Funding URM Retrofits

Report to City of Seattle from National Development Council

May 2019

NDC 50 YEARS

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"Congratulations to the people of Alaska for being really prepared for this earthquake," U.S. Geological Survey Geophysicist Paul Caruso said Saturday.

Gov. Bill Walker said sometimes people, including himself, grouse about stringent building codes. But he's "really glad" they were in place as he only had minor water damage at his home. "Building codes mean something," he said.

Mark Thiessen and Rachel D'Oro —*The Seattle Times.*
"Strict building codes helped Anchorage withstand quake," *Seattle Times*, December 1, 2018.

EXECUTIVE SUMMARY

In 2012, the City of Seattle established an Unreinforced Masonry (URM) Policy Committee to develop recommendations for Seattle's Department of Construction and Inspections (SDCI) on a mandatory URM seismic retrofit program. The committee provided recommendations to SDCI in 2017, though they have yet to be enacted. In July 2018, the City engaged the National Development Council (NDC) to identify potential financing and funding mechanisms, with an emphasis on strategies to assist property owners who would face financial difficulties related to URM retrofit requirements, and develop strategies to mitigate those financial impacts. NDC, along with experts in the fields of construction, finance, and economics, estimated retrofit costs, researched best practices in peer cities, examined economic impacts of retrofits, and studied a comprehensive set of potential funding sources. Our key findings include the following:

Retrofit policies must be mandatory and clearly defined. In the peer cities reviewed, successful policies limited ambiguity by providing clear retrofit guidelines and a compliance period that was enforced. This finding reaffirms what was found by the URM Policy Committee during their process. Even the successful cities had to adjust incentives and develop new solutions to account for the costs that mandatory policies impose on private building owners. Without a mandatory policy, however, there would be limited attempts at ingenuity and creativity needed to fully address this critical issue. In fact, most of the peer cities reviewed in California have moved beyond their URM inventory to address "soft-story" and other vulnerable building types.

A programmatic approach is necessary. Completing a seismic retrofit can be a daunting task for a private building owner with limited devel-

All Verified URMs:

1145

Minus substantial alterations :

1012

Minus public owned:

944

opment experience or financial capacity. The City of Seattle can promote successful policy implementation by providing support to building owners that is both internal and external to the City. External advisory services can provide proactive outreach to building owners to educate them on the policy requirements, understand retrofit approaches, and identify potential financial resources. For building owners, having immediate access to resources for third-party design and engineering expertise could be an essential ingredient in moving a project forward. Additionally, creating a separate internal team at SDCI to expedite reviews and permitting for URM retrofits would speed implementation and demonstrate public commitment. Additionally, the City's Historic Preservation Program staff have already discussed opportunities for streamlining or simplifying their review of seismically retrofitting City landmarks and buildings within historic districts.

The URM inventory that would be affected by a mandatory policy is smaller than previously estimated. The initial database created by SDCI identifies 1,145 URM buildings. Further analysis shows that roughly 11% of the inventory have previously completed a substantial alteration and would likely comply with the proposed retrofit standards.[1] Of the remaining buildings, an additional 68 are owned by government agencies and therefore fall outside this analysis. As experienced in other cities, a number of URMs will likely be demolished instead of retrofitted – but that number is difficult to predict. As such, this analysis centers on 944 URM buildings totaling 20,196,995 square feet (sf). They are estimated to contain 10,401 residential units housing approximately 22,050 residents. Thirty-seven buildings house 1,559 designated affordable housing units, though because URMs are older buildings, many more are naturally occurring affordable to households of varied income levels.

Table 1: Retrofit Type

	Building Count	% of Total URMs	Square Feet	% of Total Sq Ft
Bolts+	215	23%	5,713,521	28%
Bolts++Frame	344	36%	4,247,524	21%
Full Seismic	385	41%	10,235,950	51%
Total URM Inventory	**944**	**100%**	**20,196,995**	**100%**

Retrofit costs will likely exceed the $5-$45/sf range used in prior studies. Prior cost estimates were limited to hard construction costs only. New research, informed by extensive private development expertise, estimates total development costs, including hard costs, soft costs (fees and services), sales tax, contingency, and tenant relocation expenses. SDCI separates buildings in the URM inventory into 3 retrofit categories: Bolts Plus (Bolts+); Bolts Plus, Plus Frame (Bolts++Frame); and Full Seismic.[2] The average retrofit costs in the URM inventory range between $32-$95/sf depending on the level of retrofit required – though costs may be higher or lower depending on building specifics. Approximately 59% of the City's URM inventory are eligible for Bolts+ and Bolts++Frame retrofits, with costs estimated to average between $32-$35/sf.

Table 2: Average Costs (Per Square Foot) to Retrofit

Percent of URM inventory:	Bolts+ 23%	Bolts++ Frame 36%	Full Seismic 41%
Construction Costs			
Hard Costs[1]	$17.32	$19.24	$61.99
Sales Tax (10.1%)	$1.75	$1.94	$6.26
Hard Costs Contingency (10%)	$1.91	$2.12	$6.83
Total Hard Costs	$20.98	$23.30	$75.08
Soft Costs (15%)[2]	$3.15	$3.50	$11.26
Soft Costs Contingency (10%)	$0.31	$0.35	$1.13
Total Soft Costs	$3.46	$3.85	$12.39
Total Construction Expenses	**$24.44**	**$27.15**	**$87.47**
Relocation Expenses[3]			
	$8.00	$8.00	$8.00
TOTAL (Including Relocation)	**$32.44**	**$35.15**	**$95.47**

Notes:

1. Previous work estimates hard costs to range between $5–40 per square foot.
2. Soft costs are estimated at 15% of hard costs, and include A&E, permits, inspections, insurance, bonds, testing, inc.
3. Relocation costs will vary depending on the use of space—whether residential or commercial—and on specific tenant needs. This case assumes commercial relocation estimated at $20,000 per unit, and a typical unit of 2,500 square feet.

1 Substantial Alteration is a Seattle Existing Building Code process applied when a building undergoes a significant renovation, change in use, or re-occupancy after being vacant. For URMs, improvements to the seismic force resisting system are required to address the building's seismic safety deficiencies. In most cases, these upgrades exceed the proposed technical standard for the URM Policy and significantly mitigate life safety risks.

2 The URM Technical Committee proposed a modified Bolts Plus (Bolts+) standard similar to those adopted by many California jurisdictions. Bolts+ retrofits require that walls are tied to the floors and roof, parapets are braced, diaphragms are reinforced, and tall brick walls are strong backed to prevent out-of-plane bending failure. A subset of the inventory qualifies for Bolts+ retrofits with the addition of a steel frame or shear walls to strengthen the building (Bolts++Frame). Buildings that do not qualify for Bolts+ or Bolts++Frame require a full seismic retrofit.

Table 3: Full URM Inventory Retrofit Costs				
	Total	**Bolts+**	**Bolts++**	**Full Seismic**
Number of Buildings	944	215	344	385
% of Total URMs	100%	23%	36%	41%
Hard Costs	$819,800,000	$90,800,000	$96,100,000	$632,900,000
Sales Tax (10.1%)	$91,000,000	$10,000,000	$10,700,000	$70,300,000
Hard Costs Contingency (10%)	$82,000,000	$9,100,000	$9,600,000	$63,300,000
Total Hard Costs	$992,800,000	$109,900,000	$116,400,000	$766,500,000
Soft Costs (15%)	$149,000,000	$16,500,000	$17,500,000	$115,000,000
Soft Costs Contingency (10%)	$14,800,000	$1,600,000	$1,700,000	$11,500,000
Total Soft Costs	$163,800,000	$18,100,000	$19,200,000	$126,500,000
Total Construction Expenses	**$1,156,600,000**	**$128,000,000**	**$135,600,000**	**$893,000,000**
Relocation (Commercial)	$105,200,000	$19,500,000	$25,000,000	$60,700,000
Relocation (Residential)	14,300,000	$4,700,000	$3,500,000	$6,100,000
TOTAL (Including Relocation)	**$1,276,100,000**	**$152,200,000**	**$164,100,000**	**$959,800,000**

The 944 buildings, containing 20,196,995 square feet, have an estimated retrofit cost totaling $1.28 billion.

In order to simplify the presentation of project costs and financing options, we created a hypothetical retrofit project that reflects an average URM building in terms of square feet and number of stories. That prototype is a 3-story, 22,000 square foot mixed-use building with commercial space on the ground floor and 20 residential units above. Our estimates suggest it would cost approximately $642,000 to retrofit this hypothetical building to a Bolts+ standard. *(See page 5, Table 4.)*

Seismic retrofits do not, in and of themselves, increase the economic value of buildings. The fundamental objective of a mandatory retrofit program is improved public health and safety during a catastrophic event. In general, building improvements increase value and that increased value could offset the costs for the retrofit. In our research, however, we have not found evidence that retrofitted buildings currently command higher rental rates in the rental market. This is likely to change as public awareness increases. There could, however, be a higher future sales value generated due to the improvements. The above statement applies to seismic retrofit work alone; building improvements that result in more rentable square footage, energy savings, or improved unit quality would increase building value.

Insurance costs are likely to go up rather than down in the short run. Washington State does not require earthquake insurance, and as a result, data on insurance premium impacts are difficult to discern. The Office of the Insurance Commissioner recently surveyed earthquake insurance in Washington State.[3] They found that while there are few insurers in Washington that provide earthquake insurance, the state, and in particular King County, compares favorably with other high-risk states. The survey confirms that King County, which represents 28.1% of all policies in the state commercial market, has 45.2% coverage. However, insurers and building owners are limiting coverage in order to reduce the additional expense of earthquake coverage. A majority of insurers (57.2%) offered coverage on a ground up/full value basis but it was paired with a primary/loss limit. This confirms that insurers and building owners were limiting actual coverage from any catastrophic event in order to reduce premium costs and limit insurance payouts.

Many URM buildings in the inventory would likely face difficulties acquiring earthquake insurance due to the structural state of the building. It is

3 Washington State Office of the Insurance Commissioner. 2017 Earthquake Data Call Report.

Table 4: Prototype URM Building Example

Assumptions

Building size:	3 stories; 22,000 square feet
Building use:	Mixed Use: Ground floor commercial with 20 residential units above
Retrofit type:	Bolts+

Estimated Rehabilitation Costs

Hard Costs	$400,000
Sales Tax (10.1%)	$40,400
Hard Costs Contingency (10%)	$44,040
Total Hard Costs	**$484,440**
Soft Costs (15%)	$72,666
Soft Costs Contingency (10%)	$7,267
Total Soft Costs	**$79,933**
Total Construction Expenses	**$564,373**

Relocation Expenses

Commercial[1]	$58,667
Residential[2]	$19,240
TOTAL (Including Relocation)	**$642,280**
Construction Cost per SF	**$25.65**
Total Cost per SF	**$29.19**

Notes:

1. Estimated at $20,000 per unit moving cost; typical commercial unit size of 2,500 SF.
2. We assume some usage of Seattle's Tenant Relocation Assistance Ordinance (TRAO). In this case, we assume 25% of residential units qualify for relocation assistance of $3,848 per TRAO requirements.

possible that the structural improvements provided by the retrofit could allow building owners access to the earthquake insurance market. It is in the public interest to advance measures that increase insurance coverage. As seen in many other catastrophic events, the financial benefits from insurance coverage reduces the overall public expense in recovery efforts.

Through conversations with Washington State Insurance Commission staff, numerous insurance brokers, public risk officers and building owners, we conclude that basic property and casualty insurance would decrease due to building improvements. Structural improvements to a building should reduce the risk and, therefore, the premium costs for basic property insurance. However, the building would not be insured for earthquake damage without a separate insurance rider. This rider can cost about 50% of the basic building property casualty and loss policy. In other words, basic policy premiums would likely decrease, but the addition of earthquake coverage would increase total insurance premium costs.

Existing requirements for the Special Valuation incentive should be modified to enhance their financial benefit for retrofits. "Special Valuation", available for certain landmark buildings, provides a key financial benefit to owners of landmark buildings. Special Valuation revises the assessed value of a historic property, subtracting rehabilitation costs (for up to 10 years) that are approved by the local review board. Eligible costs are limited to the hard and soft costs directly associated with retrofit construction. Relocation expenses, which can be substantial, are excluded from this program. Reduced property taxes increase cash flow to a building owner and increase the building's value. Considering the hypothetical building, the present value of the Special Valuation over the 10-year program period is $83,656 with a present value of $63,834. The Special Valuation savings provide 10% of the total retrofit budget.

Fig 1: Hypothetical Special Valuation Estimated Value

Hypothetical Special Valuation Estimated Value

22,000 sq ft • 3 story building

Bolts+ Retrofit Budget		Cost/sf	Amount Credited Against Property Assessment	
Total–Hard & Soft Costs	$564,373	$25.65	$564,373	
Total–with Relocation	$642,279	$29.19	$12.93	Property Tax Levy Rate
			$7,297	Annual Reduction of Property Tax
			$83,656	Estimated 10 Year Benefit
			$63,834	Present Value of 10 Year Benefit

The City should explore modifications to the Special Valuation incentive. While modifications would require State legislative approval, they could increase the financial benefit of Special Valuation in several ways:

- Extend the duration of the program to match the 12-year deferral period provided by the Multi-Family Tax Exemption program.
- Allow all seismic retrofit costs to be used in reducing the buildings value. Current program guidelines only include construction costs and exclude other project expenses such as relocation.
- Allow buildings on the Historic Resource Survey to qualify for Special Valuation. While 29% of buildings in the modified inventory

have historic or landmark designations, an additional 20% are estimated to be on the Historic Resource Survey.[4]

- Eliminate the requirement that rehabilitation costs must exceed 25% of the property's current improvement value. Many smaller retrofits might not exceed this threshold but meet the balance of program requirements.

These adjustments would increase the financial benefit to $117,860 over the 12-year period. This has a present value of $85,573, which represents 13% of the total retrofit costs.

There are current efforts underway that could assist Seattle in seeking legislative changes to Special Valuation. The State of Washington is evaluating the number of URMs throughout the state. In the past Washington State Legislative session there was a bill drafted to use property tax abatement as a means to offset retrofit costs. The bill was modified to, instead, create a study process. Additionally, there is a group active in Washington State's legislative process for adoption of a Property Assessed Clean Energy (PACE) financing mechanism that could include seismic retrofits. The Shift Zero Pacer Task Force is an alliance of public, private and non-profit organizations focused on moving buildings towards a zero net carbon footprint. Both efforts could facilitate a broad coalition effort that could include these program changes.

Public funding will be required to assist non-profit owners of URM buildings. Buildings that serve a social purpose will need additional assistance to fund retrofits. In affordable housing buildings, for example, rent limits diminish the owner's ability to support additional debt through private financing solutions. In addition, non-profit owners are already tax-exempt and therefore do not benefit from existing resources such as Special Valuation. From an equity standpoint, it is imperative to improve the safety of existing affordable housing units that serve low-income and other vulnerable populations.

Seattle's Transfer of Development Rights (TDR) Program needs retuning. The City of Seattle has six different land use programs that allow for the transfer of development rights or potential (commonly referred to as "TDR"). Depending on program criteria, TDR allows buildings with excess development capacity—zoned development capacity minus existing development—to transfer that development capacity from the "sending site" to a project that is able to use that development capacity (a "receiving site").

The value of those development rights allows the sending site to recoup some of the economic value of unused development capacity. Based on an analysis of the City of Seattle's development capacity model—a parcel level tool that identifies remaining development capacity of parcels—ECONorthwest summarized remaining development capacity on TDR eligible buildings. The analysis concludes that available TDR sending sites, under the various city programs, have 18.5 million square feet in development capacity as potentially transferable.[5]

210 buildings in the current URM inventory (22%) have capacity to transfer. That capacity is estimated at 2.6 million square feet in TDR capacity or 14% of the current program capacity.

The value of this URM TDR capacity could be a significant revenue stream to funding seismic retrofits. However, it is challenging to quantify the value of the remaining TDR capacity due to several considerations that determine its financial value:

- The TDR value is not fixed but fluctuates and is a function of supply and demand. While existing rules create significant "sending" capacity (an estimated 18.5 million square feet) to transfer development potential, there are limited "receiving sites" where credits can be placed. This limit reduces the potential value of the development credit.

- Seattle's Land Use Code and incentive zoning allows for multiple methods for increasing development. Other policy priorities for affordable housing, open space, and design enhancements compete with TDRs, and developers typically seek the lowest cost option to increase density. *As a benchmark, the city's incentive zoning program (of which TDR is a component) has only placed 2.1 million square feet since 2001.*

- Some prices for development potential are set, while others fluctuate. The City has set rules for TDR pricing in certain areas via fees-in-lieu or other administrative actions. This "regulated" market sits next to a more open ("unregulated") private market for transfers. This results in little consistency, and lower pricing, concerning the market price for transferred potential.

Historical fees-in-lieu, as part of the city's past incentive zoning programs, have ranged from $5-$22 per square foot of sending site valuation. The 2.6 million of URM TDR "sending site" capacity would be valued between $13 and $57 million (assuming there is demand for their placement in receiving areas).

The URM TDR program is a way to cost-offset retrofit improvements using new private development to fund retrofit needs. However, it will require several policy issues to be addressed:

- ***Specification of receiving areas.*** All things being equal, the size of the receiving area – measured both in terms of geographic extent

4 Initiated in 2000, the Historic Resources Survey is a coordinated, multi-year effort by the City of Seattle to survey and inventory the city's known historic resources. Surveyed sites and buildings were evaluated based on age, physical integrity, architectural style, and known historic significance.

5 *Seattle OPCD Study. These figures are in draft stage and are subject to change pending further review by the City.*

and development entitlements – create the marketplace for the demand for transfers. The City could add new "receiving areas" which do not have current incentive zoning in place, such as Seattle's near-in industrial areas. There is also a current collaboration with King County on using TDR for open-space preservation. Perhaps expanding close-in unincorporated areas, such as White Center, could be designated "receiving areas" for further density.

- ***Prioritization of URM potential relative to other sources.*** As described above, URM TDR potential "competes" with other zoning incentives that increase development potential. Changes to zoning incentives can make URM potential a more attractive source to buyers and increase its value.

- ***Velocity and flow of transactions.*** Demand for URM transfers is a function of the issues listed above, yet only so much demand can be expected during any given investment cycle. Development fluctuations destabilizes the value of TDRs. A public entity could stabilize values by holding development credits until the market shifts and the value paid. In the past, the City has been an intermediary for TDR transactions through management of a "TDR Bank". The last projects using Housing TDR are being finalized as the program is phased out in lieu of Multi-family Housing Affordability (MHA) regulations. The value of those TDRs was $30/sf – well above the values seen in private transactions. At that value, nearly $78 million in TDR revenue would be available for seismic retrofits. The City should explore remaining as a sole intermediary or help establish a separate intermediary for the buying and selling of URM TDRs that can generate the needed cash flow that URM retrofits will require. Public controls would also ensure that TDR funding is committed for retrofit needs.

Development Credits could Expand TDR Impact. In addition to the TDR adjustments identified above, there are other opportunities for Seattle to look at future development as a source for funding seismic retrofits. Local developers, Peter Nitze and Brad Padden, have developed an alternative program to create a broader development credit program. This would expand the applicability of development credits and would prioritize URM retrofits as Seattle evaluates land areas not already subject to incentive zoning. These are likely Seattle's close-in industrial areas, or it could lead to a collaboration with King County on growing close-in communities, such as White Center and Burien. The proposal seeks to provide a relatively straightforward program that expands the scope of Seattle's TDR efforts. It warrants further attention and might additionally require some public-sector intermediary to function similar to that described in the TDR section above.

New Public Projects Can Include Assistance for Retrofits. Seattle is experiencing a significant convergence of public infrastructure work, including Waterfront Park and Seattle Tunnel activity, and actions on future WSDOT land holdings in Pioneer Square and Sound Transit expansion through the downtown to West Seattle and Ballard. These projects use federal funds and, as such, require a Section 106 Review (National Historic Preservation Act) as part of the National Environmental Protection Act (NEPA) review. Nearly 30% of the URM inventory are landmarks or in landmark districts. The City should require that all environmental reviews fully address impacts on these landmarks and landmark districts and identify mitigation efforts that could include assistance for seismic retrofits.

Table 5: Prototype URM Building Example with Landmark Resources

Assumptions	
Building size:	3 stories; 22,000 square feet
Building use:	Mixed Use: Ground floor commercial with 20 residential units above
Retrofit type:	Bolts+

Estimated Rehabilitation Costs	
Hard Costs	$400,000
Sales Tax (10.1%)	$40,400
Hard Costs Contingency (10%)	$44,040
Total Hard Costs	$484,440
Soft Costs (15%)	$72,666
Soft Costs Contingency (10%)	$7,267
Total Soft Costs	$79,933
Total Construction Expenses	**$564,373**

Relocation Expenses	
Commercial[1]	$58,667
Residential[2]	$19,240
TOTAL (Including Relocation)	**$642,280**

Potential Fund Sources		**% of Project**
City of Seattle TRAO support[3]	$9,620	2%
Special Property Valuation	$63,834	10%
Federal Historic Tax Credit Value[4]	$84,656	13%
Total Resources	**$158,110**	**25%**

Notes:

1. Estimated at $20,000 per unit moving cost; typical commercial unit size of 2,500 SF.
2. Assuming 25% of residential units qualify for relocation assistance of $3,848 per unit per TRAO requirements.
3. City of Seattle provides 50% of TRAO assistance.
4. Tax credit value is estimated by taking 20% of construction costs x $0.75 in value

Table 6: Prototype URM Building Example with Affordable Housing Resources

Assumptions

Building size:	3 stories; 22,000 square feet
Building use:	Mixed Use: Ground floor commercial with 20 residential units above
Retrofit type:	Bolts+

Estimated Rehabilitation Costs

Hard Costs	$400,000
Sales Tax (10.1%)	$40,400
Hard Costs Contingency (10%)	$44,040
Total Hard Costs	$484,440
Soft Costs (15%)	$72,666
Soft Costs Contingency (10%)	$7,267
Total Soft Costs	$79,933
Total Construction Expenses	**$564,373**

Relocation Expenses

Commercial[1]	$58,667
Residential[2]	$76,960
TOTAL (Including Relocation)	**$700,000**

Potential Fund Sources		% of Project
City of Seattle TRAO support[3]	$38,480	5%
4% LIHTC[4]	$203,174	29%
Total Resources	**$241,654**	**34%**

Notes:

1. Estimated at $20,000 per unit moving cost; typical commercial unit size of 2,500 SF.
2. Assuming 100% of residential units qualify for relocation assistance of $3,848 per unit per TRAO requirements.
3. City of Seattle provvides 50% of TRAO assistance.
4. Tax Credit Value is estimated at Construction Costs x 4% x 10 Years x $0.90 in value

Federal tax credits can be a significant fund source for retrofits but small projects will need help. Many of the URM buildings can benefit from federal tax credits to provide financial resources to their rehabilitation. The Rehabilitation Tax Credit (RTC) provides a federal tax credit that offsets federal taxes, which reduces the expense of the building and increases value. Many owners, however, prefer to monetize the credit to use as a source of project funding. This process can be complex and expensive for many building owners. It can also be difficult to attract investor attention for small projects (less than $2 million in project costs). However, a number of small deal funds have been established that could partner with the City of Seattle to facilitate funding seismic retrofits. Assisting building owners to package their projects for investment could help more of them utilize credits. Seattle could also work with local partners to establish a Seattle-specific fund.

If the prototype building is a landmark, we estimate that 13% of the seismic retrofit costs could be funded through Historic Tax Credits. When combined with the Special Property Valuation Program and the City's Tenant Relocation Assistance Ordinance (TRAO) funding, an estimated 25% of seismic retrofit costs are funded. *(See page 7, Table 5.)*

A second federal credit likely to assist seismic retrofit costs is the Low-Income Housing Tax Credit (LIHTC). Administered by the Washington State Finance Commission, LIHTC offers a 9% or 4% tax credit for buildings with affordable housing (below 60% AMI). There are 37 buildings in the revised inventory containing designated affordable housing units. The 4% credit is less restrictive and more readily available to support retrofits. It provides a tax credit of 4% of total construction expenses for 10 years.[6] Building owners monetize the credit by collaborating with investors. The 4% tax credit is typically coupled with tax-exempt bond financing, which has favorable terms that lower financing costs for affordable housing projects.

Seattle and its many non-profit developers have been very successful in utilizing the program and would likely continue to use it as key funding source. *Looking at our prototype as an affordable housing building, we estimate that 29% of the seismic retrofit costs could be funded from the 4% LIHTC program. When combined with the City's Tenant Relocation Assistance Ordinance (TRAO) funding, an estimated 34% of seismic retrofit costs are funded.* *(See left, Table 6.)*

Many other smaller grant programs can be used with the above program sources on a case-by-case basis to support seismic retrofit projects. These are typically for community facilities or landmark preservation and are available through the Washington State Capital Budget or public historic preservation agencies. We have not assumed use of other public funds in this analysis. Without assuming adjustments to the Special Valuation Program or the Transfer Development Rights programs, approximately 20% of the seismic retrofit costs for the URM inventory can be funded. Subsets of the inventory, such as landmark buildings and affordable housing, have a higher percentage of their retrofit costs covered.

The remaining balance of seismic funding would come from building owner funding or financing which can be amortized over the seven to thirteen years recommended by the URM Policy Committee for building owners to complete the upgrades. Some owners might choose to

6 For example, $100,000 in construction expenses x 4% credit = $4,000 in credits per year x 10 years = $40,000 total federal tax credits.

finance over a shorter lease term (5-7 years) or a longer term (over 20 years) to balance annual debt services costs with building cash flow.

A complete financing strategy will include a variety of public, non-profit and private resources. Having a comprehensive financing strategy in place will help move projects from idea to action:

Existing public and non-profit programs are already available that that can fund a portion of retrofit costs. While insufficient to fully fund seismic retrofits, they provide a public contribution to offset private sources of capital.

- Many communities surveyed for this report use pre-disaster mitigation grant funding from the Federal Emergency Management Agency (FEMA). Grants require a local match (which can be provided by private building owners), but when combined with other local and state grant support, would increase the public funding available for retrofits making them less costly to the private owner.

- Local and regional foundations are likely to provide some support. The need to address URMs is acknowledged locally, but funding interest is likely to be directed towards specific building types, such as affordable housing development, mixed-use buildings with local community-oriented commercial space, and community facilities.

- There is limited interest from national philanthropy to fund seismic retrofits. While many are active in resilience and climate change investments, they do not yet view earthquake preparedness as part of their resilience strategy. This may change as more cities expand their collaboration with philanthropy and capital markets and promote seismic retrofits as a resiliency issue.

Public-sponsored/privately-paid financing systems are essential to facilitating building owners' investment in URM retrofits; however, they may have limited usage. As noted above, public/nonprofit resources can reduce the financial costs of seismic retrofits, but a private component will remain. Having publicly facilitated financing options in place can help a building owner select a preferred path and move to project completion more quickly. Ultimately, building owners may elect to use their own savings or local bank to fund retrofits. Decisions depend on the cost of capital and the process and requirements for any publicly-sourced funds. The Washington State Constitution limits what the City can do with public funds, so further work will require a legal review. Generally, public financing options bring the benefit of lower interest rates and longer borrowing terms.

PFM, a national financial advisory company, evaluated the cost of various financing options. Rates are accurate as of 12/24/2018 and **will change**, so numbers are for comparative purposes only. A Seattle General Obligation rate was estimated for comparison purposes; there is not a current proposal to use a public financing mechanism to generate resources for seismic retrofits. Financing alternatives evaluated include:

Property Assessed Clean Energy (PACE) financing: PACE financing establishes a public financing surrogate approved by government, but financial risks are born by the private party receiving the financing. Repayments on the loan are paid via property taxes and then provided to the PACE lender. In this way, it is similar to an assessment district but applies only to specific buildings. While not currently available in Washington State, PACE is used extensively in California for energy upgrades for real estate projects and has funded a small percentage of seismic retrofits. As shown above, PACE funding can be more expensive than other options, depending on the original capital costs to the PACE lender and their mark-up for expenses. There is a local consortium, of interest parties - PACER - working with the State legislature to legalize use of PACE financing so it may be an option. Legislation did not pass this most recent legislative session though there was strong support for the program. PACE financing can be a more expensive, but potentially more accessible, financing source than other options.

Assessment District: Assessment financing requires approval from property owners. It has the benefit of accessing lower rates than private financing and potentially longer terms. This would allow the building owner to spread the costs of the retrofit over a longer term reducing the reduction of their cash flow. The City of Long Beach, CA supported early seismic retrofits by forming an assessment district that included all URM buildings whose owners opted to join—approximately 25% of their URM inventory. An assessment district approach is similar to the PACE effort. Financing is repaid by building owners with the public collecting funds via property tax payments through the special assessment. PACE typically utilizes private lenders whereas an assessment district has a public source of funding. With assessment financing, there needs to be joint benefits that accrue beyond a single property owner to meet legal and policy tests. This question would need to be explored more in the context of URM retrofits to determine if this would be an option for funding.

Affordable Housing Note: As noted in the discussion of LIHTC tax credit support, the federal credit is paired with a Private Activity Bond. The financing typically has advantageous rates and terms that reduce debt service costs to the building owner.

Private Bank Loan: Many building owners will work with local banks to finance retrofits. In San Francisco, the City worked with local lenders to establish a group of local banks willing to provide access to loans for building retrofits. The City worked with building owners and packaged materials for lenders, but the funding was private. A similar initiative could be formed in Seattle.

HUD 108 Loan: The U.S. Department of Housing and Urban Development (HUD) Section 108 Program provides the least expensive cost of funds. Through this lending program, which is within the federal CDBG Program, HUD borrows and relends to the City, which then relends proceeds to a project. The City of Seattle has an estimated $35 million in borrowing capacity, and future community development block grant

FIG 2: COMPARISON OF FINANCING ALTERNATIVES FOR SEISMIC IMPROVEMENTS

Scenarios	Cash / Debt Financing Options[1]	Property Assessed Clean Energy (PACE)[2]	Assessment District[3]	Public Agency Conduit Financing[4]	Affordable Housing Note[5]	Seattle CDBG 108 Loan Program[6]	Private Bank Loan
Term	30 Year	25 Year	30 Year	30 Year	35 Year	20 Year	20 Year
Type	Public Debt	Public/Private Bonds or Loans	Public Sale Bonds	Private Placement	Private Placement	Public Loan	Private Loan
City's Balance Sheet Impact	Yes	None	None	None	None	NONE	None
Estimated Interest Rate	3.65%[7]	6.55%[8]	4.95%[9]	5.08% [10]	4.93%[11]	3.15% [12]	5.50%[13]
Estimated Annual Repayment[14]	$46,824	$57,672	$54,692	$52,171	$38,879	$43,709	$55,415

1 Assumes legal authority for public funds to be used for retrofit costs. Financing is assumed to be repaid from the City General Fund. As such they would compete with other General Fund priorities.

2 Requires legislative authority. Financing is typically privately sourced with repayments made from additionally created property assessments.

3 Requires a legal determination of joint benefits form the proceeds rather than benefits solely benefiting a single property owner.

4 Requires a quasi-governmental agency. Financing typically privately placed with repayments from project. Rate is estimated at a taxable rate as of 05/09/2019.

5 Tax-exempt Private Activity Bond Financing

6 Federal Program Allows Seattle to Borrow from HUD and Relend to Eligible Projects

7 AAA Taxable Rates as of 05/13/2019. The rates are based on the scale of the City of Seattle Limited Tax General Obligation Improvement Bonds, 2018B.

8 Indicative Rate. Assessment created to repay debt which could be from a public or private source. Typically a higher rate than private bank financing.

9 BBB Special Tax Scale as of 5/9/2019. The actual rate is based on the size and diversity of the district.

10 BBB COPs 30-Year taxable rate as of 5/13/2019. The actual rate is based on characteristics of the conduit lender.

11 Tax-exempt financing through WSFC Private Activity Bond Program. Rate reflects an average over 2018 - present.

12 Fixed Rate Debt Based on Recent HUD Bond Debenture. Generally estimated at 10-YR Treasury + .75 bps.

13 Estimate from recrent project financings and lender interviews.

14 Assuming the prototype project amount is $642,279 with a single borrowing.

revenues secure the loans. The program is best used with affordable housing or community development projects due to federal regulations. The program allows the City to either pass through costs to the project or use some of its annual CDBG Entitlement grant to offset debt service costs. Seattle uses the program, although more sparingly in recent years. Utilizing 108 capacity for URM retrofits would limit use for other projects and reflect a prioritization of URM retrofits. As loans are repaid that capacity could be used for other City priorities. To ease the impact of debt for affordable housing projects, Seattle could use a portion of its annual CDBG Entitlement funding to offset debt service costs. This reduces the financial impact on building affordable housing units. Like the 108 capacity, this would limit use of grant funds for other purposes.

Additional areas that could benefit from a public approach to financing include:

CDFI Consortium: Similar to PACE, a lending consortium approach is under evaluation that would utilize alternative financing entities known as Community Development Financial Institutions (CDFI). CDFIs are typically public-oriented alternative lenders with more flexibility in their lending activities. The Seattle Chinatown International District Preservation and Development Authority (SCIDPDA) has received a grant to evaluate the concept. The key is to determine if CDFIs can access funding that lowers borrowing costs or provides lending flexibility unavailable through other means. If PACE legislation is adopted, this consortium could function like a PACE conduit lender.

Impact Investing: As noted above, there has been limited interest from national philanthropy in seismic retrofits, and most local foundation interest would likely be limited to specific types of projects. However, an approach utilizing impact investing might be more beneficial. In impact investing, foundations and/or high net wealth donors provide low-cost financing in order to facilitate a public benefit. This double bottom-line activity provides some limited return to the investor while meeting a social need. While not yet to scale, there have been examples with Bellwether's housing development and Forterra's community equity borrowing that were funded through impact investments.

Opportunity Zones: This new community investment tool, introduced in the 2017 Tax Cuts and Jobs Act, provides tax advantages to private investors who invest capital gains proceeds in designated Opportunity Zones. An estimated 229 URM buildings fall within State-designated Opportunity Zone boundaries. While regulations for the program are not final, use of Opportunity Zone-sourced equity in URMs is promising and warrants further exploration. When coupled with federal Rehabilitation Tax Credits, the two federal benefits could significantly lower the cost of capital to fund retrofits. This could help smaller property owners retain their buildings and potentially limit displacement created by retrofit actions.

URM retrofits could lead to cost effective energy efficiency upgrades. Our research indicates it would be cost effective for property owners to undertake other building system upgrades at the same time as retrofits. While increasing the overall project scope, these enhancements often lead to higher income due to reduced utility costs. There are also system subsidies to offset the costs for these energy and utility upgrades that exceed current standards. This allows a URM retrofit to more easily fit within Seattle's resilience policy framework. This strategy could result in additional support as Seattle moves forward on its resiliency goals. The 2030 Pilot project is an initial start to this approach but limits eligible projects to downtown Seattle. Still, the concept is promising to encourage more robust building renovations that meet both seismic and resilience goals.

MOVING FORWARD

The approach to retrofitting 944 buildings in Seattle requires a comprehensive strategy. With a new policy mandating retrofits, building owners may be concerned about requirements, approaches, and especially, costs. No single approach can solve this complex problem. Public funding is needed to pay internal and external program staff to implement a mandatory retrofit policy and equip building owners with the resources they need to comply. Re-use or adjustment of permit fees and Seattle's share of the sales tax collected on URM retrofits (estimated at $7.7 million for the entire inventory) could be allocated to program costs. Existing public resources, if improved upon and directed appropriately to building owners, can provide significant support to building owners – though additional funding will be needed for non-profit owners that cannot utilize many of the existing resources. A publicly-facilitated financing system would provide lower-cost, more flexible capital resources to private building owners. At a minimum, it will provide an option to private owners that are unable to access other sources.

It remains apparent that, at least in the short term, the costs and benefits resulting from mandated URM retrofits are asymmetric between public and private parties. In the long term, building owners and tenants benefit from greater safety and potentially lower recovery costs for a retrofitted building, and the greater public benefits from increased safety and resilience in the event of an earthquake. The immediate financial cost, however, largely falls onto private building owners who, at least in the short term, do not receive significant economic benefits from seismic retrofits. As a result, a successful policy approach will involve a combination of public and private resources. This will ease its financial burden, facilitate support and compliance, and lead to a safer and more resilient Seattle.

BACKGROUND

What is an Unreinforced Masonry Building?

Unreinforced masonry (URM) buildings are constructed with one or more bearing walls made of clay brick or clay tile masonry that provide the primary support for vertical loads from floors or roofs and walls. Current estimates suggest there are approximately 1,145 of these buildings throughout the City of Seattle that were constructed between 1886 and 1957 when building codes and construction practices were far less strict than contemporary standards. Historically, the outmoded engineering of these buildings has made URMs particularly prone to structural failure, shearing, and even collapse during seismic activity (See Figure 1). More than 50 of the city's neighborhoods are currently affected by these vulnerable buildings, with the highest concentrations in some of the city's oldest neighborhoods—Capitol Hill, Pioneer Square, and Chinatown International District. Many of Seattle's URM buildings are also concentrated in areas that are likely to experience the strongest levels of ground shaking during a seismic event. For these reasons, URM buildings will continue to be a serious public safety concern to the City of Seattle and its residents until they are appropriately addressed.

Historical Context

Earthquakes are considered the most critical natural hazard threatening Seattle. The Cascadia Subduction Zone and the Seattle Fault line, the latter of which runs east to west through the middle of the city, pose the greatest risk. The most recent major seismic event in the Seattle area was the 6.8 magnitude 2001 Nisqually earthquake which caused considerable damage to several of Seattle's URM buildings. Though it is not possible to accurately predict when the next major earthquake will occur, some experts suggest there is a 10% chance that a 9.0 earthquake could occur along the Cascadia Subduction Zone within the next 50 years.[1]

Addressing Seattle's URM problem has long been motivated by the life safety of occupants (and passersby) of these buildings. According to the recommendations from the URM policy committee, many of these buildings are located in "neighborhoods where communities of color live and work, where languages other than English are spoken, and where local businesses serve these communities. A neighborhood's economic recovery may be delayed by the cleanup of debris from earthquake-damaged buildings" (2017). In the 1970's, the City of Seattle made its first steps toward a safer and more resilient city by passing an ordinance making seismic retrofits mandatory on all URMs. At the time, the City offered no public financial assistance to property owners to ease the high cost burden of seismically retrofitting a URM building. After widespread outcry and minimal progress from owners due to the insurmountable financial barriers, the City repealed its mandate in 1978 after four years. Since then the issue remained relatively untouched from a policy standpoint until the Nisqually earthquake prompted the City to take action in the mid-2000's.

The most recent progress made on this public safety issue is the set of policy recommendations presented by the Unreinforced Masonry Policy Committee to the City of Seattle in July 2017.[2] The committee identified tools to make a retrofit policy more effective and recognized that retrofit costs are the greatest barrier for building owners to comply with a policy. Seismically retrofitting buildings remains a costly endeavor, and many of Seattle's URM owners still may not have the financial resources available to bring their building into compliance with the City's proposed mandatory retrofit ordinance. Thus, our research focuses on gauging the true cost of retrofitting Seattle's URMs and exploring the public and private financing options that may be applied to lessen the encumbering financial burden on URM property owners.

Seattle's URM Inventory

The City of Seattle has made several efforts since the 1990's to better understand the scope of this issue by amassing a comprehensive inventory of the city's URMs. The Seattle Department of Construction and Inspections (SDCI) manages the inventory and publishes

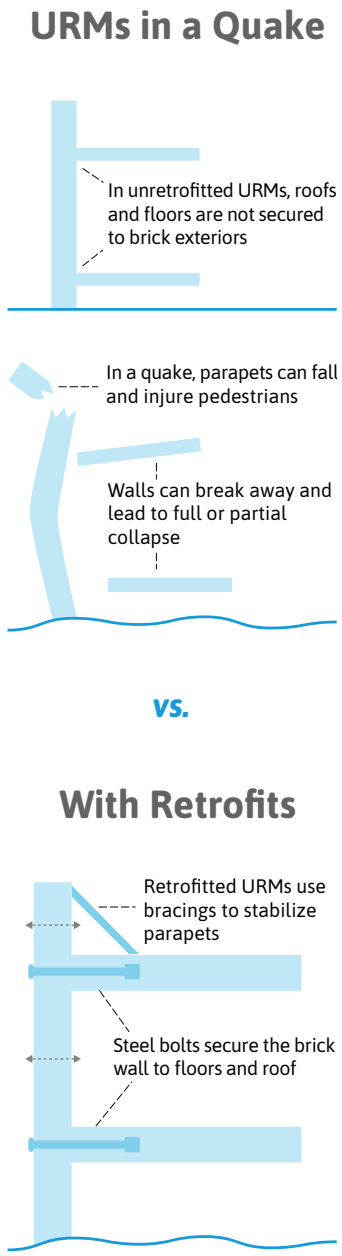


fig. 1

Source:National Trust for Historic Preservation, based on image by Stephanie Redding, Seattle Times

1 Cascadia Region Earthquake Group (CREW). (2013 update). *Cascadia Subduction Zone Earthquakes: A Magnitude 9.0 Earthquake Scenario* (p. 8).
2 The URM Policy Committee's Final Recommendations can be accessed from the City of Seattle's website: https://www.seattle.gov/sdci/codes/changes-to-code/unreinforced-masonry-buildings

MODIFIED INVENTORY:

1145

The City's most current estimates identify 1,145 URM buildings in Seattle, excluding single-family homes and duplexes. These URMs amount to approximately 26.1 million square feet of Seattle's building stock.

1012

Buildings that have been substantially altered would likely meet or exceed the Bolts Plus minimum standard being proposed in the City's planned URM policy. Thus, we exclude 133 buildings that have already undergone substantial alterations, which leaves 1,012 buildings that will likely need to be retrofitted. Detail on retrofit levels is provided in the next section.

944

The modified inventory used in this analysis also excludes an additional 68 buildings that are publicly owned – including by the City of Seattle, King County, and State of Washington.[3]

3 The analysis retains affordable housing buildings owned by Office of Housing and Seattle Housing Authority.

it on their website regularly. Data collected by SDCI identifies several building characteristics that helped inform the social and financial aspects of our research, such as building occupancy level, ownership type, historic designation, building use, building size, required retrofit type, etc.

To more accurately measure the financial ramifications of a mandated retrofit ordinance, and to align potential sources of funding, this analysis refines the inventory to exclude buildings that have already been seismically retrofitted to a sufficient level and publicly owned buildings (which can access different sources of funding).

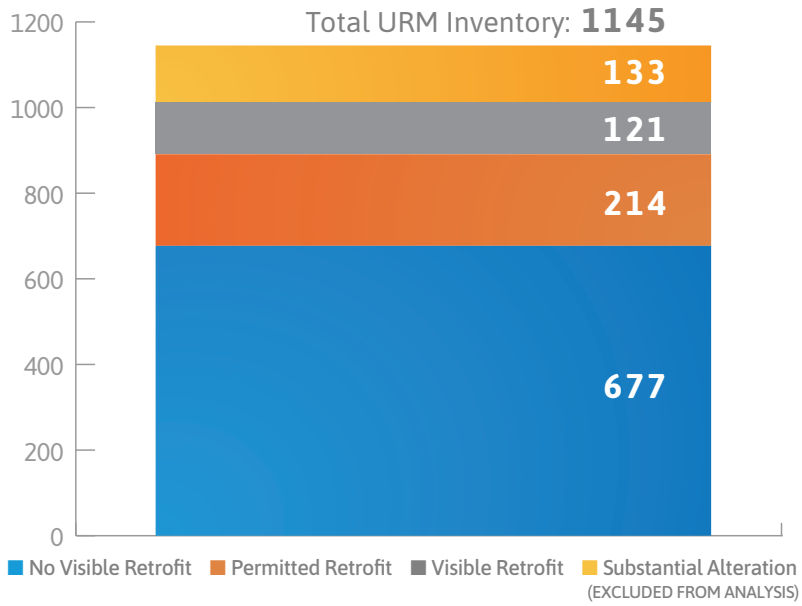
The 944 buildings remaining in the modified inventory total **20.2 million** square feet.

Building Characteristics

Retrofit Level

Due to the longstanding threat of earthquakes in Seattle – and in anticipation of a citywide mandate – roughly 41% of URM owners have already completed some level of retrofit or currently have permits to complete proposed retrofits. Our modified URM Inventory categorizes buildings into four retrofit levels (See Figure 2):

fig. 2



All Verified URMs:

1145

Minus substantial alterations :

1012

Minus public owned:

944

Substantial Alteration – Buildings that have undergone considerable renovations or changes in use that trigger required structural improvements to address building code deficiencies, including seismic upgrades.

Visible Retrofit – Buildings that do not have a permit record of retrofit work being done but physical evidence on the building exterior suggests at least some seismic strengthening has been completed.

Permitted Retrofit – Buildings that have a permit record of at least some seismic upgrading. This designation includes any seismic upgrade ranging from parapet bracing to a full seismic upgrade.

No Visible Retrofit – Buildings that do not have a permit record of retrofit work ever being done and the building exterior does not suggest any seismic upgrades.

Building Use

The inventory categorizes buildings by their reported building use: commercial, residential, office, public assembly, schools, government, industrial, emergency services, and other mixed uses. Shown in Figure 3, a majority of the city's URMs are used for commercial and residential purposes or have a combination of both. The modified inventory includes roughly 340 buildings with some residential space which accounts for a total of nearly 10,500 units.[4] This is important to consider for tenant relocation purposes that may be required during some of the more invasive retrofit construction projects.

Number of Stories

The number of stories in a URM building contributes both to its potential impact in the event of a collapse, as well as the cost of seismic retrofits. Seattle's URMs range in height from one to ten stories. In the modified inventory, 89% of buildings are four stories or less and 95% are five stories or less. Figure 4 shows the category of retrofit that applies to the building based on the number of stories. Nearly 25% of the URMs in the inventory are one-story buildings in need of a Bolts++-Frame upgrade.

Fig. 3: Building Use

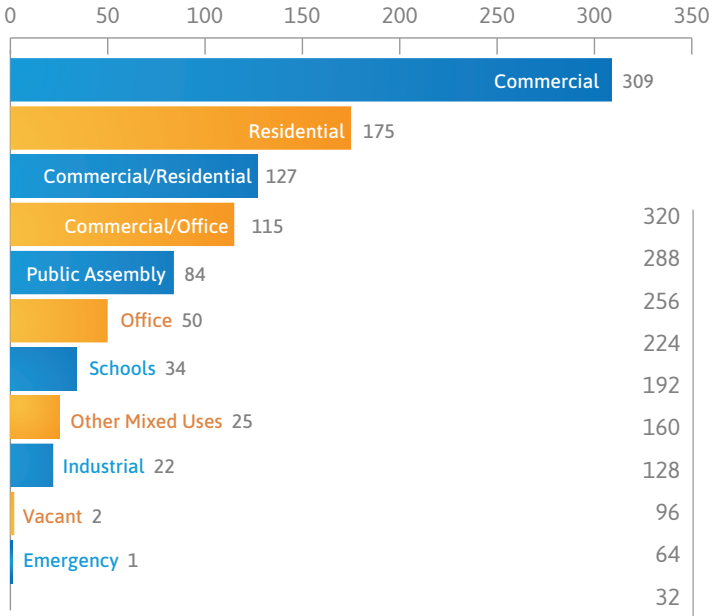
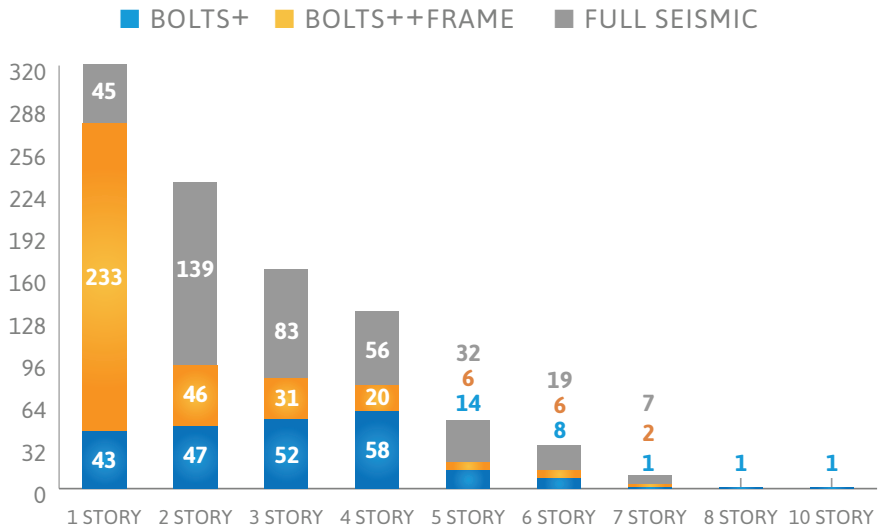


Fig. 4: Number Of Stories By Retrofit Type



4 Residential unit counts for most URMs in the inventory was compiled by the Seismic Retrofit Roundtables and Working Groups. For the remaining residential buildings, we estimated units by multiplying the building square footage by 80% (accounting for hallways, common areas, etc.) and divided by 595, which is the weighted average unit size of the known units.

All Verified URMs:

1145

Minus substantial alterations :

1012

Minus public owned:

944

URM Seismic Retrofit Standards

In 2011, the URM Technical Committee proposed a retrofit standard called "Bolts Plus" (Bolts+) that is similar to standards adopted by jurisdictions in California. A Bolts+ retrofit requires that 1) the walls are tied to the floors and roof, 2) parapets are braced, 3) weak floor and roof diaphragms are strengthened, and 4) tall brick walls are strong backed to prevent out-of-plane bending failure. Bolts+ retrofits significantly improve the structural performance of a URM, reducing the likelihood of full or partial collapse in an earthquake. Note that this retrofit level is not designed to fully protect the building from damage that would allow for immediate occupancy after an earthquake. It is, however, a cost-effective method for protecting lives.

Of the buildings included in the modified URM inventory, 215 buildings (23%) appear eligible for the Bolts+ standard. An additional 344 buildings, or 36% of the modified inventory, appear eligible for the Bolts+ standard with the additional installation of a steel frame or shear walls to strengthen the building. This standard is referred to as "Bolts Plus, Plus Frame" (Bolts++Frame). Many of the buildings that will need this level of retrofit have open storefronts at street level. Figure 5 illustrates the basic components of a Bolts+ and Bolts++Frame retrofit.

For the remaining 41% of buildings in the URM inventory, building configuration and characteristics require a more rigorous standard than Bolts+ or Bolts++Frame. These buildings will require a Full Seismic retrofit with a specifically engineered design.

Fig. 6 & 7: Retrofit Standard

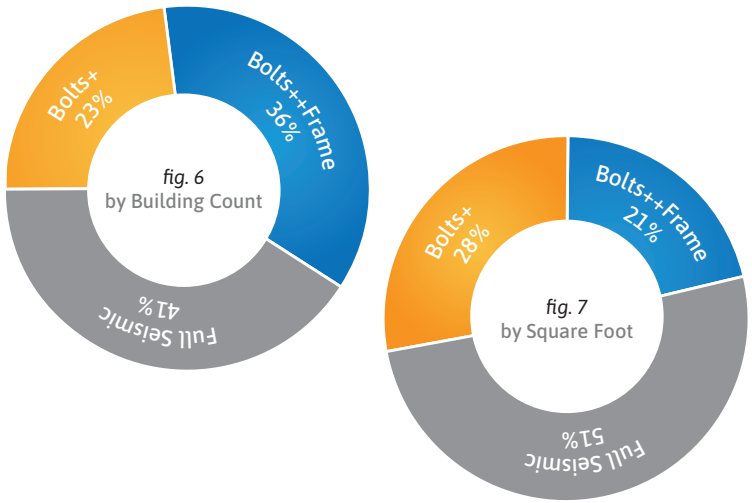
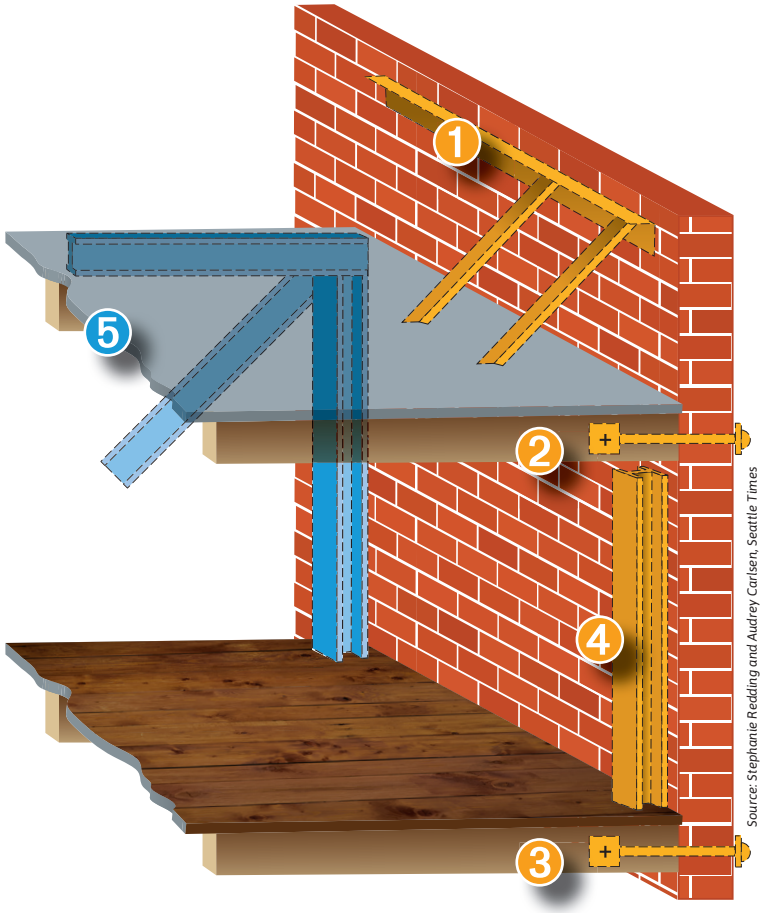


fig. 5

Retrofitting old brick buildings

Upgrading an old building to make it more earthquake-safe involves connecting brick walls and parapets to the roof and floors.



Source: Stephanie Redding and Audrey Carlsen, Seattle Times

1 **Parapet bracing**: The portions of a wall that extended past the roof (parapet) need a diagonal bracing that is generally made of steel.

2 **Wall-to-roof diaphragm:** Steel bolts horizontally secure the brick wall to the roof. Rosettes seen on the outside of the building can indicate this retrofit has been done.

3 **Wall-to-floor diaphragm:** Steel bolts tie the brick wall to the floors.

4 **Out-of-plane wall bracing:** Steel beams that vertically connect the brick wall to the floors to keep the wall from bending.

5 **Overall building bracing:** Steel beams that increase the building's overall strength. This is often important for buildings with large windowed shops on the first level.

■ Bolts+
■ Bolts++Frame

WHAT ARE OTHER CITIES DOING?

As Seattle looks to move forward with a mandatory URM policy, there is much to be learned from jurisdictions that have already addressed these vulnerable buildings. While unreinforced masonry is a cause for concern in all regions that experience seismic activity, the State of California has been the primary leader in this policy area for decades. In 1986, the State of California enacted a law requiring all local governments located in Seismic Zone 4—the highest seismicity zone in the state—to create their own URM inventory and develop a hazard mitigation plan. This law applied to nearly every major city along the coastline. The law was broadly defined and did not require cities to pass ordinances or create financial incentives, but it swiftly accelerated URM mitigation efforts in the applicable jurisdictions. Between the prevalence of earthquakes in the region and the strong evidence that voluntary retrofit programs are not effective, most jurisdictions opted to make seismic retrofits on URM buildings mandatory as well as provide some form of financial relief to building owners. The following takeaways are based on our comprehensive review of URM programs in the following jurisdictions: Berkeley, CA; Long Beach, CA; Los Angeles, CA; Oakland, CA; Portland, OR; San Francisco, CA; Salt Lake City, UT; and Santa Monica, CA. See Appendix A for the detailed URM program case studies from each peer city we reviewed.

Berkeley and Oakland

Due to their close proximities, the local governments of Berkeley and Oakland collaborated on this issue and implemented similar financial assistance programs. Berkeley pioneered the tax rebate program in 1991 when its initial URM ordinance passed, and Oakland implemented a similar tax rebate model in 2007. Berkeley and Oakland had the lowest demolition rates of the cities we reviewed—despite having relatively minor financial incentives. While it is unclear exactly how these cities achieved such nominal demolition rates, Berkeley's weak enforcement of the ordinance after it passed in 1991 could be one contributing factor. Property owners were not held accountable to retrofit deadlines in the first decade of the program, and only 20% of the city's URM stock had been mitigated by the early 2000's. As a result, URM building owners had substantially more time to complete retrofits than initially intended without any ramifications for non-compliance. **It was not until the city hired a URM program manager to apply pressure on property owners in the early 2000's that the pace of the city's mitigation efforts picked up.** Berkeley and Oakland each still have a few URM buildings that have yet to be retrofitted. Nonetheless, both cities have recently initiated similar FEMA-funded retrofit grant programs and are now targeting other vulnerable building types.

(clockwise from top left) Portland, San Francisco, Salt Lake City, Los Angeles, Oakland

Long Beach and San Francisco

The cities of Long Beach and San Francisco have both suffered from devastating, large-scale earthquakes, witnessing firsthand the damage caused to URMs during a seismic event. This historical context may be the reason these two jurisdictions provided the most substantial financial assistance of the cities reviewed in this report. In coordination with its 1991 URM ordinance, the City of Long Beach developed a special assessment district and issued $17.4 million in limited obligation bonds to provide loans for seismic resistance improvements. After months of political and legal maneuvering to initiate the bond issue, 137 URM buildings were able to benefit from these loans. Meanwhile, the City of San Francisco issued $350 million in voter-approved GO bonds to provide affordable loans to URM owners in 1992. However, as of 2000, only 17 URM owners benefitted from these bond loans as a result of several complications, and the excess bond funds were eventually repurposed for a different use.

Long Beach and San Francisco's URM mitigation efforts each demonstrate notable characteristics. **Long Beach's program resulted in an incredibly high demolition rate of 40%, which suggests little effort to preserve historic character and repurpose URM buildings.** While it is more common among Southern California cities to have higher demolition rates than its northern counterparts, Long Beach's demolition rate stands out. Further, **San Francisco's bond loan program was the largest**

allocation of public funds for the purpose of retrofitting URMs across all cities reviewed, yet it was also the least used. Critics of San Francisco's bond loan program attribute its lower-than-expected participation to two things: First, the loan process was reportedly complex, and the loans came with extensive restrictions and conditions that turned away borrowers. Secondly, the City suggests that the low participation was due to commercial banks offering loans with lower interest rates than those offered by the City. Due to the bond proceeds being used for private purposes, the bonds were no longer tax-exempt, and the city was unable to compete with the private interest rates.

Los Angeles and Santa Monica

Los Angeles and Santa Monica are the only two cities reviewed that made no city-wide effort to provide public financial assistance for URM retrofits. While a small portion of Los Angeles' 8,079 URM owners found some subsidiary funding sources such as Community Development Block Grant (CDBG) monies and redevelopment funds, the bulk of owners were forced to self-finance retrofits or rely on private loans. Nonetheless, Los Angeles is one of two cities reviewed that has completely eradicated every URM on its inventory (the other is Long Beach). Santa Monica, which had far fewer URM buildings than Los Angeles (265 total), experienced minimal progress towards URM mitigation after its ordinance passed in 1999. This lasted until 2017 for the same reason that Berkeley's program became stagnant—weak enforcement. In 2017, Santa Monica re-established its retrofit program by passing the most progressive seismic retrofit ordinance to date, requiring mandatory retrofits on all of the city's most vulnerable building types: URM, concrete tilt-up, soft-story, non-ductile concrete and steel moment frame buildings. Once again, the City of Santa Monica provided no financial support for building owners. Instead, property owners seeking financial support from the City are redirected to California's state-wide retrofit programs: CalCAP/Seismic Safety, Earthquake Brace + Bolt, and PACE Financing.

Many of the jurisdictions in California's Seismic Zone 4 have been working on retrofitting their URM buildings for nearly 30 years. As a result, each of the aforementioned California cities (with the exception of Santa Monica) has full or near-full compliance with their respective URM ordinances. Within the last five years, most of these jurisdictions have transitioned focus to other vulnerable building types, primarily soft-story buildings. As the State of California looks to the future, Assembly Bill 2681 is currently being deliberated on in the State Legislature. If passed, this bill would essentially expand the 1986 URM Law beyond Seismic Zone 4 and require nearly all local governments in the state to identify potentially hazardous buildings and establish mitigation programs for them.

Salt Lake City

Salt Lake City is one of the large metropolitan jurisdictions we reviewed outside of California. Salt Lake is unique as it is the only city that includes single-family homes on its URM inventory. As a result, its official city-wide URM count is 31,892, and this does not even account for commercial properties.[1] The Fix the Bricks Program in Salt Lake City provides FEMA grants to single-family property owners to complete seismic retrofits on their homes. Each year homeowners apply to the program, and if accepted, FEMA funds 75% of the relevant retrofit costs and the homeowners are responsible for the remaining 25%. In the first year of the program it was able to fund retrofits for 44 unreinforced masonry homes and is on track to upgrade 100 homes in its second year. Construction on the second round of homes is projected to be completed in the spring of 2019. A seismic retrofit on a single-family home is far less intensive and invasive than a retrofit on a multi-story, multi-family or commercial property like those on the Seattle URM inventory. Because of this, Salt Lake City's average retrofit costs are $15,000 to $20,000 per home, and that price is highly unlikely to translate to any of the URM's on Seattle's inventory.

Portland

The City of Portland, Oregon is currently in the process of addressing its own URM problem and is facing similar challenges to the City of Seattle. In 1994, Portland began developing its first inventory of the City's URMs, which was later updated to its current form in 2015-2016. The inventory includes over 1,600 URM buildings, the highest concentration of URMs for a city in the Northwest.[2] Like Seattle, Portland's URM Building Policy Committee recommended the City make retrofits mandatory and established classifications that prioritize URMs based on criticalness to city functions (public utility infrastructure) and risk level. In June 2018, the City Council passed a resolution directing the development of language for a mandatory retrofit policy within one year based on committee recommendations.[3] The same resolution also directed the creation of a property tax exemption program for URM owners.

In October 2018, the City Council passed an ordinance requiring owners of URMs without retrofits to post a placard on their building(s) that warns it may not be safe in the event of an earthquake. This decision has come under major public scrutiny and has even sparked legal threats against the City as URM owners feel these signs will greatly decrease their building values. As a result, in February 2019, the City Council voted to delay the sign requirement for URM owners until November 2020. The City plans to consider and develop a replacement policy during the delay.

1 Western States Seismic Policy Council. (2019). Monthly Bulletin - February 2019. Sacramento, CA.
2 Portland Bureau of Emergency Management, Unreinforced Masonry (URM) Building Policy Report, Dec. 2017
3 Resolution 37364, June 18, 2018, The City of Portland

Key Takeaways from Program Review:

Mandatory Retrofits and Consistent Enforcement Are Critical

URM mitigation programs are most effective when retrofits are mandatory, and cities consistently enforce deadline compliance. In 2006, the Seismic Safety Commission of California surveyed 260 URM loss reduction programs throughout Seismic Zone 4.[4] Of these programs, 39 allowed voluntary retrofits and their average rate of retrofit was 16%. When you compare that to the 70% average rate of retrofit across the 134 mandatory retrofit programs, it is clear that voluntary retrofit programs have historically been ineffective. Several cities we explored had created mandatory retrofit programs but then lacked when it came to enforcement. As a result, their seismic retrofit programs became stagnant as some property owners chose not to perform mandatory retrofits because they felt there would be no repercussions. A January 2019 article in the LA Times noted the number of cities in California without a mandatory requirement or no strategy.[5] The article also noted that "San Jose, California's third-largest city, doesn't even know where its vulnerable buildings are located, but it has applied for a grant to create an inventory." As a result, making retrofits mandatory, remaining diligent in enforcement efforts throughout the compliance timeline, and appropriately penalizing non-compliant property owners are three fundamental components of a successful URM program.

Unreinforced Masonry is Only the First Step

Most coastal California cities addressed their URM problems between the 1980's and early 2000's and have therefore moved beyond URMs to address other vulnerable building types. After URMs, mandatory retrofits of soft-story buildings and non-ductile concrete buildings are becoming increasingly common. Other vulnerable building types that jurisdictions are beginning to address include concrete tilt-up and steel moment frame.

Staff a Programmatic Effort

It is beneficial to have internal and external relationships to direct the various URM program needs in order to streamline the URM effort and help navigate property owners through the retrofitting process. Berkeley, Oakland, and Salt Lake City expressly recognized the value of having at least one full-time employee devoted to overseeing their URM retrofit efforts, managing their financial assistance program(s), and aiding URM owners throughout the process.

FEMA Grants Are Important Resources but Challenging to Navigate

Whether building safe rooms in tornado-prone Oklahoma or fortifying homes for hurricanes in Florida, the use of FEMA dollars for pre-disaster resiliency efforts is very prevalent. Three of the cities reviewed currently operate seismic retrofit programs that use FEMA grant funds. Berkeley and Oakland's retrofit programs are funded through FEMA's Hazard Mitigation Grant Program, which requires a Presidential Disaster Declaration. Salt Lake City's 'Fix the Bricks' retrofit program relies on FEMA's Pre-Disaster Mitigation Grant Program. It is important to note however, that FEMA Mitigation Grant programs are project-based by design, and not structured for ongoing programmatic funding. As a result, the maximum result is to gradually address the problem of a large vulnerable inventory.

Among the cities that use FEMA grants, many expressed frustration navigating the FEMA grant process. City officials in Berkeley and Oakland who manage the retrofit programs suggested that FEMA's grant requirements are not always pragmatic and there is often a disconnect between the documentation that FEMA requests and what the city is able to provide. Salt Lake City expressed similar concerns but suggested that their biggest hurdle is the gap between funding cycles which occasionally leads to construction delays and frustrated funding recipients.

Private Loans or Self-Financing is Common

Nearly all URM retrofit programs that have been completed or are still in progress have created some form of publicly-sponsored financing program. Although the size, structure and scale of each URM program varies by city, the motivation to provide public financial assistance remains consistent: to support wide-scale retrofit needs and provide relief to property owners that cannot afford seismic upgrades. While some URM owners have undoubtedly benefit from public support, most URM retrofit financing is done privately through commercial loans or independently financed by the property owner.

Cities Tend to Prioritize Residential Buildings

In Seattle's URM inventory, there are 309 buildings used only for commercial purposes, 175 buildings used only for residential purposes, and 127 buildings that serve both residential and commercial functions. While commercial-use URMs represent the largest portion of the inventory, residential properties still make up 19% of the city's total URM square foot area. Several jurisdictions that have implemented a seismic retrofit program have placed a higher urgency on residential properties compared to commercial buildings. Some cities even go so far as limiting the use of their financial incentives to residential properties. For example, Berkeley and Oakland excluded commercial property owners from their transfer tax rebates, and Salt Lake City's 'Fix the Bricks' program only offers grants for residential properties, despite FEMA having no such exclusionary restrictions on their grants.

4 California Seismic Safety Commission. "Status of the Unreinforced Masonry Building Law: 2006 Progress Report to the Legislature." SSC 2006-04, 9 Nov. 2006.
5 Lin II, R. (2019, January 17). Big earthquake would topple countless buildings, but many cities ignore the danger. *LA Times*.

State-Wide Financial Support

Beyond the financial assistance programs offered by local jurisdictions, property owners in California also have access to three state-wide programs that can be used for seismic retrofits: PACE Financing, Earthquake Brace + Bolt, and the California Seismic Safety Capital Access Loan Program. In Oregon, the state legislature is currently considering a bill (HB 2208) to create the Unreinforced Masonry Seismic Safety Program. This statewide program, administered by the Oregon Business Development Department and financed using lottery bonds, would provide grants that cover up to 35% of eligible seismic retrofit costs. State-wide financing programs are also common on the east coast for hurricane and wind mitigation. It may be due to the greater prevalence of natural disasters, but it appears state governments are active in resilience investment on the East Coast. In Washington, Senate Bill 5557 was recently drafted to create a State grant program for URM retrofits. The legislative session ends at the end of April, so we will know by then if this becomes a feasible option of building owners. The Bill confirms a growing statewide interest in seismic retrofit needs with resources provided through the State Department of Commerce.

Demolition Rates Vary by Locality

While public safety is the City's top priority in its URM mitigation efforts, preservation of the historic value inherent in URMs is also a significant concern. For some URM owners, demolition may be the only financially sensible option when retrofits become mandatory. Therefore, it is very reasonable to expect some portion of Seattle's URM inventory to be demolished, but the extent to which that will occur is unpredictable. Improving access to financial assistance may contribute significantly to reducing unnecessary demolition. In some California cities, primarily Southern California, there has been little evidence of any coordinated effort to prevent URMs from being demolished unless the building has historical significance. Instead, cities have prioritized the mitigation of URMs as quickly and efficiently as possible, whether that be through demolition or retrofit. In 2006, the average rate of demolition for URMs under a mandatory retrofit program in Seismic Zone 4 was 17 percent.[6]

Table 4: Demolition Rates

Jurisdiction	Total URMs	URMs Demolished	Demolition Rate
Berkeley	587	6	1%
Oakland	1,612	108	7%
Los Angeles	8,079	1,942	24%
Long Beach	936	370	40%
San Francisco	1,985	158	8%
Santa Monica	265	71	27%

Philanthropy and Impact Investing Are Limited

Our research also explored the possible role of local and national philanthropy in the retrofitting of URMs. The organizations we looked at include the Rockefeller Foundation, Ford Foundation, Lincoln Land Institute's Center for Community Investment, Kresge Foundation, Mission Investors Exchange and The Seattle Foundation. While philanthropies have expressed interest in contributing to the resilience space, there has been little tangible action or financial investment from them to date. The Rockefeller Foundation is making the greatest strides in the area, particularly through their 100 Resilient Cities (100RC) program, of which Seattle is a member. Many resilience strategies and financing programs prioritize long-term climate change and environmental adaptation, which in many contexts does not directly incorporate risk reduction efforts for earthquakes.

To gain a better understanding of resilience, we explored financing strategies among peer cities who face similar earthquake threats and also assessed some non-seismic resiliency programs throughout the US. Of the existing resilience financing mechanisms available (Green Bonds, CAT Bonds, Impact Bonds, etc.), they have rarely been used to fund earthquake hazard mitigation projects like seismic retrofits, especially among privately-owned buildings. These financial tools tend to have more application with larger infrastructure investments that impact development such as expanded water/sewer facilities, energy investments, etc.

Retrofits May Promote Other Building Upgrades

It is not uncommon for property owners to pursue other building systems upgrades in concert with a seismic retrofit. Retrofitting can often be an invasive procedure; therefore, some building owners take advantage of this construction period to pursue additional remodeling or refurbishing. While our research suggests seismic retrofits alone do not inherently generate immediate added economic value, it may be achieved through improvements to a building's aesthetics, functionality, energy efficiency or marketability. Building owners should determine whether additional upgrades would trigger substantial alteration requirements, and compare the economic benefits from improved performance against the additional costs.

6 California Seismic Safety Commission. "Status of the Unreinforced Masonry Building Law: 2006 Progress Report to the Legislature." SSC 2006-04, 9 Nov. 2006.

RETROFIT COST ESTIMATES

Cost estimates range between roughly $9 and $95 per square foot, with an average of between $32-$35/sf for Bolts+ and Bolts++Frame retrofits and $95/sf for full seismic retrofits. This includes hard costs, sales tax, soft costs (fees and services), contingency, and tenant relocation costs. These estimates only cover seismic retrofits, and do not take into consideration other improvements that could impact a building's economic value. Table 5 shows the average cost per square foot for the three retrofit types, and Figures 8 and 9 show the range of construction costs (hard costs) per square foot for buildings in the inventory that qualify for Bolts+ and Bolts++Frame retrofits.

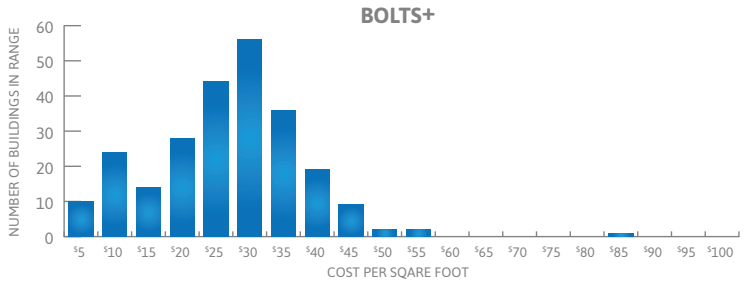
Table 5: Average Costs (Per Square Foot) to Retrofit

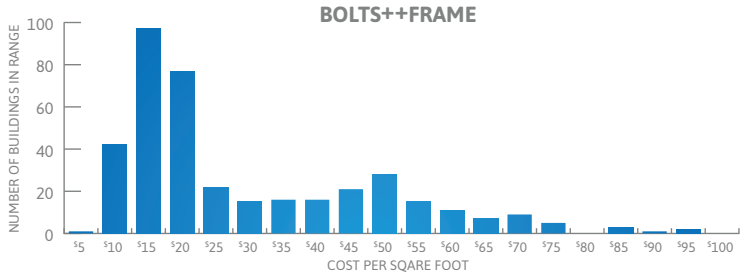
Percent of URM inventory:	Bolts+ 23%	Bolts++ Frame 36%	Full Seismic 41%
Construction Costs			
Hard Costs[1]	$17.32	$19.24	$61.99
Sales Tax (10.1%)	$1.75	$1.94	$6.26
Hard Costs Contingency (10%)	$1.91	$2.12	$6.83
Total Hard Costs	$20.98	$23.30	$75.08
Soft Costs (15%)[2]	$3.15	$3.50	$11.26
Soft Costs Contingency (10%)	$0.31	$0.35	$1.13
Total Soft Costs	$3.46	$3.85	$12.39
Total Construction Expenses	**$24.44**	**$27.15**	**$87.47**
Relocation Expenses[3]			
	$8.00	$8.00	$8.00
TOTAL (Including Relocation)	**$32.44**	**$35.15**	**$95.47**

Notes:

1. Previous work estimates hard costs to range between $5–40 per square foot.
2. Soft costs are estimated at 15% of hard costs, and include A&E, permits, inspections, insurance, bonds, testing, inc.
3. Relocation costs will vary depending on the use of space—whether residential or commercial—and on specific tenant needs. This case assumes commercial relocation estimated at $20,000 per unit, and a typical unit of 2,500 square feet.

Fig. 8 & 9: Construction Costs per Square Foot





A detailed study performed by a qualified engineer is required to estimate the actual cost of retrofit for any given building. However, given known building characteristics (square footage, number of floors, the existence of parapets, and qualifying retrofit standard), we approximate retrofit costs across the inventory of URMs. The estimates are informed by professionals with extensive private development expertise with retrofits to local buildings. Detail on eleven Seattle URMs that have undergone or planned seismic retrofits can be found in Appendix B. Real project costs and details for the retrofit undergone by Anew Apartment's Terry Building, as well as cost differential information between a full seismic retrofit and Bolts+ retrofit, can be found in Appendix C.

Table 6 *(see page 23)* summarizes total construction and relocation costs for the 944 buildings in the URM inventory.

Table 6: Full URM Inventory Retrofit Costs				
	Total	**Bolts+**	**Bolts++**	**Full Seismic**
Number of Buildings	944	215	344	385
% of Total URMs	100%	23%	36%	41%
Hard Costs	$819,800,000	$90,800,000	$96,100,000	$632,900,000
Sales Tax (10.1%)	$91,000,000	$10,000,000	$10,700,000	$70,300,000
Hard Costs Contingency (10%)	$82,000,000	$9,100,000	$9,600,000	$63,300,000
Total Hard Costs	$992,800,000	$109,900,000	$116,400,000	$766,500,000
Soft Costs (15%)	$149,000,000	$16,500,000	$17,500,000	$115,000,000
Soft Costs Contingency (10%)	$14,800,000	$1,600,000	$1,700,000	$11,500,000
Total Soft Costs	$163,800,000	$18,100,000	$19,200,000	$126,500,000
Total Construction Expenses	**$1,156,600,000**	**$128,000,000**	**$135,600,000**	**$893,000,000**
Relocation (Commercial)	$105,200,000	$19,500,000	$25,000,000	$60,700,000
Relocation (Residential)	14,300,000	$4,700,000	$3,500,000	$6,100,000
TOTAL (Including Relocation)	**$1,276,100,000**	**$152,200,000**	**$164,100,000**	**$959,800,000**

Cost Estimation Methodology and Assumptions

To estimate retrofit costs, a Seismic Retrofit Working Group, comprised of local developers, engineers, and architects, compiled retrofit costs for actual retrofit projects. Using this knowledge, we then extrapolated estimates to approximate retrofit costs for the entire URM inventory. As shown in Appendix B, costs vary widely and depend on a variety of factors, such as building size, complexity, and condition.

Construction Costs

For each building in the inventory, we estimate the linear feet of work to be done by using the building's square footage, number of floors, and assumed rectangular shape.[1] To calculate hard construction costs for Bolts+ retrofits, we combine the following:

1. Linear feet of floor to wall connection x $500 per linear foot (plf) cost[2]
2. Linear feet of roof to wall connection x $101.24 plf cost[3]
3. If applicable, linear feet of parapet connection x $202.15 plf cost[4]
4. For Bolts++Frame buildings, we add a multiplier of 75%.
5. For buildings requiring a full seismic retrofit, we estimate a cost of $61.60 per square foot based on the Terry Building analysis. However, it is important to note that costs for full seismic retrofits will vary widely for each building.

We add sales tax (10.1%), hard cost contingency (10%), soft costs (15%) and soft cost contingency (10%) to measure the total construction cost.

Relocation Costs

While relocation costs depend largely on the type of tenant and assistance provided, we separate costs into two categories: commercial and residential.

Commercial relocation: $20,000 per unit, based on an average unit size of 2,500 SF.

Residential relocation: $3,848 per unit, as mandated under the City's Tenant Relocation Assistance Ordinance (TRAO). Because TRAO applies to tenants earning less than 50% of the area median income, we estimate that all known affordable housing units will qualify for TRAO and 25% of the remaining units will qualify. This estimate does not include subsidized rent or moving costs should building owners provide additional assistance to tenants.

1 Linear feet measures length (i.e. length of floor to wall connections) compared to square feet, which measures area.
2 $500 plf estimate is extrapolated from Anew Apartment's Terry Building Case Study, shown in Appendix H.
3 $101.24 plf estimate is based on the Terry Building Case Study and cost estimates from the City of Portland.
4 $202.15 plf estimate is based on cost estimates from the City of Portland.

We use the cost estimate methodology to estimate retrofit costs for a hypothetical building that reflects an average URM building in terms of square feet and number of stories. That prototype is a 3-story, 22,000 square foot mixed-use building with commercial space on the ground floor and 20 residential units above. Our estimates suggest it would cost approximately $642,000 to retrofit this hypothetical building to a Bolts+ standard.

Table 7: Prototype URM Building Example

Assumptions	
Building size:	3 stories; 22,000 square feet
Building use:	Mixed Use: Ground floor commercial with 20 residential units above
Retrofit type:	Bolts+
Estimated Rehabilitation Costs	
Hard Costs	$400,000
Sales Tax (10.1%)	$40,400
Hard Costs Contingency (10%)	$44,040
Total Hard Costs	$484,440
Soft Costs (15%)	$72,666
Soft Costs Contingency (10%)	$7,267
Total Soft Costs	$79,933
Total Construction Expenses	**$564,373**
Relocation Expenses	
Commercial[1]	$58,667
Residential[2]	$19,240
TOTAL (Including Relocation)	**$642,280**
Construction Cost per SF	$25.65
Total Cost per SF	$29.19

Notes:

1. Estimated at $20,000 per unit moving cost; typical commercial unit size of 2,500 SF.
2. We assume some usage of Seattle's Tenant Relocation Assistance Ordinance (TRAO). In this case, we assume 25% of residential units qualify for relocation assistance of $3,848 per TRAO requirements.

ECONOMIC VALUE OF SEISMIC RETROFITS

URM retrofit measures are primarily motivated by life safety concerns, as well as historic preservation and economic vitality. In addition to these public values, private URM owners who have completed retrofits will benefit from tenants who are more protected and the potential to reopen commercial doors more quickly after a seismic event.

The asymmetry of the distribution of the costs and benefits of the URM retrofits, however, is the most challenging aspect facing policymakers. Building owners are concerned that mandates for improvements will be borne on them individually without the ability to recoup those costs through either cost savings or the ability to be competitive for higher land prices (or rents). These mechanisms could include:

- Lower insurance costs from reduced risk of life safety damages from liability or litigation.
- Better market pricing through a higher willingness to pay by tenants for seismic safety.
- Lower risk premium stemming from the reduced loss of building function and occupancy in the aftermath of an earthquake.

The challenge for property owners is that it is extremely unclear if they can attain these private financial benefits from the retrofit improvements, at least in the short term. While some anecdotal information is available, there is **little empirical data** that sheds light on the possibility that:

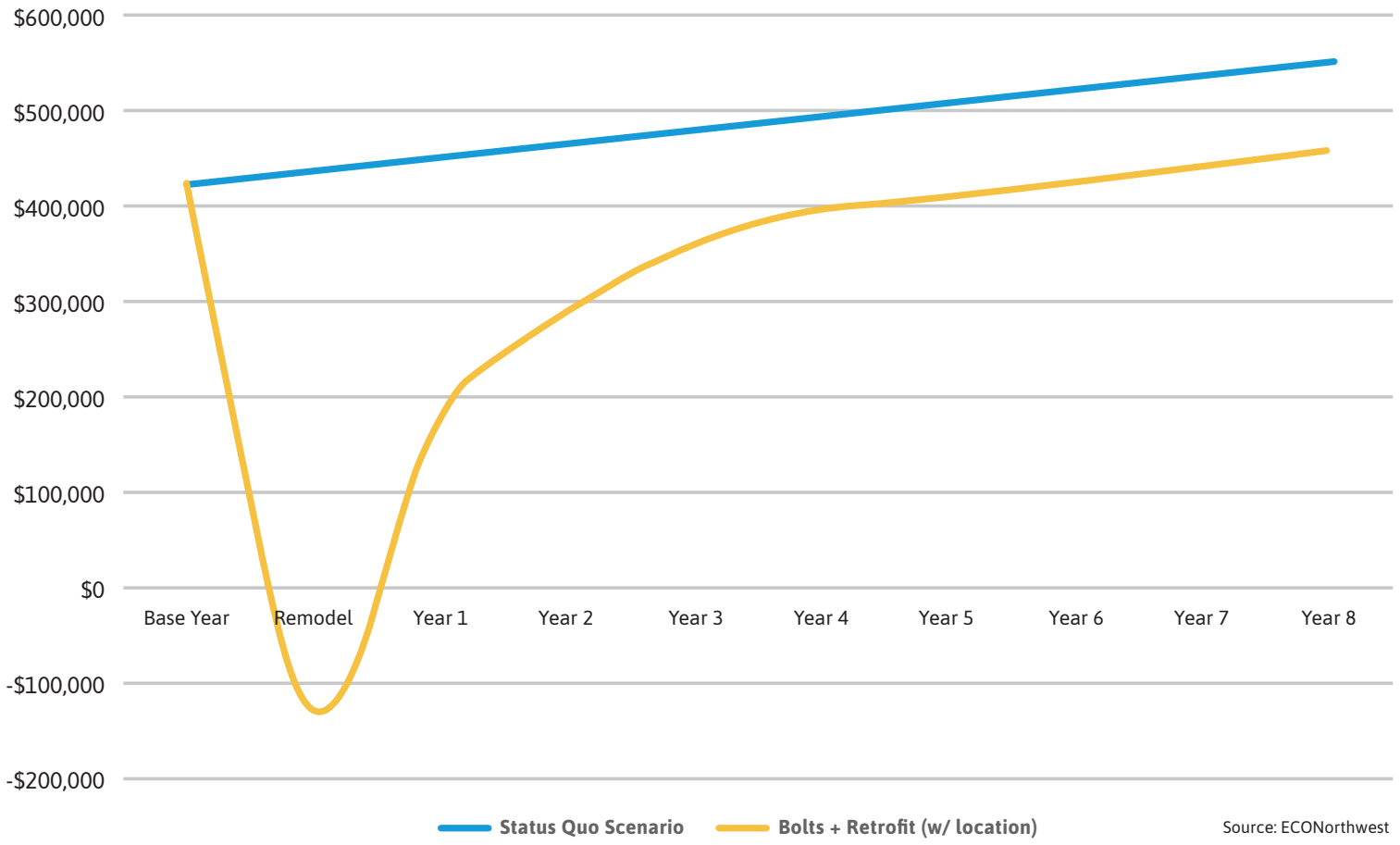
- Insurance markets have priced the impacts of seismic events relative to building type and retrofit needs as part of commercial property insurance. Since earthquake insurance is not mandated in Washington State it is very difficult to get estimates for earthquake coverage. For many buildings this could be an additional cost for retrofits if any financing sources require additional coverage. It is clear that a retrofitted building should lead to modestly lower general property loss insurance as the building is structurally improved.
- Tenants currently price the probability of seismic safety into the selection of buildings and their willingness to pay more for a retrofitted URM building. Most office commercial leases are 5-10 years (residential leases can be one year or less) and this length of time may not match tenants probabilistic sense of safety with other market attributes that they are shopping for such as location and furnishings.

To illustrate the financial impact that building owners confront, consider the following example of a Bolts+ standard of retrofit valued at approximately $29.19 per square foot.[1] Figure 10 *(page 26)* compares two scenarios for a hypothetical URM property: a bolts+ retrofit and status quo (no retrofit). The following assumptions are used:

- A 22,000 rentable square foot URM building (3 stories with 7,300 square foot floor plates).
- Retail and lobby on the ground floor, residential on floors 2 and 3 (20 units).
- $25 per square foot NNN rents for retail and office spaces. $1,529 per month rent for the units with $7 per square foot for operating expenses for the residential units. No rent premium is shown for the URM building post-retrofit.
- Tenants are moved out at the end of leases, and the building incurs higher charges to vacancy to release.
- 8-year construction loan term at 5.5% (80% loan to value)
- Exit cap rate of 5.9%

1 Based on the cost/sf estimate for the prototype URM building.

Fig. 10: Illustrative Financial Performance of Retrofit or No-Action – Net Cash Flow



Source: ECONorthwest

The above figure graphically shows the challenges that the project would have to bear if there is no cost reduction on operating costs or rent premium that can be attained from the retrofit. The costs of the retrofit to the project are:

- Total cost of the project is $642,300.
- Construction expenses total $564,000.
- Amount financed is $514,000.
- Loss of rental income during construction.
- Additional vacancy costs for the retrofit that must lease with new tenants.

The impact of these costs is a lower net operating income resulting in lower project valuation. In the example above, the effect of the retrofit is the loss of $1.5 million (the retrofit scenario has a NPV of $2.6 million compared to $4.1 million in the status quo scenario).[2] For context, the retrofit cost accounts for roughly four years of net stabilized operating income.

2 Net Present Value (NPV) is calculated over 10 years with a discount rate of 4.5%.

All Verified URMs:

1145

Minus substantial alterations :

1012

Minus public owned:

944

FUNDING OPTIONS

In 2017, the URM Policy Committee recognized that the greatest barrier for building owners to retrofit URMs is the cost and recommended that options for financial support be provided to URM owners. Fortunately, more funding mechanisms have become available since the City's original URM retrofit mandate. Seattle also benefits from the institutional knowledge learned from peer jurisdictions that have already implemented their own URM retrofit programs. Nearly every city with a URM program, currently and historically, has provided or made available some form of financial assistance to ease the cost burden of seismic retrofits. However, despite the numerous and varying financing alternatives that have been used for this purpose over the last 30 years, there is no tool (or combination of tools) that has proven to be a silver bullet solution. A full summary of all financial options is included in Table 8 *(page 28)*.

NDC partnered with PFM Financial Advisors to analyze the cost and efficacy of several financing alternatives. The funding options detailed below identify a wide range of both public and private financing tools that could be used to finance URM retrofits in Seattle. Several of the funding options explored apply to specific subsets of URMs (i.e. landmarks and affordable housing) while others apply more broadly. PFM modeled a subset of the financing alternatives to compare the cost of financing for different tools *(Fig. 11, page 29)*. The rates used in the modeling are based on estimates that are accurate as of this writing and will change.

General Obligation (GO) Bonds

General Obligation (GO) bonds are a widely accepted and understood public debt source backed by the full faith and credit of the City of Seattle. The City currently has the highest credit quality obtainable in the capital markets, so the involved risk and interest rates would both be low. The biggest barrier to using GO bonds is the logistical complexity involved with the voter requirement which can prolong the planning horizon up to two years in some cases. Polling is typically undertaken to determine potential level of voter support under varying circumstances. Since a sixty-percent majority vote is required, the decision to use GO bonds is fundamentally political.

The City must also consider how the use of this source fits with other priority needs that may be under consideration for bonded debt in the same timeframe. GO bonds are characteristically reserved for the highest priority needs and those that are most likely to receive a high level of public support. Although GO bonds do not impact the balance sheet (since they have their own tax revenues), they still must be viewed as a scarce resource. Most cities have a target tax level for GO bonds and attempt to fit in any projects

under consideration within this rate. Therefore, projects must fit within the City's overall capital plan. While there is some historical precedent for the use of GO bonds for URM retrofits, it is atypical to use this funding source for assets that are not publicly owned and managed.

Example: The City of San Francisco issued $350,000,000 in GO bond debt in 1992 to provide loans to URM owners to cover the cost of seismic retrofits.

Table 8: Prototype URM Building Example

Financing Instrument	Credit Quality & Cost of Financing	Logistical Complexity	Historical Experience	Ability to Meet Programmatic Objectives	City Balance Sheet Impact	Political Considerations	Where Has it Been Used? (For Seismic Purposes)
GRANT FUNDING							
Community Development Block Grants	Low cost	Strict elgibility criteria with limited allocations	Limited use in CA for seismic retrofits	Would fit Seattle's CDBG funding objectives	Seattle receives approx. $9.4 million in annual funds	May divert funding from other projects	Los Angeles, CA Upland, CA
FEMA Grants	Low cost	Funding is competitive and applications are complex	Used for at least one seismic retrofit in Seattle	Very applicable	None	May divert funding from other projects	Berkeley, CA Oakland, CA Salt Lake City, UT
Preservation Grants (4Culture)	Low cost	Low complexity	Over $1 million on preservation projects	Applicable for some landmark URMs	None	May divert funding from other projects	Hansen Building in Ballard
Washington State Capital Facilities Grants	Low cost	Low complexity	Active since 2008 and grants remain highly competitive	Limited applicability due to eligibility criteria	None	May divert funding from other projects	Multiple projects througout WA
Washington State Heritage Capital Projects (HCP) Program	Low cost	Low complexity	Cumulative request of $10 million per application cycle	Limited applicability due to eligibility criteria	None	May divert funding from other projects	Multiple projects througout WA
Seattle Cultural Facilities Fund	Low cost	Low complexity	Typically for projects that address racially equitable access	Limited applicability due to eligibility criteria	None	May divert funding from other projects	Multiple projects througout WA
SEATTLE BUDGET ADJUSTMENTS							
Permit Fee Waivers or Discounts	Low cost	Easy to implement	Full and partial waivers have been common in CA	Reduces costs early on and may incentivize retrofits	Reduces city revenues	Some but limited	Arroyo Grande, Berkeley, San Jose, Sonoma, Hollywood
Real Estate Excise Tax Rebate	Medium cost	Transfer taxes are very volatile	Allows for multiple renovations over time	Insignifcant relative to high cost of retrofits	Reduces city revenues	Diverts tax revenues from current use	Berkeley, CA Oakland, CA
Seattle Sales Tax	Medium cost	Can be unstable and difficult to predict	Limited	Sales tax revenue based on URM inventory is projected at $7.6 million	Reduces city revenues	Diverts tax revenues from current use	N/A
ZONING - NEW DEVELOPMENT FUNDED PROGRAM							
Transfer Development Rights (TDR)	Medium cost	Current program would require modifications to bring to scale	Initated in 2013, TDR has been limited	TDRs are limited in their ability to assist existing URM buildings	None	TDR exchanges are only allowed in specific zones	N/A
New Development Credits	Medium cost	Current program would require modifications to bring to scale	None	Allows credits to trade at prices closer to development value	None	Some but limited	N/A
PROPERTY TAX RELIEF							
Property Tax Abatement – Special Valuation	Low cost	Low complexity	Longstanding program with track record of effectiveness	Applicable to historic or landmark buildings	None	Some but limited	Seattle & King County, WA Portland, OR
FEDERAL TAX CREDITS							
Historic Tax Credit	Low cost	Important to assess likelihood of success before attempting	Record of success but high percentage of failure	Difficult to work at scale	None	None unless there are competing local projects	Louisa Hotel, Seattle Pacific Tower, Seattle
FINANCING OPTIONS-PUBLIC PAYER							
General Obligation (GO) Bonds	High credit quality Low cost	Voting requirement causes long planning horizon (2 years)	Well understood form of capital with broad market acceptance	Typically reserved for highest priority projects	None	Public support needed to gain voter approval	San Francisco, CA
Green Bonds	High credit quality Low cost	Same as above. No advantage over other bond types	Commonly used in the water and wastewater sectors	Use for seismic uprgrades would be a novel application	None	Public support needed to gain voter approval	None
HUD 108 Loan Fund	Low cost	Depends on City priorities and application process	City has has a long track record of 108 lending	Good fit for affordable housing	None	May divert funding from other projects	Lewiston Hotel, Seattle
FINANCING OPTIONS - PRIVATE PAYER							
Lease Revenue Bonds	High credit quality Low cost	Planning and execution would likely take one year	Well understood form of capital with broad market acceptance	Typically used for a city's core priority projects	Debt would be directly on the City's balance sheet	Privately owned URMs will not compete well for balance sheet capacity	Yountville, CA
Assessment Districts	Medium cost	Significant, but can be done in correct circumstances	Well understood form of capital with broad market acceptance	Typically for core infrastructure purposes	None	Requires reasonable consensus among property owners	Long Beach, San Jose, and Torrance, CA
PACE Financing	High cost	Passage of enabling legislation and progam creation will be lenghty	Some PACE programs are expanding to include seismic upgrades	Financing covers the entire project cost, including soft costs	None	PACE requires legislative approval in WA	California, Oregon, Utah
Private Lending Consortium	Medium cost	Considerable effort needed to assemble a bank cohort	San Franciso had extensive success with this strategy	Seattle's high property values should allow for program success	None	May not be equitable to those who lack borrowing capacity	San Francisco & Upland, CA

FIG 2: COMPARISON OF FINANCING ALTERNATIVES FOR SEISMIC IMPROVEMENTS

Scenarios	Cash / Debt Financing Options[1]	Property Assessed Clean Energy (PACE)[2]	Assessment District[3]	Public Agency Conduit Financing[4]	Affordable Housing Note[5]	Seattle CDBG 108 Loan Program[6]	Private Bank Loan
Term	30 Year	25 Year	30 Year	30 Year	35 Year	20 Year	20 Year
Type	Public Debt	Public/Private Bonds or Loans	Public Sale Bonds	Private Placement	Private Placement	Public Loan	Private Loan
City's Balance Sheet Impact	Yes	None	None	None	None	NONE	None
Estimated Interest Rate	3.65%[7]	6.55%[8]	4.95%[9]	5.08% [10]	4.93%[11]	3.15% [12]	5.50%[13]
Estimated Annual Repayment[14]	$46,824	$57,672	$54,692	$52,171	$38,879	$43,709	$55,415

1 Assumes legal authority for public funds to be used for retrofit costs. Financing is assumed to be repaid from the City General Fund. As such they would compete with other General Fund priorities.

2 Requires legislative authority. Financing is typically privately sourced with repayments made from additionally created property assessments.

3 Requires a legal determination of joint benefits form the proceeds rather than benefits solely benefiting a single property owner.

4 Requires a quasi-governmental agency. Financing typically privately placed with repayments from project. Rate is estimated at a taxable rate as of 05/09/2019.

5 Tax-exempt Private Activity Bond Financing

6 Federal Program Allows Seattle to Borrow from HUD and Relend to Eligible Projects

7 AAA Taxable Rates as of 05/13/2019. The rates are based on the scale of the City of Seattle Limited Tax General Obligation Improvement Bonds, 2018B.

8 Indicative Rate. Assessment created to repay debt which could be from a public or private source. Typically a higher rate than private bank financing.

9 BBB Special Tax Scale as of 5/9/2019. The actual rate is based on the size and diversity of the district.

10 BBB COPs 30-Year taxable rate as of 5/13/2019. The actual rate is based on characteristics of the conduit lender.

11 Tax-exempt financing through WSFC Private Activity Bond Program. Rate reflects an average over 2018 - present.

12 Fixed Rate Debt Based on Recent HUD Bond Debenture. Generally estimated at 10-YR Treasury + .75 bps.

13 Estimate from recrent project financings and lender interviews.

14 Assuming the prototype project amount is $642,279 with a single borrowing.

Public Funding Options

Public funding is another approach to easing the costs of seismic retrofits. The City currently has the highest credit quality obtainable in the capital markets, so the involved risk and interest rates would both be low. The lower cost could be passed on to the project. Barriers to using City funding would be: 1) confirming the public purpose legally needed for use of public funds; and 2) determining the method of financing support. City general fund uses would compete with other budget priorities and reduce resources for other priority needs. City bonds, councilmanic or voter-approved create logistical complexity with the voter requirement which can prolong the planning horizon up to two years in some cases. Polling is typically undertaken to determine potential level of voter support under varying circumstances. Since a sixty-percent majority vote is required, the decision to use public bonds is fundamentally political.

The City must also consider how the use of this source fits with other priority needs that may be under consideration for bonded debt in the same timeframe. Bonds are characteristically reserved for the highest priority needs and those that are most likely to receive a high level of public support. Although voter-approved debt do not impact the balance sheet (since they have their own tax revenues), they still must be viewed as a scarce resource. Most cities have a target tax level for bonds and attempt to fit in any projects under consideration within this rate. Therefore, projects must fit within the City's overall capital plan. While there is some historical precedent for the use of public bonds for URM retrofits, it is atypical to use this funding source for assets that are not publicly owned and managed.

Example: The City of San Francisco issued $350,000,000 in GO bond debt in 1992 to provide loans to URM owners to cover the cost of seismic retrofits.

PACE Financing

Property Assessed Clean Energy financing, or PACE, is a mechanism for funding energy efficiency upgrades on private property. Some jurisdictions, such as California and Oregon, have expanded the scope of their PACE programs to include seismic retrofits. Thus, precedence suggests there is potential to create a PACE program in Washington to finance resiliency efforts that protect against earthquake damage.

PACE provides upfront funding for eligible projects and repayment is made as an assessment on the property's tax bill. Actual rates vary by program but typically range between 7-10% depending on term and asset type. PACE financing is typically offered for terms up to 25 years for amounts that cover 100% of the entire project cost, including soft costs. PACE financing is typically provided by private investors / lenders without state or local liability or funding requirement. As a result, the loans have no effect on the City's balance sheet. In some cases, though, the local government may elect to fund PACE loans on their balance sheet or support the issuance of bonds to fund loans, which would require balance sheet recognition. Borrower credit has little impact on loan pricing since the primary security is a property lien that ranks pari-pasu to ad valorem property taxes. While PACE loans may have higher interest rates than other options *(shown in Figure 11, above)*, the high loan value combined with long loan terms make it a suitable financing option.

The primary barrier to using PACE to finance URM retrofits in Seattle is the required legislative action that would be needed since PACE financing has not been authorized in the State of Washington. The time to pass enabling legislation, in addition to having an administrator design and stand-up a program, can be lengthy. Current legislative efforts are already being undertaken by a group in Washington State to make PACE financing possible.

Table 9: California PACE Program Comparison

Program Details						
General	Programs	HERO	Ygrene Works	CaliforniaFIRST	Alliance NRG	Figtree
	Launch Year	2011	2010	2014	2015	2010
	Seismic?	✘	✔	✔	✔	✔
Projects Financed	Commercial	20 projects $2.1 million	350+ projects $45 million	20 projects $30 million financed	150 applications $50 million approved	50+
	Residential	90,000+ projects for $1.9 billion+	26,000 projects for $542 million	12,000+ projects $300 million+	Program has just begun accepting applications for residential projects	Residential program launching 2016
Financing Details						
Terms	Commercial	5 to 25	5 to 30	5 to 30	5 to 30	5 to 20
	Residential					
Interest Rates	Commercial	6.75%–8.35%	6.75%–8.49%	6.0% +/-	5.95% - 7.50%	5.50% - 7.50%
	Residential			6.75%-8.49%	5.99%	6.49%-7.99%
Min/Max Financing Amounts	Commercial	Minimum: $5,000 Maximum: >15% of property value on the first $700,000 value and 10% thereafter	Minimum: $2,500 Maximum: per CAEAFTA	Minimum: $5,000 Maximum: 15% of estimated home value or $200,000, whichever is smaller	Minimum: $50,000 Maximum: 15% of appraised value	Minimum: $50,000 Maximum: 20% of property value
	Residential		Minimum: $2,500 Maximum: 15% of FMV		Minimum: $2,500 Maximum: 15% of property value up to $700,000 and 10% thereafter	

Source(s): Data provided by PACE providers. This is a modified and consolidated version of the PACE Comparison Matrix developed by the Association of Bay Area Governments. Full table details can be accessed at: https://abag.ca.gov/bayren/pace/pdfs/PACE_Comparison_Matrix.pdf Information last updated on May 18, 2017.

Legislation does have sponsors in the State House and Senate but was not able to pass in the most recent legislative session. It could potentially be viable option for retrofit financing in the not-too-distant future.

Private Lending Consortium/Bank Loans

The City and County of San Francisco coordinated with local banks to create a consortium of lenders that would make loans directly to property owners. The consortium created a user-friendly application and rapid processing system to encourage use of the lending mechanism. ***According to city representatives of San Francisco, this was the most widely used mechanism to support seismic strengthening over the last five years, and was instrumental in bringing many buildings into conformity with state and local requirements.*** Considerable effort would be needed to assemble a cohort of banks and to arrive at a common application and method of processing. The banks will be motivated to make this work as long as the program is safe and profitable. It should be noted that San Francisco properties, like those in Seattle, are more likely to have unleveraged value because of the increase in property values over the last several decades. This is probably a necessary prerequisite to success with this approach. As long as property owners are able to tap the property's equity, they may be willing to do so to bring their property into compliance. Seattle's high property values should enable this type of program to be successful.

It is important to note that this type of program also requires the property owners to have sufficient cash flow to be able to repay loans and as such, this approach is vulnerable to economic changes that negatively affect property values and income. Given that this approach imposes the cost of the needed improvements on the property owners, there will inevitably be some pushback. However, it is fair to note that costs are balanced by risk reduction and other benefits are conferred on the property owners by the investments they make. Although this program may work for many property owners, there will need to be complementary financial support for those who cannot take advantage of this approach because of a lack of financial capacity. Programs that could be paired with this approach are PACE, philanthropic support, or city-backed bond programs.

Assessment District

Assessment districts are a well understood mechanism for funding core infrastructure projects in neighborhoods and communities. Beneficia-

ries of this form of financing repay the money through assessments on the properties that receive capital improvements—potentially at lower rates and longer terms than private financing. This funding mechanism is less expensive than private debt and equity but higher than "on balance sheet" government financing mechanisms. An assessment district could be established through a majority vote by a legislative body, but this could be overturned by protest of 60% of property owners in the district. This process would require legal confirmation as to the joint benefits to multiple owners and the district as opposed to a single project as well as reasonable consensus among property owners and significant outreach to gain public support. The legal requirement for creating a clear nexus between cost of assessment and value of improvements may be challenging. For these reasons, creating an assessment district is a possible but potentially problematic solution for retrofit financing. Seattle has utilized assessment district financing for South Lake Union street car improvements and is planning on its usage to fund the Waterfront Park.

Examples: City of Torrance, CA; City of Long Beach, CA; City of San Jose, CA

HUD 108 Loan Fund

The Section 108 Loan Guarantee Program provides a relatively low-cost source of financing for economic development, housing rehabilitation, public facilities, and other physical development projects in communities throughout the US. Eligible projects also include improvements to community resilience against natural disasters. Projects funded under this program must benefit low- and moderate-income communities, eliminate or prevent blight, or meet urgent needs of the community. Thus, the 108 Program could potentially provide a federal funding resource for the rehabilitation of affordable housing URMs in Seattle. The nature of these retrofit projects would be to retain low- and moderate-income housing and be eligible for this program.

As of November 2018, the City of Seattle has $41,374,750 of available capacity under this program and has a long track record of 108 lending.[1] Loans are straightforward but projects must meet strict compliance requirements. Repayments can come from project-generated revenues, housing resources and Community Development Block Grant (CDBG) funds. The City could also use its CDBG program to offset debt service costs. This would reduce future availability of grant funds for other community development purposes but could be effective for seismically retrofitting multiple buildings.

Example: Lewiston Hotel, Seattle, WA

OTHER POTENTIAL FINANCING ALTERNATIVES FOR URM RETROFITS THAT WE REVIEWED INCLUDE:

Grant Funding

Community Development Block Grants

The Community Development Block Grant (CDBG) Entitlement program is the federal government's primary community economic development funding program. The program is administered by the Department of Housing and Urban Development (HUD), and Seattle's fund allocations are managed by the City's Human Services Department. CDBG funds are largely applied to projects that benefit low-income families or serve a critical community need. The City's Consolidated Plan for HUD Program Years 2018-2022 acknowledges the unreinforced masonry threat as a "particular concern" for Seattle. The City of Seattle's FY2018 CDGB allocation was $9,488,150, and King County's was $5,338,855. These funds are inherently limited and competitive. Though, at the official request of the Mayor or City Council, a portion of future funds could be repurposed for addressing URM buildings.

Examples:

- Upland, CA: The Upland Town Center Commercial Rehabilitation Rebate Program was established to incentivize the city's URM owners to pursue seismic retrofits.[2] The program reimbursed URM owners up to $10,000 for costs incurred related to seismic engineering, architectural services, city fees and façade improvements. The rebates were funded with CDBG dollars and were issued after all construction was completed.

- Los Angeles, CA: The Los Angeles City Council enacted its mandatory retrofit ordinance without establishing any sort of funding assistance or incentive program. However, LA's Community Development Department later used $29 million in CDBG monies to offset costs for 27 URM retrofits.

FEMA Grants

The Federal Emergency Management Agency (FEMA) administers several risk-reduction grant funding programs to state and local governments to address risks posed by natural hazards, prevent loss of life, and reduce the need for federal funding in future disasters. The total cost of approved mitigation improvements, and the costs incurred by jurisdictions to manage and administer the grants, are typically funded by a combination of Federal and non-Federal sources.

1 U.S. Department of Housing and Urban Development. (2018, November 15). HUD Exchange. Section 108 Loan Guarantee Program. Retrieved from https://www.hudexchange.info/programs/section-108/

2 Association of Bay Area Governments, and California Office of Emergency Services. "Seismic Retrofit Incentive Programs: A Handbook for Local Governments." Seismic Retrofit Incentive Programs: A Handbook for Local Governments, 1992.

Pre-Disaster Mitigation Grant Program (PDM): The goal of the Pre-Disaster Mitigation Grant program is to reduce overall risk to the public and structures in future natural hazards. ***To be eligible, FEMA requires the state and local governments to develop and adopt hazard mitigation plans as a condition for receiving certain types of non-emergency disaster assistance, including funding for PDM mitigation projects.*** The FY2018 PDM Grant Program caps the maximum federal cost share for PDM applications at $4 million for mitigation projects and $10 million for Resilient Infrastructure projects. Under the PDM cost-share requirements, FEMA will only fund up to 75% of project costs, and the remaining 25% must come from other sources.

Hazard Mitigation Grant Program (HMGP): The goal of the Hazard Mitigation Grant Program is to implement mitigation measures, primarily after a disaster has occurred, that reduce the risk of loss of life and property from future disasters. Any jurisdiction applying for funding under this program would require a Presidential Disaster Declaration to be eligible. Under the HMGP cost-share requirements, FEMA will only fund up to 75% of project costs, and the remaining 25% must come from other sources.

Examples:

- Berkeley, CA uses FEMA grant funds to subsidize retrofit costs for various vulnerable building types including non-ductile concrete, tilt-up, soft story, and its few remaining URMs. Though, the City's priority remains soft-story buildings.
- Oakland, CA uses FEMA grant funds to subsidize retrofit costs specifically for soft story retrofits.
- Salt Lake City uses FEMA grant funds to subsidize retrofit costs for single-family URM homes.

4Culture Landmarks Capital Grant Program

The Cultural Development Authority of King County, which operates under the official name 4Culture, funds and supports universal access to cultural experiences in the region. This tax-exempt public development authority issues grants of up to $30,000 through its Landmark Capital grant program.[3] Eligible applicants include owners or leaseholders of properties that are officially designated as a historic or landmark building at the local, state or national level. Buildings designated as contributing members to one of Seattle's eight established historic districts are also eligible. Grant funding may only be used for building stabilization or restoration costs, which includes seismic retrofits. In 2017, the Landmarks Capital grant program received 41 applications and 4Culture granted $265,525 to 20 awardees. 4Culture's grant programs have historically been funded by King County's lodging tax revenue, but current legislation has suspended the use of lodging tax receipts for cultural purposes through 2020. Beginning in 2021, 37.5% of the County's annual lodging tax revenue will be allocated to 4Culture (approximately $14.4 million).

Washington State Capital Facilities Grants for Community-Based, Nonresidential Community and Social Service Projects

The Building Communities Fund Program awards state grants to nonprofit, community-based organizations to defray up to 25 percent or more of eligible capital costs to acquire, construct, or rehabilitate nonresidential community and social service centers.[4] There is no minimum or maximum grant award amount. Created by the Washington State Legislature in 2008 (RCW 43.63A.125) to provide a means of identifying qualified community and social service capital projects, and ***the program provides capital support to nonprofit agencies and their partners to develop or improve these facilities.*** These investments will play a key role in improving the economic, social, and educational climate in distressed communities and other areas that serve low-income persons. Due to the specific requirements a project must meet to be eligible to receive these program funds, only a small fraction of Seattle's URMs may benefit from this financing option.

The Washington State Heritage Capital Projects (HCP) Program

The Heritage Capital Projects (HCP) program was created by an act of the Washington State Legislature in 1995 (RCW 27.34.330) and established HCP as a program of the Washington State Historical Society. It provides a path to capital funds for projects that increase public access to history through historic preservation and history interpretation. In 1998, WAC 255-02 was implemented to determine how applications were to be reviewed and ranked. The Washington State Historical Society is assisted by an advisory panel of experts to determine the application guidelines and evaluation criteria. Following a determination of eligibility (Threshold Review), the advisory panel scores eligible applications according to merit. In a public meeting, the panelists determine a ranked list of applications that are then forwarded to the Governor and Legislature to include in the state's capital budget. The ranked list of applications may include no more than a cumulative request of $10 million per application cycle. State funds may provide no more than 33.3% of the project's eligible capital costs.

3 For additional detail, visit https://www.4culture.org/grants/landmarks-capital
4 For additional detail, visit https://www.commerce.wa.gov/building-infrastructure/capital-facilities/building- communities-fund

Seattle Cultural Facilities Fund

The program awards funding to Seattle arts, heritage, cultural and arts service organizations with facility projects that address more racially equitable access for those who have been excluded from the City's cultural infrastructure-building. Recognizing that communities of color have had the least access to controlling cultural space, this fund prioritizes projects that address this disparity. Eligible organizations must have at least a one-year operating history as a legally established for-profit or non-profit organization. Applicants for capital funding must have control of the facility to which improvement will be made through ownership or a lease with a minimum of five more years of site control (applicants for pre-capital funding are not required to have site control). The maximum grant award is $100,000 and can be used for pre-development project needs.

City of Seattle Budget Adjustments

Permit Fee Waivers or Discounts

High permit fees can be an early financial barrier in the seismic retrofit process that may deter or discourage property owners from pursuing seismic rehabilitation. ***To minimize the financial burden on URM owners, many jurisdictions have historically waived or reduced permit fees for retrofit projects.*** If adopted, this would have a negative impact on the City's balance sheet. Thus, the Seattle Department of Construction and Inspections (SDCI) may want to forecast potential forgone revenue through the URM ordinance compliance horizon prior to implementation.

Examples:

- City of Berkeley, CA (Full Waiver)
- City of Sonoma, CA (Full Waiver)
- City of West Hollywood, CA (Full Waiver)
- City of San Jose, CA (Full Waiver)
- City of Portland, OR (Partial Waiver)
- City of Arroyo Grande, CA (Reduced)

Real Estate Excise Tax Rebate

The real estate excise tax (REET) is a levy imposed on all real property transactions within a jurisdiction. The Washington REET rate is 1.28% and King County charges an additional county rate of .50% for a combined local rate of 1.78% on the full selling price of real estate. In 2016, statewide REET revenue collections amounted to $959 billion—approximately 5.3% of all state tax revenue.[5] Some cities, including Berkeley and Oakland, have established rebate programs that refund some portion of the tax to property owners that voluntarily initiate seismic upgrades to their newly acquired residential property. Property owners can also receive the rebate any time a property changes hands, so it is not a one-time deal and building improvements can be made gradually. However, this revenue stream is highly volatile as it entirely depends on the real estate economy. Also, at a rate of 0.05% of the sale price, the refunds produced by this type of program are limited in comparison to the full cost of seismically retrofitting a URM. As such, it is questionable as to how much this mechanism incentivizes property owners to pursue seismic upgrades. It could, however, remain a source of capital funding for public retrofit projects.

Examples: Berkeley, CA and Oakland, CA

Seattle Sales Tax

Property owners are required to pay sales tax on construction costs. The King County sales tax rate is 10.1% and is used in the cost estimates in this analysis. The City of Seattle portion of that sales tax is .85%. Total sales tax to the City, based on the URM inventory, is projected at $7,665,471. The availability of tax receipts is dependent on project construction schedules so is relatively unstable and difficult to predict but does represent City revenue that could be used to offset retrofit program costs.

ZONING – NEW DEVELOPMENT FUNDING

Transfer of Development Rights

Policy and Zoning that Allow TDR Programs in Seattle

The City of Seattle has six different land use programs that allow for the transfer of development rights (TDR) or potential (also commonly referred to as "air-rights"). TDR allows building owners to transfer unused development capacity from their building to another building. The value achieved from this transfer can provide resources for building improvements. According to the Seattle Municipal Code (SMC), the following are types of TDR that may be transferred according to the conditions set forth in Table A, section 23.49.014. Further to the code, TDR exchanges are only allowed in specific zones. The zoning describes what sites are eligible to send development rights to receiving areas (shown in Table 12). See Exhibit 1 for TDR program descriptions.

- Within-block TDR
- Housing TDR
- DMC Housing TDR
- Landmark TDR and Landmark Housing TDR
- Open Space TDR
- South Downtown Historic TDR

5 Washington State, Department of Revenue. (2016). Tax Reference Manual (p. 88).

Table 10: Sending and Receiving Areas by Type of TDR

PERMITTED USE OF TDR	TYPES OF TDR					
Zones 1	Within-Block TDR	Housing TDR	DMC Housing TDR	Landmark TDR and Landmark Housing TDR	Open Space TDR	South Downtown Historic TDR
DOC1 and DOC2	S, R	S, R	X	S, R	S, R	R
DRC	S, R[2]	S, R[2]	X	S, R[2]	S, R[2]	R
DMC 340/290-440	S, R	S, R	S	S, R	S, R	R
DMC 145 and DMC 240/290-440	X	S, R	S, R	S, R	S, R	R
DMC 170	X	S, R	S, R	S, R	S, R	R
DMC 95 and DH2	X	S, R	X	S, R	S, R	R
DMC 75 and DMC 85/75-170	X	S	X	S	S, R	R
DMR	X	S, R	X	S, R[4]	S, R[4]	R[4]
IDR	X	S	X	X	S	S
IDR/C	X	S	X	X	S, R[5]	S
IDM	X	S, R	X	X	S, R[5]	S, R
PSM	X	S	X	X	S[5]	S, R

S=Eligible sending lot
R=Eligible receiving lot
X=Not permitted
1 Development rights may not be transferred to or from lots in the PMM or DH1 zones
2 Transfers to lots in a DRC zone are permitted only from lots that also are zones DRC
3 Transfers are permitted only from lots zoned DMC to lots zoned DOC1
4 Transfers to lots in a DMR zone are permitted only from lots that also are zoned DMR except that transfer of TDR to a lot in a DMR zone located in South Downtown is permitted from any eligible sending lot in South Downtown
5 Transfers of open space TDR to lots in South Downtown are permitted only from lots that are also located in South Downtown

Source: SMC 23.49

Impact of Incentive Zoning and Development Potential Considerations

Separately, the City of Seattle has established zoning incentives designed to help developers achieve increased floor area in exchange for the provision of public benefits as specified in the Land Use Code. These include privately owned and publicly available open space; on-site amenities (e.g., bathrooms, atriums, childcare); purchasing TDR from designated Landmark or historical sites, Vulnerable Masonry structures; and improvements to specified Green Streets. With the planned implementation of Mandatory Housing Affordability (MHA), Incentive Zoning will be limited to areas with height restrictions over 85 feet (i.e., most of Downtown and South Lake Union and partially extending into the University District, Uptown, and North Rainer).

The City put forth an initial proposal to update Seattle's Incentive Zoning program in 2018. They provided the program summary shown in Exhibit 2. In the Downtown Urban Center, 40 projects have used Incentive Zoning since 2004. Of these projects, 14 met all their Incentive Zoning requirements through affordable housing or affordable housing and childcare. Residential projects outside of South Downtown and projects in PSM 85-120 and zones with height limits less than 85 feet achieve all their Incentive Zoning requirements through affordable housing or affordable housing and childcare. Of the remaining 26 projects, below is a breakdown of the public benefits other than affordable housing that were provided.

Table 11: Seattle Incentive Zoning Update

	Amount of Square Feet	Percentage of Square Feet	Number of Projects	Percentage of Projects
Open Space	297,880	14%	4	12%
Green Space	162,752	8%	4	12%
All TDR	1,546,958	74%	23	68%
Landmark TDR	*552,978*	*26%*	*9*	*26%*
Open Space TDR	*148,631*	*7%*	*4*	*12%*
LPAT TDR	*72,816*	*3%*	*2*	*6%*
MPAF TDR	*279,692*	*13%*	*8*	*24%*
Regional TDR	*316,653*	*15%*	*12*	*35%*
In-Block TDR	*176,188*	*8%*	*2*	*6%*
Human Services Use	25,739	1%	1	3%
Other Amenities	67,968	3%	2	6%
TOTAL	**2,101,297**		**34**	

Source: City of Seattle Report on Incentive Zoning Updates, 2018.

The conclusion of the incentive summary shows that affordable housing and/or childcare incentives facilitate substantial development without triggering demand for TDR incentives. Even though TDR incentives supported 1,546,958 square feet of development, only 552,978 was the result of TDR supporting landmark buildings. Recently, the City of Seattle proposed changes to the Incentive Zoning program to establish clarity and consistency, improve permitting, tracking, and enforcement processes, and achieve better public benefits-related outcomes. The proposal does not extend eligible areas nor does it alter the amount of currently available floor area.

One feature of a new pilot program, however, would allow for historical structures to sell more TDR, contingent upon meeting the proposed 2030 Challenge High-Performance Building Pilot. This policy change would affect Incentive Zoning throughout the city. For sites within Downtown, including PSM and IDM, the proposal seeks to increase transparency between buyers and sellers of TDR and to remove within-block restrictions for TDR transactions. Currently, the City allows for TDR transfers

to take place from designated sending sites including open space, historic buildings, and rehabilitated unreinforced masonry structures (but limited to the pilot). A key point of these reviews is that *TDRs are limited in their ability to assist existing URM buildings due to the wide range of other options available to developers to seek desired density. Even within the TDR program there are multiple policy objectives competing with each other, with neither reaching critical financial scale.*

Supply of Transfer of Development Potential in Seattle Zones

Based on analysis of the City of Seattle's development capacity model – a parcel level tool that seeks to understand how much development capacity exists on a specific property – ECONorthwest summarized how much capacity remains on TDR eligible buildings based on draft analysis prepared by the City of Seattle in April 2018. These figures should be treated as a draft and are subject to change pending further review by the City. There are numerous identified parcels in the capacity model that are available TDR sending sites under the various city programs *(Table 12)*. Those that are classified as an eligible TDR sending sites have 18.5 million square feet in development capacity as potentially transferable.

Table 12: Summary of TDR Capacity
(City of Seattle Capacity Analysis)

Location	Potential transferable floor area (existing rules)
Downtown, excluding South of Downtown	2,743,750
International District	1,056,382
Pioneer Square	1,810,769
Downtown and South of Downtown	5,610,901
First Hill	1,256,451
South Lake Union	473,000
U District (Landmark only)	582,123
Uptown (Landmark only)	4,929,281
TOTAL	**18,462,657**

Source: City of Seattle

It is difficult to quantify the value of the remaining TDR capacity due to three considerations that determine value:

- First, the price is a function of supply and demand. While the former city rules have allowed for the potential for significant transfers of development potential, there are limited places where credits can be placed. Significant capacity exists (18.5 million as an estimate) and there are many policy options and needs for how to dedicate that capacity.
- Second, demand for development is finite, and markets for transferred potential are smaller than the capacity available. In addition, development potential can only be transferred when there is demand to build and to build more than what the base zoning allows. As a benchmark, the city's incentive zoning program (which TDR is a component) has only placed 2.1 million square feet since 2001. *It is unclear whether this amount of placement is function of demand for building space generally or the amount that can be accomplished in receiving areas where development is happening.*
- Third, some prices for development potential are set through City policy. The city has set rules for the pricing of the transfer of development potential in certain areas via fees-in-lieu or other administrative actions. These sit next to a more open private market for transfers. Through the specification of where potential can originate and where potential can be placed, there is likely little consistency concerning the market price for transferred potential.

To provide some perspective, using historical fees-in-lieu as part of the City's past incentive zoning programs, we can generate a rough range-of-magnitude estimate of the value. Assuming $5-$22 per square foot of sending site valuation, the remaining capacity on these parcels would work out to be worth between $92 and $406 million (assuming there is demand for their placement in receiving areas). Again, there are tradeoffs between the amount of supply and receiving areas demand. The amount of alignment between these areas will determine the equilibrium price.

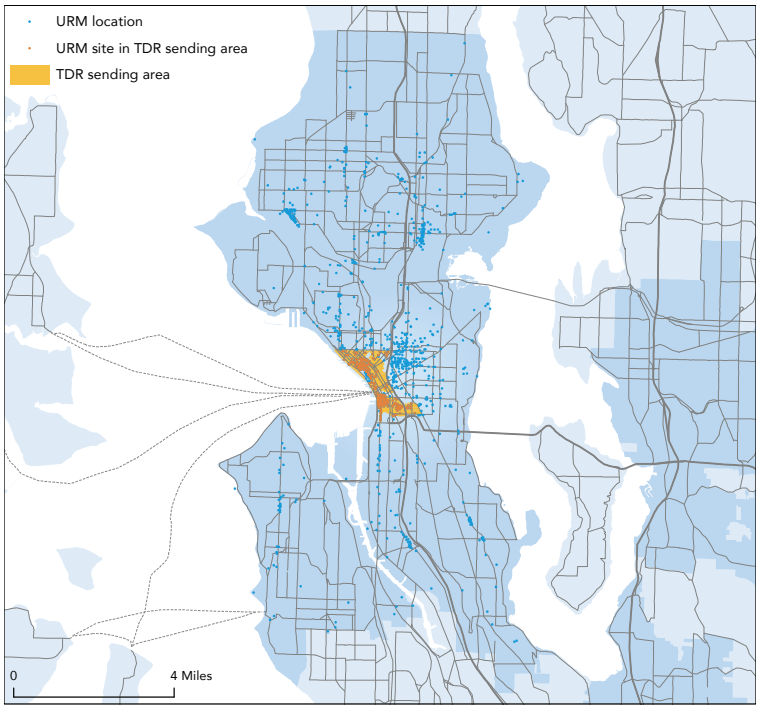
Prioritizing URM TDR, as a way to cost-offset retrofit improvements, will require some policy issues to be addressed. At a minimum, there are four key considerations:

1. Specification of receiving areas. All things being equal, the size of the receiving area – measured both in terms of geographic extent and development entitlements create the marketplace for the demand for transfers.
2. Transfer pricing in receiving areas. Market factors will determine the willingness to pay for potential, but that value may be accentuated or diminished depending on a number of policy and zoning factors.
3. Prioritization of URM potential relative to other sources. As described above, URM TDR potential "competes" with other supply of development potential. Policy action can create pricing equivalence or weighting that can make URM potential a more attractive source to buyers.
4. Velocity and flow of transactions. The amount of demand for URM transfers is a function of the issues listed above, yet only some

much demand can be placed during an investment cycle. The establishment of an intermediary, in the buying and selling of URM potential, could provide more of a fixed value for TDRs and generate the needed cash flow the URM retrofits will require. The City has functioned as an intermediary in the past, for example.

The map in Figure 12 shows the estimated location of URMs in Seattle.

Fig. 12: Estimated Location of URM Parcels in Seattle



Source: ECONW crosswalk of City of Seattle URM address to parcel locations.

Table 13 points:

- Only 210 of the 944 URM projects (not already retrofitted) are in areas that allow TDR and have capacity to transfer.
- Properties in zones PSM, IDM, DOC1 and DOC 2, DMR, and IDR have TDR capacity totaling over approximately 2,600,000 square feet for 210 properties.
- Incomplete address data in the PSM zone makes it difficult to get an accurate estimate of TDR capacity but it is likely in the 1,700,000 to 1,800,000 square foot range.
- The IDM zone has 31 TDR properties, accounting for a total square footage of over 600,000, the second highest square footage compared to other zones.
- There are eight TDR properties in the DOC 1 and DOC 2 zones, accounting for over 170,000 square feet.

Table 13: Summary of TDR Capacity for URMs

Zones	Sum of TDR Supply	Count of TDR Supply
DOC 1 and DOC 2	171,384	8
DRC	0	0
DMC 340/290-440	0	0
DMC 145 and DMC 240/290-440	0	0
DMC 170	0	0
DMC 95 and DH2	0	0
DMC 75 and DMC 85/75-170	0	0
DMR	91,328	72
IDR	21,600	4
IDR/C	0	0
IDM	616,140	31
PSM	~1,700,000	95
TOTAL	**2,600,452**	**210**

Source: ECONW crosswalk of City of Seattle URM address to parcel locations joined with data from the city's Development Capacity Model.

Exhibit 1: Existing TDR Programs

Within Block TDR

TDR can be transferred from any lot to another lot on the same block. Within-block is the only existing TDR option that does necessarily result in the preservation of an existing building. The original intent was to encourage variation in structure.

South Downtown Historic TDR

South Downtown Historic is "located within the Pioneer Square Preservation District or the International Special Review District, that includes one or more structures determined to be contributing to the architectural or historic character of the district according to Section 23.66.032" (SMC 23.84A.008). Part of the City of Seattle's Comprehensive Plan was to not only preserve South Downtown's neighborhood character, but also to maintain low-income and affordable housing to balance real estate market growth. In 2011, the Seattle City Council passed an amendment to the Land Use Code allowing for increased density in South Downtown neighborhoods. Because of the cultural and historical significance of this area, along with its role as a centralized hub for regional infrastructure, the insufficient use of viable space became a focus for targeted growth given housing and employment projections.

Open Space TDR

Open-space TDR must be approved as a sending lot in accordance with SMC 23.86.018, which specifies that open space has permeable ground surface except where pedestrian access, patios, and paved areas for recreation are located. Further, these sites must meet the Washington State Rules and Regulations for Barrier-Free Design and be landscaped with ground covering bushes and/or trees, and grass.

Landmark TDR and Landmark Housing TDR

According to the "Landmarks Preservation Ordinance" (SMC 25.12.020; SMC 25.12.160), a "Landmark" is an "improvement, site, or object that the Board has approved for designation" based on the fact that the "cultural, architectural, engineering or geographic significance [...] are required in the interest of prosperity, civic pride, and general welfare of the people." As the name suggests, Landmark housing must be located on a site with designated Landmark status (SMC 23.84A.038). The rehabilitation and maintenance of designated Landmark structures on eligible sending Landmark TDR or Landmark housing TDR sites is determined by the Landmarks Preservation Board. Structures located on sending sites from where South Downtown Historic TDR are transferred will be maintained and rehabilitated according to the requirements of the Director of Neighborhoods "upon recommendation by the International Special Review District Board or the Pioneer Square Preservation Board" (SMC 23.49.014.B.6.).

DMC Housing TDR

Along with being located in the DMC zone, DMC housing TDR must have structures with at least "50 percent of total gross above-grade floor area committed to low-income housing for a minimum of 50 years, unless such requirement is waived or modified by the Director of the Office of Housing for good cause" (SMC 23.84A.038). Further, the lot must have the above-grade gross floor "equivalent to at least 1 FAR committed to very low-income housing use for a minimum of 50 years" (SMC 23.84A.038).

Housing TDR

Housing TDR sites can be located in any Downtown lot, with the exception of PMM, DH-1, and DH-2 zones, or South Lake Union Urban Center in any SM zone with a height limit of 85 feet or higher (SMC 23.84A.038). These are held to the same standards regarding low-income and very low-income housing as DMC sites (SMC 23.84A.038).

Regional Land Conservation TDR

In 2013, the City of Seattle established an agreement with King County to develop a regional program for the transfer of development rights (TDR) from rural areas to South Lake Union, Denny Triangle, and the Commercial Core. This market-based tool focuses growth toward targeted areas, subsequently mitigating urban sprawl, while protecting natural resources and sensitive lands. The exchange takes place between private landowners, who can sell their unused development rights, and developers, who can subsequently use these rights to increase density and potential profitability of their projects.

These transactions occur between designated "sending" and "receiving" sites through a TDR bank responsible for making prudent development purchases. Sending sites typically consist of large, undeveloped tracts of land that contain assets to the public (e.g., open space, working land, and historical sites). Receiving sites are areas that have been distinguished for growth and contain adequate infrastructure to support increased development. Once TDR credits are purchased from a sending site, the land is placed under a conservation easement, ensuring it remains undeveloped, permanently.

New Development Credits

The City uses its land use code to achieve many development objectives. As discussed above, development incentives support open space goals, funding for affordable housing, and provide the basis for transfer of development rights. In order to support the retrofit requirements of URMs, the City could look to additional incentives on new development to finance older URM buildings. Local developers—Peter and Lisa Nitze of Nitze-Stagen and Brad Padden of Anew Apartments—have advanced one such proposal after extensive consultation with a broad range of concerned stakeholders. The full 'URM Retrofit Credit Proposal and Working Group Recommendations' can be found in Appendix D—below is an abbreviated version.

Proposed Integrated Retrofit Credit Program

The proposed mechanism is a new Retrofit Credit ("RC") program created through the amendment of Title 23 of the Seattle Municipal Code to establish credits that will be sold on behalf of owners of buildings required to undergo mandatory seismic and/or voluntary environmental retrofits. This proposed program bears some similarities to existing transfer of development rights (TDR) programs, but the current TDR market is extremely limited, only allowing development rights to be traded in the same neighborhood and sometimes limited within the block. The current price of development credits is also significantly under market value, currently at $15-$20 a square foot, which is well below the incremental value of the bonus floor area. ***The proposed RC program would address these issues by creating a robust market for credits that would trade at prices closer to their development value.***

Purchasers of these credits will apply the RCs to achieve greater density on their development/rehabilitation projects, while the sellers will be required to apply the proceeds toward seismic upgrades of their properties and/or the upgrades necessary to achieve the defined 2030 environmental goals. The life of the seismic retrofit credits will be tied to the timeline for the mandatory completion of required seismic retrofits, providing an incentive for property owners to meet the deadlines or bear the cost themselves.

Given that the 2030 program is voluntary, while seismic retrofits under the proposed legislation will be mandatory, some URM building owners may choose to only do what is required to meet the seismic standards without performing environmental upgrades. There are compelling advantages to doing both at the same time however, since they both require removing walls and performing substantial structural modifications, including:

- Reduced cost through economies of scale in construction;
- Significant reduction in the period of displacement for residents and businesses;
- More efficient and rational building systems design.

Therefore, the RC program, while providing for two types of RCs, is designed to provide strong incentives for URM owners to commit to doing both – yielding significant private and public benefit through the reduction in the risk to public safety and the reduced impact on the environment.

Create two classes of RCs – RC(S) for URM seismic retrofits, and RC(E) for 2030 environmental retrofits. Both classes of credits would confer the same benefit, namely, one square foot of bonus density per credit, but proceeds from the sale of RC(S)s could only be used for seismic upgrades and those from RC(E)s for environmental upgrades (see below). As the program unfolds and more is learned about the impact of these incentives on property owners' upgrade decisions, the allocation of these credits could be tuned to achieve the desired mix of seismic and environmental retrofits.

Classify all URM and 2030 Pilot properties as "sending" lots and all other properties as "receiving" lots. All assessed URM structures will automatically qualify as "sending" lots, enabling owners of vulnerable masonry buildings to finance essential life-safety upgrades. All of the potential 2030 Pilot projects will also become "sending" lots, allowing flexibility of how much an owner will or can add density to the building. While ideally all properties across the city would be eligible to buy and use the credits—not just those within the zoning district where the URM or Pilot project "sending" lot is located—we recognize the challenge of adding density in certain neighborhoods.

Property Tax Abatement – Special Valuation

The Historic Preservation Property Tax Exemption allows for a "special valuation" (e.g., exemption) on building rehabilitation improvements for properties within designated historic preservation districts on their assessed value. The exemption reduces the taxable assessed value of the building improvements and thereby reduces the property tax bill to the owner. The following detailed information is provided by the City of Seattle regarding what is commonly known as the Historic Preservation Property Tax Exemption.

Exhibit 2: Historic Preservation Property Tax Exemption Program Details

During its 1985 session, the Washington State Legislature passed a law allowing "special valuation" for certain historic properties. Before that law, owners rehabilitating historic buildings were subject to increased property taxes once the improvements were made. "Special valuation" revises the assessed value of a historic property, subtracting, for up to 10 years, those rehabilitation costs that are approved by the local review board.

For the purposes of the Special Valuation of Property Act, the Seattle Landmarks Preservation Board acts as the Local Review Board (RCW 84.26). The primary benefit of the law is that, during the 10-year special valuation period, property taxes will not reflect substantial improvements made to the historic property. Eligible properties, as defined by the Seattle City Council, are designated as landmarks subject to controls imposed by a designating ordinance or contributing buildings located within National Register or local historic districts. The property must have undergone an approved rehabilitation within the two years before the date of application and rehabilitation cost must equal or exceed 25% of the assessed value of the improvements, exclusive of land value, before rehabilitation. Expenditures are based on Qualified Rehabilitation Expenditures. "Qualified rehabilitation expenditures" are expenses chargeable to the project, including improvements made to the building within its original perimeter, architectural and engineering fees, permit and development fees, loan interest, state sales tax, and other expenses incurred during the rehabilitation period. Not included are costs associated with acquiring the property or enlarging the building.

Interested property owners must file an application by October 1 with the King County Department of Assessment after the rehabilitation work has been completed. The Assessor will transmit the application to the Landmarks Preservation Board for review. The Board will review and approve the application, confirming the cost of the rehabilitation and that rehabilitation complies with previous Board approval. Once approved, the property owner will sign an agreement with the Board for a 10-year period, during which time the property must be maintained in good condition. The owner must obtain approval from the Board prior to making improvements. If the property is sold, the new owner must sign the same agreement if the special valuation is to remain in effect.

Using our URM prototype we can estimate the financial value of the special assessment benefit. Once completed, the property assessment would be reduced by the $564,373 in eligible project costs. With a current property tax levy of $12.93 mills, the value of this reduction would amount to a savings of $7,297 per year. The benefit is provided every year for 10 years. The value of the reduction over 10 years would be $83,656, with a present value of $63,834 – or 10% of project costs *(shown in Table 14 on Page 40)*.

Key conditions on the program include:

- The cost of improvements must total at least 25% of the assessed value. This minimum threshold could limit the benefits for small projects.
- The program only provides a deduction to capital costs and excludes other related costs (i.e. relocation).
- The tax exemption is for 10 years, whereas other tax abatements, such as the Multi Family Tax Exemption (MFTE), are for 12 years.

Examples: Seattle, WA, King County, WA, and Portland, OR

Fig 13: Prototype Building: 10-Year Property Tax Abatement Value

Assumptions	
Building size	3 stories, 22,000 sq ft
Retrofit type	Bolts+

Retrofit Budget		
	Cost/SF	Total
Hard and Soft Costs	$25.65	$564,373
Total Budget w/Relocation	$29.19	$642,279

Amount Credited Against Property Assessment	
$564,373	Eligible Project Costs
$12.93	Property Tax Levy Rate
$7,297	Annual Property Tax Savings

Year	1	2	3	4	5	6	7	8	9	10	Total Property Tax Deferred
Annual Property Tax Savings	$7,297	$7,516	$7,742	$7,974	$8,213	$8,460	$8,713	$8,975	$9,244	$9,521	$83,656
Present Value[1]	$63,834										
% of Project Costs	10%										

1 Assumes a 3% Annual CPI Adjustment on Property Value and a 5% Discount Rate.

Table 14: URM Building Example–Landmark with Special Valuation

Assumptions		
Building size:	3 stories; 22,000 square feet	
Building use:	Mixed Use: Ground floor commercial with 20 residential units above	
Retrofit type:	Bolts+	
Estimated Rehabilitation Costs		
Hard Costs		$400,000
Sales Tax (10.1%)		$40,400
Hard Costs Contingency (10%)		$44,040
Total Hard Costs		$484,440
Soft Costs (15%)		$72,666
Soft Costs Contingency (10%)		$7,267
Total Soft Costs		$79,933
Total Construction Expenses		**$564,373**
Relocation Expenses		
Commercial[1]		$58,667
Residential[2]		$19,240
TOTAL (Including Relocation)		**$642,280**
Potential Fund Sources		**% of Project**
City of Seattle TRAO support[3]	$9,620	1%
Special Property Valuation[4]	$63,834	10%
Total Resources	**$73,454**	**11%**

Notes:

1. Estimated at $20,000 per unit moving cost; typical commercial unit size of 2,500 SF.
2. Assuming 25% of residential units qualify for relocation assistance of $3,848 per unit per TRAO requirements.
3. City of Seattle provides 50% of TRAO assistance.
4. Present Value of 10 Year Property Tax Reduction

This financial benefit could be enhanced with legislative adjustments. Key areas for modification include:

1. Extend the special valuation to 12 years to be consistent with the Multi-Family Tax Exemption (MFTE);

2. Eliminate the 25% threshold for capital improvements. Many retrofits will likely be lower than this threshold and would not be eligible; and

3. Include all project costs – not just capital improvements. Other project expenses, such as tenant relocation, can add significant costs with no offset. *(see Fig. 14, page 23)*

With these adjustments, the program would provide financial benefits totaling 13% of total project costs for the prototype building, or a 30% increase.

Federal Tax Credits and Incentives

Historic Tax Credits

The 20% Federal Historic Tax Credit is a long-standing incentive program that promotes private investment into the restoration and rehabilitation of historic buildings. The Historic Tax Credit creates value by inserting equity directly into the project, thereby reducing rehabilitation costs. Eligibility is limited to the certified rehabilitation of a building that is 1) listed on the National Register of Historic Places, or 2) is a contributing building to a registered historic district. Roughly one-third of the Seattle's URM stock may qualify for this incentive. With passage of Tax Cuts and Jobs Act of 2017, the credit is now paid ratably over five years after project completion rather than all at once. This same legislation also repealed the 10% Historic Tax Credit for non-historic buildings.

The credit is assessed on eligible capital costs for renovating a historic structure. For a renovation project costing $100,000, the federal credit would be:

$100,000 x 20% = $20,000. This would provide an annual credit of $4,000 per year for the initial 5 years after renovation.

While building owners can utilize federal credits to offset their federal tax liability, many prefer to seek investors to raise investment capital to offset the renovation costs. This process can be complicated with high transaction costs for require legal opinions and financial analyses. As a result, small projects – below $2.0 million ($400,000 in federal credits) have a difficult time finding investors. A few "small deal" funds have been established to provide capital to these smaller projects. One, managed by the National Trust's Community Investment Corporation (NTCIC) invests in smaller historic renovation project. Twain Capital is a fund managed out of St. Louis, MO, which also manages a small investment fund. The credit can be combined with other federal credits like Low-Income Housing Tax Credits (LIHTCs) and New Markets Tax Credits to increase funding for renovations. Both investment entities are active with other federal credits as well. As the URM retrofit program gets underway, the City could approach both Funds to gauge their interest in Seattle projects or a Seattle-specific Fund could be established to better help small projects.

Only an average of 15 applications are submitted per year across Washington, so it may not be practical for every eligible URM to apply. Due to the greater scale, however, having many retrofits occurring within a

Fig 14: Prototype Building Changes to Property Tax Abatement Value (12 year extension, all project costs)

Assumptions	
Building size	3 stories, 22,000 sq ft
Retrofit type	Bolts+

Retrofit Budget		
	Cost/SF	Total
Hard and Soft Costs	$25.65	$564,373
Total Budget w/Relocation	$29.19	$642,279

Amount Credited Against Property Assessment	
$564,373	Eligible Project Costs
$12.93	Property Tax Levy Rate
$7,297	Annual Property Tax Savings

	1	2	3	4	5	6	7	8	9	10	11	12	Total Property Tax Deferred
Annual Property Tax Savings–Hard & Soft Costs	$7,297	$7,516	$7,742	$7,974	$8,213	$8,460	$8,713	$8,975	$9,244	$9,521	$9,807	$10,101	$83,656
Present Value[1]	$75,193												
% of Project Costs	12%												
Annual Property Tax Savings–All Project Costs	$8,305	$8,305	$8,810	$9,075	$9,347	$9,627	$9,916	$10,214	$10,520	$10,836	$11,161	$11,496	$117,860
Present Value[1]	$85,573												
% of Project Costs	13%												

1 Assumes a 3% Annual CPI Adjustment on Property Value and a 5% Discount Rate.

shorter required time frame increases the viability of a concerted approach towards tax credits.

Examples: Louisa Hotel, Seattle, WA; Pacific Tower, Seattle, WA

By combining the federal Historic Tax Credit with the Special Property Valuation, the financial benefit to property owners would be 25% of total project costs *(see Table 15)*.

Opportunity Zones

The Opportunity Zones program, introduced in the 2017 by the Tax Cuts and Jobs Act, is designed to spur private sector investment in low-income communities. It provides tax incentives to investors to take unrealized capital gains and invest them as equity into qualified businesses and real estate projects located in designated census tracts. The federal tax benefits can increase investor returns by 30% and make difficult investments more possible in Seattle's Opportunity Zones. Many investors will seek the higher tax benefits resulting from investment equaling or exceeding 10 years. This longer-term perspective will benefit URM retrofits as any economic benefits would not be immediate but occur over time as rents increase. With annual financial returns supplemented by federal tax benefits and a 10-year investment horizon, Opportunity Zones could support the long-term patient capital needs of existing URM owners.

While final regulations have yet-to-be released, the incentive appears promising as a resource of equity capital to fund seismic retrofits. Shown in Figure 15, the eligible census tracts in Seattle (all south of downtown) contain approximately 202 URM buildings – about 21% of the modified URM inventory.

Fig. 15: URMs in Opportunity Zones

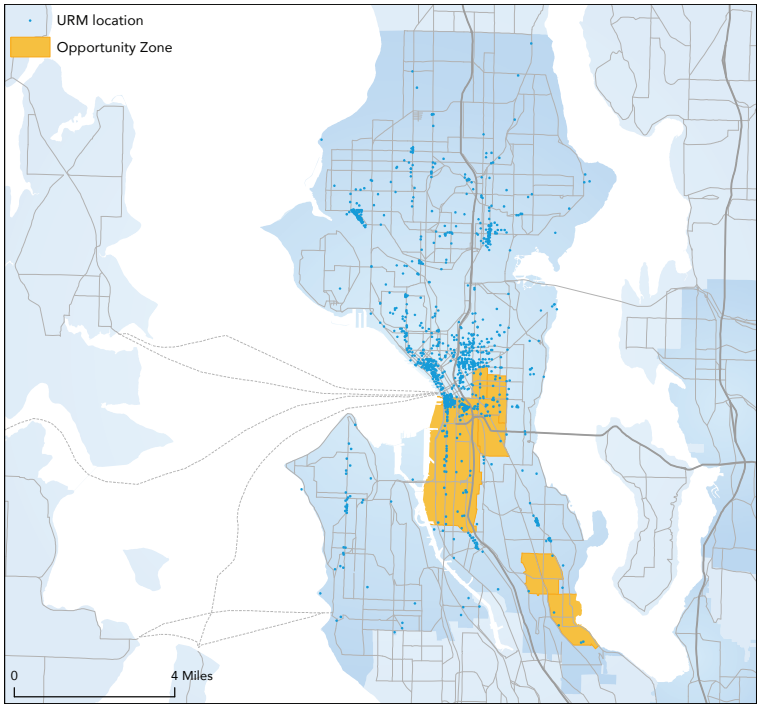


Table 15: URM Building Example - Landmark w/ Special Valuation and Tax Credits		
Assumptions		
Building size:	3 stories; 22,000 square feet	
Building use:	Mixed Use: Ground floor commercial with 20 residential units above	
Retrofit type:	Bolts+	
Estimated Rehabilitation Costs		
Hard Costs		$400,000
Sales Tax (10.1%)		$40,400
Hard Costs Contingency (10%)		$44,040
Total Hard Costs		$484,440
Soft Costs (15%)		$72,666
Soft Costs Contingency (10%)		$7,267
Total Soft Costs		$79,933
Total Construction Expenses		**$564,373**
Relocation Expenses		
Commercial[1]		$58,667
Residential[2]		$19,240
TOTAL (Including Relocation)		**$642,280**
Potential Fund Sources		**% of Project**
City of Seattle TRAO support[3]	$9,620	1%
Special Property Valuation	$63,834	10%
Federal Historic Tax Credits[4]	$84,656	13%
Total Resources	**$158,110**	**25%**

Notes:
1. Estimated at $20,000 per unit moving cost; typical commercial unit size of 2,500 SF.
2. Assuming 25% of residential units qualify for relocation assistance of $3,848 per unit per TRAO requirements.
3. City of Seattle provides 50% of TRAO assistance.
4. Tax Credit Value is estimated at Construction Costs x 20% x $0.75 in value

Financing Options—Public Payer

Green Bonds

Green bonds are a form of municipal bond debt specially dedicated for environmentally sensitive purposes. Green bonds have been used in international markets for many years, but they represent a relatively small (yet growing) portion of the domestic market. It is important to understand that the green bond term is simply a colloquial designation given to any type of municipal bond credit and does not produce any credit advantages.

Anecdotal evidence has indicated that the green bond designation appears to broaden investor interest in initial bond sales. However, most empirical studies have concluded that green bonds do not create a pricing advantage. The spread (or lack thereof) between green and non-green bonds may change over time depending on investor demand, but bond funds have not clearly aggregated green bonds in a way that investor demand can be understood so far. If some form of traditional public financing is used, the green bond designation appears to be a good fit with the broad objectives of the URM program and may provide some upside in the marketing of the bonds. Since green bonds have typically been seen more commonly in the water and wastewater sectors, the designation would also be somewhat novel, which could attract positive attention.

Financing Options—Private Payer

Lease Revenue Bonds

Lease revenue bonds are typically used for projects and investments that represent a core priority. This form of debt is a very well understood method of finance both by issuers and the capital markets. Revenue bonds are typically issued to finance core infrastructure that will be owned by the issuing entity. The use of this tool to retrofit privately owned URMs, even when there is a clear public safety interest in improving those parcels, would be unusual, although not unprecedented. Further, it should be noted that the bonds would likely need to be issued on a taxable basis because of the private interests involved.

This debt would go directly on the balance sheet of the City and would thus compete with other critical projects for balance sheet capacity. In addition to using financial capacity, lease revenue bonds require a physical asset for collateral. After repairs have been made, the retrofitted URM building may serve as that collateral. The planning and execution timeline for this funding option would probably require a year, but it could be done more quickly if desired. ***The bond issuance process itself would require roughly four months. It may be worth considering this approach for critical or high risk, publicly-owned projects that have no other available resources and must be repaired to protect public safety.***

Chase PRO Neighborhoods Grant Plan: CDFI Collaborative Working Group

The Seattle Chinatown International District Preservation and Development Authority (SCIDPDA) received a grant from Chase Bank's PRO Neighborhoods Program to evaluate the creation of a CDFI collaborative and help align their capital strategies with the Seattle Chinatown International District's neighborhood needs. URM owners are often embattled by the high cost of seismic retrofit work, limited cash flow and capital reserves, complicated ownership structures, deferred maintenance, and other code issues. With these funds, SCIDpda is exploring ways to create funding options to help owners maintain these buildings. SCIDpda is also looking to restore affordable housing and commercial spaces back to productive use and manage the change in the neighborhood to counter powerful gentrification pressures.

ALIGNING COSTS WITH FUNDING OPTIONS

Some URM buildings have specific public programs that can be used to assist retrofit costs. In particular, two asset classes of URM buildings deserve special consideration given their social significance and the unique funding sources they are eligible for—historic buildings and affordable housing. For example, historic buildings may be able to use federal rehabilitation tax credits and a local special property valuation program. Also, buildings with affordable housing (typically units for households at or below 80% of Seattle's Area Median Income) can potentially access federal Low-Income Housing Tax Credits (LIHTCs), Multi-Family Tax Exemption (MFTE) benefits, or other governmental grant resources. For those reasons we have separately evaluated cost estimates and sources of funding for these two building types.

Historic Buildings

Historic and landmark-designated URMs make up one-third of the entire inventory in terms of building count and cover approximately 42% of URM square feet area *(shown in Figures 17 and 18)*. Thus, resolving the seismic risks of this asset class would address a significant portion of the City's URM stock. Landmark buildings are designated buildings, sites, structures or objects in Seattle that are regulated through the City's Historic Preservation Program. Historically significant buildings may be registered on the National Register of Historic Places or serve as contributing members of one of Seattle's eight established preservation districts *(shown in Figure 16)*:

1. Ballard Avenue Landmark District
2. Columbia City Landmark District
3. Fort Lawton Landmark District
4. Harvard-Belmont Landmark District
5. International Special Review District
6. Pike Place Market Historical District
7. Pioneer Square Preservation District
8. Sand Point Naval Air Station Landmark District

Historic and landmark buildings may be subject to specific ordinances, building codes, and are often more limited in the rehabilitation that they can undertake. However, their historic status also makes them eligible for a few financial, preservation, and code incentives that are not available to other URMs. It is important to note that buildings located within the boundaries of a historic district are not automatically considered historic. Buildings must be registered with the City as contributing to the district; those that are not may not be eligible for the same incentives as their contributing counterparts.

Fig. 16: URMs in Landmark/Preservation Districts

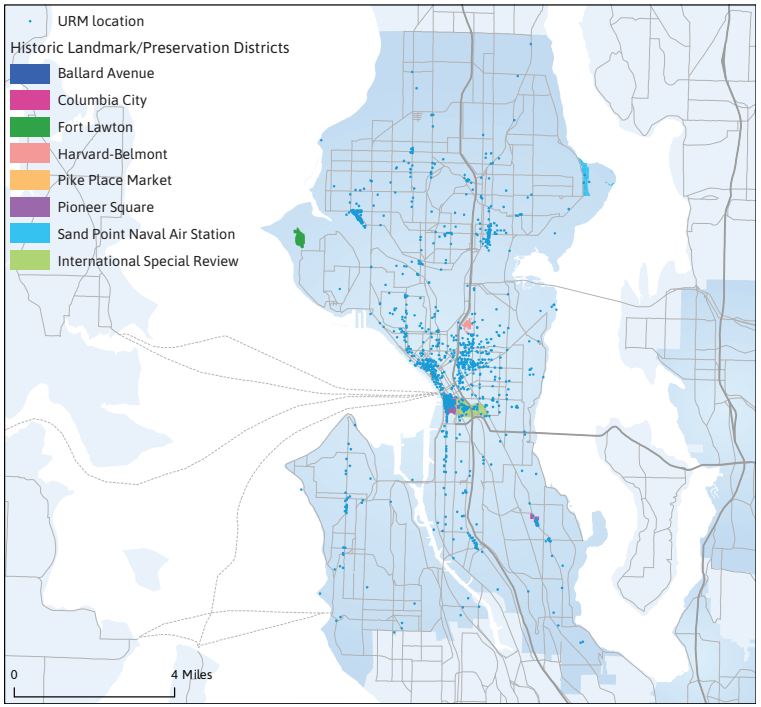


Fig. 17: Historic Designation
(by Number of Buildings)

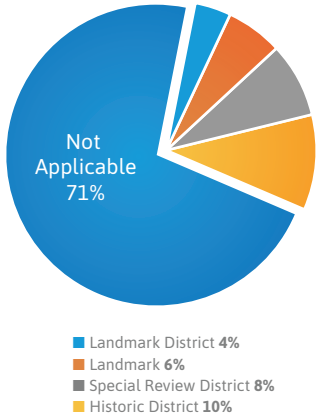
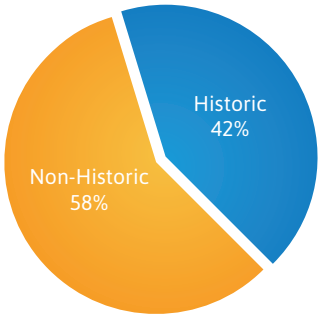


Fig. 18: Historic Designation
(by Square Feet)



Mt. Baker Park Presbyterian Church

- Built in 1924
- Landmark Designation
- Mt. Baker Neighborhood
- No Visible Retrofit

Shown in Table 16, the cost to retrofit the 278 historic and landmark buildings in the URM inventory is estimated at $641,800,000. Should building owners utilize Historic Tax Credits and Special Property Valuation, roughly 26% of rehabilitation costs could be covered – leaving 74% to be funded by other means.

Table 16: Retrofit Cost Estimates – Historic URMs

	Total	Bolts+	Bolts++ Frame	Full Seismic
Number of Buildings	**278**	**30**	**88**	**160**
% of Total Historic URMs	**100%**	**11%**	**32%**	**57%**
Hard Costs	$414,900,000	$13,900,000	$47,000,000	$354,000,000
Sales Tax (10.1%)	$46,100,000	$1,500,000	$5,200,000	$39,300,000
Hard Costs Contingency (10%)	$41,500,000	$1,400,000	$4,700,000	$35,400,000
Total Hard Costs	$502,500,000	$16,800,000	$57,000,000	$428,700,000
Soft Costs (15%)	$75,400,000	$2,500,000	$8,500,000	$64,300,000
Soft Costs Contingency (10%)	$7,500,000	$300,000	$900,000	$6,400,000
Total Soft Costs	$82,900,000	$2,800,000	$9,400,000	$70,700,000
Total Construction Expenses	$585,400,000	$19,600,000	$66,400,000	$499,500,000
Relocation (Commercial)	$51,500,000	$6,100,000	$8,800,000	$36,600,000
Relocation (Residential)	$4,900,000	$600,000	$2,000,000	$2,300,000
Total	**$641,800,000**	**$26,300,000**	**$77,100,000**	**$538,400,000**

1. Residential relocation assumes that all known affordable housing units, plus 25% of remaining housing units, qualify for TRAO relocation assistance of$3,848 per unit. We estimate 3,057 total residential units in Historic URM buildings, with 1,276 qualifying for assistance.

Table 17: Potential Funding Sources – Historic URMs

	Total	Bolts+	Bolts++ Frame	Full Seismic
Historic Tax Credits	**$87,800,000**	**$2,900,000**	**$10,000,000**	**$74,900,000**
% of Cost	*14%*	*11%*	*13%*	*14%*
Special Property Valuation	**$73,900,000**	**$2,200,000**	**$7,300,000**	**$64,400,000**
% of Cost	*12%*	*8%*	*9%*	*12%*
City of Seattle TRAO Assistance	**$2,500,000**	**$300,000**	**$1,000,000**	**$1,200,000**
% of Cost	*0.4%*	*1%*	*1%*	*0.2%*
PERCENT FUNDED	**26%**	**21%**	**24%**	**26%**
OWNER FUNDING / FINANCING	**74%**	**79%**	**76%**	**74%**

1. 20% Credit on Total Construction Expenses over 5 years, .75 Pricing
2. 10-year Present Value of Tax Valuation. Note that if extended 12 years, could provide 13% of financial need.

Affordable Housing

Many of Seattle's most vulnerable residents live in the city's most vulnerable buildings. There are 37 affordable housing buildings in the modified inventory that contain approximately 1,559 affordable housing units.[1] This means roughly 6% of Seattle's URM square footage contains income-restricted affordable housing – with a significant portion of the remaining housing units in URMs likely providing naturally occurring affordable housing given their location in older buildings. Additionally, some URMs have unused upper floors, particularly in Pioneer Square and Chinatown-International District, which may provide an opportunity to add more affordable residential units to Seattle's inventory. Although, under current code, reoccupying these are likely to trigger substantial alterations provisions. Like historic buildings, income-restricted affordable housing buildings are eligible for a variety of government programs and incentives that could

Fleming Apartments

- Built in 1918
- Cascade/Eastlake Neighborhood
- 36 units
- No Visible Retrofit

1 An additional 10 buildings in the URM inventory are designated as affordable housing but have undergone substantial alterations so they are excluded from this analysis. This brings the total number of affordable units to approximately 2,214 units in 47 URM buildings.

Table 18: Affordable Housing URMs

	Building Count	% of Total URMs	Square Feet	% of Total Square Feet
Total URM Inventory	**944**	**100%**	**20,200,000**	**100%**
Affordable Housing Type				
4% LIHTC	3	>1%	100,000	>1%
9% LIHTC	14	1%	400,000	1%
No Type	19	2%	500,000	2%
Use Restriction	1	>1%	100,000	>1%
Total Soft Costs	**37**	**3%**	**1,100,000**	**4%**

help ease the cost burden of a seismic retrofit. Of the buildings in this asset class, 32 are funded by the Seattle Office of Housing and 17 have received additional funding from the federal 4% and 9% Low Income Housing Tax Credits programs. See Appendix E for a list of Seattle's URM buildings on the modified inventory that contain affordable housing.

The 37 URM buildings that contain affordable housing are eligible to receive Low-income Housing Tax Credit (LIHTC) equity. These federal credits are established based the project's capital costs and the restriction of rents targeted to low-income households. The credit is available for 10 years with a 15-year compliance period. There is a federal 4% and 9% credit available.[2] The WA State Finance Commission allocates the 9% credit annually through a competitive application process. Examples of each credits show:

> 4% Program - $100,000 project costs x 4% = $4,000 annually x 10-year program period = $40,000
>
> 9% Program - $100,000 project costs x 9% = $9,000 annually x 10-year program period = $90,000

Modeling the 4% LIHTC program over 10 years shows that URM retrofits could attract $30.4 million in LIHTC equity for the full inventory of affordable housing buildings, covering 32% of project costs. City of Seattle TRAO assistance covers 3% of project costs, which is a higher portion than the remaining inventory because we assume that all residents in affordable housing buildings are eligible for TRAO assistance. Combined, available resources from TRAO and LIHTC account for 35% of project costs, leaving 65% dependent on other sources of funding.[3] Table 23 shows sources and uses for the prototype building and Tables 24 and 25 show the inventory of affordable housing URMs.

Table 19: Prototype URM Building Example with Affordable Housing Resources

Assumptions

Building size: 3 stories; 22,000 square feet

Building use: Mixed Use: Ground floor commercial with 20 residential units above

Retrofit type: Bolts+

Estimated Rehabilitation Costs

Hard Costs	$400,000
Sales Tax (10.1%)	$40,400
Hard Costs Contingency (10%)	$44,040
Total Hard Costs	$484,440
Soft Costs (15%)	$72,666
Soft Costs Contingency (10%)	$7,267
Total Soft Costs	$79,933
Total Construction Expenses	**$564,373**

Relocation Expenses

Commercial[1]	$58,667
Residential[2]	$76,960
TOTAL (Including Relocation)	**$700,000**

Potential Fund Sources		**% of Project**
City of Seattle TRAO support[3]	$38,480	5%
4% LIHTC[4]	$203,174	29%
Total Resources	**$241,654**	**34%**

Notes:

1. Estimated at $20,000 per unit moving cost; typical commercial unit size of 2,500 SF.
2. Assuming 100% of residential units qualify for relocation assistance of $3,848 per unit per TRAO requirements.
3. City of Seattle provvides 50% of TRAO assistance.
4. Tax Credit Value is estimated at Construction Costs x 4% x 10 Years x $0.90 in value

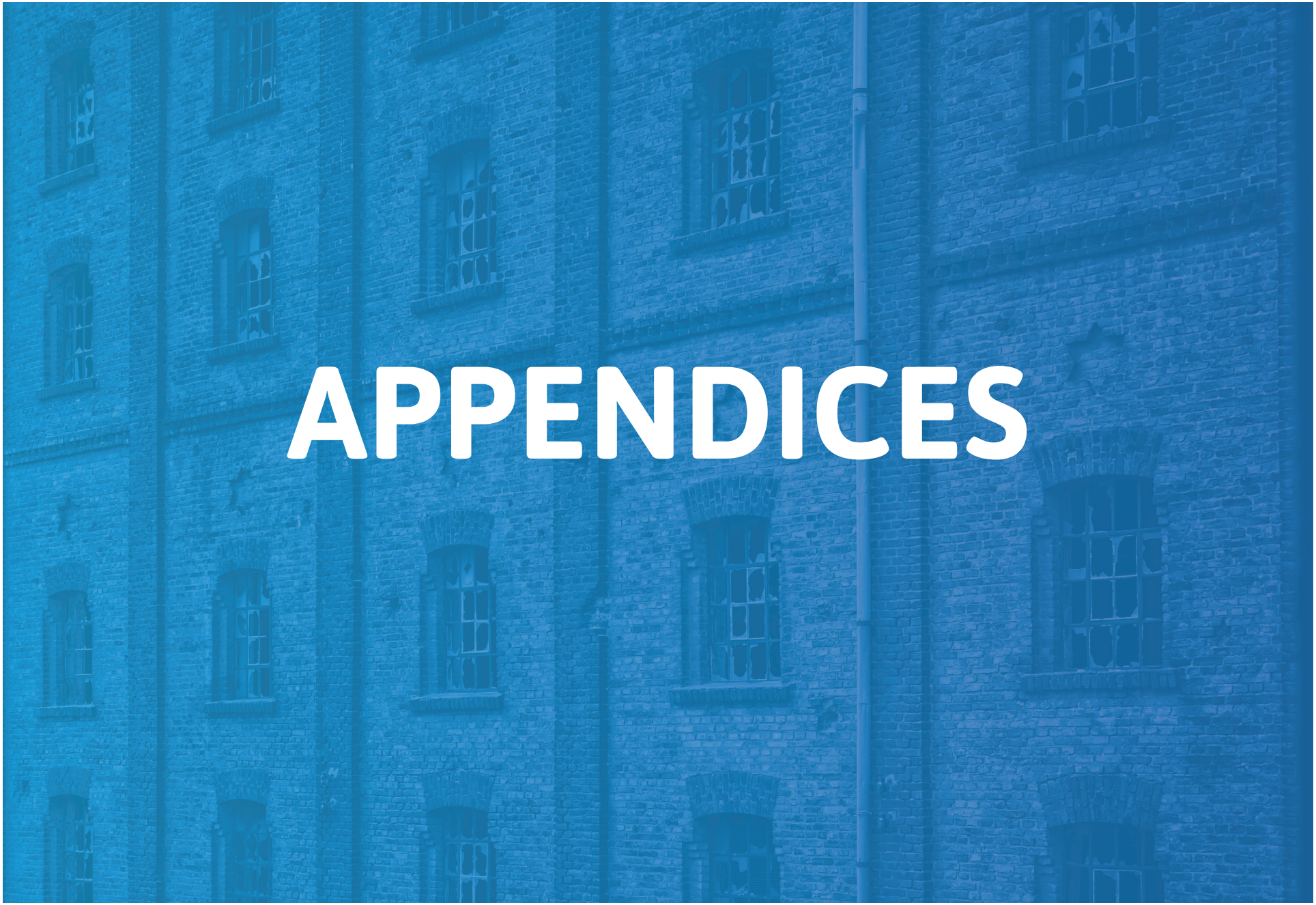
2 The actual 4% credit rate is estimated annually by the IRS. The current rate is 3.27% (February 2019).
3 Individual percentages may not add up to total due to rounding.

Table 20: Retrofit Cost Estimates - Affordable Housing URMs				
	Total	Bolts+	Bolts++Frame	Full Seismic
Number of Buildings	37	6	14	17
% of Total Affordable Housing URMs	100%	16%	38%	46%
Number of Housing Units	1514	182	617	715
Hard Costs	$54,200,000	$3,000,000	$15,300,000	$35,800,000
Sales Tax (10.1%)	$6,000,000	$300,000	$1,700,000	$4,000,000
Hard Costs Contingency (10%)	$5,400,000	$300,000	$1,500,000	$3,600,000
Total Hard Costs	$65,600,000	$3,600,000	$18,600,000	$43,400,000
Soft Costs (15%)	$9,800,000	$500,000	$2,800,000	$6,500,000
Soft Costs Contingency (10%)	$1,000,000	$100,000	$300,000	$700,000
Total Soft Costs	$10,800,000	$600,000	$3,100,000	$7,200,000
Total Construction Expenses	$76,400,000	$4,200,000	$21,600,000	$50,600,000
Relocation (Commercial)	$4,000,000	$–	$1,500,000	$2,500,000
Relocation (Residential)[1]	$5,800,000	$700,000	$2,400,000	$2,800,000
TOTAL (Including Relocation)	**$86,200,000**	**$4,900,000**	**$25,500,000**	**$55,800,000**

1. Assuming 100% of residential units qualify for relocation assistance of $3,848 per unit per TRAO requirements.

Table 21: Potential Funding Sources - Affordable Housing				
	Total	Bolts+	Bolts++ Frame	Full Seismic
City of Seattle TRAO Assistance[1]	$2,900,000	$400,000	$1,200,000	$1,400,000
% of Cost	*3%*	*8%*	*5%*	*3%*
Low-Income Housing Tax Credits (LIHTC)	$27,500,000	$1,500,000	$7,800,000	$18,200,000
% of Cost	*32%*	*31%*	*31%*	*33%*
Total Resources	$30,400,000	$1,900,000	$9,000,000	$19,600,000
PERCENT FUNDED	**35%**	**39%**	**35%**	**35%**
OWNER FUNDING / FINANCING	**65%**	**61%**	**65%**	**65%**

1. The City of Seattle provides 50% of TRAO assistance, which equates to $1,924 per unit.
2. Tax Credit Value is estimated at Construction Costs x 4% x 10 Years x $0.90 in value



APPENDICES

APPENDIX A - PEER CITY CASE STUDIES

BERKELEY, CALIFORNIA

URM Program Established: October 1991

URM Buildings Identified: 587

Financial Assistance: Real Estate Transfer Tax Rebates, FEMA Grants (as of 2018), Fee Waiver

Program Description and Status Update:

The City of Berkeley established the Seismic Hazard Mitigation Program for URM Buildings in October 1991. At the time, 587 URM buildings were identified. The city's ordinance passed the same year mandating seismic retrofits for all buildings constructed prior to 1956 with masonry bearing walls.

The most recently available data of URM counts from the Seismic Safety Commission is the 2006 progress report to the California State Legislature.[1] As of 2006, Berkeley reported 542 URM buildings had been brought up to compliance, 6 buildings were demolished or slated to be demolished, and 31 buildings made no progress towards mitigation. As of August 2017, 5 URM buildings remain in the city as a result of owners making no progress towards mitigation. These remaining URM properties have all received multiple citations and the city continues to work with the property owners to try to achieve full compliance. As Berkeley has achieved a nearly 98% mitigation rate of its URM buildings, the city shifted its focus towards soft-story buildings in 2014—which are significantly less costly to retrofit than URMs.

Building Classification and Compliance Schedule

Per 19.38.060, URM buildings in Berkeley were classified by the following risk categories and were required to have seismic retrofits completed by their respective compliance dates:

RISK LEVEL	BUILDING TYPE	COMPLIANCE DATE
Risk Level I	○ Hospitals, fire and police offices/stations, emergency operation centers, buildings housing medical supplies, government administration offices ○ Any building with an occupancy load of 1,000 or more.	March 1, 1997
Risk Level II	○ Commercial buildings with an occupancy load of 300 or more ○ Residential buildings with more than 100 living units ○ Any building with a combined occupancy load greater than 300	March 1, 1997
Risk Level III	○ Commercial buildings with an occupancy load of 100 or more ○ Residential buildings with more than 50 living units ○ Any building with a combined occupancy load greater than 100	June 30, 1997
Risk Level IV	○ Commercial buildings with an occupancy load of 50 or more ○ Residential buildings with less than 50 living units ○ Any building with a combined occupancy load greater than 300	Dec. 31, 1997
Risk Level V	○ Commercial buildings with an occupancy load of 50 or less ○ Residential buildings with 20 or less living units ○ Any building with a combined occupancy load greater than 300	Dec. 31, 1998
Risk Level VI	○ Any non-residential building that is used less than 20 hours/week ○ Buildings located in high traffic corridors with at least one brick in-fill wall, a brick veneer that is 10 feet or higher, or an unreinforced parapet that exceeds a 1:1.5 height to depth ratio.	Dec. 31, 2001

1 California Seismic Safety Commission. "Status of the Unreinforced Masonry Building Law: 2006 Progress Report to the Legislature." SSC 2006-04, 9 Nov. 2006.

Financial Support:

Seismic Retrofit Refund Program[2]

The sole financial incentive available to URM owners was a tax break on the city's real estate transfer tax. The City of Berkeley levies a real estate transfer tax at a rate of 1.5% of the selling price of real estate. The City offered to refund seismic retrofit expenses up to 1/3 of that tax amount (0.5% of the property value transferred), up to a maximum refund of $2,000. A property owner is only eligible for this refund if the owner completes the seismic upgrades within one year of purchasing the building. Every time a property changes hands, each new owner is eligible to take advantage of the economic incentive, so the housing stock as a whole will be significantly safer over time. Since this program's inception in 1991, $10 million has been rebated to property owners through the rebate program, impacting approximately 2,500 buildings. It is important to note that commercial buildings are excluded from the transfer tax rebate program.

Permit Fee Waiver

No fee shall be required for permit applications or inspection for seismic retrofit work for eligible structures and buildings as defined in the Berkeley Municipal Code (BMC 19.66.030)

Soft Story Retrofit Grant Program (As of 2018)[3]

In 2014, Berkeley established its Soft Story Retrofit Program with a city ordinance that applies to the city's wood frame buildings constructed prior to 1978. In 2018, Berkeley received a Hazard Mitigation Grant of $1.2 million from FEMA and the California Governor's Office of Emergency Services to provide design and construction grants to property owners for seismic retrofits. Priority for these grants generally goes towards soft story buildings, but all vulnerable building types are eligible to apply, including URM buildings. The City is making efforts to apply funds from this newly established grant program towards finally eradicating the last remaining URMs. The following table summarizes the grants property owners are eligible receive depending on the type of building they are retrofitting:

Building Type	Design Grant Maximum Size	Construction Grant Maximum Size
Non-Ductile Concrete	$10,000 (cap at 75% of design cost)	$25,000 to $40,000 (cap at 40% construction cost)
Tilt-up and other Rigid Wall – Flexible Diaphragm		
Soft Story 5+, residential units, non-residential, and hotels/motels	$5,000 (cap at 75% of design cost)	$20,000 (cap at 30% of construction cost)
Soft Story 3-4 units		$15,000 (cap at 40% of construction cost)

Rent Pass-Through:

The City of Berkeley does not allow capital improvement costs to be passed-through to rent controlled tenants.

Current Program Administration:

The recently established grant program is staffed with two program managers (total of 1.5 FTE on seismic programs) and two interns (each working 0.5 FTE for a total of 1 FTE). Annual salary costs for program management total approximately $220,000 and their tasks include:

1. ongoing management of the soft story program (including citations)
2. a small amount of time managing the last few URM projects
3. managing the Retrofit Grants program (including program outreach, working with property owners, program development, ongoing project management, and all reporting to funders)
4. and a number of other assorted projects related to disaster preparedness and hazard mitigation.

2 City of Berkeley Finance Department. "Seismic Retrofit Refund Program." Real Property Transfer Tax, www.cityofberkeley.info/Finance/Home/Real_Property__Transfer_Tax_Seismic_Refunds.aspx.
3 City of Berkeley Building and Safety Division. "Retrofit Grants." https://www.cityofberkeley.info/retrofitgrants/

OAKLAND, CALIFORNIA

URM Program Established: 1988

URM Buildings Identified: 1,612

Financial Assistance: Real Estate Transfer Tax Rebate, FEMA Grants, Permit Fee Discount

Program Description and Status Update:

The most recently available data of URM counts from the Seismic Safety Commission is the 2006 progress report to the California State Legislature. As of 2006, Oakland reported 1,107 URM buildings had been brought up to the mandatory hazard reduction standard established in the local URM ordinance, which establishes Bolts Plus as the minimum retrofit standard.[4] Further, 222 buildings had been brought up to UCBC compliance, 106 buildings were demolished, 2 were slated for demolition, and 50 buildings made no progress towards mitigation. While unconfirmed with the city, multiple media outlets reported in 2014 that approximately 80 to 90 URM buildings had yet to be retrofitted in the city.

Due to few URM buildings remaining in the city, Oakland's Department of Housing and Community Development has also shifted focus from unreinforced masonry to soft-story buildings.

Building Classification and Compliance Schedule:

URM Priority Level*	Submission of Permit Application	Construction Completion
1	1 Year	2 Years
2	2 Years	3 Years
3	3 Years	4 Years

*The priority levels for each potentially hazardous URM building will be determined by the Building Official and shall be based on the type of soil on which the building is located, number of stories, pedestrian and vehicle traffic adjacent to the building, use of building, number of occupants and complexity of retrofit work.

Financial Support:

Homeowner's Reimbursement Incentive Program[5]

In an attempt to partially replicate the model used by Berkeley, the City of Oakland instituted a similar real estate transfer tax rebate program in 2007. The Homeowner's Reimbursement Incentive Program 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 was lower—for costs associated with seismic retrofits within one year of the property transfer. The key difference between the Oakland program and the Berkeley program is that Oakland only set aside $500,000 of the real estate transfer tax revenue for this purpose. This cap was meant to prevent over-reducing city revenue, but as a result, the program exhausted funds within a few years and is now defunct.

Soft Story Retrofit Grant Programs

After transitioning focus to soft-story buildings, the City of Oakland's Department of Housing and Community Development created two grant programs to mitigate soft-story buildings. In the program's first round in 2016, it received $6 million in FEMA's Hazard Mitigation Grant funds –$3 million for each program. The city now has two active FEMA Hazard Mitigation grant applications submitted and awaiting approval for a second round, and these grants would be for $5 million each ($10 million total). However, the funds from one of these second round applications will be exclusively for the 5+ unit soft-story building program and the other application is for a program dedicated towards retrofitting affordable housing buildings.

1. **Earthquake Safe-Homes Program (ESHP)[6]:** ESHP offers grants to owner-occupants of **1-4 unit** homes to finance seismic retrofits with priority being for properties built prior to 1957. Grants issued under this program cover 75% of total ESHP allowable costs, and the homeowner is required to provide the remaining 25% of project costs. Low and moderate-income homeowners with a household income equal to or less than 80% of AMI may be eligible for additional financial assistance. Some CDBG funds have been set aside specifically to help homeowners who need further assistance to cover their 25%.

2. **Safer Housing for Oakland Program (SHOP)[7]:** SHOP offers grants to rental property owners in Oakland to finance retrofits on soft-story buildings with **five or more units**. During the first round of the SHOP program, Oakland submitted 40 applications to FEMA for retrofits on 5+ unit residential buildings. Once informed of possible new funding, the city submitted an additional 20 applications for a total of 60 applications under this program in round one. It is projected that only around half of these projects will be followed through to completion. Grant recipients under this program are eligible to choose from the following grant structures:

4 California Seismic Safety Commission. "Status of the Unreinforced Masonry Building Law: 2006 Progress Report to the Legislature." SSC 2006-04, 9 Nov. 2006.
5 City of Oakland. "New Homeowner Voluntary Seismic Strengthening Reimbursement Incentive Program" City of Oakland, 18 Sept. 2007, www.oaklandca.gov/documents/new-homeowner-voluntary-seismic-strengthening-reimbursement-incentive-program.
6 City of Oakland Housing & Community Development Department. "Earthquake Safe Homes Program.", wbcapp.oaklandnet.com/oaklandnet/government/o/hcd/s/HousingRepairRehabPrograms/OAK062291.
7 City of Oakland. "Safer Housing for Oakland Program (SHOP)." City of Oakland, www.oaklandca.gov/resources/safer-housing-for-oakland-program-shop.

	Option 1	Option 2	Option 3
Grant Funds	75% of TAC	75% of TAC	75% of TAC
Owner Funds	25% of TAC	15% of TAC	0% of TAC
City Loan Funds*	0% of TAC	10% of TAC	25% of TAC
Additional Rental Restrictions	No additional restrictions	5-year restriction on any rental increases above CPI	10-year restriction on any rental increases above CPI

**0% amortized for number of restricted years*

Permit Fee Discount

Retrofitting permits can cost upwards of 10% of the cost of retrofit construction, and depending on the scope of a retrofit that can become a very large expense. Due to high permit prices, homeowners in Oakland were avoiding the permit process altogether, and without city inspections, homeowners cannot be assured that the work is meeting current seismic retrofit standards. Thus, in 2007, Oakland established a flat permit fee of $250 for owners of qualified single-family residences to perform seismic retrofits (OMC 15.30.310).

Rent Pass-Through:

The City of Oakland allows owners to pass through 70% of the cost of capital improvements, including seismic retrofits, to the tenants of a retrofitted building, amortized over 5 years. The property owner is responsible for the remaining 30%. Property owners who receive a grant may not pass any of the allowable costs to tenants since the grant funds already exceed the allowable pass-through as determined by the City of Oakland Rent Adjustment Ordinance.

Current Program Administration:

The city's two residential seismic retrofit programs, ESHP and SHOP, are managed by one individual with support in the permitting and planning processes coming from other city departments. In the first round, the staffing costs for these programs were funded by a portion of the FEMA grant money received. In the second round, if the city receives the two $5 million grants requested, all FEMA funds will be put towards retrofits and the city will be responsible for coming up with the money to fund staffing costs.

SANTA MONICA, CA

URM Program Established: 1999
URM Buildings Identified: 265
Financial Assistance: None

Program Description and Status Update:

The City of Santa Monica conducted an initial URM inventory in 1977 which found 265 unreinforced masonry buildings in the city. Some media reports suggest that this initial inventory may have even been lost due to high staff turnover in the city. Regardless, minimal progress towards mitigation was made between then and 1999—the year the city adopted its mandatory seismic retrofit standards for unreinforced masonry buildings as well as four other vulnerable building types (concrete tilt-up buildings, soft story buildings, non-ductile concrete buildings, and welded steel frame buildings). Santa Monica is the only known city to pass an ordinance mandating retrofits across all five of these vulnerable buildings[8]. In 1999, in concert with the passage of the ordinance, another survey of building types was conducted which resulted in the following counts:

Vulnerable Building Type	Number of Buildings Placed on Seismic Evaluation Inventory List
Unreinforced Masonry Buildings	209
Concrete Tilt Up Buildings	34
Soft-Story Buildings	1,573
Non-Ductile Concrete Buildings	66
Steel Moment Frame Buildings	80
Overall Total Number	**1,962**

At the time of last publication (2006), the Seismic Safety Commission's report on the California URM Law stated that of the 209 unreinforced masonry buildings remaining, 144 had at least some form of upgrade work done and 65 had no upgrade work done[9]. Of these buildings, at least 60 buildings had major damage from the 1994 Northridge Earthquake. Despite the ordinance requiring mandatory upgrades by law, there was no formal enforcement effort, essentially making compliance voluntary. As a result, insufficient mitigation progress was made between 1999 and 2017.

After nearly two decades of non-compliance from property owners, the Santa Monica City Council established the official Seismic Retrofit program in March 2017 with the passage of Ordinance 2537. This new ordinance established time limits for compliance, upgraded retrofit standards across all five building types, and created stricter enforcement mechanisms. At the time this ordinance passed in 2017, approximately 100 URM buildings remained in the city and they were given the shortest compliance timeline of all five building types—all URM retrofits must be completed by August 2019

Building Classification and Compliance Schedule[10]:

Building Type	Approx. # of Buildings in Inventory	Compliance Deadline
Unreinforced Masonry	**100**	**August 2019**
Concrete Tilt-up	30	August 2020
Soft-Story (3 or more stories)	1,700	Varies by Number of Stories and Units
Non-Ductile Concrete	70	October 2027
Steel Moment Frame	80	October 2037

Financial Support:

When establishing this new program, the City of Santa Monica did not create any financial assistance/incentive programs and currently has no plans do so. If a property owner of a vulnerable buildings is seeking assistance, the city directs them towards the state-wide assistance programs: Property Assessed Clean Energy Program (PACE), Earthquake Brace + Bolt (EBB), or the California Seismic Safety Capital Access Loan Program (CalCAP).

Rent Pass-Through:

The Santa Monica Rent Control Board determined that property owners of rent-controlled properties will not be able to pass-through retrofit costs to tenants.

Current Program Administration:

Santa Monica does not have a specially allocated budget for the program. Since the nature of the program is to have varying periods of high and low levels of activity, management of the ordinance's implementation has been absorbed by existing City staff (i.e. no new full-time positions created). However, the city has secured outside consultants to assist with the review of structural reports and the review of project plans, as needed during periods of high activity, to supplement existing City staffing.

8 City of Santa Monica. "City Council Report: Study Session on Proposed Mandatory Seismic Retrofit Program.", Santa Monica City Council, 6 Dec. 2016.
9 California Seismic Safety Commission. "Status of the Unreinforced Masonry Building Law: 2006 Progress Report to the Legislature." SSC 2006-04, 9 Nov. 2006.
10 City of Santa Monica Permit Services. "Seismic Retrofit Ordinance Noticing and Compliance Schedule.", Aug. 2017. www.smgov.net/uploadedFiles/Departments/PCD/Programs/Seismic-Retrofit/Seismic Retrofit Noticing Schedule.pdf.

LONG BEACH, CALIFORNIA

URM Program Established: 1976
URM Buildings Identified: 936
Financial Assistance: Special Assessment District Bond Loans

Program Description and Status Update:

In 1933, the City of Long Beach was devastated by a 6.4 magnitude earthquake in which more than half of the city's unreinforced masonry buildings experienced damage ranging from significant wall damage to complete collapse. Throughout the 1950's, Long Beach adopted several ordinances to address unreinforced masonry. In 1971, the city passed its first mandatory strengthening ordinance for unreinforced masonry buildings, which was later updated in 1976 and 1990. Some experts credit the Long Beach ordinance as serving as the model for other California cities as they developed their own ordinances.

After the Long Beach earthquake in 1933, the construction of unreinforced masonry buildings was prohibited, so all URM's in Long Beach are pre-1934. The city first adopted its seismic ordinance in the late 1970s, in which it implemented the compliance deadline seen below. At the time of passage, the city's URM survey identified 936 URM buildings in the city, of which 49 are historic buildings. By the end of the 1980's, all of the URM buildings in the 'Most Dangerous' and 'More Dangerous' categories had been addressed. A secondary URM inventory, conducted in 1990, updated the city's URM count to approximately 560. At the time of last publication (2006), the Seismic Safety Commission's report on the California URM Law stated that of the city's initial 936 unreinforced masonry buildings: 559 were in compliance with the ordinance, 3 were in partial compliance, 370 had been demolished, and 0 buildings had no progress made towards mitigation.[11] Long Beach's demolition rate—roughly 40% of the city's entire URM stock—is the highest among all of the cities researched. The city's final seismic retrofit for an unreinforced masonry building was completed in 2007, and the city's focus has since transitioned to tilt-up and soft-story buildings.

Building Classification and Compliance Schedule:

Risk Classification	Compliance Timeline
Most Dangerous	These buildings were ordered to be repaired immediately or torn down
More Dangerous	These buildings were given until 1985 to be brought up to code or demolished
Least Dangerous	These buildings were given until January 1991 to be brought up to code or torn down

Financial Support:

Special Assessment Bond Loans[12]

In coordination with the URM inventory and updates to the seismic ordinance, the City of Long Beach established an assessment district composed of the affected URM properties, which allowed the city to issue bonds. In June 1991, the newly formed district issued $17,440,000 of City of Long Beach Earthquake Repair Assessment District No. 90-3 Limited Obligation Improvement Bonds (Bonds) for the construction and installation of seismic resistance improvements to eligible commercial and residential properties within the city. The bond proceeds, accrued interest, and owner deposits amounted to a pool of $17.7 million, and the funds were allocated as follows:

- $14.9 million was deposited into the improvement funds and allocated towards retrofit costs. Monies in this fund earned interest, which was also deposited into the Improvement Fund and allocated to the projects. Together these sources were projected to supply the $15.1 million needed to cover project costs.

11 California Seismic Safety Commission. "Status of the Unreinforced Masonry Building Law: 2006 Progress Report to the Legislature." SSC 2006-04, 9 Nov. 2006.
12 California Seismic Safety Commission. "Status of the Unreinforced Masonry Building Law: 2006 Progress Report to the Legislature." SSC 2006-04, 9 Nov. 2006.

- $1.7 million was placed in a reserve account to ensure timely bond payments
- $500,000 was borrowed to cover interest payments which had to be made before assessments were collected
- $450,000 was used to pay the financing team and issuance costs
- $140,000 was used to cover the city's administrative costs

The application period to be included in the district was 7 months—initially three months but a four-month extension was later added. Long Beach's program provided participants with long-term financing at the then-market interest rate of 11.3%. After all applications were submitted and reviewed, 137 URM buildings were included in the assessment district. The bonds were then repaid by the assessments that were placed on the owners in the assessment district. Owners who defaulted on their loans could have their property foreclosed, with the city verifying in advance that there was enough value in the property to cover the loan value.

While assessment bonds of the type contemplated were commonly used by cities throughout California for other purposes, they had never before been publicly issued to finance repairs of privately owned structures. The uniqueness of this purpose made the assessment bond issuance process far more complicated than would normally be expected. New ground had to be broken on many fronts, a process which ended up taking 18 months rather than the 3 to 6 months more commonly spent on assessment financings. While developing an appropriate legal structure was challenging, the most difficult aspect of the development process involved qualifying the properties for participation in the district.

Note: In September 1996, the Bond's Fiscal Agent determined that there were insufficient funds to make a full payment of principal and interest due to significant delinquencies in payment of assessments. To structure a remedy for the default, the City formed the Long Beach Bond Financing Authority (LBBFA). The LBBFA divided District properties into performing and delinquent pools. The assessment revenue from each pool was then used as collateral for new LBBFA bonds sold in July 1997. Series A bonds (Series A) and Series B bonds (Series B) represent the performing pool and the delinquent pool, respectively. A breakdown of these pools are as follows:

Bond	Maturity	Rate	Par Amount
Series A	September 2, 2015	8.874% - 9.375%	$ 5,900,000
Series B	September 2, 2015	11.300%	$ 6,717,000

SAN FRANCISCO, CALIFORNIA

URM Program Established: July 1992
URM Buildings Identified: 1,985
Financial Assistance: General Obligation Bond Loans

Program Description and Status Update:

San Francisco's first effort to address seismically vulnerable buildings dates back to 1975 with the development of the Parapet Safety Program which addressed the safety requirements of the parapet in a building's roof. In 1989, three years after California's URM law passed, northern California was hit by the Loma Prieta Earthquake which caused significant damage to some of San Francisco's unreinforced masonry. The passage of California's URM law in 1986 and the subsequent 1989 Loma Prieta Earthquake ultimately culminated in the passage of San Francisco's Earthquake Hazard Reduction Ordinance 225-92 on July 13, 1992.

The Seismic Safety Commission reported a total of 1,985 unreinforced masonry buildings in San Francisco. As of 2006, the city witnessed a mitigation rate of 86% of its URM buildings. At the time, 1,555 buildings were fully compliant with the city's ordinance, 163 were partially compliant, 81 were in the retrofit pipeline, 158 were demolished, and 28 building owners had made no effort towards seismic retrofitting their property.[13] Currently, nearly all unreinforced masonry buildings have been mitigated or demolished and it is estimated that only 15 to 20 URM buildings currently remain non-compliant.

San Francisco transitioned its focus towards soft story retrofits in 2013 with the passage of a mandatory ordinance. The deadline for completion of retrofit construction on all soft-story buildings is 2020.

Financial Support:

Seismic Safety Loan Program[14]

When the City of San Francisco passed its mandatory retrofit ordinance in 1992, city officials were well aware that there would be a portion of URM owners that would not be able to implement a seismic retrofit without financial assistance. Thus, San Francisco voters authorized the issuance of $350 million in General Obligation bonds to be used for URM retrofits. Of that total issuance, $150 million was allocated specifically for low-interest loans at a 2.5% interest rate intended for retrofits on affordable housing buildings. The

13 California Seismic Safety Commission. "Status of the Unreinforced Masonry Building Law: 2006 Progress Report to the Legislature." SSC 2006-04, 9 Nov. 2006.
14 City of San Francisco. "What You Should Know About Unreinforced Masonry Buildings." Department of Building Inspection. sfdbi.org/ftp/uploadedfiles/dbi/downloads/psvcs/commercial/19-UNREINFOR_MASONRY_BUILD.pdf

remaining $200 million was less restricted and could be used to retrofit any other type of unreinforced masonry building at an 8.5% interest rate. All loans were fully amortized over a 20-year period.

The bond issue was initiated due to high financing rates among banks and a general unwillingness among banks to provide seismic retrofit loans at the time. However, very few owners of market-rate buildings used the bond program. As of March 2000, only 17 loans totaling 10.4 million were made under the bond program. Some critics credit the failure of the program to overly complex restrictions and conditions placed on borrowers. Other critics suggest that the desire for the loans amongst building owners was grossly overestimated to begin with. The City of San Francisco attributes the program's less-than-expected participation to commercial banks undercutting the city program's rates, despite not offering seismic upgrade loans prior to the bond issue. Because loan proceeds were used for private purposes, they were not tax exempt and the City could not compete with the rates offered by commercial banks.

Seven years after voters passed the bond issue for seismic retrofit loans to owners of SF's most vulnerable buildings, a task force concluded that the city would never be able to sell all the bonds and recommended relinquishing $214 million of the issue. In 2016, Proposition C passed in San Francisco which authorized the city to issue $260.7 million general obligation bonds originally approved by voters in 1992. The passage of this measure repurposed the bonds to be used for other types of seismic retrofits beyond URM buildings and to fund the purchase and improvement of buildings in need of safety upgrades in order to convert them into affordable housing. Despite the funds now being available for soft-story retrofits, the city continues to see little to no interest among property owners in using these funds.

Building Classification and Compliance Schedule

Unreinforced Masonry Building Compliance Schedule				
Risk Level	**Submit Inventory**	**Apply for Building Permits or Demolition**	**Obtain Building Permit**	**Complete Structural Alteration**
1	Feb. 15, 1994	Feb. 15, 1995	Aug. 15 1995	Aug. 15 1996
2	Feb. 15, 1994	Aug. 15, 1995	Feb. 15, 1996	Feb. 15, 1998
3	Feb. 15, 1994	Feb. 15 2001	Feb. 15, 2002	Feb. 15, 2004
4	Feb. 15, 1994	Feb. 15, 2003	Feb. 15, 2004	Feb. 15, 2006

Rent Pass-Through:

In 2013, San Francisco's Rent Control Board granted property owners the ability to pass through 100% of retrofit costs to tenants with a monthly cap of ten percent of the current rent—approximately $74.00 per month.

Current Program Administration:

The San Francisco Department of Buildings Inspection managed the city's former URM program and currently operates the city's existing soft-story retrofit program. During the peak of San Francisco's URM mitigation efforts, the Department of Building Inspection created an entire unit dedicated to training city officials to conduct URM inspections and perform related administrative tasks.

LOS ANGELES, CA

URM Program Established: 1981
URM Buildings Identified: 8,079
Financial Assistance: None

Program Description and Status Update:

The City of Los Angeles launched the largest mandatory local government retroactive seismic safety program in the United States when the City Council passed an ordinance in 1981. Division 88, enacted in 1981, was the city's ordinance mandating seismic upgrades for all unreinforced masonry bearing wall buildings constructed prior to 1934. Retrofit standards were later upgraded and enacted in 1984. The initial survey of URM's in Los Angeles occurred around the same time that the ordinance passed and identified 8,079 URM buildings that were out of compliance with Division 88.[15]

As of 1992, two-thirds of the 8,100 identified URMs had been strengthened or were under construction and less than 20% had been demolished. In 2006 the Seismic Safety Commission reported that 1942 URMs had been demolished, 6133 retrofitted, and only 4 remained to be demolished or retrofitted. Currently, no unreinforced masonry buildings remain in the City of Los Angeles. In 2015, the city adopted Ordinance No. 183893 to address the city's approximately 15,000 soft-story buildings, requiring property owners to seismically upgrade their soft-story properties within seven years. Additionally, the city has mandated that owners of non-ductile concrete buildings that are subject to the city's ordinance have 25 years to complete seismic retrofit construction.

Financial Support:

The Los Angeles City Council initially considered financial incentives for seismic retrofits but opted to enact the mandatory ordinance without resolving the issue of financial assistance. The city did attempt to enact a bond program to fund URM retrofits in 1989, the measure did not receive enough votes from the public. As a result, there was no comprehensive financial assistance program for seismic retrofits in Los Angeles. Nevertheless, there were a few fragmentary financing options that became available during the city's mitigation efforts:

- The City's Community Development Department funded 27 retrofits using $29 million in federal CDBG monies
- The city used $32 million in redevelopment funds to finance seismic retrofits for 50 URMs
- Two retrofit projects were funded by tax-exempt revenue bonds authorized by the state legislature in 1984
- Some property owners took advantage of a state law that exempts seismic retrofits from property tax increases, and several owners of historic URM buildings used federal tax credits.

15 California Seismic Safety Commission. "Status of the Unreinforced Masonry Building Law: 2006 Progress Report to the Legislature." SSC 2006-04, 9 Nov. 2006.

Out of the roughly $1.7 billion spent on URM retrofits and replacements in Los Angeles, less than 10% came from government finances.

Building Classification and Compliance Schedule:

Rating Classifications		
Class	**Rating**	**Definition**
I	Essential	Any building housing a hospital or other medical facility having surgery or emergency treatment areas, fire or police stations, municipal government disaster operation and communication centers.
II	High Risk	Any building not classified as an essential building having an occupant load of 100 occupants or more.
III	Medium Risk	Any building not classified as a high-risk building or an essential building having an occupant load of 20 occupants or more.
IV	Low Risk	Any building not classified as an essential building having an occupant load of less than 20 occupants.

Time Limits for Compliance			
Required Action by Owner	**Obtain Building Permit Within**	**Commence Construction Within**	**Complete Construction Within**
Complete Structural Alterations or Building Demolition	1 Year	180 Days (from date of permit issuance)	3 Years
Wall Anchor Installation	180 Days	270 Days	1 Year

Rent Pass-Through:

Building owners are permitted to pass through 50% of seismic retrofit costs amortized over 120 months with a monthly cap at $38 per month. If the monthly amount approved exceeds $38 per month, the timeframe for collection may be extended until the full cost recovery is obtained.

Current Program Administration:

The information regarding staffing and administrative expenses associated with retrofit programs in Los Angeles is extremely limited. The city's current Soft-Story Retrofit Program and Non-Ductile Concrete Retrofit programs are managed by the Los Angeles Department of Building and Safety, as was the city's former Unreinforced Masonry Retrofit Program.

SALT LAKE CITY, UTAH

URM Program Established: 2016
URM Buildings Identified: 31,892 (residential)
Financial Assistance: FEMA Grants, Revolving Loan Fund

Program Description and Status Update:

Salt Lake City (SLC) is one of the most recent cities to establish a program to address unreinforced masonry. Salt Lake's inventory revealed 31,892 residential unreinforced masonry buildings in the city. It is important to note that this number includes single-family residences, which is why it is substantially higher than other peer cities. Of these properties, 462 are multi-unit homes. Of the 1228 Salt Lake County buildings that are expected to completely collapse in the next large earthquake 888 of those are in SLC. And of those 888 at-risk buildings, 15% have 20 or more dwelling units in them.

The principal contributing factor to SLC's large concentration of URM buildings is the lack of implementation of strong seismic codes until the late 1980s. Additionally, the city still remains without a mandatory seismic retrofit ordinance due to several failed attempts at passing one, and it is not likely to do so in the near future. As a result, the bulk of people who have performed seismic retrofits since those codes were updated in the 1980's are property owners who chose to do it voluntarily or those who did a substantial enough renovation to trigger them to go through the city's permitting process.

Building Classification and Compliance Schedule

There is no enforced timeline for compliance at this time, and there is unlikely to be one until a seismic ordinance passes.

Financial Support:

Fix the Bricks Program[16]

Salt Lake City's Fix the Bricks Program is a hazard mitigation program designed to assist homeowners with the costs of seismic structural improvements to their unreinforced masonry residences. The program operated for three years as strictly an educational campaign to raise awareness about the dangers of leaving unreinforced masonry homes un-retrofitted. Buy-in from homeowners lacked until Salt Lake City later applied for and received FEMA's Pre-Disaster Mitigation Grant Program funds in 2016, which helped es-

16 Salt Lake City Office of Emergency Management. "Fix the Bricks." SLC.gov, www.slc.gov/em/fix-the-bricks/.

tablish the Fix the Bricks pilot grant program. If a property owner is accepted into the program, the grant will cover up to 75% of the retrofit costs and the homeowner will be responsible for the remaining 25%. Although there are a number of seismic upgrades that can be done to a property that will improve its performance during a seismic event, funds under this program can only be allocated towards the two deficiencies the Utah Seismic Safety Commission deems top priority: the strengthening and bracing of special features (chimneys) and anchoring the roof to URM walls.

In the pilot year of the program the goal was to complete seismic upgrades on 50 homes. After a press conference where the SLC mayor publicly endorsed the initiative, the Fix the Bricks Program received 600 grant applications within 48 hours. At the conclusion of the application window for the pilot program, Fix the Bricks received over 800 applications and 44 projects were accepted. After receiving $507,500 in FEMA grant money during the 2016 funding cycle, retrofit construction on the first round of homes was completed between September 2017 and February 2018. In an effort to expand the program in the second year, Fix the Bricks has accepted 100 homes and has 50 alternates in case any property owners drop out. In this current funding cycle, the city expects to receive $1,916,395.50 in FEMA funds to finance these projects. There are currently 1,455 applicants on the program's wait list.

Preservation Utah's Revolving Fund Loan Program[17]

Preservation Utah, a private, not-for-profit formerly known as the Utah Heritage Foundation, was established in 1966 to preserve and protect Utah's historic built environment through public awareness, advocacy and active preservation. One of Preservation Utah's active preservation mechanisms is its low-interest revolving loan fund which provides historic building owners with loans to perform seismic upgrades. To be eligible, a building must generally be at least 50 years old and retain its original architectural integrity. The loans are paid off monthly based on a 20-year amortization schedule, but the payment term for the loan is 5 years with a balloon payment of the remaining principal and interest due at the end of the fifth year. The interest rate is fixed at one-half of the prime interest rate at the time the loan application is approved.

Rent Pass-Through:

There are no regulations in place in Salt Lake City that prohibit property owners from passing through capital improvement costs to tenants in the form of rent increases. Participants in Fix the Bricks are generally the owners and occupants of the retrofitted homes, so this is not a prevalent issue at this time.

Current Program Administration:

Staffing and administrative costs are covered by both the City and FEMA grant money. Staffing costs for the Fix the Bricks program include expenses for one full time program administrator and one full time clerical assistant within the Salt Lake City Office of Emergency Management. Additional assistance for internal tasks from City staff is provided by the Planning, Finance, IMS, Historic, and Permitting departments. Lastly, the city has contracted external consultants to conduct engineering reports, scopes of work and home evaluations for the purposes of grant application documentation, and these contract services are paid for with the grant. Due to the expansion of the program to impact more homes, the administrative costs are projected to increase this year. As a result, homeowners can expect to pay closer to 30% for their retrofit costs as opposed to the initial 25% in the first year of the program.

17 Preservation Utah. "Low-Interest Loans." Preservation Utah, preservationutah.org/resources/tools-for-property-owners/low-interest-loans.

CALIFORNIA'S STATEWIDE SEISMIC RETROFIT FINANCIAL ASSISTANCE PROGRAMS

CALIFORNIA SEISMIC SAFETY CAPITAL ACCESS LOAN PROGRAM (CALCAP/SEISMIC SAFETY)

Program Description:

The California Capital Access Program (CalCAP) was established in 1994 and is managed by the California Pollution Control Financing Authority (CPCFA). CPCFA was founded in 1973 and is a statewide financing authority aimed at stimulating environmental cleanup, economic development and job growth throughout California through the use of bonds, credit enhancements and grants.

The CalCAP program encourages banks and other financial institutions which have a principal office in the State of California to make loans to small businesses that have difficulty obtaining financing. CalCAP also provides for specialty programs targeted toward creating more charging stations for electric vehicles, helping at-risk small businesses comply with requirements of the federal Americans with Disabilities Act, assisting small businesses and property owners with financing the costs to seismically retrofit existing buildings and homes, and retrofitting polluting diesel trucks.

On June 25, 2016, Senate Bill 837 was signed by the Governor of California which allocated a $10 million, one-time appropriation to CPCFA to fund the California Seismic Safety Capital Access Loan Program. The purpose of the program is to incentivize private financing for small businesses and residential property owners to offset costs associated with seismic retrofits on buildings and homes. Proceeds from loans enrolled in the CalCAP/Seismic Safety Program may be used for seismic retrofit construction alterations performed on or after January 1, 2017.

As of March 5, 2018, only one financial institution was participating in the CalCAP/Seismic Safety Program—Pacific Bank Enterprise.

Program Terms[18]:

- Building owners obtain:

  1. certification that their building is hazardous and in danger of collapse in the event of a catastrophic earthquake from the local building code enforcement authority;

  2. cost estimate(s); and

  3. necessary permit(s).

- Building owners reach out to participating lenders for financing, based on the lender's own underwriting standards.

- Lenders and borrowers deposit between 2 and 3.5% of the total loan amount into the lender's CalCAP/Seismic Safety loan loss reserve account.

- CPCFA contributes up to 4 times the amount of the lender's fee to the CalCAP/ Seismic Safety loss reserve account depending on the length of coverage of the loan. CPCFA contributes an additional amount up to 2 times the lender's fee for buildings in economically distressed areas.

- Loans up to $250,000 can be enrolled for a maximum of 10 years.

- Earthquake Brace + Bolt (EBB) Program

Program Description and Status Update[19]:

Established by the California Residential Mitigation Program (CRMP) in 2013, the Earthquake Brace + Bolt program offers up to $3,000 to help California homeowners retrofit their home to reduce potential damage from earthquakes. CRMP is a joint powers authority formed by the California Earthquake Authority (CEA) and the Governor's Office of Emergency Services (Cal OES). Upgrades that are eligible for funding include bolting the house to its foundation and adding bracing around the perimeter of a home's crawl space. The program is presently funded with contributions from the California Earthquake Authority's Mitigation Fund.

In 2013 the EBB pilot program randomly selected houses in two ZIP Codes in Los Angeles and two ZIP Codes in Oakland. By April 2014, eight homes in these areas had been retrofitted in part or in full through EBB grants. In 2015, EBB expanded to 28 ZIP Codes in Oakland, San Francisco, San Leandro, Los Angeles, Pasadena, Santa Monica and Napa. The 2015 goal was to complete 600 retrofits, and as of the close of the 2015 EBB program, 527 retrofits had been completed. Plans to expand the program for 2016 were developed and implemented, further growing the program to 105 ZIP Codes in 18 cities. The CRMP governing board approved 600 EBB retrofits for the 2016 program. Additionally, the State of California appropriated an additional $3 million to the California Department of Insurance in order to complete

18 California Department of Housing and Community Development. "CalCAP/Seismic Safety Financing Program." California Pollution Control Financing Authority. www.hcd.ca.gov/community-development/building-blocks/docs/CalCAP_Seismic-Safety.pdf.

19 "About Earthquake Brace Bolt." *California Residential Mitigation Program*, earthquakebracebolt.com/

an additional 1,000 retrofits in 2016. In 2018, the California Earthquake Authority (CEA) authorized $6 million in funding for the grants, which is enough to support an additional 2,000 or more code-compliant seismic retrofits this year. Additionally, CEA offers homes with qualifying retrofits discounts of up to 20 percent on CEA earthquake insurance premiums. The 2018 program is now available in 50 cities:

Northern California		Southern California	
Albany	Piedmont	Alhambra	Redlands
Berkeley	Redwood City	Altadena	San Bernardino
Burlingame	San Bruno	Claremont	San Fernando
Colma	San Carlos	Colton	San Gabriel
Daly City	San Francisco	Fillmore	San Marino
El Cerrito	San Leandro	Glendale	Santa Barbara
Emeryville	San Mateo	Granada Hills	Santa Monica
Eureka	Watsonville	La Crescenta	Santa Paula
Hayward	Woodside	La Verne	Sierra Madre
Hillsborough		Los Angeles	South Pasadena
Los Gatos		Mission Hills	Sun Valley
Millbrae		Monrovia	Valley Village
Napa		Montecito	West Hollywood
Oakland		Pasadena	

FINANCIAL ASSISTANCE FOR NON-SEISMIC RESILIENCY EFFORTS

Program Summaries

In this section we aggregated and reviewed financial assistance and incentive programs for non-seismic related risk mitigation efforts. Examining what local governments are doing in other regions to increase overall resilience against natural disasters allows the City of Seattle to better assess which financial mechanism(s) may be effective for its URM mitigation efforts. Many finance programs listed this section are located in regions of the U.S. that are prone to floods, high winds, and hurricanes.

Shore Up Connecticut Loan Program

Location: Connecticut
Financing Mechanism Used: Revolving Loan Fund
Program Description: Shore Up Connecticut is a low-interest loan program to provide financing to retrofit structures to be more resilient to impacts from flooding and extreme storms[20]. Both home and business owners are eligible for loans under the program4. Eligible properties include primary and secondary single family homes, 1 to 4-unit owner-occupied multi-family rental properties, and businesses with fewer than 100 employees. Properties must also be located in a flood hazard zone and in a listed coastal municipality. Loans are available at competitive terms (2.75 % fixed interest rate / 2.894% APR) with a 1% origination fee for loans of $10,000 to $300,000 with a 15-year term. Borrowers must maintain flood and other insurance for the life of the loan and must be up-to-date on taxes. The program will also have the benefit of helping homeowners elevate homes, which can reduce their flood insurance rates under the National Flood Insurance Program (NFIP). The Shore Up program is administered by the Housing Development Fund, a nonprofit organization established in the state to finance the development of affordable housing. The program is funded by $25 million in bond funding authorized by Connecticut legislature in 2014.

Virginia Shoreline Resiliency Fund

Location: Virginia
Financing Mechanism Used: Revolving Loan Fund
Program Description: In 2016, the Commonwealth of Virginia established the Virginia Shoreline Resiliency Fund, a revolving loan fund for local governments to "help residents and businesses that are subject to recurrent flooding as confirmed by a locality-certified floodplain manager."[21] The fund is administered by the Virginia Department of Emergency Management. The fund is modeled after *Shore Up Connecticut*. However, in contrast to that program, the Virginia Shoreline Resiliency Fund uniquely provides loans for developments needed to prevent not only known recurrent flooding risks, but also for resiliency to predicted or future coastal flooding, such as from sea-level rise. Under the law, the fund can draw from multiple, different sources of revenue including money appropriated by the Virginia General Assembly, repayment of local government loans made through the fund, and "any other sums designated for deposit to the Fund from any source, public or private." *As of May 2018, the fund has not been allocated money from any source and the Department of Emergency Management has not developed guidance for the loan program or awarded any loans.*

Residential Hurricane Mitigation Program

Location: Florida
Financing Mechanism Used: Grants
Program Description: REBUILD Northwest Florida is a not-for-profit 501(c)(3) organization that manages the Residential Hurricane Mitigation Program which helps repair and strengthen homes to better resist high wind events.[22] The program is funded through the Florida Department of Emergency Management using allocations from FEMA's Hazard Mitigation Grant Program. Successful applicants receive FEMA funding for 75% of the cost of improvements and the homeowner covers the remaining 25%, and REBUILD takes care of all the work. After a home is fortified through REBUILD Northwest Florida property owners are typically eligible for discounts on their windstorm insurance premium. Often homeowners find that their insurance discounts will amortize their 25% cost share for their house-hardening in just a few years. Due to the success of its Residential Hurricane Mit-

20 "Shore Up Connecticut Loan Program." Adaptation Clearinghouse, 29 Oct. 2013, www.adaptationclearinghouse.org/resources/shore-up-connecticut-loan-program.html.
21 "Virginia Shoreline Resiliency Fund." Adaptation Clearinghouse, 20 Apr. 2016, www.adaptationclearinghouse.org/resources/virginia-shoreline-resiliency-fund.html.
22 "About REBUILD Northwest Florida." REBUILD Northwest Florida, www.rebuildnwf.org/about/.

igation Program, REBUILD has received $89 million in FEMA funds and has grown into a public/private partnership that **has completed over 13,000 home mitigation projects.**

Hurricane Loss Mitigation Program

Location: Florida
Financing Mechanism Used: Grants
Program Description: The Florida's Division of Emergency Management created the Hurricane Loss Mitigation Program in 1997 to act as a specialized, state-funded mitigation program aimed at minimizing damages caused by hurricanes.[23] The program, which is sometimes known as the Residential Construction Mitigation Program (RCMP), began as an active response to the devastation brought by Hurricane Andrew, specifically to the insurance Market in the State of Florida. With an annual budget of $7 million, provided by the Florida Hurricane Catastrophe Trust Fund, the program is funding activities that promote property resiliency through retrofits made to residential, commercial, and mobile home properties, the promotion of public education and public information, and through hurricane research activities. Roughly fifty-percent ($3.4 million) of the $7 million grant goes towards funding the actual retrofit project costs. Forty-percent of the $7 million total ($2.8 million) shall be used to inspect and improve tie-downs for mobile homes. And the remaining ten-percent is allocated to Florida International University to be applied to research and outreach conducted by the International Hurricane Research Center[24].

SoonerSafe – Safe Room Rebate Program

Location: Oklahoma
Financing Mechanism Used: Grants
Program Description: SoonerSafe was developed in 2011 by the Oklahoma Department of Emergency Management to provide a rebate for purchase and installation of safe rooms for Oklahoma homeowners.[25] The program is funded through FEMA's Hazard Mitigation Grant Program and applications are selected at random to ensure fairness. Construction industry experts estimate the cost to range from $2,500 to $8,000 or more to install a safe room. A maximum rebate of $2,000 is available per home, not to exceed 75 percent of the actual cost of the safe room. Once selected and participation is confirmed, homeowners may then hire a contractor to install the safe room on their property and submit all of the required documentation upon project completion. Requested documents will then be reviewed by OEM and FEMA and rebate checks will be remitted to homeowners.

Strengthen Alabama Homes

Location: Alabama
Financing Mechanism Used: Grants
Program Description: Strengthen Alabama Homes is a legislatively established grant program managed by the Alabama Department of Insurance.[26] It provides residents of Baldwin and Mobile Counties in Alabama for residential wind mitigation on existing, owner occupied, single family homes. The Strengthen Alabama Homes grant program's mission is to lower insurance rates in Alabama by mitigating as many homes as possible in Baldwin and Mobile County. Funding for this program comes from increased licensing fees for insurers who do business in Alabama and is not funded from the state's general budget, nor is it tied to a federally funded program. Funding for the grants come from contributions by the insurance industry and other entities to this program. Although a state agency administers this program, funding does not come from Alabama's General Fund nor does it come from any Federal programs such as FEMA. The grant amount issued for this program will cover 100% of the cost of the mitigation up to $10,000. The applicant is responsible for paying all costs for their mitigation project that exceed $10,000. This grant must be applied to a mitigation project that meets all other program requirements and completes a Fortified designation.

SC Safe Home Mitigation Grant Program

Location: South Carolina
Financing Mechanism Used: Grants
Program Description: The South Carolina Safe Home Mitigation Grant program, administered by the South Carolina Department of Insurance, provides grant money to individual homeowners to make their property more resistant to hurricane and high-wind damage.[27] The funds provided by this program are for the sole purpose of retrofitting owner-occupied, single-family homes. Implementation of this program is subject to annual legislative appropriations. All grants will be determined based on the cost of the mitigation project and a percentage of the total adjusted household income of the applicant per the most recent federal tax return. Applicants with a total annual adjusted gross household income that is less than eighty percent (80%) of the median annual adjusted household income within the county in which the home is located may be eligible for a maximum grant award amount of $5,000. If total annual adjusted income is greater than (80%), the awarded amount may not exceed $4,000. If the cost of the mitigation project exceeds the amount of the grant award, the remaining cost is the homeowner's responsibility.

23 "Hurricane Loss Mitigation Program." Florida Disaster, Florida Division of Emergency Management, www.floridadisaster.org/dem/mitigation/hurricane-loss-mitigation-program/.
24 Florida Division of Emergency Management. "Hurricane Loss Mitigation Program." Florida State Board of Administration, 6 Aug. 2016, www.sbafla.com/fhcf/Portals/FHCF/Content/AdvisoryCouncil/2014/1014/20141014_RCMP_Handout.pdf?ver=2016-06-08-091005-443.
25 State of Oklahoma. "SoonerSafe Safe Room Rebate Program." OK.gov, www.ok.gov/OEM/Programs_&_Services/SoonerSafe_Safe_Room_Rebate_Program/Rules_&_Regulations.html.
26 Alabama Department of Insurance. "Frequently Asked Questions." Strengthen Alabama Homes, strengthenalabamahomes.com/content/pdfs/sahfaqs.pdf.
27 "SC Safe Home." State of South Carolina Department of Insurance, www.doi.sc.gov/605/SC-Safe-Home.

General Insurance-Based Incentives for Hurricane/Wind Mitigation[28]

Table 1. Insurance premium incentives for states along the Atlantic and Gulf coasts	
Alabama	Mandates that insurers provide the Department of Insurance with actuarially justified rating plans containing appropriate discounts. These are available to any owner who builds or retrofits insurable property in any county contiguous to the Gulf of Mexico and Mobile Bay, to mitigate loss due to hurricane or other catastrophic windstorm events.
Florida	Requires insurance companies to offer discounts, promulgated by the Office of Insurance Regulation, for features demonstrated to reduce windstorm losses. These discounts apply only to the windstorm (including non-hurricane wind) portion of policies.
Louisiana	Mandates that insurers provide a premium discount to homeowners who build or retrofit a structure to comply with the State Uniform Construction Code using construction techniques that reduce the amount of damage from a windstorm or hurricane. Discounts vary by company.
Maryland	Requires insurers to offer at least one actuarially justified premium discount to policyholders who submit proof of improvements made to mitigate loss from a hurricane or other storm. Premium discounts can total 45% of the original policy's premium.
Mississippi	Mandates that insurers give wind mitigation credits to qualified new and existing homeowners in Harrison, Hancock, Jackson, Stone, and Pearl River counties. Discounts vary by insurer and can reach 30% of total premium for the Mississippi Windstorm Underwriting Association (wind pool).
New York	Homeowners can qualify for credits by installing storm shutters or hurricane-resistant laminated glass meeting specified standards for withstanding wind pressure and the impact of wind-driven debris.
South Carolina	Insurers are required to file rating plans for properties in the coastal and seacoast areas, with mitigation discounts and credits or surcharges and debits for rating factors, including the use of storm shutters, roof tie-downs, having flood insurance, and elevation. Discounts vary by insurer.
Texas	The state's hurricane insurance pool, the Texas Windstorm Insurance Association, offers premium discounts of 19% to 33% for building code compliance. Windstorm insurance discounts are available for qualifying new homes or for existing structures on which exterior openings have been retrofitted with windborne debris-resistant products.

28 "Improving Wind Mitigation Incentives." AIR Worldwide, 21 Aug. 2013, www.air-worldwide.com/Publications/AIR-Currents/2013/Improving-Wind-Mitigation-Incentives/.

APPENDIX B - COST ESTIMATE STUDY SUMMARY

	Anew Terry[1]	Anew Terry[1]	Building A	Building B	Building C	Building D	Building E	Building F	Building G	Building H	Building I	Building J
Retrofit Type	Bolts +	Full Seismic	Full Seismic	Full Seismic	Bolts +	Bolts +	Bolts +	Bolts +	Bolts +	Bolts ++	Bolts ++	Bolts ++
Historical	No	No	No	Yes	No	No	No	Yes	No	Yes	Yes	No
Condition	Excellent	Excellent	Below Average	Good	Good	Good	Below Average	Average	Good	Good	Good	Good
Complexity	Medium	Medium	Medium	Medium	Low	Low	High	High	Low	Low	Low	Low
Occupied During?	No	No	No	No	No	No	Phased	Phased	Yes	Yes	No	No
Soil Condition	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Poor	Good
Occupancy Type	MF	MF	MF	Mixed-Use	MF	MF	MF	Residential	MF	R+O	R+O	R+O
Floors	5	5	6+Basement	2	3	4	1	4+Basement	4	6	4	4
Square Footage	40,877	40,877	38,000	4,500	23,000	46,000	3,000	23,176	800	85,000	30,000	42,000
Hard Cost Subtotal	$1,185,200	$1,932,400	$2,152,700	$351,000	$379,500	$759,000	$126,000	$1,274,680	$28,800	$1,360,000	$900,000	$1,344,000
Sales Tax	$118,520	$193,240	$215,270	$35,100	$37,950	$75,900	$12,600	$127,468	$2,880	$136,000	$90,000	$134,400
Hard Cost/SF incl. Tax	$32	$52	$62	$86	$18	$18	$46	$61	$40	$18	$33	$35
Contingency	$118,520	$193,240	$215,270	$35,100	$37,950	$75,900	$12,600	$127,468	$2,880	$136,000	$90,000	$134,400
Contingency Sales Tax	$11,852	$19,324	$21,527	$3,510	$3,795	$7,590	$1,260	$12,747	$288	$13,600	$9,000	$13,440
Engineering Investigation	$59,260	$96,620	$107,635	$17,550	$18,975	$37,950	$6,300	$63,734	$1,440	$68,000	$45,000	$67,200
Soft Costs	$94,816	$154,592	$172,216	$28,080	$30,360	$60,720	$10,080	$101,974	$2,304	$108,800	$72,000	$107,520
Full Project Cost	**$1,588,200**	**$2,589,468**	**$2,884,680**	**$470,426**	**$508,548**	**$1,017,078**	**$168,886**	**$1,708,132**	**$38,632**	**$1,822,418**	**$1,206,033**	**$1,800,995**
Full Project Cost/SF	**$39**	**$63**	**$76**	**$105**	**$22**	**$22**	**$56**	**$74**	**$48**	**$21**	**$40**	**$43**

[1] See Appendix C for the full details of Anew Apartment's Terry Building Case Study

Source: Data provided by the ASAP Seismic Working Group

ANEW

TERRY

URM Cost Analysis

October 2018

423 Terry Property Info

Area of City: **First Hill, Seattle**

Description: **(5) Stories**

Estimate Date: **8/6/18**

Type: **URM–over 40% Piers**

Gross S/F: **40,877**

Specifications: **All detail call-outs per Terry 2018**

BUILDING DETAILS

Number of Floors: **5 ea**

Building Footprint: **8,250 sf**

Perimeter: **460 lf**

Parallel: **230 lf**

Perpendicular: **230 lf**

SUMMARY OF CONSTRUCTION COSTS

Full Seismic Upgrade
Total Estimated Costs:
$2,050,759 | $50.17 sf*

Bolts Plus Update
Total Estimated Costs:
$1,253,729 | $30.67 sf*

*If converted to sf Cost

Report Contributors:

BRAD PADDEN, Anew Apartments

Anew focuses on improving Seattle's resiliency by increasing the supply of workforce housing while also improving the safety and performance of some of its most character rich, vintage buildings.

CRAIG HAVESON, STS Construction Services

STS Construction Services has established its hard-earned reputation by finding the best solutions to tough challenges based on a foundation of hard work, innovation and execution.

AARON PAMBIANCO, AJP Engineering

AJP Engineering has extensive experience creating innovative, value engineered solutions to a variety of complex unreinforced masonry challenges.

URM Seismic Upgrade Cost Study—Full Seismic Upgrade

Cost Estimate Details

	Qty	Cost/Unit	Cost	Comments
1. Parapet Bracing				
Parallel - SSK1				*roof (lf) 230*
Cont. channel: C6x8.2	230 lf	$61.60	$14,168.00	
5/8" epoxy anchor @ 2'oc	115 ea	$30.40	$3,496.00	
Standoff: HSS 4x3x.25" @ 8'oc	29 ea	$308.00	$8,855.00	*Galvinized*
Roof Plates: See SSK1	29 ea	$43.00	$1,236.25	*Galvinized*
(2) H2.5 clips @ 24"oc	230 ea	$5.22	$1,200.60	*Requires H2.5 clips and joist hanger nails*
6x6 centered on standoff	29 ea	$163.00	$4,727.00	*6x6 beam cut to fit and labor to install*
2X blocking	230 ea	$12.90	$2,967.00	*2x10 stud cut to fit for blocking; nails and labor to install*
Roof sheathing (R&R)	460 sf	$3.83	$1,761.80	*Requres 2' wide opening spaning length of parapet wall to install stand-off; demo, replace with 1/2" ply, nail down*
Roofing (R&R)	920 sf	$10.04	$9,236.80	*Assumes for smooth torch down to overlap all cuts; roofing material will dictate costs; grandulated torchdown not recommended to patch*
Perpendicular - SSK2				*roof (lf) 230*
cont. channel: C6x8.2	230 lf	$61.60	$14,168.00	
5/8" epoxy anchor @ 2'oc	115 ea	$30.40	$3,496.00	
Standoff: HSS 4x3x.25" @ 8'oc	29 ea	$308.00	$8,855.00	*Galvinized*
Roof Plates: See SSK2	29 ea	$43.00	$1,236.25	*Galvinized includes brace*
(2) H2.5 clips @ 24"oc	230 ea	$5.22	$1,200.60	*Requires H2.5 clips and joist hanger nails*
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2X blocking	230 ea	$12.90	$2,967.00	*2x10 stud cut to fit for blocking; nails and labor to install*
Roof sheathing (R&R)	460 sf	$3.83	$1,761.80	*Requres 2' wide opening spaning length of 6x6 blocking to install stand-off*
Roofing (R&R)	920 sf	$10.04	$9,236.80	*Assumes for smooth torch down to overlap all cuts; roofing material will dictate costs; grandulated torchdown not recommended to patch*
SUBTOTAL			**$95,256.15**	
2a. Roof Attachment				
Parallel - 8/S3.3				**roof (lf) 230**
3/4 epoxy anchor @ 48" oc	58 ea	$98.42	$5,708.36	
Simpson LTT19 @ anchor	58 ea	$23.67	$1,372.86	*Hardware, nails and labor to install*
2x blocking + toe nailing	116 lf	$12.90	$1,496.40	*2x10 cut to fit for blocking; nails and labor to install*
(4) A35 clips (2/bay)	232 ea	$6.10	$1,415.20	
5/8" rod and plate washer	58 ea	$20.57	$1,193.06	
Perpendicular - 7/S3.3				**roof (lf) 230**
3/4 epoxy anchor @ 48" oc	58 ea	$98.42	$5,708.36	
Simpson LTT19 @ anchor	58 ea	$23.67	$1,372.86	*Hardware, nails and labor to install*
2x10 backing	232 lf	$10.90	$2,528.80	
Roof Patches				
Roof Sheathing (R&R)	920 ea	$3.83	$3,523.60	
Roofing (R&R)	1840 sf	$10.04	$18,473.60	*This is 116 2ft x 8ft patches*
SUBTOTAL			$42,793.10	

	Qty	Cost/Unit	Cost	Comments
3. Floor to Wall Attachments: 2nd–4th				
parallel - 12/S3.3				*48”oc @ 4th, original spec doubled frequency for straight bolt use instead of angled bolt 460lf*
3/4 epoxy anchor	517 ea	$98.42	$50,930.23	*32”oc @ 3rd,original spec doubled frequency for straight bolt use instead of angled bolt 460lf*
Simpson LTT19 @ ea. epoxy anchor	517 ea	$23.67	$12,248.71	*24”oc @ 2ndoriginal spec doubled frequency for straight bolt use instead of angled bolt 460lf*
Remove/patch plaster ceilings, paint	517 ea	$500.00	$258,500.00	*Includes masking and demasking, return of unit to original condition*
2x blocking + toe nailing	1035 ea	$12.90	$13,350.94	
(4) A35 clips (2/bay)	2070 lf	$6.10	$12,626.47	
5/8” rod, coupler, and plate washer	517 sf	$20.57	$10,644.53	*$162*
perpendicular (11/S3.3)				
3/4 epoxy anchor	517 ea	$98.42	$50,930.23	*Hardware, nails and labor to install*
Simpson LTT19 @ ea. epoxy anchor	517 ea	$23.67	$12,248.71	
2x10 backing	1034 lf	$10.90	$11,270.60	
remove/patch plaster ceilings, paint	517 sf	$500.00	$258,500.00	*Includes drywall demo, replacement, match existing light texture finish, prime, paint, replace baseboard, and cabinet/counter removal and replace in 3 units*
SUBTOTAL			**$691,250.43**	
4. Floor and Roof Diaphragm Interconnectivity				
2nd- Roof: parallel only (6/S3.3)				*2nd (lf) 258*
CS16x32” @ 32”oc	97 ea	$24.69	$2,388.73	
remove/patch plaster ceilings, paint	194 ea	$500.00	$97,000.00	
SUBTOTAL			**$99,388.73**	
5. Secondary Columns				
1st - Roof				
HSS 3x3x1/4	15 ea	$1,620.13	$24,301.88	
Top plate and base plate (5/S3.3)	ea		$-	*Included in column install*
HSS 4x4x1/4	20 ea	$1,751.25	$35,025.00	
Top plate and base plate (6/S3.2)	ea		$-	*Included in column install*
remove/patch plaster as needed, paint	35 sf	$750.00	$26,250.00	
remove/patch flooring and baseboard	35 sf	$500.00	$17,500.00	*Assumes hw patch only no refinishing of entire floor*
SUBTOTAL			**$103,076.88**	
6. Cross Ties				
Building				
(2) Opposing HDU2 ties (7/S3.2) @ Beam Splices	60 ea	$85.28	$5,116.80	
(2) CS16 straps at columnt-to beam (9/S3.3)	15 ea	$45.00	$675.00	
remove/patch plaster ceilings, paint	135 ea	$500.00	$67,500.00	
SUBTOTAL			**$73,291.80**	

	Qty	Cost/Unit	Cost	Comments	
7. Retro-fit Column Caps and Bases (when not existing)					
Column Caps					
(2) opposing ACE Caps	60 ea	$21.42	$1,285.20		
remove/patch plaster ceilings, paint	0 sf		$-	*included in paithing for cross tie section*	
Column Bases					
Custom fabricated plates (9/S3.0, 10/S3.0)	15 ea	$198.00	$2,970.00		
remove/patch flooring	15 ea	$500.00	$7,500.00	*Assumes hw patch only no refinishing of entire floor*	
SUBTOTAL			**$11,755.20**		
8. Veneer Ties (when venneer wythe occurs)					
Where veneer wythe occurs					
Helical Anchors (20/1.0)	1200 ea	$91.00	$109,200.00		
SUBTOTAL			**$109,200.00**		
9. Cross Walls					
Sheath hall walls - Per CROSSWALL					
1/2" Sheathing; 8D @ 6"oc @ edges, 12"oc field	1285 lf	$22.48	$28,886.80		*5th fl. 263 lf*
remove/patch plaster, paint	12850 sf	$10.80	$138,780.00	*Includes drywall on ceiling also for blocking install and repainting wall and ceiling*	*4th fl. 242 lf*
Baseboard	1485 lf	$3.00	$4,455.00		*3rd fl. 265 lf*
2x blocking @ per. Joist (12/S3.2)	4812 ea	$12.90	$6,216.19		*2nd fl. 265 lf*
A35 Clips (12/S3.2)	964 ea	$5.46	$5,262.08	*Clips, nails and labor to install*	*1st fl. 250 lf*
Anchor. Bolts @ basment	72 ea	$30.40	$2,188.80	*8s3.1*	*Total 1,285 lf*
SUBTOTAL			**$185,788.86**		
10. Tuck-pointing (when Vot<30psi)					
Tuck-point outer wythe of URM					
Testing: (2) locations ea. elevation, ea. floor	40 ea.	$50.00	$2,000.00		
tuck-point	4410 sf	$12.45	$54,904.50	*flr 1-3 @ perimeter*	
SUBTOTAL			**56,905**		
Allowances					
Estimated/Design contingency	$1,468,706	10%	$146,871		
General conditions/Ins/Bond	$1,468,706	10%	$146,871		
General Contractors OH & Profit	$1,468,706	15%	$220,306		
SUBTOTAL			**$514,047**		
GRAND TOTAL—Entire Project		**$48.51 sf**	**$1,982,753**		

URM Seismic Upgrade Cost Study—Bolts Plus Upgrade

Cost Estimate Details

	Qty	Cost/Unit	Cost	Comments
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Parallel - SSK1				*roof (lf) 230*
cont. channel: C6x8.2	230 lf	$61.60	$14,168.00	
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remove/patch plaster ceilings, paint	194 ea	$500.00	$97,000.00	
SUBTOTAL			**$99,388.73**	
5. Allowances				
Estimated/Design contingency	$928,688	10%	92,869	
General conditions/Ins/Bond	$928,688	10%	92,869	
General Contractors OH & Profit	$928,688	15%	139,303	
SUBTOTAL			**$325,041**	
GRAND TOTAL—Entire Project		**$30.67 sf**	**$1,253,729**	

Important points to note

- Excludes Hazmat Remediation
- Excludes tenant displacement costs
- Excludes costs for structural investigation to determine scope
- Excludes moving utilities that are in the way behind existing finishes
- Some buildings could have more kitchens and bathrooms to remove and reinstall
- Cannot roto hammer brick for epoxy bolts must use core drills

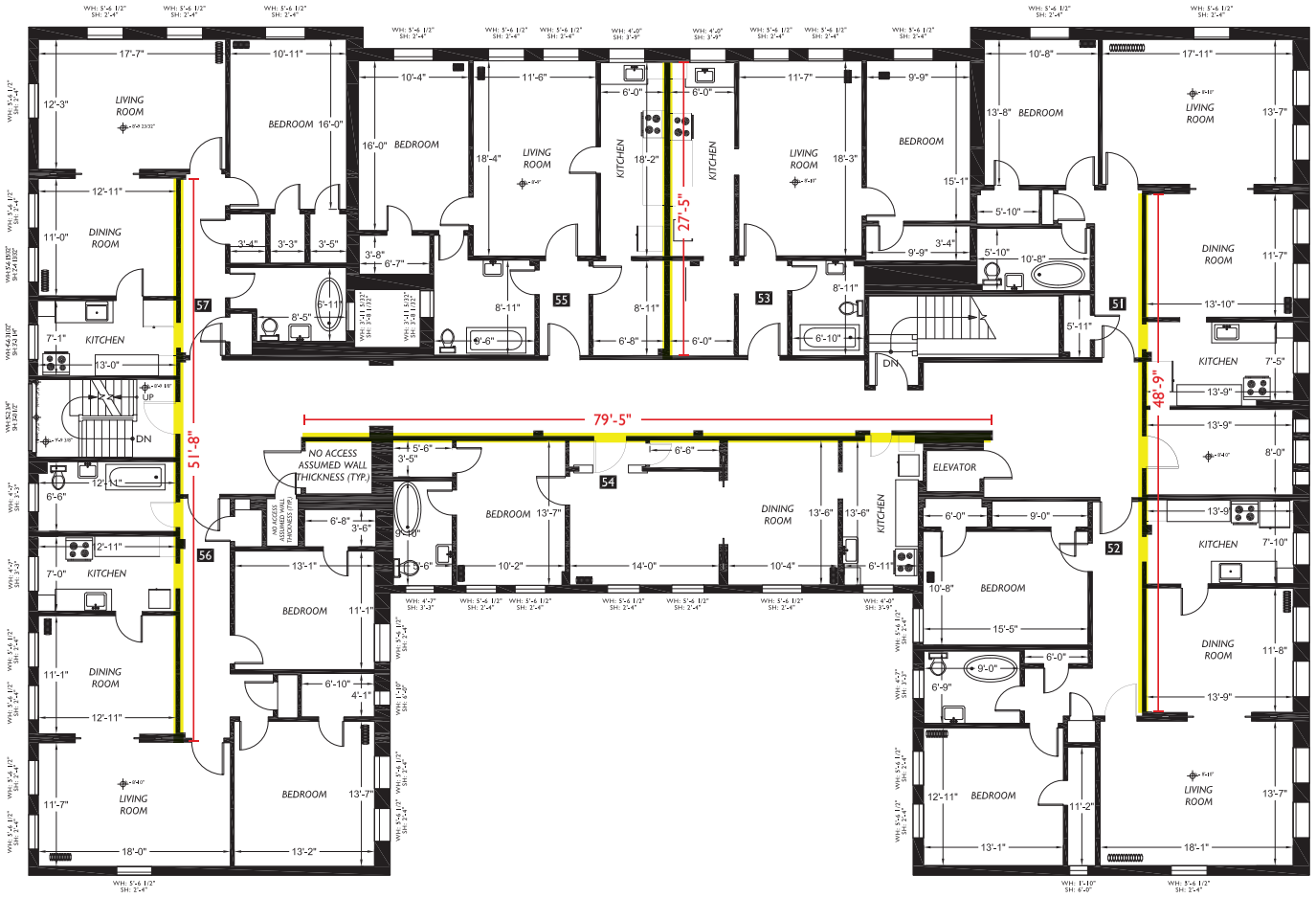
  Core drills use water so more protection of existing finishes is required
- Existing Ship Lap was installed perpendicular to joists
- Used Cross walls to strengthen floor
  (No guarantee this will work for all structures)
- No new floor sheathing was required
- Must determine adequate access routes for full sheets of plywood
- Does not include frames, concrete shear walls, or other lateral systems

  Prism testing and yielded an adequate mortar strength
- Other building performance improvements that could leverage the seismic upgrade work are not included

  Energy updates
  Modernization of units
  New plumbing
  New electrical systems
  Fire sprinklers
  Accesibility improvements
  New roofing

Cross Walls

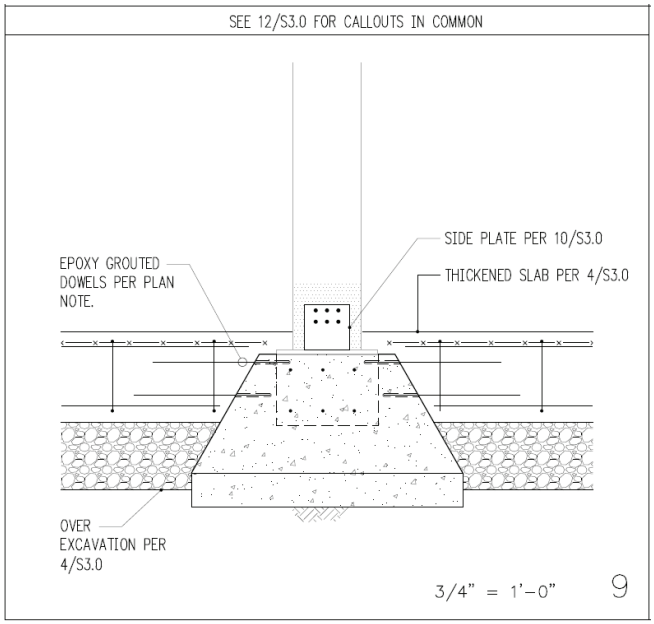
Jefferson Street

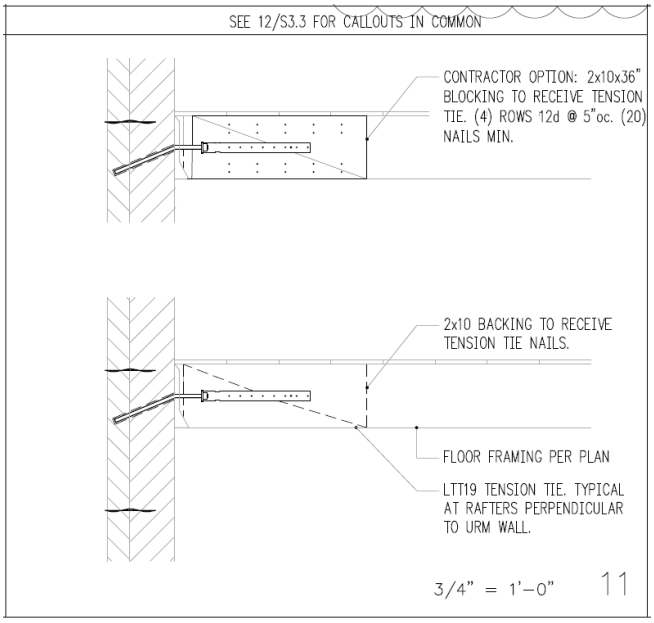


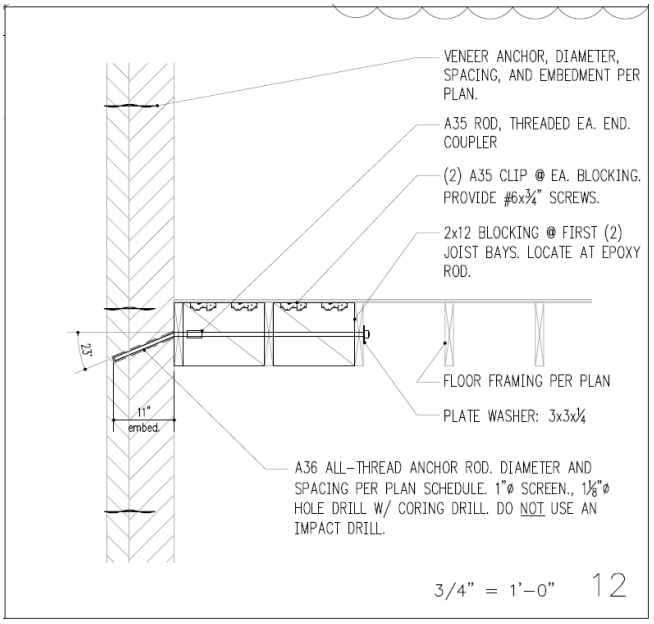
Terry Avenue

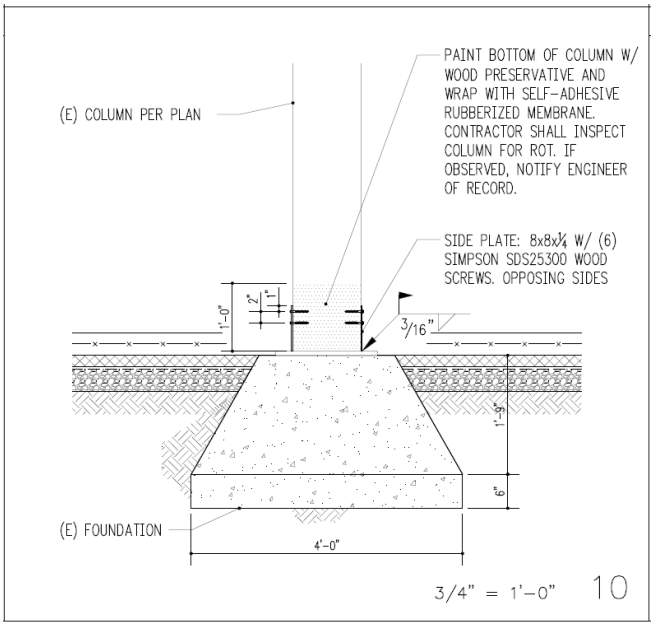
Cadence Builds 423 Terry Avenue Seattle, WA 98109	423 Terry Ave 423 Terry Avenue Seattle, WA 98104	**Floor Plan** 5	3/32" = 1'-0"	2-D AS-BUILT FLOOR PLANS 2DFLOORPLANS.COM 206-328-7410 600 NW Gilman Blvd. Suite E Issaquah, WA 98027	
Client	**Subject**	**Floor**	**Scale**	**Measured:** June 2013	**Project:** C15-577

Structural Details







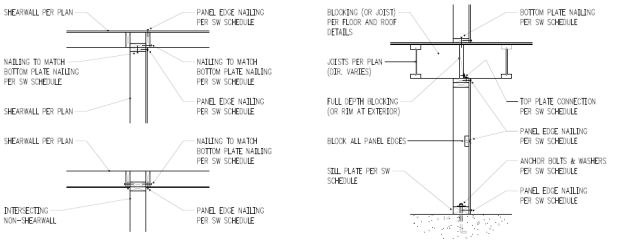


Structural Details

CROSS WALL SCHEDULE

MARK	SHEATHING[1]	STUDS AT ABUTTING PANEL EDGES[2]	PANEL EDGE NAILING[3,4]	RIM JOIST OR BLOCKING TO TOP PLATE		BOTTOM PLATE ATTACHMENT		
				SOLID RIM	TJI RIM	BOTTOM PLATE TO RIM JOIST BELOW[4]	ANCHOR BOLT TO CONCRETE[5]	SILL PLATE AT FOUND.
CSW1 & CSW2	15/32" COX PLYWOOD	2x	8d @ 6"oc	A35 @ 24"oc	12d @ 6"oc	16d @ 6"oc	5/8"ø @ 48"oc	2x

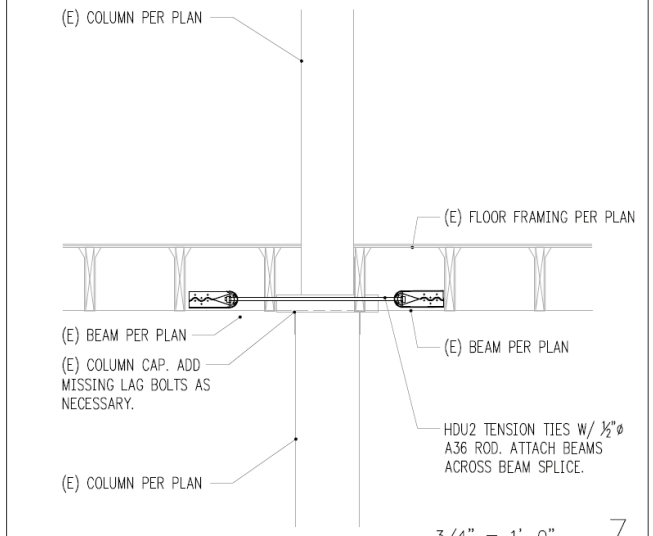
1. WALL SHEATHING SHALL CONSIST OF APA RATED PLYWOOD WITH SPAN RATING 24/0. ALLOW 1/8" SPACING AT ALL PANEL EDGES AND ENDS OF PANELS. 7/16" APA RATED SHEATHING (OSB) MAY BE USED IN PLACE OF 15/32" COX.
2. STUDS AT ABUTTING PANEL EDGES MAY CONSIST OF (2)2x STUDS IN PLACE OF 3x STUDS – NAIL (2)2x STUDS TOGETHER WITH BOTTOM PLATE ATTACHMENT NAILING.
3. BLOCK ALL PANEL EDGES W/ 2x4 FLAT, ATTACH W/ PANEL EDGE NAILING. TWO STUDS MINIMUM ARE REQUIRED AT EACH END OF ALL SHEARWALLS. END STUDS SHALL RECEIVE PANEL EDGE NAILING. INTERMEDIATE STUDS SHALL BE 2x STUDS. NAIL SHEATHING TO INTERMEDIATE FRAMING MEMBERS WITH 8d @ 12"oc.
4. 8d NAILS SHALL BE 0.131" DIAMETER x 2½" (COMMON). 16d NAILS SHALL BE 0.135" DIAMETER x 3½" (BOX).
5. ANCHORS TO CONCRETE SHALL CONSIST OF CAST-IN-PLACE ANCHOR BOLTS, EXPANSION BOLTS, EPOXY GROUTED ALL-THREADS, OR TITEN HD HEAVY DUTY SCREW ANCHORS. CAST-IN-PLACE ANCHOR BOLTS MAKE A 7" EMBED AND SHALL BE J-BOLTS OR SHALL HAVE A HEX NUT AT THE BOTTOM END. EXPANSION BOLTS SHALL HAVE 5" EMBED AND SHALL NOT BE USED AT STEM WALL LOCATIONS WITH EDGE DISTANCE LESS THAN 5". (INSTEAD, USE EPOXY GROUTED ALL-THREADS OR TITEN HD ANCHORS). EPOXY GROUTED ANCHORS SHALL HAVE 5" EMBED AND 2½" MIN. EDGE DISTANCE. TITEN HD ANCHORS SHALL HAVE 3½" EMBED AND 1¾" MIN. EDGE DISTANCE. AT ALL ANCHOR BOLTS, PROVIDE STEEL PLATE WASHERS THAT ARE A MINIMUM OF 0.229" (3 GAUGE) x 3"x 3" (SIMPSON BP3)9–3 OR SIMILAR). PLACE BOLTS PER ANCHOR BOLT PLACEMENT DETAIL.



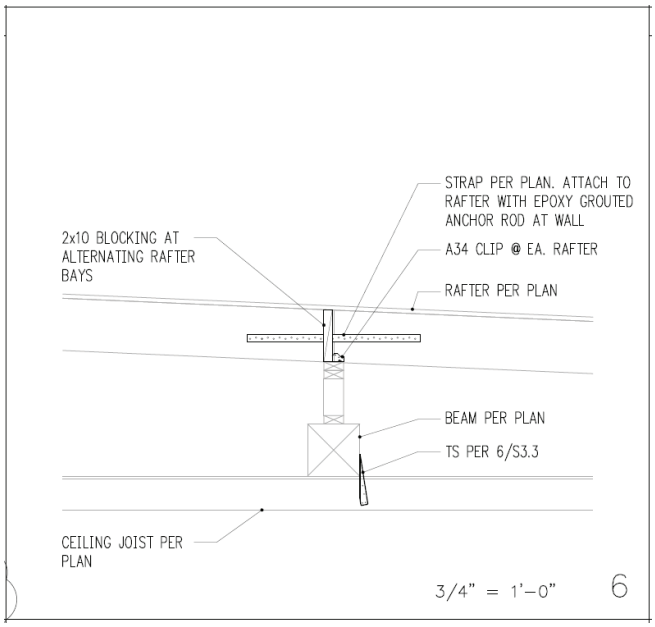
TYPICAL CROSSWALL INTERSECTIONS

TYPICAL CROSSWALL SECTION

3/4" = 1'–0" 8

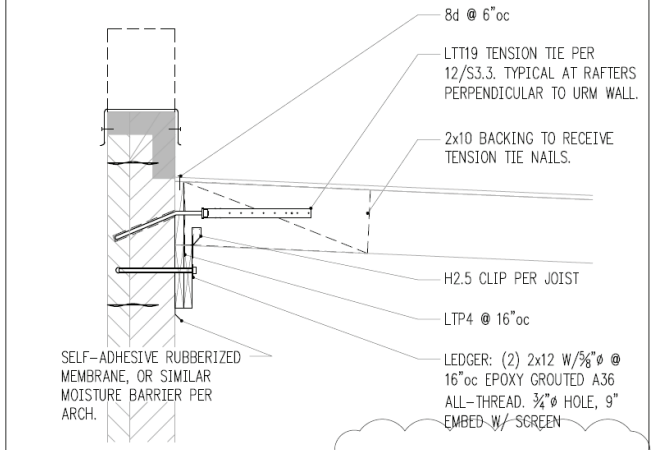


3/4" = 1'–0" 7



3/4" = 1'–0" 6

SEE 8/S3.3 FOR CALLOUTS IN COMMON



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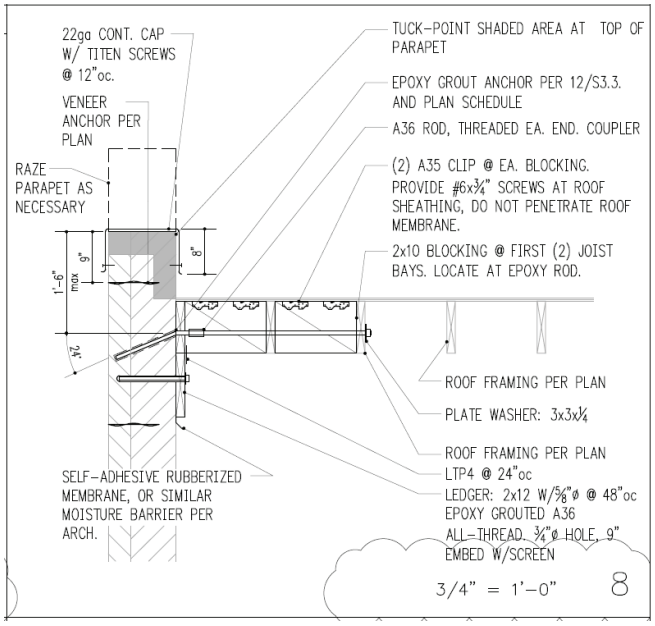
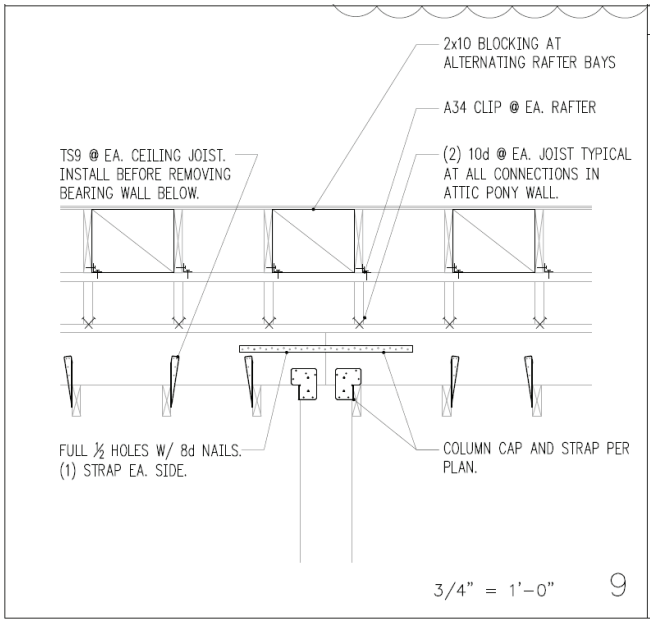
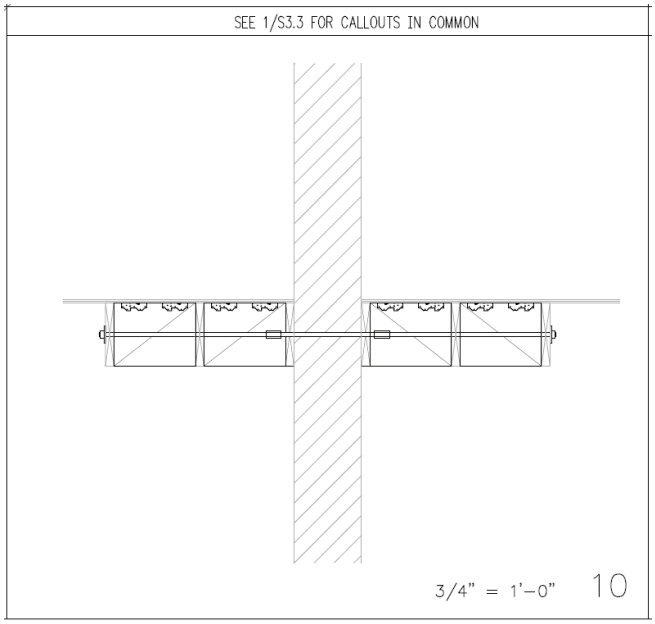
Structural Details







ANEW

TERRY

423 Terry Avenue
Seattle, WA 98109

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URM Retrofit Credit Proposal and Working Group Recommendations

The presence of over 1,100 unreinforced masonry (URM) buildings in the City of Seattle, not to mention many more across the state, poses a grave and persistent threat to public safety, affordability and the preservation of the City's historic legacy. Animated by the belief that this situation can only be effectively addressed through the passage of mandatory retrofit legislation, in late 2017 Nitze-Stagen and Anew Apartments, two developers focused on the restoration and adaptive reuse of older (often URM) buildings in Seattle, began meeting with City officials, developers (both market-rate and affordable), URM property owners, historic preservationists, engineers, policy experts and neighborhood associations. The purpose of these meetings was to explore ways to overcome the obstacles to passage of such legislation - principal among them the challenge of financing the significant cost of seismic upgrades.

Starting in late March through late June of this year, three roundtables consisting of a broad cross-section of representatives of the groups listed above met to discuss creative financing approaches, and to identify the other key challenges associated with a City-wide retrofit program.

These discussions led to the formation of four separate working groups focused on addressing the leading concerns raised by the roundtable participants: 1) physical and economic displacement of tenants of URMs; 2) delays in regulatory review and approval of retrofit applications; 3) engineering challenges and estimated cost of meeting the proposed technical specifications; and 4) the need to provide an incentive structure not just for seismic, but also for environmental upgrades.

Each working group, consisting of a similar cross-section of concerned stakeholders, met two or three times between mid-September and mid-October and discussed each of these issues at length. The outcome of these sessions is an overarching policy proposal that describes a novel financing mechanism together with a set of specific recommended actions associated with each of the key concerns.

This Retrofit Credit proposal and working group recommendations appear below. The participants in the groups, whose names and affiliations are provided as well, believe that this policy and these recommendations, if implemented, offer a pragmatic approach to addressing this critical challenge that is: a) technically and financially feasible; b) meets the needs of all stakeholders; and c) successfully protects Seattle's URM buildings from the impact of the next big earthquake.

URM Retrofit Credit Proposal:
Making Seattle a More Resilient & Sustainable City

Background

For the past half century, the City of Seattle has wrestled with the challenge of how to deal with the public safety risk posed by its most seismically vulnerable buildings. The most recent inventory identified over 1,100 of these structures, known as unreinforced masonry (URM) buildings, within Seattle. While they take many forms and can be found in many neighborhoods, these buildings are disproportionately located in lower-income, ethnically diverse communities, and many are landmarked or have historic significance. The next earthquake will impact the entire city, but it is these buildings and these communities that will be hardest hit.

The City has attempted to implement common-sense requirements for seismic upgrades to URM buildings since the mid-'70s, but while the risks to life and property are well known, the projected cost for property owners to retrofit their URM structures has been a major impediment. To address that obstacle, we propose mandatory seismic upgrade legislation and a financing solution that will provide property owners with the means and incentive to upgrade the URM structures in our region thereby helping to save lives, protect affordable housing and preserve the historical and cultural fabric of our most cherished neighborhoods.

In addition to addressing seismic risk, the City of Seattle is also deeply concerned with environmental sustainability. In July the City Council passed an ordinance establishing the 2030 Challenge Pilot Program which offers incentives to building owners in the form of density bonuses if they undergo major renovations that achieve deep green building goals. In the ordinance, the Council directed City Staff to create a program that allows the transfer of development rights between urban centers if a building goes through a major building renovation and achieves the goals of the Pilot but does not want, or is unable, to add stories on to the building. The sale of these development rights will help pay for the environmental upgrades necessary to achieve the goals. Further, for URM buildings, the City has provided the extra incentive of an additional 5% FAR bonus.

In sum, the City of Seattle is committed to promoting dramatic improvements in the performance of its building stock from both a resiliency and sustainability perspective. In particular, in light of the clear public safety and environmental impact benefits, it is focused on significant upgrades to the **seismic** and **environmental** systems of existing buildings, many of which are constructed with unreinforced masonry (URM). Currently this may be achieved when an owner chooses to undertake a major renovation, thereby meeting the "substantial alteration" (or "sub-alt") criteria. Under sub-alt, an owner is required to bring the building up to all current codes, including, but not limited to, seismic, energy, ADA, and fire safety codes; but, while compliance with sub-alt requirements clearly meets the City's objective, it is typically very costly to the property owner, and existing incentives and subsidies are insufficient to adequately offset the expense.

Consequently, many owners have decided to either defer renovation, or limit their renovation to just below the sub-alt threshold. This means that there are a large number of buildings, particularly URMs, that are neither seismically sound nor nearly as energy efficient as they need to be in order for Seattle to achieve its emergency management and Climate Action Plan (CAP) goals.

Two current initiatives aim to address this challenge:

- The first is the 2030 Challenge Pilot Program, described above, which provides additional density to existing building owners who voluntarily commit to meeting the 2030 standards for energy consumption, water use, and transportation emissions.
- The second is the ongoing effort led by SDCI and OEM and supported by a coalition of developers, preservationists, neighborhood associations, structural engineers, and other concerned stakeholders know as ASAP! (Alliance for Safety, Affordability and Preservation) to pass mandatory retrofit legislation for URM buildings requiring compliance with a set of technical standards for seismic safety along with a financing solution.

Proposed Integrated Retrofit Credit Program

A critical component of both of these initiatives is the mechanism for funding the respective upgrades.

The 2030 program provides additional density that may yield future revenue to offset the capital cost of environmental upgrades. There will be many cases however, where the owner does not have the upfront capital, is under landmark/historical restrictions, or just may not want to add space to the building yet wants to fund the environmental upgrades by monetizing the bonus density.

In the case of the URM retrofit program, building owners would be required to seismically retrofit their buildings to meet defined technical standards over a period of seven to thirteen years. Unlike the 2030 program, where participation is voluntary, seismic retrofits would be mandated. To offset the cost of the retrofits the program would enable owners to finance them through the sale of density credits, as described below.

The proposed mechanism is a new Retrofit Credit ("RC") program created through the amendment of Title 23 of the Seattle Municipal Code to establish credits that will be sold on behalf of owners of buildings that undergo mandatory seismic and/or voluntary environmental retrofits. Purchasers of these credits will apply the RCs to achieve greater density on their development/rehabilitation projects, while the sellers will be required to apply the proceeds toward seismic upgrades of their properties and/or the upgrades necessary to achieve the defined 2030 environmental goals. The life of the seismic retrofit credits will be tied to the timeline for the mandatory completion of required seismic retrofits, providing an incentive for property owners to meet the deadlines or bear the cost themselves.

Given that the 2030 program is voluntary, while seismic retrofits under the proposed legislation will be mandatory, some URM building owners may choose to only do what is required to meet the seismic standards without performing environmental upgrades. There are compelling advantages to doing both at the same time, however, since they both require removing walls and performing substantial structural modifications, including:

- Reduced cost through economies of scale in construction;
- Significant reduction in the period of displacement for residents and businesses;
- More efficient and rational building systems design.

Therefore, the RC program, while providing for two types of RCs, is designed to provide strong incentives for URM owners to commit to doing both – yielding significant private and public benefit through the reduction in the risk to public safety and the reduced impact on the environment.

This proposed program bears some similarities to existing transfer of development rights (TDR) programs, but the current TDR market is extremely limited, only allowing development rights to be

traded in the same neighborhood and sometimes just the same block. The current price of development credits is also way below the market value, currently at $15-$20 a square foot, well below the incremental value of the bonus floor area. The proposed RC program would address these issues by creating a robust market for credits that would trade at prices closer to their development value as described below.

Create two classes of RCs – RC(S) for URM seismic retrofits, and RC(E) for 2030 environmental retrofits. Both classes of credits would confer the same benefit, namely one square foot of bonus density per credit, but proceeds from the sale of RC(S)s could only be used for seismic upgrades and those from RC(E)s for environmental upgrades (see below). As the program unfolds and more is learned about the impact of these incentives on property owners' upgrade decisions, the allocation of these credits could be tuned to achieve the desired mix of seismic and environmental retrofits.

Classify all URM and 2030 Pilot properties as "sending" lots and all other properties as "receiving" lots. All assessed URM structures will automatically qualify as "sending" lots, enabling owners of vulnerable masonry buildings to finance essential life-safety upgrades. All of the potential 2030 Pilot projects will also become "sending" lots, allowing flexibility of how much an owner will or can add density to the building. While ideally all properties across the city, not just those within the zoning district where the URM or Pilot project "sending" lot is located, would be eligible to buy and use the credits, we recognize the challenge of adding density in certain neighborhoods.

However, we believe that there are at least three neighborhoods that can/should be in a position to absorb additional density. Specifically, the industrial neighborhoods of SODO and Interbay, and the Belltown residential, mixed use area. Based on some rough calculations, at a reasonable price per credit, allowing the sale of RCs into these three neighborhoods could provide over 60% of the cost to seismically retrofit every unmodified URM building in the City. Such a designation will be unlike traditional Landmark TDRs or Open Space TDRs, which may be transferred only within the property's respective zoning district. Making these properties eligible to use RCs should stimulate demand and significantly expand the number of potential consumers. Under this model, a property owner in SODO, Interbay or Belltown, as a "receiving" lot, could theoretically achieve greater density by purchasing RCs from a qualified URM and/or 2030 "sending" lot in Pioneer Square.

Exempt all chargeable floor area for URM sending sites to maximize the number of RCs that an owner of an assessed URM structure may sell. Such an exemption will be similar to those already applied to vulnerable masonry structures under SMC 23.48.620.C.6, or residential use under SMC 23.49.011.B.1.f, and apply notwithstanding whether the owner of the sending site has previously sold otherwise qualifying TDRs. Exempting the chargeable floor area for all assessed URM structures will allow the owner to sell one hundred percent of its development potential up to the maximum FAR. For example, the owner of a 10,000 square foot lot with a single story, 10,000 square foot building in an area with a maximum FAR of 4.5, can sell all 45,000 square feet of the owner's development potential under the new RC program. This flexibility to sell all development potential is critical to maximizing revenue from RC sales to finance the URM policy goals.

Apply all RC proceeds toward funding the seller's retrofit. A newly formed, City-sanctioned entity would be created that would be responsible for holding and selling the retrofit credits allocated to each URM property. As a condition of allowing owners of assessed URM structures or 2030 Pilot projects to benefit from the sale of one hundred percent of their development potential up to the maximum FAR and/or any additional bonus FAR gained from the 2030 Pilot, the City would mandate that the proceeds from such sales be applied towards the seismic and/or environmental retrofit of the sending site until it

is certified complete. Proceeds of the RC sales will be directed to a Retrofit Fund ("Fund"), to be administered by the entity, from which the property owners will be reimbursed for documented and validated costs of upgrades. This entity will be responsible for tracking the balance of RC(S) and RC(E) credits and the proceeds associated with the sale of either on a property-by-property basis.

Provide incentives for property owners to perform both types of upgrades. In order to motivate URM building owners to go beyond the mandatory seismic retrofit and perform comprehensive environmental upgrades: 1) successful URM applicants to the 2030 Challenge Pilot Program will receive an additional 5% FAR bonus; 2) URM building owners that commit to making the upgrades to meet the 2030 goals, whether in the pilot program or not, will be granted additional RC(E) credits equal to those granted under the terms of the 2030 Challenge Pilot; and 3) the City (SCL) will form a task force that assesses URM buildings and provides priority access to energy-related rebate and subsidy programs.

Exempt the sale of RCs from real estate excise tax. Because the primary purpose of the RC for URM is public safety and the 2030 RC is helping the City of Seattle achieve its CAP goals, the sale and purchase of these credits should be exempted from transfer taxes, such as the real estate excise tax, to ensure the full value of the credits may be applied to the needed seismic retrofits and/or building efficiency upgrades.

Allow RC receiving sites to increase their density. Receiving sites will be permitted to purchase RCs to gain additional floor area beyond the otherwise maximum FAR and/or height limitation of the receiving site's zoning regulation. Extra FAR or structure height available through the purchase of RCs shall be in addition to any bonus, extra, or otherwise additional floor area available according to any other provision of Title 23.

Provide additional benefits to RC receiving neighborhoods to mitigate impact of added density. In recognition of the impact of the additional density on neighborhoods with receiving sites, the City will commit to investing in additional open space. The receiving site will also be required to achieve the City's LEED Gold plus standard, which is 15% better than code, which provides an environmental benefit to the community receiving the greater density.

Use increased tax revenue from the "receiving" lot for public use. In addition to the above policy recommendations, the City and King County will enter into an agreement that will direct a portion of the increased tax revenue specifically generated by the additional density of the RC "receiving" lot to the Fund. Such an agreement between the City and County to redirect property tax revenue to address a public concern is not uncommon, as the City already receives approximately 17% of increased tax revenue from the County for projects in South Lake Union that use rural TDRs to help finance public parks and public transit improvements. In this case, the City can use the tax revenue collected from benefiting "receiving" lots to help finance the restoration of publicly-owned, vulnerable and costly URM structures by contributing these tax revenues to the Fund.

Grant URM structures with historic significance and/or containing affordable housing units top priority as sending sites for the purchase of RCs. Receiving sites seeking to use RCs will need to purchase them first from a list identifying the "sending sites" as either historic sites and/or sites containing affordable housing units (in addition to being URM), until all such credits are exhausted.

Working Group 1: Solving for Physical and Economic Displacement

Brad Padden, Coordinator

The Physical and Economic Displacement Working Group is focused on identifying ways to ease the impact of construction work on individuals and businesses housed in vulnerable masonry buildings. Displacement will be an ongoing issue throughout the upgrade period as large sections of these buildings will be made uninhabitable for extended periods of time, so mitigating the effects of displacement and finding economically viable temporary and longer term solutions is vitally important to the success of any retrofit program.

Participants:

- Matt Auflick, Office of Emergency Management
- AJ Cari, Office of Economic Development
- Maiko Winkler-Chin, SCIDPDA
- Chuck Depew, National Development Council
- Matt Gee, GAARD
- Julie Howe, Urban Evo
- Tom Im, Interim CDA
- Marty Kooistra, Housing Development Consortium
- Brad Lange, Capitol Hill Housing
- Jamie Lee, SCIDPDA
- Jessica Long, Seattle Department of Construction and Inspections
- Jovan Ludovice, Bellwether Housing
- Laurie Olson – Office of Housing
- Mike Omura, SCIDPDA
- Josh Sellers, SCIDPDA
- Pradeepta Upadhyay, Interim CDA

Recommendations:

- Ensure residents of buildings undergoing a bolts plus upgrade or greater are eligible for the Tenant Relocation Assistance Ordinance (TRAO) even if the project does meet the threshold of a substantial alteration

- Permit residents displaced by mandatory URM upgrades to qualify for TRAO while earning up to 80% of area median income (AMI) versus the current 50% AMI

- Go beyond TRAO to include additional wrap-around relocation and support services for the most vulnerable residents (i.e. 0-30% AMI)

    - Assign a project manager to manage the entire process for those individuals
    - Utilize the resident's regular onsite manager or community manager who knows the residents the best and can help provide an emotional grounding to the process helping them to adjust on a personal level at both the sending and receiving sites
    - Make a caseworker available to help with medical, transport and language issues
    - Provide a relocation contractor to help with the move itself

- Accommodate and/or subsidize qualified URM displaced individuals including 0-30% AMI and 30-50% AMI in Office of Housing funded, MFTE, incentive zoned or market rate projects

    - Housing Finance Commission may need to create a special housing class for “qualified URM-displaced” individuals to be able to prioritize them in Affordable housing (could require a declaration of emergency due to the life safety threat posed by vulnerable masonry buildings)
    - Prioritize “qualified URM-displaced” individuals and families for replacement housing

- Use new Affordable housing projects to move the populations of entire buildings at once so neighbors can maintain support networks (preferably within their existing neighborhoods)

- Do not allow building owners to retenant units that were vacated to perform a URM upgrades once residents have been relocated

Working Group 2: Streamlining the Regulatory Review and Approval Process

Peter Nitze, Coordinator

The Regulatory Working Group is focused on identifying ways to streamline the permit review and approval process for seismic retrofits. With the added influx of hundreds of new applications following passage of URM retrofit legislation, meeting the URM Policy Committee's recommended timeline of one year for permit approval will be very challenging, and almost certainly require changes to the existing process. Toward that end, the Regulatory Group will explore how municipal resources could be allocated most effectively to ensure swift review and approval, as well as how to best balance sound seismic design with the preservation of important historic features, where applicable.

Participants:

- Jamie Anderson, Seattle Department of Construction and Inspections
- Matt Aalfs, Building Works
- Chuck Depew, National Development Council
- Lisa Howard, Alliance for Pioneer Square
- Kji Kelly, Historic Seattle
- TJ McDonald, Office of Emergency Management
- David Neiman, Neiman Taber Architects
- Chris Moore, Washington Trust for Historic Preservation
- Brett Phillips, Unico
- Michael Sullivan, Architectural Historian
- Karen True, Alliance for Pioneer Square

Recommendations:

Passage of legislation mandating seismic retrofits of URM buildings in Seattle will precipitate a significant increase in permit applications. Even with the current volume of applications, depending on the complexity of the project, review and approval can take over a year, as can be seen by the case studies summarized at the end of this document.

The following are recommendations for changes to the existing review and approval process intended to simplify and accelerate processing these retrofit applications, both to ensure timely completion of the retrofits and to minimize the incremental burden on SDCI staff.

The first set of recommendations relates to the pre-intake phase of the process and the second to the period after formal permit intake.

- Pre-Intake
    - Provide for an exemption from SEPA review for changes of use in URMs undergoing retrofits;
    - Provide broader latitude to URM retrofits to permit environmental and other improvements (in addition to seismic) without triggering a substantial alteration;
    - Form a dedicated cross-departmental team with the specific technical, historical and code expertise to perform historical and code reviews in parallel:

        - Dedicate/recruit resources with special expertise in URM building construction and retrofitting; rehabilitation of historic structures; and application of relevant code provisions;
        - Appoint steering committee to conduct up-front screening to qualify projects as straightforward, moderately complicated, or very complicated;
        - Develop review and approval paths for each category; straightforward projects would follow an administrative process (described below); more complicated ones would go to a specialized review unit with an optimized review process.

- Post-Intake
    - Empower Dept. of Neighborhoods (DON) to coordinate with Landmark Review Board to develop a Director's Rule for retrofits of historic URM projects to simplify and clarify the guidelines for granting a Certificate of Approval (C of A);
    - Create standard detail sheet for simple URM retrofits (e.g. Bolts +) and have review done by DON administratively, rather than obtaining a C of A (see above) (Landmarks can only say "No". "Yes" needs to come from DON, so DON can bypass Landmarks Board review when appropriate);
    - Create a single point of contact (Ombudsman) for URM seismic upgrade applications who would ensure projects follows the correct review and approval path, and track the total elapsed time to complete each significant step in the process;
- Authorize SDCI to make URM buildings a PRIORITY 1 classification (Affordable Housing is a 2). This designation would cut every queue in every cycle, potentially reducing the 6-9-month code review process to 3-6 months.

Case Studies:

Project 1 Queen Anne Exchange
Renovation and addition to a Seattle Landmark building (Garfield Exchange building).
Involved change of use from institutional to multi-family. Substantial Alteration, with full seismic retrofit, all new MEP, new stairs and elevator, new parking, new top floor addition. Full build out of 25 residential apartments.

Review times: engaged in the building permit review process for more than 12 months now;
waited 8 weeks for initial review, 12 weeks for second review, and 20 weeks for the third review.
Successive reviews are supposed to get shorter, but the opposite has occurred.

Project 2 Block 4A
New construction mixed-use residential. Permit submittals have been broken out into three separate permits in order to help expedite review.

Review times: engaged in the building permit review process for more than 7 months now.

Project 3 Block 5A
New construction mixed-use residential. Permit submittals have been broken out into three separate permits in order to help expedite review.

Review times: engaged in the building permit review process for more than 6 months now.

Project 4 International Apartments
This project is an excellent case study for the URM roundtable. This is an existing URM building. The project is a voluntary bolts-plus seismic retrofit and window replacement.

Review times: submitted for permit on 9/5/18. Still awaiting permit correction notices.

Working Group 3: Assessing the Engineering Components and Cost of Retrofits

Brad Padden, Coordinator

The Engineering Working Group will examine structural plans for bolts plus and full seismic upgrades to unreinforced masonry buildings in the context of a City-wide upgrade mandate. Means, methods and costs associated with achieving these upgrades will be developed and reviewed, using case studies for a variety of building types as references. The working group will provide the structural engineering community the opportunity to clarify technical requirements with City subject matter experts, and to explore ideas that may differ from current practice to arrive at more cost effective solutions. The evaluation of the case studies is intended to provide the City with a more thorough understanding of the proposed requirements in the context of real world projects.

Participants:

- Chuck Depew, National Development Council
- Nancy Devine, Seattle Department of Construction and Inspections
- Brian Gibson, MRJ Constructors
- Craig Haveson, STS Construction
- Tom Hudgings, KPFF
- Rod Kauffman, Building Owners and Managers Association
- Melissa LaFayette, National Development Council
- Aaron Pambianco, AJP Engineering
- Bob Power, SEACON Construction
- Dan Say, Swenson Say Faget
- Andy Taylor, KPFF
- Bryan Zagers, Coughlin Porter Lundeen

Recommendations:

The recommendations of this working group are contained in the URM cost matrix Excel Workbook.

Working Group 4: Incentivizing Additional Environmental Upgrades

Peter Nitze, Coordinator

The Energy & Environmental Working Group is focused on identifying complementary incentives that will spur URM property owners affected by the mandatory retrofit ordinance to improve not just the seismic performance of their buildings, but their overall energy and environmental performance as well. Since satisfaction of the seismic technical standards will in most instances require significant structural work, this presents an opportunity to simultaneously upgrade and modernize the building's systems (e.g. HVAC, lighting) and envelope (e.g. windows, insulation) to improve energy efficiency and emissions. A good example of an incentive that could be combined with a URM retrofit program is the Seattle 2030 Challenge Pilot, which offers transferable development rights to building owners who commit to achieving the 2030 energy, emissions, and water conservation targets.

Participants:

- Matthew Combe, Seattle 2030 District
- Chuck Depew, National Development Council
- Jim Graham, Graham Baba Architects
- Kji Kelly, Historic Seattle
- Doug Larson, Heartland
- Erika Lund, Office of Emergency Management
- Sandra Mallory, Seattle Office of Sustainability and Environment
- Chris Moore, Washington Trust for Historic Preservation
- David Neiman, Neiman Taber Architects
- Brett Phillips, Unico
- David Rodenhizer, Seattle City Light
- Tadashi Shiga, Evergreen Certified
- Sabrina Villanueva, Clise Properties
- Phoebe Warren, Seattle City Light
- Ed Weinstein, Weinstein A+U
- Eugenia Woo, Historic Seattle

Recommendations:

The recommendations of this working group are contained in the Retrofit Credit Proposal.

APPENDIX E - AFFORDABLE HOUSING BUILDINGS

Affordable Housing Summary

Short Address	Neighborhood	Units	Stories	Sq. Foot Area	Historic	Retrofit Type
2201 1st Ave	Belltown	52	4	27,140	✘	Neither
2300 1st Ave	Belltown	41	3	23,015	✘	Bolts++Frame
115 Blanchard St	Belltown	43	4	35,520	✘	Bolts++Frame
1921 3rd Ave	Belltown	55	6	40,109	✘	Bolts++Frame
2119 2nd Ave	Belltown	60	4	29,796	✘	Bolts++Frame
2212 1st Ave	Belltown	49	3	19,980	✘	Bolts++Frame
2408 2nd Ave	Belltown	59	3	33,440	✘	Neither
2905 1st Ave	Belltown	49	5	33,400	✘	Neither
2209 1st Ave	Belltown	54	4	29,340	✘	Bolts++Frame
1930 Post Al	Belltown	0	5	70,850	✔	Neither
914 E Harrison St	Capitol Hill	32	4	23,242	✘	Neither
1020 E Denny Way	Capitol Hill	29	3	20,457	✘	Neither
1305 E Madison St	Capitol Hill	30	4	37,010	✘	Bolts+
1520 Melrose Ave	Capitol Hill	30	4	15,281	✔	Bolts+
1531 Belmont Ave	Capitol Hill	23	4	17,642	✔	Bolts+
2321 4th Ave	Cascade/Eastlake	36	4	21,284	✘	Bolts+
601 Eastlake Ave E	Cascade/Eastlake	30	4	29,970	✔	Bolts++Frame
2045 Westlake Ave	Cascade/Eastlake	33	3	23,568	✘	Neither
133 Pontius Ave N	Cascade/Eastlake	35	4	24,000	✘	Bolts+
1814 Minor Ave	Cascade/Eastlake	37	3	12,136	✘	Neither
2008 Westlake Ave	Cascade/Eastlake	53	3	39,201	✘	Bolts++Frame
117 18th Ave	Central Area/Squire Park	55	3	19,064	✘	Bolts+
4900 Rainier Ave S	Columbia City	8	3	7,890	✔	Bolts++Frame
216 James St	Downtown	64	7	63,712	✔	Neither
619 3rd Ave	Downtown	64	6	23,338	✘	Neither
1413 3rd Ave	Downtown	38	3	27,250	✘	Neither
1431 Minor Ave	First Hill	92	7	51,976	✔	Bolts++Frame
823 Madison St	First Hill	72	4	55,700	✘	Neither
306 6th Ave S	Pioneer Square/Chinatown International District	63	7	34,848	✔	Bolts++Frame
506 Maynard Ave S	Pioneer Square/Chinatown International District	47	4	33,887	✔	Neither
77 S Washington St	Pioneer Square/Chinatown International District	23	5	21,600	✔	Neither
519 7th Ave S	Pioneer Square/Chinatown International District	21	3	25,600	✔	Bolts++Frame
657 S King St	Pioneer Square/Chinatown International District	30	4	34,920	✔	Bolts++Frame
204 3rd Ave S	Pioneer Square/Chinatown International District	52	4	25,027	✔	Bolts++Frame
117 John St	Queen Anne	55	2	5,000	✘	Neither
6545 Ravenna Ave NE	Ravenna/Bryant	39	4	15,500	✘	Neither
4649 Sunnyside Ave N	Wallingford	6	5	87,262	✔	Neither