California Alfred E. Alquist Seismic Safety Commission

Meeting Minutes

May 11, 2017

I. CALL TO ORDER AND ROLL CALL

Chairman Gardner called the meeting to order at 10:04 a.m. 200 N. Spring Street, Los Angeles

City Hall Council Chambers Los Angeles, California.

ROLL CALL:

Michael Gardner, Chairman
Ryan Arba (for Mark Ghilarducci)
Elizabeth Hess (for Ken Cooley)
Peggy Hellweg
Douglas Humphrey (for Chet Widom)
Helen Knudson
Kit Miyamoto
Timothy Strack

Mark Wheetley

Tracy Johnson, Vice-Chair (ABSENT)
Anthony Cannella (ABSENT)
Randall Goodwin (ABSENT)
Mia Marvelli (ABSENT)
Ian Parkinson (ABSENT)
David Rabbitt (ABSENT)
Fuad Sweiss (ABSENT)

II. CHAIRMAN'S REMARKS

Chairman Gardner informed the Commission that this was Commissioner Helen Knudson's last meeting, stating Commissioner Knudson served on the Commission for many years and filled an important role in leading the Nominating Committees over the years. He noted that Commissioner Knudson brought a wealth of experience to the Commission, and her presence will be missed. Chairman Gardner thanked Commissioner Knudson for her service and valuable contributions to the Commission.

Commissioner Miyamoto commented that cities around the world have been grappling with ways to address their seismic risks and improve seismic safety, and Los Angeles has been a leader in this field for years. He cited Los Angeles' soft-story ordinance as an example of progressive legislation that can be used as an example by other jurisdictions. Commissioner Miyamoto introduced Ms. Marissa Aho, Chief Resiliency Office, City of Los Angeles.

Comments or Questions from the Commissioners
No comments or questions from the Commissioners

Comments or Questions from the Public
Not comments or questions from the Commissioners

III. BEYOND "A RESILIENT LOS ANGELES"

Ms. Aho introduced Mr. Ted Ross, Chief Information Officer, City of Los Angeles, to help her provide an update on a number of Los Angeles' seismic resilience initiatives.

Ms. Aho mentioned the Mayor's first step and the cornerstone of the city's resilience work, is a project called "Resilience by Design," done in partnership with Dr. Lucy Jones. She stated that this product was released in December of 2014 and is being implemented throughout various city departments and outside organizations.

Ms. Aho noted that Los Angeles adopted a historic mandatory seismic retrofit program for soft-story buildings in October of 2015. She advised that Los Angeles has 15,500 soft-story buildings and approximately 2,000 nonductile buildings. She reported that more than 200 of the soft-story buildings have been retrofitted so far, and there are more than 1,400 in the process.

Ms. Aho said the nonductile building notices were sent out this spring, and that started a twenty-five year clock for those building owners to get that work done.

Ms. Aho reported that the Mayor's second annual Retrofit Resource Fair was held on April 17, 2017. She explained that this fair provided an opportunity for engineers, contractors, financial institutions, and building owners to exchange information. She added that representatives from the CalCAP Seismic Program were on hand to talk about the seismic loan access program.

Ms. Aho talked about the "Building Forward L.A.," a new initiative to refresh and "futurize" policies and processes that implement how city buildings are designed to be sustainable and resilient. She said this project is being done in partnership with a number of local and national organizations.

Ms. Aho stated that in December of 2015, Los Angeles was selected as one of the first members of Highly Resilient Cities, along with San Francisco, Oakland, and Berkeley. She said the Highly Resilient Cities program gives Los Angeles four important things: 1) provides funding for a chief resilience officer, 2) furthers the development of a resilience strategy for the city, 3) a group of service partners that are working to advance resilience practices, and 4) a network of all cities.

Ms. Aho noted that Los Angeles plans to build off existing efforts, including the "Resilience by Design" project, the sustainability plan, and other programs, and the focus will be on building resiliency for now and the future, improving access and opportunity for all residents of Los Angeles, restoring buildings and innovating Los Angeles' infrastructure, and facilitating better

dialogue through partnerships. She said the city will develop recommendations at the household scale, the neighborhood scale, a Los Angeles River scale based on revitalization there, and a citywide scale. She added that the city hopes to broaden its effort in the future to partner with nearby states, the region, the state, the nation, and global organizations that work on resilience.

Ms. Aho noted that in the mayor's April 20 "State of the City" address, he made a commitment to get earthquake early warning technology to Los Angeles by the end of 2018. She invited Mr. Ted Ross, Chief Information Officer for the City of Los Angeles' Information Technology Agency about our work to advance the earthquake early warning system.

Mr. Ross remarked that as an IT executive, he is constantly aware of how times are changing and how those changes can open new opportunities. He observed that this is a transformative era of technology now, with new digital capabilities that can help people prepare and respond to earthquakes. He said research by the Pew Research Group shows that 95 percent of Americans have cell phones, 77 percent own a smart phone, 69 percent are active on social media, and the average digital consumer owns 3.6 devices per person.

Mr. Ross said this connectivity and capability is exciting in light of the opportunity for earthquake early warning. He noted existing earthquake sensors can be connected with the new digital world, and the City of Los Angeles has been working closely with seismic experts, technologists, and policy makers to understand the feasibility of digitally communicating a coming earthquake before the shaking is felt. He added that this capability could provide precious seconds that can warn students in schools, open fire station doors to assure egress of emergency vehicles after tremors, and allow sensitive airport and port operations, as well as manufacturing assembly lines, to be paused, and even provide for shut-off of utilities that would result in fire or flooding after the shaking.

Mr. Ross stated that the City of Los Angeles has already invested $5 million in earthquake sensors and technology, and the city is working hard now to ensure that the earthquake early warning system goes forward.

Comments or Questions from the Commissioners

Commissioner Knudson asked whether the city's grant for resiliency was a one-year grant or longer. Ms. Aho responded that the grant was for two years.

Commissioner Ryan Arba, Earthquake and Tsunami Branch, Office of Emergency Services (CalOES), said CalOES is very excited about its commitment to earthquake early warning and earthquake resiliency. He noted that the Governor this year committed $10 million to help build the sensor network for the earthquake early warning system and start an education and outreach campaign. Commissioner Arba expressed interest in having a discussion about cell phone capabilities. He noted that CalOES has been working with various telecommunications firms to improve their post-earthquake services.

Commissioner Humphrey asked when the city expects the earthquake early warning system

would be available to school children? He said schools are now connected automatically to local fire departments, and he asked how those connections would be affected. Mr. Ross replied that the city is investigating the best type of user interface; he noted that possibilities include a TV screen, alarm or siren, or a message to mobile devices, and the best form depends on the type of user. He indicated that the city plans to start first with the infrastructure, and then identify how users will be notified. Ms. Aho added that the city is working with the U.S. Geological Survey and the Los Angeles Unified School District on a pilot program at a Los Angeles high school.

Chairman Gardner expressed interest in hearing about how the city works with property owners of buildings that require retrofit, and how the city can assist with funding for the necessary work. He said any city would benefit from having its stock of vulnerable buildings improved, but there is always the issue of how to pay for the work. Ms. Aho responded that she would be happy to share additional information with the Commission and other cities.

Comments or Questions from the Public
No comments or questions from the public

APPROVAL OF MEETING MINUTES – MARCH 9, 2017

MOTION: Chairman Gardner noted that approval of the minutes of the last meeting was inadvertently omitted from the agenda. He suggested that the Commission approve the minutes of the March 9 meeting. Commissioner Hellweg said she had submitted some corrections to the staff. Commissioner Hellweg made a motion, seconded by Commissioner Knudson, that:

The Commission approve the minutes of the March 9 meeting as amended.

* Motion carried, 9 – 0.

IV. PROJECT UPDATE: POST-EARTHQUAKE FIRE PERFORMANCE OF A LIGHT-GAUGE COLD-FORMED STEEL FRAMED BUILDING

Chairman Gardner welcomed Dr. Tara Hutchinson, University of California at San Diego (UCSD), and invited her to brief the Commission on the latest shake table research.

Dr. Hutchinson noted that this project was a collaboration between UCSD and Wooster Polytechnic with the support of the U.S. Department of Housing and Urban Development and a cadre of industry sponsors who are dedicated to moving the knowledge base forward with respect to cold-formed steel systems.

Dr. Hutchinson stated that the focus of this project was on mid-rise cold-formed steel systems. She noted that there have been studies on the performance of cold-formed steel buildings after strong shaking, but not much research on fire following earthquakes, especially in mid-rise

buildings. She said the Commission's support provided an opportunity to conduct a secondary multi-hazard phase to study a building system under a variety of post-earthquake fire scenarios.

Dr. Hutchinson showed slides of the six-story cold-formed steel building constructed on the shake table at UCSD, intended to represent a modern multi-family residential occupancy. She described the structural system and showed examples of the various features. Dr. Hutchinson noted that the loading scenario involved low-amplitude characterizations to better understand how vibrations can move through the structure and estimate the dynamic properties of the building.

Dr. Hutchinson reported that the tests on the shake table involved a series of incremental base shaking prior to performing a suite of live fire tests, and then tests after the live fire tests had been performed. She said the purpose of the study was to understand better performance from a seismic design perspective. She pointed out the locations in the building that were subjected to live fire scenarios. Dr. Hutchinson described the equipment used for the fire tests and explained how the tests were conducted.

Dr. Hutchinson displayed slides depicting the damage that resulted from the live fire. She pointed out particular problems with gypsum wall board and other components. Overall, she said, the key structural components performed well, up to and including the maximum credible event. She noted that engineers can use the information from these tests to make the buildings they design more resilient.

Comments or Questions from the Public

Mr. Dennis Richardson, civil engineer and Western Regional Manager, American Wood Council, said he worked as a California building official for 17 years and now does fire testing work with the American Wood Council. He said current fire-testing research indicates that some building contents tend to burn at a high temperature for a long time, and gypsum board can actually protect contents. He pointed out that the fire-testing conditions at the shake table may not have been realistic. Mr. Richardson offered to share information from the American Wood Council's research.

Comments or Questions from Commissioners

Chairman Gardner thanked Mr. Richardson for his comments. He clarified that the UCSD is not intended to be absolutely definitive, but it does provide helpful information that was not previously known.

Chairman Gardner thanked Dr. Hutchinson for her presentation. He said the Commission looks forward to more tests that will further advance safety in fires following earthquakes.

Commissioner Strack expressed his appreciation to Mr. Richardson for his remarks and to Dr. Hutchinson for her report. He observed that the information provided by this study can help reduce fire deaths in the future.

Commissioner Miyamoto asked a question about the design level drift effect, and Dr. Hutchinson replied that the design level event was about 1 percent.

Commissioner Miyamoto asked Dr. Hutchinson if the extent of damage after the tests would make repairs feasible, and he asked for an estimated cost of repair. Dr. Hutchinson said some wall bracing systems have built-in redundancy. She observed that shear walls are more vulnerable because they tend to be in long corridors, and repairs would entail removal and replacement of sheathing, repair of corridors, and possibly replacement of wall bracing. Overall, she noted, the actual damage and cost of repair would be quite minimal, even under the maximum credible event.

MOTION: Executive Director McCarthy recommended that the Commission approve this phase of the project, and he referred to the materials in the meeting packet for more details.

Commissioner *** made a motion, seconded by Commissioner Knudson, that:

The Commission approved the project as proposed.

* Motion carried, 9 – 0.

V. PROJECT UPDATE: INSPECTION OF EARTHQUAKE- AND FIRE-DAMAGED BUILDINGS USING UNMANNED AERIAL VEHICLES (UAVs)

Mr. McCarthy noted that the Commission support for the shake-table testing of a hospital building provided an opportunity for additional research in the use of UAVs for inspecting buildings for fire and earthquake damage. He invited Dr. Hutchinson to discuss the results of that study.

Dr. Hutchinson said unmanned aerial vehicles (UAVs) can be used to deliver and collect data and provide timely access to otherwise hard-to-reach places, so they can be extremely useful in rapid response.

Dr. Hutchinson described the study methodology. She said the first step was creating a special drone operating area near the shake table, and she displayed a slide showing the layout of the site. She stated that drones typically took one or two flights to collect sufficient pre-, during-, and post-event photos. She noted that in this case, the drone images captured the sides and tops of the structure, so they flew in a spiral flight path around and over the structure. Dr. Hutchinson showed videos and slides of some of the images taken during the UAV flights. She said the images are then used to create a three-dimensional reference model of the structure, a digital surrogate using virtual reality technology. Dr. Hutchinson observed that UAV data collection allows nearly real-time imaging to aid first responders in their work.

Dr. Hutchinson displayed an example of a temporal three-dimensional model capturing multiple fire events. She pointed out that residual damage to the exterior of the structure had already occurred, and the lower and upper floors and corridors were also damaged. She said the

structure had been braced, but final extreme stage of testing made the structure lean and nearly collapse. She presented a series of images and compared the pre-event baseline and post-event results.

Dr. Hutchinson advised that the next step will be development of a UAV-based acquisition and processing pipeline for rapid data capture, entailing more extensive data analysis and correlation with other sensor data. She reported that UCSD secured $100,000 in matching funds from the insurance industry to support the next six months of a second phase of the project. She said the next pending large-scale test in 2019 will provide another opportunity to test a variety of finishes, and she urged the Commission to move forward with this next step.

Comments or Questions from Commissioners

Chairman Gardner thanked Dr. Hutchinson for her report. He recommended that the Commission accept the report on the first phase.

Commissioner Miyamoto asked how this technology compares to 3-D scanning. Dr. Hutchinson replied that 3-D laser scanning has a fixed base, so its range is more restricted, but technology is moving in that direction. She said the UAV technology extracts and patterns images. She noted that there are drawbacks with both types of technology. She advised that a LIDAR laser stops at its target and does not see anything beyond, and it also has a fixed location that can be moved to other places to collect enough reference locations. In contrast, she noted, a high-resolution camera image capture on a UAV can quickly capture other fields of view without having to reset the system, but there are issues with resolution. Dr. Hutchinson expressed her opinion that it was beneficial to move in that direction.

Commissioner Miyamoto asked about deployment of UAVs inside buildings. Dr. Hutchinson responded that UAVs cannot be flown safely inside structures. She added that LIDAR post-earthquake scans can produce interior and exterior images.

Comments or Questions from the Public
No questions or comments from the public

MOTION: Commissioner Mark Wheetley made a motion, seconded by Commissioner Knudson, that:

The Commission accepts the report and accepts the proposal to explore the next phase.

* Motion carried, 9 – 0.

VI. BACK TO NORMAL: EARTHQUAKE RECOVERY MODELING PROJECT

Chairman Gardner introduced Dr. John Schneider, Global Earthquake Model (GEM), and invited him to address the Commission.

Dr. Schneider thanked the Commission and staff for supporting the recovery modeling project as well as the modeling assumptions project, the next item on the agenda. He recognized Dr. Chris Burton and Dr. Henry Burton, who presented the results of their progress to the Commission last November.

Dr. Schneider gave a brief description of GEM's background as a global non-profit organization working with public and private sectors and international organizations to make the results of current research and technology available to anyone around the world. He said GEM's guiding principles are collaboration; development of credible information that can be used by all; providing open source and open data for the public good; capacity-building to improve collaboration on software, databases, and models.

Dr. Schneider noted that the Back to Normal recovery modeling project is part of GEM's Socioeconomic Vulnerability Program, which provides a calculation of integrated seismic risk based on seismic hazards, exposures, vulnerability, incorporating socioeconomic parameters to provide a more holistic view of risk. He said most recovery models calculate direct impacts of a seismic event by looking at economic risk and physical damage. He stated that the goal of this study was to predict or estimate the recovery trajectory over time.

Dr. Schneider indicated that GEM first conducted a survey of damage and the reconstruction process for residential structures after the 2014 Napa earthquake. He said Dr. Henry Burton of UCLA used this data to implement a reconstruction process-based model for predicting the recovery process, and he then applied socioeconomic factors from Napa to develop an alternative and combined model to capture the best of both approaches.

Dr. Schneider displayed slides showing Napa's location and the damage resulting from the 2014 earthquake. He said 1,467 residential structures were red- or yellow-tagged, and the researchers selected 350 of these buildings to track over time. He noted that recovery categories were assigned based on the level of damage, and the buildings were monitored at six months, twelve months, and eighteen months to assess the recovery process in blocks of buildings. Dr. Schneider displayed slides showing the buildings that were tracked.

Dr. Schneider reported that the result of the monitoring is a combined recovery curve based on observed recovery for all of the buildings. He noted that the recovery process includes steps involving building inspection processes, engineering assessments, permitting, and repairs, and times can be estimated based on normal practice, and then adjusted to account for impediments such as utility or lifeline destruction, lack of transportation access, availability of labor, financing, and other less tangible socioeconomic factors that are impediments to recover. He said all of this data is combined to predict how well a given community will recover from earthquakes of varying size.

Dr. Schneider advised that the first pass at applying Dr. Burton's model resulted in a prediction of a faster recovery than what was observed. He said the researchers then looked at socioeconomic variables distributed across the community to adjust the model to provide a better estimate of the recovery process.

Dr. Schneider reported that the researchers were able to identify what socioeconomic factors were affecting the recovery process the most. He said the most dramatic factors were the initial level of damage, status as a homeowner, percentages of households with male householder, presence of health insurance, employment status, and English-speaking households. He presented a graph showing the groupings of the community and the repair process over time.

Dr. Schneider advised that Dr. Burton's model has been incorporated into GEM'S Integrated Risk Modeling Toolkit that allows users to change the parameters to reflect their conditions. He cautioned that Dr. Burton's model is only applicable for moderate-sized earthquake where impediments to recovery are relatively small and with socioeconomic conditions similar to Napa. He noted that the model does not address certain issues like impact on infrastructure or extent of insurance coverage, and there may be other impediments to recovery that were not identified.
Dr. Schneider stated that the study's main findings are that recovery is significantly influenced by pre-existing socioeconomic factors, which should be includes in recovery predictions; that the level of building damage is a main driver of recovery; and that the pre-existing earnings and wealth of the populace were the main sources and drivers of recovery. He said the researchers found that residents who did not speak English tended to be reluctant to report their own damage, and that 80 percent of the structures in Napa that were not seismically designed sustained significant damage.

Dr. Schneider recommended conducting additional long-term recovery studies from other earthquakes to improve the tool GEM developed into something more robust with more extensive data on socioeconomic factors. He said the recovery of critical facilities and infrastructure systems should be factored in the analysis as a potential impediment, and researchers should study mechanisms for reducing recovery time, such as cost-benefit analyses of retrofit projects to show their effect on overall community recovery time. Dr. Schneider also recommended involving the insurance industry in future projects. He added that GEM has been working with Los Angeles and other cities that have been recognized by the Resilient Cities program and have very high earthquake risk.

Comments or Questions from Commissioners

Commissioner Knudson thanked Dr. Schneider for his report. She asked why having a male in a household would be an important factor. Dr. Schneider said he did not have an immediate answer and was reluctant to speculate. He remarked that having males in the household could put an owner in a better position to move forward with minor repairs themselves.

Commissioner Wheetley asked how the survey recipients were selected. Dr. Schneider responded that the participants were selected randomly from the overall group in a sufficient quantity to provide a geographically distributed and statistically valid sample.

Commissioner Hellweg commented that she was pleased California did not have more moderate or stronger earthquakes in California to improve the statistical analysis of the model. She observed that besides the structural and physical risk factors, there are socioeconomic factors that have can major impacts on the speed of recovery. She expressed support for continuing to collect data and case studies, possibly from other kinds of disasters, to develop an accurate

estimate of resilience.

Commissioner Miyamoto commented that public policy also has a major impact on recovery durations, and he cited local permitting and inspection processes as examples. He observed that the findings of the Napa study would be amplified in a much stronger earthquake near a major city like Los Angeles. He noted that the Napa study provides at least a lower bound of what can be expected for relatively low-level damage. He said that for larger-scale disasters, factors like access and availability of transportation and labor also need to be taken into account. Dr. Schneider agreed, and he thanked Commissioner Miyamoto for his comments. He said the inclusion of case studies as references would help illustrate the importance of socioeconomic factors.

Chairman Gardner observed that the Napa report shows that a very low percentage of California homeowners have taken advantage of earthquake insurance, and he emphasized the need to provide good coverage and affordable policies. He said current earthquake insurance in California is more expensive than most people are willing to pay, and the deductibles are higher than most people find acceptable, so market penetration has lagged.

Comments or Questions from the Public
No questions or comments from the public

MOTION: Chairman Gardner thanked Dr. Schneider for his report. He thanked Dr. Burton and GEM for their work, and he recommended that the Commission adopt the report. Commissioner Hellweg made a motion, seconded by Commissioner Knudson, that:

The Commission accepts the report on the GEM modeling project as proposed.

Commissioner Miyamoto suggested revising the report to clearly identify the most active elements of socioeconomic variables that affect the recovery process. Mr. Schneider said the report will be augmented to highlight that information.

Mr. McCarthy suggested approving the document with that modification. He said Dr. Schneider can provide the final version before the July meeting.

The maker and seconder of the motion accepted that amendment.

* Motion carried, 9 – 0.

VII. BEYOND BUTTON-PUSHING: IMPACT OF ASSUMPTIONS ON EARTHQUAKE MODEL RESULTS PROJECT

Dr. Vitor Silva, The Global Earthquake Model (GEM), presented the results of GEM's Commission-funded study on the impact of assumptions on earthquake modeling. He explained that the purpose of this project was to identify the amount of variability in estimating losses in seismic risk assessments and sensitivity analyses from the different assumptions used in existing

models. He said this information can help determine the uncertainty and reliability of the risk models.

Dr. Silva stated that the risk analysis is intended to represent seismic hazard exposure in a particular region. He said the researchers used HAZUS, satellite images, and design maps to provide basic information about residential, commercial, and public buildings, and then GEM used its team of experts from around the world to gather data and develop risk profiles to project losses, both in terms of extent and certain time periods. He noted risk estimates are based on expected annualized losses, an analysis widely used by the insurance industry and government agencies, plus expected loss frequency and building type.

Dr. Silva presented a graph showing baseline results and loss projections using various models. He said the analysis can be simplified by eliminating variables that will not have a great impact on losses, and this will help focus remediation efforts on areas that matter most. He noted that the results of the model are very site-dependent, and he showed maps of San Diego and San Francisco to highlight the contrast. He observed that the model can be used anywhere in California to assess local risks.

Dr. Silva advised that key findings of the report include: 1) the likelihood of collapse is highest for low-rise buildings, lower for mid-rise, and even lower for high-rise buildings; 2) wood-frame buildings in California tend to perform well in earthquakes, but because they are the most common type in California, they also sustain the most economic losses; 3) the way different variables affect losses across the state differs depending on different risk methods; 4) variables are quite different depending on building location and type of construction; and 5) a list of variables that tend to affect earthquake losses the most.

Dr. Silva said the study recommendations were that uncertainties in the variables that make up the model should be reflected in the estimate of risks; risk estimates should be performing using open and transparent tools; and a sensitivity analysis can be used to simplify the model. He also acknowledged that there are important uncertainties with respect to the accuracy of the exposure and vulnerability estimates used in the model.

Dr. Silva advised that the model can be used to determine whether pre-1973 buildings in California should be retrofitted or replaced because it can show how much losses can be reduced by making specific changes. He pointed out that this kind of data can encourage local jurisdictions to adopt retrofit interventions. He added that the results of this GEM project will be included in the risk analysis guidelines for the U.S., and GEM will continue to work with researchers at Stanford University, USGS, FEMA, and others to look at ways of reducing exposure and vulnerability.

Comments or Questions from Commissioners
No questions or comments from Commissioners

Comments or Questions from the Public
No questions or comments from the public

MOTION: Commissioner Knudson made a motion, seconded by Commissioner Wheetley, that:
The Commission accepts the report as presented.
* Motion carried, 9 – 0.

VIII. IMPLEMENTING JET PROPULSION LABORATORY (JPL) TECHNOLOGIES FOR IMPROVING EARTHQUAKE RESILIENCY IN CALIFORNIA (PHASE II PROPOSAL UPDATE)

Chairman Gardner said several Commissioners had an opportunity the previous day to tour the Jet Propulsion Laboratory (JPL) and see some the its work firsthand. He noted that JPL has developed some exciting technologies that can be applied to improve seismic safety. He welcomed Dr. Sharon Kedar, Research Scientist, and invited him to address the Commission.

Dr. Kedar provided an update on the second phase of the Commission-sponsored project exploring ways JPL technology can assist in post-earthquake damage identification and emergency response. He said the first phase identified specific JPL technologies that could be deployed to be benefit the state and improve seismic safety. He reported that the JPL decided to pursue the application of two technologies: airborne imaging spectroscopy to detect gases, and airborne- and space-borne radar technology using existing satellites to identify ground motion, damage to infrastructure facilities, and damage to individual structures.

Dr. Kedar noted that the airborne- and space-borne radar technology entails collection of baseline data, collecting data continuously at regular intervals thereafter, and then prioritizing the data. He stated that imaging spectroscopy technology is used to survey large swaths of land from the air to detect hazardous gases and emissions.

Dr. Kedar reviewed the deliverables and cost breakdown for the proposed second phase, to be completed within a year. He said a detailed task plan is making its way through NASA. He noted the deliverables include a written set of project requirements, data products, demonstration of a critical infrastructure assessment, and a rapid response protocol for implementation immediately following a disaster. Dr. Kedar discussed how actual airborne data collection and data processing would take place. He emphasized the importance of having predefined priorities to make sure resources are deployed as effectively as possible.

Dr. Kedar said JPL also looked at short-term and long-term plans for how the airborne- and space-borne radar data can be disseminated to scientists and researchers outside NASA. He noted that for the long term, JPL plans to develop a formulation study to outline a plan to develop a system for the state, including identifying the necessary infrastructure, aircraft, data systems, maintenance, and distribution systems.

Dr. Kedar displayed a chart showing the task plan and cost estimate for the proposed second phase.

Comments or Questions from Commissioners

Commissioner Hellweg observed that the proposal presents a complex system of interacting factors to identify stakeholders, and the timeline does not seem to address this point. She questioned whether it would be better for JPL to develop a smaller, intermediate proposal to discuss and define the issues, and then move forward slowly with a full proposal. In response to Commissioner Hellweg's comments, Dr. Kedar noted that the process so far has focused on building relationships, and the work of putting together the stakeholder list will start on the first day. He welcomed suggestions and assistance from the Commission and other interested parties, and he confirmed JPL's commitment to including as wide a range of stakeholders as possible.

Chairman Gardner stated the stakeholder pool will be constantly evolving as new entities discover what the technology offers and want to be included as potential users. He noted that JPL has already identified some of the key stakeholders, including the Commission, the Air Resources Board, California Energy Commission, Air National Guard, California Earthquake Clearinghouse, California Office of Emergency Services, Department of Water Resources, and other agencies. He added that he was comfortable moving forward with the proposal based on the information already provided.

Mr. McCarthy advised that the Governor's Office has expressed interest in this JPL technology. He expressed concern that the contracting process between NASA and the State of California could be complicated and time-consuming, so it would be more efficient to approve the overall contract rather than breaking it into smaller parts.

Commissioner Wheetley suggested showing concrete examples of how the JPL technology can be applied as a way of building support and attracting partners. He recommended moving forward with the contract at this time.

Comments or Questions from Public
No questions or comments from public

MOTION: Commissioner Strack made a motion, seconded by Commissioner Wheetley, that:

The Commission accepts the report and authorize the staff to work with JPL to develop a final proposal.

* Motion carried, 9 – 0.

IX. LEGISLATIVE REPORT

Ms. Valencia gave an update to the CalCAP Program (CA Pollution Control Financing Authority) per the request of Commissioner Knudson. CalCAP enrolled the first lender – Citizens Business Bank in Southern California. No loans have been enrolled yet, but lenders are starting to take notice and evaluate the merits of enrolling in the program as they are slowly becoming aware of local government mandatory retrofit programs statewide. The LA City Soft

Story program has promoted CalCAP to property owners who have received the mandatory soft-story building retrofit letters. Toward that effort CalCAP also been interacting with the LA Mayor's Office about an upcoming event that we will be exhibiting and presenting at – the 2nd Annual Los Angeles Seismic Retrofit Resource Fair on April 17th. This is a free public event to connect property owners with contractors, engineers, and other service providers.

CalCAP has been fortunate to have considerable support from the California Banker's Association and the California Mortgage Banker's Association. Both have done newsletters, blogs, and a fantastic job promoting this program to their members. The California Earthquake Authority has also been collaborating with CalCap to promote the program.

Ms. Valencia said CalCAP plans to hold a promotional event this summer in northern California. She noted that CalCAP is working with the California Small Business Development Centers (CASBDC) to organize the event, and she promised to provide additional details as they become available.

Ms. Valencia observed that the Commission has a current project with CASBDC to develop training materials for disaster preparedness for small businesses. She indicated that the project has produced a 5-minute video clip and a pamphlet, and disaster preparedness is addressed at each training session. So far, she said, CASBDC has held over 312 training sessions, with a total of 2,900 attendees. Ms. Valencia advised that the CASBDC project will be completed at the end of October, and a final report will come to the Commission for approval.

Ms. Valencia said the budget deal reached in Congress early in May cancels $10.2 million in funding for the earthquake early warning system for the West Coast. She noted the network is being built under the leadership of USGS, with assistance from scientists at Cal Tech, UC Berkeley, the University of Washington, and the University of Oregon.

Ms. Valencia said the Commission's Website was undergoing a conversion and updating process. She noted that she and Ms. Daniel have been working closely with the Department of Consumer Affairs Office of Technology to build a new site.
Ms. Valencia informed Commissioners that May 7 through May 13 has been designated as "Public Service Recognition Week," and Secretary Podesta has asked that each department observe the week by designating and highlight employees within the department. She drew attention to the memo describing the request.

Comments or Questions from Commissioners
No questions or comments from Commissioners

Comments or Questions from Public
No questions or comments from public

X. EXECUTIVE DIRECTOR'S REPORT

Update on Commission's Statewide Insurance Task Force Concept

Mr. McCarthy noted that one of the recommendations in Dr. Johnson's report on the Napa earthquake was to form a statewide task force to identify ways of increasing the percentage of homeowners who purchase earthquake insurance. He said the National Research Council has expressed interest in working with the Commission on this project. He stated that he also had discussions with the Department of Insurance in the State of Washington, where the take-up rate for earthquake insurance is about 10 percent, similar to California's. Mr. McCarthy added that the State of Oregon is also bringing up this issue, providing possible opportunities for the three states to coordinate their efforts.

Update on the Commission's *Homeowner's Guide to Earthquake Safety*

Mr. McCarthy indicated that the Commission had just received comments from the Department of Insurance regarding the *Homeowner's Guide*. He said Senior Structural Engineer Fred Turner has reviewed the document, met with California Earthquake Authority Representatives, and incorporated the suggested changes. He noted that the Commission will be receiving a draft for review soon.

Project to Survey Japanese Companies on Earthquake Recovery Lessons

Mr. McCarthy reported that the purpose of this project is to mine the knowledge of Japanese companies doing business in California regarding recovery lessons and needs. He said the researchers will hold two seminars with Japanese companies, one in northern California and one in southern California, to discuss the issues in more detail. Then, he noted, the Commission and CalOES will work together to develop a survey and send them out to almost 1500 Japanese companies that are members of two large trade organizations. Mr. McCarthy said the survey will include questions on the companies' experience with earthquake early warning.

July Meeting

Mr. McCarthy reviewed possible agenda items for the July Commission meeting and it was determined that the Commission will have a in-person meeting in Sacramento California. Mr. McCarthy reminded Commissioners that the September meeting would be held in Riverside California.

Administrative Reporting

Ms. Daniel reported that the staff was working with Contracted Fiscal Services to close out the Fiscal Year 2016-17 financial records. She reviewed the current status of various funds. She noted that the Commission is merging all of its IT services with the Department of Business Oversight; a change that will result in cost savings and comply with all of the state's reporting requirements.

Ms. Daniel reminded Commissioners to submit all travel expense claims by May 26 so they can be included in the year-end financial records.

In honor of Public Service Recognition Week, Commissioner Hellweg thanked the Commission staff for their excellent work and support.

Ms. Daniel expressed her appreciation to Commissioner Miyamoto and his staff, and the City of Los Angeles Mayor's Office, and City of Los Angeles staff members who helped organize the meeting.

Comments or Questions from Commissioners
No questions or comments from Commissioners

Comments or Questions from Public
No questions or comments from public

XI. PUBLIC COMMENT

There were no members of the public who wished to address the Commission.

XII. MISCELLANEOUS & GOOD OF THE MEETING

Commissioner Hellweg noted that the Seismological Society of America gave the Frank Press Award for Public Service to Dr. Lorie Dengler for her extensive work making the West Coast safer from tsunamis.

XI. ADJOURN

Commissioner *** proposed that the Commission adjourn the meeting in honor of Commissioner Knudson and in recognition for her years of service. There being no further business, Chairman Gardner thanked everyone for attending, and the meeting was adjourned in honor of Commissioner Knudson at 1:20 p.m.