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**MIND
THE GAP**

**EARTHQUAKE INSURANCE &
POST-DISASTER RECOVERY**

Earthquake Insurance and Mitigation.



GLENN POMEROY

CHIEF EXECUTIVE OFFICER

MARCH 28, 2022

CEA: 25 Years of Service

1994 Northridge Earthquake Led to CEA Creation

- California requires insurance companies selling homeowners insurance to offer a separate earthquake insurance policy.
- The Northridge earthquake created significant losses for insurance companies in California.
- After Northridge, companies stopped writing homeowners policies due to perceived future earthquake losses.
- This resulted in a near shutdown of the residential real estate market.

CEA: 25 Years of Service

CEA was created in 1996 in order to:

- Ensure homeowner insurance availability in California.
- Restore real estate market by assuring availability of homeowners insurance.
- Enable CEA “participating insurers” to satisfy the mandatory offer requirement by offering a CEA policy – for which CEA bears the risk.

CEA Today

- **CEA insures more than 1.1 million residences or about 10 percent of the homes in California.**
- **In certain high-risk zones, CEA insures 20% – 30% of homes in the area.**
- **CEA accounts for 66% of the residential earthquake policies in the state.**



CEA Participating Insurers





Residential Earthquake Insurance

- 1.1 Million Policyholders
- Publicly Managed/Privatey Financed/Not for Profit
- \$19 Billion in Claim Paying Capacity



Residential Earthquake Mitigation Grants

- Pre-1980 Homes/\$3,000 Grant
- Retrofits to date: 16,000
- New Supplemental Grant for Low Income



California Wildfire Fund

- Coverage for Wildfires Caused by Investor-Owned Utilities
- Overseen by California Catastrophe Response Council
- \$21 Billion in Claim Paying Capacity

Current CEA Claim-Paying Capacity

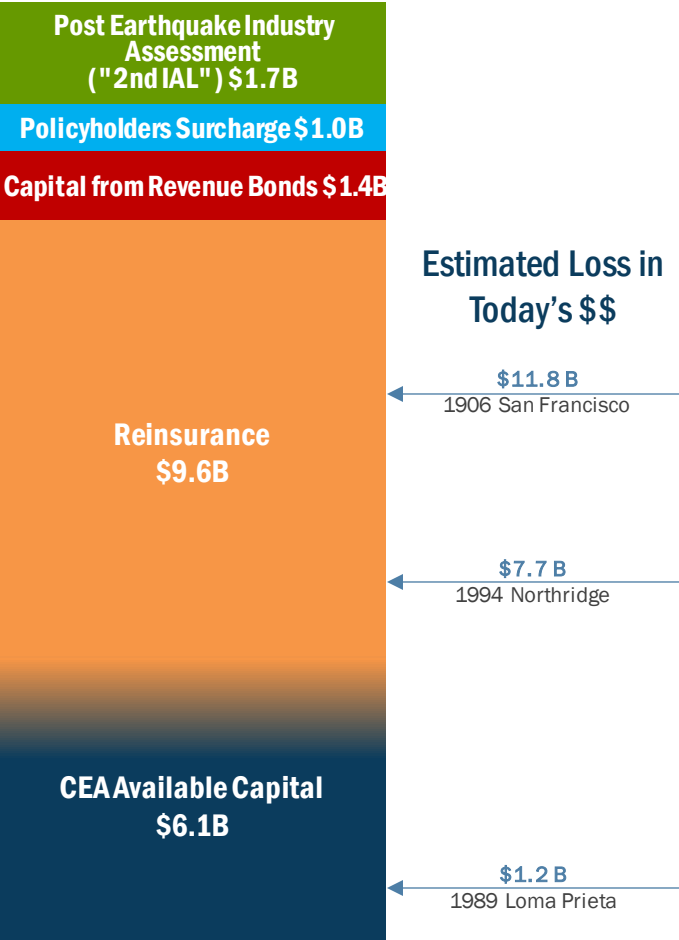
July 31, 2021

Potential CEA Loss

1 in 400 → \$18.8 B
 Probability: 0.25%

1 in 250 → \$14.6 B
 Probability: 0.4%

1 in 100 → \$8.36 B
 Probability: 1%



Total Capacity \$19.8B

- Today CEA has \$19.8 billion in claim-paying capacity – more than enough for a 1 in 400 year loss.
- The probability that CEA will not have enough capacity to pay 100% of all covered claims is about ¼ of 1%.
- A reoccurrence of the most destructive earthquake in California history (San Francisco 1906) would result in about \$12 billion in CEA loss.
- To meet the 1 in 400 year benchmark CEA purchases “reinsurance” – insurance for insurance companies.
- CEA will spend approximately \$500 million on reinsurance this year, equal to nearly 60% of amount of premium paid by CEA policyholders.

United States: Top 10 Writers of Earthquake Insurance

Rank	Group/company	Direct premiums written
1	California Earthquake Authority	\$843.7 million
2	FM Global	\$341.8 million
3	Zurich Insurance Group	\$284.4 million
4	State Farm	\$284.0 million
5	Chubb Ltd.	\$187.6 million
6	Palomar Specialty Insurance Co.	\$183.3 million
7	Travelers Companies Inc.	\$156.7 million
8	American International Group (AIG)	\$141.4 million
9	Sompo Holdings Inc.	\$122.1 million
10	AXA SA	\$119.6 million

CEA writes more than twice as much as the second largest writer

- 2020 data based on U.S. total, includes territories.
- Before reinsurance transactions. Includes state funds and commercial insurance premium.
- Source: NAIC data, sourced from S&P Global Market Intelligence, Insurance Information Institute.

California: Top 10 Writers of Earthquake Insurance

Rank	Group/company	Direct premiums written
1	California Earthquake Authority	\$843.7 million
2	FM Global	\$180.6 million
3	Palomar Specialty Insurance Company	\$135.2 million
4	Zurich Insurance Group	\$106.7 million
5	Chubb Ltd.	\$78.2 million
6	GeoVera Holdings	\$75.7 million
7	American International Group (AIG)	\$61.8 million
8	AXA SA	\$58.9 million
9	Golden Bear Insurance Company	\$50.6 million
10	Travelers Group	\$43.2 million

CEA writes more earthquake insurance in California than the next nine writers combined

- 2020 data based on California total
- Before reinsurance transactions; includes commercial premium
- Source: NAIC data, CDI website

CEA Growth: 2010 – 2020

		2010	2020
Policies in Force:	Up 40%	811,000	1,137,000
CEA Policyholder Premium:	Up 40%	\$603 Million	\$845 Million
Total Insured Value:	Doubled	\$288 Billion	\$567 Billion
Claim Paying Capacity:	Doubled	\$9.8 Billion	\$19.2 Billion
Reinsurance Purchased:	Tripled	\$3 Billion	\$9 Billion

Prioritizing Strategic Options

Policyholder Rates

Should CEA prioritize rate stability or rate reductions?

Size of CEA's book of business

Should policyholder growth be a top priority?

Coverage options

Could CEA coverage promote greater equity and/or manage growth?

Financial Strength

How much claim-paying capacity should CEA maintain?

CEA's Sustainability

Should CEA seek a more sustainable financial structure?

Earthquake Insurance and Mitigation.



JANIELE MAFFEI

CHIEF MITIGATION OFFICER

MARCH 28, 2022

CEA Mitigation

Standards • Research • Incentives

Mitigation Standards

CEA has funded and managed the development of:

- FEMA P-1100 – Vulnerability Based Assessment and Retrofit of One and Family Dwellings
- CEA EDA 02 – Earthquake Damage Assessment and Repair Guidelines (Replacement for CUREE document)

Earthquake Vulnerabilities



Cripple Wall



Living-space-over garage



Hillside House



Chimney

Cripplewall and Unbraced Water Heater Vulnerability

2014 M6.0 South Napa Earthquake



Cripplewall Vulnerability

2014 M6.0 South Napa Earthquake



CEA Mitigation Research

PEER Cripple Wall Damage Project (2020)

How Much Could I Save In “The Big One” If I Retrofit My House*?

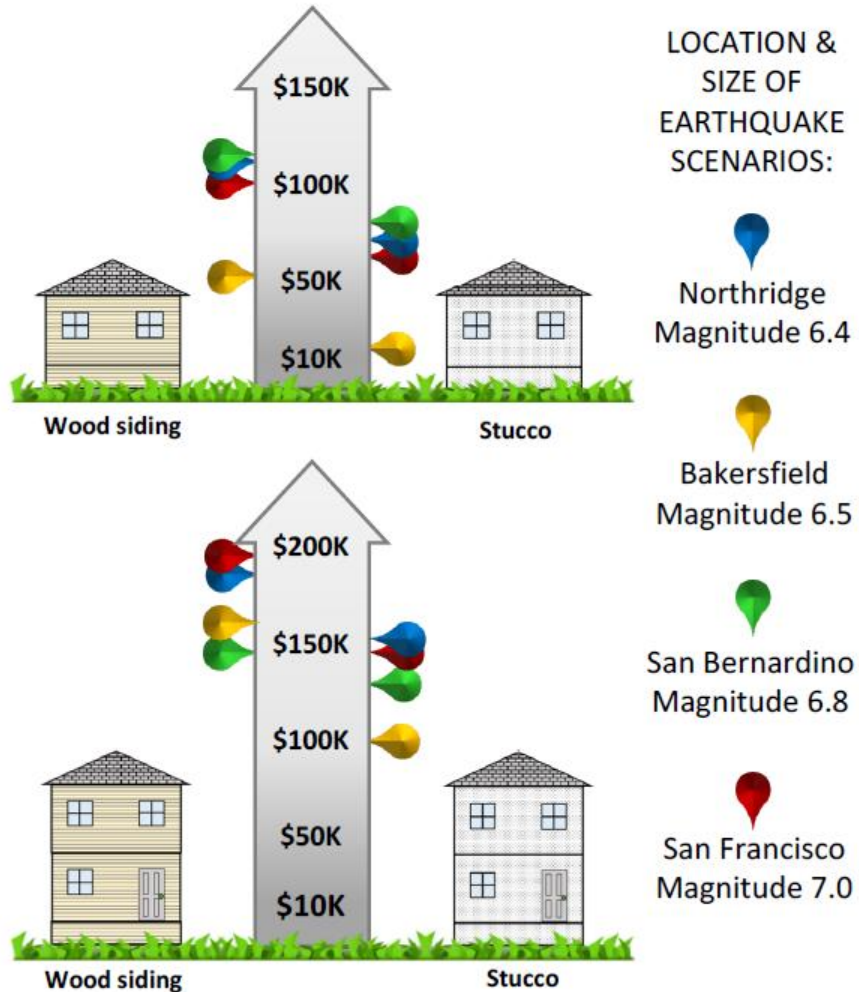


Figure 1. Estimated average savings for four generic house types in four scenario earthquakes.

*Note: Savings are average repair costs avoided in thousands of 2019 US dollars. Values assume a one-story 1,200 sq.ft. house (UPPER) and a two-story 2,400 sq.ft. house (LOWER), at a construction cost of \$200 per sq.ft. Potential savings depend on the actual size, age, location, and configuration of the house, the quality, and types of construction materials, the intensity of earthquake shaking, and regional construction market conditions.

**M 7.0 Scenario Earthquake in SF:
Retrofitted two-story house with wood siding would
have \$200,000 less damage (based on \$200/SF
replacement cost)**

Mitigation Incentive Programs

CEA has jointly managed the California Residential Mitigation Program (CRMP) with CalOES through a Joint Powers Agreement (JPA). CRMP manages the Earthquake Brace + Bolt program (EBB)

CEA Mitigation and Research Programs

California Residential Mitigation Program – 2021 Board of Directors



Alex Pal
CRMP Governing Board / Cal OES
Chief Counsel



Lori Nezhura
CRMP Governing Board / Cal OES
Deputy Director of Planning,
Preparedness, and Prevention



Laurie Johnson
CRMP Governing Board / CEA
Chief Catastrophe Response and
Resiliency Officer



Jim Lombard
CRMP Governing Board / CEA
Chief Administrative Officer

Earthquake Brace + Bolt



Earthquake Brace + Bolt Program:

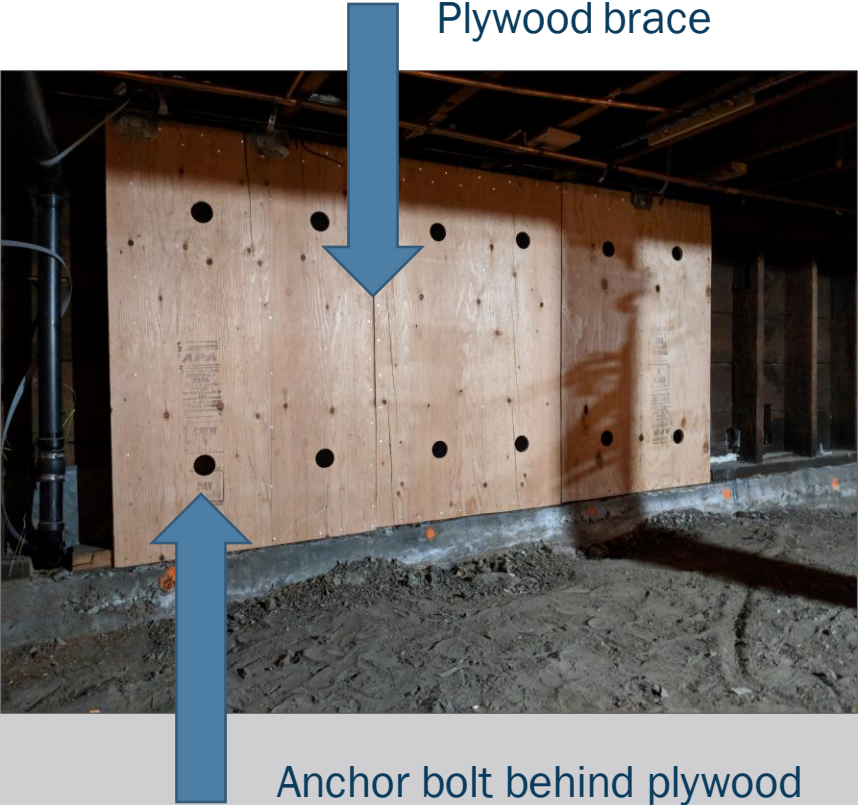
- Retrofits crawlspace with plywood bracing and new bolting
- Provides up to \$3,000 grant
- Currently requires owner-occupied
- In select ZIP Codes with high seismic hazard
- Has collected important data:
 - Retrofit averages \$5,200 in CA
 - More expensive in Northern CA
 - Number of retrofitted houses in a City

Earthquake Brace + Bolt

Short Cripple Wall Requires Framing Clips, Foundation Plates, and Plywood



Crawlspace **Before** Retrofit



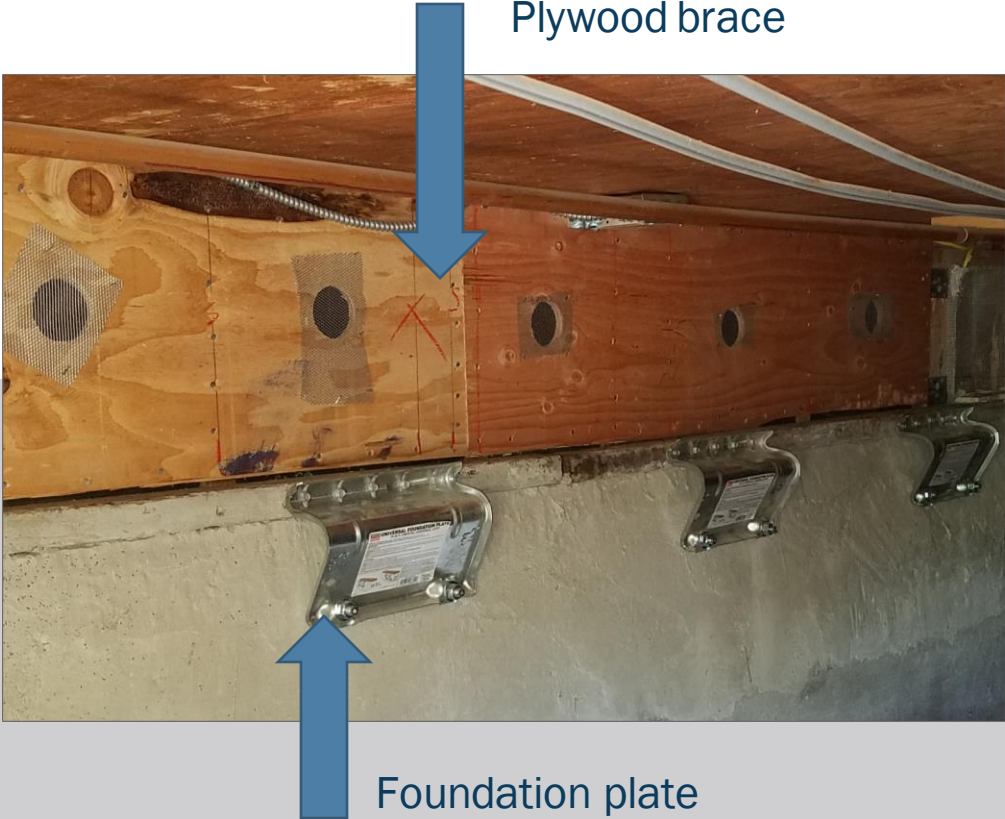
Crawlspace **After** Retrofit

Earthquake Brace + Bolt

Short Cripple Wall Requires Framing Clips, Foundation Plates, and Plywood



Crawlspace **Before** Retrofit



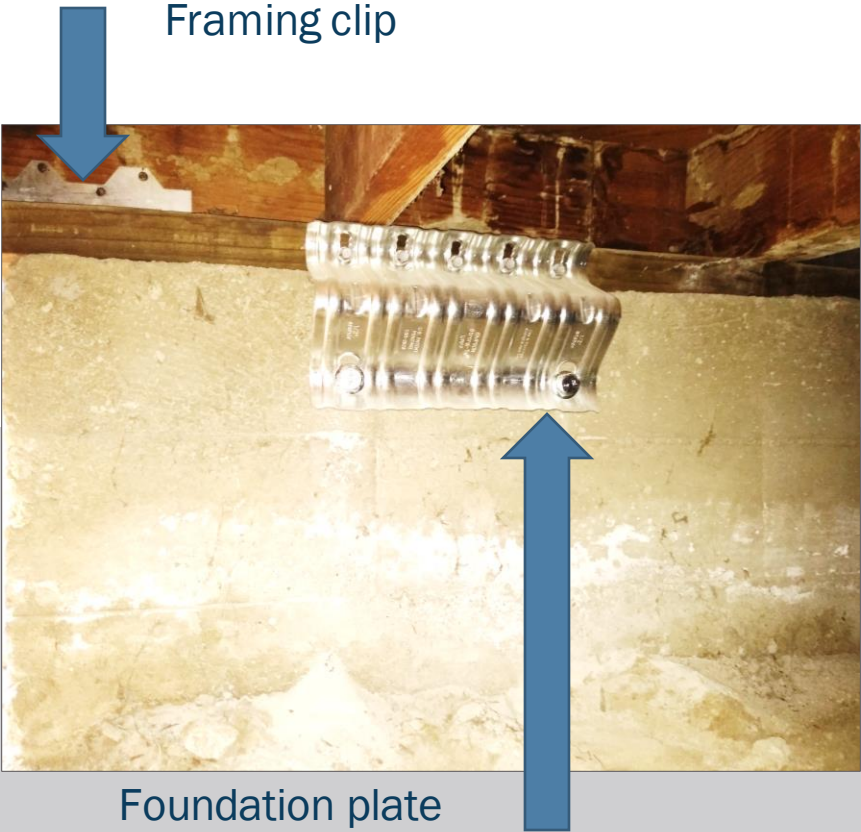
Crawlspace **After** Retrofit

Earthquake Brace + Bolt

Stem Wall (No Cripple Wall) Requires Framing Clips and Foundation Plates



Crawlspace Before Retrofit



Crawlspace After Retrofit

Earthquake Brace + Bolt

A Growing Program

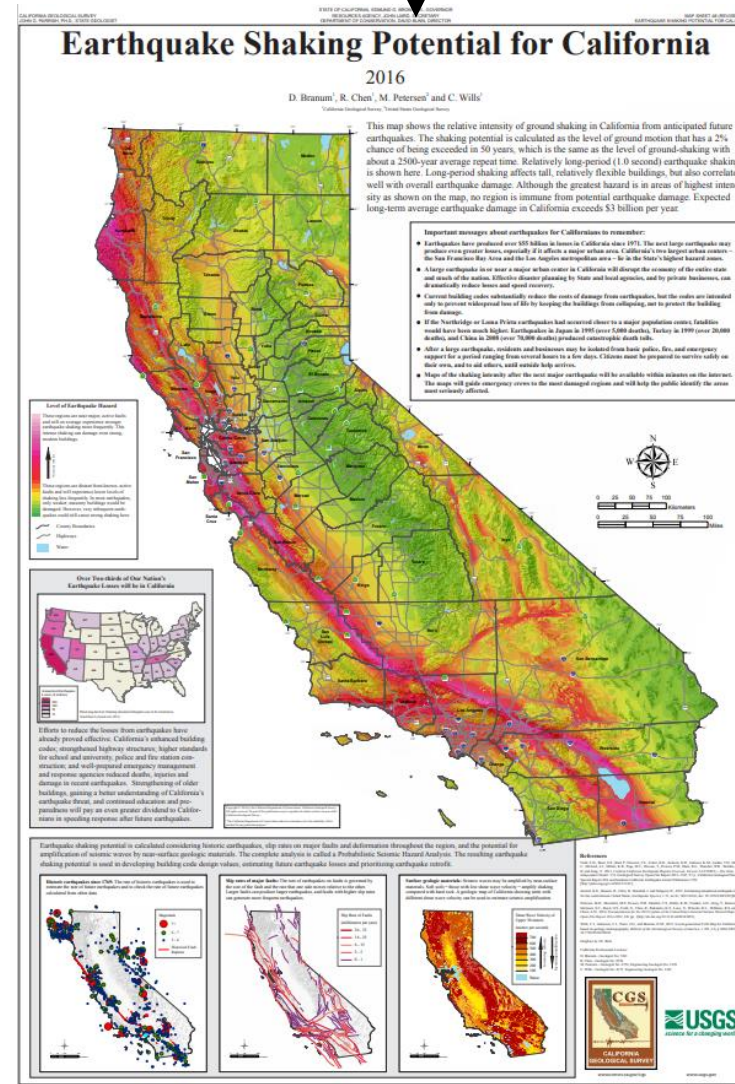
- 2014: 9 homes
- 2015: 528 homes
- 2016: 1,639 homes
- 2017: 2,182 homes
- 2018: 7,621 homes
- 2019-2021: FEMA funding \$24M
- **2022: Additional FEMA funding**



Earthquake Brace + Bolt

ZIP Codes Selection – 50% Hazard and 50% Vulnerability

Rank	City Name	Zip	USGS Map	US Census
			Hazard	Vulnerability
1			2.89	3,709
2			2.93	2,464
3			2.83	3,467
4			2.68	3,315
5			2.79	2,291
6			2.60	2,537
7			2.97	1,309
8			2.68	3,059
9			2.78	2,491
10			2.93	1,690
11			2.44	2,991
12			2.68	1,732
13			2.85	1,115
14			2.65	1,848
15			2.28	3,766
16			2.31	2,788
17			2.80	1,561
18			2.38	4,197
19			2.52	2,696
20			2.29	3,634
21			2.48	2,176
22			2.40	4,602
23			2.40	1,909
24			2.28	3,538
25			2.52	2,317
.....				
1763			0.22	1



↖ No. of Pre-1940 houses

Future Mitigation Incentive Programs

The following retrofit incentive grant programs are under development:

- Earthquake Soft-Story (ESS)
- Soft-Story Retrofit of Multi-Family (5-10 unit) Structures

Earthquake Soft-Story (ESS)

SF “Painted Ladies” Survived 1906 Earthquake



The “Soft-Story” was created when the garage doors were installed in 1920s

Earthquake Soft-Story (ESS)

Living-Space-Over-Garage (Soft-Story) Found in Pre-2000 Houses



1971 San Fernando EQ



1989 Loma Prieta EQ



1994 Northridge EQ



2014 Napa EQ

Earthquake Soft-Story (ESS)



Plywood or OSB on first-floor walls

New steel shear walls either side of garage door opening

Hardy Frame

Multi-Family Soft-Story Retrofit Program



Photo credits: LA Times

Northridge Meadows Apartments –
Northridge M6.7 Earthquake 1994

Multi-Family Soft-Story Retrofit Program



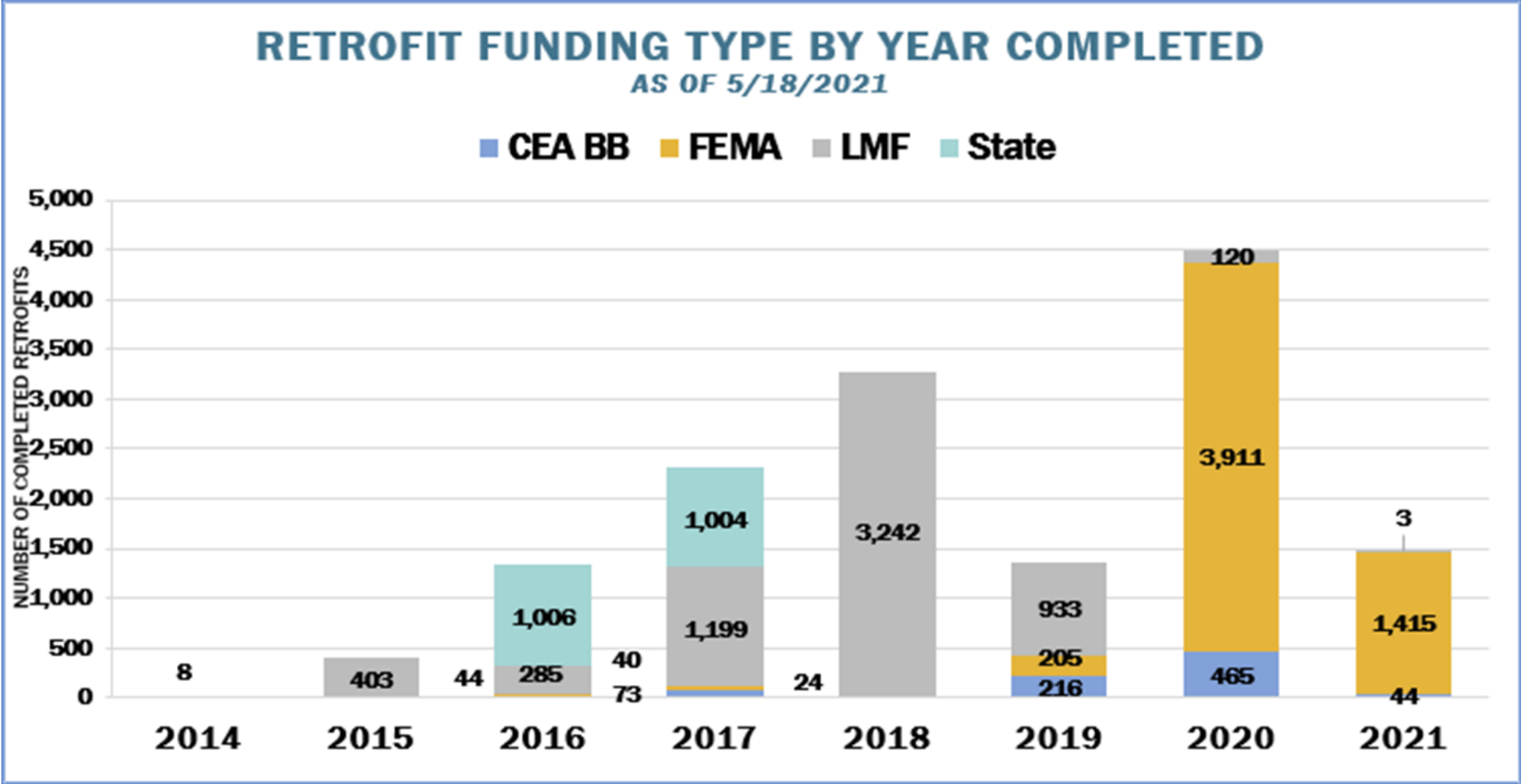
Steel frame around garage door opening

Photo credit: Janiele Maffei

Mitigation Funding

For 8 years the CRMP has leveraged the CEA Loss Mitigation Fund with State and Federal Mitigation Funding

CRMP Mitigation Funding



2021 EBB Program will include supplementary grants specifically aimed at underserved neighborhoods.

The supplementary grant:

- Will provide, in most cases, **100% OF THE FUNDS** needed
- Will be marketed widely and offered in all EBB ZIP Codes
- Will include a pilot outreach program in a few areas to identify successful communication strategies



Thank You.

StrengthenMyHouse.com

