



Office of the City Manager

WORKSESSION

June 9, 2015

To: Honorable Mayor and Members of the City Council

From:  Christine Daniel, City Manager

Submitted by: Timothy Burroughs, Assistant to the City Manager

Subject: Update and Next Steps on Berkeley's Participation in 100 Resilient Cities

SUMMARY

In 2014, the City of Berkeley was one of the first 32 cities selected by the Rockefeller Foundation to participate in 100 Resilient Cities (100RC) (www.100resilientcities.org), an initiative to build community resilience to the social, economic, and physical challenges that cities face. Resilience is defined as the capacity of a community to survive and thrive no matter what acute shock or chronic stresses it experiences. In practice, building resilience leads to investing in efforts that have multiple benefits – social, economic, and environmental – and that leverage multiple stakeholder interests.

Participation in 100RC is a two-year opportunity for the City to build on and accelerate a range of efforts that better prepare the community, especially the most vulnerable in our community, for shocks, such as earthquakes, and slower-moving stresses, such as the impacts of climate change. The first year of the grant period comes to a close in August 2015.

100RC provides the City with four main types of support: two years of funding to hire a Chief Resilience Officer and 50% of the cost of an Associate Civil Engineer; a consultant to support the City as it identifies an actionable set of resilience strategies; access to a large pool of public and private technical assistance firms that can assist the City with project implementation at no or low cost; and membership in a global network of 100 cities working toward similar goals. The Cities of Oakland and San Francisco are also in the 100RC network.

Staff in several City departments are working together to effectively utilize the support provided by 100RC to build on and integrate efforts identified in the City's Capital Improvement Plan (CIP); Climate Action Plan; and Local Hazard Mitigation Plan. The main priorities that the City is working to advance in partnership with 100RC are:

- Improve the City's ability to prepare, shelter and care for displaced residents in the event of a disaster
- Improve access to clean, emergency back-up power for critical facilities

- Understand and strengthen the community's ability to mitigate the impacts of climate change, such as drought and flooding, which is associated with sea-level rise, precipitation, and aging stormwater infrastructure

These priorities dovetail with existing efforts and are a product of community input gathered via survey and community meetings.

The purpose of this report is to provide an update on progress and next steps for advancing these resilience priorities.

CURRENT SITUATION AND ITS EFFECTS

The main deliverable that the City of Berkeley will produce as part of participation in 100RC is documentation of a resilience strategy associated with Berkeley's resilience priorities. The resilience strategy and the process of developing it will serve as important tools for creating partnerships and securing resources and technical assistance that helps Berkeley better prepare for earthquakes and climate change.

Berkeley's resilience strategy is being developed through a 2-phase process designed by 100RC. The purpose of phase 1 of the process was to conduct public outreach and research to collect qualitative information about the city that helps to identify strengths and gaps in the context of resilience. Phase 1 resulted in identification of a set of resilience priorities for further analysis in phase 2. Staff kicked-off phase 1 in September 2014 and concluded it in April 2015; phase 2 of the strategy-development process began in May 2015 and will result in development of a resilience strategy before year's end.

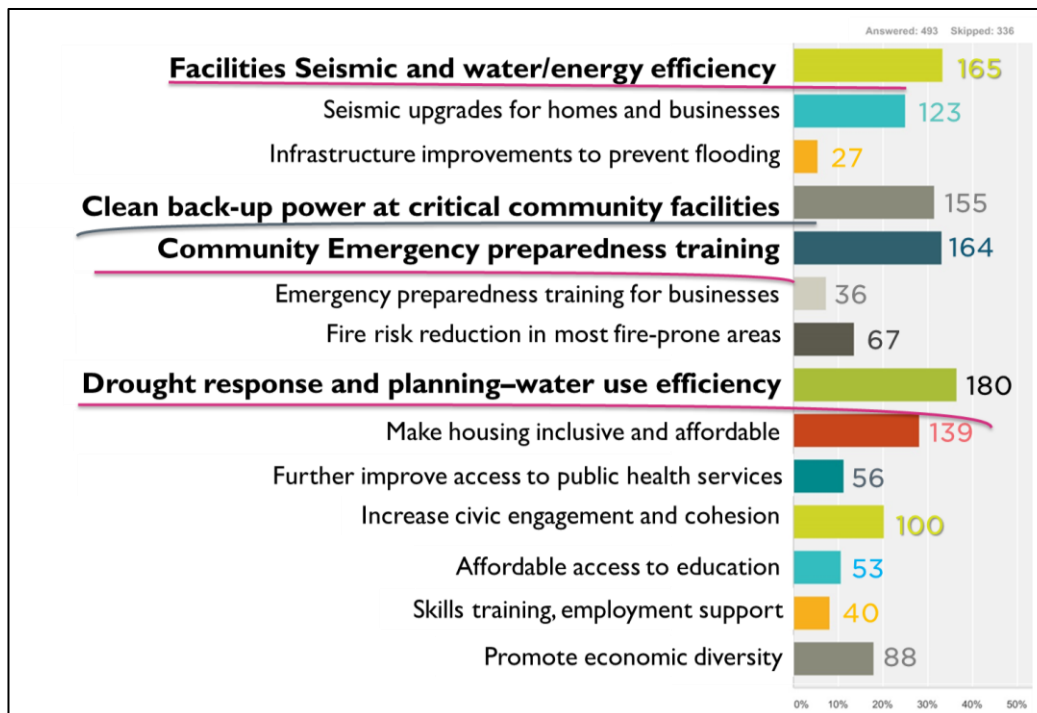
Phase 1 of the strategy development process provided staff with an opportunity to gather community input on how best to leverage the partnership with 100RC to advance community resilience. Phase 1 consisted of three main activities:

An inventory and gap analysis of existing efforts: Staff catalogued and reviewed a wide range of existing programs, policies, and plans the City and partners in the community are undertaking. The main outcome of the activity was an improved understanding of how existing efforts contribute to Berkeley's resilience. Research conducted as part of this activity included reviews of existing City planning documents, interviews with City staff, and consultation with City commissions and several community-based organizations, including the Berkeley Disaster Preparedness Network, League of Women Voters, and the Berkeley Climate Action Coalition.

A survey of community resilience priorities: Staff conducted an online survey from November 19 – December 2, 2014, to gather input on local resilience priorities. The survey was distributed to City staff, neighborhood associations, business associations, major institutions, community-based organizations, and other groups and individuals. A total of 829 people responded to the survey. Respondents were asked to rate their top three priority areas. Survey responses reflected what many community members feel is important, and were used to inform identification of a set of resilience priorities. Priority

areas identified by respondents are illustrated in the chart below.

Survey Respondents' Top Resilience Priority Areas



An online survey was conducted Nov. 19 – Dec. 2, 2014; 829 people responded.

A community risk assessment. Building on the extensive hazard and risk analysis conducted as part of Berkeley's 2014 Local Hazard Mitigation Plan, staff conducted an analysis that focused on illustrating the potential for disasters to exacerbate existing challenges. Examples include the vulnerability of the existing, centralized, conventional energy supply to disruption from earthquake, and the vulnerability of Berkeley's aging stormwater infrastructure to a combination of sea-level rise and more intense precipitation events due to the changing climate.

Staff reviewed the outputs of these three main phase 1 activities at a community meeting in February 2015. Main themes that emerged from community input and the analyses described above include:

- Upgrade critical infrastructure and facilities to mitigate the impacts of several main hazards, including earthquakes, flooding, and drought
- Prioritize the needs of the most vulnerable residents
- Partner with trusted leaders, organizations, and businesses in the community to empower residents to make their households and neighborhoods disaster-ready

These themes informed identification of three main resilience priorities to focus on in the context of the partnership with 100RC:

- Improve the City's ability to prepare, shelter and care for displaced residents in the event of a disaster
- Improve access to clean, emergency back-up power for critical facilities
- Understand and strengthen the community's ability to mitigate the impacts of climate change, such as drought and flooding, which is associated with sea-level rise, precipitation, and aging stormwater infrastructure

These priorities dovetail with existing efforts identified in the City's Capital Improvement Plan (CIP); Climate Action Plan; and Local Hazard Mitigation Plan.

Next Steps for Advancing Resilience Priorities

Phase 2 of the 100RC resilience strategy development process is designed to enable additional community input and analysis of the priorities identified in phase 1. Phase 2 will result in identification of a specific, actionable set of recommendations to be documented in Berkeley's resilience strategy.

Outlined below are next steps for advancing each of the resilience priorities identified in phase 1.

Priority: Improve the City's ability to prepare, shelter and care for displaced residents in the event of a disaster

The main goal of this priority area is to ensure that critical City facilities that serve emergency functions, such as emergency care and shelter, can effectively serve those functions in the event of a disaster. Advancing this priority area also requires developing strategies that empower the most vulnerable residents with tools and information that improve their preparedness for disasters.

The City of Berkeley has identified seven emergency care and shelter facilities. Depending on the nature and magnitude of an emergency event, one or more of these facilities may be designated as an emergency care and shelter site:

- North, South, and West Berkeley Senior Centers
- James Kenney Community Center
- Frances Albrier Community Center
- Live Oak Community Center
- MLK Jr. Youth Services Center

As was well documented in the March 24, 2015, five-year Capital Improvement Plan Work Session reports¹ from the Departments of Public Works and Parks, Recreation & Waterfront, each of these facilities is in need of significant investment to address deferred maintenance (e.g., backlog repairs), unfunded capital improvements, and seismic safety upgrades. These facilities are also in need of energy and water efficiency improvements that lower utility costs, conserve natural resources, and improve occupant comfort.

In phase 2 of the resilience strategy development process, staff will conduct additional analyses to quantify the cost and benefits of seismic and environmental upgrades in each of the City's seven care and shelter facilities. Specific next steps to be conducted by Fall 2015 include:

- Conduct seismic evaluations that identify specific upgrade needs and associated costs
- Conduct energy and water efficiency audits that identify potential resource-efficiency upgrades
- Partner with Risk Management Solutions (RMS), a world leader in catastrophe modeling, to conduct an analysis of the economic risk of various magnitude earthquakes to Berkeley's built environment, including a more granular economic analysis of the risk to the City's seven care and shelter facilities
- Partner with DigitalGlobe, a firm that specializes in providing high-resolution satellite imagery and advanced geospatial solutions, to map the City's infrastructure and facilities in order to illustrate potential vulnerabilities and the before-and-after effects of resilience program implementation and/or a natural disasters, such as earthquakes
- Identify potential additional funding and financing opportunities that could help the City improve the seismic safety and environmental performance of the care and shelter facilities

The ultimate objective of these next steps is to gain a clear understanding of the costs and benefits of improving the seismic safety and environmental performance of these facilities. This work is critical to demonstrating the value of investing in these facilities and securing the resources necessary to implement needed capital improvements.

100RC is providing significant value in advancing these next steps. For example, it is through the partnership with 100RC that the City has gained access to RMS and DigitalGlobe, each of which is providing tools and analysis that will help the City to better understand and communicate its earthquake risk and to prioritize action to mitigate that risk. RMS is leveraging its technical and scientific expertise, as well as

¹ See Capital Improvement Plan reports and presentations from the March 24, 2015 City Council Work Session here: http://www.cityofberkeley.info/Clerk/City_Council/2015/03_Mar/City_Council_03-24-2015_-_Special_Meeting_Annotated_Agenda.aspx

work already completed by public entities, to model the City's exposures in the built environment under various seismic magnitude scenarios. Digital Globe is leveraging its satellite imagery and analytics expertise to assist the City in providing maps that can be used to prioritize strategies and show progress over time.

RMS and DigitalGlobe are both providing services at no cost to the City.

Priority: Improve access to clean, emergency back-up power for critical facilities

Loss of power due to an earthquake or other disaster creates its own set of impacts that can impede delivery of essential care for community members in need and hamper disaster recovery. The most common approach to providing emergency back-up power is to install a diesel generator at critical facilities. This relatively low-cost approach is reliable, but the benefit is narrow and has some clear downsides including noise, air pollution, and reliance on access to diesel.

The main goal of this priority area is to identify and pursue integrated solutions that not only address the need for back-up power, but also create other benefits, such as reduced energy costs and lower greenhouse gas emissions. The solution that staff is pursuing is development of microgrids that could serve one or more critical facilities, such as the Public Safety Building and care and shelter facilities. A microgrid enables a facility or group of facilities to operate autonomously when the main grid is disrupted, can be powered by clean energy sources, such as solar and back-up batteries, and can be used to reduce facilities' electricity consumption during periods of peak demand when energy prices are at their highest. Microgrids are being pursued in several east coast cities in the wake of Hurricane Sandy.

In phase 2 of the resilience strategy development process, staff will work to identify the costs and benefits of microgrid development and deployment in Berkeley. Staff is currently researching existing efforts throughout the U.S. and beyond, identifying sources of funding that would enable the City to work on microgrid design, and building partnerships with experts at Lawrence Berkeley National Lab, PG&E, and other institutions that can help the City secure additional resources and expertise to advance microgrid work.

Priority: Understand and strengthen the community's ability to mitigate the impacts of climate change, such as drought and flooding, which is associated with sea-level rise, precipitation, and aging stormwater infrastructure

Berkeley and the Bay Area are already experiencing the impacts of climate change. Sea-level rise and more severe rain events exacerbate the limits of Berkeley's aging stormwater infrastructure. The result is increased flooding, especially in West Berkeley. The rain storm and associated flooding that occurred on December 11, 2014, for example, caused the closure of five different street intersections and significant flooding at Malcolm X Elementary School. The City's 311 Service Center received 125 storm-related calls that day, and staff serviced over 150 impacted locations and issued 4,500 sandbags. These storm response services come at a cost; to date in fiscal year 2015,

the City has spent \$350,000 on storm response and routine storm maintenance, which does not include equipment or material costs.

Drought is also aggravated by climate change, and has a range cascading impacts, including constraints on water usage, stressed ecosystems and urban forest, and higher commodity prices. Like with flooding, many in the Berkeley community are disproportionately vulnerable to these impacts.

With California in the fourth year of a historic drought, the City is already taking several steps to comply with the 20% water reduction mandate imposed by East Bay Municipal Utility District and to inform residents and businesses of available water-saving resources. Many of the steps the City is taking were outlined in an Information Report provided to City Council on April 28, 2015.² The City's Chief Resilience Officer is working closely with a multi-departmental drought-response working group of City staff that is guiding the City's response to the drought. The working group will coordinate closely with the Public Works and Community Environmental Advisory Commissions as well as expert partners at UC Berkeley to develop recommendations for sustainable water consumption.

Overall, this priority area is an opportunity to better understand and illustrate for the community Berkeley's vulnerability to the impacts of climate change, and to identify an actionable set of strategies to upgrade Berkeley's stormwater management systems and to use water more sustainably. Specific next steps to be conducted by Fall 2015 include:

- Partner with Alameda County and AECOM to analyze and communicate the vulnerability of Berkeley's shoreline to sea-level rise (Alameda County funded AECOM to conduct a sea-level rise analysis for the County's shoreline)
- Partner with MWH, a global firm that specializes in stormwater engineering solutions, and AECOM, which also has extensive stormwater engineering expertise, to assist with identification and evaluation of green infrastructure projects, such as bio-retention areas, permeable pavement, and cisterns (through Berkeley's partnership with 100RC, MWH and AECOM are providing services at no cost to the City)
- Partner with the UC Berkeley Climate Readiness Institute to develop a "water action plan" that provides the City with short- and long-term recommendations for sustainable water use for City operations and the community
- Identify potential funding and financing opportunities that help the City to implement additional green infrastructure and drought mitigation projects

² See April 28, 2015 Information Report on City water conservation efforts here: http://www.cityofberkeley.info/Clerk/City_Council/2015/04_Apr/Documents/2015-04-28_Item_45_Update_City_Water.aspx

BACKGROUND

The Rockefeller Foundation launched the 100 Resilient Cities initiative in 2013 to help 100 cities worldwide to advance community resilience. Nearly 400 cities across six continents applied for the first round of 100RC support; Berkeley, Oakland, and San Francisco were three of the first 32 cities selected. In late 2014, an additional 35 cities were selected to participate; the final 33 will be selected in late 2015 or early 2016.

100RC provides the City with four main types of support: two years of funding to hire a Chief Resilience Officer and 50% of the cost of an Associate Civil Engineer; a consultant to support the City as it identifies an actionable set of resilience strategies; three years of access to a large pool of public and private technical assistance firms that can assist the City with project implementation; and membership in a global network of 100 cities working toward similar goals.

City Council adopted a resolution authorizing the City Manager to execute a two-year contract with the Rockefeller Foundation on June 10, 2014.³

The Rockefeller Foundation is also finalizing an agreement with the Association of Bay Area Governments to assist the three Bay Area 100RC cities to share lessons learned from the resilience strategy process with other cities in the region.

ENVIRONMENTAL SUSTAINABILITY

Advancing strategies that reduce greenhouse gas emissions, conserve natural resources, and mitigate the impacts of climate change is fundamental to Berkeley's resilience. Each of the resilience priorities identified in this report have multiple benefits. They not only will help the community prepare for shocks, such as earthquakes, and slower-moving stresses like climate change, but also have the potential to reduce water and energy consumption and the associated greenhouse gas emissions, and save money on municipal utility bills.

POSSIBLE FUTURE ACTION

Staff will hold a series of community meetings in summer/fall 2015 to provide updates to community members on progress and next steps related to Berkeley's resilience priorities and to provide additional opportunities for input and engagement.

In June 2016, staff will provide City Council with a final report on the 100RC initiative.

FISCAL IMPACTS OF POSSIBLE FUTURE ACTION

The grant from the Rockefeller Foundation and partnership with 100RC are providing significant, high-value services at no cost to the City. Staff's intention is to leverage the work being conducted as part of the resilience strategy development process to identify

³See City Council authorization to execute a contract with Rockefeller Foundation here: http://www.cityofberkeley.info/Clerk/City_Council/2014/06_Jun/Documents/2014-06-10_Item_27_Grant_Agreement_Rockefeller.aspx

additional resources and technical assistance that can help Berkeley become more resilient to natural hazards and climate change. Analyses being conducted in partnership with 100RC will provide estimates of the cost and benefits of a range of potential resilience-building strategies.

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