

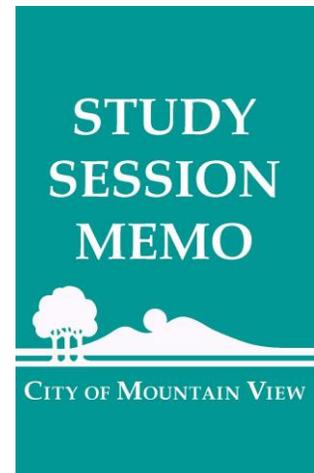
DATE: September 4, 2018

TO: Honorable Mayor and City Council

FROM: Tiffany Chew, Business Development Specialist
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Director

VIA: Daniel H. Rich, City Manager

TITLE: **Policy and Program Options for a Soft-Story
Retrofit Program**



PURPOSE

The purpose of this Study Session is to update Council on a soft-story study completed and provide City Council an overview of policy and program options for a possible soft-story retrofit program. Staff recommends Council provide general feedback on the options and will return later in the year to obtain additional direction.

BACKGROUND

In recent years, especially in California, the term “soft-story” building has come to mean a multi-story wood-frame residential building prone to collapse in earthquakes. For purpose of this Study Session and the study conducted, a soft-story building has the following attributes:

- At least two stories.
- At least three residential units.
- Wood-frame construction in the ground story.
- A ground story whose layout of walls and partitions is substantially more open than that of the story above. In Mountain View, this openness or soft-story condition is typically due to the presence of “tuck-under” parking stalls in the ground story.

Soft-story buildings are one the most common earthquake-vulnerable housing types in California cities (Attachment 1 shows soft-story buildings with severe damage and collapse in the 1989 Loma Prieta and 1994 Northridge earthquakes). When soft-story

buildings comprise a large portion of a city's housing stock, the aggregate effect of their poor performance can exceed emergency shelter capacity, exacerbate housing shortages, and delay recovery Citywide. Along with unreinforced masonry (brick) buildings, soft-story buildings are recognized by the California Health and Safety Code (Section 19161) as a hazardous structure type eligible for special treatment by cities and counties. Mountain View addressed unreinforced masonry (URM) buildings in the 1990s, after the 1989 Loma Prieta earthquake. The Council adopted a URM Ordinance which required a mandatory upgrade of all URM buildings in the City over a two-year time frame. All URM buildings were successfully upgraded and the URM Ordinance was sunsetted.

The Housing Element in Mountain View's General Plan calls for "a study that evaluates the City's policy options, opportunities, and constraints for retrofitting soft-story buildings in Mountain View." In 2016, the City amended the Zoning Ordinance to allow seismic retrofits of legal nonconforming uses and structures.

In 2017, staff hired David Bonowitz, a structural engineer and earthquake policy consultant, to review the Mountain View multi-family housing stock (buildings with three or more units), provide an updated inventory of soft-story buildings, and develop options for a soft-story mitigation/retrofit program.

DISCUSSION

Mountain View Inventory

In 2003, an informal survey of soft-story buildings in Santa Clara County was completed by San José State University. In Mountain View, the survey identified 111 multi-family, soft-story buildings containing 1,129 housing units.

Attachment 2 presents the updated inventory, which has now identified 488 suspected soft-story buildings containing 5,123 housing units. The new inventory report makes the following findings:

- The number of soft-story buildings in Mountain View is substantial and significantly larger than the 2003 estimate.
- Proportionally, Mountain View has as many or more soft-story housing units as any Bay Area city that has studied this issue.
- Mountain View's soft-story buildings represent, by far, the largest earthquake risk to its housing stock.

Table 1 provides a summary of Mountain View’s housing stock. Not every multi-unit building in Mountain View has a soft story. To understand the risks posed by these buildings, it is important to see them in the context of the City’s overall housing stock. While the total number of vulnerable buildings represents a small portion of the City’s structures, these buildings contain one of every six existing housing units and, thus, pose a disproportionate earthquake risk to the overall housing stock. In addition, approximately 50 percent of the multi-unit buildings are owned by families/individuals versus companies or corporations.

Table 1. Mountain View Housing Stock

Building subset	Buildings		Units	
	Number	% of total	Number	% of total
All residential buildings, including mobile homes	17,000 ^a	100%	32,849 ^b	100%
Buildings with 3 or more units	1,275 ^c	8%	16,490 ^c	50%
Estimated soft-story buildings	488 ^c	3%	5,123 ^c	16%

^a Estimated from 2012-2016 American Community Survey and Mountain View Soft-Story Study.

^b Source: 2012-2016 American Community Survey.

^c Source: Mountain View Soft-Story Study.

Mountain View’s multi-unit buildings and suspected soft-story buildings differ somewhat from their counterparts in other Bay Area cities.

- Compared to Oakland and San Francisco, Mountain View has very few buildings from the 1920s building boom. This is a benefit for Mountain View as the newer buildings are generally lighter weight, with a drywall finish instead of plaster.
- More than 60 percent of the Mountain View buildings and units are on multi-building parcels, which are relatively uncommon in San Francisco, Oakland, and Berkeley. (Attachment 3 illustrates the variety of multi-building parcels. Within a multi-building parcel, it is common for some buildings to have soft-story conditions while others do not.)
- Two-story wood-frame buildings are common in Mountain View and average more than nine units per building, often in a long, rectangular plan a single unit wide. These buildings are shorter than typical buildings in densely built San Francisco, but larger in unit count than the typical two-story building in Berkeley.

- No wood-frame buildings have commercial ground-floor uses. However, a majority include at least one residential unit on the ground floor, as opposed to having only parking and storage areas there.

Typical Soft-Story Retrofit Approaches

A retrofit program provides the City with an opportunity to address structurally vulnerable housing in the event of a major earthquake. In the Bay Area, retaining housing is crucial to ensuring effective disaster recovery. Limiting housing damage and allowing residents to stay in their homes not only helps people who may lack the resources to quickly recover from a disaster, but keeps communities intact.

Soft-story retrofit requires a building-specific engineered design. The engineering community recognizes that preventing building collapse is an appropriate objective of a soft-story retrofit. This objective has two direct implications on the design. First, it means an acceptable retrofit may ignore nonstructural deficiencies, even those that would normally be considered safety hazards (such as unbraced chimneys, fuel lines, or veneer). Second, it means retrofit elements need only be added to the ground story; even if the building's upper stories have minor deficiencies (Attachment 4 shows typical retrofit elements). As a result, nearly all soft-story retrofits employ some combination of the following wood or steel elements to add strength, stiffness, and twisting control to the critical ground story:

- Wood structural panels applied over existing wood stud framing to create new wood shear walls along existing wall lines.
- New wood-frame shear walls installed separate from existing wall lines, with new concrete foundations.
- Wood panel sheathing applied to the underside of second-floor joists (above the critical ground story) as needed to locally strengthen the second-floor diaphragm.
- Proprietary shear panels, especially where wall lengths are tightly limited by the existing architecture.
- Steel moment frames (two or more columns with connecting beams at the top), especially around large openings such as garage entrances and shop windows, usually with new concrete foundations.

- Steel cantilever columns rigidly embedded in new concrete foundations, especially where limited headroom inhibits the use of a frame.
- Foundation replacement or strengthening, as needed. Various steel bolts, anchors, and clips as needed to ensure a complete load path from the foundation to the second-floor diaphragm.

Retrofit designs, as well as successful retrofit programs, rely on accepted, enforceable design criteria in the form of building code provisions, technical standards, and locally customized regulations and interpretations. The building code for new construction is no longer viewed as an appropriate criterion for a substantial retrofit project as it makes assumptions that do not apply, and omits considerations that do apply, to existing buildings. Instead, standards have been used as criteria for Bay Area soft-story retrofit programs through existing California Building Code, Federal Emergency Management Agency, and the American Society of Civil Engineers.

Typical Retrofit Costs

The nature of Mountain View's soft-story building stock, together with the effects of a robust Bay Area market for seismic retrofit, should result in lower project costs than those observed in San Francisco. Factors expected to lower costs in Mountain View include:

- Younger buildings: Built largely between 1950 and 1980, Mountain View's buildings do not have the old materials and conditions of Victorian or Edwardian buildings and are less likely to have severe or extensive deterioration.
- Lighter-weight buildings: Due both to the lighter modern materials and to the prevalence of two-story buildings.
- Lower density: Providing easier construction access to the building from all sides.
- Sites are situated on flat land.
- Fewer architectural constraints: Mountain View buildings tend to have open parking stalls that allow more design flexibility than individual stalls with operable garage doors.

Table 2 gives estimated design and construction costs suitable for use in scoping a Mountain View soft-story mitigation program and in communicating with

stakeholders. The broad cost range accounts for variability in actual conditions (Attachment 2).

Table 2. Estimated Mountain View Soft-Story Retrofit Costs

Cost Component	Pre-1950 Building	Post-1950 Building: 3 or 4 Units, 2 Stories	Post-1950 Building: 5 or More Units
Pre-design investigation ^{a, d}	\$4,000 to \$10,000	\$1,000 to \$2,000	\$1,000 to \$2,000
Retrofit design ^{b, d}	\$6,000 to \$12,000	\$6,000 to \$12,000	\$10,000 to \$20,000
Construction ^{c, d}	\$20,000 to \$60,000	\$20,000 to \$40,000	\$20,000 to \$80,000
Total	\$30,000 to \$80,000	\$25,000 to \$50,000	\$30,000 to \$100,000

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- ^a Includes production of as-built plans for pre-1950 buildings only, and nondestructive investigation. Does not include destructive investigation.
 - ^b Structural retrofit of the ground story only.
 - ^c Includes permits and other fees. Includes special inspection costs, contracted separately. Does not include costs for tenant relocation or compensation for loss of housing services, if needed.
 - ^d For similar buildings on the same parcel, allow a 60 percent discount in investigation cost, a 30 percent discount in design cost, and a 10 percent discount in construction cost for each additional building.

Policy Approaches

Cities across California have developed and implemented a number of soft-story mitigation/retrofit programs. The City of Berkeley was the first municipality to implement a program in 2005. Programs range from 22 buildings in Fremont to about 13,500 buildings in Los Angeles. Table 3 outlines soft-story mitigation programs as of April 2018.

Table 3. California Cities’ Soft-Story Mitigation Programs as of April 2018

City	Program Type (year implemented)	Approximate Number of Buildings	Program Status
Bay Area			
Alameda	Mandatory evaluation (2009)	100	Complete in 2012.
Berkeley	Mandatory evaluation (2005) Mandatory retrofit (2014)	270	All retrofits due to be complete by the end of 2018.
Fremont	Mandatory retrofit (2007)	22	Complete in 2012.
Palo Alto	Program development in progress.	300	Ordinance development in progress.
Oakland	Mandatory screening (2009) Subsidized voluntary retrofit (2017)	1,400	Screening complete in 2011. Subsidy program with FEMA, covering about 100 buildings, ongoing. Mandatory retrofit ordinance in development.
San Francisco	Incentivized voluntary retrofit (2009) Mandatory retrofit (2013)	4,900	Ongoing with phased deadlines. About 4,000 retrofits expected to be complete by mid-2019, balance by late 2020.
Southern California			
Beverly Hills	Program development in progress.	300	Ordinance development in progress.
Los Angeles	Mandatory retrofit (2015)	13,500	Ongoing with staggered deadlines. All retrofits expected to be complete by 2024.
Santa Monica	Mandatory retrofit (2017)	1,600	6-year plan, begun in September 2017, all retrofits to be complete by end of 2024.
West Hollywood	Mandatory retrofit (2017)	800	5-year plan, begun in April 2018, all retrofits to be complete by 2023.

Relationship with the Community Stabilization and Fair Rent Act (CSFRA)

In November 2016, the voters amended the City Charter by adding the Community Stabilization and Fair Rent Act (“CSFRA”). The CSFRA regulates the rents of all rental property in buildings with three or more units, built prior to 1995. The Rental Housing Committee is charged with implementing and administering the CSFRA.

If a landlord does not believe the permitted annual general rent adjustment provides a fair rate of return, a landlord may petition for an upward adjustment of rent. The CSFRA sets forth the factors a hearing officer may consider when deciding whether to grant the petition. The petition process provides the vehicle for a landlord to “share costs” with tenants by passing some or all of the costs owners are permitted under the CSFRA to pass onto the tenants over time through an upward adjustment of rent. The City Council’s decision whether to establish a voluntary or mandatory soft-story mitigation/retrofit program will determine whether a landlord could pass the costs of this capital improvement onto the tenants. City Charter § 1710(a)(1)(c) states:

“The cost of planned or completed capital improvements to the Rental Unit (as distinguished from ordinary repair, replacement, and maintenance), but only where such capital improvements are necessary to bring the Property into compliance or maintain compliance with applicable local codes affecting health and safety, and where such capital improvement costs are properly amortized over the life of the improvements; [...]”

Under the CSFRA, a mandatory soft-story retrofit program would authorize a hearing officer to consider the cost of the retrofit and allow a landlord to pass the cost of the improvement through to the tenants.

If the City Council adopts a mandatory soft-story retrofit program, the CSFRA authorizes the RHC to adopt regulations to address the implementation of the program in the context of the CSFRA and provide guidance to landlords and tenants, including the amortization period. If the City Council adopts a voluntary soft-story retrofit program, retrofit costs are not allowed to be passed on.

Signatures continue to be gathered for a potential ballot measure in 2020 related to rent stabilization that may have implications to the CSFRA if adopted.

Soft-Story Retrofit Program Analysis

The Bay Area engineering and disaster management communities view soft-story buildings as high risk to owners, tenants, and cities. The Mountain View inventory analysis shows the City’s soft-story housing stock is more extensive than previously thought. In addition, the soft-story buildings pose the largest risk in a major earthquake by far of any of Mountain View’s residential structure types. Meanwhile, Bay Area and Southern California cities are adopting soft-story programs. These programs have already set useful precedents that Mountain View can follow.

There are two options for a soft-story retrofit program: voluntary and mandatory. Both options have a number of considerations, but there are two parts to each option: evaluation period and ground-story structural retrofits. The evaluation period allows the City and property owners to identify soft-story buildings parcel by parcel. Typically an evaluation period lasts two to three years in order to allow property owners to assess their properties. Once the evaluation period is complete, structural retrofits of varying degrees can begin. Under a mandatory program, landlords would have a grace period established by the Council to retrofit the buildings and, tiers would be created to allow more time and ensure a steady and workable flow for the Building Division. The tiers would be based upon the number of units per parcel. Other jurisdictions have provided five to seven years to complete the retrofit. In addition, the program would include an outreach plan to educate and support the property owners and tenants. Overall, the implementation of a voluntary program would not impact current staffing levels, but a mandatory program would require additional limited-term staff (Program Assistant and Building Inspector) to assist with the evaluation process, program inquiries, and field inspection.

Table 3. Estimated Time Frame for Voluntary and Mandatory Programs

Program Milestone	Timeline	Voluntary	Mandatory
1. Program Development a. City Council Review b. Program Adoption	Q3 2018 Q2 2019	Required	Required
2. Evaluation: Confirm soft-story buildings with property owners.	Q4 2020	Not required	Required
3. Structural Retrofits a. Tier 1 (All buildings with no ground floor units) b. Tier 2 (3-4 unit buildings not in Tier 1) c. Tier 3 (5-11 unit buildings not in Tier 1) d. Tier 4 (12+ unit buildings not in Tier 1)	Beginning Q1 2021	Not required	Required

Table 4. Voluntary and Mandatory Soft-Story Program Analysis

	Voluntary	Mandatory
Evaluation	<p><u>Pros</u></p> <ul style="list-style-type: none"> • Gauges community interest • Can be combined with outreach/awareness program <p><u>Cons</u></p> <ul style="list-style-type: none"> • No actual risk reduction; essentially the same as “do nothing” • Needs substantial incentives to justify participation • Creates future disclosure burden for owners 	<p><u>Pros</u></p> <ul style="list-style-type: none"> • Generates data at relatively low cost to owners • Might motivate some owners to retrofit voluntarily • Could be coupled with future retrofit mandate <p><u>Cons</u></p> <ul style="list-style-type: none"> • Substantial program costs but no actual risk reduction • Building staff not set up to review evaluation reports • No evidence that evaluations prompt voluntary retrofit • Owner’s evaluation costs could have been put toward retrofit • Future disclosure issues for owners
Ground-Story Structural Retrofit	<p><u>Pros</u></p> <ul style="list-style-type: none"> • Seen as less burdensome, intrusive than mandate • Effective risk reduction for those who participate • Tenants likely protected from rent increases <p><u>Cons</u></p> <ul style="list-style-type: none"> • City has no control over participants, so ineffective risk reduction at City scale • Substantial incentives needed to yield meaningful risk reduction • Tenants have no control over their own risk • Work possibly not eligible for rent increases 	<p><u>Pros</u></p> <ul style="list-style-type: none"> • Most effective risk reduction • City can tailor the scope and schedule • Already proven feasible in other cities • Capitalizes on robust existing market for engineers and contractors • Work possibly eligible for rent increases <p><u>Cons</u></p> <ul style="list-style-type: none"> • Implementation cost to City (but can be offset by normal permit fees) • Seen as intrusive by owners • Tenants possibly subject to rent increases

Question 1: Does the City Council support implementing a soft-story retrofit program?

Question 2: If yes, does Council support a mandatory or voluntary program?

Incentives

Cities have explored options to incentivize property owners by providing assistance with the financial costs associated with a soft-story retrofit. Some owners will perform voluntary seismic work if significant incentives are provided, but the results of voluntary efforts in other agencies are mixed at best. The City can provide technical assistance, project expediting, reduction of building permit fees, and policy exemptions (waivers from triggered or future work), but direct financial incentives, such as grants and loans, may also be made available.

Fee waivers and credits for soft-story retrofits have been successful, but those are relatively small, low-cost projects. Before implementing its current soft-story mandate, San Francisco waived certain permit fees to incentivize voluntary retrofit, but only a handful of owners took advantage. The poor response was cited as one of the justifications for the later mandatory program. Most believe the benefit was too small to motivate owners to undertake a project costing tens of thousands of dollars. Equally important, in retrospect, was the fact that San Francisco regulations would allow owners to recoup retrofit costs through rent increases only if the retrofit was mandatory. Since San Francisco had already signaled that a retrofit mandate was coming, it made sense for owners to wait. In Mountain View, a soft-story retrofit valued at a \$20,000 repair would result in a \$430 building permit fee; a \$50,000 repair would have an \$864 fee; and a \$100,000 repair would have a \$1,337 fee.

Grant and loan opportunities for soft-story retrofit programs may be available depending on the availability of funds. Berkeley and Oakland both recently won FEMA grants with which they will subsidize voluntary retrofit of soft-story, tilt-up, and nonductile concrete buildings. With a grant of \$3 million, Oakland will reimburse up to 75 percent of a soft-story building owner's design and construction costs. Over 200 owners applied for the program, which was advertised to about 1,400 owners identified in Oakland's previous mandatory screening phase.

Question 3: Does the City Council support incentives to assist with the financial costs associated with soft-story retrofits?

RECOMMENDATION

Staff recommends City Council provide direction regarding a soft-story retrofit program by answering the questions in this report and/or providing any other direction City Council wishes.

NEXT STEPS

Following feedback from the City Council on the questions regarding a soft-story program, staff will return to Council during the calendar year 2019 with program details for your consideration.

PUBLIC NOTICING

In addition to the standard agenda posting, property owners of multi-unit residential buildings with three or more units were notified of this meeting by mailed notice.

TC-SW-RT/1/CAM
806-09-04-18SS

- Attachments:
1. Damage and Collapse of Soft-Story Buildings in the Loma Prieta and Northridge Earthquakes
 2. Mountain View Soft-Story Study
 3. Typical Mountain View Buildings
 4. Typical Soft-Story Retrofit Elements
 5. Potential List of Soft-Story Structures

cc: Rental Housing Committee