

## Miller, Alisa

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**From:** Toy, Debbie  
**Sent:** Friday, March 15, 2013 3:23 PM  
**To:** Calvillo, Angela; BOS-Supervisors; BOS-Legislative Aides; Kawa, Steve; Howard, Kate; Falvey, Christine; Elliott, Jason; Campbell, Severin; Newman, Debra; Rose, Harvey; sfdocs@sfpl.info; gmetcalf@spur.org; Matz, Jennifer; Licavoli, Madeleine; BOS Legislation; CON-EVERYONE  
**Subject:** Controller's Office, Economic Analysis Division: Mandatory Seismic Retrofit for Wood-Frame Buildings: Economic Impact Report

The Controller's Office has issued an economic impact report on the proposed legislation to mandate seismic retrofitting for wood-frame buildings in San Francisco. The report may be downloaded here:

<http://co.sfgov.org/webreports/details.aspx?id=1546>

### Main Conclusions:

Approximately 44,000 San Francisco housing units are in "soft-story" wooden-frame buildings that are particularly susceptible to damage in an earthquake. Seismic retrofitting can significantly reduce the damage these buildings may experience in an earthquake. Retrofitting can reduce post-earthquake costs, reduce building collapse rates, and increase the ability of residents to shelter in place after a disaster.

Relatively few of these buildings have been retrofitted. The proposed legislation would require owners of most wood-frame buildings in San Francisco to retrofit them over a 4-7 year period. The OEA finds that the proposed requirement would have essentially no net economic impact, positive or negative. Under the City's Rent Stabilization Ordinance, 100% of the cost of mandatory capital improvements may be passed through to tenants, at a likely cost of \$38-\$79 / month. While retrofitting clearly makes buildings safer for tenants, it is not known if the level of additional level of safety is worth the additional cost to tenants.

Other stakeholders, including property owners and the City itself, will also benefit from mandatory retrofitting. After further study of the impact on life safety, the City may wish to consider a different allocation of costs among tenants, property owners, and the City.

CCSF Controller's Office  
1 Dr. Carlton B. Goodlett Place  
City Hall, Room 316  
San Francisco, CA 94102  
Tel: 415-554-7500  
Fax: 415-554-7466  
Email: [controller@sfgov.org](mailto:controller@sfgov.org)

# Mandatory Seismic Retrofit for Wood-Frame Buildings: Economic Impact Report

Controller's Office of Economic Analysis  
Item #130019  
March 15, 2013



### Introduction

- Approximately 44,000 San Francisco housing units are in "soft-story" wooden-frame buildings that are particularly susceptible to damage in an earthquake.
- Seismic retrofitting can significantly reduce the damage these buildings may experience in an earthquake. Retrofitting can reduce post-earthquake costs, reduce building collapse rates, and increase the ability of residents to shelter in place after a disaster.
- Relatively few owners of these vulnerable buildings have retrofitted them. In 2010, the City introduced an incentive program to encourage the voluntary retrofitting, but use of the program has been very limited.
- The proposed legislation would require owners of wood-frame buildings with five or more units, that were built before 1978, to retrofit their buildings within 4-7 years to standards set by the Department of Building Inspection.
- Under the City's Rent Stabilization Ordinance, 100% of the costs of mandatory capital improvements to residential properties may be passed through to tenants, up to a 10% increase in annual rent.

### Economic Impact Factors

- The policy will require higher near-term spending on retrofitting, which will cause reconstruction spending to be reduced after an earthquake in the future.
- As the higher near-term spending will be passed on to tenants in the form of higher rents, consumer spending in the city will be reduced by a like amount. The reduction in future repair costs will, in turn, increase property owner income by a like amount in the future.
- The costs and benefits to tenants and property owners may marginally affect market rents and property values, but these factors are not considered in this report.
- Other benefits that were discussed, but not quantified, in reports produced by the Community Action Plan for Seismic Safety (CAPSS) committee. These benefits were not considered in this report, and include:
  - Improved life safety.
  - Reduced emergency response costs, related to shelter, medical care, and fire risk.
  - Preservation of historic resources and neighborhood resiliency.
- REMI model analysis of the increased construction spending, reduced consumer spending, and future impacts yields essentially zero net impact on jobs or the local economy.

## Costs and Benefits Related to Building Repair

- The CAPSS considered three retrofitting schemes. The table below summarizes their range of costs and benefits. Given current earthquake probabilities, the net present value of the benefits is within the cost range, given reasonable discount rates.
- 18% of the buildings are in potential liquefaction zones. Liquefaction may reduce the benefits of seismic retrofitting for these properties, but the costs of retrofitting are identical for them.

<b>Scheme</b>	<b>Cost per Housing Unit</b>	<b>Repair Savings Benefit per Unit</b>	<b>Net Present Value of Retrofitting*</b>
Scheme 1: Moment frames and limited shear walls	\$9,000- \$13,000	\$24,000	\$7,100 - \$10,800
Scheme 2: Moment frames and greater shear walls	\$15,000 - \$20,000	\$41,000	\$12,100- \$18,500
Scheme 3: Cantilevered Columns and greater shear walls	\$13,000 - \$19,000	\$52,000	\$15,400 - \$23,400

Assuming a 2% annual earthquake probability based on USGS 30-year probabilities of a major earthquake on the San Andreas or Hayward faults, with discount rates ranging from 4 – 7%.



## Pass-through Impact on Rents

- The table below indicates how the costs of retrofitting could be passed on to tenants in the form of higher rents.
- All apartment buildings covered by this legislation are also subject to the City's Rent Stabilization Ordinance, as they would be built before 1979.
- In practice, property owners may not be able to pass costs along to tenants already paying close to market rent. However, longer-term tenants paying below-market rents could face the full pass-through.

<b>Scheme</b>	<b>Amortized Monthly Cost at 100% Pass-through</b>	<b>Median Rent</b>	<b>% Monthly Rent Increase due to Legislation</b>
Scheme 1: Moment frames and limited shear walls	\$38 - \$55	\$1,407	2.7–3.8%
Scheme 2: Moment frames and greater shear walls	\$63 - \$83	\$1,407	4.4–5.9%
Scheme 3: Cantilevered Columns and greater shear walls	\$55 - \$79	\$1,407	3.8-5.6%



### Conclusions

- Simply from the perspective of preventing future repair expense, the mandatory retrofit appears to be a financially advisable policy, with no overall negative economic impact. Given the limited success of the voluntary program, it may be difficult to design any voluntary program that would be widely used.
- However, the 100% pass-through allowance for mandatory capital improvements does create a potential gap between the costs and benefits for different groups of stakeholders.
- Property owners receive clear benefits, in the form of reduced future repair costs. The CAPSS data suggests these benefits would approach or exceed the costs of retrofitting for many property owners, even without a pass-through.
- Many of the purported benefits – to emergency response costs, and to future neighborhood resiliency – are general city-wide benefits. A case can therefore be made that the City should contribute to the cost of the retrofitting, but the proposed legislation does not provide for any City funding.
- While tenants clearly benefit from improved life safety in their residences, the CAPSS did not attempt to quantify how much retrofitting improves survivability. It therefore remains unclear if the benefits exceed the costs for tenants.
- The City may wish to further study how residents in affected buildings would benefit before making final decisions about the allocation of costs among tenants, property owners, and the City.

### Staff Contacts

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Ted Egan, Chief Economist, (415) 554-5268 [ted.egan@sfgov.org](mailto:ted.egan@sfgov.org)

Jay Liao, Economist, (415) 554-6159 [jay.liao@sfgov.org](mailto:jay.liao@sfgov.org)