

Soft-Story Housing Improvement Plan for the City of Oakland

Building Screening Phase

Introduction

In 2008 Oakland embarked on a process to identify and retrofit multi-unit wood framed soft-story housing within the City (See **Appendix A**). These apartments and condominiums are especially vulnerable to damage or collapse in earthquakes. The goal of this effort was to create a more resilient and equitable city by reducing the number of housing units damaged in an earthquake, protecting the health and safety of residents, and positioning the City to more quickly recover and rebuild while preserving the City's character.

Earthquakes are a fact of life in Oakland. Throughout its history, earthquakes have shaped and changed Oakland, and they will continue to do so in the future. After the 1906 earthquake many San Francisco residents left the destroyed city and relocated in Oakland, doubling its population. As a result many Oakland homes were constructed in the 1910's and 20's. After the 1989 Loma Prieta earthquake, the collapsed Cypress freeway was relocated, allowing the West Oakland neighborhood to be reunited and reshape its character. The damage to Oakland City Hall also allowed for a rethinking of Civic Center and a revitalization of the downtown area. Oakland must be prepared to minimize the disruption of future earthquakes, as well as take advantage of opportunities to improve city life. It must be a resilient city.

What are Soft-Story Buildings?

Soft-story buildings are multi-unit wood-frame residential buildings with a first story that lack adequate strength or stiffness to prevent leaning or collapse in an earthquake.¹

¹ FEMA (2012). *Seismic Evaluation and Retrofit of Multi-Unit Wood-Frame Buildings with Weak First Stories (FEMA P-807)*



Potential soft-story apartment building in Oakland's Lake Merritt neighborhood.

These buildings pose a safety risk to tenants and occupants, a financial risk to owners and risk the recovery of the City and region.

It is not always possible to know simply by looking at the outside of the building that it is a soft-story building. Large openings for garage doors or commercial spaces are a strong indicator, as are the lack of interior walls and partitions on the ground floor, but only a detailed analysis performed by a structural engineer can definitively determine whether a particular building is a soft-story building.

While a soft-story building can apply to a wide range of buildings, the scope of Oakland's soft-story seismic screening program applied only to buildings with all of the following attributes:

- permitted for construction prior to adoption on January 1, 1991 of the 1988 edition of the Uniform Building Code;

- with parking or commercial on the ground floor;
- five or more residential apartment, condominiums or live-work units;
- not structurally retrofitted for earthquake forces; and
- two or more stories in height.

Impacts of an Earthquake on City Life and Character

In a major earthquake on the Hayward fault, ABAG estimates that sixteen percent (26,000) of Oakland's 163,000 housing units will become uninhabitable. At least two-thirds (14,700) of these losses will be due to damage of soft-story apartment and condominium buildings. Some people will likely be killed and many more injured due to this potentially severe damage. Some gas lines will rupture and start fires that can spread to neighboring buildings.

ABAG estimates that a total of 21,500 Oakland residents will seek shelter as a result of uninhabitable housing, far exceeding the City's current listed shelter capacity of 5,000 beds. Retrofitting housing keeps people in their homes and out of emergency shelters.

After an earthquake, multi-family housing will return slowly and may be converted to condos, creating a significant loss of affordable housing. As renters, tenants of soft-story buildings have little ability to influence the recovery of their own housing and are dependent on landlords, often located outside of the city or even the state. Lower income residents may be forced to leave to city permanently. The diversity of the city will change forever and the city's ability to quickly recover from earthquakes will be hampered.

Retrofitting and preserving soft-story buildings will benefit the entire City and play a major role in preserving Oakland's cultural character after an earthquake. Retrofitting will also reduce Oakland's carbon footprint. The investment of energy and materials to retrofit a building is a fraction of the investment to rebuild and it reduces the volume of debris and hazardous materials from demolished homes that must be sent to the landfill. Finally, retrofitting buildings creates good jobs for contractors and engineers in the city.



*Top: Potential soft-story apartment building in Oakland.
Bottom: Soft-story building damage in the 1971 San Fernando Earthquake.*

Identifying Soft-Story Buildings

In 2008, The Association of Bay Area Governments (ABAG) identified **24,273 units in 1,479 residential buildings with 5 or more units**, 2 to 7 stories, built before 1991, and containing parking or commercial uses on the ground floor through a sidewalk survey (see **Appendix A**). These criteria were developed by the City of Oakland in collaboration with structural engineers. The buildings identified in the survey were termed "potential soft-story buildings." Buildings can be soft-story without meeting these criteria, but these are thought to be the most dangerous buildings. Based on a statistical sample, an additional **1,060 4-unit buildings** and **370 3-unit buildings** in Oakland have parking or commercial on the first floor but do not meet all the survey criterion.

Level 1 Screening Responses	Count
Total Owners Noticed	1,379
Total Completed Evaluations	655
<i>Level 1 - not on a slope</i>	464
<i>On a slope - Level 2 required in the future</i>	134
<i>Missing slope info</i>	46
<i>Level 2 in process</i>	11
Total Exemptions	239
<i>Retrofitted</i>	25
<i>Built after 1990</i>	1
<i>Engineer's letter</i>	70
<i>Less than 5 units</i>	37
<i>No large openings</i>	66
<i>No ground level parking/commercial</i>	4
<i>City inspection</i>	15
<i>Exemption request pending</i>	21
Total Incomplete Evaluations	485
<i>Non-responsive</i>	339
<i>Returned to sender</i>	129
<i>Granted extension</i>	5
<i>Level 1 pending</i>	12

Screening Level Definitions

Level 1 Screening - Non-Engineered Analysis

This screening was required to be performed by a registered design professional, licensed contractor, or certified inspector to better understand the existing conditions of the ground floor of the building. Buildings on a significant ground slope were not required to complete a Level 1 screening; they will be required to perform a Level 2 screening in future phases of the program.

Level 2 Screening - Engineered Analysis

This screening consists of structural calculations performed by an engineer to evaluate structural deficiencies in the ground floor and make a definitive determination about soft-story conditions. A Level 2 screening was not required as part of this phase of the program.

As a result of the survey, the City adopted an ordinance² in 2009 which required potential soft-story building owners to complete a simple screening evaluation of their building (Level 1). The data collected from the screening can assist the City in better understanding the scope of the soft-story seismic retrofit needs within the City and to help develop future policies, regulations and ordinances.

The Screening Process

As a result of the 2009 ordinance, the City of Oakland Building Services Department notified 1,379 building owners that their buildings had a potential soft-story condition and required them to complete the Level 1 screening evaluation. Building Services also received all of the returned evaluation forms, reviewed exemption requests, answered questions from owners, followed up with non-compliant owners, and performed inspections of many of these buildings. ABAG trained contractors and engineers on the screening evaluation requirements, provided technical assistance to owners, and recorded and analyzed the data collected on the screening evaluations.

During the Level 1 screening, many building owners became aware that their buildings had a potential earthquake vulnerability that concerned the City, and through interactions with ABAG and Buildings Services staff as well as the contractors and engineers that evaluated their buildings, owners learned about options for correcting this vulnerability.

All of the buildings that were notified originated from the ABAG survey that identified 1,479 potentially vulnerable buildings. Of the 1,379 buildings that were notified, 655 building owners (47%) completed evaluations and 239 (17%) were exempted from the ordinance. 25 buildings were exempted because they had been previously retrofitted to acceptable standards. 485 (35%) building owners were non-responsive or otherwise failed to satisfy the screening requirements. A total of 339 addresses received but did not respond to the notice and 129 letters were returned to sender. The building department conducted an exterior inspection of these buildings. Fifteen buildings were exempted

² [Mandatory Seismic Screening of Multiple Story Residential Buildings Constructed Before 1991 Ordinance \(Number 12966\)](#)

based on this inspection.

The 655 complete evaluations included 11 owners who voluntarily completed an engineering analysis of their building (Level 2 in process). 464 completed a Level 1 evaluation and 134 are on a significant ground slope and require a future engineering evaluation to understand their seismic vulnerability (Level 2 evaluation). An additional 46 buildings did not provide any information about ground slope. For purposes of this analysis, these buildings were assumed to be on a slope. The 464 buildings *not* a slope are described in charts 1a and 2a in **Appendix B**. The population of 180 buildings on a slope is described in charts 2a and 2b in **Appendix B**.

The buildings that completed a Level 1 evaluation vary in size, with the largest buildings containing 201 living units. Most have less than 30 residential units. A large number of buildings were built in the 1920's and between 1950 and 1970, matching the predominant building booms in Oakland. Buildings built in the 1920's range in size, but tend to be either 5 and 6 units buildings or 18 to 20 unit buildings. In the 1950's and 1960's buildings were primarily less than 30 units with only a handful larger than 30 units. In the 1970s, though fewer buildings were built, they tended to be larger with just 11 buildings containing 777 units. In the 1980s buildings average 20 units with two large buildings containing 54 and 77 units. Nearly 80% (361) of the buildings not on a slope are potentially wood frame buildings. See charts 1a and 1b in **Appendix B**.

Buildings that are on a slope tend to have less than 30 residential units and are predominately built in the later building boom between 1950 and 1980. In the 1970's several large buildings were built on slopes, containing more than 50 units each. See charts 2a and 2b in **Appendix B**.

Conclusion

The screening process helped narrow the scope of the soft-story building problem in Oakland and will help guide future soft-story mitigation efforts with an eye towards preserving both the housing stock and the historical character of the city. It was also useful in educating building owners about the vulnerability of their buildings, and as a result a number of residents and potential owners have begun to ask important questions about the safety of their buildings. The

process likely spurred some owners to take action. The next section describes some options for further supporting owners to assess and retrofit their buildings. The information gathered in the Level 1 screening on construction materials, openness of exterior walls and floor plan will also help provide guidance for the next phases of a soft-story building evaluation.

Many cities around the Bay Area have developed programs to identify, evaluate and retrofit soft-story buildings in their city (see **Appendix C**). Oakland can benefit from lessons learned by these cities and the general awareness of the vulnerability of soft-story buildings that is developing in the Bay Area. Their programs inform the recommended next steps identified here.

Next Steps

Oakland could take a variety of actions to reduce damage to multi-unit wood-frame soft-story buildings in an earthquake. A phased approach is recommended to respect economic realities. Laying out the full approach at once however, will give owners a sense of where the City is headed and may encourage some to perform necessary strengthening work sooner rather than later. This proposed framework matches closely with one proposed in the City of San Francisco to retrofit their soft-story buildings.

Step 1: Form a Technical Advisory Committee

An advisory committee comprised of tenants, owners, engineers, contractors, city staff and policy makers, similar to San Francisco's Community Action Plan for Seismic Safety (CAPSS) advisory committee should be established to develop and guide implementation of Oakland's soft-story program. The committee should be led by a project manager who can provide specific deliverables to the Oakland City Council by firm deadlines. The advisory committee should work alongside the City in a multi-year project to determine priorities for soft-story strengthening design and carry out the next phases of the soft-story program as outlined in the following steps. The committee would benefit the City by helping to achieve buy-in from the community about the need for strengthening soft-story buildings.

Step 2: Provide Information and Encouragement to Owners and Tenants

The City of Oakland has already notified owners that their buildings are on a list of potentially soft-story buildings, as defined by the Oakland ordinance, and required them to complete a Level 1 evaluation of their building. This evaluation helped remove buildings on the list that did not meet the criteria of the ordinance. The City should report back to these owners the results of the Level 1 evaluation, inform them whether their building remains on the City's list, and provide them with recommended actions to evaluate and strengthen their building. The letter should also make a statement about the policy intentions of the City and invite them to participate in the citizen advisory committee to help shape policy together with the City.

The City should determine a fair way to make the remaining list of suspected soft-story buildings available to the public and include those buildings that did not participate in the evaluation. Residents and tenants want to know if the building in which they live or work is a potential soft-story building. Making the list public, combined with a fair process for owners to update the list, will improve the quality of the list and give the right signal to the owners that the City is serious about strengthening these buildings. An accompanying fact sheet could explain that only residential buildings meeting specific criteria were surveyed, and buildings not on the list may still be vulnerable to earthquakes. Procedures should be developed for residents to add buildings to the list that have mistakenly not been included and to notify the City once retrofits have been completed.

Step 3: Develop an Incentive Package

A comprehensive package of incentives and financial assistance should be developed to remove as many barriers to further evaluation and retrofitting as possible. The package should be a mix of financial and land use incentives and technical assistance. Some incentives require little or no money and could be implemented fairly quickly, while others will take more time and money to develop. Incentives should provide a little something for everyone to make the process go more smoothly and demonstrate an effort on behalf of the City to share in the outcomes of the program. Significant financial incentives should be provided only to those owners who really need it such as non-profits and low

income owners. This process can happen in parallel with the development of other components of the program. Oakland should work with neighboring cities, the state, and federal government to secure these financial incentives for owners. **Appendix D** contains a comprehensive list of retrofit incentives available to the City.

Step 4: Require Level 2 Building Evaluations

In Berkeley 20% of owners, who were required to hire an engineer to evaluate their building (Level 2 evaluation), went through with a voluntary retrofit. Clear intention on the part of the City to move to mandatory retrofit requirements helped incentivize some of these owners to retrofit.

In Oakland, as an interim step to mandatory retrofits, a phased mandatory evaluation program will encourage some owners to retrofit. Oakland requires a Level 2 engineering analysis for soft-story buildings on a slope because these structures are known to be especially hazardous. This next phase of screening should also include the properties that failed to complete the Level 1 screening or that failed to provide slope information. The City should carefully define and consistently apply fines and penalties for non-compliance.

Oakland may also consider targeting large buildings, or those of a certain vintage, high hazard buildings as determined by a simplified engineering screening, or buildings in particular neighborhoods within the city that have high concentrations of soft-story buildings, such as the Lake Merritt and Adams Point neighborhoods.

Similar to the Berkeley program, owners should submit a report with the engineering evaluation and their intended next steps to the City within a certain timeframe. The results of these evaluations should be made available to the public and buildings determined to not be soft-story by an engineer should be removed from the public list. Owners that voluntarily retrofit to an approved standard should be exempt from future retrofitting requirements for a period of at least 15 years.

Step 5: Require Retrofit

The best way for the City of Oakland to retrofit these hazardous buildings is to mandate that they are retrofitted as part of a long term strategy. Oakland can provide ongoing technical assistance and set deadlines for completing

seismic retrofits sufficiently far in the future to allow owners time to secure necessary resources. This phase could come after mandatory evaluations and will target those buildings that pose the greatest risk to life and neighboring properties.

Mandatory retrofits could also be triggered upon sale of the building, during a condo conversion, or major renovation. These triggers are similar to other building upgrade requirements in place at the City and may be a relatively easy addition to standard practice. Whenever possible financial assistance should be available to those owners who cannot afford retrofits.

This report was prepared by Danielle Hutchings Mieler, Earthquake and Hazards Program Coordinator for the Association of Bay Area Governments (ABAG) with funding from the City of Oakland. Sue Piper of the Mayor's Office and Christine Calabrese of the City Administrator's Office provided program management, and Tim Low and Sandra Smith of Building Services provided technical support services for the City of Oakland. The screening evaluation process was administered by the City of Oakland Building Services Department. Significant data entry was performed by ABAG intern Diana Louie and Dana Brechwald, ABAG Earthquake and Hazards Specialist assisted with report preparation.

Appendix A

History of Efforts to Address Soft-Story Housing in Oakland¹

Building Inventory

In 2008, the Association of Bay Area Governments (ABAG), assisted by volunteer earthquake professionals,² conducted a sidewalk survey of multi-family apartment buildings within the city. The scope of the effort involved looking at parcels identified by the Alameda County Assessor's Office as having buildings on them (1) with 5 or more units, (2) between 2 and 7 stories, and (3) built prior to 1991. The volunteers collected information on (1) use of the first floor, (2) whether or not the building was on a significant slope,³ and (3) "openness" of the first floor. "Openness" was defined using the same criteria as a similar San Francisco inventory project using similar volunteer earthquake professionals.⁴ In the process of visiting these parcels, we found 53 additional buildings that fit these criteria that were not listed as buildings to visit, largely because they were listed as having

¹ Based on a *Soft-Story Residential Buildings in Earthquakes—Risks and Public Policy Opportunities for Oakland*. Association of Bay Area Governments, Jeanne Perkins. May 28, 2009.

² The volunteers were people interested in earthquakes and public safety – mostly building design professionals, earthquake scientists, home inspectors, or university students – who are members of the Structural Engineers Association of Northern California (SEAONC), the Earthquake Engineering Research Institute Northern California Chapter (EERI-NC), the American Institute of Architects (AIA), the American Society of Home Inspectors (ASHI), or other related professional organization.

³ Significant slope is defined for this program as a rise of the ground adjacent to the ground floor of more than six feet across any direction of the building. Using the criteria, larger buildings on a relatively modest slope may be considered to be on a significant slope.

⁴ The San Francisco soft-story inventory was completed by the Community Action Plan for Seismic Safety. More information can be found online at <http://sfdbi.org/ftp/uploaded-files/dbi/Services/PlanReview/FinalSoftStoryHereTodayHereTomorrow022009.pdf>

"zero" stories. A total of 3,959 total parcels were visited and data were collected on 2,908 buildings.

This survey identified **24,273 residential units in 1,479 buildings** that met the original criteria and had parking or commercial uses on the ground floor. These buildings were termed "potential soft-story buildings" by the City. Of these, 942 buildings containing 12,991 units have EITHER at least one wall that is 80% or more "open" on the first floor OR have at least two walls that are 50% or more "open" on the first floor. These buildings are even more likely to be soft-story buildings.

Based on a statistical sample, an additional **1,060 4-unit buildings and 370 3-unit buildings** in Oakland have parking or commercial on the first floor. Almost all (97%) have significant openings. However, the vast majority of units are in the buildings with 5 or more units (24,273 of about 30,600 units).

Mandatory Screening Ordinance

As a result of the building inventory, in 2009 the City adopted the Mandatory Seismic Screening of Multiple Story Residential Buildings Constructed Before 1991 Ordinance (Number 12966). The ordinance mandated that owners of "potential soft-story buildings" complete a Level 1 Screening-Non-Engineered Analysis. This screening was required to be performed by a registered design professional, licensed contractor or certified inspector to better understand the existing conditions on the ground floor of the building and whether there were many walls and partitions adding strength and stiffness to the ground floor, or whether it was very open—making it more likely to have a soft-story condition. The screening was not intended to replace an engineered analysis to quantify the building's capacity to withstand seismic forces, but to provide an additional tool

to help prioritize buildings of concern for future retrofit ordinances.

The ordinance also outlined an optional Level 2 screening which owners could perform in lieu of a Level 1 screening. The Level 2 screening consists of structural calculations performed by an engineer to evaluate structural deficiencies in the ground floor and make a definitive determination about soft-story condition.

Soft-Story Building Screening

ABAG and its Housing and Outreach Committee, along with the City designed the Level 1 screening evaluation that would meet the requirements of the mandatory screening ordinance.⁵ Buildings that were on a significant ground slope were not required to complete the Level 1 screening. The engineering complexity of these buildings does not lend them to a simplified evaluation and require a more detailed engineering analysis to make any kind of risk determination. Property owners were instead required to document the slope condition pending a mandatory Level 2 screening at a later date.

The screening also gave owners the opportunity to remove themselves from the potential soft-story list if their building contained fewer than 5 units, had less than two stories, was built in 1991 or later (using the 1988 Uniform Building Code) when building codes became strong enough to prevent soft-story construction, or was previously retrofitted using relevant building codes.

ABAG trained 56 registered engineers, licensed contractors and home inspectors to complete the Level 1 screening. Letters were mailed to building owners requesting their compliance with the mandatory screening ordinance.

⁵ *The screening form collected information about the footprint of the ground floor, construction materials and length of solid walls versus wall openings in each of the exterior walls as well as interior walls or partitions. Screeners were asked to provide a dimensioned sketch of the ground floor and take pictures of the exterior walls.*

Appendix B

Summary Charts

Charts 1a and 1b include 464 buildings which are NOT on a significant slope.

Chart 1a. Residential Units in Buildings NOT on a Slope by **Building Size**

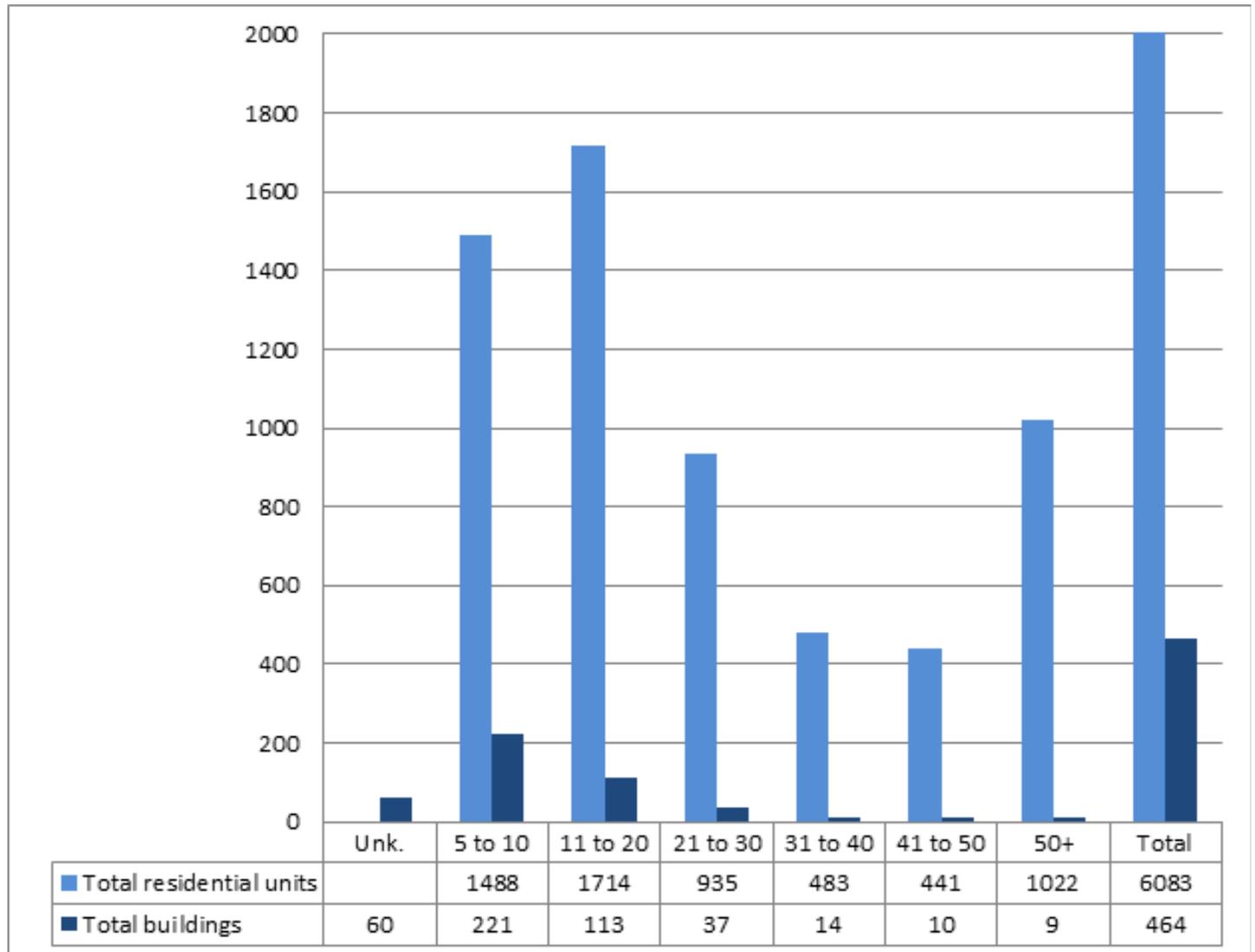
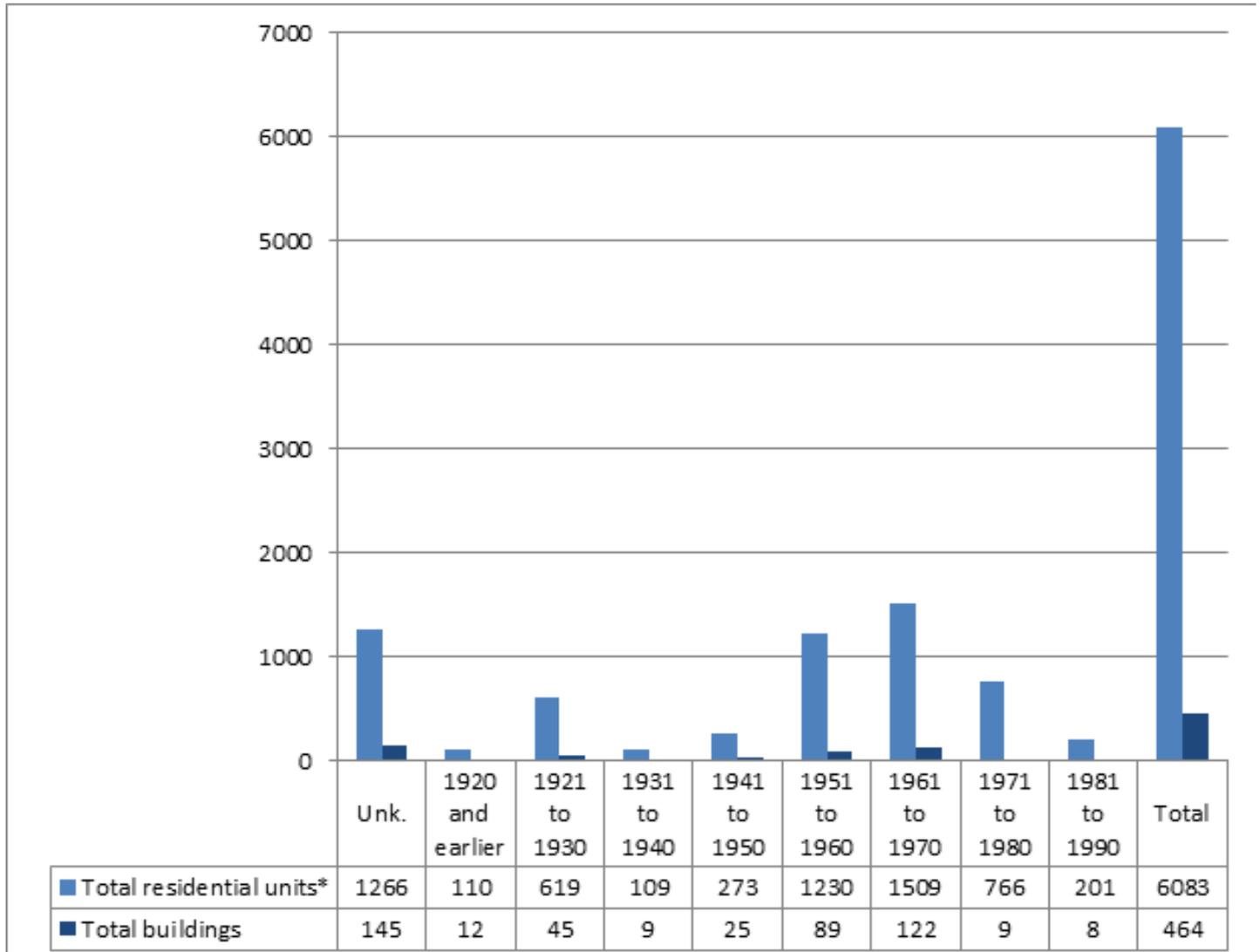


Chart 1b. Residential Units in Buildings NOT on a Slope by Year Built



*Residential units is unknown for some buildings

Charts 2a and 2b include 134 buildings on a significant ground slope and 46 buildings that did not provide any information about slope but completed a Level 1 survey.

Chart 2a. Residential Units in Buildings on a Slope by Building Size

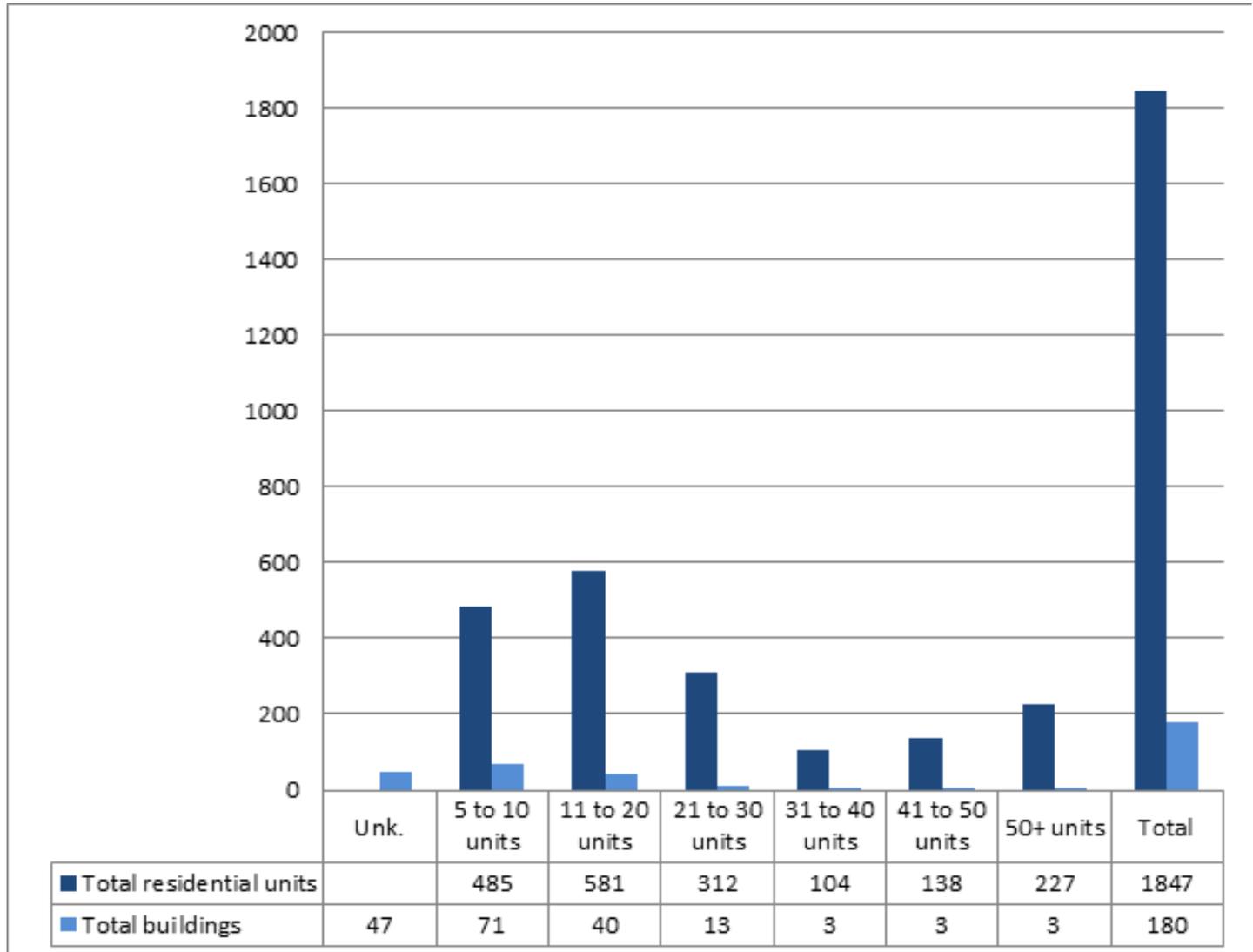
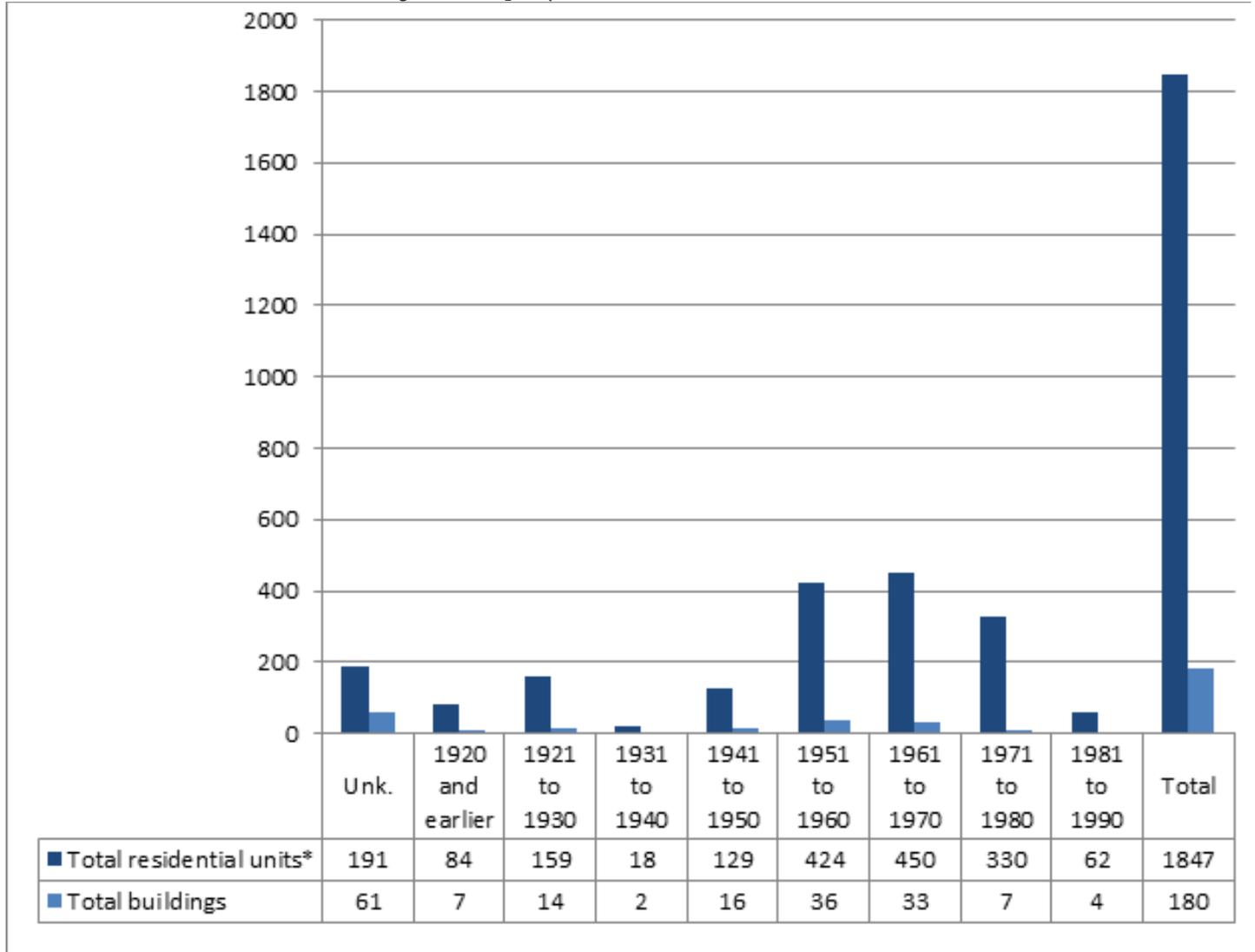


Chart 2b. Residential Units in Buildings on a Slope by Year Built



*Residential units is unknown for some buildings

Appendix C

What are other cities doing?

After an earthquake, loss of housing will impact the entire region. Displaced residents from one city may seek housing in Oakland and employers in Oakland may be negatively affected if their employees residing in nearby cities are unable to come to work.

San Francisco and Berkeley are both nearing the phase of mandating soft-story retrofits. For these cities, as well as Oakland, financing these retrofits remains a major barrier. It may be useful to convene staff members from each of these cities to identify common solutions and work jointly to identify funding or legislative needs that will allow for soft-story retrofit ordinances to be passed. The following is a summary of soft-story programs in various cities.

City of San Francisco

The City of San Francisco has identified 2,800 potential soft-story buildings in the city. This survey was completed as part of a ten-year study by the Community Action Plan for Seismic Safety (CAPSS). In 2011, CAPSS released its implementation plan, which recommended that the City mandate retrofit of soft-story buildings by 2016. In 2011, the City put a \$46.2 million bond measure before the voters to raise the funds to assist owners of affordable housing with retrofits. The bond measure was intended to pave the way for a mandatory retrofit, but was turned down by voters. Under the leadership of the new mayor, the City plans to move forward with a phased mandatory retrofit ordinance targeting the largest buildings first. At the time this report was prepared San Francisco was in the process of passing the required legislation for a mandatory retrofit program.¹⁰ For more information, please see <http://sfdbi.org/index.aspx?page=245>.

City of Berkeley

In 2005 the City of Berkeley passed Phase One of a soft-story ordinance, which required owners of 450 buildings to complete an engineering analysis of their building within two years and post a notice to building occupants that the building is vulnerable. As a result of the mandate,

nearly 20% of owners voluntarily retrofitted their buildings. In preparation for Phase Two of the ordinance, the City performed an economic analysis of building owners, which determined that most owners may have the financial capacity to pay for a retrofit without incentives or subsidies. As a result of that survey, the City is currently evaluating the feasibility of moving forward with Phase Two. For more information, please see <http://www.ci.berkeley.ca.us/contentdisplay.aspx?id=622>.

City of Alameda

In 2009 the City of Alameda passed a soft-story ordinance which allowed for the Building Official to complete an inventory of wood frame multi-family apartment buildings, containing 5 or more units, built before 1985 with soft-story, weak or open front walls. This list of potential soft-story buildings was made available to the public. Owners of these buildings were required to perform an engineering evaluation of their building using an engineering standard adopted by the city and immediately notify tenants of the potential soft-story condition. Owners were also required to immediately install an earthquake gas shut-off valve on their building. For more information, please see <http://www.cityofalamedaca.gov/City-Hall/Seismic-Retrofit>.

City of Fremont

In 2007, the City of Fremont implemented its soft-story ordinance which required owners of 22 apartment buildings to perform an engineering analysis and retrofit of vulnerable portions of the structure. Condominium owners were exempted from the mandatory retrofit requirement, but were encouraged to voluntarily participate. Because there were a small number of soft-story buildings in the area, Fremont was able to subsidize mandatory retrofits for all soft-story buildings. For more information, please see <http://www.fremont.gov/index.aspx?NID=377>.

Santa Clara County

The Emergency Preparedness Council of Santa Clara

County and its cities hired the Collaborative for Disaster Mitigation at San Jose State University to count and map soft-story buildings. Their inventory defines a multifamily building as one containing 4 or more units. They identified 2,630 buildings containing 33,119 units. For more information, please see <http://www.sjsu.edu/cdm/public/EPC-Report.pdf>.

City/County	Number of Soft-Story Buildings*	Building Inventory	Notified Owners	Notified Tenants	Adopted Engineering Standard	Mandated Engineering Standard	Mandated Simplified Analysis	Mandated Retrofit
San Francisco	2,800							
Oakland	1,479							
Berkeley	400							
Alameda	70							
Fremont (not including condos)	22							
Santa Clara County	2,630							
San Leandro	350							
Sebastopol	55							

* The year built, size of building, number of units, construction and occupancy type for inventories, and mandatory ordinances vary from city to city

Appendix D

Glossary of Potential Soft-Story Retrofit Incentives

While the direct benefit for retrofitting soft-story buildings goes to the building owners and tenants, there is significant benefit to the City as a whole. Retrofitting preserves affordable housing, maintains the City's architectural character, minimizes the number of displaced residents, and protects the environment by avoiding debris and hazardous material from demolished homes going to the landfill. Retrofitting also creates good job for city residents.

The following list of incentives to encourage seismic retrofits was largely developed by Laura Samant and Tom Tobin for the San Francisco Community Action Plan for Seismic Safety (CAPSS).¹ The options presented in that memo, while focused on San Francisco, are also applicable to other cities with similar seismic vulnerabilities.

Building retrofit incentives can be divided into the following categories:

- Financial incentives: grants, rebates, credits, loans, loan interest reductions, deferred loans, donated and reduced-rate labor, insurance premium savings, fee waivers
- Policy incentives: expedited processing of permit applications and loan applications, reduced permit fees, waiver of property restrictions
- Technical assistance incentives: advices on retrofitting, standard details, help with garnering incentives, assistance with contracting questions
- Information incentives: information and materials

Example incentives from each category are discussed below.

¹ Samant, Laura and Tom Tobin. *Memo to the Advisory Committee, Community Action Plan for Seismic Safety, "Incentives to Encourage Seismic Retrofits: Options for San Francisco"*. San Francisco, CA. 5 Sept. 2008. http://www.sfcapss.org/PDFs/Incentives_to_Encourage_Seismic_Retrofits.pdf

Financial Incentives

Grants

Community Development Block Grant (CDBG) funds could be used to provide grants to cover the cost of a retrofit or building evaluation for moderate or low-income building owners. CDBG funds are given to cities by the U.S. Department of Housing and Urban Development. CDBG funds have been successfully used in the past by cities to assist with the retrofit of unreinforced masonry buildings.

Tax Credits

The City might waive a portion of a business tax for a number of years to encourage owners to retrofit. A portion of the real estate transfer tax might be rebated to qualified retrofit work when a property is sold. Since 2007 Oakland has successfully used this incentive to rebate up to 1/3 of the property transfer tax for qualified seismic retrofit of single family homes.

Loans

The City could assist building owners to pay for seismic retrofits by:

- Offering loans with rates lower than commercial rates,
- Providing loan guarantees,
- Reducing or buying down loan interest rates, or
- Make market-rate loans available to those who might not otherwise qualify for them.

Oakland could provide these loan services or assist building owners to get them from other sources. Loans could be repaid through assessment liens paid along with property taxes. Loan payments could be deferred for a period of time, or until the sale of the property for hardship cases. Small Business Association CDC/504 (Certified Development

Corporation) loans may be available for small businesses.

Property Tax

Existing state tax law (Section 74.5 California Revenue and Taxation Code) provides that the cost of an earthquake retrofit should not increase the property assessment used to determine the amount of property taxes. However, it could be challenging for building owners to secure this benefit because they must submit specific information to the County Assessor's Office prior to conducting retrofit work. Due to lack of state support, many Assessors' Offices around the state do not have forms for this purpose and their staff is not trained to process this benefit. At this time, we do not know how Alameda County manages this issue. In a few jurisdictions, city officials have worked with the County Assessor's Office to facilitate this process for building owners. Oakland could make sure this benefit is truly available to building owners, and could advertise

Real Estate Transfer Tax Rebate

Oakland currently has a real estate transfer tax of 1.5% of the purchase price of properties sold. Oakland could rebate a portion of its real estate transfer tax to building owners who spend those funds on qualified seismic upgrades. If reducing City revenue is not acceptable, the tax rate could be raised by the amount offered to compensate for seismic retrofitting.

In the past Oakland has offered new owners of older single-family homes or duplexes to be rebated .5% of the purchase price of the house or \$5,000—whichever is less. The funds for the program were exhausted and it is no longer being offered.

The City of Berkeley rebates up to one-third of its transfer tax amount (1.5 percent of purchase price) for qualified seismic retrofit on homes. Berkeley paid for this rebate by increasing the transfer tax rate. Through these and other efforts, more than 2,500² (12% percent) of single-family homes have been strengthened to various degrees since 2004. These upgrades include both structural and nonstructural mitigation measures.

In 2008, San Francisco voters approved Measure N which

increased the transfer tax for properties sold for \$5 million or more. One-third of the transfer tax could be rebated to property owners for conducting seismic upgrades or installing active solar systems.

Waiver or Reduction of Building Permit Fees

Building permit fee reductions, while a loss of revenue to the City, signifies a major gesture of good will to the owners of these buildings. Permit fees represent a relatively small portion of the cost of seismic retrofit and should be paired with other retrofit incentives in order to be effective.

The Cities of San Francisco, Berkeley, and Alameda have offered flat or waived plan check fees as an incentive for owners to retrofit their buildings. Oakland currently offers a flat permit fee of \$250 for owners of qualified single-family residences to perform seismic retrofits.

Pass Through of Retrofit Costs to Tenants

Building owners who seismically retrofit their buildings could be allowed to pass through the costs of these retrofits to renters in rent-controlled units.

San Francisco's unreinforced masonry building program allowed building owners to pass through 100-percent of seismic retrofit costs to rent-controlled tenants over a 15 year period, with a maximum increase of 10 percent of the base rent in any one year. This was coupled with a daily stipend for temporary relocation and other protections for tenants. Some, but not all, building owners took advantage of this benefit. Presumably, many buildings had turnover in their tenants, allowing them to rent units at market rate and negating the need to seek pass-through for retrofit expenses.

In 2002, San Francisco passed a law allowing 100 percent pass-through of any code mandated seismic or energy upgrades. When this work is voluntary, however, only 50 percent of costs can be passed through to tenants.

Tax Reduction for Historic Properties

There are two existing incentive programs that could be used to reduce taxes for historic properties that conduct seismic upgrades: the State Mills Act and the creation of a federal historic district.

2 *Information per Building and Safety Division as of March 2012.*

The Mills Act³ gives local governments the authority to enter into contracts with owners who restore and maintain historic properties. In exchange, the property owners could get significant property tax savings.

Creating a National Register Historic District could provide a federal income tax credit for qualifying work on contributing historic properties within the district.

The City of St. Helena used both of these tools to assist owners of unreinforced masonry buildings to seismically retrofit. Creating a federal historic district was a successful incentive, giving owners a twenty percent federal tax credit. Many building owners found the Mills Act less appealing because of its cumbersome process.

Insurance Incentives

The ability of property insurers to offer incentives is limited by market competition, federal tax law, state regulation and the nature of insurance working best with covering large numbers of predictable losses and dispersed over time and location. Risks that are infrequent, unpredictable and concentrated in time and space by a single event are hard to cover by actuarially based reserves.

Insurance agents could be enlisted in efforts to explain the risk of earthquake damage to residential and commercial policyholders. Property insurance policies exclude damage due to earthquake shaking, but they do cover fire losses. Because of the direct link between earthquake shaking and fire in Oakland, there might be an incentive to insurance companies to encourage retrofitting measures that also reduce the risk of fires following earthquake. Insurance companies that provide owners with liability coverage should have an interest in retrofitting.

FEMA grants

Grants from FEMA are not an incentive per se, but because they could be used in a variety of ways to help fund incentive programs, we briefly mention them here.

FEMA offers a variety of grants to state and local agencies

³ *California Government Code, Article 12, Sections 50280-50290, California Revenue and Taxation Code, article 1.9, Sections 439-439.4*

to reduce the risk from hazards. Hazard Mitigation Grants⁴ provides matching grants from a fund established from a percentage of post-disaster repair grants. The amount available depends on the magnitude of grants to the state following disasters declared by the President and the percentages established at the time. These grants could be used by communities not affected by the declared disaster (i.e., Oakland could apply for grant funds after an earthquake in Los Angeles)

FEMA has historically provided grants from the Pre Disaster Mitigation Program to state and local governments. In the current fiscal budget, FEMA has proposed combining this grant with Homeland Security grants. It is not yet clear what this may mean for seismic mitigation projects.

Federal, State or Private Sector Incentives

There are a number of frequently mentioned potential financial incentives that would require action by federal or state level government or private sector institutions. It is not within the power of the City to offer these incentives. If these incentives are considered desirable, it may be worthwhile for several cities to work together to implement them.

These include:

- Preferable mortgage rates for earthquake resistant structures provided by lending institutions such as Frannie Mae or private banks.
- Income tax credits and/or owner deductions for the costs of seismic retrofits, or accelerated depreciation rates for retrofit improvements. The value of deductions carries with taxpayer's adjusted gross income while tax credits provide a specific tax reduction to all taxpayers.
- Removal of financial disincentives for retrofitting, by removing programs that subsidize post-disaster losses through casualty tax deductions of disaster losses, and disaster assistance that subsidizes losses of owners who chose not to retrofit. This policy could have unintended implications on recovery and be perceived as callous, and;
- Companies that provide building materials could offer a discount or rebate on materials used for retrofitting deficient properties. There would have to be compensating

⁴ *Section 404 and 406 of the federal Stafford Act*

factors such as increased volume or market share due to favorable publicity.

Policy Incentives

Density/Intensity Bonuses

Where a number of soft-story buildings contribute to the historical or architectural character of a district or area, a city may want to offer specific increases in the maximum allowable building density or intensity to help offset the added costs of seismic upgrades.

Exemptions for Nonconforming Conditions

Many older buildings have nonconforming conditions that do not meet current code requirements, such as construction directly on the lot line, inadequate setbacks, or inadequate parking. If upgrade projects trigger changes to nonconforming conditions, such as when buildings are altered or enlarges, the City could offer some exemptions to these requires if owners seismically retrofit.

Zoning Incentives

The City could exempt owners that retrofit from selected zoning restrictions, such as allowing concessions regarding encroachment into setbacks, increased floor/area ratios, height limits, density bonuses, and onsite parking requirements. These concessions could be more powerful if owners, who elect not to use them, could sell them to others, or transfer them to another location within the City (Transfer of Development Rights). An owner might be allowed to add an additional ground-floor unit to a building to partially offset the cost of a retrofit, even if addition of such a unit might result in densities that exceed those of existing zoning.

Palo Alto modified its zoning laws to encourage owners of unreinforced masonry buildings to retrofit. The zoning laws were modified to permit expansion of the floor area of downtown buildings included in the program if the owner performed seismic upgrades. These building were also exempted from onsite parking requirements and fees for offsite parking.

Condominium Conversion

Converting multi-unit residential properties to condo-

miniums (or tenant in common) buildings is a lengthy, complex process generally intended to limit the number of conversions. This process, which is driven by the different in market value between rental and individually-owned units, could be used to trigger mandatory seismic retrofit, or could be eased as an incentive to those who retrofit voluntarily.

Exempt of Defer Triggered Work

Owners that choose to voluntarily seismically retrofit their buildings might trigger other required work, such as Americans with Disabilities Act (ADA) upgrades, Fire resistance upgrades and sprinklers, Title 24 energy analysis and upgrades, or neighborhood notification. The City could exempt owners from some triggered requirement. Note that owners cannot be exempted from triggered ADA upgrades, which can be costly. This is a federal requirement and the courts have determined that seismic strengthening projects should not be exempted from this requirement.

Expedite Permits and Reviews

The City could provide over the counter permits without delay whenever possible. All permit reviews for seismic retrofits could be expedited. Planning Department review for most projects with seismic retrofits could be bypassed.

Rebuilding Restrictions

Currently a rent-controlled apartment building that is demolished after an earthquake could be replaced by a building having a greater return on investment than apartments. This potential could be viewed as a disincentive to seismically upgrade the city's worst buildings. Post-earthquake rebuilding policies could be changed to restrict this.

Transfer of Development Rights (TDR)

The City could allow owners to transfer unused development rights to another site. This incentive might be especially valuable for owners of historic properties. The value of the development rights to be transferred should be comparable to the cost of a seismic retrofit.

Technical Assistance Incentives

Many, maybe most, owners have never hired an engineer, sought permits or engaged a contractor and find the process

daunting. Technical assistance incentives help building owners navigate the complex engineering issues associated with building retrofits. City-offered technical review and advice would improve the chances that building owners would carry out effective retrofit projects.

Training Construction Professionals

The City of Oakland could provide training to engineers and contractors in all stages of the retrofit process: building evaluation, retrofit design, and construction. A list with the names of those who complete the training successfully would be made available to building owners. However, training would not guarantee that those on the list are properly licensed and insured, or engage in good business practices.

Training could be provided free (FEMA grants could cover the cost), at a subsidized cost, or at-cost to prospective inspectors, civil engineers, architects, contractors and owners interested in developing a retrofit specialty. Training could be offered through existing organizations and training programs. A program name and logo could be copyrighted and trained individuals allowed to use it in advertising and business documents. The City's awareness literature could promote use of trained individuals.

The City of Berkeley provided training for civil engineers in preparation for its soft story building program, and ABAG has provided training to contractors for retrofitting cripple walls.

Information for Building Owners

The City of Oakland could provide publications or other materials about how to work with engineers and contractors for evaluations, design and contracting. These could include information that will help them ask relevant questions and evaluate proposed costs and activities.

Independent Advice and Evaluations

Technical advice could be provided through intermediaries with no financial interest in the outcome. The Department of Building Inspection could inspect properties before approving construction drawings and critique plans. Partner organizations – private non-profits and professional associations – could provide technical advice through the auspices of the Department of Building Inspection. This type of

program could be funded by a FEMA grant.

Assistance Navigating City Program

Owners of multi-unit buildings have a variety of characteristics. Some live in their buildings, some live out of state; some have cash available, others might have all of their assets in the property with little monthly income. Many owners have never hired an engineer or architect for a major project and have never engaged a contractor. The process of retrofitting would be daunting for many. The City of Oakland could provide assistance on project financing and how to secure incentives. An ombudsman could be designated for all retrofit activities, guiding building owners through requirements, incentives, and financing options.

Building Owner Training Programs

Building owners could be trained in:

- the City's retrofit program,
- the types of damage expected when buildings are retrofitted to different standards (performance objectives), and
- how to select engineers to evaluate building and design retrofits and contractors to conduct the work.

This could be integrated into an ongoing community-training program, such as the Fire Department's Citizens of Oakland Respond to Emergencies (CORE) program.

Information Incentives

Many building owners and users do not know how their buildings will perform in an earthquake. Being better informed about risk can allow people to make informed choices about the level of risk they are willing to accept. Information can drive market-based decisions about seismic retrofitting. Owners choose to strengthen their building to protect their investments; tenants choose to occupy safer buildings; and retrofitted building should be more valuable when sold.

Real Estate Transfer Disclosures

Existing state real estate disclosure laws require building owners to disclose any known seismic deficiencies when a building is sold. Sellers are not required to evaluate the

vulnerability of their building or to strengthen any known weaknesses.

The effectiveness of disclosure is compromised when owners often check the “do not know” option rather than speculating on deficiencies. Real estate earthquake vulnerability disclosure requirements could be amended to require an engineering evaluation of a building when sold. Existing state statute would need to be amended to require this.

The City of Oakland could note information about a building’s seismic status as part of its tax assessor/official record. This could include a “certificate of retrofit” or documentation of whether the building is on a list of potentially vulnerable buildings.

Tenant Notification

Building owners can be mandated to notify tenants if their buildings are deemed to be potentially hazardous in earthquakes.

The City of Oakland would need to identify hazardous or potentially hazardous buildings before such a program could occur. For some types of hazardous buildings (e.g. URMs) this is a relatively straightforward process. For others (e.g. older concrete buildings) this is challenging and could identify many buildings as potentially hazardous that actually pose little risk.

Building Ratings

Proposals to evaluate and rate the earthquake performance of buildings are discussed frequently. The objective would be to create an evaluation system that would be meaningful and that would be replicated closely by a variety of inspectors or engineers. The ratings would reflect the risk of earthquake loss and the objective would be to influence market value, insurance premiums, and lending rates. Meaningful and replicable analysis methods are not yet available.

Placards

Owners of unreinforced masonry buildings are required to post signs warning occupants of the building’s earthquake vulnerability. The objective is to give those who enter a chance to make an informed decision, and to warn those who might rent or purchase the building of its condition. These signs tend to not discourage persons from entering

for limited periods, but might have an impact on market or rental values. Owners of buildings found to have a weak first story could be required to post a notice and then be allowed to remove it upon completion of retrofit work

Standard of Care

Owners have a responsibility to maintain their properties in a safe condition. Following earthquakes, those who are harmed might believe the owner is responsible for damages. A jury in a recent court case awarded damages against a property owner for bodily injury caused by their unreinforced masonry building (URM) during an earthquake.⁵ The jury concluded that the building owner was negligent in failing to perform a seismic retrofit that could have prevented these deaths. Owner notification programs such as those taking place in Berkeley, Oakland, and Alameda are part of a broader societal trend recognizing the seismic hazards of soft-story buildings that will make it harder for owners to avoid liability in future court cases.

By establishing criteria for identifying vulnerable buildings, clear retrofit standards and compliance deadlines, the City of Oakland could affect how the standard-of-care would be interpreted and applied. Those who comply are more likely to be found as having acted reasonably than those who have not. Clarifying liability in this fashion might encourage those who are concerned about liability and might encourage liability insurers to exert pressure on owners to retrofit.

Additional References

California Seismic Safety Commission, Incentive to Improve California’s Earthquake Safety: An “Agenda in Waiting”, June 1999, SSC 99-02

Earthquake Engineering Research Institute, Incentives and Impediments to Improving the Seismic Performance of Buildings, June 1998, SR 98-1

20% of owners voluntarily retrofitted their buildings. In preparation for Phase Two of the ordinance, the

⁵ *Myrick v. Mastagni* (2nd Dist. 2010) 185 Cal. App. 4th 1082; 111 Cal. Rptr 3d 165

