd say, "Okay." It was getting to the point where it was taking all of my time. My partner George and I talked about it and I said, "I am not going to quit being a professor. Being a professor is my first choice and research is really taking all of my time. I don't have time to run this practice or be a partner running this practice. You need somebody who is going to be more willing to do that." That led to us trying to get other partners.

One architect we considered managed all our construction documents. He was fabulous at that. Without him, we would have never had such beautiful technical documents. But he couldn't

manage the business. This is not a criticism of him; it's just acknowledging where his skills were.

Another person we brought in as a partner also didn't work out for us. We were not making progress on finding a new partner. Luckily, George's wife, Jenny, was a lawyer, and she had made us write formal partnership arrangements and contracts when we created the firm. So the solution was easy: George bought my shares. It was a non-acrimonious separation. And then George said, "But you're not going to leave, are you?" [laughter] I said, "Isn't that the point?"

He said, "You can rent your desk. You'll still have to have a place to work. You still need to do your consulting. Then you'll be around when I need to ask you a question."

Of course I said, "Okay." Eventually we were priced out of the beautiful San Francisco office space and moved to Oakland. I stayed with them in that office through the late 1990s until George finally moved the office further east, closer to where he lived.

I set up a company called Arch Research, in which I was sole proprietor, so I could run contracts through my consulting firm. But I decided two things: I never wanted to write another RFP as long as I lived, and I didn't want to have employees.

I was willing to hire people as subcontractors or consultants, but not as employees. I preferred to be a consultant to another firm and let them do the contracting. I was perfectly happy to manage a contract if I was on my own, doing the work. I did a number of projects with Fran Rabinovitz, an economist and academic at the University of Southern California. She also had a consulting firm called Hamilton Rabinovitz & Alschuler. We did a number of things together, but either she would get the contract or I would get the contract, and we would subcontract to each other. We're still friends. We met when we were both doing work for Rent Stabilization in the City of Los Angeles and it was easy for us to continue doing work together.

We had many contracts focused on a variety of different research topics around the issues related to housing and post-disaster social services. Loma Prieta and Northridge obviously shaped a lot of housing work, both for California and for the nonprofit community. The issues faced by low-income and immigrant populations were not addressed by FEMA and other government assistance programs. As such, many of the larger nonprofit institutions, such as the Irvine Foundation, the Red Cross, and others were looking for data and ideas.

They wanted to understand what percentage of the population they were actually serving through faith-based organizations or other community entities. They didn't fully understand what was needed, and yet they wanted to be able to help low-income and minority disaster victims and they wanted to understand the situation better. Fran and I had a series of different research and data-gathering contracts that followed from those concerns.

It was also while I was renting my desk in the Oakland office of GMA that I was writing my first book, *Disaster Hits Home.* That made sense since much of my thinking was being

influenced by my research work after Loma Prieta and Northridge. Going to the office helped me maintain the discipline needed to write that book. It emerged in just a couple of years out of that office.

Arendt: In the meantime, you were also doing a host of other things, only some of which would have been complementary. Knowing that writing a book, a really good book, is a time-consuming labor, how did you stay?

Comerio: One of the things that became eminently clear to me was that the book was just one more contract in the office, and it had to be managed and scheduled just like every other job. Even though I had never written a book before, I had written lots of long research reports and papers. It was easy for me to see how organizing a book was similar to doing a set of working drawings. You had to have your big schematic plan. You had to understand what themes you were developing, and where you were going. You then did the detailed documents for each chapter and then you refined and massaged the whole thing. It seemed manageable because for me it was just like doing a building.

Arendt: That's a great analogy.

Comerio: I was also really lucky. I had funding for all the Northridge-related work. I had had funding for the Loma Prieta work. I received additional funding for the research for the other case studies in the book. I had a sabbatical. I spent it in Cambridge, England, because my friend and colleague there, Robin Spence, was the only person in the world who actually had a copy of every plan and government document that had come out of the Mexico City rebuilding effort. Everybody else had thrown his or her copies away, but Robin, being a good academic, had it all in a box in the basement.

I spent a semester sitting in Cambridge, reading these documents in Spanish, which I don't actually know, but with enough French and Italian to figure it out. The reports were in formal, bureaucratic Spanish, with lots of charts and tables, so it wasn't too hard. I worked it out, but I drank a beer every day of that effort.

Arendt: Pre–"Google Translate"…

Comerio: Pre-computer! These were paper documents. I had to go there to look at them. I had some funding for various pieces of the research. The grants made it easier for me to manage the work because each funding piece had a deadline. Even though what I wrote for the book wasn't necessarily what I wrote for the contracts. The contracted work provided the data needed for the book.

It was opportune to have these things happening simultaneously. I tell this to students all the time: there is opportunity and there is luck and you need to take advantage of both. You have to be conscious of what you need to do, otherwise you are going to miss the opportunities or the lucky break.

Arendt: A recurring theme is your willingness to say yes at the right time to the right things.

Comerio: I never thought I'd go back to architectural practice, but it was an opportunity that was interesting. George was

a really good friend for whom I had enormous respect. It seemed like I should try it. If it didn't work, I knew I could always course-correct. I think you have to be willing to try things and not just say no.

Arendt: How would you summarize what you were able to do in this time?

Comerio: I think the big picture is that there was probably almost a decade of work in Los Angeles, from the mid-1980s to the mid-1990s. I traveled more in the 1980s and less in the 1990s; it was a long time to commute.

What mattered was that the work focused on housing recovery and reconstruction: it was focused on a combination of technical and economic and social issues. At that point, I was also getting involved with EERI, as a member, and as part of the post-earthquake reconnaissance. I was showing up at the Northridge clearinghouse every night even though I wasn't on the reconnaissance team. I was there in my capacity working for the city and/or the nonprofits.

We seemed to make a lot of progress once Clinton was elected in 1992. There were a fair number of Berkeley graduates working in Washington, DC, along with many colleagues who had gone to Washington to work in the Clinton administration. They went to work for HUD, for FEMA, and for other federal agencies. It was easy to call people up that you knew. Those relationships really mattered. There were a lot of academics in both state government and national government; coordination was easier as a result.

Honestly, I thought that was how it was supposed to work. It didn't always, though.

Arendt: Can you give an example?

Comerio: I had an NSF research project and I also had a contract with HUD to process survey data for them. For both of these projects, I had to persuade people at FEMA and people at HUD to share their data with each other. At that point in time, there was zero coordination among any federal agencies around disasters. They didn't talk to each other. Even after Northridge, even with a good political administration, it was like pulling teeth to try to get FEMA and HUD to share information for the NSF project. Even though it was in all of their interests to work together. Part of the fun for me was bringing a lot of these people together and pushing them just a bit out of their comfort zones. I think I was successful in part by pushing the envelope, but also in part by being nice about it. I was not angry or yelling; I wasn't being difficult.

Arendt: I think this is an important takeaway. It's not okay to simply be focused on what you want from other people. You also have to acknowledge what you can do for them and that you are in fact trying to build and maintain a relationship.

Comerio: HUD was new to a post-disaster role. Northridge was their first serious involvement in post-disaster recovery housing.

In fact, the agencies still struggle. First of all, it's not how they are structured. HUD knows it should be paying attention to disaster recovery housing now and it even created CDBG-DR [Community Development Block Grant–Disaster Recovery], but it's still managed as a "regular" CDBG program because they don't have any legislation to tell them to do it any

other way. They tried to adapt a normal housing program to a post-disaster circumstance. It's not surprising that it's clunky and slow because they don't have any new rules to make it work in a post-disaster situation. This is a huge problem for institutions and bureaucracies wherein the rules stay the same for years and years and the world changes.

Arendt: In looking at your consulting work, one thing I noticed was that your sphere of influence broadened over time. Can you comment on that?

Comerio: I think it's a natural progression for academics as they publish. You build a set of issues and concerns and ideas. At a given point in your career, you have enough of a track record that people can see how your methodology is useful in other areas.

Arendt: You've become synonymous with expertise in housing, especially around the issue of seismicity and how that might affect it. It seems to me that this is an issue requiring an interdisciplinary focus, where one draws from a lot of different fields.

Comerio: My development and construction experience made me credible to my professional engineering colleagues. I wasn't just an academic making an argument for the importance of housing; I was somebody they'd actually worked with on a building. Even if they didn't always agree with me on some of the issues, they were at least willing to listen, because they knew that I had my facts straight. I think having my feet in both the consulting world and the academic world helped to bridge the interdisciplinary pieces.

Chapter 10

Disaster Hits Home: Early 1990s – 1998

Arendt: Why don't you talk a bit about what ultimately led to your writing the book, *Disaster Hits Home.*

Comerio: We had been through some small earthquakes in California such as Coalinga in 1983 and Whittier in 1987. After the Mexico City earthquake in 1985, there was a push in Southern California to speed up the enforcement of the Los Angeles Division 88 URM Retrofit Ordinance [passed in 1981].

It was 1986 when California passed SB547, the law that required all local governments in the highest seismicity zone to do an inventory of their URM buildings and to develop a risk-reduction plan for dealing with them. Actually, it never said that cities had to require retrofits; it simply said they had to understand the risk and plan for it. Los Angeles and Long Beach already had ordinances. In 1986, I had completed the "earthquake hazards and housing" work for the City of San Francisco, the city had an inventory, and they had my detailed assessment of the housing conditions. They then hired Bill Holmes to categorize the remainder of the inventory. Then, the city commissioned an economic study. Basically, there was a lot of focus on unreinforced masonry in both San Francisco and Los Angeles in the late 1980s.

Then in October 1989, Loma Prieta happened. It was 5 o'clock in the afternoon, the start of the World Series. I'm not interested in baseball, so I was in my office talking to a student. Then the

bookshelves began rocking, and the student went running down the hall, screaming. I remember watching the light fixtures swing back and forth and yelling, "Get out from under the lights" because I was worried that the big fluorescent fixtures were going to fall and hit her. I stood in my office doorway; probably not the safest place. I was so worried about the student; I was trying to watch where she was going rather than get under my desk. Then it was over. The power didn't go out in Berkeley so I thought, "Oh well, that was an interesting earthquake" and went back to work.

It wasn't long before Mike Teitz, my husband, came in and said, "Somebody has a radio and they are saying the Bay Bridge is down. I think that was a big earthquake. Maybe we should leave the building." Good faculty members that we were, we went to the Faculty Club Bar to watch television because there was a TV, and every TV camera in the country was in San Francisco for the World Series. The damage to the Bay Bridge, the freeways, and the Marina District were on the news. We couldn't go home because the bridge was down. So we hung around, had dinner, and kept watching the news. Some other colleagues who also lived on the north side of San Francisco joined us. They didn't know whether they'd have an apartment or not.

Arendt: That had to be unsettling, even surreal.

Comerio: We all left finally, arriving home at 11:00 or 11:30 at night, to a completely dark city. It was stunning. We drove across the Richmond Bridge down through Marin and across the Golden Gate Bridge. There were hundreds of people with flashlights out directing traffic at every intersection. We got home and there was no electricity, but everyone on our block was out barbecuing whatever food was in their refrigerators. Someone had a TV on the roof of a Volkswagen, plugged into the car's battery, so they were getting the news. They cheered when we came home.

We went to bed, but of course I didn't sleep very much. I kept thinking about the buildings in Chinatown and the Tenderloin, all the buildings I had studied and made the case for a small intervention of bolting the floors and walls together. I thought, "I've got to get out there and look."

I don't think I contacted EERI immediately. Again, this was pre-cell phone. We didn't have email and the phones didn't work. I couldn't stay home, but Mike was very uneasy about me going out to survey damage. I said, "I have to go to Chinatown. I can't function unless I go to Chinatown." So I went and started inspecting buildings and looking at the damage there and in the Tenderloin. Of course, there was a lot of damage to unreinforced masonry buildings, but there weren't the kind of collapses we saw with the buildings located on the soft soils. Along Jackson Street, which is over an old streambed, there were huge cracks in the walls and lots of plaster down. I met up with my colleagues at the various nonprofits and we started taking a systematic approach to cataloguing the damage.

By the next day or so, we started to learn more. Information spread. Even though we didn't have phones and we didn't have the Internet, word of mouth helped share data and information. Manuel Perlo, Professor of

Planning at UNAM, and the former Ph.D. student who had invited me to Mexico City after 1985, called me up when our phone was restored. He said, "I'm coming to San Francisco with Mexico State Television and I want you to be our guide."

Arendt: This sounds like one of those moments of opportunity and luck you've described.

Comerio: Suddenly, I had a press pass, which meant we could go anywhere. I became something of a, short-lived, star of Mexican television, doing all the news reports from the Marina, from the freeways, from here, from there. That first week or so, we were just out looking at buildings, going to the clearing-house in the evening, meeting up, talking to people. There was a lot of interaction with the state agencies as we began to understand all the problems. A great deal of effort was being focused in the Marina, and everyone seemed to be ignoring South of Market, the Tender-loin, and Chinatown, as if those areas didn't have any damage. No one seemed to pay much attention to Oakland either.

It was hard to know what was happening in Santa Cruz and Watsonville for several days because of the lack of access. It didn't help that the news media was focused in the Marina. The Red Cross was feeding everyone in the Marina, but there were a lot of others who were homeless in the rest of the city. So the nonprofits got very active very quickly and the state agencies were pretty responsive because the federal agencies were not. At that time FEMA assistance rules required tenants to have a lease, so people in single-room occupancy hotels [SROs] were not eligible for any aid because they don't have a regular lease.

Needless to say, the housing nonprofits thought that was pretty outrageous. Art Agnos was the mayor at the time. He was a liberal politician and very supportive of the community organizations. In time, there was a coalition of organizations and cities focused on the disparities between assistance available to middle class and to low-income victims, especially in terms of housing services.

Arendt: It seems as though many people were not interested in what was happening to the city's poor in the aftermath of the earthquake.

Comerio: Of course, there was an intensive focus on the bridge and on the freeway damage.[11] Still, the housing group got active very quickly. There was definitely a lack of responsiveness and a lack of assistance for poor people. That started to feel like pretty significant discrimination against people of color, against people who were poor, against immigrants.

Three counties—San Francisco, Alameda and Santa Cruz—sued FEMA for not upholding its aid agreements around affordable housing. FEMA was interpreting the law very literally. At some point, Mayor Art Agnos was asked to comment on the lawsuit on national television. That proved to be embarrassing in Washington, DC, so things started to change.

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11 I remember seeing Steve Mahin on television every night. Sometimes he was jackhammering concrete samples from the Bay Bridge and taking it to the lab for testing. Sometimes he was talking about buildings.

There was a settlement. The three counties got $22–23 million for affordable housing. Of course, it took a long time to get that started. Meanwhile, we saw emergency shelters turned into homeless shelters in San Francisco and Oakland. We saw the complete loss of elderly housing in Santa Cruz.

The Watsonville story was special and different because they had damage to single family homes owned by farmworkers, who were able to do their own construction. Watsonville rebuilt the damaged housing in a year because their mayor created a local program. He assumed that his constituents were too poor to qualify for government loans or aid. At the same time, the city received many small financial contributions in the mail. The $10 and $20 dollar checks added up to about $1 million in total. The mayor used those funds to assist housing recovery. The city gave every damaged house owner $20,000 and a permit. Essentially, they told citizens "Go fix your house. We're going to be easy on permits and hard on inspections. We'll make sure you do it right."

Arendt: Flexibility when it's needed: a key element of rebuilding and recovery?

Comerio: In addition to the self-help, there were many faith-based groups coming into Watsonville to assist. Often, the work took on a "barn-raising" approach, with weekend work crews focused on one house at a time. The result was that Watsonville rebuilt wood-frame housing quickly. The locals would get together to put the houses back on the foundation, bolt it, and fix the cripple walls. If a house had collapsed and they needed to start from scratch, they had groups like Habitat for Humanity and the Salvation Army who came with volunteers to do construction for a weekend or week. Again, Watsonville was a very special case.

The majority of the affordable housing in the Bay Area was primarily three- to six-story apartments or SRO hotels. Private owners owned a large portion, but some of it was owned by nonprofits. It took ten years to repair and/or rebuild. It took ten years in part because many times the owners didn't even want to do the work. In most cases, the non-profit housing groups would then try to get funding to buy the damaged buildings so that they could do the retrofits to maintain a stock of affordable housing.

After ten years, about 75% of the damaged affordable housing had been repaired or replaced. By contrast, every damaged building in the Marina was fixed within six months, the rents were raised, people moved in, and it was fine.

Arendt: It's a good thing that you and others were paying attention to what was happening with affordable housing!

Comerio: Every time there was a meeting with California Office of Emergency Services [OES] or the Bay Area Regional Earthquake Preparedness Program [BAREPP] or even EERI, when the conversation turned to housing, everyone always said, "Mary will do that." There was state funding for housing-related research and I did a fair amount. It is important to note that the State of California understood the diversity of housing needs and supported the research.

Four years later, we had Northridge. I had

already been working for the City of Los Angeles on the residential URM retrofits, so I was on a plane to Los Angeles immediately after the earthquake. Again, I showed up at the clearinghouse and coordinated with the EERI team, and all the other groups doing damage assessment.

After Northridge, everybody was focused on the damage to soft-story apartments. When it came to estimating the losses in single-family homes, the insurance companies put the value to be about $1 billion. Three years later, when the majority of homeowners in the San Fernando Valley had made an insurance claim, it had turned into a $12.5 billion problem. Valley homeowners who had been through the San Fernando earthquake in 1971 all had insurance. At the time of the earthquake, moderate damage to homes was not obvious from the street, so these homes never had a city inspection. The owners didn't call the city's Building and Safety Department; they called their insurance companies.

Arendt: What a nightmare. For everyone.

Comerio: Insurance paid for people to fix the damaged area and all the associated finishes. If a wall and doorframe were racked, they not only had to fix the wall and doorframe, they would also replace drywall, repaint the walls and/or the ceiling and perhaps replace the carpet if there was broken glass. Essentially, the refinishing in all the damaged rooms got expensive.

Afterwards, there were some studies saying that the insurance companies probably were overpaying by about 30%, which isn't surprising. The insurers were actually pretty generous in settling early claims, thinking it wasn't a big deal, but as claims mounted, the problems emerged. Another contributing factor was related to what had happened after the 1991 Oakland Hills fire. In that event lots of people were under-insured; the insurance companies were sticking to the limits on the policy, even if it didn't match the value of the house. Politically, it looked really bad. Rules were instituted to make policies clear and understandable. In addition, after Northridge, Governor Wilson brought all the heads of the insurance companies in a room and said, effectively, "No more political fallout; after what happened with the fire, you're going to deal with the claims expeditiously."

Arendt: A bit of a preemptive strike, it sounds like.

Comerio: Since at the time the insurers thought it wasn't a big problem, they said, "Yeah, sure. We're on it!" Other economic issues also influenced the housing recovery. At the time of the earthquake, rental vacancy rates were almost 10%. The economy was weak in Southern California in 1994. So it was easy to rehouse people from the damaged apartments and even to find temporary housing for those doing major house repairs. Everybody was housed in their same zip code within three months because there were so many empty units. It was unbelievable, compared to the experience in the Bay Area.

I continued to work for the City of Los Angeles, looking at many of these issues. I had a number of funding sources for many of the components of my housing research and lots of students working on these various things. It was a very important moment for trying

to understand what was happening in the recovery. In addition to the misunderstanding surrounding damage and insurance payouts for single family homes, there was also the limited capacity to finance apartment repairs and maintain affordability. In that case, the city created a loan program with a three-year advance on their HUD CDBG funds. All of the recovery issues became components of my research.

For California, the single biggest policy change came from the insurance industry's unwillingness to continue to offer private earthquake insurance. The overwhelming number of claims post-Northridge came on the heels of a similar scale of claims in Florida after Hurricane Andrew two years before. Insurance companies didn't want to offer disaster insurance anymore. They wanted to walk away. The state created the California Earthquake Authority [CEA] as a result. This played out over a period of several years. None of it happened in one go.

Arendt: How did all of this turn into the book?

Comerio: With the combined research from Loma Prieta and Northridge, a book seemed like the next natural thing. In a short span of time, we also had Hurricane Hugo and Hurricane Andrew, as well as the Kobe, Japan earthquake. On the day of that earthquake there was a joint U.S.–Japan engineering conference scheduled in Osaka, near Kobe. Rich Eisner, Coastal Region OES Director, and I were both invited to that conference, but were not allowed to go because the governor said we *had* to be in Los Angeles for a conference marking the one-year anniversary of Northridge. And then there was the earthquake and all of our friends and colleagues got to go to Kobe to assess the damages.

That concentration of events from the late 1980s to the mid-1990s focused everyone's attention, including mine. The research data from all of those events became the genesis of *Disaster Hits Home*. The period between 2005 and 2012 had a similar concentration of disasters and a similar impact on research.

Arendt: Had anyone published anything like it previously?

Comerio: There were some important books on disaster processes, including the recovery component, but none those were housing-focused. I was intent on having comparable data for every event. Whether the tables were on housing loss or federal dollars spent, every table for every event included the same categories and types of data.

I thought that was going to be a piece of cake. I had reams of information, but it turns out it's not easy to accurately count anything. Internationally, it is even harder. I was making spreadsheets of all of the different versions of damages and losses for each event based on many different reports. The information on Mexico City was the most dramatic. It ranged from the "official" number of housing units lost, 2,000–3,000, to reports from NGOs with losses listed as high as 10,000 units. One report claimed the number was 20,000. I remember thinking, "How can these be so different?" It turns out it depends on what you choose to count. If you count all the units in shantytowns and other illegal in settlements, the number can get big, really fast.

By contrast, if you only count legally built units, then it's a different lower number. I had to interpolate between the official numbers on damaged housing and the data that social service agencies and community advocates assembled, often with a sensitivity analysis on the probable range of losses, depending on what was counted and by whom.

It made me realize third world conditions were alive and well in the United States. We also had difficulty counting housing losses. I guess one is supposed to know this, but understanding what actually happened in many neighborhoods after Loma Prieta and Northridge was a different thing. I saw ethnic communities where both the legal residents born in Los Angeles, as well as the undocumented families, were too afraid to ask for any assistance from any government agency. Their losses were typically underrepresented in official data.

Similarly, communities of ethnic Koreans in Kobe were not always accurately counted in the loss and recovery data. The experience of trying to understand data discrepancies certainly opened my eyes to a more complex set of issues around disasters and recovery. It made me rethink what it means to recover and to stress how important housing impacts are in disasters. I think that the book changed my thinking as I wrote it—not something I expected! Having reasonably accurate data on a series of events so that you can compare apples to apples was important. Equally important was evaluating the social, economic and demographic profile of the people whose homes were damaged, and the ways in which certain groups are or are not served in the recovery process. In the United States, our disaster response and recovery programs evolved over a century, in response to actual events. From the 1920s to the 1960s there were lots of floods in rural areas and our programs reflect that experience. Is this the right model for dealing with urban housing?"

There were two issues. On the technical side, we had not paid enough attention to building codes for residential construction and a national effort was begun [see, for example, the CUREE wood frame research]. Similarly, the losses in Kobe led to significant research there, including shake table testing of whole apartment buildings on the E-Defense Shake Table in Japan.

On the social side we weren't paying attention to the kind of human impacts to people who were not being very well served by traditional "aid-the-homeowner" models of disaster aid. We began to see extensive social science research on social and economic impacts to people and to businesses.

Arendt: It sounds like thinking was evolving, laying the foundation for a more contemporary understanding of the role that housing really plays in a community in general and a community trying to recover from a disaster.

Comerio: Weirdly enough, though, as soon as the book was published in 1998, things got really quiet. We didn't have any disasters. It really wasn't until 2005 and Hurricane Katrina that I think anybody actually read it. That's how it felt anyway.

Arendt: Mary, how long did it take you to write that book?

Comerio: A lot of the research was either underway or completed. I was probably working on the research for Northridge well into 1995. I think I started working on the book about year or so after Northridge because I was too busy for the first year.

It took a couple of years to complete. I had to go back and look at data from Mexico City. I had to go back and collect the Kobe information. That was the last case that I wrote, because that didn't happen until 1995. It seemed important to include it and not just cover American events. There was significant back and forth with the editors. UC Press was very old-fashioned. They had fastidious editors and fact checkers. It felt like a whole year was spent crunching through editorial reviews, until the point where I just never wanted to see it again.

And there are still typos I find every once in a while.

Arendt: Have you updated or thought about updating the book since its publication in 1998?

Comerio: I've thought about it, but, realistically, I would need to write a new book. So much has happened since it came out. Disasters in the U.S. have been largely hurricanes and floods, not earthquakes. Instead, the earthquake lessons have come from a mix of developed and developing countries. That means the lessons are different and sometimes unique. The book would have to double in size; how could anyone redo it and not include New Zealand, China, Chile, Haiti, Nepal, Indonesia, and more.

The dilemma I had even when I first published the book was realizing the lessons from the developing countries were so different from those from the developed countries. If we're talking about Indonesia and Haiti and Nepal, the recovery issues are a completely different kettle of fish from those faced by the U.S., New Zealand, Japan, and Chile, where there are modern building codes in place, and systematically organized disaster aid and recovery programs and agencies.

I've written chapters in books by others. For example, there's a very good one edited by Alka Sapat and Ann-Margaret Esnard titled *Coming Home after Disaster.* I also contributed material to Ian Davis and David Alexander's book, *Recovery from Disaster.* I've continued to write articles, with quite a lot on New Zealand and Chile.

Arendt: Clearly, there would be many challenges with updating the book.

Comerio: Andrew Coburn and Robin Spence updated their 1992 book, *Earthquake Protection*, in 2002. I think it took them a year or two to present a global perspective. It was a major undertaking. I usually think anyone contemplating an update to a book might be better off just writing a new book.

Frankly, we've learned so much about resilience that I now see housing in the context of the broader recovery and societal issues. I think a second edition would take too much tinkering, and I'd still be frustrated in the end.

Arendt: Maybe that's a good baton for someone else to pick up, right?

Comerio: All the young people whom I've been mentoring all these years, it's their turn.

There are also other great books and research

reports. Laurie Johnson and Robert Olshansky's book, *After Great Disasters*, is focused on governance and planning, an international comparison. Walter Peacock and his colleagues have published extensively on housing and social issues after hurricanes, and Lori Peek and Alice Fothergill have won awards for their book *Children of Katrina*. I find myself referring to these newer books all the time when people ask me, "What's new in the field?"

Arendt: I have the sense that you're excited about the work of others; that you're thinking more about what they might have to say and less about making the big statements yourself.

Comerio: I think what I find quite exciting is the work of younger people who are really trying to understand resilience and put some mathematics around it. Even though we all know the mathematical models aren't quite accurate and they aren't perfect. However, I think the effort to undertake that methodology helps people to understand the complexities and the components of recovery, and helps develop a better understanding of the next stages.

At the beginning of the development of Performance-Based Earthquake Engineering [PBEE], having the triple integral[12] gave us a vehicle by which researchers could have a conversation about what mattered around understanding risk. It wasn't perfect; it didn't need to be. I think the next effort will be modeling resilience with all of its physical, social, interconnected systems, time problems, and spatial problems….This is really exciting!

The work has already started, and it will mature in the next decade or so.

12 Moehle, Jack and Deierlein, Gregory D. (2004) "A Framework Methodology for Performance-Based Earthquake Engineering," Paper 679, Proceedings of the 13th World Conference on Earthquake Engineering, Vancouver, BC Canada.

Chapter 11

The Disaster-Resistant University: 1998–2002

Arendt: One of the many projects with which you were associated in the 1990s was the Disaster-Resistant University [DRU] Initiative, a pilot for a national program that was funded by FEMA, together with UC Berkeley. What can you tell us about this important work?

Comerio: That project began just after the book was finished. It evolved in coordination with an effort on campus to look at the seismic condition of buildings, prompted by the Loma Prieta, Northridge, and Kobe earthquakes. The SAFER [Seismic Action plan for Facilities Enhancement and Renewal] program was created with a technical focus. After the 1971 earthquake, for example, the campus did an inventory of the campus buildings.[13] They retrofit some dorms and other buildings in the late 1970s and early 1980s. University Hall, for example, which used to house the Office of the President, was retrofit with exterior steel X-bracing.

Berkeley also has the Seismic Review Committee [SRC], a group

13 The UC Regents adopted the University of California Seismic Safety Policy in 1975. Following that, the Berkeley campus participated in a system-wide study of seismic performance ratings that assigned a rating of "good" "fair" "poor" or "very poor" to its facilities.

of about ten members that reviews the structural design of proposed capital projects in terms of their seismic capacity. This is a very sophisticated committee that includes both practitioners and academics in engineering and architecture. They are very influential in making sure that projects meet a high standard. Having that committee accomplished two things. First, it led to consistently high standards. Second, it built a relationship between the practitioners and the academics, an important partnership that would prove useful later.

Arendt: Was this something that other universities in California were doing?

Comerio: No. I think it was unique to Berkeley. There was a long-term tradition at Berkeley—both the review of seismic issues and the engagement with the region's practitioners. As I talk more about the DRU Initiative, you can see how that program might have evolved naturally at Berkeley, given who we were and what we were accustomed to doing.

Arendt: The past may not predict the future, but it sure seems to condition it, doesn't it?

Comerio: It wasn't a surprise, then, when the university decided to do a structural inventory of all the buildings. The 1997 Preliminary Seismic Evaluation, Phase 1 Report, conducted jointly by three renowned structural engineering firms [Degenkolb Engineers; Rutherford & Chekene, Consulting Engineers; and Forell/Elsesser Engineers], analyzed the probable performance of campus structures under a major earthquake on the Hayward fault. The survey revealed that about 30% of campus space was in need of seismic retrofits. This led to the SAFER program.

I wasn't involved in that survey, but I knew it was happening. Then one day out of the blue, I got a phone call from the Chancellor's Office: "The Chancellor wants you to do some research." My first thought was, "Do I have a choice in this matter?" followed by "Okay." I knew that whatever we did, it had to be done right. It had to be done credibly.

The idea for the DRU Initiative came from James Lee Witt, the director of FEMA during the Clinton administration. Actually, the DRU Initiative grew out of another FEMA program: Disaster-Resistant Communities, which was also called Project Impact. The thrust of Project Impact was to have communities identify their disaster risks and then to make plans to reduce future losses from those risks. He was impressed that UC Berkeley was retrofitting its buildings; he believed this was a good model for loss reduction. HAZUS,[14] FEMA's loss-estimation model, was fairly new at the time and perhaps he thought, "Well, we'll just get them to run HAZUS and show what good economic benefits there would be if you retrofit buildings."

He met the Chancellor in Washington, DC and said, "You should do this. We'll give you some funding, and you can match the money for the research." At the same time, FEMA also provided $20 million in demonstration grants to assist in the retrofit of some buildings."

14 In 1997 FEMA released its first edition of a commercial off-the-shelf loss and risk assessment software package built on GIS technology.

Arendt: That sounds pretty appealing.

Comerio: I didn't know about that meeting at the time I was asked to write a proposal for the research.

The Pacific Earthquake Engineering Research [PEER] center [founded in 1997] was already in place at this point; I was part of PEER, which influenced my thinking about the research. I thought, "If we're really going to look at this, we're going to have to look at it holistically. For example, we're going to have to understand the ground conditions. We're going to need a micro-zonation map of the entire campus. We're going to need to know where all the utilities are and how they work or don't work. We're going to need to do a nonstructural inventory of all the buildings that were evaluated through SAFER. We have a structural inventory, but we're probably going to need pushover curves for all of them if we really want to know how they're going to behave. I'm going to need to know who occupies these buildings. Do we have some way to calculate their annual equivalent occupancy because, how do you compare the football stadium to a building with students in it every day? And we need to know about research and teaching."

I was thinking about what happens on a campus: teaching, research, service, libraries, housing. I wanted to know how the buildings are actually used. I wrote a very large and detailed proposal, and it seemed like I was asking for a lot of money, about $4 million. I sort of assumed FEMA and the Chancellor's office would select some subset to fund. Instead they said, "Do it." I was very surprised and daunted all at once.

Arendt: You were thinking, "I meant $5 million!"

Comerio: I fully expected them to cut some sections out. Well, when they said go, I put together an interesting team of both academics and practitioners because there was no way we could complete the work in the timeframe allotted if we didn't have some professional involvement. There was no way, for example, to have students making a microzonation map of the campus. So we hired Geomatrix, a geotechnical engineering firm, to do that work. They collected data from every boring that had ever been done for any project on the campus. There were hundreds of them. That was definitely a professional activity. Of course that map was incredibly useful for all future buildings. I hired the same three engineering firms to relook at all the buildings that they'd evaluated during the SAFER structural review and asked them to do a more detailed structural analysis of each building and also a nonstructural analysis of each building. Peter Morris of Davis Langdon Adamson was the cost consultant.

I had Professor Vitelmo Bertero from engineering and Professor John Quigley from economics, as Co-Principal Investigators. Professor George Goldman, another economist, was also on the team. Initially, Professor Nicholas Sitar was not happy with me because I didn't use the geotechnical students for the microzonation map, but when he saw the complexity of the effort, he said that he was glad I hired a firm.

I included real estate consultants from the private sector. I had academic heavyweights and I had teams of students and consultants to

move along some of the technical work because there was a high volume of work, and we had a two-year window to complete it. It was like managing a huge architectural project that happened to be the whole campus.

We inventoried everything. Needless to say, I was becoming something of an inventory expert by this time. My PEER colleagues started to call me the "data queen." I counted everything. My architecture students were documenting spaces in every building because we were trying to understand how they were used. We had access to all manner of campus data: everything from detailed breakdowns of classroom use to summaries of research activity, environmental hazards, and insurance.

FEMA required us to have an outside advisory committee with both campus people and business representatives on it. This turned out to be extremely useful to the research team and to the campus.

Probably the single most significant individual on that committee was the Emergency Manager for Bayer Corporation. Bayer had a facility in West Berkeley where they manufactured a blood clotting treatment for hemophilia. This facility was the only place it was made in the United States. That meant they couldn't afford to have the facility shut down, and they were committed to staying in Berkeley. They thought a lot about what we call "downtime."

Arendt: People like that are great for introducing a dose of reality into projects, aren't they?

Comerio: Absolutely. The Bayer representative on our committee asked in one of the meetings, "What are you all thinking about in terms of downtime?" And most of the university folks were thinking in terms of months. He said, "For us, it's three days maximum, because if production is interrupted for more than that length of time, then the whole production line goes down. The lines would have to be cleaned before they could be restarted. It'll take two weeks to make that happen and people will die. They need this product. We cannot be without this product. You *have* to think about downtime." That comment created another way of thinking about the campus and its functions. We came to understand that in a university, maintaining undergraduate teaching matters. If we can't teach Econ 1 or Psych 1 or other "gateway courses" for a semester , then we don't have an undergraduate program because no student can enroll in advanced courses without those prerequisites. The impact of a lost semester goes beyond the undergraduate program to the impacts on graduate student teaching jobs and research for dissertations.

Several of the campus classroom buildings had been retrofitted in the 1980s. That had been an important life safety priority. So we were doing pretty well on classrooms, but it turns out that classrooms represent only 6% of the space. What do you think is the biggest amount of space use on a campus?

Arendt: Hmm. Housing?

Comerio: Not at UC Berkeley because we don't provide very much campus housing. At Stanford, housing represents a relatively high percentage of the space, but even there, it's not the largest portion of campus space.

Arendt: Next guess, I'd say, labs.

Comerio: That's correct. It makes sense when you think about it because classrooms are used over and over again every day. Every hour or hour and a half, a new group of students comes in, and fills up the lecture hall. A lab belongs to one researcher and his or her students; it's their dedicated space. It's similar to office space; whether you're in your office or not, it's yours; nobody else uses it.

It turned out that approximately 50% of all the research money that came to the campus was expended in five buildings; 75% was expended in 17 buildings. Of the five buildings, three were collapse hazards. Needless to say, we were somewhat shocked by these findings. We shared this with the Chancellor's Campus Planning Committee and the Executive Committee.

I said, "We have a serious research problem. If we lose these research buildings, we lose one-third of the campus budget." I was concerned that Harvard or others would poach our faculty members, offering them labs and research opportunities. At the same time, I was concerned about our Ph.D. students. How would they finish their dissertations? They might go wherever their faculty advisor goes. This could decimate the university.

Those findings meant that FEMA and the Chancellor provided two more years' worth of funding to look at laboratory seismic safety specifically.

We developed a separate, focused study—jointly, with PEER—on laboratory buildings. It was a major effort, with long-lasting impacts. At the time, it got to be a joke that the engineering community called Bill Holmes "Nonstructural Engineer Number One." This work was the leading edge of nonstructural research; people didn't necessarily understand what we were doing or why it was important.

In the early 2000s it was hard to explain the significance of nonstructural damage to downtime. In 2006, I published a paper in *Earthquake Spectra* about estimating downtime,[15] trying to highlight this very real concern. I divided downtime into two components: 1) the more predictable time needed for construction; and 2) the situation-specific components such as time needed to mobilize for repairs—redesign, financing, regulatory change. I called that the "irrational" component. You can just imagine that the term "irrational" might not sit well with the engineering community.

The article did generate a new area of downtime research. A number of people began to look really hard at how we understood loss and what that meant in terms of costs, given the uncertainty in the length of time a facility might be closed.

Arendt: Sounds like a key component of what we construe as resilience research.

Comerio: Yes. I believe the research that came out of the Disaster-Resistant University effort became the foundation for all kinds of thinking about resilience in disasters, well beyond just universities. In our particular case, the research focus was on laboratories and their contribution to the university's

15 Comerio, M. C. (May, 2006). "Estimating downtime in loss modeling," *Earthquake Spectra*, 22(2): 349–365.

intellectual and economic wellbeing. Imagine taking this focus to the next level, to the level of a city. Then you start to evaluate how much time it actually takes to get financing, to mobilize professional teams, to get permits, and to do all the things needed in the redevelopment of a city. How much might that slow your recovery?

In the end, the work that came out of the DRU Initiative, both the specific findings on the economic benefits of loss reduction for universities and the role of laboratories, as well as the broad impacts of downtime on recovery, contributed to the development of resilience planning.

Arendt: Just to help people understand the scope of this project, approximately how many buildings are we talking about?

Comerio: In 1999, the UC Berkeley campus had approximately 110 major buildings with about eight million square feet. We did not review the Lawrence Berkeley National Laboratory. However, we met with their safety teams and shared what we were doing. There was good dialogue back and forth because all of us were focused on labs.

For FEMA, the DRU project was larger than UC Berkeley. Five other campuses were funded and we trained them to do a hazard assessment and develop mitigation plans. They weren't all focused on earthquakes. The hazards included hurricanes and floods, as the campuses were distributed around the country. In 2003, FEMA published a booklet for disaster preparedness for universities[16] and offered DRU grants to universities up until 2015. Hundreds of universities went through a more simplified process than we went through.

Arendt: At some point it was concluded that, for other places, both the scale and the focus could be different, and the overall gains would still manifest?

Comerio: One of the things we learned in our very detailed assessments of building systems was that a few components dominate the cost of the losses. For example, when evaluating nonstructural damage, we found that future assessments did not need to catalogue every window-type and cladding system. We found that the damage to ceilings and sprinkler systems caused the greatest impact because water damage is expensive. So, the FEMA guideline focused on the critical elements of hazard assessment and mitigation planning.

Arendt: At the time that you were doing this work, how many people were even thinking about nonstructural?

Comerio: It was uncommon. Some people thought it was trivial. The joint DRU/PEER case study of a biological sciences laboratory building was focused on nonstructural performance. We selected a case study building that we knew would perform well structurally. We were interested in the nonstructural loss impacts. The building contained many pieces of equipment that cost a million dollars each and I thought damage to these instruments would be the thing that

16 Building a Disaster-Resistant University, FEMA 443, Federal Emergency Management Agency, Washington D. C. August 2003. https://www.fema.gov/media-library/assets/documents/2288

everybody would care about. The scientists all said, "Oh, no, we can buy another one another of those." They said, "What we really care about are the refrigerators and freezers, because that's where our data is housed."

They didn't always have a "back-up" for biological samples. And they didn't want a refrigerator with bio-soup. At that time, there were several animal labs in the building—now all have been moved off campus—and there were wheeled bakery racks with cages of genetically engineered mice. I had an image of these racks rolling across the room in an earthquake, the cages falling over, and the mice escaping.

Arendt: Completely understandable!

One thing that I think about when considering the DRU Initiative is the degree to which one might transfer the knowledge gained at UC Berkley and other institutions to larger-scale entities, like communities. Was it possible to apply the lessons learned there to other settings?

Comerio: As I mentioned earlier, the DRU Initiative grew out of Project Impact: Building Disaster-Resistant Communities. The DRU Initiative was a narrowing of focus from the community level to the university. Cities have many uses and multiple kinds of property owners, rather than a university with a single owner and a single vision about what it needs. In cities there are public and private holdings, social and cultural institutions, schools and services; there are definitely similarities and yet cities are much more complicated.

Arendt: Quite a few publications came out of this research, right?

Comerio: Many publications were completed during the period the DRU was funded: four and a half to five years by FEMA, the university, and PEER. They fed into dissertations, like one by Judy Mitrani-Reiser at Cal Tech [*An Ounce of Prevention: Probabilistic Loss Estimation for Performance-Based Engineering*], and it fed into FEMA P-58, a ten-year effort developing guidelines for Seismic Performance Assessment of buildings and the Performance Assessment Calculation Tool, PACT.

I think the fact that it became integrated into PEER research was really important.

Arendt: Why do you say that?

Comerio: The focus of PEER was performance-based earthquake engineering. Within the first couple of years, Allin Cornell of Stanford wrote the famous triple integral, which integrated seismicity, soil conditions, and geotechnical issues with building damage and losses. I was in charge of defining losses. Peter May and I held a whole series of workshops and consulted with lots and lots of people. We made the case to include downtime along with casualties and dollar losses in the definition of loss. Later the losses were informally known as the Three Ds: deaths, dollars, and downtime.

Initially, the PEER faculty thought downtime was not necessary, assuming that casualties and dollar losses would best describe the decision variables. But we convinced everyone that downtime had to be part of the equation. That decision generated new areas of research in loss modeling, and downtime gradually became part of the definition of how we

understand performance. Hence, it became part of PBEE and PEER. The laboratory building testbed [the joint DRU-PEER study on Seismic Protection of Laboratory Contents] helped that integration.

Another important contribution that emerged through PEER research was the requirement for interdisciplinary teams. The research groups were organized into three major teams: building systems; lifeline and transportation systems; and the OpenSees software development. While the software became the module that underpinned the theoretical component, the buildings and infrastructure teams demonstrated the application with seismologists, geotechnical engineers, structural engineers, loss modelers, economists and policy folks. At one point, I remember that PEER actually had a hard time convincing NSF that economics and policy were social sciences. Because they weren't sociology, some people thought that neither economics nor public policy had a behavioral component.

Arendt: As a social scientist, I hear you!

Comerio: We tried to include sociology as it was appropriate, but we were focused on economics and policy because that's how we were defining loss impacts in the definition of performance engineering.

Arendt: I imagine that part of the appeal of including economists along with public policy and planning folks was that these folks have a strong foundation in understanding decision making.

Comerio: That's exactly what we were focused on. We wanted people to make well-informed decisions.

Arendt: Are there any more thoughts you'd like to share about the DRU initiative?

Comerio: It was a significant part of my life. It consumed me for five years. I've probably never had as much fun on a research project as I had on that one. Because we literally had to go into every single building, every single room, and every single lab, my students were having a blast.

There were days when they were sewed, head to toe, into biological safety suits in order to enter certain spaces. The scientists would say, "This is not to protect you. We don't want your germs to get in our samples!"

We learned how research was done in every field of study. It was fascinating. Universities are amazing places and faculty are doing really cool things that most people have never heard of, even people who are part of the same university.

Arendt: It sounds magical in terms of all those bright people coming together—academics, practitioners, and students—working on this very significant puzzle.

Comerio: At one point my husband said to me, "Why you? Why did they ask you?" And I said, "I think it's because I'm an architect and I'm used to managing an array of consultants." I truly think it was the architectural mindset that made it possible to manage the overall DRU process and to see all the pieces, to keep the different disciplines directed and focused on the parts they were doing, all while making sure that they could talk to each other.

I had to be able to explain building damage to the economists who thought, "If this building is damaged, and closed, our model will assume that everybody who works in this building will lose their job." And I said, "No. Faculty have tenure and many staff are working under union contracts. It's not the case that people will simply lose their jobs. Instead, we will have to figure out how people will be able to work, despite a disaster. We must think differently."

In general, it taught me how to translate between and among disciplines, something that was going on in PEER also. It was very valuable to have this very immediate experience with the DRU project, and to then be able to take that experience and learning into PEER.

Arendt: We can see how your experiences accumulated over time, enabling you to cross boundaries and address complicated and complex problems without oversimplifying or losing sight of the big picture.

Comerio: I've been fortunate.

Chapter 12

PEER: 1997–2007

Arendt: We've referenced PEER already in our prior conversations. Can you tell us more about your involvement in that?

Comerio: When the first National Center for Earthquake Engineering Research was created at Buffalo in 1986, the California academics were truly shocked that it didn't come to California. Part of the problem was that institutions in the state were competing with each other in order to get that center. The State of California didn't think it had to do anything; everyone assumed that it would come to California. By contrast, New York State made a huge effort; they contributed matching money, and other kinds of support, brought people together, and so the national center went to the University at Buffalo.

Several years later, there was a new call for proposals. It was initially a competition for one center. At some point in the process, NSF decided they needed to support multiple centers. In the proposal process, California universities came together with the earthquake engineering community to develop the proposal. I participated as one of the academics. Since the proposal was supposed to be interdisciplinary, it was a natural fit for me.

We were successful and PEER was funded. The original center at Buffalo became MCEER, a multidisciplinary center, and a third Midwest Center was also funded. PEER was headquartered at Berkeley and had nine core and nine affiliate participating

institutions and others were added over time. It was a collaborative venture.

The initial goal of PEER was to develop performance-based earthquake engineering. I don't think anybody fully knew what that meant when we started, but we worked hard to define it. I was part of the decision variables group that tried to define the relationship of policy and economics to performance engineering. A huge issue was how we should define the desired outcomes. As I've mentioned previously, the non-engineers in the group were emphatic that downtime had to be included.

Arendt: You've talked some about PEER's three focus groups: building systems; transportation and lifeline systems [bridges, freeways, utilities]; and OpenSees. How did PEER coordinate the efforts of these groups?

Comerio: Everything was organized around these three "legs of the stool." Within each group, the teams included many disciplines, from seismicity to geotechnical and structural engineering, to seismic performance to loss modeling and decision variables across every project. There was a matrix of disciplines across research programs. All the research within the three focus groups was overseen by the Research Committee, made up of Jack Moehle as PEER Director, Greg Deierlein as Research Director, the leaders of each of the three teams, plus the individuals who managed education and outreach and industry relationships. Internally, the research committee funded all the projects to ensure interdisciplinary coordination and to see that the overall PEER goals were being met.

That process created the need for people to work together across disciplines. Those individuals, including the graduate students, became very comfortable with sharing data and coordinating with others. It changed the culture of the way people work.

A good example would be the Building Systems focus group. Helmut Krawinkler and I led the group. Some of the Ph.D. students included Curt Haselton, in structural engineering at Stanford, and Christine Goulet, in geotechnical engineering at UCLA. They worked with my architecture students and with Judy Mitrani-Reiser at Cal Tech to provide the data inputs to our downtime models. They all worked together and they still have the social and professional bonds from their PEER research. We built important relationships amongst the next generation of academics.

That shift in the way the next generation of academics and professionals work together is a very valuable contribution, in addition to the development of the PEER performance-based engineering methodology.

Arendt: How many people would you estimate were influenced directly by the interdisciplinary approach taken by PEER?

Comerio: It must be 40 or 50, if not more. Over the ten years of the NSF funding for the national centers, it is probably more like 100.

Arendt: That's amazing, especially as one imagines the multiplier effect as these academics do other things.

What else came out of your involvement with PEER?

Comerio: The downtime research and loss modeling were very important and probably

the most influential "product" from me. However, it is the teamwork with so many wonderful colleagues that I appreciate most. Although the research committee often complained about the amount of "reporting" required by NSF, we found that when the ten-year funding ended and we no longer had to meet so frequently, we missed the camaraderie.

In 2007, Jack Moehle and I and a group of faculty from ten institutions applied for and received an NSF-NEES Grand Challenge Research Project to mitigate the collapse risk in vulnerable concrete buildings.[17] The work included a case study concrete building inventory for Los Angeles, extensive experimental laboratory testing of components, analytical simulations of ground motions, progressive collapse, building fragility studies, as well as loss modeling and policy analysis. That work took place over five years, and was organized on the PEER approach, with a smaller group. The results of that research provided the background for the 2014 resilience planning effort undertaken by Lucy Jones. Lucy was "on loan" from USGS for a year to Los Angeles' Mayor Eric Garcetti's office. Not many people realize that our research project helped support the Mayor's Seismic Safety Task Force, which released the *Resilience by Design* report in December of 2014. That was fine with us.

While doing the case study inventory of concrete buildings in Los Angeles, reporters from the *Los Angeles Times* followed us around for three or four years. They were interested in what we knew about the buildings and they were mostly patient about recognizing that we could not release data until the study was complete. In the interim, they wrote a number of articles about seismic safety in Los Angeles, which ultimately made a difference in influencing political attitudes there.

We had to finish the research before we could give them any data. Still, as reporters, they were persistent, and even registered for and attended a NEES meeting, just so that they could hear our talks. Ultimately, coverage of seismic safety issues in the *Los Angeles Times*, based on our research, really helped get the Mayor's office onboard. He became convinced that this was an issue that the people in Los Angeles cared about. That led to the outreach to Lucy Jones, and the creation of the Task Force. I think in terms of significant research contributions from this time, the Grand Challenge project represents the integration of detailed engineering research with a case study combining the inventory, loss modeling, downtime analysis, and policy options.

Arendt: Another aspect to your experience with PEER deals with support for women and academic jobs. Can you talk about that?

Comerio: Advocating for women in engineering is important to me. It was something I took on very early in PEER. Sitting in research committee meetings and hearing colleagues suggest that we meet on a Saturday, I would have to say, "No, I have a kid who needs me to care for her then. I need to do this work during business hours. Let's make that happen."

17 This was one of three Grand Challenge projects funded for five years through the George E. Brown, Jr. Network for Earthquake Engineering Simulation (NEES) program.

At some point, I also said that if we really wanted our women Ph.D. students to get jobs, we had to change our culture. We had to help them, which meant we had to change the way our departments behave. I took on the role of the *de facto* women's consultant. I didn't set out to do that, but I did it because, again, it was a practical thing to do.

Arendt: What did you do, exactly?

Comerio: In addition to the obvious mentoring for students and young faculty, I pushed the research committee to agree that babies were welcome at PEER meetings. We had a husband and wife team sharing a job. They were both involved in PEER research. Who was going to take care of their kids when they went to a meeting? So of course they brought them. Not everyone embraced this way of thinking. Some women thought, "This is going to make me look weak. I can't do this." But we just kept saying, "It's okay. It's just PEER daycare. It's going to work."

With time, it started to feel more natural and more comfortable. I also did the same thing when I was department chair: I encouraged young faculty who were on parental leave to bring their children to faculty meetings. In PEER we also talked a lot about how our women Ph.D. students got jobs, how they applied, how they presented themselves, what they had to do to get through the whole process. Previously, there was not enough mentoring about how to *be* an academic. I became that mentor in addition to their advisors who were focused more specifically on their research topics.

Arendt: We know from the research that's been done on mentoring specific to women that having senior people who not only pave the way for them, but also give them guidance is critical to their success.

Comerio: I think it's very important for them to hear the stories from someone who is a generation or two ahead of them. It was certainly important to me. When I came to Berkeley, there were older women on the faculty and they were very helpful. I learned a lot from them, including how to function in that environment.

Younger women academics have all sorts of questions. Should they get married, have children? How will they juggle everything? Too many women in academe still think that they can't have both their career and families. So of course it's very useful for them to hear someone say, "It's okay. Here's what I did. Here's what somebody else did. Here's how we screwed up. And you know what? Our kids aren't in therapy. They are fine."

Arendt: What else should we know about your experiences with PEER?

Comerio: Performance based earthquake engineering (PBEE) is the foundation of a culture change in engineering, from prescribed design standards to a consequence-based approach. PEER laid the foundations for resilience-based design and "functional recovery." It was cutting edge research done in a collaborative environment.

Somehow we managed to laugh, to work, and to get everything done. It was how research should happen. I really appreciate all the people who were good colleagues and great researchers.

Chapter 13

Advocacy for Community Housing: 2005 to the Present

Arendt: It's relatively easy to see how your interests might converge around resilience, particularly community housing resilience. Can you share some of your experiences with this?

Comerio: Even though I was getting involved with PEER and with the broader earthquake engineering research in the sense of loss modeling, performance-based engineering, and concrete buildings, I never really lost my focus on housing. It was always there.

The tsunami in the East Indian Ocean at the end of 2004, followed by Hurricane Katrina in 2005, followed by the Sichuan earthquake [the Great Wenchuan earthquake] in 2008, followed by the earthquakes in Christchurch, Chile, Japan, and Haiti in 2010–2011—all of those events had significant housing issues. Those events brought back the issues around housing in a national and international context, and I began to put it all together in a broader sense.

I had the opportunity to work for the United Nations Environment Program [UNEP] in 2009, specifically its Disasters and Conflict Intervention Section. The program officer called me and asked me if I would go to China for a month. As it happened, I was on

sabbatical and I was going to be home that semester anyway.

Arendt: What did you do there?

Comerio: We looked at issues associated with losses, recovery, and the processes used to enable that recovery. We wrote a number of reports. We began to look at different building systems being used and evaluate other building systems that China was considering for recovery. All of that generated a renewed focus for me on housing.

I later worked for the same UN agency in Haiti in 2010. In fact, I was there at the same time as the EERI team, but we only had limited coordination because of my commitments with the UN team. I was there for quite a while and then went back a couple of times for the UN work.

Part of what made the work fulfilling was that it was interdisciplinary. We had geotechnical engineers, environmental safety experts, a structural engineer, a climate engineer, and more: there was a range of people on the teams, with the shared expertise to tackle the many really complex issues.

Arendt: What were some of the outcomes of that work?

Comerio: Reports, of course. Suggested interventions. It wasn't so easy to make progress, especially in China. China likes to hear advice, but they don't necessarily want to implement it. They were happy to hear our recommendations, but they weren't necessarily going to change all of what they were doing.

That taught the UNEP some lessons on how to think about this type of work.

When we were in Haiti, there was better coordination between the UN Environment Program and the UN Development Program, the World Bank, and others. Many different groups were collecting loss data for a variety of needs, so it helped that there was some learning and coordination across the various agencies, probably more important than what China did or didn't adopt.

Arendt: Besides some of the international activities in which you were involved, what were you doing stateside?

Comerio: Many things were happening around the same time. One program that I was involved in was CAPSS, the Community Action Plan for Seismic Safety, a San Francisco program which started in 1998. It was a multi-year study to look at and mitigate the earthquake risk faced by the city. I was involved in the loss-estimation aspect of that.

Mary Lou Zoback of USGS co-chaired the Advisory Committee for that effort. It was stopped because of some differences of views between individuals on the Building Commission and Laurence Kornfield, the Chief Building Inspector and Department of Building Inspection Project Officer. It sat about for almost a decade and then got picked up again with the Applied Technology Council [ATC] leading the work for a second round. Out of that came a report on soft stories and more.

Arendt: Was this work related to what you did with SPUR [the San Francisco Bay Area Planning and Urban Research Association]?

Comerio: My involvement in SPUR happened just after that. Chris Poland, who

was CEO of Degenkolb at the time, was spearheading some work by SPUR to define resilience and develop metrics around issues related to resilience; it all fell under the umbrella of "The Resilient City." There was the CAPSS Project, which I was involved in from the very beginning, and then there were two SPUR reports related to The Resilient City project on which I worked: one on housing, *Safe Enough to Stay*, and one on land use, *On Solid Ground*.

Sarah Karlinsky, the Deputy Director of SPUR, was the lead staff person for this particular effort. Both Degenkolb and the USGS provided the funding.

Arendt: There were other reports. And many people who are part of and recognizable to the EERI community worked on these reports.

Comerio: There were nearly ten in total; they fit into one of three categories: before the disaster, emergency response, and after the disaster. *Safe Enough to Stay* was part of the before series; *On Solid Ground* was part of the after series. Laurie Johnson and I both worked on these very intensely, along with a couple of PEER REU students, Amy Dhaliwal and John Pham. REU stands for Research Experiences for Undergraduates. It's a program for undergraduate students, often minority or disadvantaged students, who receive funding to work on a research project over the summer. The idea is to encourage the students to pursue either a Master's Degree or a Ph.D.

The two REU students who worked at SPUR, under supervision by Laura Samant and me, that summer were great. We did a lot of data crunching, looking at the impacts of housing losses across San Francisco. A unique aspect of that work was to prepare a map showing usable and unusable housing units by supervisorial electoral districts rather than by the city overall.

Arendt: That's brilliant. I can imagine the reaction that received.

Comerio: Only a few districts [at the southern edge of San Francisco] had less than 25% of unusable housing units in a M7.2 San Andreas quake scenario. Some districts were as high as 50%, and they weren't necessarily the poor neighborhoods.

That got a lot of people's attention.

It was a wakeup call and probably the smartest thing we did in that report. We did a lot of good things in that report, but making that map was really important for getting political attention.

Arendt: What was the process like, working on these SPUR reports?

Comerio: The wonderful thing about SPUR is that a committee of volunteers does the work. Their staff manages the process and the committee, much like we do at EERI. There were 10–20 people on each committee. There were probably about four of us who did the lion's share of the writing on the two reports, but the input from the diverse, larger group of interests was invaluable. SPUR puts out polished, publicly accessible reports. They don't read like an academic paper; they read like an informative magazine or newspaper article. That's very useful! We did lots of public presentations and lots of outreach.

The SPUR staff had funding, but the rest of us were all volunteers. It was a big commitment of time and effort. I think it was very important because it laid out a framework for cities to see how resilience makes sense globally. One of the early 100 Resilient Cities' Chief Resilience Officers, Patrick Otellini, was involved in the project as well.

A lot of people—business people, building owners, developers, tenant organizations, public health and building department officials, various and assorted interest groups—all had a stake in the committees responsible for writing and reviewing these reports. They all had to vet the outcomes of what they were deciding to do. That process was important in building public support for the concepts and recommendations. "The Resilient City" project put San Francisco very much at the forefront of this kind of planning effort. Many people still come to San Francisco to better understand the ideas behind the project. It was a model for what Lucy Jones did in Los Angeles, but the process in San Francisco took much longer.

Laurie Johnson created a slide showing the timeline of all these different planning efforts and how much time they've actually taken. It's a great depiction of how things evolve. I've used it in talks, crediting her, of course. It's a valuable graphic image of how we went from the CAPSS Program to the SPUR Resilient City work, to all the ordinances for soft stories. It's a multi-year timeline. Change this big doesn't happen in one fell swoop.

Arendt: You mentioned soft stories and ordinances. Can you talk a bit more about that for San Francisco?

Comerio: San Francisco is unique in that we have such a high percentage of our housing that is multifamily; something like 75% of the housing in San Francisco is multifamily. About 50% of it is rental. That combination is very different from what exists in most other American cities.

People became worried about how we were going to survive a major earthquake without losing so much of our residential base. One of the lessons that came out of the SPUR work and the loss modeling from CAPSS was just how much of that housing was going to be damaged. It wasn't only the big buildings; it also included many of the single family and two to four-unit smaller buildings.

Soft stories in San Francisco included the large apartment buildings like the ones in the Marina District that had first soft story collapses in Loma Prieta. Similar to other neighborhoods, that district had a mix of ten-plus unit buildings, three to five-unit buildings, and single-family homes, typically houses over garages. There is a potential soft story situation in all of those housing types, and there are commercial storefronts on the ground floors of many residential buildings, again, potential soft story situations. This is a profile of the majority of the residential buildings in the city.

The loss of residential units was one of the things that many groups in the city felt was a critical issue. As Patrick Otellini said, doing resilience is like getting your kids to clean up their room. You can't do it all at once. You can't say to a five-year-old, "Clean up your room." What you say instead is, "Let's pick up the Legos." Then, "Let's pick up the stuffed toys."

After that, "Let's pick up the clothes that are on the floor." Eventually you make some progress.

In San Francisco the first ordinance that passed was focused on the largest multifamily units: more than three stories, more than five units, basically apartment buildings that had soft stories. After being notified about the need for change, I think the owners are moving quite well through that process. I believe that the intention has been to move on to the smaller-sized buildings. Whether there's sufficient political momentum right now to do that, we will see.

There had been a great deal of momentum for a while. Right now, though, there is so much stress about unaffordable housing costs in general and increasing homelessness in San Francisco, that I think those issues will take priority. That means the seismic issues may get back-benched for a while.

Arendt: And the situation in Los Angeles?

Comerio: Los Angeles learned from what's happened with San Francisco's soft story situation. Cleverly, they decided to put forward one general ordinance to enact the "resilience by design" concept as outlined in the report. The report made the case for seismic improvements to the water system, telecommunications, soft story apartments and concrete buildings. The implementation details were left for later legislation, that is, how to enforce it, and how to pay for it. Each of the components has different issues and different timelines, different stress points.

I thought it was a clever strategy to obtain unanimous support from the City Council for the big overarching concept before haggling about finance and implementation. The details took longer and were done in smaller incremental pieces after the initial agreement.

On the soft story issue, the City of Los Angeles has made retrofit the owners' responsibility, but is allowing them to pass through some costs to the tenants within the rules of rent control and other regulations. I don't think they have fully operationalized rules for concrete buildings yet. The water component is handled by Los Angeles Water and Power. I don't know the status of telecommunications improvements.

Los Angeles has provided a great civics lesson. It is a different kind of city, with different political and technical issues, and they're doing resilience a slightly different way. I think that's important. Now we have both the Association of Bay Area Governments [ABAG] and the Southern California Association of Governments [SCAG] trying to figure out how they can assist the smaller cities to begin adoption of resilience ordinances. Three or four cities have moved forward with soft story ordinances in Southern California, and Berkeley and Fremont have similar ordinances in Northern California.

But it's a daunting prospect. Earthquake damage doesn't stop at the political boundary. That means if we really want resilience in our individual communities, then we have to think about how to make a difference in the larger region.

Arendt: Can you talk about the idea of seismic upgrades for continued habitability, in order to keep housing usable after an earthquake, as distinct from seismic upgrades for safety?

Comerio: One of the key ideas that came out of the SPUR and the CAPSS work was that we don't want the young mobile population that lives in San Francisco to go elsewhere after an earthquake.

If they leave the city, the jobs go, and the economy falls; it's a very dangerous situation. A lot of younger residents don't have deep ties to the city or region. They came here for a "tech" job and they can easily move to the same job in Phoenix or Austin or Seattle. Their companies would probably happily move them to another of the corporate offices. So, for San Francisco, the question is how to limit damage in the housing stock so that the units may be "safe enough to stay" even if they are not completely undamaged.

That sort of goal implies that the existing building code—for both new construction and retrofits—with its focus on life-safety is not good enough. We would also need to limit nonstructural damage so that a housing unit could be lived in after an earthquake, even if it needs some minor repairs. That's a huge culture change for the technical community and the regulatory community as well as for developers. The building code has always been based on life safety, not continued functionality.

Arendt: What would it take?

Comerio: I served on the steering committee for National Institute of Standards and Techology [NIST] report on what research would be needed to move from the current state of building codes to some kind of immediate occupancy code. The report differentiated between a definition of "immediate occupancy" for habitable and repairable and the definition of the term as it is used for continuous occupancy in a hospital.

The report was released in 2018.[18] It lays out a research agenda for building design, community considerations, economic and social considerations, and adoption and implementation concerns. We know that a change of this sort cannot be accomplished overnight. We had a bill in California in 2018 that was passed by the legislature, but vetoed by the governor in this last cycle, which proposed raising the standards of the building code. Perhaps we weren't ready quite yet.

However, movement in that direction comes out of the resilience work in San Francisco and Los Angeles, and others in the 100 Resilience Cities. The research community needs to think through the implications of major code revisions and to think more broadly about how a city functions as a whole system. Basically, we need to think about cities in the same way that UC Berkeley thought about campus functions and returning to work after an earthquake in the Disaster-Resistant University Initiative.

This requires a systemic approach. Should we retrofit every single building or only certain kinds of buildings? How do we decide? We can't make the buildings stronger and ignore the infrastructure. If there is no water and no

18 Sattar, S., et al. (August 2018). *NIST Special Publication 1224:* Research needs to support immediate occupancy building performance objective following natural hazard events. Available from https://doi.org/10.6028/NIST.SP.1224.

power, people can't inhabit their buildings anyway.

Arendt: History would suggest that we would most likely come up with answers through a lot of collaborative dialogue and research, right?

Comerio: It's important to remember how far we have come in the past 30 years in earthquake engineering research and practical applications; we've made enormous progress. That progress has taken time. So when we talk about resilience, we have to recognize that we're at the front end of this.

We've gotten it this far. It's going to take at least 30 more years to address. It's my generation's job to inspire the next generation to tackle this, we can provide leadership, but the next group needs to move it along.

Arendt: Before closing out this section on advocacy for community housing resilience, I think it makes sense to talk briefly about the Urban Land Institute [ULI] Housing Task Force.

Comerio: The ULI is a builder-developer organization. There are some individuals in San Francisco saying, "Why isn't the development community more interested in seismic issues? Why aren't they paying attention? Don't they want their buildings to survive an earthquake?"

In the past two years, I have been on a ULI committee effort to investigate where and how they could get involved. The committee began with a look at what ULI might do to support soft-story apartment retrofits, but after intensive consultation, they decided to support efforts to enable soft story ordinances undertaken by ABAG [Association of Bay Area Governments] and SCAG [Southern California Association of Governments]. That said, they also want to make sure that the issues are in front of their membership as part of more general housing discussions. I did manage to bring the ULI committee, the ABAG resilience team, and the USGS HayWired scenario team from northern California together to discuss how they can support each other. This was possible because I'm on all of the steering committees.

A second focus of the ULI committee was to look at some of the legal problems caused by losses to condominiums; that is an area that needs work to simplify how owners in condominium associations can finance and manage repairs.

Arendt: What are the issues there?

Comerio: In a condominium building there are many owners and they each have their own mortgage with their own bank. If the homeowner's association does not carry earthquake insurance for all of them, what are they going to do? Typically, they can't resolve it. We know this from past events. So, devising a legal and financial methodology to resolve the conundrum is very important. That piece of work is ongoing.

Arendt: This liaison role seems to be a common feature of your career, connecting people and ideas in order to make meaningful change happen.

Chapter 14

International Work: 2003—present

Arendt: You've talked briefly about some of your international experiences, notably China and a bit about Haiti. Tell us more about the intersection of seismic issues and housing around the world.

Comerio: The experiences in China and Haiti were very different from events in the developed world.

Chile and New Zealand are two significant earthquake events that were important for me. Both countries have long traditions of good building codes and earthquake engineering research. Both events caused extensive housing damage.

Two years after the Maule, Chile, earthquake of February 2010, I was asked to do a mid-program review of their housing recovery by the head of the Ministry of Housing and Urban Development [MINVU is the equivalent of HUD in the U.S.]. The work was funded by the United Nations Development Program, but the "client" was the ministry. I made three trips to Chile and interviewed hundreds of people. I travelled throughout the affected areas and spoke with individuals whose homes had been lost, including some who were in new homes, as well as those who were waiting for a house repair or replacement. I interviewed mayors and national government officials, and the housing program staff at all levels of government.

The first detailed report for them was published as a PEER report.

I've also done a series of papers that looked carefully at their housing program.[19] The housing recovery in Chile was a very efficient model program. The government funded recovery for 220,000 housing units, half of which were new construction, half of which were repaired. In the great majority of cases, they genuinely served the communities and completed the work in a four-year period.

Arendt: Were there any particular challenges working there?

Comerio: Officials in Chile often describe their country as "the most developed of the underdeveloped countries." A big challenge and an opportunity was a change in government at about the same time as the earthquake. The earthquake happened just after a national election, but before the new party took office. The political party that held the office of president for 20 years had been voted out.

The incoming ministers had to appoint their regular staff *and* disaster recovery teams. In MINVU, the minister recruited some individuals from the private sector as staff to manage the recovery programs. They quickly made a series of key decisions. The government created new taxes on copper mining, tobacco, and other non-affected industries. They chose to use their existing budgeting and funding mechanisms through the ministries, and again chose not to create a new entity as a government recovery agency. At the housing ministry [MINVU] they brought in an engineer and an architect from the private sector and a planner from academia to lead the recovery. Because none of them had experience as regular government bureaucrats, they treated it like a consulting job.

As a team, they moved quickly, often with limited data. They made important decisions early in the planning. The housing recovery program was generously aimed at low- and middle-income families, with a focus on keeping families in place. There were no large "greenfield" developments of new housing. Every family would get a 50 square-meter unit designed to high seismic and energy standards, with details to allow expansion. All were to be designed and built locally.

Four months after the earthquake and tsunami, 80,000 emergency housing units were completed primarily on owners' sites. The MINVU team worked with mayors to register families eligible for housing and allocated 60% of the subsidies within the first year. If community members expressed concern that the program(s) did not suit their circumstances, the leadership team developed new options, saying, "Okay we will just add a few more boxes to the matrix of approaches." It seemed as if they didn't know how to say no.

Arendt: That was a good thing.

Comerio: Yes, the approach was highly tailored toward the needs of different groups of people: those who owned their land and

19 See, for example, Comerio, M. C. *Housing Recovery in Chile: A Qualitative Mid-Program Review,* Pacific Earthquake Engineering Research Center, University of California, Berkeley. PEER Report # 2013/01, February 2013 and Comerio, Mary C. "Housing Recovery Lessons from Chile," *Journal of the American Planning Association* 80:4, 340–250 (2014).

those who didn't, people who could do their own construction and those who could not, and people in single-family homes and people in multi-family social housing. There was a matrix of problems and solutions, with data on how many families were in need of housing units in each category. They also helped create urban plans to mitigate future hazards and paid attention to historic buildings and local economic issues.

I learned a great deal from them and have tried to bring that to other places in the world. Of course, you can't necessarily do what they did in Chile in a place like Haiti. It's a totally different situation. Chile is a more developed country, it had money, and it had a stable government. It had funding processes in place, all those elements that a lesser-developed country might not have.

Arendt: That's a really important point. Sometimes, I think people are searching for a standardized solution. What we discover instead is that while there are many good approaches, ultimately we have to tailor solutions to the particular context.

Comerio: Around the same time, the Canterbury earthquake sequence began in New Zealand. I had previously spent time there, having completed a sabbatical in 2003 as an Erskine Fellow at the University of Canterbury. So, I knew Christchurch well, and it was easy to lead the EERI Reconnaissance Team after the September 2010 Canterbury earthquake.

Arendt: I remember that experience well!

Comerio: That's right. You were part of that reconnaissance team.

Unfortunately, that event wasn't the end of their earthquake story. Fewer than six months later, on February 22, 2011, they had another event with the epicenter directly under downtown. In that event, there were more casualties and much more damage. Ken Elwood was in New Zealand at the time of the February earthquake for an engineering meeting. He told me later that they all had to get out of a downtown building and walk to wherever they were going to stay. It was summer and many were wearing only flip-flops or sandals on their feet. Of course, they could not return to their hotels, and there was no cellphone service or Internet for days.

When we finally connected, EERI had decided that he and I should be the co-leaders of a large reconnaissance effort, in part because of my experience with the September reconnaissance and in part because Ken was already on the ground and working.

During and after the earthquake, Ken and I developed relationships with several government agencies, including Civil Defense and Emergency Management [CDEM], and the Ministry of Business Innovation and Employment [MBIE].[20] At that time, Ken was considering a move to New Zealand, so while we worked together on some post-event research, we also talked about his family's future there.

Arendt: You've spent a fair amount of time

20 Formed on 1 July 2012, MBIE is a merger of the Department of Building and Housing (DBH), the Department of Labor (DoL), the Ministry of Economic Development (MED), and the Ministry of Science and Innovation (MSI).

in New Zealand since the 2010–11 earthquake sequence, haven't you?

Comerio: I went back in 2013 as an Erskine Fellow, again. Ken joined the University of Auckland in 2014. Shortly thereafter, an opportunity arose to develop a proposal to the New Zealand Tertiary Education Commission for what became QuakeCoRE, essentially a PEER-type research program for New Zealand. It's an interdisciplinary, multi-university, earthquake engineering center for earthquake resilience. QuakeCoRE is one of several Centers of Research Excellence [CoREs] in New Zealand. The real work in developing the proposal was done by Ken Elwood and Brendan Bradley, but I played a small role as an advisor during the grant writing process. Later, I was asked to head the International Scientific Advisory Committee and be a member of the Governing Board. All of these interactions have helped me build long-term relationships in New Zealand, not only with those helping with the recovery in Christchurch, but also with people engaged in seismic and housing issues more generally.

Arendt: What activities are you involved in now?

Comerio: In addition to my role in QuakeCoRE, I have also been asked to participate in a second nationally funded research program called Resilience to Nature's Challenges, one of ten National Science Challenges. I also am the chair of their International Scientific Advisory Committee. The combination of activities has kept me very deeply engaged with research in New Zealand and with implementation programs by the government.

Arendt: What do you think is a resilience challenge in New Zealand?

Comerio: There is clearly a housing challenge. After the Christchurch earthquakes, people were personally quite resilient, and many people continued to live in their damaged homes while waiting for insurance settlements and repairs. That type of "can do" attitude is part of the Kiwi culture, but in fact there are some vulnerable populations who need more specialized assistance after disasters.

As a country, they need to broaden their thinking beyond the single-family home. If there is an earthquake in Wellington, for example, they will have a large population in multifamily buildings, and a much broader range of population types. Wellington is the seat of national government and it has a dense urban core. The housing issues in future events there will be different from those in Christchurch.

Arendt: Wellington also has interesting access challenges.

Comerio: Wellington has both access and infrastructure issues thanks to the geography of the region. Both QuakeCoRE and the Science Challenge are studying these issues and working with the city. Similarly, there is other joint research in the South Island to model infrastructure interdependencies.

There are two scenario research projects underway right now, the Alpine Fault Scenario and the Wellington Scenario. They are being done in what QuakeCoRE has called a collaboratory—a collaborative laboratory where interdisciplinary researchers,

government agencies, and stakeholders are engaged in the process. That's a big step forward from what we were able to do in PEER.

Arendt: It sounds very exciting!

Comerio: It's a great model for the next steps necessary in creating resilience.

Arendt: Are there other international experiences you'd like to describe?

Comerio: I have made some visits to Japan, though I don't have the depth of experience there that I have with other countries. Norio Maki came to UC Berkeley as a visiting researcher and worked with me. I have many Japanese colleagues I consider friends, and I do feel an affinity with their researchers because we have so much in common. The sharing of research and knowledge across Japan, the U.S., and New Zealand has been an important long-term collaboration.

Another important collaboration for me has been with colleagues in Mexico City, both at UNAM and at an organization called *Mejor Ciudad. Mejor Ciudad* is trying to be an impetus for good governance, with a focus on resilience and urban planning. They are a young organization highly engaged with Mexico City on earthquake recovery, and willing to learn from experienced organizations such as SPUR. UNAM plays a critical role in the city's resilience efforts, both in terms of the strength of the research in the engineering department, but also in terms of its urban planning resources and the integration across disciplines. Sergio Alcocer, Gustavo Ayala, and Manuel Perlo are three faculty members with whom I have worked and who are making important contributions to resilience efforts in Mexico.

Arendt: Is this level of collaboration across disciplines and among different countries something unique to earthquake engineering research?

Comerio: Every discipline has international cooperation and sharing. However, the earthquake professions are unique in that we need input from many fields—from seismology to decision science—so we do need to reach out across traditional disciplinary boundaries. In traditional engineering research, there's a strong history of engineers sharing shake tables and data. Researchers regularly conduct tests on tables in other countries, especially if they need large-scale tests. It's just practical to share these resources and the knowledge that comes from doing the research.

For both academics and professionals, earthquake engineering is a highly internationalized group. We have the World Conference on Earthquake Engineering every four years as a testament to this. I think there is a strong sense that we are all in this together; organizations like EERI play an important role in developing and maintaining these ties. Many other countries' organizations want to model themselves on EERI. So, it's not just the academic researchers making collaboration a central focus; it's also the culture of our professional organizations that are interested in earthquake engineering. The collaboration engages both practitioners and academics, enriching both our learning and our ability to effect evidence-based changes in practice. It's a win for everyone.

Chapter 15

EERI and Learning from Earthquakes: 1997–present

Arendt: One of the exciting new programs sponsored by EERI is its Learning from Earthquakes (LFE) Study Program. I know that you've been very involved in getting this off the ground and that you were involved with the first offering in Chile. I believe that you're also involved in what will be the next offering in New Zealand. Do you want to talk a little bit about how this program came to be and your role in it?

Comerio: I have been involved with LFE for a long time. Like many people in EERI, I can honestly say that LFE changed my life. It was an incredibly important component in my career. Although I wasn't officially on the LFE teams in Loma Prieta and Northridge, I interacted frequently with the LFE teams. It felt very natural. I've been on the LFE Committee for years. I became involved when Bill Holmes chaired the committee and Susan Tubbesing was the Executive Director.

I was asked to participate in an LFE reconnaissance team after the Umbria, Italy earthquake in 1997. Susan called me and said, "I know you are not travelling as much now since Catherine is little [my daughter, who was five at the time], but there has been an earthquake in Italy and it's affected Assisi and the Marche. You are Italian and you know this part of the world. Would you be willing

to go?" I said, "Let me talk to Mike" [my husband]. Stephen Tobriner, Mel Green, and I formed the small team; we managed to get a lot done there.

LFE continued to be part of my activities within EERI as time went by. As we've discussed, I led and co-led the two LFE teams after the two Canterbury earthquakes. It wasn't long after those quakes that NSF stopped funding LFE, after 40 years of doing so. EERI went into a bit of shock. "How are we going to continue to do this reconnaissance we've done for so long? People rely on our reports."

Arendt: It was beyond shocking, wasn't it? How did EERI figure out a way forward? After all, LFE is one of its signature programs. For many people, EERI *is* LFE.

Comerio: The LFE Committee held some workshops. Ken Elwood and I were involved in the organizing and planning. Jack Moehle had finished his term as LFE Committee Chair; Ken took over the role just as we were trying to figure out what to do since the funding had disappeared. Thankfully, there were many good ideas about how to rejuvenate LFE, how to fund it, and—this was very important—how to engage more young people, all of whom had heard stories about LFE from more senior people. They wanted to know, "How do I get this opportunity?"

Arendt: Very little compares with the opportunity to participate in a reconnaissance trip and see, firsthand, the intersection of the built, natural, social, and economic environments in the aftermath of an earthquake event.

Comerio: Of the ideas that came out of the LFE workshop, the prime one that the EERI Board of Directors dealt with as part of its 2014 strategic alignment retreat was the challenge of making LFE sustainable. We needed to reassure members that the board thought LFE was important and worth continuing. We also needed to consider how we could keep doing LFE reconnaissance in the modern era.

It was Ken Elwood who said, "Why don't we go back to places that have had earthquakes and take younger people to see them?" We knew that we couldn't take many younger members as part of a post-earthquake reconnaissance team. It was already a difficult time for the community that's experienced the earthquake, and it did not seem appropriate to expand reconnaissance teams to include a "teaching" component.

I thought about the 2009 L'Aquila, Italy earthquake, where I had also been on the reconnaissance team. Nothing much had changed in central L'Aquila; you could still see the damage and also the new housing and other recovery efforts. We also thought about Christchurch and the lessons that would come from looking at long recovery issues. About the same time, Laurie Johnson and Bob Olshansky and others in EERI had received funding for the Resilience Observatory.

Arendt: With a focus on resilience, taking people to see the consequences of earthquakes even many years after an event can make a great deal of sense.

Comerio: The combination of events started to suggest that we could take a group of young people back to a place that had had a disaster within five to eight years and actually

take lessons from the damage, recovery progress, and resilience efforts. The genesis of the LFE Study Program was parallel to the board's contemplation of how to make LFE sustainable.

At around the same time, Heidi Tremayne, who was an EERI Program Manager at the time and is now its Executive Director, had the idea of virtual reconnaissance team members—what we now call VERT [Virtual Earthquake Reconnaissance Team]. This has proved to be a brilliant innovation. It engages an amazing group of primarily younger professionals in the gathering of electronic data about an earthquake event in its immediate aftermath. The data collected has been enormously useful, not only to the teams going into the field, but also to everybody who wants to learn about the earthquake wherever they might be.

Arendt: We're fortunate to have such creative minds in EERI!

Comerio: VERT and the LFE Study Program became the foundation of the plan to engage younger members in LFE.

It seemed obvious to those of us involved in its planning that the very first LFE Study Program should be in Chile in conjunction with the 16th World Conference on Earthquake Engineering in 2017. Young people were going to Chile to attend the WCEE; maybe they were going to submit a paper. They could apply for this program *and* submit a paper.

It was an experiment. We had an incredible partner in Católica University with CIGIDEN, a research entity there that really got behind the program. They were enthusiastic about having our group there. The idea was to have a mix of young professionals and more senior graduate students from the U.S. along with locals from the host country. We didn't have as many Chileans as we hoped, but overall it still worked.

Arendt: Experiments don't always go as we plan, but they always teach us something.

Comerio: We tried to keep this first experiment small because we weren't sure how it was going to work. We didn't really know how much it was going to cost. Thalia Anagnos chaired the LFE Study Program Committee, and there was also a Ph.D. student, Kelsey Wittels, a former intern at EERI, who was paid to do some of the organizing.

Thalia and Kelsey organized most of the program. Because of my experience working with the Housing Ministry, they asked me to be a speaker. I was initially just going to stay for the first day of the program, which was right after the conference, and then come home. Once I saw the program, though, I said to Thalia, "I think I'd actually like to be there for the whole week. You will visit a number of the places where I conducted interviews, and it would be interesting for me to see how the places have changed, and to talk to the group about what we saw four years ago, and two years ago, comparing then to now." They thought that was a good idea.

Judy Mitrani-Reiser, who was on the Chile EERI reconnaissance team and was there for the world conference, stayed for part of the program. Overall, it was a highly successful endeavor; I think that people really liked it and learned a great deal.

Arendt: That had to be very gratifying, given the uncertainty that characterized the program planning when no one knew how things might go in reality.

Comerio: We got very good feedback from the 20 people that were in the group. One thing that Thalia and I realized was that being there, being with them, having meals together, being on the bus together, allowed for a number of more casual conversations, which actually became mentoring exercises. We saw that a valuable part of the program was the mentoring, in the same ways that we were mentored as younger people participating in LFE and other major EERI activities.

It wasn't just the "experience" of being where an earthquake had happened. There were exercises and activities, assignments and things to follow up on; there were subgroups and each had to look at different things: housing, business, hospitals, and schools. The reporting they were assigned was very much like what a reconnaissance team member would do.

We discovered that some of the Ph.D. students were trying to figure out what it meant to be a woman and an academic and whether could they have a life and be tenured as an engineering professor. I thought that this generation would have said, "Obviously, that kind of career was fine; of course they could do both!" In fact, they had many questions.

It was very useful for them to have a couple of senior women saying, "You can do whatever you want. You are not required to forego having children because you want to be a professor. Don't think like that. You decide what you want to do with your life and then you figure it out. But don't say that making such a choice is going to preclude something else, something human and personal." To Thalia and me, that just seems crazy.

I think they were quite shocked and surprised to hear us saying things like that and also comforted in some way. But, there were lots of other discussions that had nothing to do with their personal life. When they took part in a tsunami evacuation exercise with a faculty member in Valparaíso, we found that they were quite energized by it. There were some members of the group from Oregon and Washington who said, "We should be doing these exercises at home. How do we get people to be aware of this?"

Another question they raised was, "How do I make my job as interesting as this?" That's why you get involved with organizations like EERI, that's why you volunteer to do things in your local community. That's how we get a high level of engagement while also learning new ideas that make our skills more valuable.

Arendt: It sounds like learning about life in addition to learning from earthquakes.

Comerio: Those things seemed as important and as interesting as understanding the earthquake damage and what happened afterward. At the same time, I think it was particularly interesting for them to see the recovery and whether people were happy with it.

Of course, the responses were mixed. There were some things that people thought were great and then other things where local people observed negative unintended consequences. There were cases in some of the coastal

communities, for example, where the social housing that replaced the lost housing was so much nicer than what existed previously, that people were renting it out as vacation rentals.

Arendt: Not exactly what was planned!

Comerio: There were interesting lessons about those kinds of unintended consequences that we all know can happen in any setting. When implementing any political decision, some things work, some things don't work, and sometimes what happens is something you could have never predicted. I thought it was valuable for the LFE Study Program participants to see that process in action as well.

The overall result? The group was enthusiastic, the Board of Directors was enthusiastic, and the program is continuing. Thalia is still chairing the committee and I've stayed on it.

The next study tour was in May 2019 in New Zealand. It focused on Christchurch, Kaikoura, and Wellington. Unfortunately, I could not participate because I had an invitation to be a visiting professor at La Sapienza in Rome during that time.

We know it was well organized by EERI and QuakeCoRE. They were very excited to have an equal distribution of New Zealand and U.S. participants. We wanted a mix of cultures of young people in the group.

Between the LFE Study Program and VERT and the efforts on the part of the Board of Directors to create an endowment for LFE, I see the LFE program gaining a solid footing. The three together will help to ensure continuing interest from our membership, engagement of young professionals, and the financial means to do what we want and need to do to sustain this signature program.

Arendt: As a member of the Board of Directors, I'd say that you're right on point.

Comerio: I agree that we have a plan going forward that people are excited about. I know I'm most excited about the opportunities to engage much larger numbers of younger people in LFE.

Arendt: I think that's a point that can't be stated too much. Trying to engage as many younger people as possible is key to ensuring that they also have a life and career-changing experience related to LFE and EERI. We're making the future that much brighter for EERI overall by getting young professionals involved.

Comerio: They are technologically savvy, able to work with virtual teams, and deal with changes in the way information is procured and assembled and reorganized. It's just easy for them to be doing many of these things, more so than for folks of our generation, frankly.

I also think having younger engineers look at the long-term consequences of decisions that are made in the aftermath of disasters is incredibly important for their understanding of what it really means when we want to change the building code, what it really means when we want to create policy about rebuilding a downtown or rebuilding housing or whatever.

There are lots of programmatic decisions that engineers are involved in, whether they're

working in the consulting world, in the academic world or in government agencies, such as FEMA in the U.S., Civil Defense in Italy or New Zealand, or other types of government agencies, or NGOs. It's important that early in their career they get an experience of seeing the consequences of different policy decisions. We know that no one policy is going to be perfect, but developing an understanding of how these things play out is valuable.

Arendt: It's one thing to read about something, but to be on the ground and to witness it is another.

Comerio: The combination of seeing the physical aftermath of a disaster and talking to people who were affected by it, people who lived through it all. Those experiences leave a lasting impression.

Chapter 16

EERI President: 2014–2018

Arendt: Let's talk now about your service to EERI as its president. First, how were you persuaded to serve?

Comerio: I was in New Zealand on sabbatical, by myself for a while, as my husband was planning to come later. We talked regularly on Skype and he said, "You got a call from someone named Bill Anderson and he really wants to talk to you in person. He doesn't want to send an email." He said that he told Bill that he would talk to me and see if I wanted to talk to him. He didn't know who Bill Anderson was.

Arendt: That's great!

Comerio: Bill called me on Skype in New Zealand and said, "You've been nominated for EERI President and we really want you to do it." My response was, "Wow, this is a really big deal, and probably a huge amount of work."

I said, "I'm on sabbatical now. I am a Professor of the Graduate School,[21] I'm not in a place where I have any staff support." I was

21 Professor of the Graduate School is unique to UC Berkeley. It is designed for active research faculty who want to "retire" from teaching, but who are still actively involved in research and the supervision of Ph.D. students. Faculty are invited to apply for the title as part of their retirement package. To maintain that status, individuals are then reviewed in a campus process every three years, much like a major promotion review.

thinking of when Chris Poland was EERI President and he always had his secretary organizing meetings and sending out emails and that sort of thing. It seemed to me that other EERI presidents may have been in a university, but they were part of a research center or had another type of appointment where they had staff support.

I said, "I'm by myself, doing research on my own. I don't know if I can take on such a role." Bill said, "Oh come on, you're not teaching. You're not really retired anyway. You can retire after this."

Arendt: He was a terrifically persuasive guy.

Comerio: I thought about it for a day or two and I said to myself, "Yes, of course, I'll do it." I joined the board as President Elect when Ian Buckle was President. Like everyone else, when you're new on the Board of Directors, you sit there for the first few meetings just trying to figure out everything that's going on.

Ian immediately handed me a number of projects that needed to be done and said, "Well, you do these. You are incoming."

Arendt: Not that you would have said no.

Comerio: One of the tasks was staff evaluations and reviews. So I organized a committee and we did them. While I may not have planned to undertake something like that so early in my tenure as President Elect, I learned a lot by doing them. I also looked much more carefully at the budget and the accounting, and all the things one normally never pays attention to when one is just a regular EERI member. I learned that there was some frustration and dissatisfaction on the part of staff as to how things were working and how things were budgeted. Several staff members were very worried about the sustainability of LFE. It was very eye opening and important to know during my two years as president.

Arendt: It was a lot to take in.

Comerio: There were a number of issues to be concerned about, how to continue to support LFE, and *Earthquake Spectra*, given that a large component of our budget goes to supporting *Spectra*. That was fine when there was another source to support LFE, but without the NSF support, it wasn't clear how we would balance the budget. We came up with the idea of organizing a retreat, what we called a "strategic alignment," to which both the board and staff were invited. We discussed who we are as an organization, what we really want to accomplish, and how to accomplish that with limited resources and limited staff time.

Part of the problem is that it's easy for an organization like ours to keep adding new projects. We have an Initiatives Development Committee (IDC) tasked with reviewing new initiatives that are to be funded, initially from endowment dollars. All of the ideas forwarded by the IDC were great ideas. As time went by, though, every one of those projects started to become permanent and suddenly the staff was overwhelmed by the amount of work that some of these efforts were generating. Volunteers need to be managed and coordinated and projects need to be documented. Every new initiative required staff time.

We hired a consultant to facilitate what turned out to be a very intensive two-day workshop with the board and the staff. The

goal was to get everybody on the same page, to strategically align our thinking about our priorities with the realities of our resources. It was quite something to organize, but really important and I think really valuable.

In the same time period, there had been some dissatisfaction among the staff about the workload and how to juggle everything. Some people had opportunities elsewhere and they took advantage of them. If that wasn't hard enough, then Jay Berger, EERI's Executive Director, decided he was going to retire. That meant the board was going to face another major set of changes, which we did.

Arendt: As a board member while all of this was happening, I can attest to the challenges faced by the board and especially the staff. As I recall the situation, you didn't flinch from dealing with what needed doing.

Comerio: At that point, David Friedman was president elect, and I called him up and said, "This is what we have to deal with." David and I went to work. We both understood how to manage the process.

We knew we needed to focus on hiring the best director possible. We knew how hiring works: how long to get an ad published, to receive applications and screen applicants, and so on. We made a decision not to spend money on a search firm because we believed that EERI was a unique organization, and that a head-hunter would be a waste of money. Instead, we used the board to promote the position opening to people, we laid out a schedule and we let the process happen. We had a formal search process and interestingly, we hired one of our own, Heidi Tremayne. She's been fabulous, but we had no idea how well everything would turn out at the beginning of the process.

Honestly, we didn't even know whether she was going to apply because she had said that it would have been better for her if the opening had happened five years later.

Arendt: I know that she wasn't sure about the timing. It hadn't been on her radar.

Comerio: We had a significant applicant pool, more than we expected and several extremely good, qualified people. We did a three-stage process of phone interviews, in-person interviews, and then final reviews. We narrowed the list down as we went and ultimately decided to offer the position to Heidi.

Arendt: When you say it like this, it doesn't sound like a labor-intensive process, but I know that it was.

Comerio: As I think about it, the defining moments of my presidency were the combination of the strategic alignment and the redirection and renewal of the staff. It was like having a full-time job. I have never spent so much time on another volunteer activity as I did during my term as president. By the time I became past-president, it was starting to all fall into place.

David Friedman also put in a significant amount of time as Chair of the Search Committee and he continued to ensure that everything went smoothly during his presidency. You can't expect that out of every EERI president. Some people have more time than others. Some people have lots of other professional

commitments in their lives and they can't invest quite as much time.

I feel as if my time was well spent. It was an opportunity for me to give back to an organization that has been extremely good to me. EERI allowed me to have important interactions, to present papers and give talks, to be an active part of several committees, and to be part of an ongoing conversation that crossed disciplines and engaged both academics and practitioners. There is nothing else like it. I think we all know that about EERI.

Taking on the presidency was a way for me to give something back to the organization in a way that was useful and that I could be satisfied with. It felt like it was the right thing for me to do. I am very glad that I did it. I wished it wouldn't have been quite so much hard work, but I learned long ago to deal with things as they happen.

Arendt: I think I can speak for other members of EERI when I say that your efforts as president were noticed and greatly appreciated. Of all the things you dealt with while you were president, what would you say was especially challenging?

Comerio: There were probably two things. Of course, it was challenging to hire a new executive director and make sure that our members were comfortable with the process knowing that we had an internal candidate. But, while it was challenging in some ways, it wasn't anything I didn't expect.

The truly challenging task was figuring out how to send a large reconnaissance team to Nepal after the April 2015 earthquake. It was an important event; how were we going to pay for it? It was important that we respond not only because of the amount of damage and issues faced by a developing country, but also because we had a significant relationship with NSET [National Society for Earthquake Technology] in Nepal. We felt a great sense of responsibility to our sister organization in this developing country and yet it was really expensive to send a team and do the follow-up publication of research findings.

Arendt: I remember that there were many, many people involved in this conversation: the LFE Executive Committee; the EERI Board of Directors; the *Spectra* Board. It wasn't an easy set of decisions to make.

Comerio: In addition to getting a team on the ground, we also had to raise funds if we were going to try to publish a special issue of *Spectra*. There wasn't enough money in the operating budget. Jay Berger did his best to raise money from FEMA and other organizations. There was a point at which we had not quite reached our goal and the deadlines were closing, and I decided to ask the EERI board members if they would make personal contributions for the publication. That was more challenging than I expected. Some people said, "Of course" and others said, "Oh, wait a minute, I'm already giving all my time to this organization". Asking board members to contribute to funding an activity was not the standard model.

Was this a new model? The issue it raised wasn't so much about the money, specifically. I don't think anybody complained about making a gift per se. I asked people to give what they could. At the same time, I was saying, "I would

like to be able to say that the board really thinks this is important. We all support this." In the end, many made contributions and the board was thanked in the special issue.

It was more challenging than I expected because it raised a set of fundamental questions about what kind of organization EERI is. It is clearly different from SPUR in San Francisco, with a large board of directors, each of whom make significant contributions to that organization. EERI has never been structured that way. We are a hybrid organization that's both a membership organization and an advocacy group, one that combines professionals and academics across disciplines. We engage our members to become involved and do things because they care about earthquake engineering.

Arendt: As the president, you needed to be thinking about the kind of organization we've been and also the kind of organization we want to be.

Comerio: People participate in EERI because they care about the field and the interdisciplinary nature of what we do. Their commitment to the organization isn't because they're giving money for a cause. Facing the dilemma of how to fund the Nepal reconnaissance meant we had to define the organization for the future. It underscored the need to move forward on our strategic alignment plans, and to make both *Earthquake Spectra* and LFE more financially sustainable, so that we would not have to go back to our membership or our board and ask for things we wouldn't typically ask them for. It was much more challenging than I expected.

Arendt: As a board member during your presidency, I can attest to your description of what I would call watershed moments. It became clear that relying solely on dues was probably not going to work in terms of achieving a sustainable organization.

Comerio: It was terrifying. I wasn't sure how people were going to react when I asked for donations. And people reacted differently than I expected. I realized then what it meant for the organization. I think it was good for the board to have that conversation. But I didn't sleep a lot during that period.

Arendt: How about talking about something that you are really proud of?

Comerio: The strategic alignment initiative helped change the profile of the board from being a group of more passive managers to people who are more actively thinking about the organization and engaging with both staff and members. I can remember serving on the board previously where members simply listened to reports, discussed options, and gave their approval.

The board didn't always play an active role. Perhaps that has to do with the maturity of the organization and the fact that there were many more activities underway during my tenure than there were 20 years before. The organization needs everyone to be engaged: the board, the staff, the committees, the entire membership. We can't expect either the staff or only the most committed volunteers on the committees to do it all.

Arendt: The organization is evolving along with the changing times.

Comerio: When EERI was smaller, it was easier for everyone to talk to each other and to get things done. Members were highly engaged. As the organization and the staff grew, and there were more things happening, with different people being responsible for different groups, and different committees working on new tasks; it became too difficult for simpler more casual processes to work. We had to create more formalized processes to manage a large number of activities. We needed budgets for the staff and the committees, with reviews by the board. We needed staff members to participate as appropriate and assist board members.

Changing processes can be healthy. We'll have a stronger organization going forward as a result. I think we owe a certain depth of gratitude to Eleanor Smith, the consultant who worked with us on the strategic alignment. It was very helpful to have an outside person step in to facilitate our conversations, someone without a vested interest, someone who had worked with other nonprofits, but who didn't know anything about engineering. She helped us work through our organizational decisions and the effort really changed the culture.

Arendt: I would agree. There have been a number of sustained changes as a result of that exercise, including, for example, a tighter relationship between staff and the board, thinking about what really matters to EERI and trying to figure out how to implement its priorities.

The timing was good.

I can say that I have known few, if any, people who have brought more energy than you to anything. I've been continually impressed by your energy, your effort, and also your communication skills, your collaboration skills, and your decision-making skills.

Comerio: My only regret is that we lost Bill Anderson way too soon. If he were still with us, I would be giving him a really hard time about how many hours I put in. [laughter]

He was wonderful, but I would just love to razz him about it.

Arendt: Before stepping away from this conversation about your presidency, I want to return briefly to some of the LFE efforts that occurred on your watch.

Comerio: There were the 2016 Kumamoto earthquakes in Japan and the 2016 Kaikoura earthquake in New Zealand.

Arendt: Right, also Chile in 2015 and Ecuador and Italy in 2016.

Comerio: And Mexico in 2017. For each of those, we enacted the new model, meaning the virtual team [VERT] was up and running very fast and collected information. The LFE Executive Committee met and discussed each event. We decided to partner with other groups; we didn't send 15-person teams in part because we didn't have the budget, but also in part because in the modern world it makes more sense to collaborate with local partners. Interestingly enough, in all the places that we just mentioned, EERI has good relationships with people and organizations. We had solid partners in every country.

We could use our virtual team; we could collaborate internationally with other teams that were going, as well as those from engineering

firms and Geotechnical Extreme Events Reconnaissance teams sponsored by NSF. We provided the clearinghouse and the ability to host collaboration calls. We collected and sorted all that information and discovered that this new role was in fact useful and important.

An example of this happened after the Kaikoura earthquake in 2016. A message popped up on my iPad from Ken Elwood, whom I'd been talking to regularly after the earthquake, that said, "Are you still awake, can we talk on Skype?"

It was about midnight when we talked and he said, "Look, one of the faculty here is trying to put together a basic website where they can assemble information from the various New Zealand teams, including QuakeCoRE, GNS, and all the other players. If it were possible to upload the data on the EERI website, they wouldn't have to invent the platform from scratch." Somehow or another, he must have also sent a note to Heidi [Tremayne] and Heidi jumped on this call. I said, "Heidi, you have a new baby. You're supposed to be asleep." And she said, "I'm awake."

Heidi said the virtual team was already organizing the online clearinghouse. The website was up at 8:00 the next morning. Basically, our young members worked their magic. In New Zealand, various groups all uploaded their data to that website making it accessible to all. I said to Heidi, "This is the new model. Make sure that every single organization gets credit in the banner." All the collaborators were listed, not just EERI and QuakeCoRE, all the contributing New Zealand organizations such as GNS Science, GeoNet and more.

That gesture went a long way in building trust and building relationships. In the past, some individuals may have been a little bit leery, wondering if EERI was trying to move into their turf. Clearly, in this case, we weren't even physically there. We were just trying to help. With that earthquake, and the others since then, we demonstrated a new model of how we could move forward with LFE such that not every earthquake event required a large reconnaissance team. Some events will require a big team, but it is good to have a variety of tools for different events.

Arendt: Having been in Nepal with the Housner Fellows the following year, it was easy to see the value of sending a larger reconnaissance team to a developing country where the people on the ground were able to benefit from our help while we were learning from their experience.

Comerio: With the events in countries where we had well-established relationships, it made sense that we could do LFE a different way. Kaikoura and Mexico were significant examples of how LFE is in the process of changing. Heidi Tremayne and Maggie Ortiz-Millan, EERI Program Manager, are onboard and excited about the new model.

Arendt: As the co-lead for Mexico in 2017, that was exactly our thinking. We wanted to make sure that we were playing this hub role, facilitating relationships and collaboration because there were people already on the ground that had important insights to share with others. We didn't need to replicate their work; we needed to see if there were any gaps that needed filling and to support what we could.

Comerio: I think it's a great model. As we begin to develop an endowment funding base for LFE that's more secure, then we'll have even more and better choices moving forward for how we do LFE in the future.

It's a great time for EERI and its membership.

Chapter 17

The Future of Earthquake Engineering & Resilience

Arendt: It's time for you to discuss what you foresee for the role that resilience might play in the practice of earthquake engineering.

Comerio: I recently came back [in November 2018] from the 17th U.S.–Japan–New Zealand Workshop on the Improvement of Structural Engineering and Resilience that took place in Queenstown, organized by ATC. The workshop completely surprised me because it was the first time I heard a large number of both academics and practitioners saying resilience matters. Maybe we shouldn't build just for life safety; maybe we have to design cities differently.

I felt like I had been a lone voice for so long. Clearly, Lucy Jones had become an advocate, after her work with the City of Los Angeles, but it was something that I had been saying to the engineering community for a long time. Suddenly here were 60 people saying something similar, from three different countries— younger and older, academics and practitioners—and some of the practitioners were the greatest advocates. I felt really heartened. It leads me to think that we are at a turning point, that we've come a certain

amount of distance with performance-based engineering, and with thinking about consequences and life-cycle costing and different choices that can be made.

People are also starting to think about the bigger picture of how the world works and what we can do. I believe we can make progress on disaster resilience and that the next 25 to 50 years will be as exciting as the last 25 to 50 years. What we see will be different. It will not be limited to technological solutions or laboratory tests or even designing buildings better. We'll still be doing that, of course, but we'll also be looking at much broader culture changes in the professions and I mean the professions plural.

Arendt: Tell us more what you mean by that.

Comerio: All the earthquake safety professions have a role. I'm thinking especially about changes in policy and changes in the way we manage data. I think that's where we're going.

Arendt: How do you see this way of thinking getting incorporated into university curricula?

Comerio: Well, we need to change the engineering and architecture/planning curricula, without question. We need to have these disciplines learning how to improve the functioning of the built environment and talking to each other much earlier than we do now, not waiting until they join EERI. They need to understand what they are doing in the context of performance-based design, in the broadest sense, as well as what resilience-based design means in a downstream set of policies. As we develop some of that fluency in the universities, we'll develop that fluency in the next generation of professionals. It'll take a while. If there's anything I've learned in the last 25 or 30 years, it's that nothing happens fast.

We have to imagine a long-term horizon, at least 50 years, and think about where we'll be then and where we want to be. If we think back to the 1970s and 1980s, for example, we had no idea then that we would be talking on Skype like this, looking at each other. It's remarkable.

Computers were babies then. We couldn't model very much. There was no performance-based engineering; there was no infrastructure-interdependency modeling; no probabilistic analysis. We did very little cost benefit analysis or lifecycle costing of different seismic design options. I think we've come a long way technically and we are now going to see another wave of technological growth, in addition to the social, political, and economic waves. There's still is a lot of technical work to be done.

We can start to visualize optimum policy choices, including the best combination of work on existing buildings and changed codes for new construction. Should we focus on every building type or targeted building types? The minute we start thinking about targeting rules for different building types or setting different planning regulations for different soil conditions, we start thinking about significant changes across a wide variety of fields.

Arendt: Such as?

Comerio: Architecture and engineering would change, of course. In addition, planning, real estate, development and finance—every

field that plays a role in creating and managing the built environment—will change.

Involving so many fields with so many potentially clashing goals means any change will have to be long-term change.

Arendt: What needs to happen to move this kind of change forward? Who gets this change started and keeps it moving?

Comerio: Perhaps it starts with people talking about it in meetings, like at the U.S.-Japan-New Zealand Workshop on the Improvement of Structural Engineering and Resilience. Beyond that, I foresee more multidisciplinary research projects as well as ATC projects that translate the research into practical guidelines. I see professionals devising guidelines for what "repairable damage" actually means. These efforts then translate into codes. Practitioners will say, "No way, we'll never do that," and then they're all doing it 20 years later. The students and the young practitioners will be the leading edge.

Arendt: Switching gears, how do you foresee changes from the more developed countries making their way into still-developing countries?

Comerio: Actually, I think the developing countries have some opportunities that we don't. For example, they don't have as many embedded technologies and practices, which means they have the opportunity to leapfrog to new technology. You see that happening in the way farmers in India use cellphones to track the weather, irrigate and manage their crops. Estonia is an example of a country that went from having a population without phones and Internet to an electronic society where a citizen can access basic services and do all their government interactions online and never have to go into an office or stand in line.

I could imagine a system like that around planning permissions and building regulations. If you start in a place where they don't have a lot of those things already, you could skip some of the steps and just move forward. Recently, I spoke with a group of people from a large U.S. technology company who are thinking about disaster issues because, of course, many of their employees are from third world countries that have been experiencing disasters.

The company was interested in how to use data and modeling to help inform disaster-planning processes in developing countries and also how to use that same technology to help people in the immediate aftermath of a disaster.

I think that there are many opportunities.

Arendt: Agreed. In my own work with young professionals in EERI, especially the Housner Fellows, I've noticed a growing sensibility among them that we are all connected to each other. While we may have some more sophisticated technological solutions in developed countries that we can share, we can also learn a lot from developing countries about how to be innovative when we don't have much in the way of monetary resources.

Comerio: I hope in the future we will better understand how much we can learn from people in developing countries.

Chapter 18

Family & Fun

Arendt: We've talked at length about your professional career, but haven't devoted much time to some of the personal aspects. Tell us a little bit about your immediate family.

Comerio: My immediate family includes my husband, Michael B. Teitz, who was born in London, England. He's a Professor of City and Regional Planning at UC Berkeley. We met at UC Berkeley. That meant we met after our careers were established and so we did not have to negotiate the two-career couple logistics. [laughter]

I have a step-daughter, Alexandra Elizabeth Teitz, Mike's daughter from his first marriage. Alexandra is married to Craig Brooks and they have a 12-year-old named Cecily. They live in the Washington, D.C. area. Mike and I have a daughter, Catherine Rose Edith Teitz, currently a Ph.D. student in Classical Archeology at Stanford.

Arendt: How did you and your husband meet?

Comerio: Before I describe that, I have something important to say. As a woman in a technical field, coming of age in the late 1960s and early 1970s, from an immigrant family where marriage meant an assignment to the kitchen, I wasn't too keen on getting married. I was not at all keen on serious relationships. It took a long time for me to get there.

That way of thinking was inevitable for a woman of my generation. A lot of us thought we could not have careers and families, because it seemed so hard to do both. Now, I'm shocked when I hear young women still saying that. It shouldn't be true any longer!

Marriage was a big issue for professional women of my generation. It seemed as though women who got married fell into two groups: one group set aside their careers and put their spouse's career first; the other had to negotiate with their partners over how they were going to run their life. There weren't many good role models here.

Interestingly enough, in Italy and other countries, there is a whole professional class of women, including academics, from my generation. However, that is within a certain social class. Professional/academic families all have help—people to cook, people to clean, people to take care of the kids. I didn't have that kind of upbringing so I didn't know that it was even possible. I thought I had to do it all myself.

Mike and I met when we were both attending a meeting at UCLA. It turned out we were on the same flight. We chatted. We went to the meeting, and then, at some point, I suppose we got bored, and went out to the movies.

Arendt: Sometimes, it's the simplest things!

Comerio: Shortly after returning home, I was leaving for Italy to teach at ILAUD [the International Laboratory for Architecture and Urban Design] for the summer. So I said, "Well, I'll see you when I'm back." Later, we dated and our relationship just evolved. He was, and is, the best person one could ever talk with about research. He was so good at it. He's still good at it.

Really, there is nothing quite like talking about research questions with Mike. You get deep into it, and that's why his students adore him. Being with him was fun. It was intellectually challenging. It was interesting. He was different from anyone I had ever dated.

We dated for a long time, in a low-profile way at Berkeley. Then we lived together and we eventually got married. Neither of us was in a hurry.

Arendt: I love how you talk about this relationship as one that has a strong foundation in the intellectual tradition.

Comerio: Yes, absolutely.

Arendt: I find that very romantic.

We've talked previously about work-life balance. Sheryl Sandberg, who wrote *Lean In*, contends that women need to work harder and assert themselves more, and then they can have it all. I think most women's experience is more along the lines of what you might describe as "You can have it all, but maybe not at the exact same time and not without some help." Is that right?

Comerio: I would agree with you.

Arendt: I imagine that some of your thinking today has to do with your long-standing relationships with family and close friends. Can you talk about this more?

Comerio: My parents died when I was relatively young. My brother Mike is eight years older and lives in suburban St. Louis. He has adult children and grandchildren. We talk on the phone, but we don't see each other very often. He chose not to go to college and we lead different lives. By the time I arrived in Berkeley, I had a completely different life from his.

Early on, I was isolated from cousins and

aunts and uncles because we moved out to the country; our extended family was not part of my regular life. Interestingly, the families with whom I feel the closest kinship are the families I sort of adopted, and who sort of adopted me.

A good example would be my two best friends from architecture school, who married—Kathy and Bennett Lord. I lived with her mother in Rome when I finished graduate school. His parents regularly had me to stay at their house in California when I came to work with the farm workers on my thesis. They had six children, I was just one more.

We all have stayed very close over the years. I'm very close to all of the siblings in both families. They are much more my extended family than my own relations.

Arendt: It's neat to become a part of another family and to develop those relationships by choice.

Comerio: It is something you do by necessity. When Catherine was in school, our closest friends were the parents of other kids. They were similar to us: older parents who lived away from where they were born. They didn't have cousins and brothers and sisters for backup. They didn't have built-in babysitters, so we all just took care of each other, and we still are friends.

Arendt: Academia can lead to great friendships as well.

Comerio: Our close friends include academic colleagues, not only people who do similar research, but also people from other departments and other universities. My PEER colleagues, at all the different schools, remain good friends. We're close and, similarly, Mike has many colleagues that we see all the time. When we go to London, we absolutely have to see our friends as well as his family. When international colleagues are traveling through the U.S., they often stop here. Then there are what we call the Ph.D. children, and Ph.D. grandchildren, at this point. We are extremely close to many of our Ph.D. students and they are family to us.

Our home is an easy stopping point; after all, San Francisco is on the way to somewhere. It seems perfectly normal that when colleagues are in town, we'll see them for dinner. On Alexandra's 16th birthday, there were some friends from MIT visiting UC Berkeley, and we said, "Come to dinner, but we're having a birthday party."

Catherine jokes that her best training for graduate school was the "dinner seminar," where there was no acting like a teenager. There was always some topic to debate, and everyone, including her, participated in the discussion. It served her well.

Arendt: I'm reminded that one of the ways you like to spend your time is traveling. How did you get the traveling bug?

Comerio: When I was a child, we had many magazines including *National Geographic*. My father was interested in the world and so I was interested. We looked at photos and read articles, and talked about places together. We talked about how wonderful it would be to go to those places. I always wanted to go.

Sometimes, he and I just got in the car and drove, all day, somewhere. Then we came home, of course, but no matter what, we were

going someplace new. Those experiences never left me.

Arendt: You've been to many places, and not only visiting for the short term that many people might imagine, but you've lived for extended periods of time around the globe. What are some of your favorite places?

Comerio: I think that New Zealand is probably one of my favorite places on earth. I love it. It's so beautiful. The people are delightful. The scenery is exquisite. It's intellectually interesting from the disaster point of view. The other place that I adore is Italy. It is, after all, the home turf! I always feel happy there. Even if I get frustrated with the difficulties of daily life caused by Italian bureaucracy, there are Roman ruins, and churches with amazing domes, and the food's really good.

Arendt: That's always a winning proposition!

Comerio: Italy is beautiful and it's full of history and architecture. It's an architects' heaven. I always take my old *Companion Guide to Rome* by Georgina Masson, an architectural historian, and I follow Georgina around the Renaissance.

I love the buildings, and even if I have seen many of them, it doesn't matter. I'll see them again.

My third favorite place is London. That's Mike's hometown. We've spent so much time there, and we have his family and so many friends there, it feels like home. It's probably one of the greatest cities in the world. When we're there we go to the theatre and to concerts. It's a fabulous city that works, especially compared to Rome, which is beautifully intertwined with the ancient world, and the food's great, but it only semi-works.

New Zealand, on the other hand, is rural splendor. It has fjords and rain forest, crashed up against remarkable mountains. It has farms and villages, hiking, sailing and fishing. It's my outdoor adventure paradise.

Arendt: Is there a place that's still on your list of must-sees that you haven't had a chance to get to yet?

Comerio: I haven't traveled in Southeast Asia. I have not been to Vietnam or Cambodia. I've not been to India. They are fascinating places, amazing cultures, great food. I just haven't had an opportunity to go there, and I don't know if I will. I would like to, but I'm also drawn back to these other places.

I'm still relatively comfortable spending time in airports, which is amazing. When I start to hate that, I'll stop traveling.

Arendt: What do you like to do in your so-called free time?

Comerio: I'm a pretty serious cook. I'm an old country girl. I like to put-up things from the garden, and make jam. I like to make everything myself.

Arendt: That's amazing. By the way, you gave yourself away when you said you like to "put-up" food. That's something that only a person who has canned can say.

Comerio: It came naturally from my father, who was a phenomenal cook and chef. It was bred in the bone. This was how we did things.

Marcella Hazan, a famous Italian cookbook author, used to give cooking classes in Venice in the 1980s. My great life regret was that I never took a class with her. By the time I could afford it, she had passed away.

Arendt: How unfortunate!

Comerio: I mention her specifically because in the introduction to her books there are essays on "the rules" of the kitchen. As I read her words, it's like hearing my own father's rules: "Margarine will not cross my doorstep, butter is good. Use only the best quality olive oil and only the freshest vegetables. Make this dish a particular way, there's a reason you do it this way." It's so wonderful to read her books because it's as if I can hear the voices of my childhood and relive all my food memories.

Arendt: What is it that you like so much about cooking?

Comerio: It's the creative process, like sewing, like architecture. To make something, you have to design it, you have to figure out the components, you have to understand the structure, you have to put it together, and you have to make it beautiful as well as make it taste good.

Arendt: What else besides cooking do you enjoy doing?

Comerio: I like to walk. I like to swim. My life has been pretty much centered on work. It's the nature of academia that one spends life working. But I've had fun doing my life! I get to exercise and walk in beautiful places, take nice hikes, go for a swim. I think that's also why cooking is important. Part of what I find relaxing at the end of the day is making dinner. It gives me time to change gears, to do something creative with my hands, and there's an end product, which we can enjoy right away.

We also enjoy visiting with friends and going to the theatre. Mike and I go to the theatre when we're in London.

Arendt: What's special about going to the theatre in London?

Comerio: It's the best, the West End. There are no better productions, there is no higher quality, no better actors anywhere. On any given day there are 25 serious dramatic plays in the West End plus an equal number of musicals, plus all the fringe productions, plus operas, plus everything else; it's fantastic.

Arendt: It sounds like it's an ideal ecosystem for theatre.

Comerio: That's a great way to describe it. When Catherine was a little kid, we used to take her to children's theatre, and there were perhaps 15 dedicated theatres for children. The acting was good because London is filled with people who want the opportunity to perform. A London production of *The Giraffe, and the Pelly and Me* can be a moving experience.

Endnote

Mary Comerio: I would like to thank EERI for the opportunity to share some of my research, career, and life experiences. I hope that in the editing, I have managed to get all the project titles and people's names correct. If there are any errors, the fault is mine. If there are any omissions, especially people who should have been named as part of a project, but were inadvertently left out, I apologize.

Laurie Johnson and Lucy Arendt began the first three interviews at the 2018 U. S. National Conference in Los Angeles, but Laurie's consulting schedule made it difficult for the three of us to continue the dialogue. We really valued Laurie's experience with past Oral Histories to kick-start the process. However, we all agreed to move forward with Lucy as interviewer. I want to extend special thanks to Lucy, who has been an incisive, empathetic, and energetic interviewer. I was not surprised. I have seen her in action on reconnaissance missions, and I know that she never tires of asking good questions and drawing out reluctant subjects. I could not have had a better person to interview me for this Oral History.

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Photographs of Mary C. Comerio

Mary Comerio's parents, Rosa Maria Ruggeri and Mario Augustus Comerio, at their January, 1942 marriage.

Mary in her grandparents' garden, 1953.

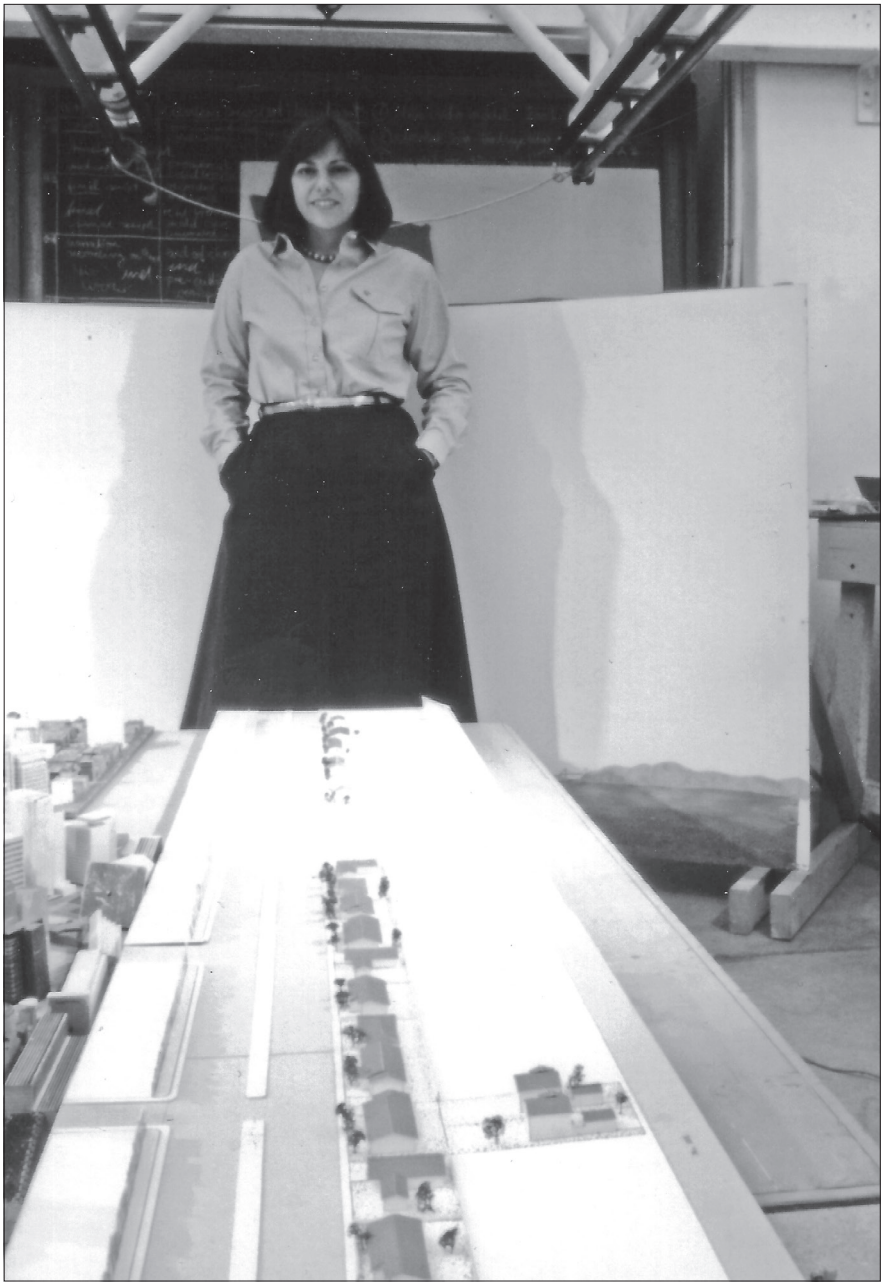
Mary in the photographer's studio, 1953.

Mary as a high school student on the television program, "Scholar Quiz," 1968.

A college classmate's drawing of Mary.

Mary beginning her career at UC Berkeley in 1978

At UC Berkeley, 1978



With a model of self-help housing in Oakland made by her students.

Mary with students at the Elmhurst Community Design Center in 1979

With fellow UC Berkeley faculty member, Spiro Kostof, teaching at the International Laboraatory for Architecture and Urban Design held in Urbino and Sienna, Italy, 1983

At a meeting of architects and planners with Fidel Castro in Havana in 1988

Mary's step-daughter Alexandra and daughter Catherine in about 1994.

Mary with her husband, Michael Teitz, and daughter Catherine at a "Take Your Daughter to Work Day" in 1996.

Left to right: Catherine, Michael, Mary, and Alexandra at Christmas, 2005.

Left to right: Thalia Anagnos, Mary Comerio, and Judy Mitrani-Reiser on the EERI Learning from Earthquakes Study Tour, *Santiago, Chile, 2017.*

Mary at the Goodnight Resilience Panel of the Curry Stone Foundation, June, 2018.

(courtesy of Drew Altizer)

Left to right: Taryn Williams, President of the Structural Engineers Association of Northern California (SEAONC), Mary, and SEAONC member Bill Holmes, as Mary becomes a SEAONC Honorary Member in 2018.

(courtesy of SEAONC)

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While sometimes overused, in the case of Mary Comerio, "passionate" is the word that best describes her commitment to providing safe housing for all people. Her book, *Disaster Hits Home,* was praised for its analysis of the impact of disasters on housing and the need for better public policies. Originally from the St. Louis area, Comerio is an architect and housing recovery expert who eventually landed in California where she used her voice and expertise to make buildings in Los Angeles, Oakland, and San Francisco safer for people who live and work in them. A professor at UC Berkeley, she has made a material difference in the lives of thousands of people around the globe: as the President of EERI, LFE reconnaissance leader, professor, scholar, mentor, advocate, community member, wife, and mother. She seamlessly walks among all these roles. The details of her many interests and professional accomplishments are shared in this oral history.

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