Seismic Safety Commission Meeting Materials

April 11, 2024

ALFRED E. ALQUIST
SEISMIC SAFETY COMMISSION MEETING

April 11, 2024
9:00 am - 1:00 pm PST

In Person Location:
10370 Peter A. McCuen Blvd.
Mather, CA 95655
Building E: Santa Catalina Room

Virtual Information:

https://us02web.zoom.us/j/82872640254

Webinar ID: 828 7264 0254

Dial (Toll-free):
(888) 788-0099

MEETING AGENDA	TIME	ACTION
1. Chair Remarks	9:00 am	Discussion
2. Call to Order and Roll Call	9:10 am	Roll Call
3. Public Comment: Items on Agenda	9:20 am	Discussion
4. Approval of Seismic Safety Commission January, 11, 2024 Meeting Minutes	9:30 am	Discussion & Action
5. BRIC 2023 Cal OES Seismic Safety Commission Building Code Plus Up - *Annde Ewertsen, Executive Director, SSC* - *Jia Wang-Connelly, Senior Structural Engineer, SSC*	9:40 am	Discussion & Action
6. Southern California Edison Letter of Support - *Annde Ewertsen, Executive Director, SSC*	9:55 am	Discussion & Action
7. Ferndale Earthquake Sequence: Understanding Impediments to Local Recovery in Rio Dell, California - *Annde Ewertsen, Executive Director, SSC*	10:10 am	Discussion & Action
8. Earthquakes and Climate Change Workshop - *Annde Ewertsen, Executive Director, SSC* - *Jia Wang-Connelly, Senior Structural Engineer, SSC*	10:30 am	Discussion & Action
Break	10:50 am	Break
9. AB 100 Report: California State University - *Andrew Theisen, Emergency and Continuity Manager, Systemwide Emergency Management* - *Jack Andersen, Chief of Planning & Design, Capital Planning, Design, and Construction*	11:05 am	Discussion
10. AB 100 Report: University of California - *Lauren Friedman – AIA* *Executive Director Capital Asset Strategies* *University of California, Office of the President* - *Ellen Owens, AIA* *Director, Design and Construction Services* *University of California, Office of the President*	11:30 am	Discussion
11. UCSD Shake Table Update - *Tara C. Hutchinson, P.E., Ph.D.* *University of California, San Diego*	11:55 am	Discussion

12. Project Updates: a. Ferndale & Türkiye Report b. Fire Station Inventory c. Northridge Anniversary – Quake Heroes	12:05 pm	Discussion
13. Misc. Announcements	12:15 pm	Discussion
14. Public Comment: Not on Agenda	12:30 pm	Discussion
15. Chair and Vice-Chair Election	12:40 pm	Discussion & Action
16. Adjourn	1:00 pm	Adjourn

STATEMENTS FROM THE PUBLIC: The public will be allowed to address the Seismic Safety Commission during Item 3 on any item on the agenda and Item 14 on any item not on the agenda. Questions posed to the Seismic Safety Commissioners may be answered after the meeting or during a future meeting. Dialog or extended discussion between the public and the Seismic Safety Commissioners or staff may be limited per the Bagley-Keene Open Meeting Act. Public comments will typically be limited to two (2) minutes per speaker; however, the Chair may decide to lengthen the public comment periods at their discretion. Although not required, speakers are requested to identify themselves by stating their name and city of residence for the official record. All remarks shall be addressed to the Seismic Safety Commission as a body. Speakers should be brief and are to limit their comments to the subject of discussion.

SIGN-UP & TIME LIMITS: If you wish to speak on an item and you are attending the meeting in-person or virtually and you know in advance that you'd like to comment on an item, please fill out a "Request to Speak" form and give it to a staff person before the meeting. The forms are available online with the current month's agenda here: https://ssc.ca.gov/. Submit any requests to speak to InfoSSC@caloes.ca.gov. If you are attending virtually, the Chair will provide an opportunity to comment during the scheduled public comment section and after each item.

SUGGESTIONS FOR SUBMISSION OF WRITTEN MATERIALS: It is requested that written materials be submitted to the Commission staff prior to the meeting. If this is not possible, it is requested that at least 30 copies be submitted to the Commission. This material will be distributed to the Commission members. Applicants are responsible for presenting their projects at the public hearing. NO FAXES will be accepted at the meeting site. You may be able to make prior arrangements with staff by sending an email to InfoSSC@caloes.ca.gov but you will be responsible for paying the hotel or meeting site for its receipt.

ACCESS TO MEETING: Meeting facilities are accessible to persons with disabilities. If you require special assistance, please contact any staff member at the phone or email address below, prior to the meeting. An interpreter for the deaf will also be made available upon request to the staff at least five calendar days prior to the meeting.

For more information please contact:

Tanya Black 916-224-8819 or Tanya.Black@CalOES.ca.gov.

ALFRED E. ALQUIST
SEISMIC SAFETY COMMISSION MEETING
In-person and Zoom Teleconference Meeting
Thursday, January 11, 2024

I. Call to Order

The meeting was called to order by Chair Silva. Roll call was conducted by Tanya Black and the following Commissioners and Representatives attended in-person, virtually, or were absent:

Commissioner	In-Person	Virtual Attendance	Absent
Cindy Silva, Chair		X	
Representative Sean Connelly for Assemblymember Rodriguez, Vice Chair		X	
Representative Astighik Hakobyan for Senator Portantino	X		
Ida Clair	X		
Alegría De La Cruz (Arrived 9:08am)		X	
Debra Garnes	X		
Representative Lori Nezhura for Nancy Ward	X		
Joone Kim-Lopez		X	
Representative Irina Brauzman for Building Standards Commission	X		
Kevin McGowan		X	
David Rabbitt	X		
Vincent Wells	X		
Dr. H. Kit Miyamoto			X

II. Chair Remarks:

Chair Silva opened with a welcome and highlighted the importance of the in-person attendance of seven commission members to ensure a quorum. She also announced that the Executive Director would, for a short time, chair the meeting during her absence.

Chair Silva then shifted focus to recent global seismic events and briefly discussed the December 18, 2023, earthquake in Northwestern China, and the January 1, 2024, earthquake in Japan. Commissioner Miyamoto, currently in Japan, was mentioned for his involvement in post-earthquake efforts and is expected to provide a report later.

Chair Silva also commemorated past earthquakes, including the first anniversary of the Ferndale earthquake sequence in California, the upcoming 30th anniversary of the Northgate earthquake, and the February 6, 2023, earthquake in Türkiye. Chair Silva highlighted the ongoing need for vigilance in seismic safety, emphasizing that the commission's job is never complete, regardless of the season.

III. Public Comment:

Chair Silva opened public comments for items on the agenda. There were no public comments.

IV. Approval of Seismic Safety Commission October 12, 2023, Meeting Minutes:

A motion was made to approve by Commissioner De La Cruz and seconded by Commission Clair. A roll call vote was taken, and the motion to approve the amended October 12, 2023, Meeting Minutes passed unanimously.

Commissioner	Yes Vote	No Vote	Abstained
Cindy Silva, Chair	X		
Representative Sean Connelly for Assemblymember Rodriguez, Vice Chair	X		

Representative Astighik Hakobyan for Senator Portantino	X		
Ida Clair	X		
Debra Garnes	X		
Alegría De La Cruz	X		
Representative Lori Nezhura for Nancy Ward	X		
Joone Kim-Lopez	X		
Representative Irina Brauzman	X		
Kevin McGowan	X		
Dr. H. Kit Miyamoto			
David Rabbitt	X		
Vincent Wells	X		
	Total Votes: 12	Total Votes:	Total Votes:

V. Approval of Seismic Safety Commission Strategic Plan:

Speakers: Annde Ewertsen, Executive Director, SSC

The Executive Director presented an update on the Seismic Safety Commission's (SSC) Strategic Plan. Chair Silva and Commissioner Garnes, members of the ad-hoc committee, worked on revising the previously incomplete strategic plan.

A motion to approve by Commissioner Garnes and seconded by Commission Kim-Lopez. A roll call vote was taken, and the motion to approve SSC's Strategic Plan passed unanimously.

Commissioner	Yes Vote	No Vote	Abstained
Cindy Silva, Chair	X		
Representative Sean Connelly for Assemblymember Rodriguez, Vice Chair	X		
Representative Astighik Hakobyan for Senator Portantino	X		
Ida Clair	X		
Debra Garnes	X		
Alegría De La Cruz	X		

Representative Lori Nezhura for Nancy Ward	X		
Joone Kim-Lopez	X		
Representative Irina Brauzman	X		
Kevin McGowan	X		
Dr. H. Kit Miyamoto			
David Rabbitt	X		
Vincent Wells	X		
	Total Votes: 12	Total Votes:	Total Votes:

VI. Mobile Home Project

Speakers: Annde Ewertsen, Executive Director, and Jia Wang-Connelly, Senior Structural Engineer, SSC

Executive Director Ewertsen introduced the topic, highlighting the seismic vulnerability of mobile homes.

Jia Wang-Connelly, Senior Structural Engineer, discussed three key systems for reducing lateral load vulnerability:

(1.) Engineered tie-down systems.
(2.) Foundation systems.
(3.) Earthquake Resistance Brace System (ERBS).

Jia Wang-Connelly pinpointed specific regulatory gaps and the outdated reference to the 1982 Uniform Building Code in ERBS regulations. These gaps highlight a disconnect between current seismic understanding and existing code provisions.

The proposed project aims to secure a Federal Emergency Management Agency (FEMA) BRIC (Building Resilient Infrastructure and Communities) Building Code Plus-Up Grant of $300,000, with a 25% local match to be covered by in-kind staff contributions. The project's objectives include:

- Evaluating current code provisions
- Developing a testing program
- Analyzing data
- Recommending code improvements
- Understanding the benefit and cost of code changes
- Engaging the public in these changes

Housing and Community Development's (HCD) support for this initiative was noted, emphasizing the project's alignment with broader seismic safety goals.

A motion to approve by Commissioner Rabbitt and was seconded by Commissioner Garnes. A roll call vote was taken, and the motion to direct staff to complete and submit the BRIC grant sub-application passed unanimously.

Commissioner	Yes Vote	No Vote	Abstained
Cindy Silva, Chair	X		
Representative Sean Connelly for Assemblymember Rodriguez, Vice Chair	X		
Representative Astighik Hakobyan for Senator Portantino	X		
Ida Clair	X		
Debra Garnes	X		
Alegría De La Cruz	X		
Representative Lori Nezhura for Nancy Ward	X		
Joone Kim-Lopez	X		
Representative Irina Brauzman	X		
Kevin McGowan	X		
Dr. H. Kit Miyamoto			
David Rabbitt	X		
Vincent Wells	X		
	Total Votes: 12	Total Votes:	Total Votes:

VII. 2023 Seismic Safety Commission Reports

Speakers: Annde Ewertsen, Executive Director, and Tanya Black, Administrative Processes Manager, SSC

Chair Silva initiated the discussion and then excused herself at 9:43 a.m. Executive Director Ewertsen took over the discussion of the 2023 Annual Report. The report outlined the SSC's statutory authority and provided a

financial summary. The report detailed various funding sources: $1,349,999 from the Seismic Safety Assessment Revenue through the Department of Insurance, $269,000 from the general fund for operational expenses, $15,000 from the California Public Utilities Commission (CPUC) for a specific project, and $700,000 from the California Research and Assistance Fund (CRAF).

A motion to approve was made by Commissioner Garnes and was seconded by Commissioner Rabbitt. A roll call vote was taken, and the motion to authorize SSC staff to make any necessary edits and finalize the 2023 Annual Report passed unanimously.

Commissioner	Yes Vote	No Vote	Abstained
Cindy Silva, Chair	X		
Representative Sean Connelly for Assemblymember Rodriguez, Vice Chair	X		
Representative Astighik Hakobyan for Senator Portantino	X		
Ida Clair	X		
Debra Garnes	X		
Alegría De La Cruz	X		
Representative Lori Nezhura for Nancy Ward	X		
Joone Kim-Lopez	X		
Representative Irina Brauzman	X		
Kevin McGowan	X		
Dr. H. Kit Miyamoto			
David Rabbitt	X		
Vincent Wells	X		
	Total Votes: 12	Total Votes:	Total Votes:

Administrative Processes Manager Tanya Black proceeded with the discussion on the 2023 Attorney General (AG) Report. She provided a brief history of the fund, which mandates the SSC to submit an annual report to the Attorney General's office, detailing activities and programs funded during the year, along with a financial summary.

A motion to approve by Commissioner Rabbitt and was seconded by Commissioner Clair. A roll call vote was taken, and the motion to authorize staff to make any necessary edits and finalize the 2023 AG report passed unanimously.

Commissioner	Yes Vote	No Vote	Abstained
Cindy Silva, Chair	X		
Representative Sean Connelly for Assemblymember Rodriguez, Vice Chair	X		
Representative Astighik Hakobyan for Senator Portantino	X		
Ida Clair	X		
Debra Garnes	X		
Alegría De La Cruz	X		
Representative Lori Nezhura for Nancy Ward	X		
Joone Kim-Lopez	X		
Representative Irina Brauzman	X		
Kevin McGowan	X		
Dr. H. Kit Miyamoto			
David Rabbitt	X		
Vincent Wells	X		
	Total Votes: 12	Total Votes:	Total Votes:

A break was taken at 9:53 am
The meeting reconvened at 10:09 am

VIII. California Geological Survey Updates

Speaker: Jeremy Lancaster, PG CEG, State Geologist, Director of the California Geological Survey (CGS)

Executive Director Ewertsen directed that item XI. California Geological Survey Updates be heard out of order.

Jeremy Lancaster provided a comprehensive update on:

- CGS's activities and achievements in 2023

- The survey's seismic hazards activities, mentioning two principal programs the Seismic Hazards Program and the Earthquake Engineering Program
- Strong Motion Instrumentation Program and its four primary functions: field operations, data products, structure response and data utilization, and ground response
- Earthquake Early Warning (EEW) Project
- The Seismic Hazard Zoning team's achievements in 2023
- The Tsunami/Coastal Hazards Program's accomplishments

IX. Building Code and Other Updates

Speaker: Ryan Kersting, S.E., Principal, BUEHLER Engineering, Co-Chair, Structural Engineers Association of California (SEAOC) Legislative Committee, President, National Council of Structural Engineers Association (NCSEA), and Chair, 2026 NEHRP Functional Recovery Task Committee

Ryan Kersting, a principal at Buehler Engineering, provided an extensive update on developing updated seismic design provisions for functional recovery. The objective is to achieve a state of functional recovery within an acceptable time frame, varying based on the type of building or service. This approach moves beyond safety, considering the time frame needed for various buildings and services to recover, ranging from immediate needs like emergency services to less critical amenities that can afford longer recovery periods.

Concluding his presentation, Ryan Kersting called for the SSC to continue educating the public about what is achievable through building codes and to encourage local jurisdictions to supplement these codes for higher performance relative to community risks and vulnerabilities. The need for retrofitting existing buildings and considering the state's specific needs in terms of functional recovery, suggesting that California could lead the way as it has in other areas like green building design and energy efficiency.

X. Project Updates, Speakers: Annde Ewertsen, Executive Director, and Jia Wang-Connelly, Senior Structural Engineer, SSC

Executive Director Ewertsen provided an update on the Ferndale & Türkiye Report project, comprising three components.

- Lessons Learned report: currently in draft and expected for internal review by the end of January 2024. The report will be ready for the April 11, 2024, SSC meeting.
- Incremental Damage Assessment: the contract is currently with PEER for scope finalization.
- Jia Wang-Connelly then spoke about the third part: the IN-CORE project, explaining it as a computational platform funded by NIST to quantify community recovery after natural disasters. Three cities - Rio Dell, East Richmond Heights, and Monte Sereno in California - were selected for the project. These cities were chosen for their similar sizes and populations but significantly different economic profiles.

Executive Director Ewertsen continued by providing an update on the progress of the fire station inventory project. The survey draft for this project has been approved by the ad-hoc committees, which include Commissioner Wells and Representative Gould. Additionally, the survey received input and was vetted by both Cal OES Fire and Rescue and CAL FIRE. Currently, it's in the testing phase with a selected group of fire stations.

Additional project updates included a discussion on the Northridge anniversary Quake Heroes project, for which the Statement of Work (SOW) was completed in December, but contract details with CalOES are being finalized, and the Shake.

Shake Table project. This project is expected to conclude by the end of the summer and may begin as early as late fall.

XI. Miscellaneous Announcements

Executive Director Ewertsen provided several miscellaneous announcements and updates:

1. Legislative Update:

- AB 1046, a chaptered bill, recast the exemption for alteration projects on structures for human occupancy if the alteration value does not exceed 50% of the appraised value.
- AB 1505 and AB 1770 were moved to the inactive file.
- SB 544 (Laird Bagley-Keene Open Meeting) was chaptered.
- AB 1471 was also chaptered, extending the compliance deadline for a specific hospital.

2. Executive Director Ewertsen announced that Jia Wang-Connelly was invited to join the California Building Standards Commission (CBSC) Structural Design/Lateral Forces Code Advisory Committee.

3. A reminder about the upcoming election for the positions of Chair and Vice-Chair was provided. Members will receive a statement of qualifications to review. Those interested in running for the Chair or Vice Chair positions need to submit the required form by March 15th.

4. Several activities are planned to commemorate the 30th anniversary of the Northridge Earthquake on January 17th:
    a. Northridge 30th Symposium at Caltech: An event sponsored by the Structural Engineers Association of Southern California.
    b. California Specialized Training Institute (CSTI) is conducting a mobilization exercise, also known as Mobex, which is a combined agency exercise. It involves the California Regional Urban Search and Rescue (USR) and Rescue Task Forces (RTFs). This exercise will take place at the National Disaster Search Dog Foundation property in Santa Paula, California.
    c. The Earthquake Country Alliance "Welcome to Earthquake Country" website will provide additional information and recognition activities for the Northridge Earthquake.

5. A new SSC YouTube channel has been launched featuring previous commission meetings from 2023.

6. The Earthquake Brace + Bolt (EBB) program opened for registration for 30 days. This grant program focuses on seismically retrofitting of single-family residences with raised foundations.

7. Executive Director Ewertsen expressed gratitude to Salina Valencia for her nearly nine years of invaluable service to the SSC.

XII. Public Comment

There were no public comments on items that were not on the agenda.

XIII. Adjourn

Chair Silva concluded the meeting by thanking everyone for their attendance and reminded everyone that the next meeting is scheduled for Thursday, April 11th, during which the election for Chair and Vice-Chair for the coming year will take place.

Chair Silva adjourned the meeting at 11:29 am

To view the full meeting recording go to the following link: https://youtu.be/KSUmS8gLPOM?si=vMCgIpnnDVQ-ilor

ALFRED E. ALQUIST
SEISMIC SAFETY COMMISSION MEETING

Memorandum

To: Seismic Safety Commissioners

From: Annde Ewertsen, Executive Director

Date: April 11, 2024

Subject: BRIC 2023 Cal OES Seismic Safety Commission Building Code Plus Up

Recommendation:

Staff recommends Commissioners review the background information, be prepared to provide comments/questions on the presentation, and vote on the request to increase the project budget to $450k.

Background:

The Seismic Safety Commission (SSC) approved the mobile home seismic design code update project in January 2024. It directed staff to submit a sub-application for a $300k FEMA 2023 BRIC Building Code Plus Up grant. The local match is anticipated to be staff time.

Cal OES Hazard Mitigation Assistance (HMA) notified SSC staff that additional BRIC funding was available and inquired if SSC was interested in expanding the project's scope. SSC staff was interested in the possibility of adding related to geotechnical testing of bracing assemblies to the project. In addition, after SSC approval of the $300k project, other entities submitted estimates for the testing that were significantly higher than the one entity that had submitted costs by the application deadline.

With the request from HMA and the potential for higher estimated costs for testing, SSC staff increased the budget to $450k when the sub-application was submitted. The local match is still anticipated to be covered by staff time. SSC staff will be requesting SSC approve the increased budget. If the request is denied, SSC will change the budget submitted in the application to $300k.

ALFRED E. ALQUIST
SEISMIC SAFETY COMMISSION MEETING

Memorandum

To: Seismic Safety Commissioners

From: Annde Ewertsen, Executive Director

Date: April 11, 2024

Subject: Southern California Edison Letter of Support

Recommendation:

Staff recommends Commissioners review the background information, be prepared to provide comments/questions on the presentation, and vote on the proposal to support Southern California Edison's seismic mitigation upgrades.

Background:

Southern California Edison's (SCE) seismic expert, Dr. Ken Hudnut, presented to the Seismic Safety Commission (SSC) on SCE's Seismic Resiliency Program (SRP) at SSC's October 2023 meeting.

SCE submitted its General Rate Case (GRC) for 2025-2028 to the California Public Utilities Commission (CPUC) on May 12, 2023; the rate case, which includes rate increases for seismic mitigation activities, is pending. SCE has requested SSC consider providing a support letter. The GRC includes doubling the current seismic mitigation spending of $35M/year to $70M/year by 2028.

SSC staff have drafted a general support letter for the importance of seismic mitigation upgrades to critical infrastructure but specifically states the SSC will not weigh in on how those upgrades should be financially accomplished.

Please note: draft of letter will be sent separately at a later date

April 11, 2024

California Public Utilities Commission
505 Van Ness Avenue
San Francisco, CA 94102

Subject: Support for Seismic Retrofitting of Critical Infrastructure—SoCal Edison's Seismic Retrofit Program

Dear Commissioners,

The Alfred E. Alquist Seismic Safety Commission's (SSC) mission is to improve the seismic safety and resiliency of California communities by providing resources and guidance, facilitating research, and fostering collaboration in earthquake preparedness, mitigation, and recovery. Through our efforts, we aim to protect lives, property, and infrastructure from seismic hazards by reporting and recommending to the Governor and Legislature policies and programs needed to reduce earthquake risk.

The SSC provides the following in response to SoCal Edison's (SCE) request for a letter in support of their Seismic Resiliency Program. In providing this letter of support, the SSC does not offer an opinion on SCE's proposed rate increase, which is currently pending before the CPUC.

The SSC strongly supports the prioritization of seismically retrofitting aging, critical infrastructure. As our communities continue to grow and evolve, ensuring the safety and resilience of our critical infrastructure, much of which was built many decades ago, against seismic events is paramount. With each passing year, the risks associated with seismic events pose an increasing threat to the safety, functionality, and resilience of our communities.

While the SSC acknowledges SCE for the seismic mitigation efforts it has already taken, more is needed.

Until all critical infrastructure in California has been retrofitted or rebuilt to withstand the myriad of disasters, including earthquakes, that occur in our state, we remain vulnerable and less resilient than we could be.

In addition to its practical benefits, seismic retrofitting demonstrates our commitment to prioritizing safety and sustainability. It sends a powerful message that we are good stewards of our communities, taking proactive measures to protect current and future generations.

Together, we can work towards building a safer, more resilient future for all Californians.

Sincerely,

Annde Ewertsen, Executive Director
Seismic Safety Commission

ALFRED E. ALQUIST
SEISMIC SAFETY COMMISSION MEETING

Memorandum

To: Seismic Safety Commissioners

From: Annde Ewertsen, Executive Director

Date: April 11, 2024

Subject: Ferndale Earthquake Sequence: Understanding Impediments to Local Recovery in Rio Dell, California

Recommendation:

Staff recommends that commissioners review the background information, be prepared to provide comments/questions on the report, and vote to authorize Seismic Safety Commission (SSC) staff to make any edits and finalize the report.

Background:

The Ferndale Earthquake Sequence: Understanding Impediments to Local Recovery in Rio Dell, California report is part one of three of the Rio Dell and Türkiye Project. It has been reviewed by the ad-hoc committee, Chair, Cal OES Preparedness and Recovery, Cal OES Legal, Cal OES Coastal and Rio Dell and Humbolt County Staff.

After the report is finalized, it will be available on the SSC website.

Ferndale Earthquake Sequence:
Understanding Impediments to Local Recovery in Rio Dell, California

CALIFORNIA SEISMIC SAFETY COMMISSION

SSC No. 24-02

April 11, 2024

111 Faces Off the 101, Rio Dell (portion of mural), Julia Fordyce, Artist

Acknowledgments

The Seismic Safety Commission (SSC) wishes to thank the staff members of both the City of Rio Dell and Humboldt County for their assistance in helping to organize the SSC's May 23, 2023 hearing and their time during subsequent interviews. Mayor Debra Garnes and the City's public servants, as well as Humboldt County's public servants, also deserve special thanks for their tireless and dedicated work in the aftermath of these earthquakes. The SSC also appreciates the support received from staff members of the California Office of Emergency Services (Cal OES), the California Geological Survey (CGS), and others for the time and expertise offered to prepare this report.

Commissioners & Representatives

Honorable Cindy Silva	Chair, Local Government
Honorable Freddie Rodriguez	Vice Chair, State Assembly
Alternate: Stephanie Nguyen	
Ida A. Clair	State Architect
Alternate: Diane Gould	
Alegría De La Cruz	Social Services
Honorable Debra Garnes	Local Government
Joone Kim-Lopez	Public Utility
Kevin McGowan	Emergency Services
Dr. H. Kit Miyamoto	Structural Engineer
Honorable Anthony Portantino	State Senate
Honorable David Rabbitt	Local Government
Nancy Ward	CA Governor's Office of Emergency Services
Alternate: Lori Nezhura	
Vincent Wells	Fire Protection
Irina Brauzman, Representative	Building Standards Commission
Vacant	Planning
Vacant	Insurance

Commission Staff

Annde Ewertsen, Executive Director
Tanya Black, Administrative Processes Manager
Jia Wang-Connelly, Senior Structural Engineer
Trinity Gleckler, Program Analyst
Christopher Lozano, Program Analyst

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Figures

Ferndale Earthquake Sequence
Understanding Impediments to Local Recovery in Rio Dell, California

Executive Summary

In the early morning hours of December 20, 2022, a magnitude (M)6.4 earthquake occurred near the small city of Ferndale in Humboldt County, a seismically active region along the far-northern coast of California. Just 12 days later, on January 1, 2023, a M5.4 earthquake occurred in the same area, beginning a year-long sequence of almost 500 aftershocks of magnitude 1.0 or greater. Aftershocks continued into 2024.

Although the Ferndale Earthquake Sequence was felt widely across Humboldt County, the community of Rio Dell, a small city of some 3,400 residents, sustained the most significant physical damage from the earthquake event and has suffered the greatest long-term economic and societal effects of the event. By the end of 2023, total damage in Humboldt County was approximately $40 million, with $32 million of that damage in Rio Dell.

Within hours of the initial mainshock, Humboldt County proclaimed a Local Emergency. A Local Assistance Center (LAC) was established in Rio Dell within 10 days, which brought together various organizations to aid in the aftermath. The Federal Emergency Management Agency's (FEMA) disaster Public Assistance and Individual Assistance funding were unavailable because the level of damage did not meet FEMA's minimum thresholds for California.

On May 23, 2023, the Seismic Safety Commission (SSC) held a hearing in Rio Dell on the impacts and lessons learned from the sequence of earthquakes. The SSC heard testimony from approximately 25 individuals including local, state, and federal representatives and members of the public. Several potential policy considerations and lessons learned emerged from the hearing and follow-up interviews, particularly highlighting the challenges faced by small, rural communities in the aftermath of disasters.

While this report reflects findings and recommendations similar to those in prior SSC post-event reports, it is focused, intentionally, on insights and recommendations unique to the Ferndale Earthquake Sequence. Further, the purpose of this report is not to develop a compendium of all information known about the sequence of earthquakes but, rather, to identify and focus on priority findings and recommended actions that should be considered, particularly in support of small, rural communities that experience vulnerability in disasters and recovery.

Priority Recommendations

After analyzing the information received both during the hearing and from follow-up interviews, the SSC formulated a series of recommendations to improve the disaster preparedness, mitigation, response, and recovery efforts of local governments. A number of the recommendations are a priority.

Develop or update a local emergency operations plan (EOP) in coordination with the local operational area or county. Ensure the plan includes low-tech communication alternatives in case power, cellular, and/or internet capabilities become unavailable. Regularly review and practice the plan.

Educate local residents and businesses on the value of and funding sources for seismic retrofits and other earthquake mitigation activities and how to protect property and reduce economic losses. Focus outreach efforts on housing, particularly older single-family homes and mobile homes.

Identify local Non-Governmental Organizations (NGO) and Community-Based Organizations (CBO) and establish a post-disaster plan with these organizations. NGO and CBO partners are essential to long-term recovery.

Working through the State, with the California State Association of Counties, the League of California Cities, the California Special Districts Association, and with federal representatives, encourage FEMA to update its eligibility criteria for federal assistance programs so small, rural communities that experience social vulnerability and/or economic disadvantage have equitable access to federal disaster-assistance funding.

As a stop-gap to the unavailability of federal assistance, work with the State to add an individual assistance funding program. Be prepared to demonstrate how communities that experience social vulnerability and/or economic disadvantage fall further behind when federal assistance is unavailable for individual community members.

Support long-term disaster recovery and resilience by having a plan to address the post-disaster social and mental health needs of all community members.

Introduction

The Ferndale Earthquake Sequence struck Humboldt County on December 20, 2022, and January 1, 2023. Registering M6.4 and M5.4, respectively, the mainshock and aftershock caused 17 injuries. Although two deaths were initially attributed to the earthquakes, it was later determined that the deaths were caused by medical emergencies that occurred around the same time as the earthquakes.

Although the Ferndale Earthquake Sequence was felt widely across Humboldt County, the community of Rio Dell (City) – a small city located along the Eel River and about 14 miles from the Pacific coast – sustained the major physical damage of the earthquakes and has suffered the long-term economic and societal effects of the event. Numerous homes and businesses sustained damage or were deemed uninhabitable, gas leaks and power outages occurred, internet, and cellular communications were unavailable for several days. In addition, the elementary school was damaged and Rio Dell's water and wastewater systems sustained significant damage. The Fernbridge which leads to Ferndale also was damaged. Initially, damage in Rio Dell was estimated at $22 million; by the end of 2023, the level of damage was estimated at $32 million with total damage in Humboldt County estimated at $40 million.

Rio Dell was established in the 1840s as a lumber town and was incorporated as a city in 1965. The small city has about 3,400 residents. The area is considered severely disadvantaged economically with a median household income (MHI) of about $37,000 per year, in comparison to the statewide average MHI of $84,097. The local municipal government has 24 employees, including a 9-officer police department, a public works staff of 8, and a volunteer fire department. The local business community boasts about 100 small businesses, but only about 25 are storefront businesses, most of which belong to the Chamber of Commerce. Several businesses were shuttered due to the COVID-19 pandemic. The community has no major industry.

Humboldt County proclaimed a Local Emergency within hours of the December 20, 2022 mainshock. A Local Assistance Center (LAC) was established in Rio Dell within 10 days. The LAC brought together organizations that aided in the aftermath, including the Small Business Administration (SBA), the California Department of Insurance, city and county agencies, and numerous social service agencies.

Despite the significant level of damage for a small community like Rio Dell, a Presidential Disaster Declaration (PDD) was not requested by the State because the level of damage did not meet FEMA's minimum thresholds or indicators for California. In addition, California could not demonstrate that its resources were overwhelmed. See pages 14-17. Some federal funding from the SBA and U.S.

Department of Agriculture was made available after the earthquakes and the City coordinated with the County of Humboldt to utilize Community Development Block Grant (CDBG)[1] Owner-Occupied Rehabilitation program funds to assist citizens with repairs.

On May 23, 2023, the Seismic Safety Commission (SSC) convened a hearing in Rio Dell to hear testimony about and gather information on the Ferndale Earthquake Sequence and what can be learned for the future. The hearing was held at Rio Dell's City Hall and featured testimony from 25 individuals representing local, state, and the federal government; residents, and businesses impacted by the earthquakes, and other organizations.

During the hearing, public testimony focused on the earthquakes' impacts to infrastructure, lessons learned from first responders, and ongoing recovery efforts. The stories of personal experiences were enlightening and made it clear the Rio Dell community came together to support one another both during and after the earthquakes. The testimony demonstrated that Rio Dell has a culture of self-sufficiency and resiliency—lessons that can serve as a guide to local governments that must be prepared to manage earthquakes and other disasters.

Many of the findings and recommendations in this report are similar to those identified by the SSC following the 2014 Napa and 2019 Ridgecrest earthquakes. In particular, earthquake recovery in both Ridgecrest and Rio Dell was hampered by the same challenge: the unavailability of federal disaster funding assistance for small, rural communities in economically strong states like California. (Note: Unlike Rio Dell, Ridgecrest is located near a major military installation (China Lake Naval Air Weapons Station) and was able to capitalize on the indirect economic benefits of the federal government's required post-earthquake infrastructure work.)

The Ferndale Earthquake Sequence

The Ferndale Earthquake Sequence was a series of almost 500 earthquakes that occurred near Ferndale, California, a small community near the coast of Humboldt County in northern California. The earthquakes began in December 2022 and January 2023 and continued through 2023 and into 2024.

The mainshock, a M6.4 earthquake, struck on December 20, 2022, at 2:34 a.m. Pacific Standard Time with its hypocenter about 10 miles (15 kilometers) southwest of Ferndale, at a depth of 11 miles (18 kilometers) (Figure 1). At 1.458g (gravity), the M6.4 earthquake unleashed one of the strongest accelerations ever measured in California. Because the earthquake struck in a rural part of California, the damage, even with such strong accelerations, was relatively minimal. In all likelihood,

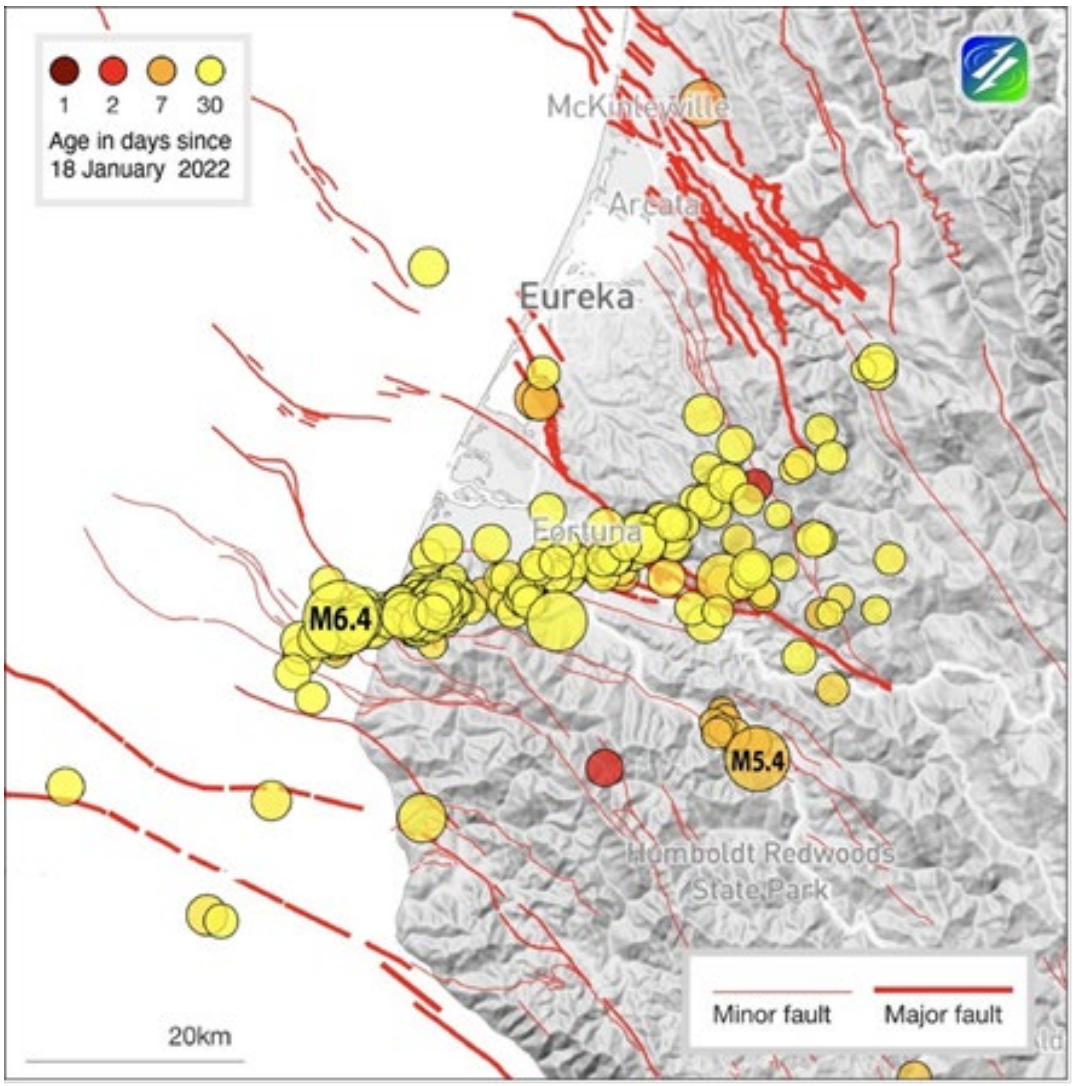
[1] News Flash • April 6, 2023 | Humboldt County Earthquake Reco (humboldtgov.org)

damage would have been much more severe if an earthquake with similar acceleration had occurred in a densely populated area.

The December mainshock was followed by a sequence of aftershocks, including the largest at M5.4 on January 1, 2023. Over the ensuing 12 months, the area experienced nearly 500 recorded aftershocks of M1.0 or greater, including 5 aftershocks in the range of M4.0 to M4.9. Aftershocks have continued. As shown by the yellow dots in Figure 1, the aftershocks have occurred along a previously unknown subsurface fault that trends northeast from the Humboldt County coast.

This information will help scientists to better assess the seismic hazards of this region.

Figure 1: Map of M.6.4 and M5.4 Earthquakes & Aftershocks

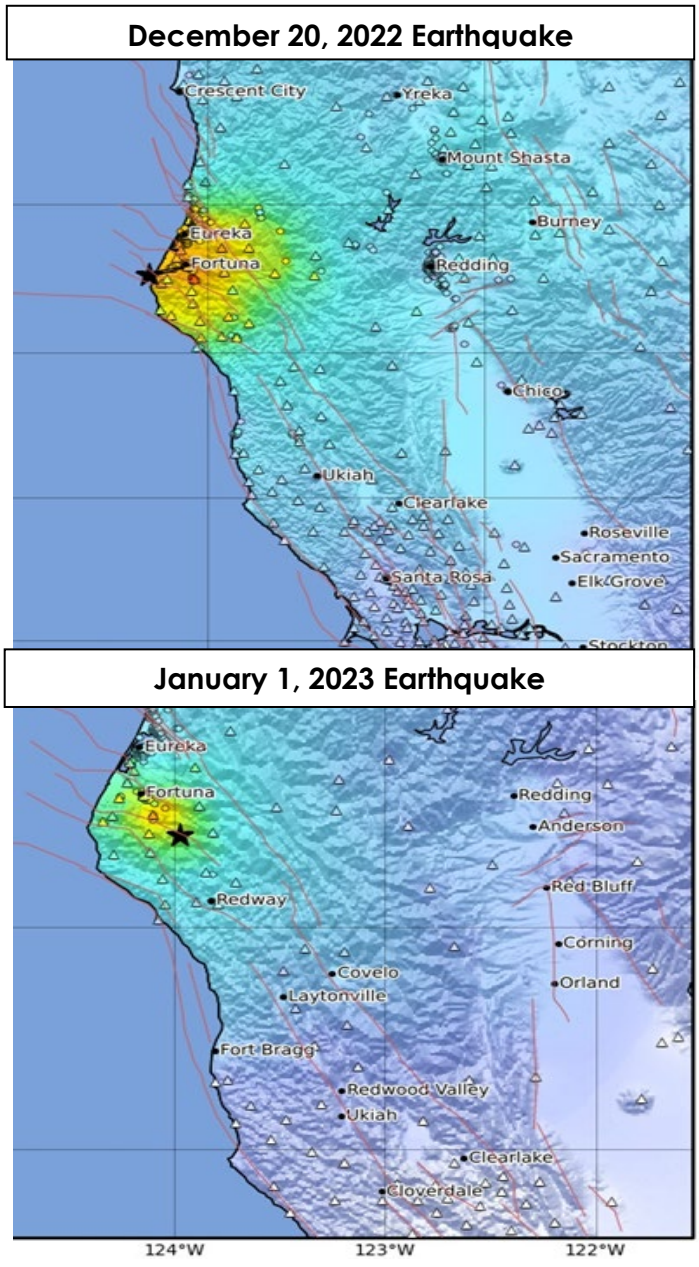


Source: Stein, R. S., Toda, S., Rollins, C., and Sevilgen, V., 2023, December 2022 California earthquake ruptured unknown fault: an analysis, Temblor[2]

[2] https://temblor.net/earthquake-insights/dec-2022-california-earthquake-unknown-fault-analysis-14867/

The United States Geological Survey (USGS) ShakeMaps in the next figure illustrate the intensity of shaking for the December mainshock and the January aftershock (Figure 2).

Figure 2: December 20, 2022 & January 1, 2023 ShakeMaps



SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
DAMAGE	None	None	None	Very light	Light	Moderate	Moderate/heavy	Heavy	Very heavy
PGA(%g)	<0.0464	0.297	2.76	6.2	11.5	21.5	40.1	74.7	>139
PGV(cm/s)	<0.0215	0.135	1.41	4.65	9.64	20	41.4	85.8	>178
INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+

Scale based on Worden et al. (2012) Version 6: Processed 2023-01-02T00:37:27Z
△ Seismic Instrument ○ Reported Intensity ★ Epicenter

Source: Worden, C. B., and D. J. Wald (2020). ShakeMap Manual Online: Technical manual, user's guide, and software guide, U.S. Geological Survey, DOI:10.5066/F7D21VPQ.

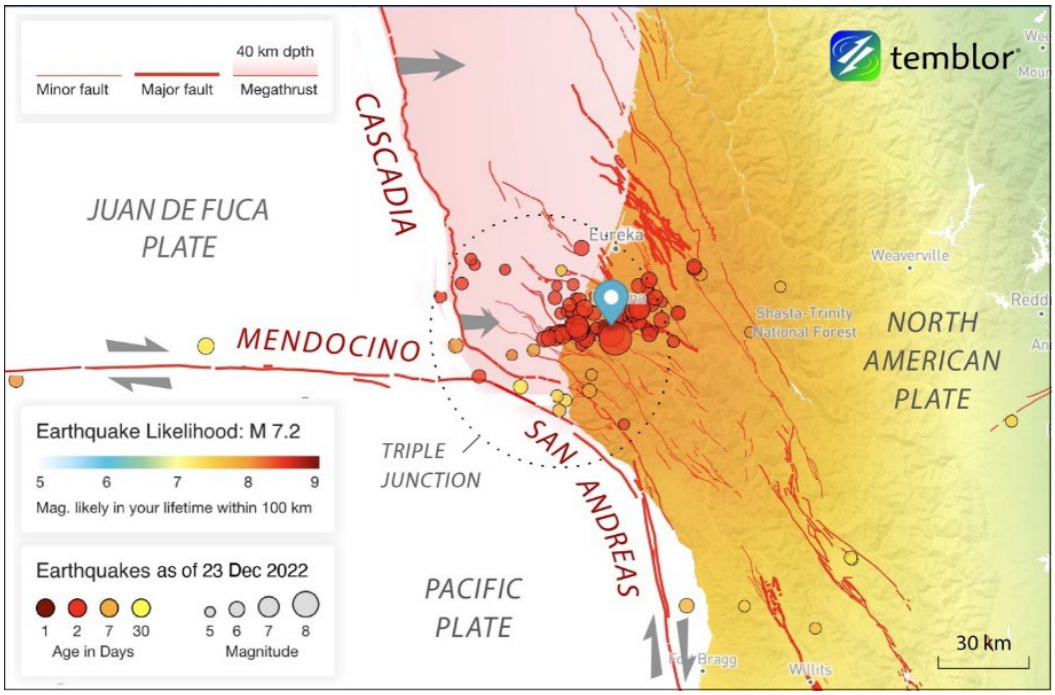
Ferndale Earthquake Sequence and Rio Dell

Located about 14 miles from the coast and about 10 miles southeast of Ferndale, Rio Dell is situated on the Mendocino Triple Junction, one of the most seismically active areas of California. As shown in Figure 3, the Mendocino Triple Junction is formed by the meeting of three tectonic plates—the North American, the Juan de Fuca, and the Pacific.

Because of this tectonic setting, the region – including Rio Dell – can experience large earthquakes. In fact, over the last 90 years, the region has experienced 20 earthquakes with a M6.4 or higher, and 5 of these events were recorded at M7.0 to M7.2. A previous sequence of large earthquakes began a year earlier on December 20, 2021.

The Ferndale Earthquake Sequence and the resulting damage to Rio Dell are a direct result of the tectonic interaction within the Mendocino Triple Junction.

Figure 3: Mendocino Triple Junction Map



The magnitude-6.4 quake (not shown) struck within the Mendocino Triple Junction, where three tectonic plates meet. Because the junction is distorted and compressed, deformation is distributed across a network of faults, one of which ruptured on Dec. 20, 2022. Historically, the junction has been extremely seismically active. The arrows give the sense of motion of the faults. The color ramp gives the magnitude (within 100 kilometers) that's likely in a lifetime. Note that likely maximum magnitude within 100 kilometers of the Mendocino region in a lifetime is magnitude 7.2.[2]

Ferndale Earthquake Sequence: Triggered Earthquakes?

In recent years, seismic interest has begun to focus on the phenomena of

earthquake sequences that involve at least two large-magnitude events within a short period of time. Some of these sequences—which have occurred in different parts of the world—have been described as "triggered" events because the subsequent earthquake has occurred on a different (but near) fault that scientists believe was triggered by the release of energy from the earlier event.

As an example, the February 2023 Türkiye earthquake sequence was likely a triggered sequence, as it involved two mainshocks, an initial M7.8 mainshock that likely triggered the subsequent M7.5 mainshock. Extensive casualties and building collapse resulted from the two mainshocks as well as several large-magnitude aftershocks between and following the two mainshocks. Many of the buildings that survived the M7.8 mainshock collapsed during the M7.5 event.

In the U.S., the 2019 Ridgecrest earthquake sequence also was characterized by mainshocks that occurred on more than one fault.

The consequences of the Ferndale Earthquake Sequence are clear: the M6.4 and M5.4 earthquakes both caused significant and compounding damage. However, scientists have determined that the Ferndale Earthquake Sequence was not a triggered event.

Appendix A provides information on post-event structural damage assessments in Rio Dell.

To date, little research is available on how buildings and infrastructure withstand a sequence of strong earthquakes. The SSC has recently begun research on the cumulative effects of strong earthquake sequences.

Economics of Disasters for Underserved Communities

The ability of a community to effectively prepare for and respond to a natural disaster is often dependent on resources, particularly financial resources. This is uniquely true for small, underserved communities like Rio Dell, where local financial resources may be limited and state and/or federal assistance can be constrained.

Rio Dell's Economic Topography

Rio Dell is a rural community located in the Eel River Valley in Northern California's Humboldt County. Established in the 1840s as a center for the local lumber industry, Rio Dell—like many rural communities—has suffered with the decline of its primary industry.

Today, the State of California classifies Rio Dell as an economically disadvantaged

community.

- Rio Dell's Median Household Income (MHI) is about $37,000[3], approximately less than half the statewide MHI ($84,097).
- With an average per capita income in Rio Dell of $24,700, some 38 percent[4] of Rio Dell's residents are living below poverty and nearly 43 percent receive some form of public assistance[5].
- Rio Dell experiences a high level of social vulnerability (0.8278)[6] and also has an "unhealthy places" designation[4], which is a determinant that contributes to lower life expectancy.
- Rio Dell's population is primarily White (Non-Hispanic) with English as the self-reported language spoken in the home[3].

Federal Disaster Assistance

Federal disaster assistance is critical to local communities. When a natural disaster strikes and the damage exceeds the capabilities of state or local government to respond, a state may ask the federal government to declare a disaster, which "unlocks" a variety of federal aid programs, including funding from the U.S. Department of Homeland Security's Federal Emergency Management Agency (FEMA).

FEMA offers two disaster assistance programs,[7] both of which can be used for immediate relief and long-term recovery, and one program for mitigation projects.

- Public Assistance (PA) for infrastructure such as roads, bridges, and community facilities
- Individual Assistance (IA) for individual community members
- Hazard Mitigation Grant Program (HMGP) for mitigation projects

FEMA has a separate process for determining if assistance will be provided. For public infrastructure, FEMA considers, primarily, the severity of damage and an applicant's capabilities. For individual assistance, FEMA primarily looks at total uninsured homes and personal property losses.

Significantly, FEMA has established a minimum damage threshold for each state

[3] https://datausa.io/profile/geo/rio-dell-ca/

[4] https://map.healthyplacesindex.org/?view=7be44f16-734b-4c6a-919b-303133117e49

[5] https://headwaterseconomics.org/apps/economic-profile-system/600060900

[6] https://www.atsdr.cdc.gov/placeandhealth/svi/interactive_map.html

[7] https://www.govinfo.gov/content/pkg/COMPS-2977/pdf/COMPS-2977.pdf

that is based on state-level metrics. The estimated value of damage from a local event must exceed the state-level minimum threshold to qualify for federal assistance.

Currently, California's minimum per-event threshold is $72,750,330. The California threshold is exceedingly high because of the high economic value of the Los Angeles and San Francisco Bay Area regions and of the State's tech industry. As a result, small and/or rural communities that experience economic disadvantage or social vulnerability in other areas of California are unable to qualify for federal assistance and are deprived of an equitable opportunity for recovery.

For the Ferndale Earthquake Sequence, the level of damage did not meet the federal minimum threshold requirement. Although about 25 percent of Rio Dell's housing was damaged and there was significant damage to the local water and wastewater systems, neither FEMA's Public Assistance nor Individual Assistance funding programs were available.

Other federal programs for individuals and businesses are available for mitigation and/or post-disaster recovery activities. The United States Department of Agriculture (USDA) offers two grant programs: one that may assist homeowners with mitigating post and pier foundation concerns and the other for repairs following a disaster. The SBA may also issue a disaster declaration allowing homeowners and businesses to seek loans after a disaster. See Appendices C and D.

State Disaster Assistance for Local Governments

The State of California assists local governments with disaster response and recovery efforts through California Disaster Assistance Act (CDAA) funding and technical assistance by Cal OES.

Funding Support

Local governments may request CDAA funding with or without a federal disaster declaration. Through this program, the State may provide funding to cover public infrastructure costs incurred from a disaster; the State may also provide funds to meet the matching requirements under federal programs. Through CDAA, the State may provide funding at a minimum level of 75 percent of eligible costs; however, in certain cases, the State may authorize CDAA to cover up to 100 percent of the repair costs[8]. Even with 75 percent coverage from CDAA, the remaining 25 percent

[8] Jurisdictions may not receive from the State more than 75% of the state's cost share on eligible CDAA funded projects unless they are AB 2140 compliant. AB 2140 authorizes cities and counties to adopt within the safety element of its general plan a federally specified local hazard mitigation plan (LHMP) that includes specified elements. Therefore, complying with AB 2140 may also significantly reduce the local cost share for both federal and CDAA-only funded projects.

local cost share for communities experiencing social vulnerability and/or economic disadvantage can be challenging. The 100 percent CDAA coverage is retroactive, granted on a project-by-project basis and is not guaranteed. Given the scale of public infrastructure damage in Rio Dell and as projects may take years to complete, the City may face fiscal uncertainty for years to come.

Following the Ferndale sequence, six local government entities, including three cities, have successfully tapped into CDAA funding to support local disaster response efforts. As of February 2024, $2.1 million in assistance funding for 13 projects ranging from emergency response activities and sheltering to debris removal and public infrastructure repair has been approved. An additional $1.4 million in assistance for 3 projects has been approved, but not yet paid (funding is provided when projects have been completed), and more than 60 projects are still being scoped and/or reviewed for approval. See Appendix B for CDAA-approved projects.

Rio Dell may ask the State to adjust its local cost share for CDAA-submitted projects because they are AB 2140 compliant. However, the City has yet to ask the State for an adjustment. More detail on AB 2140 is in Appendix D.

CDAA funds are not available for individual assistance.

The California Residential Mitigation Program (CRMP), a joint powers authority between Cal OES and the California Earthquake Authority, offers a homeowner grant program, Earthquake Brace + Bolt (EBB), to help retrofit raised-foundation homes. This program also can help homeowners retrofit post-and-pier houses with continuous perimeter foundation upgrades.

Cal OES Programmatic Recovery Assistance

To bolster local recovery efforts, Cal OES offers a range of specialized technical assistance and support services to help local communities transition from response to recovery. The Cal OES support personnel can help identify alternative funding for housing, health, and social services; community planning and capacity building; infrastructure systems; and natural and cultural resources.

Cal OES also manages the Safety Assessment Program (SAP), which utilizes volunteers and mutual aid resources to provide professional engineers, architects, and certified building inspectors, to help local communities conduct building safety evaluations after a disaster.

For the Ferndale earthquake response and recovery effort, a Cal OES Recovery Support Team worked locally for three months to aid with:

- Safety assessments and evaluations for damaged property
- Sheltering assistance

- Identification of low-interest home rehabilitation loans through sources such as CalHome and U.S. Housing and Urban Development's Community Development Block Grant (CDBG) funding

As of early February 2024, three USDA disaster grants for $40,675 have been funded. See Appendices C and D for information on the USDA programs.

Improvements Needed for Individual Assistance

The absence of FEMA and CDAA funds for individual assistance disproportionately hinders recovery in communities experiencing disadvantage and underservice that are already struggling financially.

Although FEMA has recently improved[9] the Individual Assistance Program (i.e., quicker access to funds, expanded eligibility for property and home repairs, simplified application process), the changes do not address the disparity that occurs in a state like California where the minimum-threshold requirement limits the availability of funds.

To better avail small communities that experience disadvantage with equitable federal aid after disasters, FEMA should consider expanding the eligibility criteria to include factors such as poverty level and community vulnerability and evaluate impacts on a regional basis as an alternative to statewide thresholds that unfairly penalize residents of large and diverse states, such as California.

Further, because communities like Rio Dell face post-disaster financial challenges both at an individual and community level, the State should consider establishing a program like CDAA that provides individual assistance to disaster victims.

Findings and Recommendations

Based on the May 13, 2023 hearing, follow-up interviews, and subsequent research and data-gathering efforts, the SSC used the findings and lessons learned to formulate recommendations that, if implemented, will likely improve the disaster preparedness, mitigation, response, and recovery efforts of local governments.

This report first presents the findings from the local experience during and following the Ferndale Earthquake Sequence. The report then organizes recommendations within the four pillars of emergency management.

[9] https://www.fema.gov/press-release/20240119/biden-harris-administration-reforms-disaster-assistance-program-help

- **Preparedness** increases a community's ability to respond to a disaster through a continuous cycle of planning, training, and exercising**.**
- **Mitigation** involves hazard assessments and actions that will reduce the impact and consequences of a disaster and build community resilience.
- **Response** focuses on the event-initiated mobilization of resources and expertise to save lives and minimize damage.
- **Recovery** is a long-term process that begins during the response phase and extends far beyond the immediate aftermath of a disaster.

Findings

Emergency operations infrastructure, plans, and supplies

The apparatus bay doors at the Rio Dell Fire Department collapsed and came off the tracks, which caused a delay of 20 minutes to get an engine to respond. The fire department has received a grant through the Humboldt Area Foundation to replace the doors.

The Rio Dell fire station lost power following the earthquake and had no automatic transfer of emergency power. In addition, automated testing for the fire station's generator had not been installed. The Fire District is researching how it might purchase and install it in the future and plans to institute automated generator testing.

Some emergency supplies were not readily available or maintained. For example, first responders had to work in the dark because flashlight batteries were dead, some equipment was not charged, and vehicles were low on fuel.

Public safety radio system

The repeater for Rio Dell's police radio system lost power. Rio Dell officers initially used the fire channel to listen to calls and, eventually, switched to the City of Fortuna's repeater to facilitate communication. Although the Fortuna repeater was better than nothing, the connection was not clear.

Immediately after the earthquake, police officers were only able to communicate face-to-face.

Power

Following the earthquakes, more than 70,000 were without power; most of the electric power outages were restored within 48 hours. Almost all of the power outage was not from infrastructure damage but, rather, from automatic shutoffs triggered by ground shaking and from phase-to-phase and phase-to-ground faults caused by wire swaying, in 12 kV, 60 kV, and 115 kV systems. Subsequent assessments found no damage for 98 percent of these types of faults.

Pacific Gas & Electric (PG&E) completed 13,000 post-event natural gas assessments and found just 78 gas leaks. Only 12 leaks were caused by earth movement; most of the leaks occurred in customer distribution lines that were corroded or brittle and susceptible to earthquake damage. One leak in Rio Dell reportedly led to a structure fire.

Public communications

Cell phone and landline facilities were damaged.

With power, internet, and cellphone services mostly out, communications with the public and between public safety officials were nearly impossible.

To distribute information to community members, Rio Dell used Nixle, an opt-in mass-notification cellphone-based application. Unfortunately, only about 300 individuals out of a population of 3,400 had subscribed to the app and with most cellphone services out, information dissemination was limited.

Other than Nixle, Rio Dell had no other way to easily and consistently disseminate information and no way to reach community members who did not have cell phones.

Emergency responders posted information on an A-frame board near the fire station. Rio Dell was unable to utilize their electronic message board because power was unavailable. The Fire District has since purchased a portable message display sign.

Rio Dell conducted a press conference in English with Spanish and Mandarin translators. Humboldt County officials took efforts to ensure information disseminated was provided in English and Spanish but noted that translation into other languages may have been needed.

Emergency responders

Staff to handle emergencies is limited. Rio Dell has a small city staff of 9 police officers and 8 staff members responsible for public works, water, and wastewater. The City also relies on an all-volunteer fire department.

At the time of the Ferndale earthquakes, Rio Dell did not have trained Community Emergency Response Teams (CERT). Other communities have experienced the invaluable neighborhood-level support from these volunteers.

There were challenges with the collection of data from applicants for disaster aid as well as volunteers for recording service hours.

Some City staff, including first responders, had significant damage to their residences and personal property. With their continued support for the community,

they were unable to address the needed repairs for their property.

Shelters and displaced persons

Immediately following the disaster, Rio Dell's designated shelter locations could not be used. The primary shelter location—a local elementary school—incurred damage and could not be used until the structure was evaluated. The secondary shelter site was under renovation, and there was not an identified third backup shelter site. Once it was determined there was not a third site, the Red Cross provided a shelter site in Fortuna.

Immediately following the earthquake, people congregated at the fire station, which overwhelmed the station and its staff. Fortunately, the number of medical emergencies was not so high as to negatively impact the ability of emergency responders to provide services.

Most people who had been displaced were able to shelter with family and friends.

Those individuals who could not shelter with family or friends were directed to the shelter in Fortuna. This was problematic for some residents who were concerned about sheltering with individuals of special circumstances/requirements (e.g., sex offender status). Later and only for a brief period, the shelter was moved to a school in Rio Dell after it was identified as safe. Had the school been the initial shelter location and given State law, sex offenders would not have been allowed to shelter there. The County partnered with Red Cross to assist several individuals with special circumstances in accordance with standard sheltering practices, but immediately following the earthquake the City was unsure of where and how these individuals would be sheltered.

While the initial shelter sites were not designated to help residents with pets, coordination with a local animal shelter helped address pet sheltering needs.

After the American Red Cross shelter closed, non-congregate housing, serving almost 100 displaced households, was coordinated by the Humboldt County Emergency Operations Center (EOC) and was available for almost four months. EOC staff coordinated directly with non-congregate shelter clients to identify short and long-term sheltering options, and assisted clients in returning to their pre-disaster residence when possible. Humboldt County allocated $1 million to fund an Earthquake Recovery & Assistance Program to assist Humboldt County and Rio Dell residents experiencing earthquake-related displacement.

Distribution of emergency food and supplies

There were challenges with distributing food and supplies to non-congregate shelter locations. Initially, deliveries of water, food, and clothing went to the Rio Dell fire station, which became overwhelmed until other locations were identified. Later,

providing meals and other wrap-around services to individuals without access to transportation and with multiple non-congregate sites was difficult. Also, with the power outage, keeping medication refrigerated (e.g., insulin) was an issue for individuals. Rio Dell is seeking a grant to establish a community resilience center that address some of these issues.

NGOs and CBOs

Non-Governmental Organizations (NGO) and Community-Based Organizations (CBO) were valuable in providing immediate assistance to people and supporting long-term recovery. Agencies such as World Central Kitchen, Humboldt Made, and Food for People (Humboldt County's Food Bank) were pivotal in finding and distributing food, water, and clothing to affected residents and businesses. Food for People set up multiple food pantries throughout the community. Humboldt Made provided free hot meals every day until January 13, 2023. Later, Habitat for Humanity helped repair homes.

Beyond the immediate aftermath of the disaster, Habitat for Humanity, Catholic Charities and Hope Crisis Response Network—which have extensive long-term recovery experience—were instrumental in helping to form a Long-Term Recovery Group for Humboldt County. These organizations held in-person meetings to share education on the recovery process.

Humboldt County formed a Long-Term Recovery Group[10] and hired a recovery officer to assist with the post-disaster needs of individual community members, including non-congregant housing. To ensure an individual's eligibility, Disaster Case Management[11] protocols needed to be established. According to local officials, it is the centerpiece of long-term recovery efforts. It should be noted that pre-disaster needs are not considered unmet post-disaster needs.

Public education

Rio Dell is not unlike other local communities, in that residents and business owners are unaware of programs for mitigating disasters and post-disaster assistance, and greater public education is needed. Local building owners and homeowners reported being unaware of programs that will help them retrofit their homes and businesses (e.g., EBB). They also were unaware of grant and loan programs that may support seismic retrofits, such as USDA's Single-Family Housing Repair Loans & Grants Program (Section 504 Home Repair program), and repairs, such as USDA's Rural Disaster Housing Repair Grant program and the Small Business Administration's

[10] https://humboldtrecovery.org/

[11] Disaster Case Management (DCM) is a time-limited collaboration between a trained case manager and a disaster survivor involving the development of a disaster recovery plan and a mutual effort to meet those disaster-caused unmet needs described in the plan. Source: https://www.fema.gov/emergency-managers/practitioners/recovery-resilience-resource-library/disaster-case-management

low-interest loan programs for that help businesses and homeowners. See Appendices C and D.

Federal and state financial assistance and cost-sharing requirements

Rio Dell, Humboldt County, and other local cities and special districts in the region sustained significant and costly damage both to public infrastructure and privately owned homes and businesses. About 25 percent of the housing stock of Rio Dell was damaged—a proportionately significant number for a remote community that is experiencing social vulnerability and underservice.

As explained on pages 14-17, because the total damages within California from the earthquake sequence did not meet the FEMA minimum threshold for federal assistance, the State did not request a Presidential Disaster Declaration and, therefore, FEMA did not provide federal aid for either public assistance or individual assistance. In addition, other State assistance can be limited and may take extended periods of time to receive. The FEMA financial assistance threshold can unintentionally disenfranchise small, rural communities that experience social vulnerability and underservice. A more equitable approach is needed.

In general, community leaders, residents, and business owners were unaware of the constraints of FEMA's requirements for providing federal aid. Most people believed federal funding would be forthcoming.

Earthquake insurance is expensive, particularly for low-income families. Residents told officials the cost of premiums and high deductibles were reasons why they did not have earthquake insurance. In California, the percentage of homeowners and renters with earthquake insurance is low, with an average uptake of 13 percent statewide. In low-income areas, the percentage is generally much lower. The number of Rio Dell households with earthquake insurance is disproportionately low.

More than a year later, many residents and businesses are still struggling, because they do not qualify for financial assistance to repair earthquake damage.

Some businesses and homeowners complain that loan assistance from the SBA has been delayed and that the application process is complicated and difficult to navigate.

Smaller community service districts and water districts have found it difficult to fund infrastructure that will improve seismic resiliency. Cal OES assisted with expediting an existing $12,862,989 State Water Resources Control Board (SWRCB) grant opportunity, which had been in the works for several years, for the replacement of a water storage tank, various water mains, pipes, fire hydrants, service meters, and more to update Rio Dell's water system. While the initial SWRCB grant project scope would have replaced vulnerable sections of the system in advance of the earthquakes, it is now helping to remedy the damage incurred following the

Ferndale Earthquake Sequence.

Residential property damage and repairs

About 25 percent of Rio Dell residential buildings sustained significant damage (defined by the residence receiving a yellow or red tag). Some yellow-tagged houses were re-evaluated after the second earthquake and were then red-tagged (see Appendix A). Even some green-tagged (safe to occupy) residences sustained damage that required repairs.

Repairs have been slow and, as of early 2024, many residents have found alternative permanent or long-term housing because they have been unable to return to their pre-disaster residence.

Rio Dell reports show that 30 of the original 60 red-tagged homes have completed repairs and/or closed out the pulled building permit (see Appendix A).

Both the age and type of housing stock and tenancy have been factors in both the amount of damage and the recovery.

Age and type of housing: As can be expected, most damage occurred in[12]:

- Older homes with raised-floor foundations that lacked bracing or bolting
- Homes built with post-and-pier construction
- Pre-1994 mobile homes that sit on simple vertical supports and/or lack tie-downs

In contrast, most newer site-built homes—particularly homes with slab-on-grade construction (i.e., no "cripple walls")—experienced little earthquake damage. The mobile homes in Rio Dell's newer park had little to no damage because they had tie-downs or seismic bracing systems. (Note: The Housing and Urban Development (HUD) mobile home bracing code only addresses wind, not earthquakes. The efficacy of this code has not been tested by a strong earthquake in California.)

Tenancy: Almost 40 percent of Rio Dell's housing is rented[13]. Because most funding for residential retrofit programs is designated for owner-occupied dwellings, rental residences are less likely to be retrofitted and, consequently, are more likely to be damaged in an earthquake. In addition, property owners can find it more difficult to secure funding assistance to repair damaged rental units, delaying repairs.

[12] https://www.cityofriodell.ca.gov/home/news/damage-rio-dell-ferndale-earthquakes-20-december-2022-and-1-january-2023

[13] https://affordablehousingonline.com/housing-search/California/Rio-Dell#google_vignette

Mental health assistance

Disasters can have a profound and lasting impact on the emotional well-being of a community.

In January 2023, and following the earthquake sequence, the CAL FIRE Trauma Team led a training effort for the community on how to manage post-traumatic stress disorder (PTSD) after an earthquake event and how to identify the signs of PTSD in others.

The issuance of a Presidential Disaster Declaration can offer a community a sense of hope and support because it acknowledges the magnitude of the disaster and shows the government's commitment to supporting recovery. Conversely, the lack of a declaration can have a long-term psychological impact on a community.

Recommendations

Preparedness Recommendations

Local Governments should:

- Establish a Local Emergency Operations Plan and drill. Equipment also should be routinely checked in advance in case of an emergency.
- Participate (especially cities) in operational area coordination meetings, trainings, and exercises.
- Designate location(s) within the community where emergency responders can access medical/emergency supplies, communicate with residents, conduct meetings, etc., to avoid emergency response structures, such as the local fire station, from being overwhelmed during disaster.
- Pre-select multiple shelter locations (congregate and non-congregate) that are accessible and emergency command center sites including pre-planning of grounds and facilities within those sites for respective purposes.
- In case of large events, prepare for extended power outages.
- Ensure emergency responders have multiple communication methods available for emergency alerts and public information. This includes making improvements to existing public safety communications systems and having low-tech methods for communicating with the public.
- As part of disaster planning, establish and integrate a network of Non-Governmental Organization (NGO) and Community Based Organization (CBO) partners into the planning process. Include organizations located outside the community to ensure resources are available in the event a future disaster is community/county-wide.
- Set up a community resilience center (i.e., a non-shelter facility with a kitchen, refrigeration, and storage capacity for food and medications as well as space for meetings).

- Ensure emergency personnel will be able to operate for up to 72 hours without outside support (e.g., supplies of food, water, medicine, and first aid supplies; electrical power; refrigeration for medication).
- Local governments should continue to improve the delivery of mental health services to both emergency responders and the public at large after future disasters. Create partnerships before disaster strikes so post-disaster support is immediately available.
- Ensure culturally responsive services (including language) from local and state resources are available to all community members impacted by a disaster.
- Recruit and train CERT volunteers.

Mitigation Recommendations

- Regularly provide the community with information on how to retrofit homes and buildings and how to protect property from seismic damage. Include information on auto-gas-shut-off valves. Include information on funding opportunities and the realities of post-disaster assistance. Don't wait for post-event funding opportunities.
- Local governments should ensure communities with current FEMA-approved Local Hazard Mitigation Plans are adopted into the safety element of their general plan pursuant to AB 2140[14] to ensure eligibility for future post-event local-share match funding opportunities.
- Homeowners should consider seismic auto-gas-shut-off valves to reduce fire following earthquake risks.
- When developing long-term capital improvement plans, cities, counties, and special districts should consider their aging infrastructure and the risk of catastrophic loss as a prioritization factor.

Response Recommendations

Local Governments should:

- Provide multiple adequate and accessible post-event sheltering options in communities, to address special circumstances/requirements.
- Encourage Safety Assessment Program (SAP) Evaluator and Coordinator training, especially in rural regions of California. The earthquakes occurred during the winter holiday season in a remote area that experiences winter weather that could impede the arrival of assistance from outside of the area.
- Train appropriately qualified local government personnel to conduct rapid safety assessments of all potentially damaged residences and shelter locations. Each local government should have at least one trained SAP Coordinator on staff.

[14] https://www.caloes.ca.gov/wp-content/uploads/Hazard-Mitigation/Documents/AB-2140-fact-sheet-11.7.2023.pdf

- Establish a consistent and shareable digital data format for assistance programs to collect disaster victims' data and a system to document volunteer hours, which are used in offsetting local cost share. This will help minimize duplication of data entry across programs and forms.

Recovery Recommendations

- The State, in cooperation with the California State Association of Counties, the League of California Cities, and the California Special Districts Association, and with federal representatives, should encourage FEMA to update its eligibility criteria for federal assistance programs so small, rural communities that experience social vulnerability and/or economic disadvantage have equitable access to federal disaster-assistance funding. This includes consideration of regional-based threshold metrics so that residents of large states like California are not unfairly penalized. There may be an opportunity to address this disconnect in building resilience through federal initiatives such as Justice 40,[15] which focuses on Climate and Economic Justice and defines Rio Dell's tract as overburdened and underserved.
- The State of California should consider the implementation of a State Level Individual Assistance Program that can make financial assistance available directly to survivors and individual households when federal aid is not available.
- The State of California and local governments should set expectations ahead of time on what local/state/federal assistance will provide in emergencies. Proactive communication tools about the criteria for aid are needed to facilitate understanding of why a community may not receive state or federal aid.
- Local governments should identify and contract with key partners that focus on recovery and revitalization specific to the community's needs.
- Local governments should consider implementation of a program/service to assist first responders in addressing damage/repairs to their homes while they are supporting their communities.

Conclusion

The Ferndale Earthquake Sequence that began in late December 2022 substantially impacted the City of Rio Dell. Significant damages were incurred by the community and challenges were faced in the response and ongoing recovery efforts. The region is likely to experience another significant event because it is within the area of the Mendocino Triple Junction, one of the most seismically active in the state.

[15] https://www.whitehouse.gov/environmentaljustice/justice40/

Recommendations in this report aim to bolster the preparedness, mitigation, response, and recovery capabilities of Rio Dell and similar communities facing seismic risks. Establishing local emergency action plans and enhancing mental health support services will help communities build resilience and ensure equitable recovery. Proactive measures such as seismic retrofits and community partnerships, will help mitigate the impact of future disasters. A reassessment of eligibility criteria for federal assistance and the creation of a state assistance program that provides individual assistance directly to survivors will better address the post-disaster response and recovery needs of communities experiencing social vulnerability and underservice.

Moving forward, partners at all levels—local, state, and federal—should collaborate effectively and prioritize investments in disaster preparedness and resilience. Heeding the lessons learned from the Ferndale Earthquake Sequence, communities like Rio Dell may better withstand future seismic events and facilitate a more equitable and sustainable recovery process.

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Appendix A: Rio Dell Structural Damage by Damage Type

The four images on the following pages, data provided by the City of Rio Dell Building Division and the Cal OES Safety Assessment Program (SAP), show the Rio Dell buildings that were yellow-and red-tagged following the mainshock and subsequent aftershock and the status of repairs.

Image 1: Following the December 20, 2022 mainshock, 117 structures were found damaged.

- 23 buildings were deemed unsafe (red-tagged)
- 94 buildings were mandated restricted use (yellow-tagged)

Image 2: Following the January 1, 2023 aftershock, buildings that were not previously red-tagged were re-examined, including buildings that had been previously yellow-tagged. The total number of damaged buildings nearly tripled to 292.

- 37 red-tagged buildings
- 255 yellow-tagged buildings

Image 3: The total number of tagged structures after the mainshock and aftershock was 409.

- 60 red-tagged buildings
- 349 yellow-tagged buildings

Image 4: As of February 15, 2024, some 14 months after the initial M6.4 earthquake, repairs had been completed and permits closed out on 30 of the 60 red-tagged buildings.

Image 1: Safety Assessment Program Inspections—December 2022

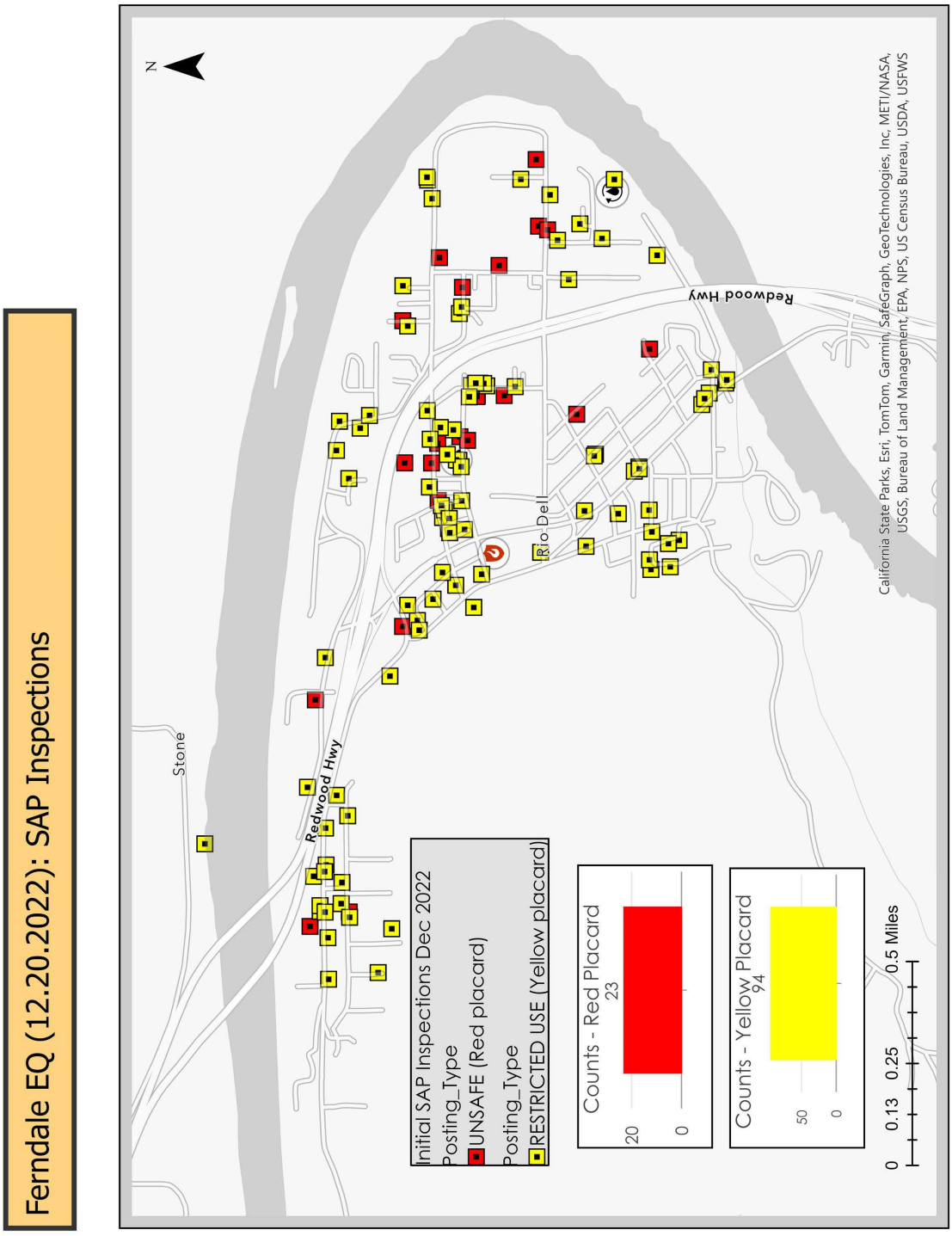


Image 2: Safety Assessment Program Inspections—January 2023

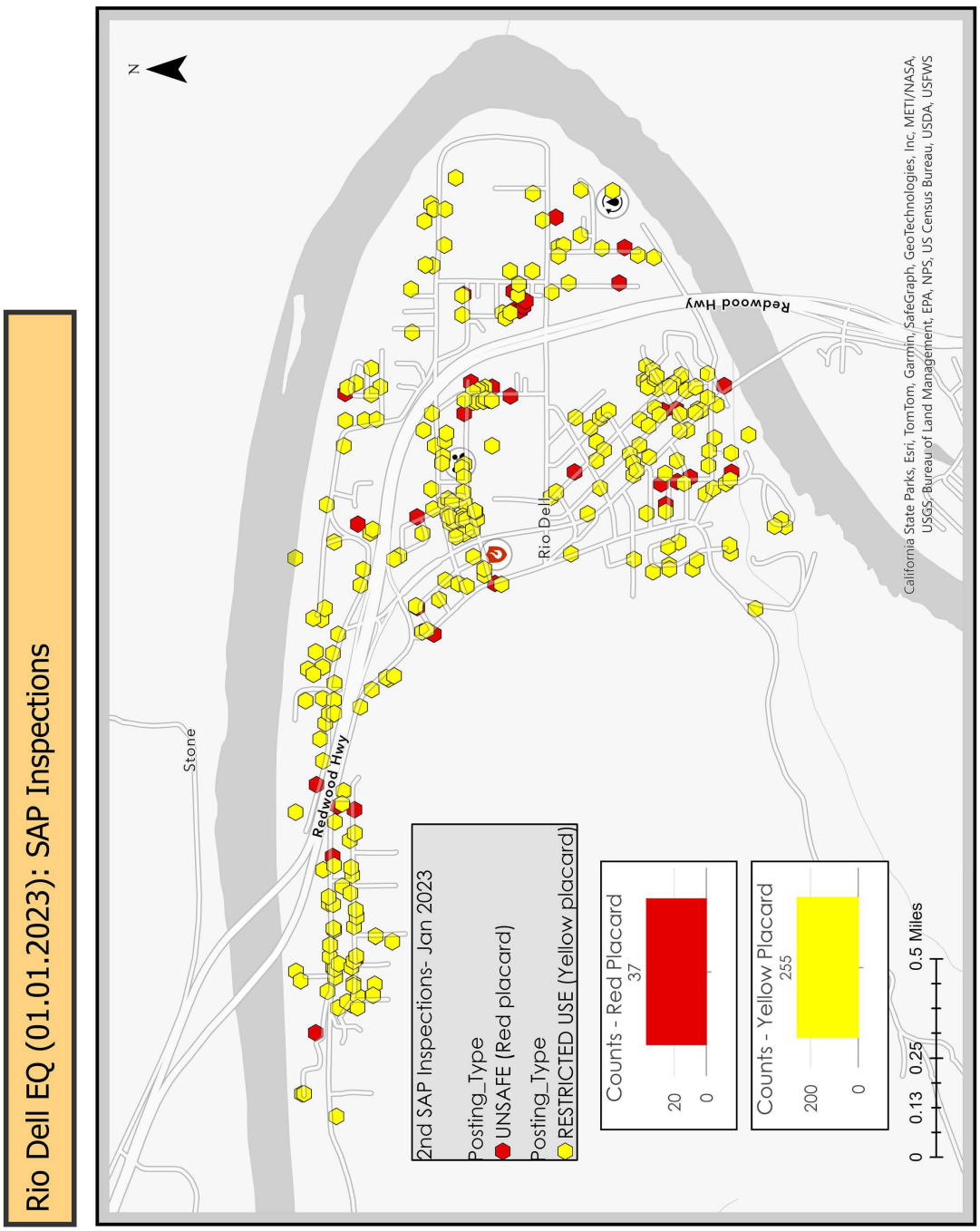


Image 3: Combined SAP Inspections

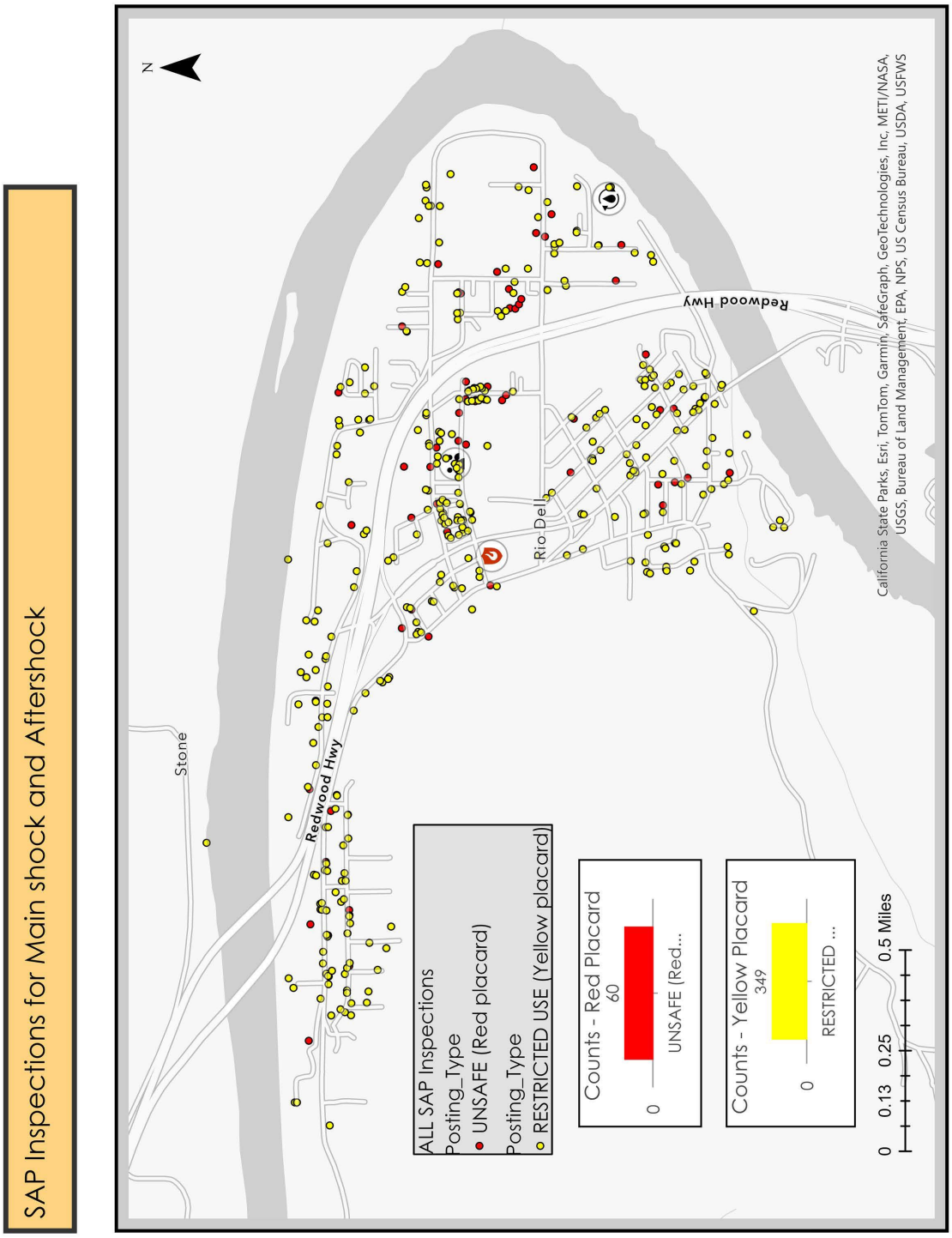
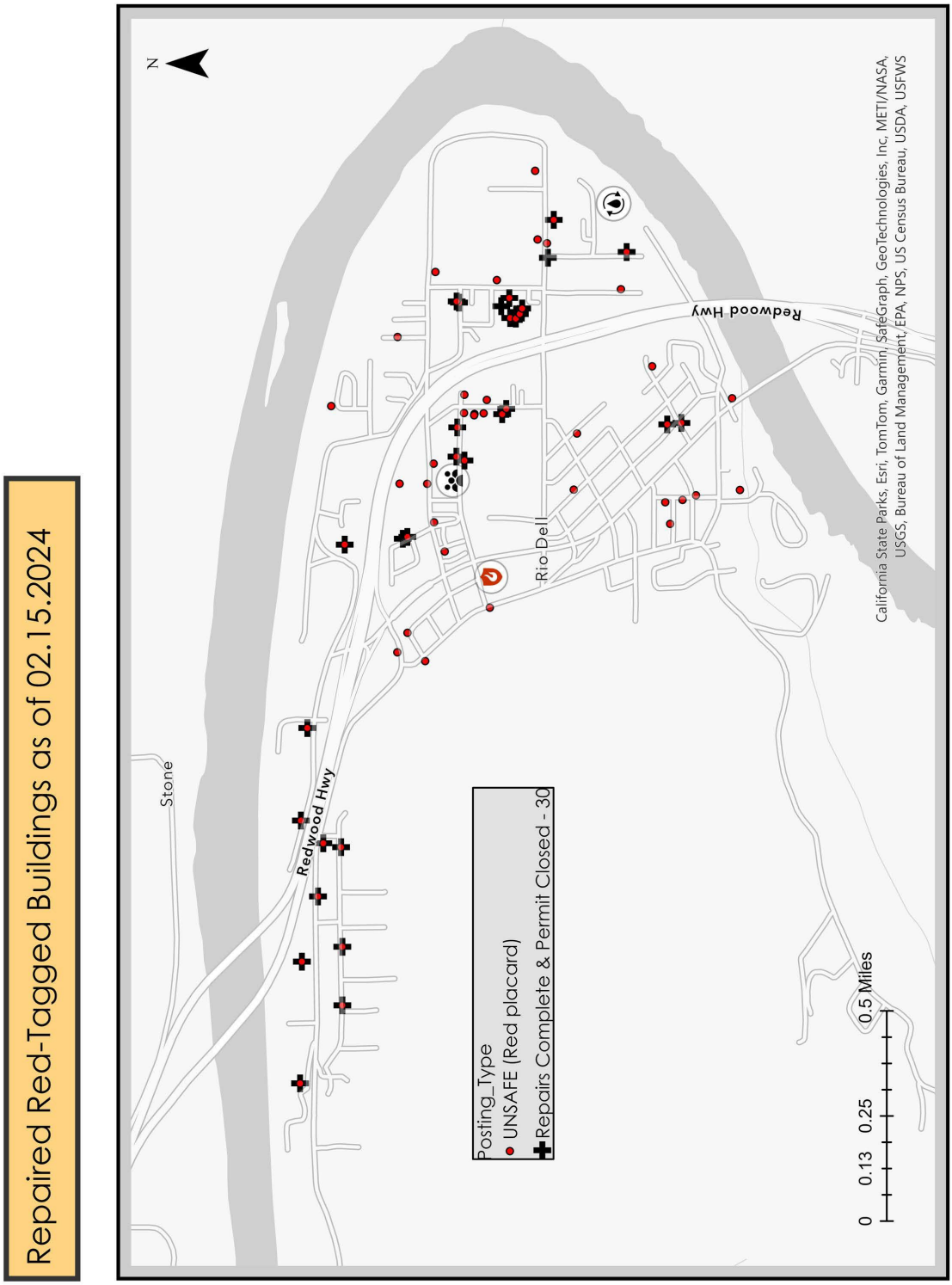


Image 4: Repaired Red-Tagged Buildings as of February 15, 2024



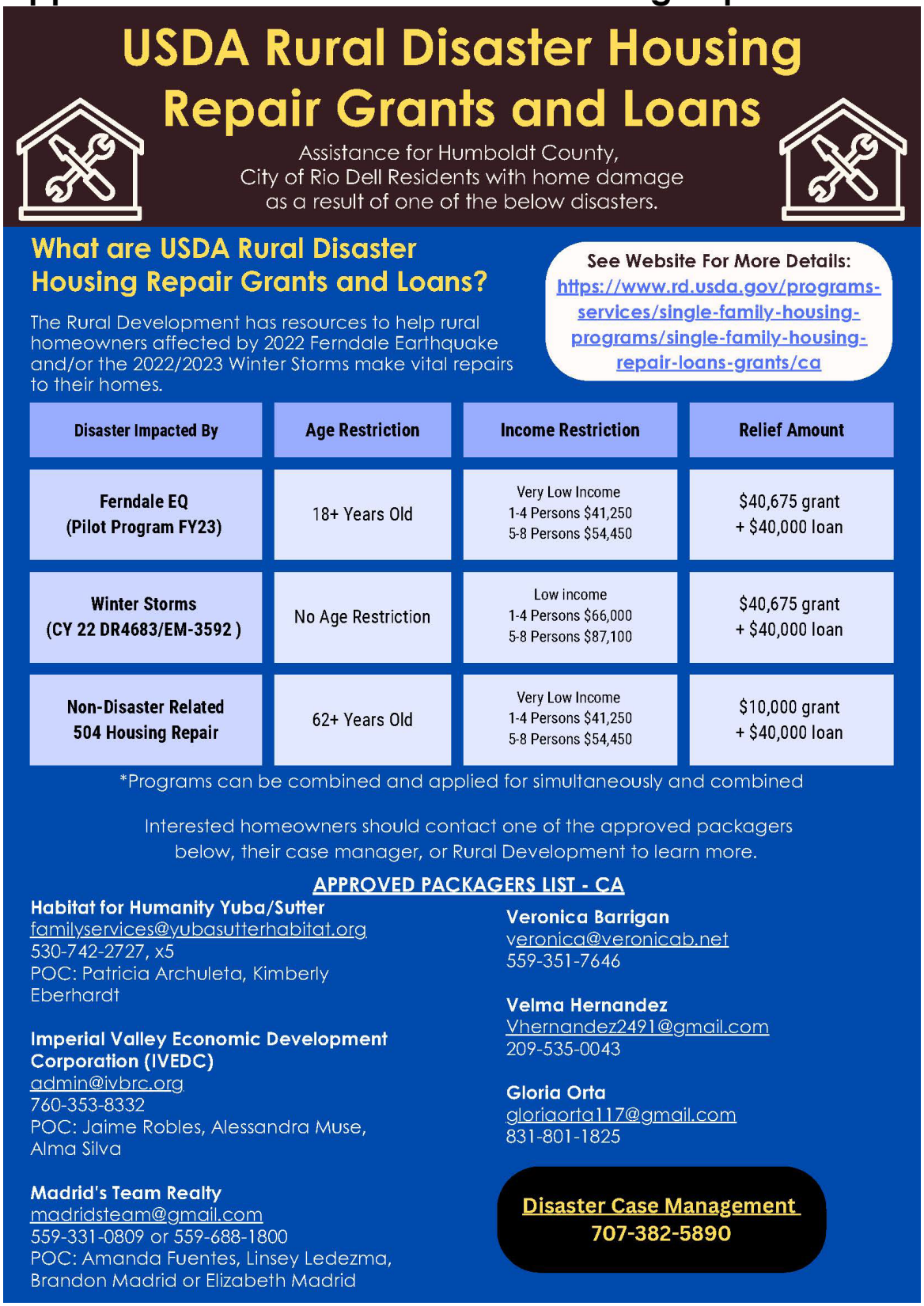
Please note: This map shows only Red placard tagged buildings (60) where repairs have been completed and permit has been closed (30) for address per Rio Dell Building Division report as of February 15, 2024.

Appendix B: California Disaster Assistance Act Funded Projects

As of February 2024, more than $3.5 million CDAA Projects had been approved with approximately $2.1 million funded. More than 60 additional projects including projects from 5 additional applicants were under review.

Applicant	Damage Survey Reports (DSR) Description	DSR Amount	Date Approved
Humboldt County Services District	Emergency Protective Measures	$33,000	03/23/23
	Damage Investigation	$ 2,413	04/21/23
City of Ferndale	Community Center Ceiling Tile Replacement	$52,500	04/06/23
City of Rio Dell	Bottled Water-Toilets-Washing Stations-Shower Trailer & Water Truck	$ 126,856	03/23/23
	Overtime - Applicant Owned and Operated Equipment - Contract Dumpsters for Debris Removal	$ 73,126	04/06/23
	Generator Fuel & Contract for Vac Trucks for Sewer Overflow	$ 15,692	04/06/23
	Building Inspections	$ 13,311	10/23/23
Humboldt County Sheriff's Office of Emergency Services	Sheltering - Phase I - pending Supplemental DSR	$ 314,621	06/06/23
	Sheltering Phase II: Supplemental DSR to DSR #4149	$ 62,476	01/04/24
	Patrol Operations	$ 18,692	08/22/23
City of Eureka	Lloyd Building (219 5th St, Eureka, CA) Demolition	$ 1,351,000	10/20/23
Westhaven Community Services District	Water Main Repairs	$ 6,345	11/06/23
	Emergency Service Road Repair & Donated Resources	$ 1,915	11/06/23
	Total Paid DSRs		**$ 2,071,947**

Appendix C: USDA Rural Disaster Housing Repair Grant



Source: https://humboldtgov.org/DocumentCenter/View/121956/-USDA-Rural-Disaster-Housing-Repair-Grants-and-Loans-Program-flier

Appendix D: Resources for Communities

1. **World Central Kitchen**: provider of meals in response to humanitarian, climate, and community crises.

   https://wck.org/?gad_source=1&gclid=CjwKCAiAt5euBhB9EiwAdkXWO5GZUOwAUC1VPV6VKpsdYBY_6ABx82csj79TW7N9yHWiAcSwkfIIRxoCdd4QAvD_BwE

2. **USDA**: The 2023 Consolidated Appropriations Act authorized the USDA Rural Disaster Housing Repair Grant program to provide resources to make essential repairs and improvements to rural homes located in Presidentially declared disaster areas that occurred in calendar year 2022. Even though, the Ferndale Earthquake Sequence was not Presidentially declared, eligibility was extended to the Humboldt County residents (see Appendix C).

3. **USDA**: Single Family Housing Repair Loans & Grants (Section 504) provides loans to very-low-income homeowners to repair, improve, or modernize their homes or grants to elderly very-low-income homeowners to remove health and safety hazards. This program is open year-round, and eligibility is not related to damage sustained from a disaster.

   https://www.rd.usda.gov/programs-services/single-family-housing-programs/single-family-housing-repair-loans-grants/ca

4. **EBB**: The Earthquake Brace + Bolt is a grant program designed to assist homeowners in seismically retrofitting their homes.

   https://www.earthquakebracebolt.com/

5. **AB 2140:** authorizes a city, county, or a city and county to adopt within the safety element of its general plan a federally specified local hazard mitigation plan (LHMP) that includes specified elements. Jurisdictions that have not adopted an LMHP as part of its safety element may not receive from the State more than 75 percent of the state's cost share of an eligible California Disaster Assistance Act (CDAA) funded project.

   https://www.caloes.ca.gov/wp-content/uploads/Hazard-Mitigation/Documents/AB-2140-fact-sheet-11.7.2023.pdf

6. **U.S. Small Business Administration (SBA):** provides low-interest loans to help businesses and homeowners recover from declared disasters.

   https://www.sba.gov/funding-programs/disaster-assistance

7. **Community Development Block Grant (CDBG):** The program supports community development activities to build stronger and more resilient communities.

   https://www.hudexchange.info/programs/cdbg/

ALFRED E. ALQUIST
SEISMIC SAFETY COMMISSION MEETING

Memorandum

To: Seismic Safety Commissioners

From: Annde Ewertsen, Executive Director

Date: April 11, 2024

Subject: Earthquake and Climate Change Workshop

Recommendation:

Staff recommends Commissioners review the background information, be prepared to provide comments/questions on the presentation, and vote on the project.

Background:

Our state is facing an unprecedented challenge in responding to natural disasters. Earthquakes are recognized as the natural disaster in California with the possibility of being the most damaging, but climate change-related hazards are seasonal, prevalent, and may occur concurrently with a disaster. In late 2022 and early 2023, winter storms occurred immediately after the Ferndale Earthquake Sequence began. The flooding caused by the winter storms further exacerbated earthquake damage to critical infrastructure.

The compounding and cascading impacts of earthquakes and climate change and their effects on the built environment and our communities are recognized as important topics by scientists, researchers, and emergency managers. In early 2024, USGS' Northern California Earthquake Hazards Workshop had a session on how climate change increases earthquake vulnerability and its impacts. California's Fifth Climate Change Assessment had the following topic, quantification of the compounding and cascading effects of climate change and the historically top natural hazards in California such as earthquake, fire, tsunami, and flood hazards on the built environment.

California needs to consider the cascading impacts of climate change and natural disasters to ensure a multi-hazard approach to resilience that aligns with the state's climate goals is discussed, researched, and implemented. To help address this gap, a multidisciplinary collaboration among earthquake

scientists/engineers, emergency managers, and climate scientists is needed.

In collaboration with the United States Geological Survey, California Geological Survey, and Cal OES, the Seismic Safety Commission (SSC) recommends organizing a workshop to explore collaboration and provide educational opportunities.

The following possible topics may be helpful for the researchers/scientists/emergency managers, and our state and local partners that fund and/or formulate policies in the area:

- Evolution of earthquake hazard development
- Intergovernmental Panel on Climate Change 6th assessment model and extreme weather events
- Global Climate Model Downscaling and California's 5th Climate Change Assessment
- Uncertainties of Earthquake and Climate model/dataset and their impacts on risk assessment of community lifelines
- Potentials from emerging technologies such as AI, supercomputing, remote sensing, satellite data, etc.
- Micro seismicity monitoring due to carbon sequestration
- Quantification of earthquake-induced liquefaction, landslide, fire following earthquake, and tsunami risk incorporating the latest climate dataset on sea level rise, fire, precipitation, and wind conditions
- Earthquake and secondary hazard risk assessment/community planning tools
- Computer simulation for climate resilience planning (digital twins)
- Success and challenges of multi-hazard preparedness and mitigation projects
- California's Energy policies to support the clean energy transition and opportunities
- Potential social equity issues

The final topics are to be determined with the collaborating agencies.

Workshop: online, TBD

Target Audience: Researchers/engineers, federal/state/local partners that fund and/or formulate policies on climate and earthquake hazard research, preparedness, mitigation, and resilience planning.

Cost to SSC: $1,600

ALFRED E. ALQUIST
SEISMIC SAFETY COMMISSION MEETING

Memorandum

To: Seismic Safety Commissioners

From: Annde Ewertsen, Executive Director

Date: April 11, 2024

Subject: AB 100 Report: California State University

Recommendation:

Staff recommends Commissioners review the background information and be prepared to provide comments/questions on the presentation.

Background:

Assembly Bill 100 (Committee on Budget), enacted as Chapter 20 of the Statutes of 2020 established an annual reporting requirement of the Seismic Safety Commission (SSC). The Legislature finds that numerous agencies at various levels of government have substantial responsibilities in the fields of earthquake preparedness and seismic safety. To provide a consistent policy framework to track and monitor those activities and to identify key activities and responsibilities related to seismic safety, the SSC has required that entities participate in the annual reporting to the SSC. The California State University is the tenth entity to come before the SSC and underscore the value of its seismic programs to the public.

CA Seismic Safety Commission
2024 CSU Report

Contents

About CSU

The California State University (CSU) is the nation's largest four-year university system. CSU has 23 universities across California, spanning 800 miles from Humboldt County to San Diego County. CSU has an annual student population of over 450,000 and a faculty & staff population of approximately 56,000. Of these campus community members, approximately 60,000 are residents of CSU campuses. CSU is known for excellence in undergraduate studies and producing an educated workforce for California. CSU operates over 2,130 buildings totaling 94.4 million square feet and over 3 million square feet of outdoor fields in 29 California counties.

The CSU is led by a board of 25 trustees, who are appointed by the Governor. The CSU Chancellor is appointed by the Board of Trustees and maintains an office for systemwide operations out of Long Beach, CA. The Board of Trustees also appoints a President for each of the 23 universities.

Within the Chancellor's Office, Systemwide Emergency Management & Continuity is responsible for Emergency Management policy and guidance on earthquake training, exercises and awareness education. The Capital Planning, Design & Construction Department maintains an Office of Architecture, which is responsible for maintaining CSU's seismic design requirements and for coordinating seismic assessments following an earthquake event.

Each campus has an Emergency Manager and a Campus Deputy Building Official that coordinate emergency response and damage assessment during earthquake response.

Legacy of Earthquake – Northridge at 30 years

On January 17, 1994 a magnitude 6.7 earthquake struck approximately one mile from CSU Northridge (CSUN). Fortunately, there were very few people on campus at the time of the earthquake because it occurred before dawn on a holiday. The earthquake caused damage to all buildings on the university, many requiring significant repairs, and one parking structure was demolished as a result of the earthquake. CSUN's buildings were under construction after the earthquake for eight years. During the first years following the earthquake, many classes were held in modular buildings on campus.

It has now been 30 years since the Northridge earthquake, and the legacy of this earthquake continues within the CSU system. On Saturday, February 3rd, CSUN hosted a 30-year remembrance event in partnership with the Earthquake Country Alliance. The event included a screening of the *Quake Heroes* film about the Northridge earthquake.

CSU's Director of Systemwide Emergency Management & Continuity recently presented on the legacy of this earthquake at the 2023 UC Merced Safety Conference. The presentation demonstrated the severe impacts to operations that earthquakes can cause and facilitated discussion around the impacts of today's technologies that may alter the way we recover and resume operations after an earthquake.

In 2016, CSUN hosted an innovative preparedness event for students that was based around the Northridge Earthquake. The 'Beat the Quake: An Earthquake Themed Escape Room' challenged groups of students to solve a series of puzzles, which included earthquake knowledge and mitigation skills to prepare for earthquakes. This interactive event was both educational and entertaining for students and engaged over 100 students in hands-on learning.

Figure 1 CSUN's "Beat the Quake"

Education & Outreach

Great Shakeout Earthquake Drills

The CSU and its campuses actively participate in the annual October Great Shakeout Earthquake Drill. 83% of the CSU's 23 campuses have registered as participants for more than 10 years, with 8 of them having been participants since the inaugural Shakeout in 2008. Even despite the challenges posed during the height of the COVID-19 pandemic in 2020, 13 campuses held some form of drill for the event, whether in-person, virtual, or a combination of both. Since 2019, an average of 355,000 CSU individuals have participated in the Great Shakeout.

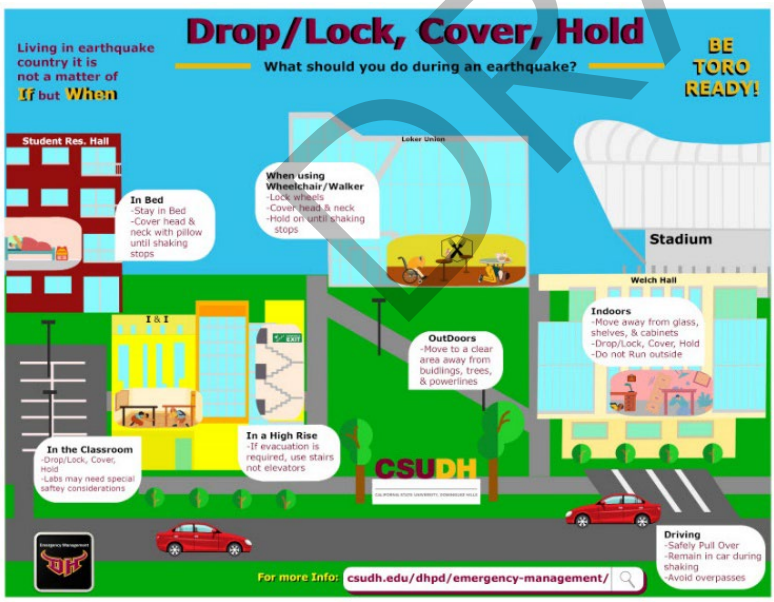


Figure 2 Example of educational outreach material from CSU Dominguez Hills

The Great Shakeout Drill provides CSU campuses an opportunity to test their emergency notification systems and provide education on the crucial "Drop, Cover, and Hold" earthquake safety practice.

Shakeout drills are frequently held in conjunction with campus outreach initiatives, such as tabling events and general emergency preparedness campaigns. Some campuses use engagement activities like "take a selfie" contests, which encourage active participation in the drill and raise awareness about earthquake preparedness.

Campus Examples of Earthquake Education and Outreach

In October of 2023, two CSU campuses were part of the California Office of Emergency Services (Cal OES) seven-city "Great California Shakeout Tour." The purpose of the tour was to raise

awareness about earthquake preparedness across the state. One of the highlights of the tour was an earthquake simulation trailer, where participants could experience the sensation of earthquakes ranging from 3.0 to 7.0 magnitude.

Emergency managers at both Cal Poly San Luis Obispo and San Francisco State University proactively worked with Cal OES to bring this experience to their respective campuses. By partnering with the state agency, these universities enhanced their own pre-Shakeout efforts to promote earthquake preparedness among their campus communities, with a particular focus on students. The collaboration not only provided access to important information and resources related to emergency safety but also facilitated outreach about California's early earthquake warning system and the MyShake application.

Active engagement with Cal OES and other partner agencies, such as demonstrated by these two universities, is a goal of CSU emergency management systemwide. Collaborations like these are one way the CSU commits to ensuring the safety and well-being of their students and staff through the impacts of any hazard, including those caused by earthquakes.

Figure 3 SFSU's Emergency Manager tries the earthquake simulator

Earthquake Emergency Plans, Training & EOC Exercises

Chino Hills Shaker Exercise 2022

In early 2022, Systemwide Emergency Management & Continuity began planning the first functional exercise for CSU's Systemwide Emergency Support Team (SWEST). The Chino Hills Shaker exercise utilized an earthquake scenario to test the coordination between SWEST and impacted campuses as well as our damage assessment processes. Cal Poly Pomona's Emergency Operations Center also played in the exercise and both sites utilized a common Simulation Cell.

The planning team for the Chino Hills Shaker Exercise was comprised of emergency managers throughout the CSU system. These professionals brought a key level of insider knowledge and expertise that facilitated the development of an exercise that addressed unique CSU and higher education emergency management needs. Personnel from a total of 10 CSU campuses assisted with the planning and implementation of the exercise: CSU Monterey Bay, CSU Los Angeles, CSU Long Beach, Cal Poly Pomona, San Francisco State University, San Jose State University, Cal Poly Humboldt, Cal Poly San Luis Obispo, CSU Channel Islands, and Stanislaus State.

The June 2022 exercise was conducted in partnership with University Architects to incorporate the Seismic Review Board's emergency response protocol into the exercise design. Multiple seismic review board members participated to enhance the realism of the damage assessment process.

Training

In July 2023, CSU Monterey Bay hosted a one-day CalOES Safety Assessment program training. The training was held virtually and open to all CSU staff through CSU's Systemwide Learning & Development team. A total of 59 CSU staff attended the training, which allows structural engineers to earn Safety Assessment Program credentials.

In October 2022, CSU hosted a case study webinar with the University of Alaska Anchorage to learn more about the impacts of the 2018 Cook Inlet Earthquake. The presentation shared multiple departmental perspectives on the recovery process and how the university has changed its preparedness plans as a result of the earthquake.

Hazard Vulnerability Risk Assessment

In 2021, CSU published a systemwide Hazard Vulnerability Risk Assessment. Earthquake was one of many hazards analyzed for potential impacts within the CSU system. The assessment revealed that all 23 CSU campuses and the Chancellor's Office are exposed to earthquake hazards. This assessment provides justification for continued earthquake mitigation, preparedness, and planning measures on all campuses.

Campus Exercise / Training Examples

Emergency Operations Center (EOC) Exercises

On June 15 and 16, 2022, Sonoma State University conducted full-day exercises with its EOC, Facilities Management (FM), and Information Technology (IT) staff and leadership. The exercise scenario simulated a Magnitude 6.2 earthquake on the Rodgers Creek Fault, resulting in flooding, fires, and other damages. A simulation cell placed calls to the 30 EOC and 100 IT and FM participants to mimic information flow from campus community members, officials, and SSU leadership. The exercise focused on response and communication mission areas, including operational communications, field response, and emergency response (such as how to conduct a needs assessment for incidents causing physical damage).

EOC and field response units successfully established communication channels and effectively managed the simulated emergency. An After-Action Report identified several areas for improvement, including formalizing EOC roles for employee accounting and IT processes for acute emergencies; better coordination of emergency operations and communications within internal departments; and formalizing procedures for activating a call center in the event of an earthquake.

Additional Campus Examples

Figure 4 San Jose State's EOC during a 2022 earthquake exercise

Our other campuses frequently hold EOC exercises related to earthquake preparedness. These trainings are sometimes conducted in conjunction with systemwide exercises, such as the Chino Hills Shaker in which Cal Poly Pomona activated its EOC for a functional exercise.

They are also conducted independently of the Chancellor's Office by campus emergency management staff. In 2021 CSU East Bay conducted a 2-day tabletop training for campus Housing staff that included an earthquake scenario. In February 2021, CSU Northridge held a virtual tabletop with its EOC policy group on earthquake operations and recovery. And in 2022, San Jose State University held an EOC tabletop exercise that included an earthquake scenario.

Earthquake Mitigation and Rapid Response

CSU Seismic Policy and CSU Seismic Requirements

The CSU has a vigorous program of maintaining the seismic integrity of its existing structures as well as ensuring a high-quality standard for design and construction of all its new and retrofitted facilities. The CSU developed a system for reviewing the seismic safety of all new projects and identifying, rating, or prioritizing the potential seismic hazard posed within the system.

CSU initiated its program in 1992 with the formation of the CSU Seismic Review Board (SRB). The University undertook the assessment of the seismic hazard posed by the entire University's building stock at the direction of Governor Deukmejian in 1992 with resources provided by the Legislature in 1993 - one year prior to Northridge Earthquake on January 17, 1994. The CSU conducted a rapid assessment of all CSU buildings on every campus and associated locations in 1993 and initiated a process of seismic engineering peer review of all proposed new and retrofit projects. Since then, CSU has reduced the unacceptable seismic risk of its owned, constructed, acquired, and leased buildings based on self-imposed criteria and enforcement to acceptable safety levels. Assessment of seismic issues also entails gravity and wind loads as necessary. As a result, the CSU Board of Trustees on May 18, 1993, adopted the following policy to apply to all CSU construction projects:

> RESOLVED, by the Trustees of the California State University, that the following policy is adopted:
>
> > It is the policy of the Trustees of the California State University that to the maximum extent feasible by present earthquake engineering

> practice to acquire, build, maintain, and rehabilitate buildings and other facilities that provide an acceptable level of earthquake safety for students, employees, and the public who occupy these buildings and other facilities at all locations where University operations and activities occur...
> *[Approved by the Trustees of California State University at its May 18-19, 1993 meeting (RTCPBG 05-93-13).]*

The CSU SRB is comprised of 6 or 7 members who are design professionals (structural/civil engineers) with expertise in lateral forces and the effects of earthquake on large institutional buildings. Membership requires these professionals are not otherwise affiliated with the University system; they are not employed by the CSU. Board members are appointed by and serve at the discretion of the Office of the Chancellor. Besides assessment of existing buildings, the SRB is also charged with implementing independent peer reviews for new projects.

After 2000, the CSU Office of the Chancellor and SRB produced the first draft of the CSU Seismic Requirements; the document has evolved and now is 63 pages with periodic updates every 3 to 4 years; see the link in the table below. The Seismic Requirements describe the CSU framework used to implement the Trustees' Seismic Policy. The key objectives and requirements are as follows:

1. The goal is, to the maximum extent feasible by present earthquake engineering practice, to provide an acceptable level of earthquake safety when acquiring, building, maintaining, and rehabilitating buildings and other facilities.

   Actions necessary to accomplish this goal were initiated in 1992 for existing buildings and will continue until all CSU existing buildings meet the seismic safety objective of the Trustees and all new construction meets this goal. Each year capital expenditures are recommended until the unacceptable safety hazard buildings are seismically retrofitted or removed from service.

2. The CSU Seismic Requirements apply to all new construction ensuring the design meets the life safety and damageability objectives of California Code of Regulations, Title 24 applicable provisions. In addition, the Requirements also apply to all renovation and maintenance construction for life safety protection consistent with that for typical new buildings.

3. Independent technical peer reviews are conducted concerning the seismic aspects of all construction projects from their design initiation, including new construction, maintenance, and remodeling, for conformance to good seismic-resistant practices consistent with these CSU requirements.

4. The feasibility of all construction projects shall include seismic safety implications and is determined by weighing the practicality and cost of protective measures against the severity and probability of injury resulting from seismic occurrences.

   The CBC establishes minimum standards for building safety. The CSU Standard may require more demanding considerations than what

current (building) code and referenced technical standards require where the SRB review indicates it is necessary to achieve the Trustees' standard of seismic performance.

By law, California State University is required to enforce the current edition of the adopted applicable elements of the California Code of Regulations, Title 24 in its entirety as adopted by the California Building Standards Commission (CBSC). These Seismic Requirements supplement the requirements of the Code (Parts 1 through 12). Where CSU requirements differ, the more restrictive apply for the design and construction of CSU buildings and structures. For existing buildings, it should be noted that CSU standards became the basis for language added to the California Existing Building Code (CEBC) – specifically CEBC Section 317.3.1 – setting requirements when seismic assessments are required for improvements to existing buildings.

In addition, every eight years as part of the CSU Seismic Building Assessment Program, the SRB examines and assesses existing buildings on each campus – three campuses per year on a rotating basis. This ongoing assessment process which functions as seismic risk management for the CSU building stock has been underway since 1993. The program is in conjunction with the Seismic Priority Lists (SPL) where existing buildings with deficiencies are listed and prioritized with and as funding for seismic upgrades become available. The objective is to provide prudent, legally defensible, and transparent risk management decisions for all 23 campuses of the CSU. The CSU Seismic Building Assessment Program along with the SPL are outlined in more detail within the CSU Seismic Requirements.

Links to Referenced Documents
CSU Seismic Requirements
CSU Seismic Priority List (See Appendix A)

Seismic Response

When a substantial earthquake occurs near a CSU campus or facility, there is need for evaluation of the safety of buildings and facilities at the university campus. The CSU has developed SRB Emergency Response Protocols when a university campus experiences significant damage as the result of a substantial seismic event. In such an event, the Chair, Vice Chair, or another SRB member of the SRB is empowered to act as an Emergency Designated Building Official (EDBO) for the purposes of structural safety determinations for the University campus.

After any significant seismic event, the EDBO will contact the CSU University campus to determine if damage has occurred at the campus; if determined that there is significate damage, the EDBO will travel to the campus as soon as time and conditions permit. Note that in the event of an emergency due to substantial earthquake with reported significant damage, the Office of the Chancellor may activate the Virtual Emergency Operations Center (VEOCI) and will likely establish a separate (physical) Emergency Operations Centers (EOCs). Coordination/communication with the EOC is maintained between the Office of the Chancellor and the EDBO as the EDBO is in route.

The EDBO is authorized to evaluate the safety of buildings on the University campus and make recommendations for additional engineering investigations to determine the condition and appropriate actions to repair individual buildings. The EDBO will oversee and/or conduct visuals

"rapid" evaluation to determine the extent of damage; applied Technology Council (ATC) 20-1 or an acceptable equivalent are used for the visual evaluations and placards are posted – Green, Yellow and Red . These designations shall be enforced to limit the risk to occupants until such time as the placard is modified or removed.
The restoration of any damaged building shall be completed to the requirements of CEBC and the CSU Seismic Requirements. Plans for all repairs shall be approved for implementation by the EDBO or the CSU Building Official in order to make repairs for re-occupying damaged buildings.

Recent Capital Improvements of CSU Building for Seismic Safety

As outlined above, the CSU has been actively engaged with the improvement of seismic safety for over 30 years with the help and guidance of the CSU SRB. Well over 200 buildings have been repaired, demolished and/or renovated to meet the CSU's strict seismic standards. Below are just a few examples of existing buildings in the last 8 years that have undergone seismic safety renovations and improvements.

Cal Poly Humboldt Library Renovation: The $34 million seismic retrofit project of the 170,000 SF building began in 2018 and was completed in 2022. The renovations have improved the safety and integrity of the library based on the engineering models of a very large earthquake which are common in the local region.

Figure 5 Cal Poly Humboldt Library Renovation

Figure 6 Cal Poly Humboldt Theater Arts renovation

Cal Poly Humboldt - Theater Arts Building: After the CSU Seismic Review Board classified the University's Theatre as a priority seismic retrofit project, the University embarked on a $1,000,000 project in 2017 to upgrade the seismic elements required to mitigate the hazards. The work was completed in 2019 and provided additional steel bracing and strengthening of existing columns and shear walls. In addition, the scope included ADA accessible path of travel and restrooms upgrades as well.

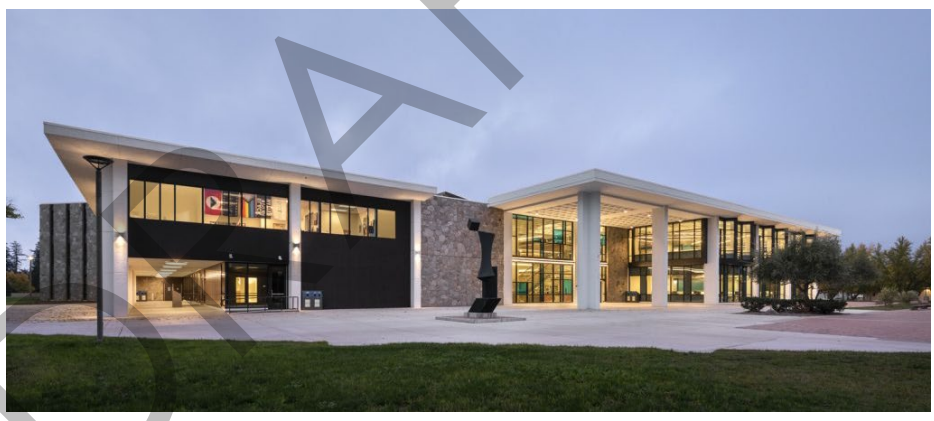


Figure 7 Stanislaus State new library

Stanislaus State Library: In 2022, Stanislaus State renovated and reopened the J. Burton Vasché Library; the original building of 127,000 SF was built in 1965. The $58 million project included full seismic upgrades, new fire protection systems, new building interiors, exterior façade improvements and state-of-the-art electronic compact book storage system. An opportunity that presented itself was structural up-grades to the roof; this structural work allowed for new openings on the second floor for daylight to filter down to the first floor from new clerestory windows.

California State University East Bay in 2019 seismically strengthened the 42,000 SF Library Annex (East) Building with braced frames along the perimeter of the east wing of the library. The installation also required column strengthening and foundation work. The budget of $ 3,800,000 also included ADA improvements to correct accessibility deficiencies.

Figure 8 East Bay Library Annex

APPENDIX A: CSU SEISMIC PRIORITY LIST

Seismic Priority List 1

Campus	Building	Building#	Capital Outlay Notes
A. Buildings occupied.			
DH	Leo F. Cain Library	20	5th and partial 1st floor remaining work to be completed
EB	Library	12	1st Phase complete – No decision by Campus on West wing
EB	Meiklejohn Hall	9	Campus performed new assessment and building transferred from List 2 to List 1.
EB	Corporation Yard – Now SPL 1A	5	New Assessment completed – need funding for retrofit… waiting for const. of upgrades
HU	Van Duzer Theatre (Theatre Arts)	10	Work Complete – waiting for COO
HU	Library	41	Work complete – waiting for COO
HU	Science B Walkway	#3A/#3B	Need to confirm if Campus is working on new assessment
LA	Administration	8	Relocation of occupants to completed Physical Sciences retrofit in 2022
PO	Kellogg West	76	Recommended to campus that hill stability be monitored
PO	CLA	98	Remaining CLA needs assessment by SRB
SF	Building 49 (Tiburon)	T-49	Retrofit work complete – waiting for COO
SF	Building 50 (Tiburon)	T-50	Retrofit construction work underway
SJ	North Parking Garage (Stair Towers)	53	Retrofit design complete; awaiting construction budget (7/18)
B. Buildings that are vacant or used for storage with no occupants. Buildings on this portion of the list may not be used for occupancies without addressing CEBC deficiencies before such is allowed.			
CI	Ironwood Hall ('SH' Shops – mid section)	24	No office use – storage only
SF	Marine Support (Tiburon)	T-21	Storage; no in and out
SF	Dispensary (Tiburon)	T-37	Unoccupied
SF	Blacksmith Shop (Tiburon)	T-22	Unoccupied and used as storage
SF	Physiology (Tiburon)	T-54	Unoccupied and entry restricted.
SL	Old Power House	76	Unoccupied
SJ	Rubis Storage (Moss Landing)	None	Storage; URM Chimney needs demolition or replacement

Seismic Priority List 2

Campus	Building	Building#	Capital Outlay Notes
CI	Ironwood Hall (Old Power Plant)	24	-
CI	Chaparral Hall	22	Schduled for Major Capital Design & Const. in 2023/2024
CI	Ironwood Hall (Warehouse)	24	-
CI	Ironwood Hall ('SH' Shops – north section)	24	-
CH	Whitney Hall	13	A structural/seismic engineering evaluation is complete (8/18)
FR	Grosse Industrial Technology	12	Schduled for Major Capital Design & Const. in 2023/2024
EB	Science Building-North	1	-
EB	Robinson Hall	10	-
FR	University Student Union	80	-
HU	Gist Hall	23	-
HU	Nelson Hall East& West	14A/14B	-
HU	Science D	3D	-
FL	Titan Bookstore	6	Design study complete
LB	Peterson Hall 1	37	Future Demo
LA	Career Center	17	-
LA	Student Health Center	14	Preliminary design study complete
LA	Kennedy Memorial Library	7	Further feasibility studies under way
PO	Administration	P	-
PO	Letters, Arts and Social Science	5	-
PO	Engineering	9	-
PO	Art/Engineering Annex	13	-
PO	Drama/Theater	25	-
PO	Arabian Horse Center	29	-
PO	Poultry Unit	31	-
PO	Sheep Unit	38	-
PO	Ag Storage/Blacksmith	50	-
PO	Los Olivos Commons	70	
PO	Manor House	111	-
PO	University House	112	-
SA	Douglass Hall	4	-
SB	Meeting Center (SMSU East	19	-
SB	Performing Arts	20	-
SB	Faculty Office Building	25	-
SB	Jack H Brown Hall	28	-
SB	Health and Physical Education Buildings A & B,	34	-
SF	HSS Classroom Building (Old Humanities)	3	PW 2018-19 Request

SF	Administration	30	Long term shoring in place
SF	University Park North (Apartment Building 6)	100	-
SF	University Park North (Apartment Building 7)	100	-
SF	University Park North (Apartment Building 8)	100	-
SF	University Park North (Apartment Building 9)	100	-
SF	Administration (Tiburon)	T-30	-
SF	Rockfish (Tiburon)	T-33	-

ALFRED E. ALQUIST
SEISMIC SAFETY COMMISSION MEETING

Memorandum

To: Seismic Safety Commissioners

From: Annde Ewertsen, Executive Director

Date: April 11, 2024

Subject: AB 100 Report: University of California

Recommendation:

Staff recommends Commissioners review the background information and be prepared to provide comments/questions on the presentation.

Background:

Assembly Bill 100 (Committee on Budget), enacted as Chapter 20 of the Statutes of 2020 established an annual reporting requirement of the Seismic Safety Commission (SSC). The Legislature finds that numerous agencies at various levels of government have substantial responsibilities in the fields of earthquake preparedness and seismic safety. To provide a consistent policy framework to track and monitor those activities and to identify key activities and responsibilities related to seismic safety, the SSC has required that entities participate in the annual reporting to the SSC. The University of California is the eleventh entity to come before the SSC and underscore the value of its seismic programs to the public.

Seismic Safety Commission Meeting

April 11, 2024

California Governer's Office of Emergency Services
Seismic Safety Commission
AB 100 Annual Reporting Requirement

University of California Office of the President
1111 Franklin Street
Oakland, CA 94607–5200

Lauren Friedman – AIA, Executive Director Capital Programs
Ellen Owens – AIA, Director Design and Construction Services

PURPOSE OF THE REPORT

The Alfred E. Alquist Seismic Safety Commission (SSC) was established in 1975 to advise the Governor, Legislature, State and local agencies, and the public about strategies to reduce earthquake risk.

Assembly Bill 100 (Committee on Budget) enacted as Chapter 20 of the Statutes of 2020, established an annual reporting requirement of the SSC. AB100 recognizes that numerous agencies at various levels of government have substantial responsibilities in the fields of earthquake preparedness and seismic safety. As part of this annual reporting requirement, the SSC has requested that the University of California provide a report that highlights our seismic programs, policy, and guidelines.

EXECUTIVE SUMMARY

The University of California's Seismic Safety Policy was voluntarily developed in 1975 to provide an acceptable level of earthquake safety for students, employees, and the public who occupy University facilities located in California. While the University of California (UC) is not required to have existing buildings meet the same standards as new construction, UC leaders determined that UC has an ongoing commitment to the safety and well-being of the UC community, and to mitigate the potential risks to the community.

The Policy is reviewed and updated over time to incorporate evolving knowledge in seismology, structural engineering, geotechnical engineering, lessons learned from past earthquakes, as well as updates to the California Building Code. Technical advice is provided by the UC Seismic Advisory Board, a group of independent structural and geotechnical engineers with seismic expertise who have been appointed by the UC Office of the President (UCOP). The University has also developed and maintains the UC Seismic Program Guidelines to help facilitate the implementation of the Policy.

The UC Seismic Safety Policy is applicable to all University facilities within California except (1) those under the regulatory authority of the Office of Statewide Hospital Planning and Development or (2) K-12 schools or community college facilities constructed after 2018 under the regulatory authority of the Division of the State Architect.

University of California Locations

Figure 1: Map of California showing University of California Campus Locations

PROGRAM

The University occupies approximately 150 million gross square feet (gsf) of built space with roughly 60 percent of this space constructed in the last (20th) century. An initiative was launched in June 2018 to seismically reevaluate and rate the inventory of over 6,000 of UC's California buildings covered by the Policy including our academic campus locations, UC Office of the President (UCOP), Lawrence Berkeley National Laboratory (LBNL), and UC Agriculture and Natural Resources (ANR). The evaluations were conducted by licensed structural engineers in a consistent manner throughout the system, in accordance with the process outlined in the UC Seismic Program Guidelines. The reevaluation effort was completed in January 2021.

Our assessments established an initial Seismic Performance Rating (SPR), based on a variety of factors including the building's location, construction type, occupancy, and other risk factors. As shown in Table 1, a higher SPR rating equates to more risk. Buildings with a SPR of IV or less are compliant with policy. At the completion of the seismic assessments in 2021, approximately 70 percent of UC buildings covered by the Policy were identified as compliant. Approximately 30 percent or 47 million gsf were determined to be out of compliance with Policy.

Table 1 – Seismic Performance Rating Policy Implications

Rating	UC Seismic Safety Policy Implication
I, II, III, or IV	UC Seismic Safety Policy compliant
V	Will require further evaluation and, if rating is confirmed, must be addressed in order of priority
VI	Priority for improvement
VII	Must be unoccupied and access must be restricted

UC owned buildings that are not in compliance with the Policy have been assigned by each location to a seismic improvement Priority Group A, B, or C. Seismic improvement prioritization considers a range of factors, including the building's SPR, occupancy risk, collapse risk, mission-criticality, logistics, and is consistent with the UC Seismic Program Guidelines. Priority Group A buildings are considered a priority for improvement compared to Priority Group B and C buildings. Table 2 provides a systemwide summary by Priority Group. This information is updated and reported annually to the Office of the President in the form of Campus Seismic Plans. Adjustments might be made based on the availability of funding, implementation of other location-related projects, and need.

UC systemwide Priority Groups A, B, and C consist of approximately 43 million gsf planned for seismic improvement. Priority Group A consists of approximately 18.9M gsf, Priority Group B consists of approximately 13.7M gsf, and Priority Group C consists of approximately 10.4 gsf.

Table 2 – Seismic Priority Group Building Count and Area

Priority Group	Building Count	Approx. Building Area (Square Feet)
A	346	18,900,000
B	364	13,700,000
C	816	10,400,000
Total Groups A, B, and C	1,526	43,000,000

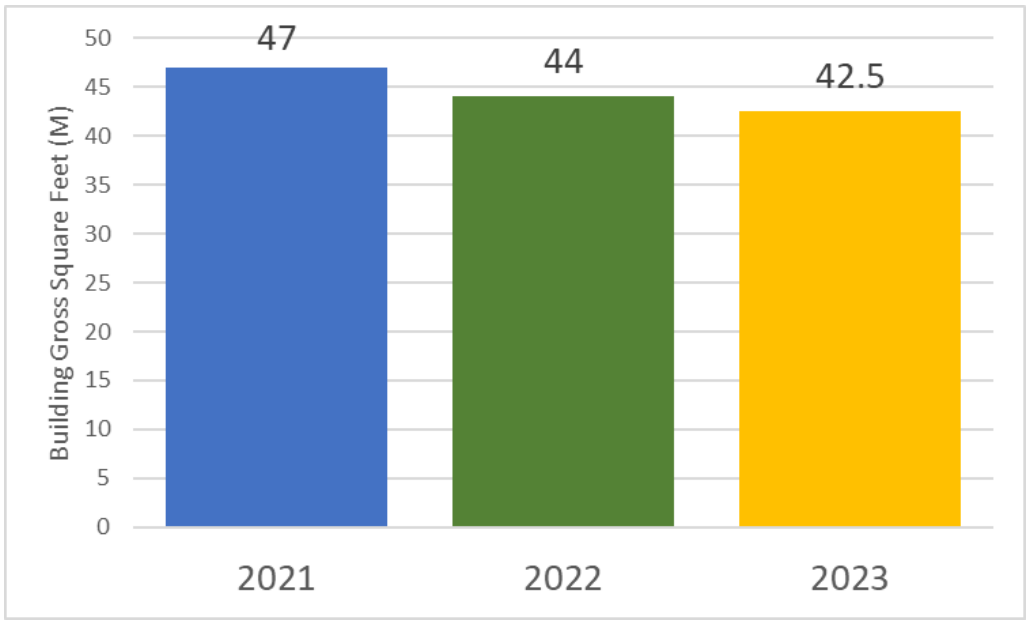
PROGRAM STATUS

Our 2017 policy requires that we take action to upgrade or vacate all noncompliant facilities by 2030. Since 2021, the University has reduced its Policy non-compliant building area by about ten percent or 4.5 million gsf (see Table 3).

Table 3: University Owned Buildings Requiring action by 2030

Table 1: University-owned buildings that require seismic improvement by 2030

University-owned buildings* that require action by 2030 under UC's current Seismic Safety Policy (MGSF)



* **Figures exclude hospitals and other facilities regulated under OSHPD/ HCAI, all UC-occupied leased space, and all OCIO investment properties.**

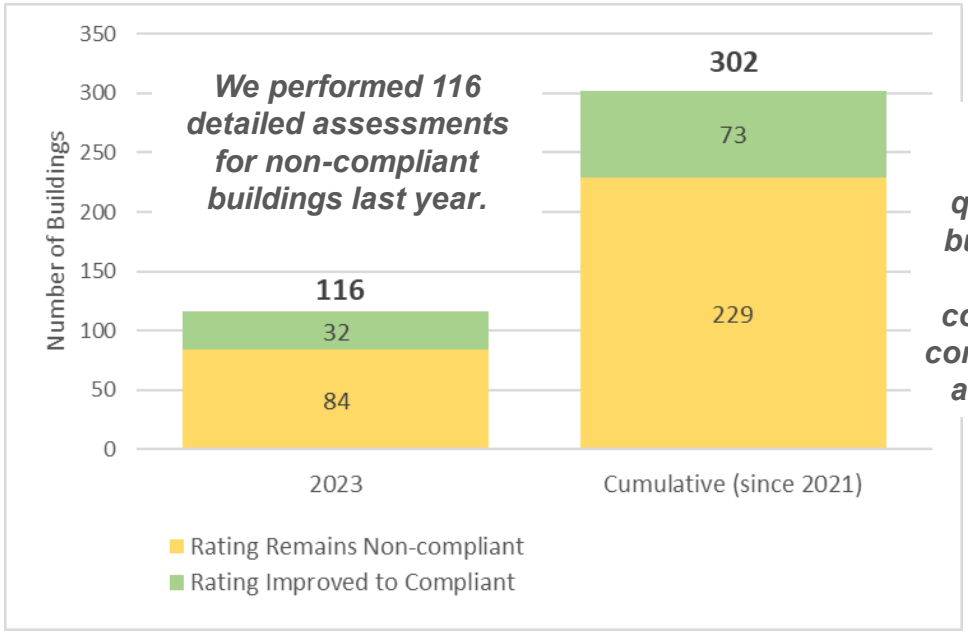
UNIVERSITY OF CALIFORNIA

The improvements that were made were the result of the completion of 30 seismic retrofit projects, the demolition of 25 buildings, and the reassessment of over 300 buildings through a Tier 2 and Tier 3 process that has resulted in an improved classification and compliance of 73 buildings (see Table 4). These more in-depth assessments use more detailed structural and geotechnical engineering analyses and testing methods and may include computer simulation, field testing, and detailed structural calculations as necessary to confirm and, in some cases, improve building ratings. Additionally, further evaluation identifies the specific scope that should be undertaken to improve the safety of a building.

Systemwide, more than 10 seismic improvement projects are currently in construction,

approximately 170 buildings are planned for demolition, and more than 25 seismic improvement projects have received budget approval. We have identified an additional 450 seismic Tier 2 and 3 evaluations that are either currently in the planning phase or in progress.

Tier 2/3 Seismic Evaluations and Results



Since 2021, nearly one quarter of our buildings have found to be compliant after completing these assessments.

FINANCIAL

The 2023-2029 Capital Financial Plan (CFP) was approved by the UC Board of Regents in November 2023. It represents approximately $1.8 billion of identified funding to specifically address seismic projects over the next six years.

Table 5 summarizes the 2023 estimated systemwide capital need to address seismic improvements for buildings not in compliance with the Policy. It totals about $19.6 billion in total capital need, with about $13.7 billion specific to seismic. About 75 percent (i.e., $14.7 billion) is associated with State supportable space, with the remaining 25 percent (i.e. about $4.9 billion) associated with space that is not State-supportable. Of the total capital need, approximately nine percent (i.e. $1.8 billion) has identified or proposed funding sources, with the remaining 91 percent (i.e., about $17.8 billion) without funding sources identified. From 2022 to 2023, the total capital need increased by about two percent (from $19.2 to $19.6 billion), and the amount of funded capital need decreased by about nine percent (i.e., about $1.9 to $1.8 billion). The amount of capital need without a funding source identified increased by about four percent (i.e., about $17.2 to $17.8 billion), primarily the result of construction cost escalation.

Table 5: 2023 UC Systemwide Estimated Seismic Need

Total Seismic Need[1]	State[2]	Non-State[3]	Funding Identified	Funding Not Identified
$13.75B	$10.31B (75%)	$3.44B (25%)	$1.82B	$17.8B

Over the past decade, seismic improvement projects have primarily been funded using University General Revenue Bonds with debt service supported by campus resources or State General Funds appropriations (AB94 Funding). Since fiscal year 2015-2016, the University has approved over $646 million in AB94 Funding for seismic improvement projects (see Table 6).

In March of 2020, Proposition 13 was put before the California voters. The Proposition was for $15 billion to modernize and build public schools, community colleges, and universities, with $2 billion to be allocated to the University of California. The measure failed, eliminating a much-needed funding source to support UC's seismic improvement projects. While the future capital need exceeds campuses' current funding and debt capacity, the University will continue its allocation of existing resources to address our seismic needs, and in parallel, explore additional funding opportunities that may

[1] Costs provided are approximate and based on limited project information, see below for additional cost assumption details.

"Seismic Need" refers to seismic improvement scope ad building code upgrades triggered by the seismic improvement scope, plus associated project soft costs.

[2] "State" refers to the approximate dollar amount and percent (%) of Total Seismic Need that is State-supportable.

[3] "Non-State" refers to the approximate dollar amount and percent (%) of Total Seismic Need that is not State-supportable.

become available over time, such as the continued use of AB94 Funding or future State General Obligation Bonds or Lease Revenue Bonds.

Table 6: State Supported Funding for Seismic Upgrades of Existing Facilities

State-supported Funding for Seismic Upgrades of Existing Facilities ($M)

Year	AB94 Seismic
2015-16	77.8
2016-17	0
2017-18	8.0
2018-19	61.0
2019-20	116.8
2020-21	243.9
2021-22	116.7
2022-23	21.9
2023-24	0
Total	646.1

CHALLENGES

The current volatility in construction cost escalation adds a layer of complexity and uncertainty in the University's strategic planning efforts. Investment in capital assets must consider the most effective utilization of limited resources, leverage opportunities to combine aging capital asset improvement efforts (e.g., restoration and renewal, energy improvements, and program modernization), and contemplate outside investment and resources. Additionally, if adequate funding was provided, the program would need to be supported by an increase in staffing at campuses to oversee and support the capital improvement programs.

Avoiding disruptions to core University business functions due to construction of seismic retrofits is vital. Many campuses have limitations on the availability of surge/swing space for relocation of programs during construction. Continuity in instruction and research is of the utmost importance and may be affected due to lack of available,

appropriate surge/swing space. The scale and magnitude of required planning and coordination increases complexity, and often necessitates construction of appropriate replacement space. Wayfinding and circulation may be affected for students, faculty, staff, and neighboring communities in and around campuses.

NEXT STEPS

Despite efforts to address seismic needs UC is far from completion of those efforts. The development of our systemwide Campus Seismic Plans Annual Update has identified approximately 335 projects that are of the highest priority.

The existing UC Seismic Safety Policy requires that all buildings come into compliance by December 31, 2030. The limited availability of funding makes meeting that deadline challenging. UC is currently in the process of revising the Seismic Safety Policy, reassessing future actions to better align with the realities of funding. Our goal is to provide continual improvement in lieu of a single deadline for compliance, allowing us to focus on our highest priority buildings.

As demonstrated by efforts and progress made in the past years, UC campuses and locations' commitment to delivering and sustaining safe, efficient, and high-quality facilities remains paramount. UCOP will continue to collaborate with campuses to incorporate seismic improvement projects into future CFP updates, and to identify strategies for addressing challenges. The University is looking forward to collaborating with State agencies and other organizations to identify and access building and infrastructure funding sources to fulfill UC's capital asset stewardship responsibilities.

Certification

The University of California certifies compliance with Government Code Section 7405 and consistent with the Web Content Accessibility Guidelines (WCAG) 2.9 for this report.

ALFRED E. ALQUIST
SEISMIC SAFETY COMMISSION MEETING

Memorandum

To: Seismic Safety Commissioners

From: Annde Ewertsen, Executive Director

Date: April 11, 2024

Subject: UCSD Shake Table

Recommendation:

Staff recommends Commissioners review the background information and be prepared to provide comments/questions on the presentation.

Background:

The Seismic Safety Commission (SSC) previously approved UC San Diego's (UCSD) Earthquake and Fire-Following Earthquake Resiliency of Mid-Rise Cold-Formed Steel project that included the recent addition of an unmanned aerial vehicle component. UCSD is contractually required to provide an update on the project when certain milestones are met. The first milestone has been met: the design of the building and the planning of the testing program. The principal investigator will also update the SSC on recent developments, such as working with the Department of Housing and Urban Development to add modular construction to the project scope.

ALFRED E. ALQUIST
SEISMIC SAFETY COMMISSION MEETING

Memorandum

To: Seismic Safety Commissioners

From: Annde Ewertsen, Executive Director

Date: April 11, 2024

Subject: Chair and Vice-Chair Election

Recommendation:

Staff recommends Commissioners vote and elect the Chair and Vice-Chair.

Background:

Article 5.1 of the Government Code Section 8589.72. states the Seismic Safety Commission (SSC) shall elect a Chairperson and Vice-Chairperson annually. SSC's policy is to seek candidates for the officer position of Chair and Vice-Chair who have the specific skills or expertise necessary to provide leadership for SSC.

Candidates were required to submit a Statement of Qualifications (SOQ) to the SSC Executive Director by March 15, 2024, outlining their competencies, experience, and willingness to fulfill the duties and responsibilities.

Three candidates submitted applications, which are attached.

Candidates will have an opportunity to address the SSC for no more than three minutes regarding their qualifications for the position. Each SSC Commissioner will have the opportunity to ask each candidate one question. The Chair-elect and Vice-Chair-elect must receive a majority of votes from the Commissioners or their representatives to be elected. SSC Commissioners shall vote on each candidate and the elected candidates will assume their new position immediately following the vote.

State of California

ALFRED E. ALQUIST
SEISMIC SAFETY COMMISSION

Governor Gavin Newsom

STATEMENT OF QUALIFICATIONS FOR CHAIR AND/OR VICE-CHAIR

NAME: **Debra L. Garnes** **DATE:** **March 15, 2024**

Please indicate the position for which you are applying. If applying for both, check both boxes.

X **Chair** X **Vice-Chair**

INSTRUCTIONS: Please complete the Statement of Qualifications in its entirety and submit to the Executive Director by **March 15, 2024**. The Statement of Qualifications (SOQ) must be received by the designated date to be considered for nomination to the position of SSC Chair and/or Vice-Chair.

The completed SOQ may be submitted electronically or in paper form. When submitting the completed document by United States Postal Mail, please allow sufficient time for delivery. Questions regarding the completion of the Statement of Qualifications should be directed to Annde Ewertsen, Executive Director at Annde.Ewertsen@caloes.ca.gov or by telephone at (916) 206-8989.

Electronic submittal: Annde.Ewertsen@caloes.ca.gov

Mail submittal: Attention: Annde Ewertsen, Executive Director
Seismic Safety Commission
3650 Schriever Ave
Mather, CA 95655

Statement of Qualifications for Chair or Vice Chair for the 2024 SSC Year
Commissioner Debra L. Garnes

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1. Provide a brief overview of your background and experience that you believe qualifies you to serve as the SSC Chair or Vice-Chair.

   I have been Mayor for 3 years. I have run public meetings (In-person and Zoom), closed sessions, and led both contract and labor negotiations. I served as president of Cal Cities Redwood Empire Division. I understand how to run a meeting as well as how to communicate and work with staff, and entities that will present.

2. Certain situations will require the Chair and Vice-Chair to attend meetings with the Governor's Office, Cal OES, or members of the legislature. This may happen with very limited advance notice. Given the importance of these meetings, will you be able and willing to make necessary adjustments to your planned schedule to attend?

   I am retired and can be available on short notice and am willing to be so. I have met and been in meetings with Governor Newsom, as well as Cal/OES, and members of the U.S. House of Representatives, Ca Assembly members and the current Pro Tem of the State Senate. I have worked directly with these individuals and have an excellent working relationship with them. With the exception of Governor Newsom, the rest know me well and know me by name. I can and have reached out to all of these individuals and receive a direct response.

3. The SSC may be affected by proposed state legislation addressing matters including, but not limited to, seismic safety, response, recovery, and public policy. Since the SSC does not sponsor or take positions on proposed state legislation, what role can the SSC take to assist Governor's Office of Emergency Services (Cal OES) and the Governor successfully understand and make effective decisions regarding proposed legislation?

   The SSC can research the subject matter, break down information, reach out to scientific and technical resources, gather and collate information and present it in a thorough but concise manner that can be quickly digested by Cal OES and Governor. Make recommendations and provide reference materials.

4. The SSC has statewide and national influences with respect to seismic safety and/or the development of seismic design standards, and it is often a political process. Explain how you would help shape and influence the process to achieve the Governor's Administration, SSC, and Cal OES' goals on both state and national levels?

I have a strong voice, and as I believe in the importance of our goals, I will use that voice whenever needed, to promote those goals. I will work with the SSC Executive and staff to identify areas that need to be built up or expanded and work to achieve them. I will work to complete projects that are currently underway. I will work to promote the identification of the need for, and a way to develop if needed, regional plans for seismic safety that will tie together all of the neighboring regions in California, and plans that tie neighboring States together to support resiliency and robust, expeditious recovery.

5. How do you believe the SSC can be most effective in reducing earthquake risk while leveraging its existing resources as a unit within Cal OES?

   Communities: Education, education and more education. Promotion of risk reducers such as Bolt and Brace, and seismic retrofitting of homes and businesses. Finding or pushing for more funding to aid homeowners and commercial businesses to accomplish retrofitting.

Annde Ewertsen, Executive Director
Seismic Safety Commission

Annde,

Attached please find my statement of qualifications for Chair of the commission.

1. Provide a brief overview of your background and experience that you believe qualifies you to serve as the SSC Chair.

In 2022, I was elected to my fourth term as Supervisor in Sonoma County after serving a term on the Petaluma City Council. I am an architect by profession who got interested in local politics though volunteer work within schools and youth sports. As Supervisor, I also serve as a Director on Sonoma Water – a wholesale water agency that delivers water to 600,000 residents with operations in three counties. Also, as Supervisor, I serve as a Director on the Sonoma County Agricultural Preservation and Open Space District. I am currently serving my fourth term as Chair for the county, water agency, and district. In addition, I am a Director of the Golden Gate Bridge Highway Transportation District since 2011 and currently serve as Finance Committee Chair and Second Vice President. I have served as Chair of every standing committee within the district. I serve also as a Director on the Sonoma Marin Area Rail Transit Agency (SMART) and served two years as Chair there. I also am a Commissioner of the Metropolitan Transportation Commission (MTC) where I am on the Executive Board, Chair of Regional Network Management and former chair of Programming and Allocations. I am a Director of the Bay Area Association of Governments (ABAG), current Finance Chair, former two-year President, and Vice-President.

I was appointed twice by Governor Brown and once by Governor Newsom to the Seismic Safety Commission and may be the longest serving or one of the longest serving Commissioners.

2. Certain situations will require the Chair and Vice-Chair to attend…

While I am admittedly busy, I will strive to make time to attend any necessary meetings within the Sacramento area or beyond. Fortunately, Sonoma is a relatively drive.

3. The SSC may be affected by proposed state legislation addressing…

The Seismic Safety Commission role in opining on state legislation should be apolitical and focused on providing thoughtful research and helpful information to aide the legislature in selecting policy direction. With the

Governor's consensus, I can see the commission providing that information to interested parties as called upon.

4. The SSC has statewide and national influences with respect to seismic…

As a political appointee, I would be cautious about jumping out in front of the administration, but once given the green light, would have no qualms in advocating for the best appropriate design standards. Again, I would rely on the commission's body of thoughtful research to help people understand the benefits of any new standards proposed and how this upstream investment, will result in better resiliency and a faster recovery after the next seismic event.

5. How do you believe the SSC can be most effective in reducing earth…

Through thoughtful analysis and by having irrefutable facts on our side. My own county has had nine federally declared disasters in the last ten years. I understand policy change pre and post disaster and I understand on how best to communicate the need to invest in resiliency for the sake of the next generation.

David A. Rabbitt
Supervisor, Second District
County of Sonoma

State of California

ALFRED E. ALQUIST
SEISMIC SAFETY COMMISSION

Governor Gavin Newsom

STATEMENT OF QUALIFICATIONS FOR CHAIR AND/OR VICE-CHAIR

NAME: Freddie Rodriguez **DATE: 3/15/2024**

Please indicate the position for which you are applying. If applying for both, check both boxes.

☒ **Chair** ☐ **Vice-Chair**

INSTRUCTIONS: Please complete the Statement of Qualifications in its entirety and submit to the Executive Director by **March 15, 2024**. The Statement of Qualifications (SOQ) must be received by the designated date to be considered for nomination to the position of SSC Chair and/or Vice-Chair.

The completed SOQ may be submitted electronically or in paper form. When submitting the completed document by United States Postal Mail, please allow sufficient time for delivery. Questions regarding the completion of the Statement of Qualifications should be directed to Annde Ewertsen, Executive Director at Annde.Ewertsen@caloes.ca.gov or by telephone at (916) 206-8989.

Electronic submittal: Annde.Ewertsen@caloes.ca.gov

Mail submittal: Attention: Annde Ewertsen, Executive Director
Seismic Safety Commission
3650 Schriever Ave
Mather, CA 95655

1. Provide a brief overview of your background and experience that you believe qualifies you to serve as the SSC Chair or Vice-Chair.

I have worked on seismic safety in a variety of capacities and am uniquely qualified to serve as the Chair of the Seismic Safety Commission (SCC). I am currently the Vice Chair of the SSC and a California State Assemblymember, representing the 53rd district. I am the founding Chair of the Assembly's committee on Emergency Management, wherein I have evaluated all seismic-related legislation for the past three years. Prior to being elected to the Assembly, I served as am emergency medical technician (EMT) and worked disaster response to multiple major disasters, including the 1994 Northridge Earthquake.

I've seen the impacts of earthquakes first hand and worked diligently and extensively in the Assembly and with the Commission to research, fund, and implement seismic safety. I am well-prepared to and would be honored to serve as Chair of the SSC and work with my fellow commissioners and stakeholders to improve earthquake safety and emergency preparedness in California.

2. Certain situations will require the Chair and Vice-Chair to attend meetings with the Governor's Office, Cal OES, or members of the legislature. This may happen with very limited advance notice. Given the importance of these meetings, will you be able and willing to make necessary adjustments to your planned schedule to attend?

I have strong working relationships with the Governor's Office, CalOES and other state agencies, and legislators. As a legislator myself, I am accustomed to faced-paced and frequently changing schedules and am regularly in Sacramento. Seismic safety and the work of the commission is of great importance to me and I am willing and able to accommodate meetings with such groups.

3. The SSC may be affected by proposed state legislation addressing matters including, but not limited to, seismic safety, response, recovery, and public policy. Since the SSC does not sponsor or take positions on proposed state legislation, what role can the SSC take to assist Governor's Office of Emergency Services (Cal OES) and the Governor successfully understand and make effective decisions regarding proposed legislation?

I am intimately familiar with the legislative process and understand the neutrality required by the Commission, yet realize the significant influence we can have on pending legislation. The Commission has an opportunity to advise the Governor's office and CalOES on legislation and programming by sharing our research and the expertise of individual commissioners. I personally bring experience with state programs, including the Earthquake Brace and Bolt, and have attended official delegations to Japan and Panama to learn and share expertise in seismic safety.

In our advisory role, it is critical that we share the on-the-ground impact of programs when the Governor's Office is considering legislation and funding. Likewise, it is important that the Commission share our lessons learned and best practices for responding to earthquakes with CalOES.

4. The SSC has statewide and national influences with respect to seismic safety and/or the development of seismic design standards, and it is often a political process. Explain how you would help shape and influence the process to achieve the Governor's Administration, SSC, and Cal OES' goals on both state and national levels?

Having served in the Assembly for more than a decade and as chair of the inaugural Assembly Emergency Management Committee, I would be well-poised to bring my strong relationships with the Governor's Office, CalOES, and state departments and agencies to the SSC as Chair. I maintain open lines of communication with these constituencies and would also include my fellow Commissioners in stakeholder conversations.

I am accustomed to garnering and leading political support for important causes, including seismic safety during my time in the legislature. I see every day the importance of sharing technical expertise and personal testimony when crafting policy and would advocate for the use of scientific research and data to inform policymakers.

Public education on earthquake preparedness and response is also critical to achieving the Commission's mission and building public support for seismic safety. I would build partnerships with local, state, and national leaders to increase awareness for existing earthquake preparedness programs, the risk of disaster, and the need to additional preparedness and mitigation. By building an educated and engaged public, we can help drive policy changes and decision making.

5. How do you believe the SSC can be most effective in reducing earthquake risk while leveraging its existing resources as a unit within Cal OES?

While we have made great strides in improving earthquake safety and preparedness, there is still much to learn. The SSC is a unique component of CalOES because our membership hails from different life experiences and holds a wide breadth of expertise. I am proud of the work the Commission has done, especially researching lessons learned from Turkey and Humboldt in the past year and I believe that continuing to invest in research and inquiry will support CalOES in effective programming.

Given the diverse background of the Commission's members, we have the unique ability to forge new global stakeholder relationships on behalf of the office, as well as partner with local communities to reach all of Californian's diverse population. I believe

that it is important for the SSC to prioritize investments and public outreach in historically marginalized and the most risk-prone communities.