

Department of Fire and Emergency Services

**Agenda
For the Regular Meeting of the
Disaster and Fire Safety Commission**

DATE: Wednesday, January 22, 2020
TIME: 7:00 PM
PLACE: Fire Department Training Facility - 997 Cedar Street

Preliminary Matters

Call to Order.

Approval of the Agenda

Public Comment on Non-Agenda Matters

1. Fire Department and Office of Emergency Services Staff Report

Consent Items

2. Approval of Draft Minutes of Meeting of December 4, 2019*

Action Items

3. Notification of Residency in Designated High Risk Fire Areas*

Discussion Items

4. Phase 3 Study to Underground Utilities Wires in Berkeley*
5. Measure T1 - Update on Phase 1 and Information on Phase 2 Public Process*
6. Special Tax Assessment for Wildfire Prevention Possible Future Action*
7. October's Public Safety Power Shutoff (PSPS) and Plans for Future PSPS's*
8. Public Outreach on Emergency Preparedness

9. Referral from City Council: Amending Chapter 19.34 of the Berkeley Municipal Code to Expand Automatic Gas Shut-Off Valve Requirements in Multifamily, Condominium and Commercial Buildings Undergoing Renovations and to All Existing Buildings Prior to Execution of a Contract for Sale or Close of Escrow*
10. Future Agenda Items

Adjournment

(*Material attached for Commissioners for this month's meeting)

Communications to Berkeley boards, commissions or committees are public record and will become part of the City's electronic records, which are accessible through the City's website. **Please note: e-mail addresses, names, addresses, and other contact information are not required, but if included in any communication to a City board, commission or committee, will become part of the public record.** If you do not want your e-mail address or any other contact information to be made public, you may deliver communications via U.S. Postal Service or in person to the secretary of the relevant board, commission or committee. If you do not want your contact information included in the public record, please do not include that information in your communication. Please contact the secretary to the relevant board, commission or committee for further information.

This material is available in alternative formats upon request. Alternative formats include audio-format, braille, large print, electronic text, etc. Please contact the Disability Services Specialist and allow 7-10 days for production of the material in an alternative format.

Email: ADA@cityofberkeley.info
Phone: 1-510-981-6418
TTY: 1-510-981-6347



This meeting is being held in a wheelchair-accessible location. To request a disability-related accommodation(s) to participate in the meeting, including auxiliary aids or services, please contact the Disability Services Specialist at 981-6418 (V) or 981-6347 (TDD) at least three business days before the meeting date. Please refrain from wearing scented products to this meeting.

Disaster & Fire Safety Commission
Regular Meeting
Wednesday, December 4, 2019
997 Cedar Street, Berkeley, CA 94710

Present: Gradiva Couzin, Jose Luis Bedolla, Annie Bailey, Shirley Dean, Robert Flasher
Absent: Ruth Grimes, Paul Degenkolb (Leave of Absence), Toby Simmons (Leave of Absence), Toni Stein
Staff: Khin Chin, Keith May
Public: Armaan Mumtaz, Sebastian Cahill, Sarah Jones, Chris Cullander, David Peattie

Preliminary Matters

Call to Order

G. Couzin called meeting to order at 7:00 pm

Approval of the Agenda

Move Item 9 before Item 7

Approved by Acclimation

Public Comment on Non-Agenda Items

David Peattie from Berkeley Disaster Preparedness Neighborhood Network (BDPNN) thanked for support on the Disaster Prep Fair in October. BDPNN's next quarterly meeting topic will be energy storage options for use during emergency. BDPNN has received a grant to help seniors and people with disabilities.

Chris Cullander said the Mayor's proposals for \$550,000 funding some emergency preparedness, vegetation management, walking paths, safe passages and other measures was passed at last night's City Council Meeting.

Gradiva Couzin said that \$1.1 million siren proposal was not passed.

1. Fire Department and Office of Emergency Services Staff Report

11/11 Structure fire on 1700 Block of Virginia St.

11/26 Structure fire on 1200 Block of Oxford

11/29 Apartment fire on 2200 Block of Dwight

11/29 Apartment fire on 1200 Block of Evelyn St.

A public neighborhood meeting on Monday December 9 in the Alvarado neighborhood regarding the Safe Passages.

Through an Alameda County funded initiative, the Zone Haven application and technology will be available to the City of Berkeley to support wildfire evacuation planning. More details will come as the project progresses.

Consent Items

2. Approval of Draft Minutes for Meeting of September 25, 2019*

Motion to approve minutes as revised: Dean

Second: Flasher

Vote: 5 Ayes: Flasher, Bailey, Couzin, Dean, Bedolla; 0 Noes; 4 Absent: Degenkolb, Grimes, Stein, Simmons; 0 Abstain:

3. Approval of Draft Minutes for Meeting of October 23, 2019*

Motion to approve minutes as revised: Flasher

Second: Dean

Vote: 5 Ayes: Flasher, Bailey, Couzin, Dean, Bedolla; 0 Noes; 4 Absent: Degenkolb, Grimes, Stein, Simmons; 0 Abstain:

Action Items

4. Motion approve to schedule regular meetings of the commission for 2020 on January 22, February 26, March 25, April 22, May 27, June 24, July 29, September 23, October 28, and December 2: Bedolla

Second: Dean

Vote: 5 Ayes: Flasher, Bailey, Couzin, Dean, Bedolla; 0 Noes; 4 Absent: Degenkolb, Grimes, Stein, Simmons; 0 Abstain:

Discussion Items

5. Special Tax Assessment for Wildfire Prevention Possible Future Actions*
6. October's Public Safety Power Shutoff (PSPS) and Plans for Future PSPS's*

J. Bedolla left the meeting at 820pm.

7. Report from Community Disaster Prep Fair
8. Public Outreach on Emergency Preparedness
9. Phase 3 Study to Underground Utilities Wires in Berkeley
10. Referral from City Council: Amending Chapter 19.34 of the Berkeley Municipal Code to Expand Automatic Gas Shut-Off Valve Requirements in Multifamily, Condominium and Commercial Buildings Undergoing Renovations and to All Existing Buildings Prior to Execution of a Contract for Sale or Close of Escrow*
11. Update on Outdoor Alerting (Sirens) and Weather Radios
12. Future Agenda Items

Adjournment

Adjourn

Motion to adjourn: Dean

Second: Flasher

Vote: 4 Ayes: Dean, Flasher, Bailey, Couzin.; 0 Noes; 5 Absent Bedolla, Grimes, Simmons, Degenkolb, Stein; 0 Abstain:

Adjourned at 9:15p



[Commission Name]

[CONSENT OR ACTION]

CALENDAR

[Meeting Date (MM dd, yyyy)]

To: Honorable Mayor and Members of the City Council

From: Disaster and Fire Safety Commission

Submitted by: [Name of Commission Chairperson], Chairperson, [Commission]

Subject Notification of residency in designated High Risk Fire Areas

RECOMMENDATION

Approve a policy that, in order to save lives and reduce property damage, it is necessary that all residents in designated High Fire Risk Areas be informed they live in such an area; and that the City create a pathway to inform such residents of both prevention and emergency steps that can be taken at appropriate times. The purpose of such a policy is to provide a platform by which residents and City become partners in addressing the annual threat of wildfire to our City. Refer the implementation of this policy to the City Manager for annual determination of costs based upon recommendations for actions that will follow.

FISCAL IMPACTS OF RECOMMENDATION

To be determined annually.

BACKGROUND

It is well recognized that the City of Berkeley is vulnerable to wildfires. In the past, such fires have usually occurred in the fall months and are associated with high winds. The City has designated two High Risk Fire Areas – the highest risk being the Panoramic Hill area and east of Grizzly Peak Boulevard, and the second high risk area being generally the North Berkeley hill area from Grizzly Peak to The Alameda and the Claremont area in the south part of the City. There is no question that under certain conditions a fire in these areas will have a devastating effect on the whole city – many lives would be lost and properties destroyed. The City has rightly declared that addressing wildfire issues is a priority matter in their goal to create a resilient, safe, connected and prepared City.

An essential step to achieve this objective is clear and timely communication with residents. While people know about the problem, it appears that many residents of areas that the City has designed as High Fire Risk Areas do not know they are actually living in such an area.

State law requires that when property located within the Alquist-Priolo Earthquake Zone is sold that the buyer be so notified of this danger. It is suggested that notification to new property buyers within a designated High Risk Fire Area also receive a similar notification to that effect. This can be done by requiring real estate agents selling properties within the designated areas to so notify buyers before closing.

Notifying existing property owners in High Risk Fire Areas could be accomplished by simply mailing notice of that fact to each one on an annual basis. Such notice should include the requirement that any rental unit in or on the property must be notified of its designated location by the property owner. This requirement would not include notification to roomers if the property is mainly occupied by the owner of the property on the basis that a roomer in such a situation would be more likely have knowledge based on the actions of the main occupant. However, if the property is not owner occupied, roomers and additional units must be informed by the absentee owner.

It should be noted that while single family homes do not come under Berkeley's rent control regulations, they are subject to the Berkeley Rental Housing Inspection Program (RHIP). This program requires an annual fee of \$40 and the preparation of self-inspections conducted jointly by owner and tenant. Currently units that are newly constructed are exempt from the program for 5 years. This could be changed to apply to notification regarding location in a High Risk Fire Area only, with a reduced fee and no joint self-inspection for the first 5 year after construction. After that period of time, the full RHIP Program would begin.

Annual notices and coordination with existing programs would provide a means for the City to communicate with residents on matters such as location in a High Risk Area, preparing go-bags, knowledge of designated evacuation routes and shelters, requirements/regulations/advice regarding vegetation management, notice of up-coming parking restrictions or special tax measures, structural hardening, signing up to receive alerts, advice about what to do about power outages. information about how to receive help with special needs and any and all neighborhood and community meetings regarding safety both in terms of prevention, preparedness and what specifically to do in an emergency.

RATIONAL FOR RECOMMENDATION

Such an approach is in line with the Council's objective to be "a customer-focused organization that provides excellent, timely, easily-accessible service and information to the community."

ALTERNATIVE ACTIONS CONSIDERED

Alternatives would be attending small neighborhood meetings or holding large community meetings. While these are valuable and undoubtedly should and would continue in one way or the other, nothing can take the place of direct written information provided to individuals that not only is a consistent message to all, but one that can be kept and consulted by recipients over time.

Various actions have been recommended by the Disaster and Fire Safety Commission, including an outdoor alert system, improved fire equipment access (parking restrictions), Measure GG spending improvements and support for the Safe Passages Program and Local Hazard Mitigation Plan. This recommendation would constitute a base for the implementation of part or all of these other recommendations.

CITY MANAGER

The City Manager [TYPE ONE] concurs with / takes no position on the content and recommendations of the Commission's Report. [OR] Refer to the budget process.

Note: If the City Manager does not (a) concur, (b) takes any other position, or (c) refer to the budget process, a council action report must be prepared. Indicate under the CITY MANAGER heading, "See companion report."

CONTACT PERSON

[Name], [Title], [Department], [Phone Number]

Attachments: [Delete if there are NO Attachments]

1: [Title or Description of Attachment]

2: [Title or Description of Attachment]



Projected Costs of Undergrounding Utilities along City of Berkeley's Evacuation Routes

City of Berkeley

December 2019

 **Bellecci & Associates**

7077 Koll Center Pkwy, Suite 210
Pleasanton, CA 94566

p. 925-681-4885
www.bellecci.com

Table of Contents

Acknowledgements	3
Section I – Executive Summary	4
Section II – Methodology	5
Section III – Analysis	7
Section IV – Planning Level Costs	17
Appendix A	20
Appendix B	22
Appendix C	24
Appendix D	29
References	34

Acknowledgements

City of Berkeley Staff:

- Andrew Brozyna, PE – Deputy Director of Public Works

PREPARED BY:

Bellecci and Associates, Inc.:

- Daniel Leary, PE, PTOE, Project Manager
- Anoop Reddy Admal, PE, Senior Civil Engineer
- Emma Schoenthal, EIT, Assistant Engineer

Section I – Executive Summary

In December 2014, the Berkeley City Council directed City staff to "develop a comprehensive plan for the funding of the undergrounding of utility wires on all major arterial and collector streets in Berkeley," with support from the Public Works Commission, Disaster and Fire Safety Commission, and the Transportation Commission. An Underground Subcommittee was formed of representatives from these commissions, and has begun a four-phase study for the City Council's referral. Phase 1 was a report titled "Baseline Study for the Development of a Utility Undergrounding Program," prepared by Harris & Associates in 2016. Phase 2 conducted a "Conceptual Study to Underground Utility Wires in Berkeley", which was presented by the Public Works, Disaster and Fire Safety, and the Transportation Commissions in 2018. The program is proceeding into the third phase, which involves multiple tasks: defining the phase 3 projects, developing the financing plan, conducting community input, coordinating with utilities, and preparing an implementation plan. Phase 4 will include implementing the plan, including financing, design and construction.

The priority evacuation routes, which have been designated in the City's General Plan, are the routes along state highways and major streets that would allow citizens to evacuate in case of emergencies and disasters. The City provides a map for East/West evacuation routes along with fire zones (Appendix A). With the considerations of both safety and power reliability, these routes are the highest priorities for utility undergrounding and are the focus of this report.

This report mainly studies the utility status along the evacuation routes and provides a planning level cost estimate for undergrounding the overhead utilities along the routes. The major objectives are to:

- a) Summarize the current status of overhead and underground facilities along the City's major evacuation routes;
- b) Identify the segments of the City's major evacuation routes with existing overhead facilities to be undergrounded;
- c) Prepare a tabular documentation with percentage of overhead and underground facilities for each roadway;
- d) Provide an opinion of probable construction costs for undergrounding the existing overhead facilities along these evacuation routes.

Section II – Methodology

The City's major East/West evacuation routes are the highest priorities for utility undergrounding and a map of these routes is included in Appendix A. These routes include:

- Spruce Street, Oxford Street, Rose Street, Grizzly Peak Boulevard
- Marin Avenue
- Gilman Street, Hopkins Street
- San Pablo Avenue, Cedar Street
- University Avenue, 6th Street, Dwight Way
- Ashby Avenue, Tunnel Road
- San Pablo Avenue, Alcatraz Avenue, Claremont Avenue

The presence of overhead and underground facilities along these routes were verified using a combination of these three methods: a) utility maps, b) field visits, and c) Google Street View.

Utility Maps

The major utility companies that possess dry utilities within the City are PG&E, AT&T, Comcast, Verizon and Century Link (Level 3). Utility map request letters were sent to the aforementioned utility companies in June 2019. The utility maps provided by PG&E, AT&T, and Comcast identified the status of their existing dry utilities. However, these maps are not included in this report due to the utility companies' confidentiality clauses.

- The Comcast maps were received on June 27, 2019.
- The AT&T maps were received on July 22, 2019.
- The PG&E Electric maps were received on August 20, 2019.
- Verizon maps were received on September 18, 2019
- Century Link Level 3 utility maps were received on August 1, 2019

The utility maps listed above were evaluated for the presence of existing overhead and underground wires, conduits, joint trenches and duct banks. While other dry utilities exist within the city, it is assumed that the utility maps listed above provide sufficient coverage of existing overhead and underground facilities.

Field Visits

Field visits of the City's major evacuation routes were performed by driving along each route and noting the presence of utility poles and overhead wires. The field visits were conducted on July 2 and 3, 2019. The observations from the field visits were compared with the utility maps and the images from Google Street View to verify the presence of existing utility poles and overhead wires. Photos were taken for perceptual understanding with selected photos shown below. More photos from the field visits are included in Appendix C.

Street View Images

Google Street View provides panoramic images from positions along streets and other paths of travel. The entirety of each of the City's major evacuation routes were captured in Google Street View. The Google Street View images were compared with the utility maps to evaluate the presence of existing utility poles

and overhead wires. Google Street View, by default, shows the most recently captured images. If available, previously captured images can be shown for the location. At the time of this report, the majority of the Google Street View images along the major evacuation routes were most recently captured within the past six (6) months.



Photo 1: Taken from Dwight Way facing West near Jefferson Avenue with poles and overhead utilities



Photo 2: Taken from Grizzly Peak Boulevard facing West near Hill Road with no overhead utilities

Section III – Analysis

In general, utility maps provide a comprehensive understanding of the utility status along the City's major evacuation routes. However, utility maps can be outdated. When discrepancies between utility maps and the field visit observations are spotted, Google Street View provides insight by showing the changes in the status of undergrounding over time. For example, along Grizzly Peak Boulevard between Latham Lane and Arcade Avenue, the utility map shows overhead Comcast utilities. However, the utility poles and overhead wires were removed between May 2011 and March 2015, based on Google images captured during those times. And field visits verify the findings from Google Street View by providing the current conditions. With the information combined and verified by all three methods, a mapping exhibit that shows the presence of overhead and underground facilities along the City's major evacuation routes was created and included in Appendix B, with overhead facilities marked in red and underground facilities marked in green. A route by route analysis is presented below with tables and figures showing utility status with descriptions. The length of overhead utility (OH) is the length of street that exists with overhead utilities. It also includes segments of street that have both overhead and underground utilities, indicating that the undergrounding status is incomplete. The length of underground utility (UG) is the length of street with only underground dry utilities. There are more north-south segments of streets that are completely undergrounded than east-west segments. Because the evacuation routes are established to bring emergency access to citizens through the Interstate 80/580, the streets that travel east-west form the basis of the evacuation routes, while the undergrounded streets that travel north-south do little to optimize evacuation. However, evaluation and adjustments of the existing evacuations routes are not part of the scope of this report, and will not be discussed further.

Street classifications are based on the volume of traffic, services, and functions that the streets are intended to provide. From the Highway Design Manual, a highway is "in general a public right of way for the purpose of travel or transportation"; an arterial highway is "a general term denoting a highway primarily for through travel usually on a continuous route"; and a collector road is "a route that serves travel of primarily intra county rather than statewide importance in rural areas or a route that serves both land access and traffic circulation within a residential neighborhood, as well as commercial and industrial areas in urban and suburban areas". The Federal Highway Administration provides definitions to the following applicable terms:

- The Interstate System is the highest classification of roadways in the United States. These arterial roads provide the highest level of mobility and the highest speeds over the longest uninterrupted distance. Interstates nationwide usually have posted speeds between 55 and 75 mph.
- Other Arterials include freeways, multilane highways, and other important roadways that supplement the Interstate System. They connect, as directly as practicable, the Nation's principal urbanized areas, cities, and industrial centers. Land access is limited. Posted speed limits on arterials usually range between 50 and 70 mph.
- Collectors are major and minor roads that connect local roads and streets with arterials. Collectors provide less mobility than arterials at lower speeds and for shorter distances. They balance mobility with land access. The posted speed limit on collectors is usually between 35 and 55 mph.
- Local roads provide limited mobility and are the primary access to residential areas, businesses, farms, and other local areas. Local roads, with posted speed limits usually between 20 and 45 mph, are the majority of roads in the U.S.

Spruce Street, Oxford Street, Rose Street, Grizzly Peak Boulevard Route

This evacuation route is within or along the perimeter of Fire Zone 2, indicating a relatively high potential of fire. It is composed of primarily residential areas with high population density. Grizzly Peak Boulevard and half of Spruce Street are hilly and winding with fire potential due to the presence of vegetation. Around three-quarters of the route has incomplete utility undergrounding as shown in Table 1 and Figure 1.

Spruce Street is a north-south minor arterial street. It is primarily residential and provides access to Cragmont School, Step One Nursery School, and Congregation Beth El pre-school and synagogue. There are bulb-outs at the intersection of Spruce Street and Rose Street, which narrow Spruce Street. The evacuation route along Spruce Street is 2 miles long. Overhead lines are present for 1.8 miles between Michigan Avenue and Rose Street, and between Cedar Street and Hearst Avenue. All the overhead utilities are distribution lines.

Oxford Street is a north-south minor arterial street. It is primarily residential with a few houses and apartment buildings. The evacuation route along Oxford Street is 0.25 miles long from Rose Street to Cedar Street. Overhead lines are present for the entire length. All of the overhead utilities are distribution lines.

Rose Street is an east-west residential hillside collector street. The evacuation route along Rose Street is 0.06 miles connecting Oxford Street and Spruce Street, with overhead lines present for the entire length.

Grizzly Peak Boulevard is a north-south minor arterial street and is a major access road for mutual responders from both El Cerrito and Oakland, and provides access to the Space Sciences Laboratory and other University of California properties. Shepherd of the Hills Lutheran Church resides near the intersection of Grizzly Peak Boulevard with Spruce Street. The evacuation route along Grizzly Peak Boulevard is 2.29 miles long from the City limit near Centennial Drive to Spruce Street. Overhead lines are present for 1.4 miles from Cragmont Avenue to Latham Lane and from Hill Road to the City limit near Centennial Drive.

Evacuation Route: Spruce/Oxford/Rose/Grizzly Peak (4.60 miles)					
Street	Segment		Segment Length (mi)	Utility Length (mi)	
				OH	UG
Grizzly Peak	Centennial Dr	to Arcade Ave	0.60	0.44	0.16
Grizzly Peak	Arcade Ave	to Lathan Ln	0.67	-	0.63
Grizzly Peak	Lathan Ln	to Spruce St	1.02	0.91	0.06
Spruce St	Grizzly Peak Blvd	to Rose St	1.69	1.45	0.24
Rose St	Spruce St	to Oxford	0.06	0.06	-
Oxford	Rose	to Cedar	0.25	0.25	-
Spruce St	Cedar	to Hearst Ave	0.31	0.31	-
Total of each OH/UG Utilities				3.42	1.09
Percentage of each OH/UG Utilities				76%	24%
Total Utilities				4.51	

Table 1: Detailed utility status for route Spruce/Oxford/Grizzly Peak

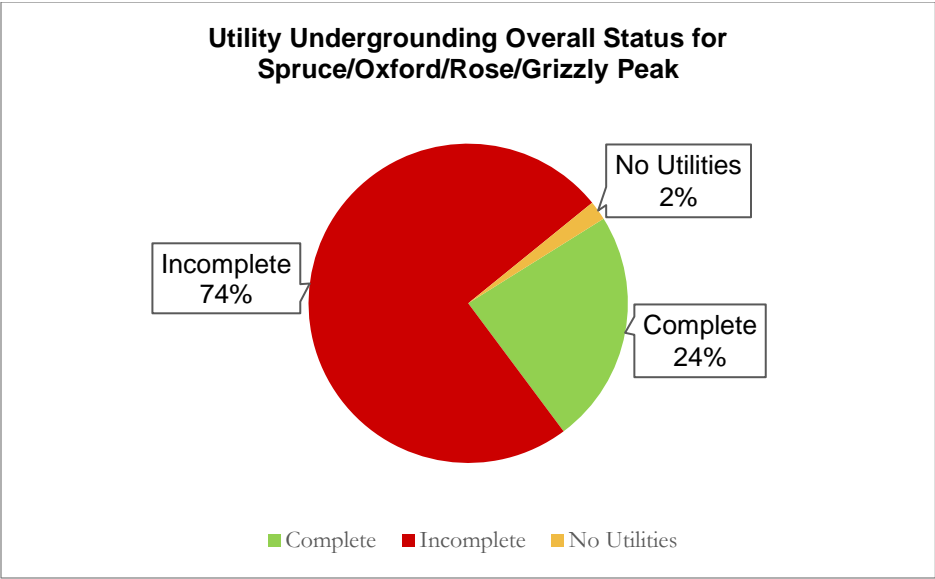


Figure 1

Marin Avenue Route

Marin Avenue is an east-west principal arterial street with primarily residential land uses along the evacuation route. It provides access to Cragmont School at the intersection with Spruce Street, Angel Academy Pre-school near the intersection with Oxford Ave, and Fire Station 4 at the intersection with The Alameda. Around 70% of the route is inside the boundary of Fire Zone 2. The evacuation route along Marin Avenue is 1.3 miles long from Tulare Avenue to Grizzly Peak Boulevard. Overhead lines are present for almost the entire length with a 94% incompleteness rate for utility undergrounding as shown in Table 2 and Figure 2.

Evacuation Route: Marin Ave (1.32 miles)					
Street	Segment		Segment Length (mi)	Utility Length (mi)	
				OH	UG
Marin Ave	Tulare Ave	to The Traffic Circle at Arlington Ave	0.53	0.53	-
Marin Ave	The Traffic Circle at Arlington Ave	to Grizzly Peak	0.79	0.71	0.08
Total of each OH/UG Utilities				1.24	0.08
Percentage of each OH/UG Utilities				94%	6%
Total Utilities				1.32	

Table 2: Detailed utility status for route Marin Avenue

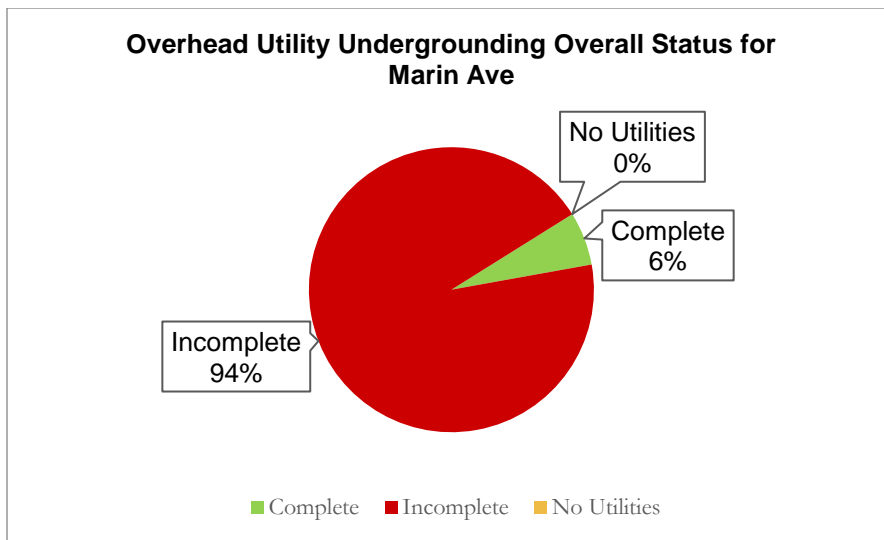


Figure 2

Gilman Street, Hopkins Street Route

This evacuation route is partially inside the boundary of Fire Zone 2 and connects to Interstate 80/580 with a railroad crossing near Interstate 80. It is composed of mostly residential areas towards the east side and mostly commercial areas towards the west side. It has over 90% incompletions for utility undergrounding as shown in Table 3 and Figure 3.

Gilman Street is an east-west principal arterial street connected to Interstate 80, and provides access to St. Ambrose Church. It is mostly commercial between Interstate 80 and San Pablo Avenue. However, between San Pablo Avenue and Hopkins Street, it is mostly residential. The evacuation route along Gilman Street is 1.2 miles long. Overhead lines are present for over 90% of the entire length.

Hopkins Street is an east-west major collector street. It is primarily residential with a few commercial buildings and a park, and it provides access to the North Branch Public Library, a couple of preschools, school facilities for Martin Luther King Junior High School, and two churches. The evacuation route along Hopkins Street is 0.9 miles long from Gilman Street to Sutter Street. Overhead lines are present for almost 90% of the entire length.

Evacuation Route: Gilman/Hopkins (2.16 miles)					
Street	Segment	Segment Length (mi)	Utility Length (mi)		
			OH	UG	
Gilman	Interstate 80 Ramp to San Pablo Ave	0.62	0.57	0.05	
Gilman/Hopkins	San Pablo Ave to The Alameda	1.23	1.20	0.03	
Hopkins	The Alameda to Sutter St	0.31	0.20	0.11	
Total of each OH/UG Utilities			1.97	0.19	
Percentage of each OH/UG Utilities			91%	9%	
Total Utilities			2.16		

Table 3: Detailed utility status for route Gilman/Hopkins

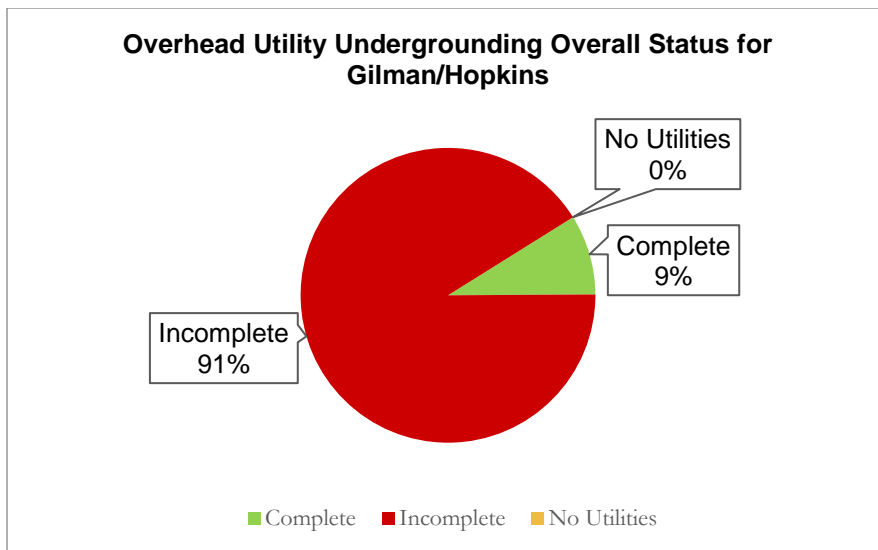


Figure 3

San Pablo Avenue, Cedar Street Route

This evacuation route is partially inside the boundary of Fire Zone 2 and connects to Gilman Street, which leads to Interstate 80. It has almost 80% incompletions for utility undergrounding as shown in Table 4 and Figure 4.

San Pablo Avenue is a north-south principal arterial street and is also State Highway Route 123 under Caltrans jurisdiction, with commercial land uses along the street frontage. The evacuation route along San Pablo Avenue, connecting Gilman Street and Cedar Street, is 0.4 miles long. There are no overhead lines along the evacuation route, and the whole street connecting Albany and Oakland has been completely undergrounded.

Cedar Street is an east-west minor arterial street. It is primarily residential, with a few businesses and provides access to two churches. The evacuation route along Cedar Street is 2.0 miles from San Pablo Avenue to La Loma Avenue. Overhead lines are present for almost the entire length.

Evacuation Route: San Pablo/Cedar (2.38 miles)					
Street	Segment		Segment Length (mi)	Utility Length (mi)	
				OH	UG
San Pablo	Gilman	to Cedar	0.37	-	0.37
Cedar	Cedar	to Juanita Way	0.39	0.32	0.04
Cedar	Juanita Way	to MLK Jr Way	0.71	0.71	-
Cedar	MLK Jr Way	to La Loma Ave	0.91	0.84	0.07
Total of each OH/UG Utilities				1.87	0.48
Percentage of each OH/UG Utilities				80%	20%
Total Utilities				2.35	

Table 4: Detailed utility status for route San Pablo/Cedar

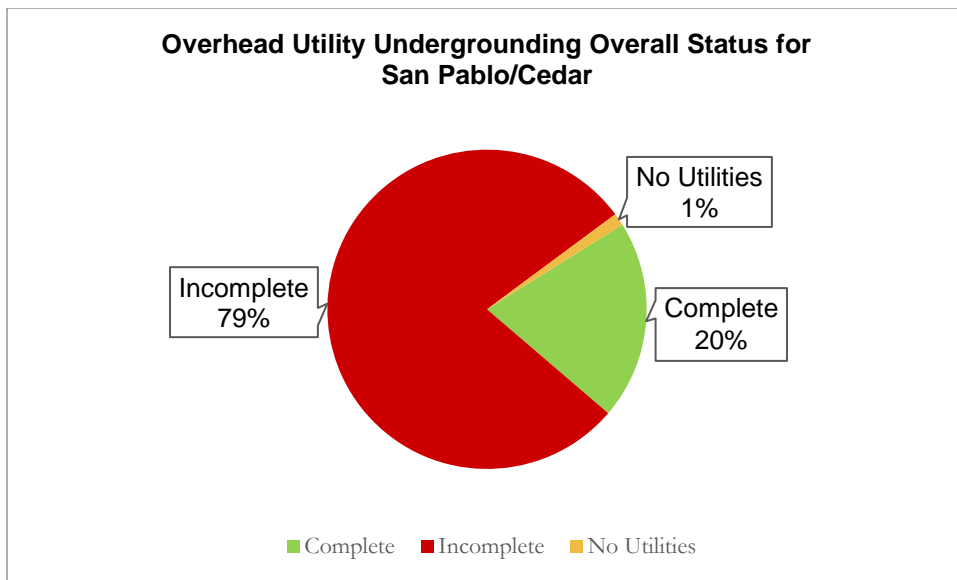


Figure 4

University Avenue, 6th Street, Dwight Way Route

This evacuation route is partially inside the boundary of Fire Zone 2, reaches the edge of Fire Zone 3, and connects to Interstate 80. It is composed of mostly residential areas towards the east side and mostly commercial areas towards the west side. Around one-third of the route only allows one-way traffic to the east, which is from Martin Luther King Junior Way to Piedmont Crescent on Dwight Way. It has around 93% incompletions for utility undergrounding as shown in Table 5 and Figure 5.

University Avenue is an east-west principal arterial street connected to Interstate 80 with primarily commercial land uses along the street frontage. The evacuation route along University Avenue is 0.3 miles from Interstate 80 to 6th Street. For the entirety of the street spanning from Interstate 80 to the University of California campus, there is only a small segment with overhead lines near Interstate 80. This street might be a better option for an evacuation route that provides safer access to citizens than many existing routes with overhead lines.

6th Street is a north-south minor arterial street. It is primarily residential with a few businesses. The evacuation route along 6th Street is 0.6 miles long connecting University Avenue and Dwight Way. Overhead lines are present for the entire length.

Dwight Way is an east-west minor arterial street. It is primarily residential with a few businesses and provides access to two urgent care centers, a couple of churches, a preschool, university residence halls, and many apartment buildings. The evacuation route along Dwight Way is 2.68 miles long from 6th Street to the street end near Fernwald Rd. Overhead lines are present for the entire length. Almost half of this segment only allows for one-way traffic to the east, however, evacuation routes should provide access to the Interstate 80 in the west side. Therefore, further investigations and discussions should be carried out for modifying the existing evacuation route.

Evacuation Route: University/6th/Dwight (3.57 miles)					
Street	Segment		Segment Length (mi)	Utility Length (mi)	
				OH	UG
University Ave	Interstate 80 Overpass	to 6th	0.31	0.07	0.17
6th	University Ave	to Dwight Way	0.56	0.56	-
Dwight Way	6th	to Fernwald Rd	2.68	2.68	-
Total of each OH/UG Utilities				3.31	0.17
Percentage of each OH/UG Utilities				95%	5%
Total Utilities				3.48	

Table 5: Detailed utility status for route University/6th/Dwight

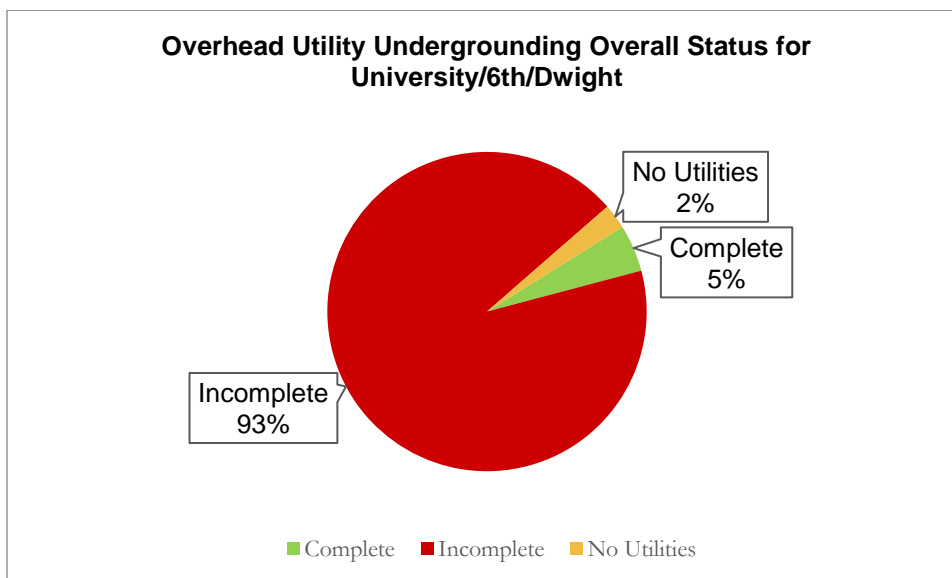


Figure 5

Ashby Avenue, Tunnel Road Route

This evacuation route is along State Highway Route 13. It is partially inside the boundary of Fire Zone 2 and connects to Interstate 80. It has a 79% incompleteness rate for utility undergrounding as shown in Table 6 and Figure 6.

Ashby Avenue is an east-west principal arterial street and is also State Highway Route 13 under Caltrans jurisdiction. It is primarily residential with a few businesses, mostly between Interstate 80 and San Pablo Avenue. It provides access to the Claremont Branch Library, a hospital, a nursing home, many apartment buildings, and a couple of gas stations. The evacuation route along Ashby Avenue is 2.9 miles long. Overhead lines are present for 2.4 miles from 9th street to Martin Luther King Jr Way, Adeline Street to Benevue Avenue, Piedmont Avenue to Domingo Avenue, a section between Bay Street and 7th Street, and at the intersection with Elmwood Avenue.

Tunnel Road is an east-west principal arterial street and is also State Highway Route 13 under Caltrans jurisdiction with residential land uses along the street frontage. The evacuation route along Tunnel Road is 0.6 miles from Domingo Avenue to the City limit near Vicente Road. Overhead lines are present for the entire length.

Evacuation Route: Ashby/Tunnel (3.56 miles)					
Street	Segment		Segment Length (mi)	Utility Length (mi)	
				OH	UG
Ashby Ave	Bay St	to Sacramento St	0.98	0.61	0.10
Ashby Ave	Sacramento	to College Ave	1.44	1.15	0.14
Ashby/Tunnel	College Ave	to Vicente Rd	1.14	1.05	-
Total of each OH/UG Utilities				2.81	0.24
Percentage of each OH/UG Utilities				92%	8%
Total Utilities				3.05	

Table 6: Detailed utility status for route Ashby/Tunnel

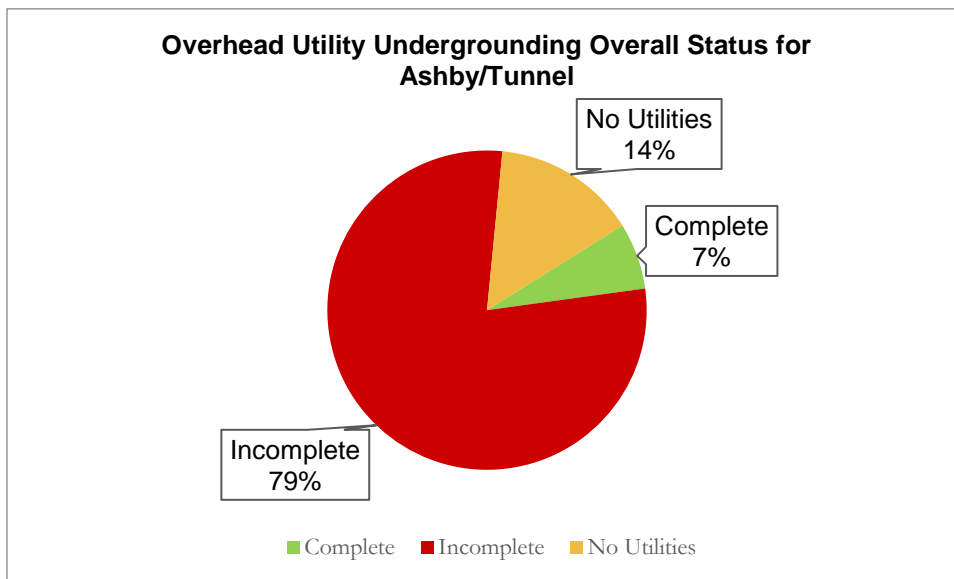


Figure 6

San Pablo Avenue, Alcatraz Avenue, Claremont Avenue Route

This evacuation route reaches the edge of Fire Zone 2 and connects to State Highway Route 13 with about one half of the route inside the City of Oakland. It has around 82% incompletions for utility undergrounding as shown in Table 7 and Figure 7.

San Pablo Avenue is a north-south principal arterial street and is designated as State Highway Route 123 under Caltrans jurisdiction with commercial land uses along the street frontage. The evacuation route along

San Pablo Avenue, connecting Ashby Avenue and Alcatraz Avenue, is 0.4 miles long. There are no overhead lines along the evacuation route except at the intersection with 65th Street.

Alcatraz Avenue is an east-west minor arterial street. It provides access to a school and a church. The evacuation route along Alcatraz Avenue is 1.9 miles long. Overhead lines are present for over 90% of the street segment.

Claremont Avenue is a north-south minor arterial street. It is primarily residential with a few businesses between Woolsey Street and Prince Street and provides access to the John Muir Elementary School near the intersection with Ashby Avenue. The evacuation route on Claremont Avenue is 0.5 miles from Alcatraz Avenue to State Highway Route 13. Overhead lines are present for the entire length.

Evacuation Route: San Pablo/Alcatraz/Claremont Ave (2.79 miles)				
Street	Segment	Segment Length (mi)	Utility Length (mi)	
			OH	UG
San Pablo	Ashby to Alcatraz	0.37	-	0.37
Alcatraz	San Pablo to Claremont	1.93	1.81	0.12
Claremont	Alcatraz to Ashby	0.49	0.49	-
Total of each OH/UG Utilities			2.30	0.49
Percentage of each OH/UG Utilities			82%	18%
Total of all Utilities			2.79	

Table 7: Detailed utility status for route San Pablo/Alcatraz/Claremont

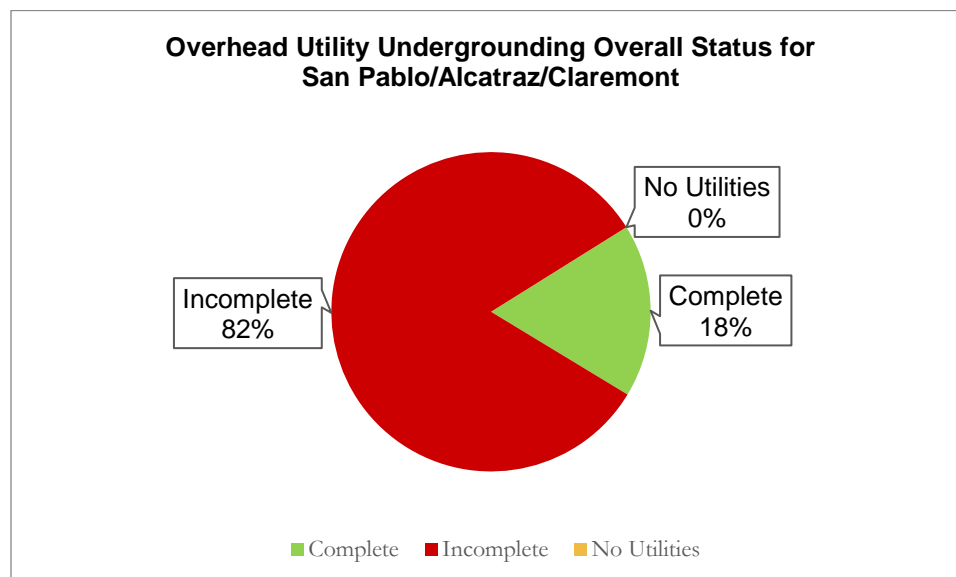


Figure 7

Summary

Currently, around 86% of the City’s major evacuation routes have not yet been undergrounded. The utility maps show that along the majority of each of the City’s major evacuation routes, there exists overhead utilities, underground utilities, or both, with a few minor segments that do not possess utilities. For the majority of the major evacuation routes, if utility poles and overhead wires are not observed, then it is reasonable to assume that there are underground utilities present along these segments.

Based on the compiled information, Table 8 shows the overall status of the utilities along the City’s major evacuation routes. Figure 8 shows the length of each evacuation route and the length with existing overhead and underground facilities. Figure 9 shows the total utility undergrounding status for the City’s major evacuation routes.

Total of OH/UG Utilities along all Evacuation Routes		
	OH	UG
Total of each OH/UG Utilities (mi)	16.92	2.74
Percentage of each OH/UG Utilities	86%	14%
Total Utilities (mi)	19.66	
Total Route Length (mi)	20.38	

Table 8: Overall utility status for Berkeley evacuation routes

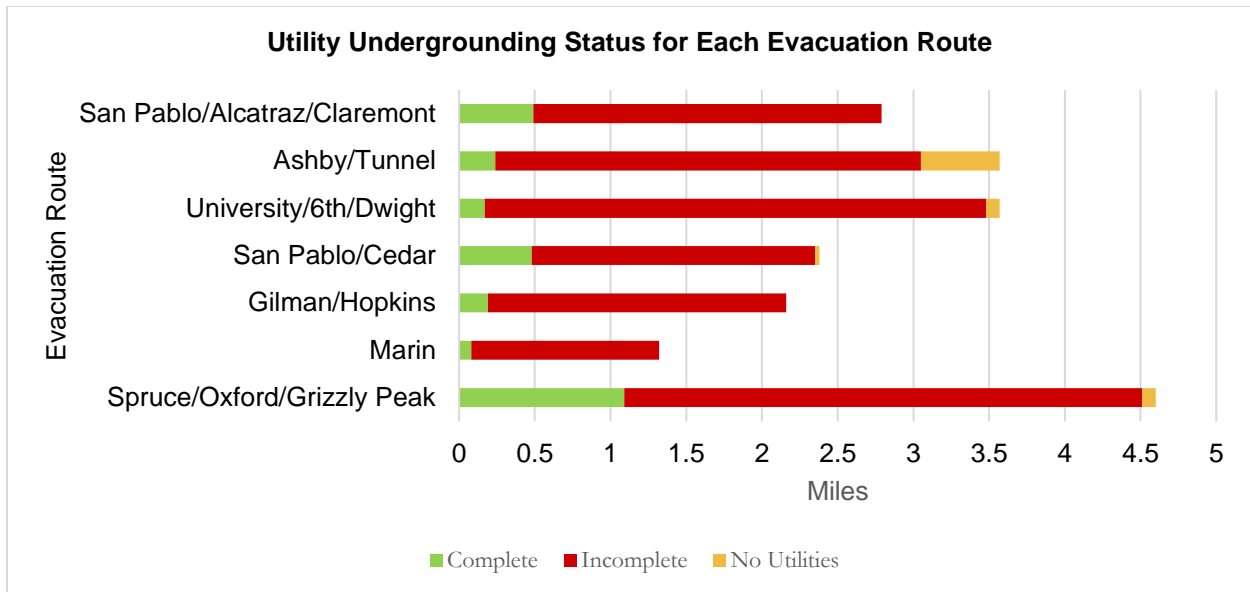


Figure 8

Section IV – Planning Level Costs

Cost Estimate Methodology

Three methods are used to determine the per mile unit cost of undergrounding: Method 1 is from a California Public Utilities Commission report regarding undergrounding program costs, Method 2 is from recent publicly bid utility undergrounding projects and Method 3 is an average of a few listed projects in a report from the City and County of San Francisco Board of Supervisors Report. Below is a description of each method.

Method 1: CPUC/Edison Electric Institute Studies on Utility Undergrounding Costs

The Policy and Planning Division of the California Public Utilities Commission (CPUC) completed a report entitled “Program Review California Overhead Conversion Program, Rule 20A for Years 2011-2015”. The report references the Edison Electric Institute study titled “Out of Sight, Out of Mind” for the unit cost per mile for undergrounding utilities. The 2012 report prepared by Edison Electric Institute concluded that the cost to underground in an urban area is approximately \$5,000,000 per mile. Using this unit cost combined with a construction inflation coefficient of 4%, the undergrounding unit cost for an arterial street in an urban area in 2019 is as shown below for Method 1.

Method 1 Costs for Utility Undergrounding	\$6,580,000 per mile
-------------------------------------------	----------------------

Method 2: Utility Undergrounding Costs in the San Francisco Bay Area

Comparison of the recent bid unit prices from recent local agency utility undergrounding projects determined a general cost for utility undergrounding in the San Francisco Bay Area. These projects are publicly bid, represent the bid results of various complicated urban utility undergrounding projects, and reflect a balance of pricing from various contractors in the San Francisco Bay Area. When reviewing the bids for local utility undergrounding projects, these projects often included incidental items that will not be associated with the Berkeley evacuation route undergrounding project and therefore can be removed from the Method 2 cost. Examples of construction cost items to be removed from the Method 2 estimates are upgrades related to: storm drain systems, sidewalks and curb ramps, Caltrans and other agency requirements, wet utilities and landscape improvements. The City of Berkeley is also anticipating a programmatic approach for the evacuation route undergrounding program; it is estimated that a programmatic approach would result in a 20% reduction in overall cost due to savings in mobilization, project overhead, and materials purchases. After consideration of the added costs of streetlights, private property service conversions, and the utility company costs per mile for wiring and vaults, engineering design fees, construction management costs; the resulting unit cost is as shown below for Method 2.

Method 2 Costs for Utility Undergrounding	\$7,058,000 per mile
-------------------------------------------	----------------------

Method 3: San Francisco Report on Utility Undergrounding Costs

City and County of San Francisco Board of Supervisors also prepared a report to review cost of undergrounding utility wires in San Francisco in March 2015. This report references several other cities that

have implemented undergrounding of utility wires and included associated costs per mile. This method includes per mile cost based on some of the undergrounding projects in San Diego, San Francisco, Oakland, and San Jose with inflation costs to the Year 2019. The average of the above projects costs (excluding the highest and lowest) for Year 2019 represents the resulting unit cost for Method 3, which is shown below.

Method 3 Costs for Utility Undergrounding	\$6,760,000 per mile
-------------------------------------------	----------------------

Utility Undergrounding Costs per Mile

The per mile unit cost for utility undergrounding for a major arterial street is calculated using the average of Method 1, Method 2 and Method 3. See below unit costs per mile with and without street lighting. These planning level cost estimates are not actual costs and may be lower or higher depending upon the project length, locations, extent of improvements, and bidding environment due to economy, when the projects are out to bid.

Avg. of Method 1, 2 & 3 Costs for Utility Undergrounding with Street Lighting FY 2019 (BASELINE)	\$6,800,000 per mile
Avg. of Method 1, 2 & 3 Costs for Utility Undergrounding without Street Lighting FY 2019	\$6,300,000 per mile
Cost for Street Lighting FY 2019	\$500,000 per mile

Street lighting costs are also shown separately as per mile cost above, since the City is considering installing solar street lighting. The above baseline includes planning costs, engineering design fees, construction costs, utility wiring costs, service conversions, street lighting costs, and project management costs.

Construction Complexity Level for City of Berkeley Evacuation Routes

The Construction Complexity Level metric is broken down into five levels; Level 1 represents the least complex conditions for utility undergrounding, and Level 5 represents the most complex conditions for utility undergrounding. The Construction Complexity Level metric is dependent on four different categories:

1. Existing wire quantity and size: The utility company record maps identify the size and quantity of overhead wires for each street segment, including high voltage conductors and transformers. Wire sizes, quantities and substructures affect the cost of the underground duct banks.
2. Average Daily Traffic (ADT): ADT levels were determined from the City of Berkeley Traffic Engineering Average Total Daily Traffic Volume Map. High traffic volumes cause increased construction costs for traffic control during construction.
3. Street categorization as either residential, commercial, or mixed-use: Commercial buildings have greater utility demands and more service conversions when compared to a single family residential building.
4. Type of pavement surfacing: Streets were categorized as either asphalt or concrete streets. Concrete streets are more expensive for trenching and resurfacing.

The City's Evacuation Routes were examined for each of the four different categories and they were assigned a Construction Complexity Level. Level 5 represents the greatest cost at \$6,800,000 per mile. A Level 4 street is assumed to be 10% less than the cost of a Level 5 street, a Level 3 street is assumed to

be 20% less than the cost of a Level 5 street, a Level 2 street is assumed to be 30% less than the cost of a Level 5 street, and a Level 1 street is assumed to be 40% less than the cost of a Level 5 street.

A summary of these unit costs in FY 2019 for each Construction Complexity Level can be found below which includes planning costs, engineering design fees, construction costs, utility wiring costs, service conversions, street lighting costs, and project management costs.

Level 5 Construction Complexity for Utility Undergrounding	\$6,800,000 per mile
Level 4 Construction Complexity for Utility Undergrounding	\$6,120,000 per mile
Level 3 Construction Complexity for Utility Undergrounding	\$5,440,000 per mile
Level 2 Construction Complexity for Utility Undergrounding	\$4,760,000 per mile
Level 1 Construction Complexity for Utility Undergrounding	\$4,080,000 per mile

For greater detail of each evacuation route undergrounding costs for FY 2019-Programmatic Approach, FY 2023-Programmatic Approach and FY 2023-CIP Approach, refer to Appendix D.

Streetlights

The cost for streetlight improvements is \$500,000 per mile (FY 2019) and \$585,000 per mile (FY 2023).





Summary of Total Program Undergrounding Costs

The total program costs for utility undergrounding along the City of Berkeley's evacuation routes is \$102.6 Million (FY 2019), \$120 Million (FY 2023) with a programmatic approach and \$139.5 Million (FY 2023) with a CIP approach.

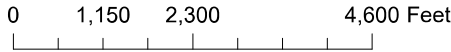
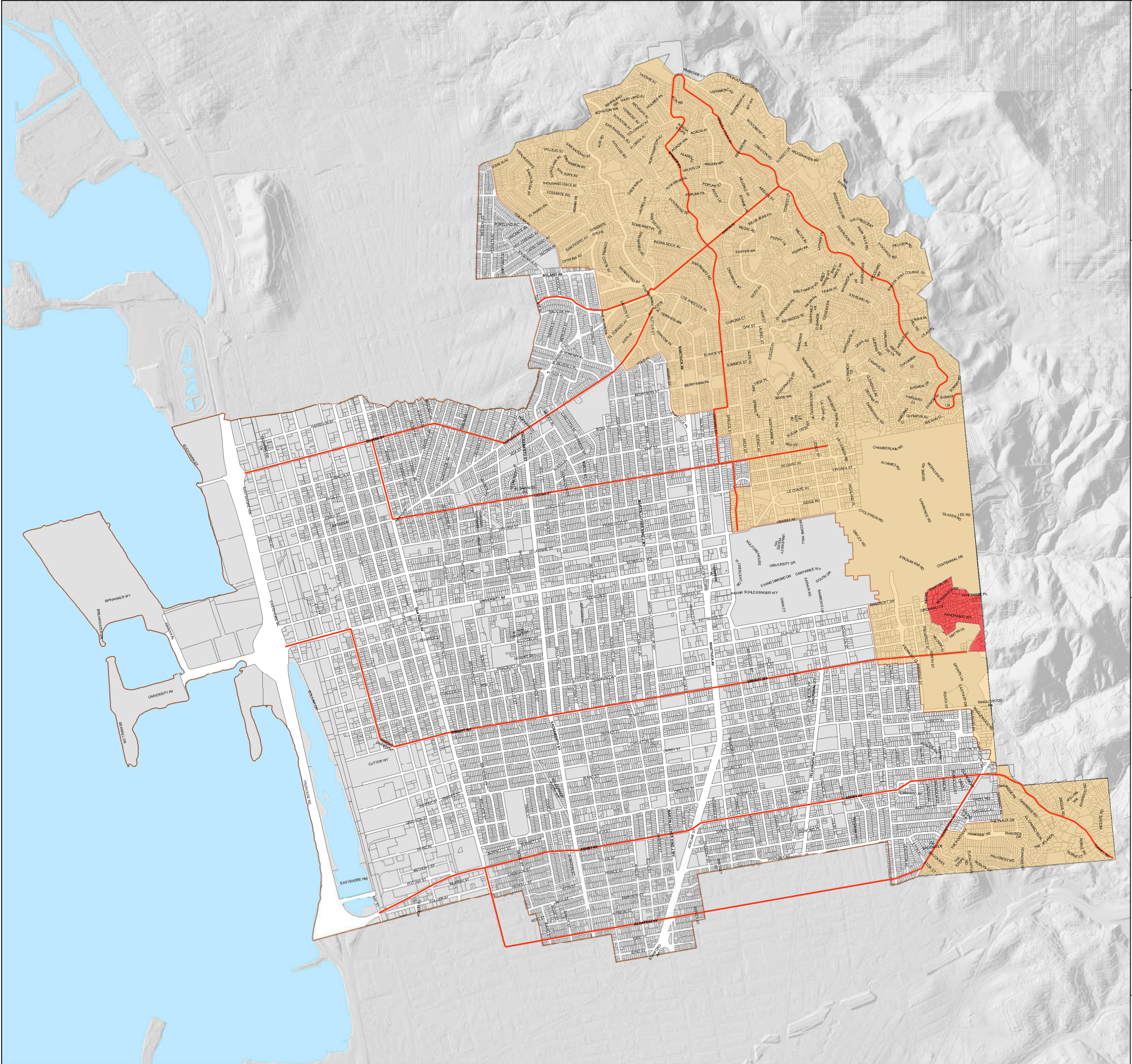
Appendix A

Map of City's Major East/West Evacuation Routes

EAST/WEST EVACUATION ROUTES

-  EVACUATION ROUTES
-  FIRE ZONE 1
-  FIRE ZONE 2
-  FIRE ZONE 3

Disclaimer:
 The City of Berkeley makes no representations about the suitability of the information contained on this map for any purpose. The map is provided "as is" without warranty, either express or implied, of any kind. The City of Berkeley hereby disclaims all warranties and conditions with regard to this information, including all implied warranties and conditions of merchantability, fitness for a particular purpose, the quality of the material, title or non-infringement. In no event shall the City of Berkeley be liable for any special, indirect, incidental or consequential damages or any other damages whatsoever, including but not limited to loss of use, data or profits, under any contract, tort, strict liability or other legal or equitable theory arising out of or in connection with the use or performance of information available from this map. The published map may contain technical inaccuracies or typographical errors. Changes are periodically added to the information herein. The City of Berkeley may make improvements and/or changes to the map at any time.



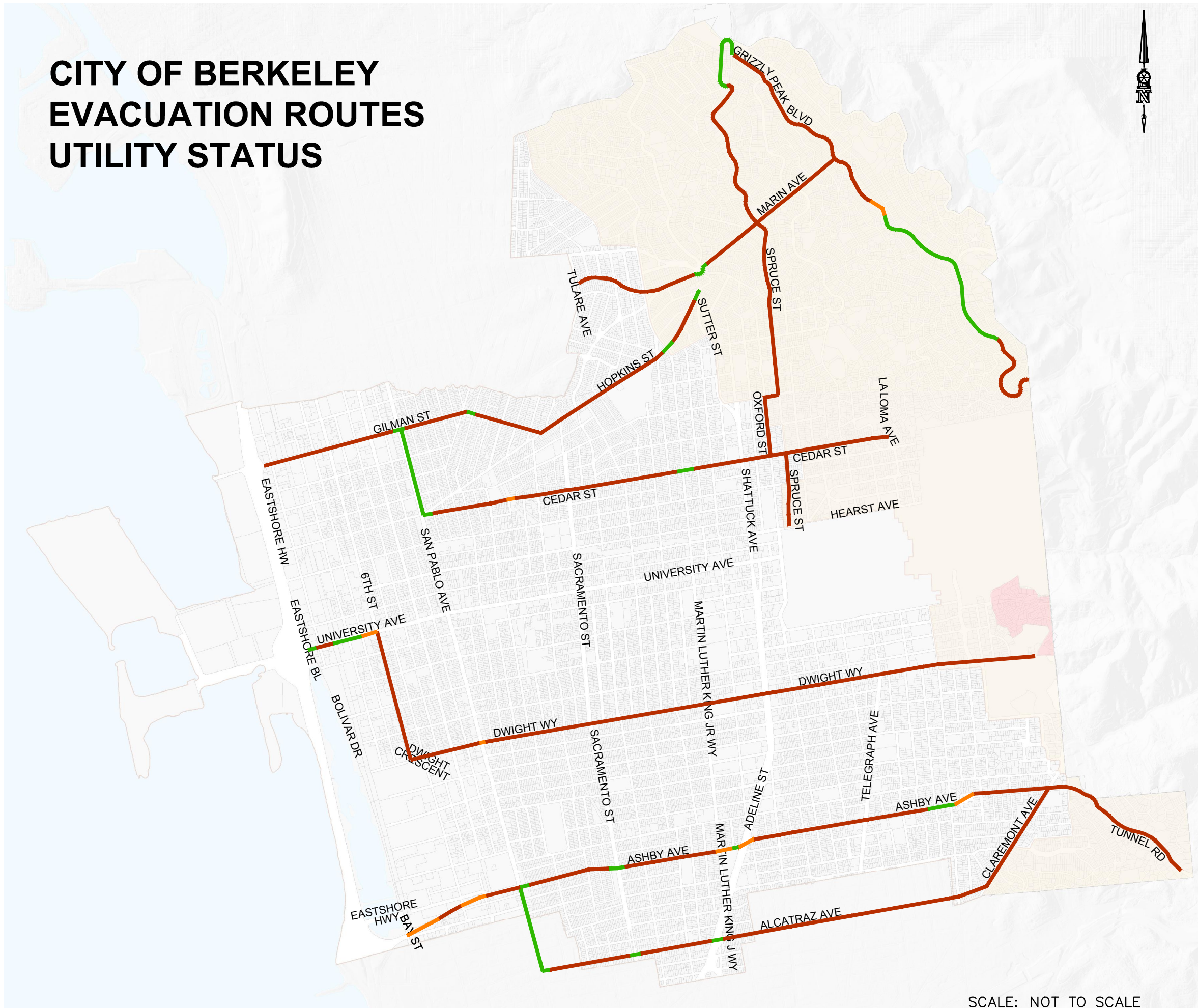
CITY OF BERKELEY
 Information Technology Department
 2180 Milvia Street, Berkeley CA 94704
 (510) 981-6525

Appendix B




Map of Existing Overhead and Underground Facilities

Along City's Major Evacuation Routes

CITY OF BERKELEY EVACUATION ROUTES UTILITY STATUS



LEGEND

-  UNDERGROUND DRY UTILITIES
-  OVERHEAD DRY UTILITIES
-  NO DRY UTILITIES

 **Bellecci & Associates, inc.**

Civil Engineering • Land Surveying

7077 Koll Center Pkwy, Suite 210 Pleasanton, CA 94566

Phone (925) 681-4885

www.bellecci.com

SCALE: NOT TO SCALE

Appendix C

Photos from Field Visits

Spruce/Oxford/Grizzly Peak Route



Grizzly Peak Blvd – Facing Northwest



Spruce St – Facing South

Marin Ave Route



Marin Ave – Facing North



Marin Ave – Facing Southwest

Gilman/Hopkins Route



Gilman St – Facing West

San Pablo/Cedar Route



Cedar St – Facing West

Ashby/Tunnel Route



Ashby Ave – Facing West



Ashby Ave – Facing West

Appendix D

City of Berkeley Evacuation Route Utility Undergrounding Costs

FY 2019 Base line costs for Utility Undergrounding with Street Lighting with a Programmatic Approach is as shown below:

Street	Construction Complexity	Centerline of Street with Overhead	Unit of Measure	Unit Cost	Total Cost
San Pablo Ave	N/A	0	MILE	\$ -	\$ -
University Ave	3	0.07	MILE	\$ 5,440,000	\$ 380,800
Ashby Ave	5	2.21	MILE	\$ 6,800,000	\$ 15,028,000
Tunnel Road	3	0.6	MILE	\$ 5,440,000	\$ 3,264,000
Gilman St	5	1.16	MILE	\$ 6,800,000	\$ 7,888,000
Dwight Way	4	2.68	MILE	\$ 6,120,000	\$ 16,401,600
Hopkins	2	0.81	MILE	\$ 4,760,000	\$ 3,855,600
Alcatraz Ave	1	1.81	MILE	\$ 4,080,000	\$ 7,384,800
Claremont Ave	1	0.49	MILE	\$ 4,080,000	\$ 1,999,200
Rose	2	0.06	MILE	\$ 4,760,000	\$ 285,600
Marin Ave	4	1.24	MILE	\$ 6,120,000	\$ 7,588,800
Spruce St	2	1.76	MILE	\$ 4,760,000	\$ 8,377,600
Grizzly Peak	2	1.35	MILE	\$ 4,760,000	\$ 6,426,000
Oxford St	2	0.25	MILE	\$ 4,760,000	\$ 1,190,000
Sixth St	3	0.56	MILE	\$ 5,440,000	\$ 3,046,400
Cedar St	3	1.87	MILE	\$ 5,440,000	\$ 10,172,800
Total		16.92			\$ 93,300,000
Total (including 10% contingency)					\$ 102,630,000
Per Mile Unit Cost (including 10% contingency)					\$ 6,100,000

FY 2023 Base line costs for Utility Undergrounding with Street Lighting with a Programmatic Approach is as shown below:

The construction costs included below use the following assumptions:

1. Construction costs with inflation of 4% per year to 2023,
2. Undergrounding projects will be implemented as a City-wide program to reduce overall cost,
3. Construction costs are scaled based on the Construction Complexity Level of the street segment, and
4. Transportation and pedestrian amenities, wet utility upgrades, and other non-undergrounding expenditures are assumed not to be included.

Street	Construction Complexity	Centerline of Street with Overhead	Unit of Measure	Unit Cost	Total Cost
San Pablo Ave	N/A	0	MILE	\$ -	\$ -
University Ave	3	0.07	MILE	\$ 6,364,000	\$ 445,480
Ashby Ave	5	2.21	MILE	\$ 7,955,000	\$ 17,580,550
Tunnel Road	3	0.6	MILE	\$ 6,364,000	\$ 3,818,400
Gilman St	5	1.16	MILE	\$ 7,955,000	\$ 9,227,800
Dwight Way	4	2.68	MILE	\$ 7,160,000	\$ 19,188,800
Hopkins	2	0.81	MILE	\$ 5,569,000	\$ 4,510,890
Alcatraz Ave	1	1.81	MILE	\$ 4,773,000	\$ 8,639,130
Claremont Ave	1	0.49	MILE	\$ 4,773,000	\$ 2,338,770
Rose	2	0.06	MILE	\$ 5,569,000	\$ 334,140
Marin Ave	4	1.24	MILE	\$ 7,160,000	\$ 8,878,400
Spruce St	2	1.76	MILE	\$ 5,569,000	\$ 9,801,440
Grizzly Peak	2	1.35	MILE	\$ 5,569,000	\$ 7,518,150
Oxford St	2	0.25	MILE	\$ 5,569,000	\$ 1,392,250
Sixth St	3	0.56	MILE	\$ 6,364,000	\$ 3,563,840
Cedar St	3	1.87	MILE	\$ 6,364,000	\$ 11,900,680
Total		16.92			\$ 109,100,000
Total (including 10% contingency)					\$ 120,010,000
Per Mile Unit Cost (including 10% contingency)					\$ 7,100,000

Planning level cost estimate for utility undergrounding (with street lighting) along City of Berkeley evacuation routes for Year 2023 with programmatic approach.

FY 2023 Base line costs for Utility Undergrounding with Street Lighting traditional Capital Improvement Program implementation is as shown below:

Street	Construction Complexity	Centerline of Street with Overhead	Unit of Measure	Unit Cost	Total Cost
San Pablo Ave	N/A	0	MILE	\$ -	\$ -
University Ave	3	0.07	MILE	\$ 7,394,000	\$ 517,580
Ashby Ave	5	2.21	MILE	\$ 9,242,000	\$ 20,424,820
Tunnel Road	3	0.6	MILE	\$ 7,394,000	\$ 4,436,400
Gilman St	5	1.16	MILE	\$ 9,242,000	\$ 10,720,720
Dwight Way	4	2.68	MILE	\$ 8,318,000	\$ 22,292,240
Hopkins	2	0.81	MILE	\$ 6,469,000	\$ 5,239,890
Alcatraz Ave	1	1.81	MILE	\$ 5,545,000	\$ 10,036,450
Claremont Ave	1	0.49	MILE	\$ 5,545,000	\$ 2,717,050
Rose	2	0.06	MILE	\$ 6,469,000	\$ 388,140
Marin Ave	4	1.24	MILE	\$ 8,318,000	\$ 10,314,320
Spruce St	2	1.76	MILE	\$ 6,469,000	\$ 11,385,440
Grizzly Peak	2	1.35	MILE	\$ 6,469,000	\$ 8,733,150
Oxford St	2	0.25	MILE	\$ 6,469,000	\$ 1,617,250
Sixth St	3	0.56	MILE	\$ 7,394,000	\$ 4,140,640
Cedar St	3	1.87	MILE	\$ 7,394,000	\$ 13,826,780
Total		16.92			\$ 126,800,000
Total (including 10% contingency)					\$ 139,480,000
Per Mile Unit Cost (including 10% contingency)					\$ 8,200,000

Planning level cost estimate for utility undergrounding (with street lighting) along City of Berkeley evacuation routes for Year 2023 with CIP approach

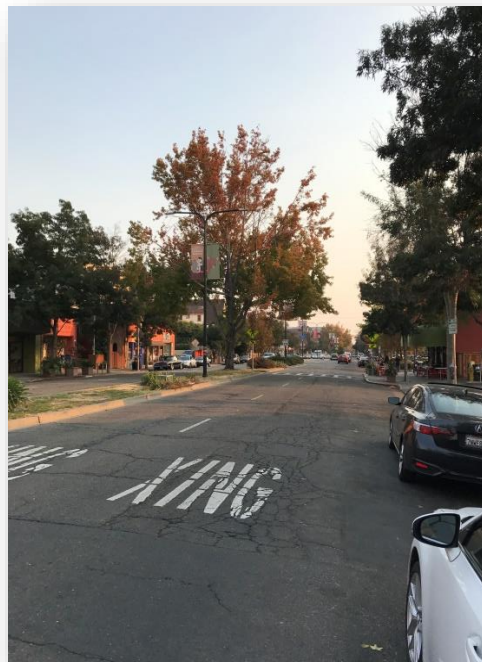
References

- *AT&T Mapping “External Map Request for Bellecci And Associates”*, prepared by AT&T, July 17, 2019.
- *Average Total Daily Traffic Volume*, prepared by City of Berkeley Traffic Engineering, n.d.
- *Baseline Study for the Development of a Utility Undergrounding Program*, prepared by Harris & Associates, July 22, 2016.
- *California Highway System*, Caltrans, Copyright @ 2018, <https://caltrans.maps.arcgis.com/apps/webappviewer/index.html?id=026e830c914c495797c969a3e5668538>
- *Century Link (Level 3) Mapping “Berkeley”*, provided by Century Link, August 1, 2019.
- *City and County of San Francisco Board of Supervisors, Budget and Legislative Analyst - Utility Wire Undergrounding Costs*, dated March 2, 2015
- *Comcast Mapping “Berkeley”*, provided by Comcast, June 27, 2019.
- *Conceptual Study to Underground Utility Wires in Berkeley*, City of Berkeley Public Works Commission, Disaster and Fire Safety Commission, and Transportation Commission, January 2018.
- *East/West Evacuation Routes*, prepared by City of Berkeley Information Technology Department, received on June 25, 2019.
- *Highway Design Manual 6th Edition*, Caltrans, December 14, 2018.
- *Land Use Zoning Districts*, prepared by City of Berkeley Planning & Development Department, March 20, 2014.
- *Out of Sight, Out of Mind*, prepared by Edison Electric Institute, January 2013.
- *Program Review California Overhead Conversion Program, Rule 20A For Years 2011-2015*, prepared by California Public Utilities Commission, November 23, 2016.
- *Road Function Classifications*, prepared by Federal Highway Administration, November 2000.
- *Verizon Mapping “Berkeley”*, provided by Verizon, September 18, 2019.

PROGRESS REPORT FOR PHASE 3 STUDY TO UNDERGROUND UTILITY WIRES IN BERKELEY

PREPARED BY BERKELEY'S

PUBLIC WORKS COMMISSION
DISASTER AND FIRE SAFETY COMMISSION
TRANSPORTATION COMMISSION
PUBLIC WORKS DEPARTMENT



Draft – January 7, 2020

ACKNOWLEDGEMENTS

Participating Commissions

The following Commissioners participated in the preparation of this Conceptual Study:

Public Works Commission

Sachu Constantine, Shane Krpata and former commissioners Nic Dominguez and Ray Yep

Disaster and Fire Safety Commission

Paul Degenkolb, Bob Flasher and former commissioner Victoria Legg

Transportation Commission

Tony Bruzzone

City of Berkeley

Phil Harrington, Public Works Director

Andrew Brozyna, Deputy Public Works Director

Keith May, Berkeley Fire Department

Hamid Mostowfi, Transportation Department

Ray Yep, Public Works Department program specialist

Other Participants

Charles Scawthorn, Earthquake and Fire Risk mitigation specialist

Gordon Wozniak, Former City Councilmember

Bellecci and Associates

TABLE OF CONTENTS

Executive Summary

1. Introduction and Background
 - A. City Council Referral
 - B. Reports to Council
 - C. Progress Report for Phase 3 Study
2. Progress with Phase 3 Study
 - A. Undergrounding Along Key Evacuation Routes
 - B. Estimated Cost of Undergrounding
 - C. Funding Strategies
3. Fire Risks and Mitigation Measures
 - A. Fire History and Environmental Risk Factors
 - B. Reducing the Risks of a Fire
 - C. Reducing the Impacts from a Fire
4. Program Recommendations
 - A. Phase 3 Completion
 - B. Phase 4 Recommendations
5. Next Steps

This page intentionally blank.

DRAFT

EXECUTIVE SUMMARY

2017 was the hottest year on record in California, following 5 years of drought that killed 129 million trees in California. Seven of the ten deadliest and most destructive fires in California’s history took place during the last 10 years, each one worse than ever experienced before. Berkeley faces a wildfire risk that threatens the lives and safety of residents throughout the City. We anticipate a fast-moving wildfire with only minutes for people to escape. Moving utilities underground on evacuation routes can save lives in a wildfire by preventing downed power lines, allowing residents to get out and first responders to get in. Berkeley’s City Council issued a resolution in October 2019 declaring wildfire prevention and safety a top priority.

Undergrounding is part of the solution and needs to be implemented in conjunction with vegetation management, evacuation planning, homeowner responsibilities, advanced warning systems, actions by PG&E and other factors. Undergrounding utilities is expensive, but is necessary on evacuation routes to save lives in a fast-moving wildfire.

In 2014, Berkeley’s City Council issued a referral to “develop a comprehensive plan for the funding of the undergrounding of utility wires on all major arterial and collector streets in Berkeley”. This is a progress report on the Phase 3 study of that referral. This phase includes identifying priority streets and funding options for undergrounding. The Undergrounding Subcommittee has identified a preliminary 15-year program for undergrounding, as follows.

Year	Street	Section	Council districts
1	Dwight Way	Fernwald Rd. to Shattuck Ave.	3, 4, 7, 8
2	Dwight Way	Shattuck Ave. to San Pablo Ave.	2, 3, 4
3	Marin Avenue	Tulare Ave. to Grizzly Peak Blvd.	5, 6
4	Grizzly Peak Blvd.	Spruce St. to Marin Ave.	6
5	Grizzly Peak Blvd.	Marin Ave. to Arcade Ave.	6
6	Ashby Ave., Tunnel Road	Vicente Rd to Telegraph Ave.	7, 8
7	Ashby Ave.	Telegraph Ave. to San Pablo Ave.	2, 3, 7
8	Cedar Street	La Loma Ave. to MLK Way	4, 5 6
9	Cedar Street	MLK Way to San Pablo Ave.	1, 5
10	Hopkins Street	Sutter St. to Gilman St.	5
11	Gilman Street	Gilman St. to San Pablo Ave.	1, 5
12	Spruce Street	Grizzly Peak Blvd. to Rose St.	5, 6
13	Rose Street, Oxford Street	Rose from Spruce to Oxford and Oxford from Rose to Cedar	5
14	Claremont Ave., Alcatraz Ave.	Ashby Ave. to Telegraph Ave.	8
15	Alcatraz Avenue	Telegraph Ave. to San Pablo Ave.	2, 3

The estimated cost of this undergrounding program is \$90 million in 2019 dollars. The centerline length of the proposed undergrounding is 15.1 miles.

The Undergrounding Subcommittee has evaluated several options to fund the undergrounding and recommends the following approach.

- Increase the Utility User Tax from 7.5% to 10.0% (increase of 2.5%). This will produce additional revenue of \$4.5 - 5.0 million per year.
- Allocate \$2.0 - 2.5 million per year from the General Fund for undergrounding.
- Purchase Rule 20A credits, as available. We estimate \$1.0 - 2.0 million per year.

This will produce revenue in the range of \$7.0 – 9.5 million per year for undergrounding. This means that the program can be completed in about 15 years, which is important to minimize the impact of construction cost escalation, which is currently running at ~4%/year. We also recommend that the City issue a GO bond in the range of \$35 million to jump start the program as each year of delay increases the total program cost of ~\$3.5 million.

The Undergrounding Subcommittee recommends to Council the following next steps:

1. Review this report and provide direction on whether to proceed with Phase 4.
2. Work with the Council's Facilities, Infrastructure, Transportation, Environment, and Sustainability Policy Committee on further development of the undergrounding program.
3. Review the funding options and provide direction to staff on the preferred approach. Consider funding from the General Fund during the fiscal year budgeting process. Also, consider ballot measures in November 2020 for an increase in the Utility User Tax and to authorize a General Obligation bond.
4. Implement a public engagement process in 2020.
5. Staff to prepare a Program Plan for undergrounding.
6. Close out the original Council referral to the participating commissions. We recommend forming an Undergrounding Task Force to ensure public input in the future planning of utility undergrounding. The oversight for the task force should be with the Office of Councilmember Susan Wengraf.

Section 1

INTRODUCTION AND BACKGROUND

City Council Referral

The Berkeley City Council (Council) referred a request to “develop a comprehensive plan for the funding of the undergrounding of utility wires on all major arterial and collector streets in Berkeley” to the Public Works Commission, Disaster and Fire Safety Commission and the Transportation Commission on December 16, 2014.

Reports to Council

The three commissions organized an Undergrounding Subcommittee to respond to the referral. This subcommittee structured the study into four phases, as follows.

- Phase 1:** Conduct a baseline study to summarize Berkeley’s current status of undergrounding utilities, cost to complete the undergrounding of arterial and collector streets, and examples of where undergrounding programs have been implemented.
- Phase 2:** Conduct a conceptual study to determine the feasibility of utility undergrounding and report back to the City Council. The work in this phase includes our synthesis of literature on undergrounding, guiding our two Goldman School Masters candidates’ thesis project on matters related to undergrounding, meetings with utility and communications service providers, and meetings with municipalities having robust undergrounding programs.
- Phase 3:** Prepare a financial and implementation plan for the recommended streets to be undergrounded. The work shall include community input, refinement of cost estimates, financing plan, relationship with utility service providers, implementation program design and schedule and other related matters.
- Phase 4:** Organize the financing, design and construction and performance monitoring of the approved program.

The Subcommittee presented progress reports to the Council on September 29, 2015 and March 28, 2017. The 2017 report included an updated work plan, the Harris and Associates baseline study, a proposal for studies by U.C. Berkeley’s Goldman School of Public Policy graduate students, and notes from meetings held with utility and communications service providers. The Council authorized the Subcommittee to complete the work through Phase 2 and report back to them.

The Subcommittee presented the Phase 2 report to the Council on February 27, 2018. The comprehensive report was well received and Council provided direction to proceed with the Phase 3 study.

Progress Report for Phase 3 Study

A recommended work scope for the Phase 3 study was included in the Phase 2 report. This work was planned as a shared responsibility between the participating commissions and Public Works Department (PWD) staff. PWD did not have staff available for the work and a funding request was made to hire temporary staff. That request was approved by Council in November 2018. The PWD made attempts to retain a temporary staff person, but it was not successful due to a shortage of qualified technical candidates. Consequently, staff procured consulting services from one of the City of Berkeley's (City) on-call design firms specializing in overhead utility undergrounding using the allocated funds in lieu of a temporary hire.

The Phase 3 study began at the beginning of 2019 with staffing from the PWD, Fire Department, participating commissions, and with technical expertise as needed from Bellecci & Associates, the City's on-call consultant. This is a progress report with what has been accomplished to date. The following is a summary of the work tasks and the work progress.

Phase 3 Work Tasks	Work Progress
<p>Task 1 – Define the Phase 3 projects</p> <p>A. <u>Major and Collector Streets</u> – The original work scope was to identify the major east/west routes to be undergrounded that would facilitate the travel of first responders and evacuation of residents.</p> <p>B. <u>Coordinate with Microgrid Development</u> – The original work scope was to evaluate microgrids as a way to increase power reliability after a major disaster</p> <p>C. <u>Review code standards</u> – The original work scope was to evaluate codes that would limit the loads carried by utility poles.</p>	<p>This work was done with input from Berkeley's fire department and transportation department. Also, we conducted a review of other fire mitigation measures underway in the Berkeley area.</p> <p>This work will be changed to a separate study by the PWD.</p> <p>This work will be changed to a separate study by the PWD.</p>
<p>Task 2 -- Develop the financing plan</p> <p>A. <u>Refine cost estimate for undergrounding</u>. The original work scope was to refine the cost estimates previously prepared by Harris & Associates.</p> <p>B. <u>Participate in CPUC Rule 20 review</u> – The original work scope was to monitor activities with the CPUC regarding Rule 20 modifications.</p> <p>C. <u>Evaluate funding options</u>. The original work scope was to evaluate funding options for Phase 3 projects in Berkeley.</p>	<p>This work has been done with a consultant from the City's pre-approved consultant list and from other references.</p> <p>This work will be done by the PWD and the recommended task force.</p> <p>This work has been done.</p>
<p>Task 3 – Conduct community input The original work scope was to conduct community outreach and workshops.</p>	<p>This work will be done following Council input on this progress report.</p>

<p>Task 4 – Coordinate with utilities The original work scope was to meet with PG&E and telecom companies regarding the phase 3 projects.</p>	<p>This work will be done at the appropriate time.</p>
<p>Task 5 – Prepare an implementation plan The original work scope was to prepare an implementation plan.</p>	<p>This work will be done following Council approval to proceed to implementation.</p>

DRAFT

Section 2

PROGRESS WITH PHASE 3 STUDY

A lot has happened regarding our understanding of the risks of wildland fires and actions being taken to mitigate the risks since the Phase 2 undergrounding report. Section 3 of this report summarizes the current information. Another important action is the Berkeley City Council's resolution declaring wildfire prevention and safety a top priority in the City of Berkeley. This occurred in October 2019 and the Council agenda item is in Appendix A.

This section provides information on the progress with the Phase 3 study.

Undergrounding Along Key Evacuation Routes

Our community has significant barriers to ensuring safe evacuation from major disasters. These barriers include our narrow-crowded roadways, hilly terrain, a daily commuting population, an aged overhead electrical distribution system and other factors. We look to undergrounding utility wires on designated evacuation routes as part of an overall suite of options to ensure that our community can safely escape advancing fire and first responders can access areas to fight fires.

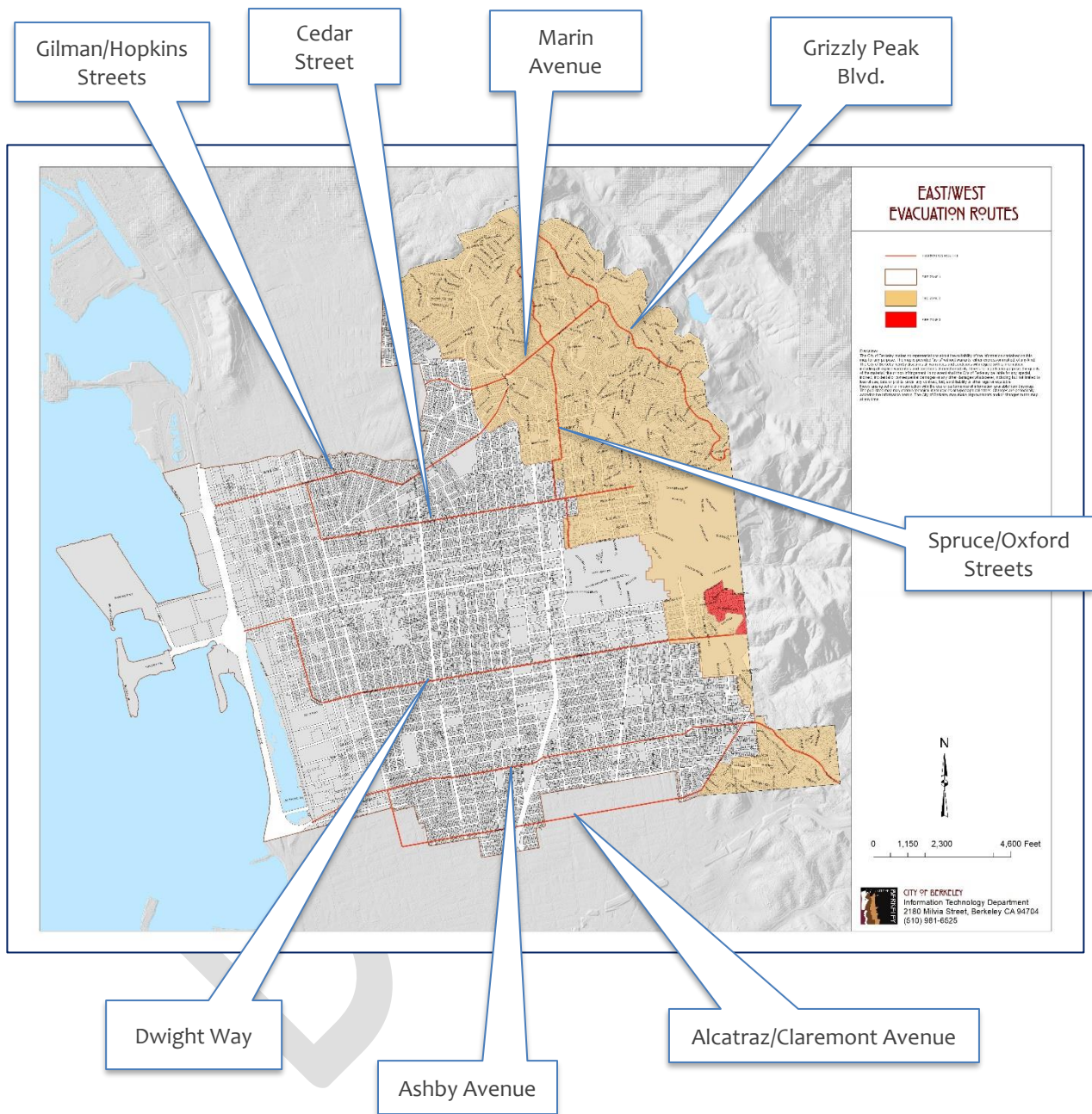
There are multiple cases of downed powerlines blocking critical escape routes. Images of persons trapped because of downed power lines in the 1991 Tunnel Fire are seared in our memory. One common cause of tragic death by wildfire is the inability to outrun fire because of downed power lines and poles blocking roadways. Supporting an undergrounding program for emergency routes is one tool we have to reduce loss of life in wildfires by creating safer egress for community members and ingress for first responders to protect our community.

Representatives from Berkeley's Fire Department, Public Works Transportation Division and participating commissions met to review the critical evacuation routes in the City. The evaluation included the following factors:

- Realize that a major wildland fire can affect all of Berkeley, just as the Tubbs Fire did in Santa Rosa.
- Consider the criticality of the routes for ingress and egress, including movement of people north/south and east/west.
- Review any barriers to the use of these routes, including width of street, capacity or blockages.
- Review the presence of overhead utility wires and the potential to underground them.

The routes selected for this study are shown on Figure 1. Other arterial and collector streets in Berkeley, such as University Avenue, Telegraph Avenue, Shattuck Avenue, Martin Luther King Jr Way, Sacramento Street and San Pablo Avenue are already undergrounded. The history of undergrounding in Berkeley goes back at least to the 1970's. Of the 25.6 miles of arterial streets, 12.5 miles have been undergrounded (49%). Of the 36.1 miles of collector streets, 11.3 miles have been undergrounded (31%). A map showing the undergrounding completed or scheduled to be completed in Berkeley is in Appendix B.

Figure 1 – Undergrounding Along Major Evacuation Routes



The development of these undergrounding routes assumed that those avoiding a major fire are leaving by vehicle to get to I-80. This assumption depends on the severity and spread of the fire. Other factors include people walking to get to shelter areas, vehicles driving to shelter areas instead of I-80 and that undergrounding all the way to I-80 may not be necessary.

Estimated Cost of Undergrounding

The project team researched the cost of undergrounding from many sources. During Phase 1 of this study, an estimate was prepared by Harris and Associates. This was supplemented with the actual costs from Palo Alto, San Diego and published sources. The work scope of the Phase 3 study was to refine the cost estimates and the engineering firm Bellecci and Associates was retained to do the work. Their analysis is summarized on Table 1 and their report is included in Appendix C.

Table 1 – Estimated cost to underground overhead wires, in 2019 dollars

Street	Undergrounding length, miles	Total cost, \$
Alcatraz/Claremont Avenues	2.30	9,384,000
Ashby/Tunnel Road	2.81	18,292,000
Dwight Way/6 th /University	3.31	19,829,000
Cedar Street	1.87	10,173,000
Gilman/Hopkins Streets	1.97	11,744,000
Marin Avenue	1.24	7,589,000
Grizzly Peak Blvd.	1.35	6,426,000
Spruce/Oxford/Rose Streets	2.07	9,853,000
Total	16.92	93,290,000
Total with 10% contingency		102,618,000
Average cost/mile		6,100,000

The estimate shown in Table 1 includes the following factors:

- The cost estimate is inclusive of trenching, conduits, wiring, service conversions, street lighting and engineering.
- The estimate is in 2019 dollars.
- Undergrounding all of the routes will be done as an overall program to achieve economies of scale.
- The estimates have considered levels of complexity for undergrounding in the various streets.

If we assume that the program will start in 2023, the estimated cost will be \$120 million. If the undergrounding is done as individual projects (not as a program), the estimated cost is \$139 million.

Funding Strategies

The City's General Fund (GF) gets the majority of its money from: a) property taxes and property-based revenues; b) economically sensitive revenues such as sales taxes, business license tax, transient occupancy tax, etc.; and c) interest and fees such as ambulance fees and parking and traffic fines. The balance of the City budget is comprised of other funding sources such as grants, special tax revenue (e.g. parks, libraries and paramedic services), and fees for specific services (marina berth fees, garbage and sewer fees, building permits, etc.).

California property taxes are set at 1% of the assessed value of the property. The City receives about a third of every property tax dollar collected in Berkeley and schools get 43% of every property tax dollar. Sales tax is 9.25 cents of every dollar and the City gets 1.00 cent. Other potential sources of revenue are General Obligation (GO) Bonds and Revenue bonds. In June of 2019, Moody's Rating

Agency upgraded the City’s GO bonds from Aa2 to Aa1, which is the 2nd highest for long-term debt. In its credit analysis report, Moody’s stated that “The City of Berkeley, CA (AA1) has a robust tax base and economy benefiting from its central Bay Area location. The city’s assessed valuation (AV) is large and growing, supported by strong resident wealth indicators. The city has a very strong fiscal position, with growing revenues, high available fund balances and strong financial management policies and practices. The city’s debt level is moderately low, but the unfunded pension liability is high, which the city is proactively addressing through establishing and funding an irrevocable pension trust.”

In summary, Berkeley has an exceptionally strong tax base and its economy benefits from its central Bay Area location. The City has a very strong financial profile, and in the last six years has significantly improved its reserve levels and liquidity.

Financing Options for Undergrounding

Rule 20 Funding

The California Public Utilities Commission (CPUC)’s Tariff Rule 20 is the vehicle for the implementation of underground programs. Rule 20 provides three levels, A, B, and C, of progressively diminishing ratepayer funding for the projects. There is also rule 20D adopted in 2014, which currently applies only to San Diego for undergrounding and other fire hardening techniques in their designated Very High Hazard Fire Zone. Under Rule 20, the CPUC requires the utility to allocate a certain amount of money each year for conversion projects. Upon completion of an undergrounding project, the utility records its cost in its electric plant account for inclusion in its rate base. Then the CPUC authorizes the utility to recover the cost from ratepayers until the project is fully depreciated. Rule 20 requires the utility to reallocate funds to communities having active undergrounding programs in amounts initially allocated to other municipalities but not spent. Cities may also commit to future 20A allocations for five years. The following table is a summary of the Rule 20 categories.

Table 2 -- Summary of Rule 20 Categories and Ratepayer Contribution

Rule 20 categories	California Ratepayer Contribution	Applicability
20 A	About 100%	Primarily ratepayer financed
20B	20%	Shared ratepayer and homeowner financed
20C	Minimal	Primarily homeowner financed
20D	About 80%	Used by San Diego Gas & Electric

Two existing Rule 20A funded undergrounding districts, formed in the early 1990s, are scheduled for completion in 2020 and 2025 respectively.

- Berkeley Grizzly Peak Summit, UUD #48 – in the engineering phase
- Berkeley Vistamont, UUD#35A - in the planning phase

Both undergrounding districts have paid their share for connection from the street to service boxes and for street light replacement.

Rule 20A is the preferred option for cities because the utility pays almost all of the cost for undergrounding. Unfortunately, the funds available are very small compared to the costs of

undergrounding. Berkeley's current Rule 20A allotment is ~\$0.53 million/year. The account balance as of March 31, was \$9,009,095. Most of this, if not all of it, will be used on the UUD 48 project. A 5-year borrow amounts to about \$2,660,390.

For most cities, the annual 20A allotment is inadequate to sustain an ongoing undergrounding program. Because cities and counties are able to trade or sell unallocated Rule 20A credits, some cities have begun to sell their unused credits at a substantial discount of ~50%. If Berkeley could find willing sellers of unused 20A credits, it could use \$3 million/year of GF monies to annually purchase \$6 million credits, which would allow it to underground ~1 mile per year.

The City rolled out 20B project guidelines in 2000 for neighborhoods interested in forming Rule 20B districts. Although many neighborhoods have expressed interest and continue to do so, one neighborhood, Thousand Oaks Heights, formed and completed an undergrounding district. A good source of information on Rule 20B procedures is from Berkeley Citizens for Utility Undergrounding. Their website is: www.berkeleyundergrounding.com

Eleven Cities in California are leading the appeal to the CPUC to redefine eligibility for 20A funds to include and increase 20A fund allocations to communities in California's Very High Hazard Severity Fire Zones for the express purpose of fire safety. A supporting resolution was presented by the League of California Cities at their annual conference in October 2019. The League took no action on the resolution and sent it back to the Committee on Environment for further review. Despite this action, the League continues to lobby the CPUC.

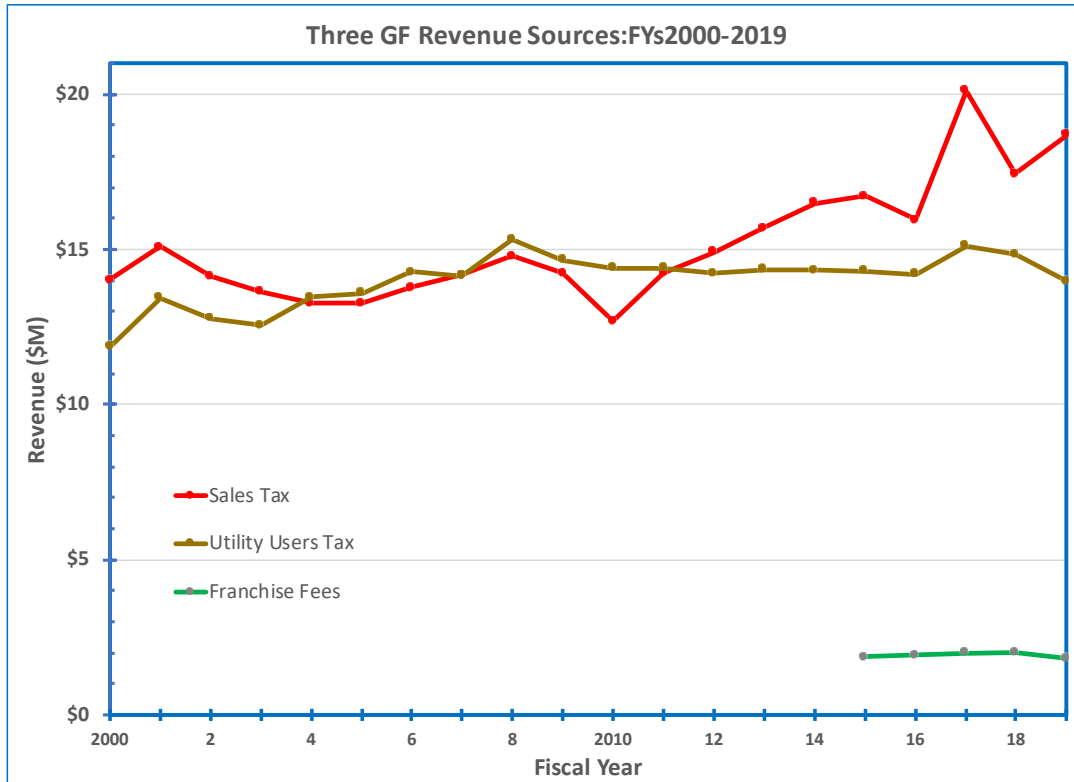
Utility User Tax or Sales Tax Funding

Another strategy for funding undergrounding projects would be the adoption of a local sales tax or Utility User's Tax that would be dedicated to funding utility undergrounding projects. Both of these would be a "special tax" as defined by Proposition 218 and Proposition 26 and require a 2/3 voter approval for adoption. Bonds could be secured by the sales tax or utility user's tax to fund the costs of the undergrounding projects. One benefit of this approach is that it could be done on a citywide basis and it may spread the tax burden across a broader base of taxpayers beyond just property owners.

1. Utility Users Tax (UUT)

The UUT is the 4th largest source of GF revenue for the City of Berkeley. The annual revenue has been very stable between \$12 and \$15 million over the last two decades. See Figure 2. The UUT is charged at a rate of 7.5% to all users of a given utility (electricity, gas, telephone, cable, and cellular), other than the corporation providing the utility. The tax is not applicable to State, County, or City agencies, or to insurance companies and banks. About 60% of the UUT revenues are generated from gas and electric services and about 40% from telecommunications.

Figure 2 – Revenue from UUT, Sales Tax, and Franchise Fees for FY2000 - 2019



Because the UUT revenues have been very stable over the last two decades and the 7.5% tax rate has not increased in two decades, raising the UUT rate could generate a substantial cash flow that could be used to issue revenue bonds for a large-scale project, such as utility undergrounding. For example, if the UUT was increased by 2.5, or 5.0 percentage points, additional annual revenue could be generated of \$5, or \$10 million. The additional cash flow could fund revenue bonds and pay-as-you-go funding to underground all of the emergency evacuation routes in Berkeley.

Since the General Fund is currently running an annual surplus of ~\$20 million/annum, another option that would reduce the ratepayer burden would be to assign \$5 million of the current UUT revenue to undergrounding and only implement a 2.5 percentage point increase in the UUT. This option would also generate \$10 million of revenue for undergrounding.

Table 3 shows the existing revenue and potential new revenue if the UUT was increased to 10.0%, and 12.5% percentage points.

Table 3 – Existing and Potential New Revenue from UUT

UUT	7.5%	10.0%	12.5%
Revenue (\$millions)	\$15	\$20	\$25
Additional Revenue (\$millions)	0	\$5	\$10

2. Sales Tax

The total sales tax rate for Alameda County is currently 9.25% and Berkeley receives 1.00%. Over the last twenty years, the sales tax revenue has increased from about \$14 million in 2000 to ~\$18 million in 2019. If Berkeley were to increase its sales tax rate from 1.0 to 1.5%, additional revenue of ~\$8.5 million/year could be generated that could be used to finance the undergrounding of utilities along emergency exit routes.

Franchise Fee Funding

Cable and Electric & Gas companies pay the City a franchise fee to use the public right-of-way. In 2018 franchise fees totaled ~\$2.0 million and are projected to increase slightly to \$2.1 million by 2021. The rate of the franchise fees is fixed by state law and cannot be changed by the City.

Currently, franchise fees accrue to the General Fund. However, as stated in the Moody's Rating Agency Report, the City's ratio of General Fund operating revenues to expenses is a strong 1.08 times. The City ended fiscal 2018 with general fund available balance of \$80 million or a very strong 41.8% of general fund revenue. This followed a \$20.2 million surplus for the year, resulting from strong revenue growth and strong expenditure management.

Since franchise fees are generated by private utilities that utilize the public right-of-way, it would be appropriate to consider assigning these funds to a public right-of-way account to finance revenue bonds for undergrounding utilities.

Unlike the City of Berkeley, Santa Barbara imposed a 1% franchise fee on its electric provider, after Proposition 13 had passed and before Propositions' 26 and 218 were passed. In 1999, Santa Barbara increased that fee to 2%. In 2001, the City of San Diego increased its franchise fee and imposed a franchise surcharge to pay for undergrounding its residential streets. These costs were then passed on to the utility users by the utility providers.

Santa Barbara was sued by a local businessman who argued that the imposition of this additional fee was an illegal tax because, contrary to Proposition 218, it was imposed without voter approval. A similar lawsuit was filed against San Diego whose surcharge fee was specifically earmarked for undergrounding residential streets, had an end date of 2065 and a provision that what was not spent in any given year would be deposited in the city's General Fund.

The trial court accepted the City of Santa Barbara's argument that the franchise fee increase was not a tax as defined by Propositions 26 and 218. This decision was later overturned by an Appeals Court but a California Supreme Court decision in June 2017 ruled in favor of Santa Barbara. The decision was based on Proposition 13 law which preceded Propositions 26 and 218. The decision is briefly summarized as follows:

- Fees for use of government property are not taxes requiring voter approval as the fee payor gets something of value in return
- Such fees generate discretionary (General Fund) revenues to be used for any lawful purpose of the agency
- Standing to challenge a revenue measure is limited to those having a legal duty to pay it
- Fees must not exceed any reasonable value of the franchise but be reasonably relating to the value of the franchise

- The 2% franchise fee imposed by the municipality on Southern California Edison must recover cost of fee only from customers in the city imposing the fee and shown as a separate line item on the utility billing statement

The lawsuit filed against the City of San Diego alleging that the surcharge was an illegal tax imposed by the City without voter approval was dismissed by a Superior Court judge in August 2018, who agreed with the City that the surcharge is a fee paid to the City in exchange for the right to use the City’s electric infrastructure.

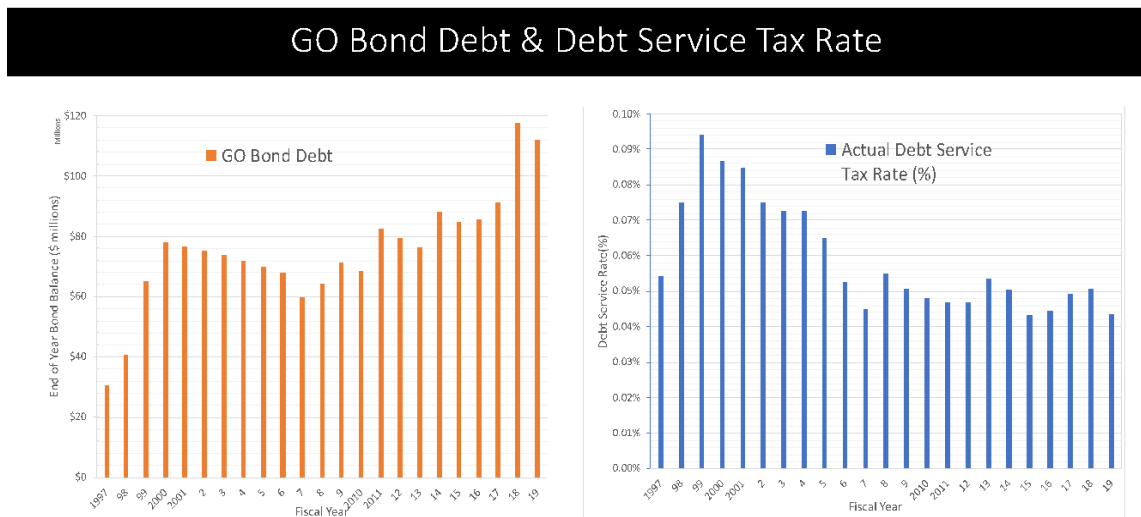
General Obligation Bond Funding

From 1997 to 2000, the City increased its General Obligation (GO) bond debt from \$30 million to \$80 million. However, due to a strong increase in total property assessed values (AVs), the debt-service rate only doubled from 0.05% to 0.09%. Moreover, during the next six years, the debt-service rate decreased back to ~0.05%, as AVs of Berkeley property continued to increase and bond principal was paid down.

After the Financial Crisis of 2008, interest rates fell dramatically. The City took advantage of the lower rates to refinance old debt and to issue new debt: Measures FF, M & T1. From 2007 to 2019, the City doubled its bond debt, while keeping its debt service rate constant due to lower interest rates and the strong appreciation in property AVs.

Because of Berkeley’s robust tax base and strong economy, which benefits from its central Bay Area location, it should be able to issue additional GO bonds during the coming decade, while keeping the debt-service rates within the historic range.

Figure 3 -- GO Bond Debt & Debt Service Tax Rate for FYs1997-2019



Recommended Financing Option for Berkeley

The project team has evaluated a wide range of funding options. We have considered the level of required funding, the number of years to carry out the undergrounding program, advantages and disadvantages of each option and other factors. The project team recommends the following financing option.

- Increase the Utility User Tax from 7.5% to 10.0% (increase of 2.5%). This will produce additional revenue of \$4.5 - 5.0 million per year.
- Allocate \$2.0 - 2.5 million per year from the General Fund for undergrounding.
- Purchase Rule 20A credits, as available. We estimate \$1.0 - 2.0 million per year.

This will produce revenue in the range of \$7.0 – 9.5 million per year for undergrounding. This means that the program can be completed in about 15 years. We also recommend that the City issue a GO bond in the range of \$35 million to get the program started quickly so as to minimize the impact of construction cost escalation on the total program cost.

DRAFT

Section 3

FIRE RISKS AND MITIGATION MEASURES

This section describes the potential for a major Wildland Urban Interface fire in Berkeley. It also presents the range of actions that can be taken by Berkeley and other agencies to reduce the risk of having a fire and to mitigate the impacts from a fire.

Fire History and Environmental Risk Factors

Fire Risk in California

2017 was the hottest year on record in California, following 5 years of drought that killed 129 million trees in California. Seven of the ten deadliest and most destructive fires in California's history took place during the last 10 years, each one worse than ever experienced before. The most destructive fires in California, in order were:

- **CAMP FIRE - (Butte County), November 2018**
Structures destroyed: 18,804
Acres burned: 153,336
Deaths: 86
- **TUBBS FIRE - (Napa County, Sonoma County), October 2017**
Structures destroyed: 5,636
Acres burned: 36,807
Deaths: 22
- **TUNNEL FIRE - Oakland Hills (Alameda County), October 1991**
Structures destroyed: 2,900
Acres burned: 1,600
Deaths: 25
- **CEDAR FIRE (San Diego County), October 2003**
Structures destroyed: 2,820
Acres burned: 273,246
Deaths: 15
- **VALLEY FIRE (Lake, Napa & Sonoma County), September 2015**
Structures destroyed: 1,955
Acres burned: 76,067
Deaths: 4
- **WITCH FIRE (San Diego County), October 2007**
Structures destroyed: 1,650
Acres burned: 197,990
Deaths: 2
- **WOOLSEY FIRE (Ventura County), Nov. 2018**
Structures destroyed: 1,643
Acres burned: 96,949

Deaths: 3

- **CARR FIRE (Shasta County, Trinity County), July 2018**
Structures destroyed: 1,614
Acres burned: 229,651
Deaths: 8
- **NUNS FIRE (Sonoma County), October 2017**
Structures destroyed: 1,355
Acres burned: 54,382
Deaths: 3
- **THOMAS FIRE (Ventura County, Santa Barbara), December 2017**
Structures destroyed: 1,063
Acres burned: 281,893
Deaths: 2

2017 was a devastating fire year highlighted by the Tubbs Fire, 2018 was highlighted by the Camp Fire, and 2019 is another severe fire year in northern and southern California. The Tubbs Fire in Santa Rosa made it clear that the flatlands are not immune from catastrophic fires. Fire raced down from the hills and flying embers started multiple smaller fires that burned down the Coffey Park neighborhood.

The following is an excerpt from the State of California's Fourth Climate Change Assessment, 2018, regarding projections on wildfires:

Impact: Climate change will make forests more susceptible to extreme wildfires. By 2100, if greenhouse gas emissions continue to rise, one study found that the frequency of extreme wildfires burning over approximately 25,000 acres would increase by nearly 50 percent, and that average area burned statewide would increase by 77 percent by the end of the century. In the areas that have the highest fire risk, wildfire insurance is estimated to see costs rise by 18 percent by 2055 and the fraction of property insured would decrease.

Fire Risk to Berkeley

The Berkeley and Oakland area has had a long history of wildland fires. The following is excerpted from the Hills Wildfire Working Group, Wildfire Problem Statement, as posted on the East Bay Regional Park District website:

Fire records for the East Bay Hills are sketchy, yet newspaper clips and old fire planning studies document an active and dangerous fire history. During the 75-year period between 1923 and 1998, eleven Diablo wind fires alone burned 9,840 acres, destroyed 3,542 homes, and took 26 lives, with over 2 billion dollars in financial loss. During the same period, three large west wind fires burned 1,230 acres of grass, brush, trees, and 4 homes.

News reports document the major fires that have threatened the East Bay Hills:

- **1923 Berkeley-** A Diablo wind fire that started East of the Main ridge at 12 noon on a Monday in September destroyed 584 homes North of the U.C. Campus. No conflagration was ever more out

of control. None ever demonstrated more vividly its power to defy all defensive resources once it gained headway. It was extinguished only by an act of providence.



Figure 4 – 1923 Fire in Berkeley
Photo by Cal Alumni Assoc.

- **1931 Leona-** 5 homes were lost and 1,800 acres burned by a Diablo wind fire that started at 7 a.m. on a Monday morning in November. "Splitting of the fire into two huge infernos left the hundreds of fire fighters almost helpless to combat the double conflagration."
- **1933 Redwood/Joaquin Miller-** 1 life and 5 homes were lost with 1,000 acres burned by a Diablo wind fire that started on the ridge at 7 a.m. on a Monday morning in November. "The fire traveled along the tops of the thick groves of trees for great distances, never reaching the ground until after the main blaze had passed."
- **1937 Broadway Terrace-** 4 homes were lost and 1,000 acres burned by a West wind fire that started at 3 p.m. on a hot Saturday afternoon in September. "Lack of water caused by exhaustion of reservoirs in the hills hampered fire fighters. The fire at times crept slowly through the brush and at other times leaped from treetop to treetop."
- **1946 Buckingham/Norfolk-** 1,000 acres were burned by a rekindled ridge top Diablo wind fire at 5:00 am on a Monday morning in September. "Sheer-walled canyons were quickly raging infernos. Flames raced so fast in the stiff wind they formed a fiery canopy over stands of pine and eucalyptus." In the ten years following this fire, at least 2 other large fires occurred in Claremont Canyon (Claremont above water tank to Stonewall) and Panoramic Hill (South of Panoramic to fire road) that did not involve structures because few existed at the time.
- **1960 Leona-** 2 homes were lost and 1200 acres were burned by a Diablo wind fire that started at 11 a.m. on Saturday morning in October. "The 84-degree temperature and low humidity aided the flames which roared with express train speed up steep slopes. Flames roared 50 ft. into the air."
- **1970 Buckingham/Norfolk-** 37 homes lost, 36 damaged, and 204 acres burned in a Diablo wind fire that started near the ridge at 10 a.m. on a Tuesday morning in September. The wind was swirling in every direction. The heat was so great that some houses were exploding before the fire actually reached them.
- **1980 Berkeley/Wildcat-** 5 ridge top homes were lost in a Diablo wind fire that started at 2 p.m. on a Saturday afternoon in December. The blaze, fed by thick underbrush and tree (eucalyptus) debris, was so hot and fast that homes literally exploded.

- **1991 Oakland/Berkeley-** The fire was rekindled at 10:45 a.m. below Buckingham/Norfolk roads, on a Sunday morning in October by a ridge top Diablo wind. The firestorm burned over 3 square miles, killed 25 people, gutted 2,900 homes and caused \$1.68 billion in damage. It was the most destructive wildfire in California history until 2017.



Figure 5 – 1991 Oakland Hills fire
Photo by SF Chronicle

- **1994 Castro Valley-** 3 homes were lost in a windy October afternoon near Lake Chabot Road when fireworks ignited a grass fire in a horse pasture below homes that provided no defensible space behind their residences.

If a fire occurs in Berkeley or the East Bay hills, how rapidly will it spread, and to where? While fires can occur under a wide variety of conditions, fires are most likely to rapidly spread and grow when high winds typically from the northeast direction coincide with hot dry conditions. This condition, winds descending the western slopes of the Coast range and known locally as a Mono or Diablo wind, is similar to the Santa Ana winds in southern California.

Given specified wind speed, fuel moisture and other data, fire spread can be computed using methods such as embodied in FlamMap (<https://www.firelab.org/project/flammap>). Such calculations are beyond the scope of this study. However, an estimate of how rapidly a fire might spread under Red Flag conditions can be gleaned by studying fire spread for events similar to those of concern. Such events include:

- The 1991 Oakland Hills fire began about 11 am during a Diablo wind – within 15 minutes it had run 2km (6,600 ft) downhill – six hours later it had run 4.5 km (15,000 ft). From Wildcat Canyon Road at Berkeley’s border with Tilden Park, to the Marin Avenue intersection at the Marin Circle, is 2.2 km. In other words, the East Bay Hills fire would have spread from Tilden Park to Marin Circle in about 20 minutes.
- The 2017 Tubbs fire spread at a rate of about 2 miles per hour, meaning it would have spread from Tilden Park to Marin Circle in about 37 minutes.

The North Berkeley Hills are a Wildland Urban Intermix area with about 26,000 residents and 7,453 assessor parcels. The likelihood of a major fire in this area similar to the Oakland Hills fire is about 0.002 per year, with Tilden Park itself having much higher likelihood (as much as 0.01 per year). Climate change may be increasing this likelihood, although how much is difficult to say. Diablo winds (“Red Flag” conditions) occur on average about 2.5 times each year, with about half those occurrences being in October to November when wildland fuels are very dry. Major WUI fires often burn the same areas that have burned in previous years. This is another reason why Berkeley is at risk.

CalFire has expanded its designation of high and extreme hazard fire zones as a result, with the subsequent loss of home insurance by many who live in these hilly and windy areas of Berkeley.

Cities that expect to rebuild after fires must develop a resilience strategy ahead of time to ensure that they don't lose citizens and businesses.

Reducing the Risk of a Fire

With the increasing risks of wildland fires from extreme climatic conditions, there are actions that the City of Berkeley, our residents, and local agencies can take to reduce the risk of a fire. The following summarizes the actions we can take through educating the public of the risks, reducing vegetation that fuels fires, and PG&E's plans to shut off power during high risk climatic conditions.

Public Education

The National Weather Service issues Red Flag Warnings & Fire Weather Watches to alert fire departments of the onset, or possible onset, of critical weather and dry conditions that could lead to rapid or dramatic increases in wildfire activity. A Red Flag Warning is issued for weather events which may result in extreme fire behavior that will occur within 24 hours. During these times extreme caution is urged by all residents, because a simple spark can cause a major wildfire. The type of weather patterns that can cause a warning include low relative humidity, strong winds, dry fuels, the possibility of dry lightning strikes, or any combination of the above.

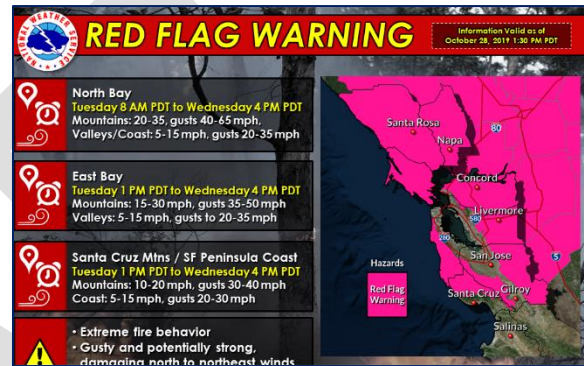


Figure 6 – AC Alert with Red Flag Warning

East Bay Regional Parks District

The East Bay Regional Parks District issues the following restrictions to the danger of fires on Red Flag days:

- No open fires, campfires, wood burning or charcoal barbecues are permitted.
- Campground visitors must clear all flammable material for ten feet from their camp stove.
- Smoking is prohibited in all East Bay Regional Parks.
- No use of gasoline powered equipment (generators).
- Increased monitoring, patrol and strict enforcement of these restrictions.

City of Berkeley

The public is notified of Red Flag conditions through AC Alert, City of Berkeley notifications, Mayor and Councilmember newsletters and local news broadcasts. Berkeley Councilmembers Susan Wengraf, Lori Droste, and Sophie Hahn hold an annual Fire Safety Town Hall every May. Representatives from the Berkeley Fire Department, the East Bay Regional Parks, the Orinda Fire Department, CalFire and UC Berkeley give presentations about what their jurisdictions are doing to mitigate and prevent wildfires. Topics covered included:

- Safe Passages pilot program (vehicle access and egress)
- Evacuation routes

- Vegetation management
- Notification and warning systems
- East Bay Regional Parks fire mitigations
- New technologies
- State legislation
- What neighboring jurisdictions are doing

Vegetation Management

Wildland fire behavior is controlled by three factors: fuels, weather and topography. Because it is impractical to control the weather and topography around us, the only practical way to modify fire is by managing its fuel source. Fire fuel refers to anything that has the ability to burn and spread fire, like trees, shrubs and dried grass.

State of California

In March 2019, Governor Newsom proclaimed a state of emergency throughout California ahead of the coming fire season. The Governor directed his administration to immediately expedite forest management projects that will protect 200 of California's most wildfire-vulnerable communities. This action follows the release of a report earlier by the California Department of Forestry and Fire Protection (CalFire), which identified 35 priority fuel-reduction projects that can be implemented immediately to help reduce the public safety risk for wildfire. The state of emergency provides time-saving waivers of administrative and regulatory requirements to protect public safety and allow for action to be taken in the next 12 months, which will begin to systematically address community vulnerability and wildfire fuel buildup through the rapid deployment of forest management resources. But will there be funding to maintain wildland fuelbreaks in the years that follow?

Regional Agencies

The East Bay Regional Park Fire Department uses several different methods to modify or reduce the amount or availability of wildland fuels for any fire that may occur. Ladder and surface fuels such as grass, brush, forest litter, and down logs and branches are modified or removed by hand crews, prescribed fire, mowing, weed-eating, masticating, or animal grazing. Dense tree stands are often thinned to remove some of the trees that contribute to fuel loading and to reduce the potential for wildfire to spread in the tree canopies. Visitors to the East Bay Regional Parks may encounter cattle, sheep or goats grazing on the grasslands. The District uses grazing animals as a practical and economic resource management tool. Grazing helps reduce fire hazards by controlling the amount and distribution of grasses and other potential fuel.

The Orinda-Moraga Fire District entered into an agreement with CalFire in May 2019 to begin planning and work on the North Orinda Shaded Fuel Break (NOSFB) project. The project area encompasses 1,515 acres along 14 miles of open space in the East Bay between the eastern portions of Tilden Regional Park and Pleasant Hill Road. This project is being carried out to reduce dangerous wildfire fuels in a deliberate manner designed to minimize environmental impacts to wildlife and

protected plants. This area receives seasonal “Diablo winds”, that were the dominant influence in several major nearby wildfires. These fuels are understory vegetation, dead/dying trees, and highly combustible brush. Reducing the quantities of these fuels will lower the intensity and speed of a wildfire. This fuel break will provide essential opportunities for firefighting success by providing areas of lower fire intensity and enhanced fire line production rates.



Figure 7 – North Orinda Fuel Break Map from SF Chronicle

City of Berkeley

Berkeley currently has an active vegetation management program both for its public space and for property owners in the Very High Hazard Fire Zone. Property owners can learn about appropriate vegetation management on its Wildfire Evacuation- City of Berkeley webpage. We know that effective vegetation management includes reducing fire laddering fuels, removing dead limbs, limbing up trees, regulating the height of hedges, and maintaining at least 5 feet of vegetation-free space next to homes. Currently, compliance is largely voluntary except for annual inspections of vacant properties in the Very High Hazard Fire Zone (VHHFZ) and all properties in the Extreme Hazard Fire Zone (EHFZ).

PG&E

PG&E also has a vegetation management program. The following is from the PG&E website:

In response to the growing risk of wildfire in our state, we are enhancing our vegetation and safety work. Our focus will be on addressing vegetation that poses a higher potential for wildfire risk in high fire-threat areas as designated by the California Public Utilities Commission (CPUC). Our Enhanced Vegetation Management program involves multiple steps to help further reduce the risk of trees, limbs and branches from coming into contact with power lines in high fire-threat areas.

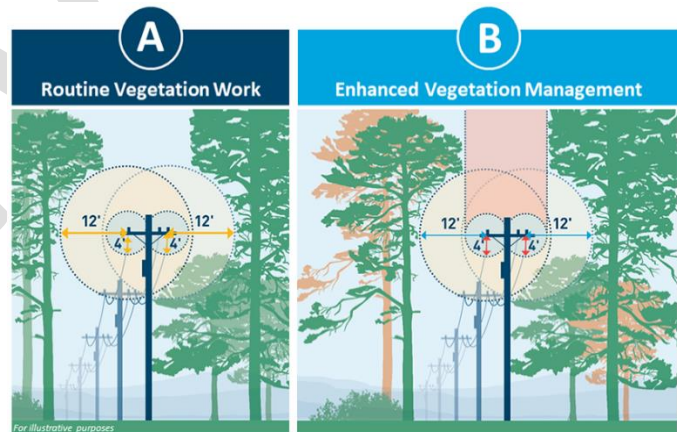


Figure 8 – PG&E Vegetation Management

The San Francisco Chronicle reported in October 2019 that PG&E was behind schedule in carrying out their vegetation management program. The following is an excerpt from their report:

As the most dangerous part of California's wildfire season continues, Pacific Gas and Electric Co. says it has finished only about 31% of the aggressive tree-trimming work it planned this year to prevent vegetation from falling on power lines and starting more deadly infernos.

PG&E told a federal judge Tuesday that as of Sept. 21, the company had completed 760 miles out of the 2,455 miles of power lines where it intends to take extra steps to cut back vegetation. The company said its ability to meet the tree-trimming target by the end of the year depends on whether it can "significantly increase the number of qualified personnel engaged" in the effort.

Electrical Power Service Curtailments

The cause for some of the recent wildland fires has been traced back to faulty overhead electrical wires or equipment. As an extreme measure to help reduce the risk of a fire, PG&E has proposed shutting electricity to high risk areas under Red Flag conditions. This program, called Public Safety Power Shutoff (PSPS), has been approved by the CPUC. It has now been done twice.

CPUC

The CPUC has reviewed the risks of wildfires and worked with the State's investor-owned utilities and determined the following:

Wildfires are more destructive and deadlier than in the past, and the threat of wildfires is more prevalent throughout the state and calendar year. The overall pattern shows the emerging effects of climate change in our daily lives.

Throughout the year, the CPUC works with CalFire and the Office of Emergency Services to reduce the risk of utility infrastructure starting wildfires, to strengthen utility preparedness for emergencies, and to improve utility services during and after emergencies. Interagency coordination, and cooperation from the utilities is essential when the threat of wildfires is high.

The State's investor-owned electric utilities, notably Pacific Gas and Electric Company (PG&E), Southern California Edison, and San Diego Gas & Electric (SDG&E), may shut off electric power, referred to as "de-energization" or Public Safety Power Shut-offs (PSPS), to protect public safety under California law, specifically California Public Utilities Code (PU Code) Sections 451 and 399.2(a).

On July 12, 2018, the CPUC adopted Resolution ESRB-8 to strengthen customer notification requirements before de-energization events and ordered utilities to engage local communities in developing de-energization programs. Utilities must submit a report within 10 days after each de-energization event, and after high-fire-threat events where the utility provided notifications to local government, agencies, and customers of possible de-energization though no de-energization occurred.

PG&E

PG&E has implemented the PSPS program. October 2019 saw the occurrence of dry conditions, Red Flag days and strong Diablo and Santa Ana winds in California. The following events have happened:

- **October 9 – 10, 2019** -- PG&E implemented its first major PSPS. About 800,000 homes and businesses in 34 counties lost power. This event tested the readiness of PG&E's public notification system and saw their website overwhelmed with contacts. Also, other facilities (such as the Caldecott Tunnel) scrambled to find back up power.

- **October 26 - 28, 2019** -- PG&E implemented a PSPS that affected about 1 million homes and businesses in 36 counties. The total number of people affected was more than 2.5 million. This was the largest intentional power shutoff in PG&E's history. This shutoff was in response to a very strong Diablo wind condition and very dry conditions.




Other shutdowns are proposed, depending on climatic conditions. PG&E's policies and procedures require inspection of their power lines and equipment before re-energizing. An outage can last several days. Figure 9 shows a summary of PG&E's PSPS policies and procedures.

SEP 2019

PACIFIC GAS AND ELECTRIC COMPANY PUBLIC SAFETY POWER SHUTOFF POLICIES AND PROCEDURES

The following is a description of Pacific Gas and Electric Company's (PG&E) policies and procedures related to proactively turning off power for safety – and later restoring power – when gusty winds and dry conditions, combined with a heightened fire risk, threaten a portion of the electric system. This is often called proactive de-energization and restoration in the industry; PG&E is calling this a **Public Safety Power Shutoff**.

Given the continued and growing threat of extreme weather and wildfires, and as an additional precautionary measure following the 2017 and 2018 wildfires, we are expanding and enhancing our Community Wildfire Safety Program to further reduce wildfire risks and help keep our customers and the communities we serve safe. Our ongoing and expanded wildfire safety actions include:

 REAL-TIME MONITORING AND INTELLIGENCE	 NEW AND ENHANCED SAFETY MEASURES	 SYSTEM HARDENING AND RESILIENCY
<ul style="list-style-type: none"> Coordinating prevention and response efforts by monitoring wildfire risks in real time from our Wildfire Safety Operations Center Expanding our network of PG&E weather stations to enhance weather forecasting and modeling Supporting the installation of new high-definition cameras in high fire-threat areas 	<ul style="list-style-type: none"> Further enhancing vegetation management efforts to increase focus on vegetation that poses a higher potential for wildfire risk Conducting accelerated safety inspections of electric infrastructure in high fire-threat areas Disabling automatic reclosing of circuit breakers and reclosers in high fire-risk areas during wildfire season Proactively turning off electric power for safety (Public Safety Power Shutoff) when gusty winds and dry conditions combine with a heightened fire risk 	<ul style="list-style-type: none"> Installing stronger and more resilient poles and covered power lines, along with targeted undergrounding Upgrading and replacing electric equipment and infrastructure to further reduce wildfire risks Working with communities to develop new resilience zones to provide electricity to central community resources during a Public Safety Power Shutoff event

Visit pge.com/wildfiresafety for more information

Public Safety Power Shutoff is one component of the Community Wildfire Safety Program. PG&E has created a set of procedures for:

- Monitoring **fire danger conditions**
- Determining what **combination of conditions** necessitates turning off lines for safety
- Identifying **potentially impacted areas**
- Notifying customers**, municipalities, agencies and critical facilities
- Restoring power as quickly as possible** once it is safe to do so

Following the wildfires in 2017 and 2018, some of the changes included in this document are contemplated as additional precautionary measures intended to further reduce future wildfire risk.

1

Figure 9 – PG&E's PSPS Policies and Procedures

Issues that have arisen from the shutdowns have included:

- The Diablo winds were very strong with speeds up to 100 miles per hour in the upper peaks. The high winds caused tree limbs to take down overhead power lines in the shutdown and non-shutdown areas.
- Public notification on the timing and extent of the shutdowns were critical. The shutdown on October 9th saw the PG&E website overwhelmed from the volume of contacts. AC Alert, City of Berkeley notifications, and local news broadcasts were effective.
- The shutdowns have been a major disruption to people and businesses. Especially affected were people with medical, mobility and other needs. UC Berkeley cancelled classes and many school districts closed. The economic impact has been estimated to be more than \$1 billion.
- Governor Newsom has criticized PG&E for decades of mis-management and for not maintaining their system.
- The local news reported that PG&E is beginning to think that undergrounding overhead utility wires may be needed to improve safety.

Reducing the Impacts from a Fire

If a wildland fire occurs in Berkeley or in neighboring areas, we need to be prepared to reduce the impacts. The following are some options for Berkeley to prepare itself, including evacuation planning, undergrounding overhead wires and creating defensible space around our homes.

Evacuation Planning

When a wildland fire occurs, it will be important to evacuate the area with or without notice from public safety officials. Berkeley has established evacuation procedures posted on the City's website (www.cityofberkeley.info/wildfireevacuation/). Some of the important features of the plan include:

- **Safe Passages** – The Berkeley Safe Passages pilot program is designed to blend traditional parking restrictions with innovative road markings and signage. Many roads in Fire Zones 2 and 3 are too narrow for parking and safe passage of vehicles when emergencies arise. Three locations will be selected so staff and the public can evaluate the efficacy and impact. The Fire Chief listed three actions that need to be done for the Safe Passages Program:
 - Identify, paint, and provide signage for new “Keep Clear” pinch points on streets
 - Expand “No Parking” areas throughout dangerously narrow streets
 - Identify funding to enable additional capacity for parking enforcement
- **Evacuation Routes** – Berkeley's evacuation routes are shown on Figure 10. The City has also shown the location of temporary evacuation sites, fire stations and schools.
- **CERT and Simulated Exercises** – In a catastrophic disaster, government resources (people and supplies) may not be available for several days following the event. The Community Emergency Response Team (CERT) Program provides education in disaster preparedness and provides training in basic emergency skills. By preparing neighborhoods and community groups with basic emergency skills, we can lessen the effects of a disaster and help sustain

ourselves until assistance can arrive. Berkeley held simulated evacuation exercises in three parts of the City in the summer of 2019.

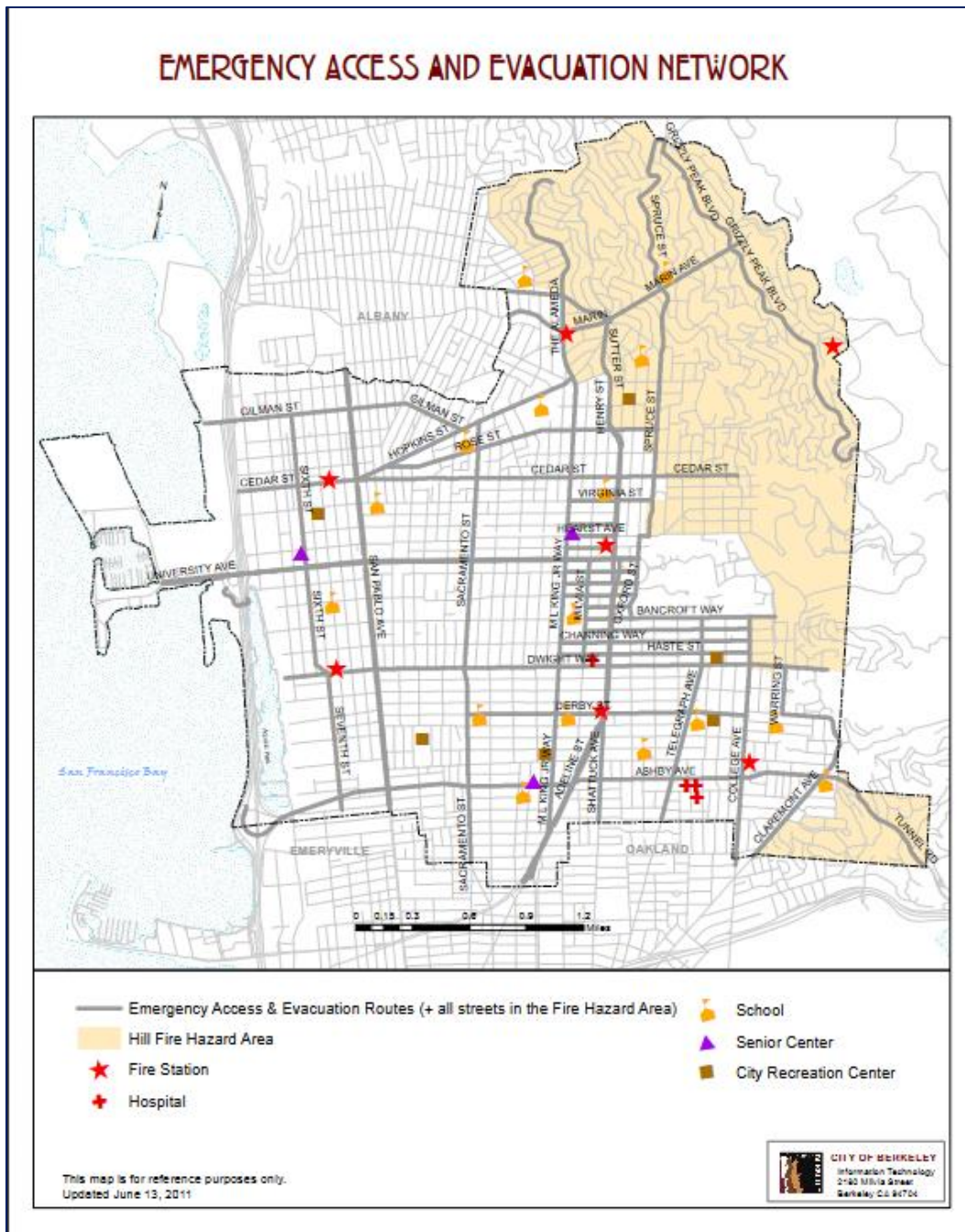


Figure 10 – Berkeley’s emergency access and evacuation network

Undergrounding Overhead Wires

Each wildland fire in California is investigated for the cause of the fire. In many cases, problems with PG&E's overhead wires or equipment have been contributing factors. Overhead wires not only can spark and cause a fire, but fallen poles and wires can impact ingress and egress on evacuation routes. This can be caused by high winds or fire damage. Figure 11 shows some of the downed wires and poles during the Tubbs Fire in 2017.

During the October 2019 power shutdown by PG&E, the intent was to reduce the potential for overhead energized wires to cause a fire. We found that the winds were so strong that they caused tree branches to take down overhead wires in shutdown and non-shutdown areas. In Berkeley's Northbrae area, a power line came down with a felled tree branch from the strong winds on October 27, 2019 (see Figure 12).



Figure 11 - Downed power poles and lines in 2017 Tubbs Fire
Photo by LA Times



Figure 12 – Downed power lines in Berkeley's Northbrae area
Photo by Berkeleyside

This shows that Red Flag conditions can affect all of Berkeley and not just the high hazard fire zones.

Property owner Responsibilities

A Fire Assessment District was created in 1992 (Berkeley City Ordinance 6129-N.S.) which funded fuel abatement and inspection programs in the Berkeley hills, including 3 full-time inspectors and a comprehensive fire fuel reduction program. The assessment district expired in 1997 following the passing of California Proposition 218 in 1996. With the primary funding source removed, dedicated Fire Prevention staffing was lost, although some programming continues to this day in the form of the Fire Fuel Chipper and Debris Bin programs. On-duty firefighters now annually inspect a small proportion of properties in Berkeley's hills.

Without a City inspection program, it is important that property owners create defensible space and harden their homes to reduce the impacts from a fire. Guidance information is available from the California Fire Safe Council (www.cafiresafecouncil.org).

- **Hardening Your Home** -- Fire hardened means your home is prepared for wildfire and an ember storm. It does not mean fireproof. Home hardening addresses the most vulnerable components of your house with building materials and installation techniques that increase resistance to heat, flames, and embers that accompany most wildfires.
- **Key Elements of a Defensible Space**
 - Keep your gutters and roofs clear of leaves and debris.
 - Maintain a 5-foot noncombustible zone around your home and deck.
 - Break up fuel by creating space between plants and between the ground and the branches of trees.
 - Mow grass to a height of less than 4 inches.
 - Keep mulch away from the house. Bark mulch helps plants retain water but ignites and becomes flying embers during a wind-driven fire.
 - During a wildfire, move anything burnable—such as patio furniture or gas BBQ tanks—30 feet away from structures.

DRAFT

Section 4

PROGRAM RECOMMENDATIONS

This section presents the project team’s recommended undergrounding program. After five years of research and study and the increasing climate change driven concerns, we believe there is a good public safety basis to underground the overhead utilities in our main evacuation streets.

Undergrounding is only part of the solution and needs to be implemented in conjunction with vegetation management, evacuation planning, homeowner responsibilities, advanced warning systems, actions by PG&E and other factors.

Phase 3 Completion

The original Phase 3 work scope has been partially completed and we recommend that the balance of the work be carried forward into the Phase 4 work. We recommend the following work activities.

Phase 3 Work Tasks	Recommendations
<p>Task 1 – Define the Phase 3 projects</p> <p>A. <u>Major and Collector Streets</u> – The original work scope was to identify the major east/west routes to be undergrounded that would facilitate the travel of first responders and evacuation of residents. This work was done with input from Berkeley’s fire department and transportation department Also, we conducted a review of other fire mitigation measures underway in the Berkeley area.</p> <p>B. <u>Coordinate with Microgrid Development</u> – The original work scope was to evaluate microgrids as a way to increase power reliability after a major disaster.</p> <p>C. <u>Review code standards</u> – The original work scope was to evaluate codes that would limit the loads carried by utility poles.</p>	<p>This work is largely completed. We recommend working with the Fire Department and their consultant to understand the latest planning on evacuation planning.</p> <p>Remove this task from the Phase 3 study and for City staff to evaluate the use of microgrids in a separate study when the City has determined a path forward.</p> <p>Remove this task from the Phase 3 study and for City staff to evaluate code standards in a separate study when timing is appropriate.</p>
<p>Task 2 -- Develop the financing plan</p> <p>A. <u>Refine cost estimate for undergrounding.</u> The original work scope was to refine the cost estimates previously prepared by Harris & Associates.</p> <p>B. <u>Participate in CPUC Rule 20 review</u> – The original work scope was to monitor activities with the CPUC regarding Rule 20 modifications.</p>	<p>This work is completed.</p> <p>Remove this task from the Phase 3 study. The PWD staff and recommended task force shall monitor activities in this area.</p>

<p>C. <u>Evaluate funding options</u>. The original work scope was to evaluate funding options for Phase 3 projects in Berkeley.</p>	<p>We recommend that Council and the City’s Finance Department review the funding options, consider other City priorities, and develop a preferred approach to fund undergrounding.</p>
<p>Task 3 – Conduct community input The original work scope was to conduct community outreach and workshops.</p>	<p>We recommend developing and implementing a robust public engagement program in 2020.</p>
<p>Task 4 – Coordinate with utilities The original work scope was to meet with PG&E and telecom companies regarding the phase 3 projects.</p>	<p>We recommend coordinating with PG&E, Comcast, ATT, and other service providers as the study moves forward.</p>
<p>Task 5 – Prepare an implementation plan The original work scope was to prepare an implementation plan.</p>	<p>We recommend preparing an implementation plan that includes the organizational resources to carry out a sustained program, the priority of the evacuation routes, duration of the program, reporting requirements, and other elements.</p>

We recommend that the remaining Phase 3 work be shifted to Phase 4. Phase 3 is now considered concluded.

Phase 4 Recommendations

Phase 4 is the implementation of a program to underground overhead utilities along key evacuation streets in Berkeley. We recommend the following program for Council consideration.

Recommend a 15-year Undergrounding Program

Considering the urgency to improve safety and the complex infrastructure conditions in Berkeley, we are recommending a 15-year program to underground the utilities along the key evacuation routes. To determine the priority of the streets to underground, we recommend preparing a set of criteria that will include the following:

- Coordination with Berkeley’s Fire Department on their evacuation planning and safe passages analysis
- The time needed for coordination with Caltrans, PG&E, and telecom companies
- Dividing each street into manageable project lengths (approximately 1 mile each)
- Consider undergrounding the more complex and costly streets early in the program
- Coordinate with street paving and other utility work in the public right of way
- Undergrounding to benefit all Council districts
- Other criteria

The project team prepared the following preliminary priority list to illustrate a 15-year program.

Year	Street	Section	Council districts
1	Dwight Way	Fernwald Rd. to Shattuck Ave.	3, 4, 7, 8
2	Dwight Way	Shattuck Ave. to San Pablo Ave.	2, 3, 4
3	Marin Avenue	Tulare Ave. to Grizzly Peak Blvd.	5, 6
4	Grizzly Peak Blvd.	Spruce St. to Marin Ave.	6
5	Grizzly Peak Blvd.	Marin Ave. to Arcade Ave.	6
6	Ashby Ave., Tunnel Road	Vicente Rd to Telegraph Ave.	7, 8
7	Ashby Ave.	Telegraph Ave. to San Pablo Ave.	2, 3, 7
8	Cedar Street	La Loma Ave. to MLK Way	4, 5, 6
9	Cedar Street	MLK Way to San Pablo Ave.	1, 5
10	Hopkins Street	Sutter St. to Gilman St.	5
11	Gilman Street	Gilman St. to San Pablo Ave.	1, 5
12	Spruce Street	Grizzly Peak Blvd. to Rose St.	5, 6
13	Rose Street, Oxford Street	Rose from Spruce to Oxford and Oxford from Rose to Cedar	5
14	Claremont Ave., Alcatraz Ave.	Ashby Ave. to Telegraph Ave.	8
15	Alcatraz Avenue	Telegraph Ave. to San Pablo Ave.	2, 3

This preliminary list has the following assumptions:

- The Fire Department has stated that Dwight Way is a high priority due to the risks in the Panoramic Hills area.
- Ashby Avenue will take significant time to coordinate the work with Caltrans.
- The work on Alcatraz Avenue is uncertain due to coordination with the City of Oakland.
- The street sections for specific projects are planned to be approximately 1 mile in length each.
- Undergrounding is planned only east of San Pablo Avenue. The cost estimates prepared by Bellecci and Associates includes undergrounding between San Pablo Avenue and I-80. We now consider those areas too far from the fire areas and those areas are subject to high groundwater levels. The total centerline length of streets to be undergrounded is now 15.1 miles and the total cost is about \$90 million (in 2019 dollars).

Use a Program Approach

Research by the project team and information from Bellecci and Associates shows that it is important to develop an overall program approach to undergrounding. This is to promote cost effectiveness and to achieve completion in a reasonable schedule. Upon authorization to proceed from Council, we recommend that a Program Plan be prepared that includes the following:

- Outcome objectives
- Project priorities, work scopes, budgets and schedules
- Program organization, staffing, consultants and resources needed
- Design criteria
- Coordination with utilities and telecom companies
- Change management process
- Reporting and oversight
- Other

Use “Dig Once” Approach

The undergrounding work shall be coordinated with street paving, water lines, sewer lines and other utility work in the public right of way. Also, consideration should be given to adding extra conduits to facilitate broadband expansion in Berkeley.

Community Engagement

Upon authorization from Council to proceed, a robust community engagement process shall be implemented. This shall include community workshops, methods for the public to submit questions, regular updates and other actions. Public input will be valuable in determining the priority and extent of undergrounding.

DRAFT

Section 5

NEXT STEPS

The project team recommends the following next steps for Council consideration.

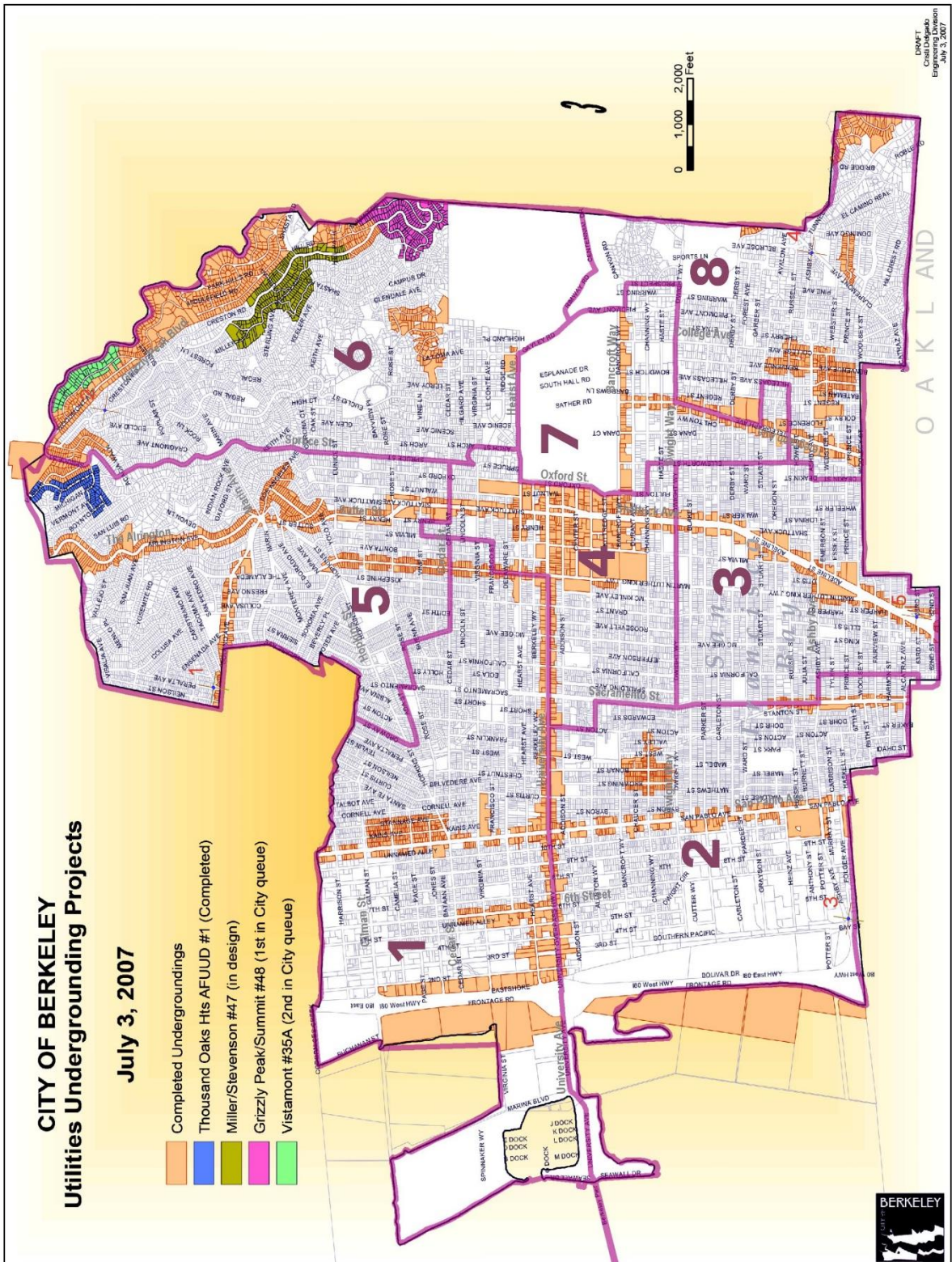
1. Review this report and provide direction on whether to proceed with Phase 4.
2. Work with the Council's Facilities, Infrastructure, Transportation, Environment, and Sustainability Policy Committee on further development of the undergrounding program.
3. Review the funding options and provide direction to staff on the preferred approach. Consider funding from the General Fund during the fiscal year budgeting process. Also, consider ballot measures in November 2020 for an increase in the Utility User Tax and to authorize a General Obligation bond.
4. Implement a public engagement process in 2020.
5. Staff to prepare a Program Plan for undergrounding.
6. Close out the original Council referral to the participating commissions. We recommend forming an Undergrounding Task Force to ensure public input in the future planning of utility undergrounding. The oversight for the task force should be with the Office of Councilmember Susan Wengraf.

Appendix A
Declaring Wildfire Prevention and Safety a Top Priority in the City of Berkeley

DRAFT

DRAFT

Appendix B Utilities Undergrounded in Berkeley



DRAFT

Appendix C
Report on Undergrounding Costs by Bellecci and Associates

DRAFT

Measure T1 Infrastructure Bond Program

UPDATE TO PARTICIPATING COMMISSIONS

NOVEMBER/DECEMBER 2019

Agenda

- ❖ Phase 1 Update
- ❖ Phase 2 Proposed Public Process

T1 Overview

- ❖ Phase 1
 - ❖ 2017 – 2021
 - ❖ June 2017 – Council approved list of 33 projects for Phase 1
 - ❖ November 2017 – \$35 million bonds sold
 - ❖ \$350,000 allocated for Public Art (1% of bond proceeds)
 - ❖ January 2018 - Council added to project list, authorizing up to \$2 million for the Mental Health Services Center Renovation
 - ❖ March 2019 – Council approved an additional \$5.3 million in funds for Phase 1
 - ❖ July 2019 – Council modification of T1 project list: Remove King School Park, adding 12 green infrastructure design projects


Visit our website!

<https://www.cityofberkeley.info/MeasureT1>

Project Updates

Community Meetings

Detailed Timelines



Measure T1 Bond Update

NORTH BERKELEY SENIOR CENTER

PROJECT DESCRIPTION
The North Berkeley Senior Center (NBSC) houses a dynamic community offering a variety of activities, classes, and services for seniors. The renovations and seismic upgrade project will modernize the interior and provide much needed upgrades to improve the safety and functionality of the building, including seismic for "care and shelter" requirements as well as ADA compliance.

PROJECT UPDATE
July 2019
Construction is in progress.

NEXT STEPS

- Complete construction (anticipated July 2020)
- Senior Center staff move-in
- Grand opening celebration

Page 1 of 5

For more information on Measure T1, visit www.cityofberkeley.info/MeasureT1



Parks Make Life Better!

We want your feedback on the Willard Clubhouse Planning and Conceptual Design Project!

YOUR T1 BOND DOLLARS AT WORK

Please join us for a community meeting to discuss the planning and conceptual design for a new Willard Clubhouse. Come meet the design team and provide feedback to help shape the future of the new clubhouse. For more information on this project, visit www.CityofBerkeley.info/MeasureT1

Location: Willard Clubhouse
2720 Hillgass Avenue, Berkeley, CA

Date: Wednesday, October 2, 2019

Time: 5:00pm—7:30pm

Session 1: 5:00pm—6:00pm Community meeting with a focus on the Willard Clubhouse Afterschool Program

Session 2: 6:15pm—7:30pm Community Meeting and Open House Workshops

FY 2020												FY 2021											
Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21			
Conceptual/ Planning and Design																							
Vesener's Building/Old City Hall/Civic Center Park Master Plan												8%											
Willard Clubhouse												Berkeley Municipal Pier/Ferry Study											
Francis Allmar Community Center												Aquatic Park Tide Tubes											
Citywide Restroom Assessment												Higgins Street (San Pablo-Alameda) Corridor Study											
												Transfer Station Masterplan											
												West Berkeley Service Center											
Construction																							
North Berkeley Senior Center Seismic Upgrade and Renovation																							
Berkeley Mental Health Services Center Renovation																							
Lise Clark Community Center Seismic Upgrade and Renovation																							
Rose Garden Tennis Courts, Pathways, and Pergola																							
Rose Garden: Repair of Erosion																							
San Pablo Park Play Area: Renovation																							
San Pablo Tennis Courts Renovation																							
												Aquatic Park Tide Tubes											
Greer Park Fields												Strawberry Creek Park Restroom											
George Florence Play												Marina Streets: University Avenue, Marina Blvd, and Spinnaker Way											
Adele Street (Dorby to Ashby)																							
Hearn Avenue (Mills to Henry)												Monterey Avenue (Alameda to Higgins)											
												Ward Street (San Pablo to Acton)											
												2nd Street (Lickens to Addison)											
												Bancroft Way (Mills to Shattuck)											
Corporation Yard Roof/Electrical Upgrade																							
Marina Corporation Yard Electrical Upgrade																							

and more!

North Berkeley Senior Center



- Construction is in progress
- Anticipated to be completed in June 2020

Mental Health Services Center



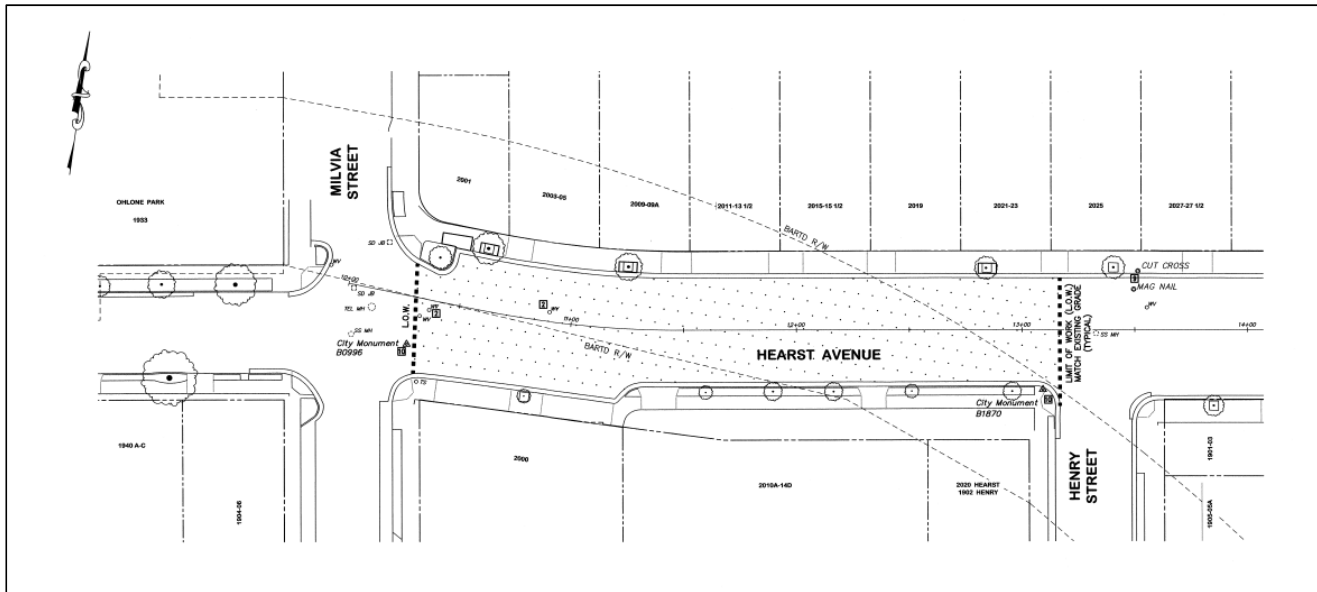
- Construction is in progress
- Anticipated to be completed in June 2020.

Live Oak Community Center



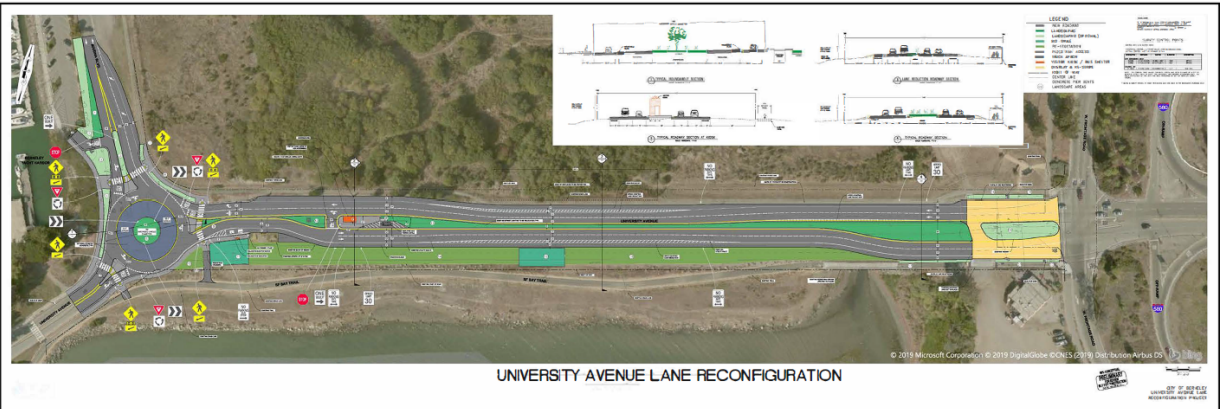
- Groundbreaking held on November 4, 2019.
- Construction has started.
- Anticipated to be completed in November 2020.

Adeline Street and Hearst Avenue

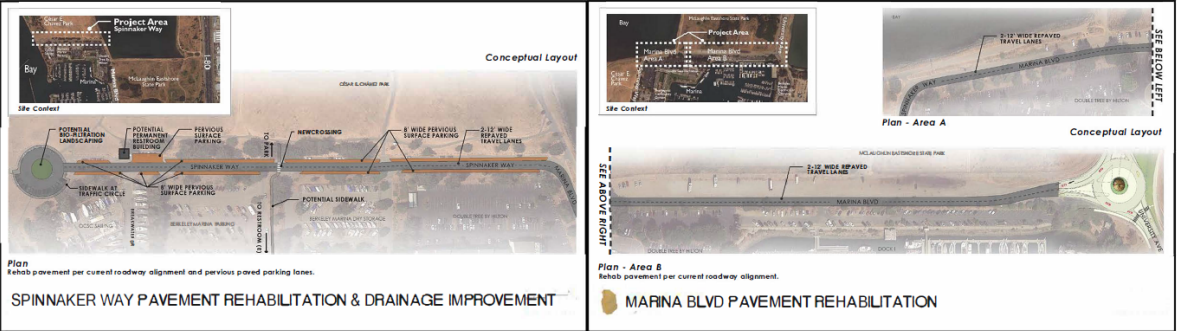


- Construction is in progress
- Anticipated to be completed by Spring 2020.

University Ave., Spinnaker Way, Marina Blvd.



- Construction is anticipated to begin in the summer of 2020



Tom Bates Regional Sports Complex Completed



Citywide Irrigation System Completed



Before



After

Phase 2 Public Process Timeline

Date	Action/Event
July – September 2019	Staff held meetings with P&W/PW T1 Joint Subcommittee to develop timeline for Phase 2 public process
October 2019	Staff presentation on public process to P&W/PW Commissions
November – December 2019	Update to participating commissions on Phase 1 progress and Phase 2 information
January 2020	Staff presentation to primary commissions
February – March 2020	Neighborhood meetings
May – September 2020	Five large area meetings
October 2020	Online survey on Berkeley Considers
November –December 2020	Update to Participating Commissions and input on Phase 2 projects
November 2020 – February 2021	Staff and commissions’ development of Phase 2 project list
June 2021	Council approval and bond sale for Phase 2



July – September 2019
Meetings with T1 Joint Subcommittee to develop
Phase 2 Public Process Timeline

Goal:

*Develop an agreed-upon process by staff and subcommittee for
Phase 2 Public Process.*

- ❖ Review proposed Measure T1 Phase 2 Public Process timeline with the T1 Joint Subcommittee
- ❖ Obtain feedback regarding Phase 2 Public Process

October 2019
Staff Presentations of Phase 2 Public Process to Primary Commissions

Goal:

Review Phase 2 public process from involved commissions.

- ❖ Review proposed Measure T1 Phase 2 Public Process timeline with the Parks & Waterfront and Public Works Commission
- ❖ Obtain feedback regarding Phase 2 Public Process

November – December 2019 Update to Participating Commissions

Goal:

Review Phase 2 public process from involved commissions.

- ❖ Review proposed Measure T1 Phase 2 Public Process timeline with the participating commissions
- ❖ Provide update on progress on Measure T1 Phase 1

January 2020 Staff presentations to Lead Commissions

Goal:

Review T1 quadrant maps and list of possible/feasible projects.

- ❖ Staff to present lists of projects based on need and separated by category (i.e streets, sidewalks, play structures etc.)
- ❖ Review maps of constructed and funded projects since 2014

February – October 2020 Online Feedback

Goal:

Provide an opportunity for community members who cannot attend neighborhood or geographic based meetings to share their feedback.

- ❖ **February – September:** Comments to T1@CityofBerkeley.info
- ❖ **October:** Survey on Berkeley Considers

February – March 2020 Neighborhood Meetings

Goal:

Obtain detailed feedback from groups in micro areas on potential projects.

- ❖ 15 – 20 group meetings as referred to by Councilmembers
- ❖ Other groups:
 - ❖ Business District Associations
 - ❖ Associated Sports Field Users

May – September 2020
5 large geographic-based meetings

Goal:

To reach all sectors of the City and obtain feedback on citywide or a specified area projects.

- ❖ Districts 5 & 6
- ❖ Districts 1 & 4 (excludes Waterfront)
- ❖ Districts 7 & 8
- ❖ Districts 2 & 3 (excludes Waterfront)
- ❖ Waterfront (includes Aquatic Park/ Tom Bates Field)

MEASURE T1 PHASE 2 COMMUNITY PROCESS

MEETING LOCATION AND DATE:

★ BERKELEY YACHT CLUB
1 SEAWALL DRIVE.
(SEPTEMBER 12, 2020)

★ JAMES KENNY
COMMUNITY CENTER
1720 8TH ST.
(SEPTEMBER 19, 2020)

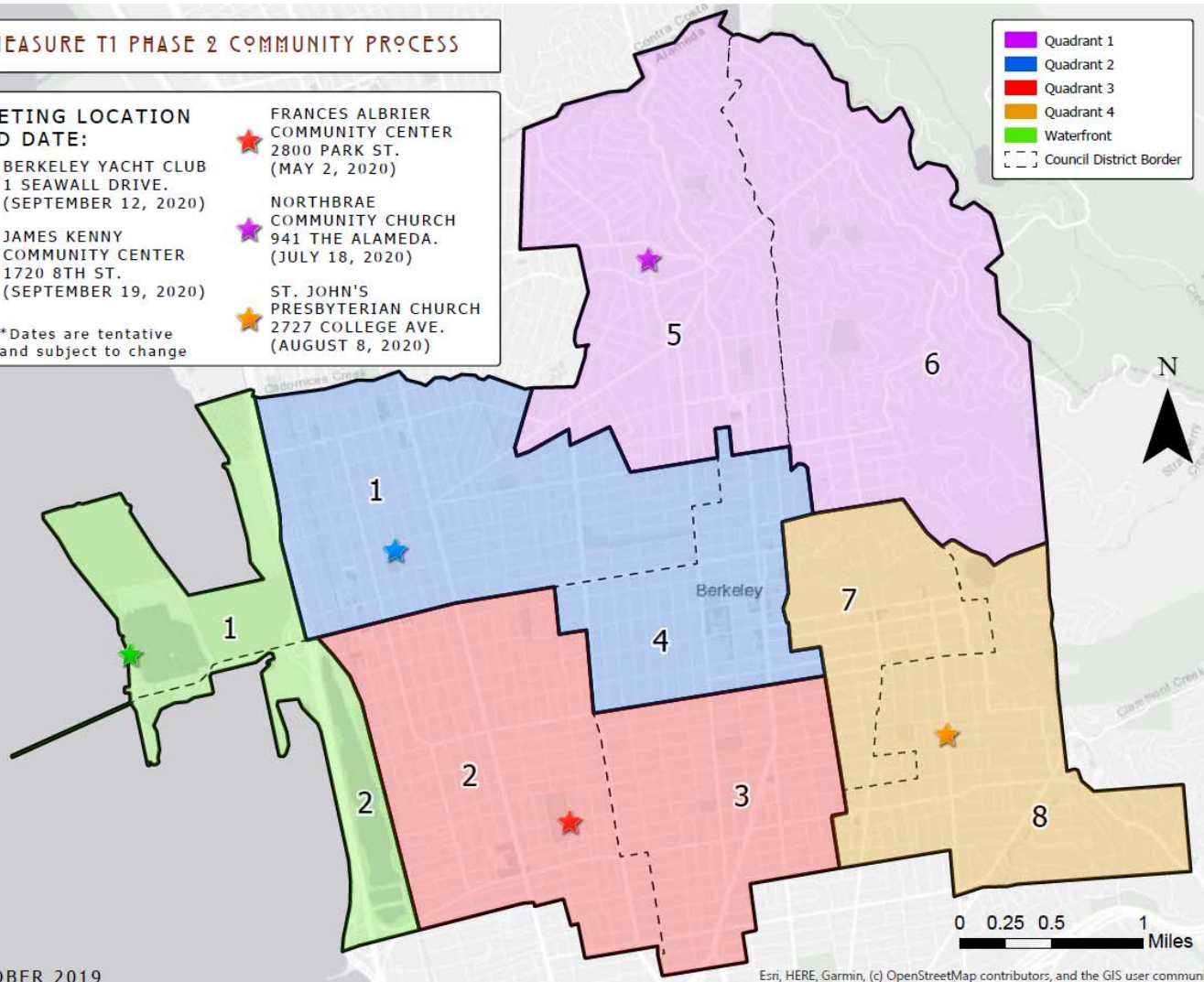
*Dates are tentative
and subject to change

★ FRANCES ALBRIER
COMMUNITY CENTER
2800 PARK ST.
(MAY 2, 2020)

★ NORTHBRAE
COMMUNITY CHURCH
941 THE ALAMEDA.
(JULY 18, 2020)

★ ST. JOHN'S
PRESBYTERIAN CHURCH
2727 COLLEGE AVE.
(AUGUST 8, 2020)

- Quadrant 1
- Quadrant 2
- Quadrant 3
- Quadrant 4
- Waterfront
- Council District Border



OCTOBER 2019

Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community

November 2020 – December 2020 Update to Participating Commissions

Goal:

*Provide an update on Phase 1 progress and
Phase 2 public process.*

- ❖ Provide an update on progress on Measure T1 Phase 1
- ❖ Provide an update on Phase 2 public process
- ❖ Obtain input on Phase 2 projects

November 2020 – February 2021
Staff and Commissions' development of Phase 2 Project List

Goal:

Develop Phase 2 list of projects.

- ❖ Staff and Commissions to review comments received from public process
- ❖ Staff and Commissions develop a list of Phase 2 projects based on public comments

June 2021
Council approval of Phase 2 Projects and Bond Sales

Goal:

Council approval of Phase 2 projects list.

- ❖ Staff and representatives from the Lead Commissions to present proposed list of projects for Phase 2 for Council's approval
- ❖ Bond sales to follow later in the year

Thank you.

Questions?

Attachment 1- T1 Project Schedule, Funding and Project Management

Update on Measure T1

November 2019

DEPT	PROJECT NAME	PROJECT TYPE	PROJECT DESCRIPTION	T1 FUNDING	OTHER FUNDING	OTHER FUNDING AMOUNT	APPROXIMATE TOTAL FUNDING	PM	STATUS UPDATE
FACILITIES/BUILDINGS				\$17,882,319		\$7,671,143	\$25,553,462		
PW/ PRW	Citywide Restrooms Citywide Needs Assessment	Conceptual	Perform needs and feasibility assessment of location for citywide restrooms; will include consideration of Ohlone Park restroom.	\$148,215			\$148,215	RM	Consultant compiling database of existing restroom inventory, 311 data, PD calls, and infrastructure. Four community meetings scheduled (two in Oct., two in Nov.)
PW	Old City Hall/ Veteran's Building/ Civic Center Park	Conceptual	Structural analysis and visioning of possible conceptual design alternatives, in concert with Civic Center Park, to help determine a direction for future capital improvements to restore and secure these facilities to maximize their community benefit.	\$376,430			\$376,430	EH	Updated seismic reports for Old City Hall and Veteran's building were completed in April 2019. Council awarded architectural contract to Gehl Studios on July 16, 2019. Public process to start in winter 2019.
PW	Transfer Station - Master Plan	Planning	Developing a Master Plan for modernization of the City's Waste Transfer Station, including the recycling center, with the goal of creating a new facility that promotes recycling and promotes elimination of solid waste.		Zero Waste Fund	\$500,000	\$500,000	GA	Alternate funding source secured for project.
PW	West Berkeley Service Center Planning and Conceptual Design	Conceptual	Structural analysis and visioning of possible conceptual design alternatives, to help determine a direction for future capital improvements.					-	Scope was revised and removed from T1 funded projects. Alternate funding source from Measure O.
PRW	Frances Albrier Community Center Planning and Design	Planning & Design	Evaluation of site conditions, facility and structural assessments, and recreation programming to determine what improvements to move forward with to upgrade the center as a Care and Shelter facility and for improved recreation programming and opportunities.	\$741,075			\$741,075	WK	A Community Work Session for the Frances Albrier Community Center Redesign Project was held on October 23rd to share goals, desired activities, and four plan options currently open for public comments and feedback.
PRW	Tom Bates (Gilman) Fields North Field House and Restroom	Planning & Design	Evaluation of needs for restroom and storage, analysis of utility and supporting infrastructure needed, and development of detailed design and construction documents.	\$247,025			\$247,025	NL	Staff provided information regarding this project and received input from the community at a Field Users Meeting in April 2018. Conceptual design has been completed. Wrapping up schematic. Next step: cost estimate for Phase 2. Remaining balance to ACTC for sewer.
PRW	Willard Clubhouse Renovation Planning and Design	Conceptual	Planning and design to renovate or expand the Willard Clubhouse.	\$247,025			\$247,025	WK	A Community Work Session was held on October 2nd to share goals and desired activities from public comments and solicit feedback on proposed project.
PRW	Live Oak Community Center Seismic Upgrade and Renovations	Planning, Design & Construction	Seismic retrofit, deferred maintenance upgrades, and programming improvements to upgrade the center as a Care and Shelter facility and enable improved recreation programming.	\$6,041,690			\$6,041,690	TL	Groundbreaking Ceremony November 4, 2019. Community Center is anticipated to be under construction for approximately 1 year.
PW	North Berkeley Senior Center Seismic Upgrades and Renovations	Planning, Design & Construction	Seismic retrofit, deferred maintenance upgrades, and programming improvements to upgrade the center as a Care and Shelter facility and enable improved senior programming, generator hook up.	\$8,219,080	FEMA	\$1,875,000	\$10,094,080	EK	Construction started in May 2019. Interior demolishing and asbestos removal almost complete. Expect substantial completion by end of June 2020.
PRW	Strawberry Creek Park Restroom Replacement	Planning, Design & Construction	Replace restroom at Strawberry Creek Park.	\$385,579	Parks Tax & PRW Capital Improvement Fund	\$500,000	\$885,579	WK	Another community meeting held 9/26/2019. Consultant working on final design. Project is bundled with FY 19 Strawberry Creek Phase 2 to leverage additional funding from Parks Tax and Capital Improvement fund. Construction anticipated to begin in Spring 2020.
HHCS/ PW	Mental Health Services Center	Planning, Design & Construction	Renovate interior for safety and energy efficiency. A Net Zero Energy project with anticipated payback savings of less than ten years.	\$1,476,200	Capital Improvement Fund, Mental Health Services Act, Mental Health State Aid Realignment Fund, Community Development Block Grant	\$4,796,143	\$6,272,343	SG	Construction started in April 2019. Expected completion by June 2020. On track.
CITY WIDE SAFETY IMPROVEMENTS				\$966,445			\$966,445		
PW	Berkeley Health Clinic Electrical Assessment	Planning and Design	Electrical upgrades to main switchboard, two panel boards, conduit, wiring, and wiring devices.	\$7,000			\$7,000	EK	Project has been completed.
PW	Corporation Yard Roof and Electrical Upgrades	Planning, Design & Construction	Roof and electrical improvements	\$568,990			\$568,990	IL	In permit review.
PW	Marina Corporation Yard Electrical Upgrades	Planning, Design & Construction	Electrical upgrades to main switchboard, two panel boards, and wiring devices.	\$370,693			\$370,693	IL	In permit review.
PW	Public Safety Building Mechanical and HVAC Efficiency Assessment	Planning & Design	Mechanical/HVAC upgrades	\$19,762			\$19,762	EK	Completed feasibility study to assess cost and effort to install a HVAC back up system. T1 scope is complete.
PARKS IMPROVEMENT PROJECTS				\$7,299,853		\$3,003,271	\$10,303,155		
PRW	Aquatic Park - Tide Tubes	Planning & Design	Final design, acquiring regulatory permits and environmental documents, and preparation of construction documents for repair of the tide tubes connecting the main lagoon with the Bay.	\$385,579			\$385,579	NL	Work underway to include cleaning, inspection, environmental permits/clearance, and construction docs.
PRW	Berkeley Municipal Pier	Planning & Design	Final design, acquiring regulatory permits and environmental documents, and preparation of construction documents for structural repairs to restore the pier for recreational use.	\$889,290	Water Emergency Transportation Authority	\$250,000	\$1,139,290	NL	Draft pier study and conceptual design alternatives presented for discussion at P&W Commission/Public Meeting in January 2018. A Memorandum of Understanding (MOU) agreement was approved by both the City Council and the Water Emergency Transportation Authority (WETA) to focus on the planning phase for the viability of a potential WETA ferry service and public recreation pier at the Berkeley Marina.
PW	Berkeley Rose Garden Repair of Erosion	Planning, Design & Construction	Improvements to Codornices Creek to repair erosion damage at the downstream end of Rose Garden site.	\$881,323			\$881,323	SM	Staff processing environmental permits. Construction is anticipated to start summer of 2020, pending receipts of environmental permits.

Attachment 1- T1 Project Schedule, Funding and Project Management

Update on Measure T1

November 2019

DEPT	PROJECT NAME	PROJECT TYPE	PROJECT DESCRIPTION	T1 FUNDING	OTHER FUNDING	OTHER FUNDING AMOUNT	APPROXIMATE TOTAL FUNDING	PM	STATUS UPDATE
PRW	Berkeley Rose Garden Pathways, Tennis Courts	Planning, Design & Construction	Renovation of existing site pathways and construction of new pathways to provide an accessible path of travel to the center of the trellis. Reconstruction of portions or all of the tennis courts for safety.	\$1,321,984	Parks Tax & PRW Capital Improvement Fund	\$1,092,499	\$2,414,483	EC	Work bundled with Phase 2 of Trellis reconstruction to leverage additional funding from Parks Tax and Capital Improvement Fund. Coordination with drainage project and LPC is ongoing. Submitted for permit. Construction anticipated to begin in early 2020.
PRW	Citywide Irrigation System	Planning, Design & Construction	Current irrigation system requires individual programming and daily monitoring by City staff. This project includes the replacement of Irrigation Control Software and Controllers and the establishment of wireless software that controls all irrigation clocks, which will conserve water and control costs.	\$591,075			\$591,075	BP	Project has been completed.
PRW	Grove Park Field and Restroom Renovation of ballfield backstop, dugout, lights, and irrigation	Planning, Design & Construction	Improvements to the ballfield, dugouts, site lighting and accessibility for safety and energy savings, including improvements to site drainage; partial renovation of the restroom building.	\$1,101,654			\$1,101,654	TL	Next public meeting on 11/7/2019 to present final design and next steps.
PRW	George Florence Mini-Park Play Equipment Upgrade	Planning, Design & Construction	Renovate age 2-5 play structures and age 5-12 play structures and complete ADA improvements.	\$660,992	Parks Tax	\$125,000	\$785,992	TL	Construction has started and anticipated to be completed in February 2020. . Public meetings were held on 10/20/18 and 11/27/18.
PRW	San Pablo Park Play Equipment Upgrade and Tennis Court Renovations	Planning, Design & Construction	Renovate ages 2-5 and 5-12 play structures and complete ADA improvements. Renovate existing lighted tennis courts.	\$1,156,736	Capital Improvement Fund and Parks Tax	\$400,000	\$1,556,736	WK	Play Equipment Renovation project bundled with San Pablo Park Tennis Renovation and Totlot Renovation to leverage funding and design effort. Coordination ongoing with Civic Arts for inclusion of functional art to the project site. Construction anticipated in 2020.
PRW	Tom Bates (Gilman) Fields Artificial/Synthetic Turf Replacement	Planning, Design & Construction	Replace artificial turf on two existing fields to include organic infill, shock pad and upgraded turf.	\$311,220	JPA, Gilman Reserve Account, Parks Tax, User Fees	\$1,135,772	\$1,447,023	NL	Project has been completed.
GREEN INFRASTRUCTURE PROJECTS				\$821,984			\$821,984		
PW	Page Street, Channing Way, Dwight Way, Grayson Street, Piedmont Avenue Median and Traffic Circle	Planning, Design & Construction	Installation of green infrastructure such as bioswales.	\$821,984			\$821,984	SM	Council approved removal of King School Park project and addition of 12 replacement green infrastructure projects. Design and geotechnical investigation underway.
PW	Jones Street, Heinz Avenue, Tenth Street, Ninth Street, Sacramento Street center median	Planning	Installation of green infrastructure such as bioswales.						
COMPLETE STREETS PROJECTS				\$9,867,625		\$1,160,667	\$10,528,291		
PW	Adeline Street & Hearst Avenue	Planning, Design & Construction	Complete streets projects to include needed upgrades to curbs, sidewalks, storm drains, bicycle/ped improvements, and pavement, as appropriate.	\$3,198,365			\$3,198,365	SM	Construction is underway.
PW	Monterey Avenue, Ward Street	Planning, Design & Construction	Complete streets projects to include needed upgrades to curbs, sidewalks, bicycle/ped improvements, and pavement, as appropriate. Ward Street to include green infrastructure.	\$2,538,060	State Transportation Tax	\$960,667	\$3,274,139	SM	Survey and design is underway.
PW	2nd Street	Planning, Design & Construction	Improvements to pavement condition , sidewalks, storm drain, and curb ramp upgrades from Addison Street to Delaware Street.	\$275,413				SM	Survey and design is underway.
PW	Hopkins Street	Planning	Improvements to pavement condition, bicycle lanes, sidewalks, curb ramp upgrades, and other improvements as identified in the corridor & placemaking study.		Council Referral	\$200,000	\$200,000	SM	Unable to complete construction in Phase 1. Hopkins Corridor & Placemaking Study needs to be completed before design. This study is anticipated to start in 2020.
PW	Bancroft Way	Planning	Improvements to pavement condition and bicycle and bus lanes from Milvia Street to Fulton Street.					SM	Unable to complete construction in Phase 1. Utility coordination is underway and expected to be completed in 2020.
PRW	University Avenue (West Frontage Rd to Marina Blvd), Marina Blvd, and Spinnaker Way Renovation	Planning, Design & Construction	Final design, obtaining permits, and pavement reconstruction. Design will be based on the preferred alternative identified in the Feasibility Study on Mitigation of Undulating Pavement at University Avenue.	\$3,855,787			\$3,855,787	NL	Conceptual design and public process for all three streets have been completed. Final design is in progress. Construction is anticipated to begin May 2020.
TOTAL				\$36,838,226		\$11,835,081	\$48,173,337		

BP - Bruce Pratt x6632 BPratt@cityofberkeley.info	GA - Greg Apa x6359 GApa@cityofberkeley.info	RM - Roger Miller x6704 RMiller@cityofberkeley.info	WK - Wendy Wellbrock x5214 WWellbrock@cityofberkeley.info
EH - Eleanor Hollander x7536 EHollander@cityofberkeley.info	IL - Ingrid Lin x6633 ILin@cityofberkeley.info	SM - Srinivas Muktevi x6420 SMuktevi@cityofberkeley.info	
EK - Elmar Kapfer x6435 EKapfer@cityofberkeley.info	NL - Nelson Lam x6395 NeLam@cityofberkeley.info	SG - Steve Grolnic x5249 SGrolnic@cityofberkeley.info	
EC - Evelyn Chan x6430 EChan@cityofberkeley.info	NC - Nick Cartagena x6338 NCartagena@cityofberkeley.info	TL - Taylor Lancelot x6421 MTLancelot@cityofberkeley.info	

Actual Cost

Key: Planning and Design Projects
Construction Projects
Alternative Funding Source

FY 2020										FY 2021										
Conceptual/ Planning and Design																				
Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	
Veteran's Building/Old City Hall/Civic Center Park Master Plan												85%								
Willard Clubhouse																				
Berkeley Municipal Pier/Ferry Study																				
Frances Albrier Community Center																				
Aquatic Park Tide Tubes																				
Citywide Restroom Assessment																				
Hopkins Street (San Pablo- Alameda) Corridor Study																				
Transfer Station Masterplan																				
West Berkeley Service Center																				
Green Infrastructure* (Jones Street, Heinz Ave., Tenth St., Ninth St., Sacramento St. center median)																				

Construction																				
Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	
North Berkeley Senior Center Seismic Upgrade and Renovation																				
Berkeley Mental Health Services Center Renovation																				
Live Oak Community Center Seismic Upgrade and Renovation																				
Rose Garden Tennis Courts, Pathways, and Pergola																				
Rose Garden: Repair of Erosion																				
San Pablo Park Play Areas Renovation																				
San Pablo Tennis Courts Renovation																				
Grove Park Fields																				
Strawberry Creek Park Restroom																				
George Florence Play																				
Marina Streets: University Avenue, Marina Blvd, and Spinnaker Way																				
Adeline Street (Derby to Ashby)																				
Hearst Avenue (Milvia to Henry)																				
Monterey Avenue (Alameda to Hopkins)																				
Ward Street (San Pablo to Acton)																				
2nd Street (Delaware to Addison)																				
Bancroft Way (Milvia to Shattuck)																				
Corporation Yard Roof/Electrical Upgrade																				
Marina Corporation Yard Electrical Upgrade																				
Green Infrastructure*																				

Completed

- Tom Bates Field Synthetic Turf Replacement
- Tom Bates Field House Conceptual Design
- Citywide Irrigation System
- Ann Chandler Health Clinic Electrical Design
- Public Safety Building AC Assessment

* Project authorized by Council on 7/23/19. Green infrastructure at Page Street, Channing Way, Dwight Way, Graywon Street, Piedmon Ave median and traffic circle will be constructed in Phase 1.

MEMO FOR DISCUSSION ON SPECIAL TAX ASSESSMENT FOR WILDFIRE PREVENTION – REVISED
FOR OCTOBER COMMISSION MEETING- G COUZIN

To: Disaster and Fire Safety Commission
From: Gradiva Couzin
Date: 10/15/2019
RE: Special tax assessment for wildfire prevention - Possible Future action

Greetings Fellow Commissioners,

I would like to share some information that may be useful in our discussion of a recommendation to City Council for reinstating a special assessment zone in the hills for Wildfire prevention.

Here's the background as I understand it:

- There was previously a special assessment (tax) in the Berkeley Hills for five years 1992-1997
- The tax was \$50 per household for 8300 households, which comes to \$415,000/yearly
- The district boundaries covered the hill area, and were the same as the zoning ordinance hill overlay district, under the assumption that the special zoning requirements for the hill area would cover the properties that should have the special requirements for vegetation management due to fire risk in the hills.
- This assessment funded fire prevention staff members: 3 civilian inspectors, one civilian supervisor, and a small portion of the salaries for the Fire Marshal, Deputy Chief and Fire Chief.
- The staff did extensive inspections and education efforts in the area, both scheduled and in response to complaints. They were able to work with people and get compliance, but were not in a capacity to fine or enforce compliance. In the event of a difficult situation, the Fire Marshal, as the person with authority, was called in.
- Money from the assessment district was also used to purchase three vans for the inspectors, to set up and pay for the chipper program, as well as some demonstration garden events to educate home owners and their landscape contractors.
- State law changed in 1997 and the special assessment district was found to not be in compliance. The city council at the time chose to allow it to lapse.

Here are some back-of-the-envelope calculations that might help to get us started in this conversation:

- Cost for 4 additional fire prevention staff: very rough estimate \$600k /year
- Approx 8300 households in the Hills Fire Zones 2 & 3
- Estimated per household assessment = \$72/year

I look forward to your thoughts and insight. Thank you,

Gradiva

MEMO FOR DISCUSSION ON PUBLIC SAFETY POWER SHUTOFFS - JANUARY MEETING - G COUZIN

To: Disaster and Fire Safety Commission
From: Gradiva Couzin
Date: 1/14/2020
RE: PG&E Power Safety Power Shutoffs - Notes and possible actions

Greetings Fellow Commissioners,

I'm sorry I'm not able to come to our January meeting. At our last meeting we did some brainstorming about how the city can respond to PSPSs to support vulnerable folks in our city.

I emailed with George Porter on the Commission on Aging about this topic over the past week. He described that the CoA has been discussing this same topic, mostly focusing on communication from the city and on preparedness for senior residents in Berkeley. He expressed interest in Senior Centers being a part of the response but also concern that they should play a limited role unless a situation becomes critical. His primary concern is that they need to keep their daily operations running smoothly.

In my opinion, deploying Senior Centers as shelters should be seriously considered as part of PSPS response, especially if there is a simultaneous heat emergency or poor air quality.

I have not been able to learn what (if any) response took place at Senior Centers in the past PSPSs. I do believe that Berkeley libraries were offering charging stations during the PSPSs, and I believe there was a daytime shelter and charging station deployed on UC campus (?) that was barely used. I would like to learn more about what was done and what plans are in the works for the future.

George plans to agendize this topic on the February Commission on Aging agenda for discussion, and I plan to attend that meeting -- or if anyone else on our commission would prefer to take this on, I'd more than welcome it.

If there is anyone who can volunteer to do some fact-finding to learn more about what was done as civic support for vulnerable people by various departments (beyond the Fire Department) and to document this so we understand it better, I think that would be wonderful. I will try to learn as much as I can as well.

Thanks!

Gradiva



Kate Harrison
Councilmember District 4

CONSENT CALENDAR
October 29, 2019

To: Honorable Mayor and Members of the City Council
From: Councilmembers Harrison, Wengraf, Hahn, and Bartlett
Subject: Amending Chapter 19.34 of the Berkeley Municipal Code to Expand Automatic Gas Shut-Off Valve Requirements in Multifamily, Condominium and Commercial Buildings Undergoing Renovations and to All Existing Buildings Prior to Execution of a Contract for Sale or Close of Escrow

RECOMMENDATION

Refer to the Disaster and Fire Safety Commission to consider an ordinance amending Berkeley Municipal Code (BMC) 19.34.040 to expand requirements for automatic natural gas shut-off valves or excess flow valves in multifamily, condominium and commercial buildings undergoing renovations and in all existing buildings prior to execution of a contract for sale or close of escrow. Ask the Commission to consider other triggers as appropriate.

POLICY COMMITTEE RECOMMENDATION

On October 3, 2019, the Facilities, Infrastructure, Technology, Environment & Sustainability Committee adopted the following action: M/S/C (Harrison/Robinson) to send the item with a Positive Qualified Recommendation back to the City Council with the following amendments.

Amend the recommendation revised to read as follows:

1. Refer to the Disaster and Fire Safety Commission to consider an ordinance amending Berkeley Municipal Code (BMC) 19.34.040 to expand requirements for automatic natural gas shut-off valves or excess flow valves in multifamily, condominium and commercial buildings undergoing renovations and in all existing buildings prior to execution of a contract for sale or close of escrow and to ask the Commission to consider other triggers as appropriate.

Amend the Financial Implications to read:

Staff savings realized from responders not having to shut off gas in an emergency.

Vote: All Ayes.

BACKGROUND

The California Building Standards Code, or Title 24 of the California Code of Regulations, specifies the standards for buildings and other structures in California. Title 24 is intended to protect public health, safety, and general welfare building occupants, and is updated at the state level and adopted by local jurisdictions every three years. Municipalities are permitted to make local amendments to the Building Standards Code¹ as deemed necessary for general welfare, as long as they are submitted to the California Building Standards Commission with the necessary findings. The ideal time to update local buildings codes is before the next code cycle. Berkeley will adopt the 2019 code on January 1, 2020.

Natural gas in buildings poses significant risks to health and safety. A recent ordinance adding Chapter 12.80 to the Berkeley Municipal Code phases out natural gas in new buildings.² This will make Berkeley's new building stock safer and greener over time, but there is an outstanding need to prevent seismic and other disasters in existing buildings.

Gas shut-off valves are a component of a plumbing system capable of preventing the flow within a gas piping system. Shut-off valves allow for a resident to stop the flow of gas in their homes in case of an emergency, such as an earthquake or a gas leak.

All existing buildings, if they have natural gas, should have a shut-off valve of some kind. However, manual shut-off valves require timely attention during a seismic event, physical access and exertion, and mechanical knowledge to operate. In case of a natural disaster, relying purely on manual shut-off valves can be dangerous. For example, following the 2010 San Bruno explosion, Pacific Gas & Electric officials testified before the National Transportation Safety Board that "gas feeding the flames could have been shut off an hour earlier if PG&E had automatic or remotely controlled valves on the pipeline that exploded."³ Since the San Bruno explosion, gas companies across California have urged a fast transfer to automatic shut-off valves.

Currently, BMC 19.34.040 requires automatic gas shut-off valves in all new construction or existing buildings that undergo repair or alteration exceeding \$50,000 consistent with sewer lateral requirements. However, it makes blanket exceptions for buildings with individually metered residential units when the building contains five or more residential units, unless the units are condominiums, putting renters at risk of physical harm.

¹ "Local Amendments to Building Standards—Ordinances," California Building Standards Commission, <https://www.dgs.ca.gov/BSC/Codes/Local-Jurisdictions-Code-Ordinances>.

² Susie Cagle, "Berkeley became first US city to ban natural gas. Here's what that may mean for the future," The Guardian, <https://www.theguardian.com/environment/2019/jul/23/berkeley-natural-gas-ban-environment>.

³ Paul Rogers, "PG&E officials grilled about automatic shut of valves," Mercury News, March 1, 2011, <https://www.mercurynews.com/2011/03/01/pge-officials-grilled-about-automatic-shut-off-valves-3/>.

In recommending this exception for multi-unit buildings in 2010, City staff intended to reduce the cost burden to property owners. For example, City staff were concerned that the ordinance would require very large multifamily buildings to install shut-off valves in every unit in a 50 unit building when completing a \$50,000 renovation.⁴

While financial costs are important, there will also likely be significant costs to human life and property resulting from natural gas infrastructure during seismic events that far outweigh the costs to property owners for installing shut-off valves. A more-tailored and comprehensive approach was adopted by the City of Los Angeles's 1997 policy in the wake of the Northridge Earthquake, requiring valves in all multifamily, condominium and commercial units when a permit for any addition, alteration or repair valued in excess of \$10,000 is taken out affecting the entire building, or in specific units affected by work in excess of \$10,000.⁵

This item proposes to apply the \$50,000 threshold for all work affecting multifamily, condominium and commercial buildings exclusive of work affecting the units and apply a \$10,000 threshold to work in excess of \$10,000 inclusive of any individual unit. In addition, this item proposes maintaining the current single-family home requirement when a permit is taken out of any addition, alteration or repair valued in excess of \$50,000.

Consistent with the Los Angeles code, the item removes the exception for commercial occupancies and uses in mixed use buildings of residential and non-residential occupancies with a single gas service line larger than 1 1/2 inches that serves the entire building. Berkeley City staff in 2010 previously suggested that pipes larger than 1 1/2 inches were marginally more expensive to retrofit with valves and therefore warranted an exception. Though upon further review, the few additional hundred dollars in labor and materials per valve does not warrant an exception due to ongoing risks to health and safety.

Berkeley is on top of one of California's most dangerous fault lines, the Hayward fault, making it prone to earthquakes. The extreme fire risk associated with natural gas infrastructure is illustrated by the 2017 U.S. Geological Survey stimulation of "a 7.0 quake on the Hayward fault line with the epicenter in Oakland." The agency's report predicted that "about 450 large fires could result in a loss of residential and commercial building floor area equivalent to more than 52,000 single-family homes and cause

⁴ "Installation of Automatic Gas Shut-off Valves," Berkeley Planning and Development Department, July 13, 2010, <https://www.cityofberkeley.info/recordsonline/api/Document/Af7NhvRQQKZ1%C3%81%C3%89xY9QpwmChW6QBqKp%C3%89scsKBclRXOVsvA1QlgXjP%C3%89Rs2zLVn2kCnCNjn918yaZSDbGqiogM WpBM%3D/>

⁵ City of Los Angeles Ordinance No. 171874, December 16, 1997, http://clkrep.lacity.org/onlinedocs/1995/95-0217-S1_ORD_171874_02-05-1998.pdf; See also, City of Los Angeles Plumbing Code Section 94.1217.0.

property (building and content) losses approaching \$30 billion.”⁶ The report identified ruptured gas lines as a key fire risk factor. This finding mirrors the destructive gas fires resulting from the Loma Prieta (1989) and Northridge (1994) earthquakes. According to the most recent census, 59.1% of units in Berkeley are occupied by renters.⁷ It is vital to extend the shut-off valve requirement to rental units to prioritize the health and safety of all Berkeley residents and the broader community.

Beyond extending this protection to large rental buildings during major renovations, this ordinance amends BMC 19.34 to mirror the City of Los Angeles’s code to require installing automatic shut-off valves prior to execution of a contract for sale in all buildings and units therein.

The transfer of property triggers various state and local building code requirements. For example, at time of sale the state health and safety code requires that, gas water heaters are seismically braced, anchored, or strapped.⁸ Other local ordinances related to environment, such as the BMC 19.81: the Building Energy Saving Ordinance, require energy efficiency reports prior to time of sale. The intention of Section 1209.4.2 is to ensure that all buildings that are sold in Berkeley include automatic gas shut-off valves, therefore enhancing seismic safety across the existing building stock.

FINANCIAL IMPLICATIONS

Staff savings realized from first responders not having to shut off valves manually in case of emergency.

Staff time to submit ordinance to the Building Standards Commission. In addition, building inspector staff time will be necessary to compliance with new provisions.

ENVIRONMENTAL SUSTAINABILITY

Mandating shut-off valves in rental units undergoing renovation and all units at sale will prevent the excess release of greenhouse gases (methane) due to gas leaks and fires during seismic events and other related emergencies.

CONTACT PERSON

Councilmember Kate Harrison, Council District 4, (510) 981-7140

ATTACHMENTS

1: Ordinance

⁶ “The HayWired earthquake scenario—Engineering implications,” U.S. Geological Survey, April 18, 2018, <https://pubs.er.usgs.gov/publication/sir20175013v2>.

⁷ “Bay Area Census: City of Berkeley” <http://www.bayareacensus.ca.gov/cities/Berkeley.htm>

⁸ Health and Safety Code § 18031.7, https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?sectionNum=18031.7.&lawCode=HSC

AMENDING CHAPTER 19.34 OF THE BERKELEY MUNICIPAL CODE TO EXPAND
AUTOMATIC GAS SHUT-OFF VALVE REQUIREMENTS IN MULTIFAMILY,
CONDOMINIUM AND COMMERCIAL BUILDINGS UNDERGOING RENOVATIONS
AND TO ALL EXISTING BUILDINGS PRIOR TO EXECUTION OF A CONTRACT FOR
SALE OR CLOSE OF ESCROW

BE IT ORDAINED by the Council of the City of Berkeley as follows:

Section 1. That Berkeley Municipal Code Section 19.36.040 is hereby amended to read as follows:

19.34.040 Gas Shut-Off Valves.

Chapter 12 of the 2016~~9~~ California Plumbing Code is adopted in its entirety subject to the modifications thereto which are set forth below.

1209.2 General Requirements for Gas Shut-Off Valves. Automatic gas shut-off valves installed either in compliance with this Section or voluntarily pursuant to a plumbing permit issued on or after the effective date of this Section, shall comply with the following:

1209.2.1 All valves shall:

1. Comply with all applicable requirements of the Berkeley Plumbing Code.
2. Be tested and listed by recognized testing agencies such as the Independent Laboratory of the International Approval Services (IAS), Underwriter's Laboratory (UL), International Association of Plumbing and Mechanical Officials (IAPMO) or any other agency approved by the State of California Office of the State Architect (OSA).
3. Be listed by the State of California Office of the State Architect (OSA).
4. Be installed on downstream side of the gas utility meter.
5. Be installed in accordance with the manufacturer's instructions.
6. Be installed in accordance with a plumbing permit issued by the City of Berkeley.
7. Provide a method for expedient and safe gas shut-off in an emergency.
8. Provide a capability for ease of consumer or owner resetting in a safe manner.

1209.2.2 Motion activated seismic gas shut-off valves shall be mounted rigidly to the exterior of the building or structure containing the fuel gas piping, unless otherwise specified in the manufacturer's installation instructions.

1209.3 Definitions

For the purpose of this Section terms shall be defined as follows:

AUTOMATIC GAS SHUT-OFF VALVE shall mean either a motion activated gas shut-off valve or device or an excess flow gas shut-off valve or device.

DOWNSTREAM OF GAS UTILITY METER shall mean all gas piping on the property owner's side of the gas meter and after the service tee.

EXCESS FLOW GAS SHUT-OFF VALVE shall mean an approved valve or device that is activated by significant gas leaks or overpressure surges that can occur when pipes rupture inside a structure. Such valves are installed at each appliance, unless otherwise specified by the manufacturer's installation instructions.

MOTION ACTIVATED GAS SHUT OFF VALVE shall mean an approved gas valve activated by motion. Valves are set to activate in the event of a moderate or strong seismic event greater than 5.0 on the Richter scale.

UPSTREAM OF GAS UTILITY METER shall mean all gas piping installed by the utility up to and including the meter and the utility's service tee.

1209.4 Devices When Required. Approved automatic gas shut-off or excess flow valves shall be installed as follows:

1209.4.1 New Construction. In any new building construction containing gas piping for which a building permit is first issued on or after the effective date of this Section.

1209.4.2 Existing Buildings. In any existing building, when any addition, alteration or repair is made for which a building permit is issued on or after the effective date of this Section and the valuation for the work exceeds \$50,000.

1209.4.2.1 Multifamily, Condominium and Commercial Buildings.

1. In any existing commercial, multifamily and condominium and commercial building, and applicable to all units and tenant spaces therein if the building is individually metered and lacks a central automatic shut-off valve downstream of the utility delivery point, when any addition, alteration or repair exclusive of individual units or tenant spaces is made for which a building permit is issued on or after the effective date of this Section and the valuation for the work exceeds \$50,000.
2. In any existing commercial, multifamily and condominium unit for all gas piping serving only those individual units, when any addition, alteration or repair inclusive of individual units or tenant spaces is made for which a building permit is issued on or after the effective date of this Section and the valuation for the work exceeds \$10,000.

1209.4.3 Sale of Existing Buildings.

The requirement to install seismic gas shutoff or excess flow shutoff valves shall apply

prior to entering into a contract of sale, or prior to the close of escrow when an escrow agreement has been executed in connection with a sale as follows:

1. in any building or structure, and all units therein when gas piping serving those units lacks a central automatic shut-off valve downstream of the utility delivery point; or
2. in an individual condominium unit for all gas piping serving that individual unit.

1209.4.4 Exceptions:

~~1.—Buildings with individually metered residential units when the building contains 5 or more residential units, unless the units are condominiums.~~

~~2.—For residential or mixed use condominium buildings, valves are required when the value of the work exceeds \$50,000 in any single condominium unit or when any work done outside of the units exceeds \$50,000.~~

~~3.—Commercial occupancies and uses in mixed use buildings of residential and non-residential occupancies with a single gas service line larger than 1 1/2 inches that serves the entire building.~~

14. Automatic gas shut-off valves installed with a building permit on a building prior to the effective date of this Section provided the valves remain installed on the building or structure and are adequately maintained for the life of the building or structure.

25. Automatic gas shut-off valves installed on a gas distribution system owned or operated by a public utility.

Section 2. The effective date of this amendment shall be January 1, 2020, or the effective adoption date of the 2019 California Building Standards Code, whichever is sooner.

Section 3. Copies of this Ordinance shall be posted for two days prior to adoption in the display case located near the walkway in front of the Maudelle Shirek Building, 2134 Martin Luther King Jr. Way. Within 15 days of adoption, copies of this Ordinance shall be filed at each branch of the Berkeley Public Library and the title shall be published in a newspaper of general circulation.

MEMO

To: Katie Van Dyke, Climate Action Program Manager, City of Berkeley
From: Gradiva Couzin
RE: Seismic Retrofit Refund Program Expansion to Include Clean Energy Improvements
Date: 11/3/2019

SUMMARY:

At the Disaster and Fire Safety Commission meeting on October 23, 2019 the Commission was presented with a status update on Berkeley's Seismic Retrofit Refund Program, along with a referral for input into possible changes to the program.

This program has been an effective way of achieving seismic improvements for Berkeley properties for many years. The proposed expansion would be likely to result in more adoption of clean energy home improvements in Berkeley. I recommend including home fire hardening in its scope as well, to save lives and slow the spread of wildfires.

It's important to recognize that the program in its current form is inequitable and adds to other problematic disparities (especially in disasters):

- Throughout the US, clean energy rebates go mostly to more affluent people
- Disasters in Berkeley will hit poorer people harder, especially due to housing & income loss
- Post-disaster assistance typically is given more to higher-income people

I hope that an expansion to this program can be intentionally designed to direct funds towards the people and properties most in need of it, and to select renovations that have the highest impact for the largest number of residents. I've included a few ideas below.

Climate change is an emergency and requires urgent action. Even though this memo describes my concern about inequity in the program, I still think expanding the program immediately should happen.

Background

The Seismic Retrofit Refund Program provides tax refunds to offset the cost of seismic upgrades to residential properties in Berkeley, including single family homes and multi-unit properties. Up to 1/3 of the transfer tax may be refunded for

seismic upgrade expenses. As an example, for a \$1.2 Million home purchase, the maximum refund amount would be \$6,000.

Seismic upgrades covered by this program have included such work as:

- Bolting to the foundation
- Repairing or replacing substandard foundations
- Securing chimneys
- Other earthquake strengthening work

Since its inception 30 years ago, this program has provided an incentive for hundreds of homebuyers each year to make their homes safer, thereby making the entire city more prepared and resilient in case of earthquake.

In recent years, however, the program has been underutilized, with only 72 properties taking advantage of the program in 2018. This represents under 10% of the potential eligible properties.

With the goal of increasing utilization of this program and also improving the City's resiliency and sustainability, City Council is interesting in expanding the scope of the program to include not only seismic retrofits, but also other home improvements such as electrification, energy efficiency, and water efficiency.

An Easy Method of Achieving Sustainability Improvements

Providing financial incentives to property owners in the form of a tax rebate can be an efficient and effective way to produce results. It's likely that expanding the scope of this program to include clean energy renovations would be effective in increasing the adoption of these improvements in Berkeley homes.

Because the administrative cost of this existing program to the City is minimal, expanding this program is an obvious path-of-least-resistance to maximize the adoption of clean energy & efficiency improvements in Berkeley homes:

- Weatherization + programmable thermostat installation
- Electrification to replace gas heating/cooling, cooking & water systems
- Solar panel + battery storage
- Electric vehicle charging station
- Greywater system installation
- Water efficient toilets installation
- Home appliance & lighting replacements

Wildfire Hardening

Adding wildfire hardening to the list of covered home improvements could reduce the spread of wildfire in Berkeley, ultimately saving lives and property. If this expansion of scope moves forward, I recommend including wildfire hardening home improvements, such as:

- Removing wood shingle roof and replacing with fire-resistant roofing
- Covering all vent openings with metal mesh
- Protecting eaves and soffits with fire resistant materials
- Installing dual pane windows including a layer of tempered glass
- Replacing outer walls with stucco or other fire-resistant materials
- Removing trees; trimming trees and shrubs
- Sprinkler system installation

An Inequitable Way to Distribute Funding

Despite this program's effectiveness, I would like to alert City Council to the lack of equity in this program. By its nature, this program provides tax rebates only to property owners who have recently purchased property. In October 2019, the median home purchase price in Berkeley was over \$1.3 million dollars. So, this program gives funding selectively to people who can afford to purchase properties at this dollar level. This excludes most people with low or moderate income, students, renters, seniors who are aging-in-place, and many others.

If Berkeley's program is expanded to include clean energy improvements, it will be adding to an existing disparity in distribution of such funds at the federal level. Research shows that the majority of funds in incentive-based clean energy programs in the US goes to people who are already affluent, as seen here:

- Since 2006, US households have received over \$18 billion in federal income tax credits for clean energy home improvements. 60% of these funds went to the top 20% of income earners, and only 10% of funds went to the bottom 60% of income earners.¹
- Income tax credits for solar panels and electric cars go overwhelmingly to high-income households.²
- The most extreme is the program aimed at electric vehicles, where the top 20% of income earners has received about 90% of credits.³

¹ <https://www.journals.uchicago.edu/doi/full/10.1086/685597>

² <https://energyathaas.wordpress.com/2015/07/20/are-clean-energy-tax-credits-equitable/>

³ <https://www.journals.uchicago.edu/doi/full/10.1086/685597>

It is concerning that Berkeley's program would join this federal trend and send Berkeley tax dollars toward people who are already affluent.

Disasters Increase Inequality

This regressive distribution of incentive funds is layered on another regressive distribution: Poorer people are at higher risk in disasters, and post-disaster assistance flows disproportionately to wealthier people⁴. Multiple studies show the same pattern after floods and other disasters: Rich people get richer, and poor people get poorer. Here are a few factors that contribute to this:

- Wealthier people are more likely to fit the requirements for federal aid. In the Northridge earthquake, 80% of damaged units were multifamily buildings, with low-cost rental housing particularly affected. However, federal recovery programs were designed to serve middle-class owners of single family dwellings. This resulted in a mismatch between needs and resources.
- In a Berkeley earthquake, low-income housing units are expected to be damaged at a much higher rate than other residences (See Berkeley's Local Hazard Mitigation Plan)
- People with funds to cover for a temporary loss of housing, or to cover a temporary loss of income, will have an easier time bouncing back from the impact of a disaster such as an earthquake or wildfire compared to people with lower incomes. "Low-income Americans are ... more likely to become homeless after a disaster and have more difficulty obtaining loans after one"⁵
- FEMA aid is not available to people who are undocumented.

The combination of

- (1) disasters have a higher impact on low-income residents
- (2) more post-disaster dollars go to higher income-residents
- (3) home-improvement incentive dollars are funneled to high-income residents

would create a triple-whammy working against people with fewer resources.

Possible Options Towards Improved Equity

Here are some possible alterations of this program to make it more equitable:

- Revise this to a property tax rebate rather than a transfer tax rebate, so it can be applicable to all properties rather than just those that are transferred in any year.

⁴ <https://www.npr.org/2019/03/05/688786177/how-federal-disaster-money-favors-the-rich>

⁵ <https://www.nytimes.com/2019/10/29/us/california-fires-homes.html>

- Allow a much higher rebate to incentivize the seismic retrofit of high-risk soft-story rental properties with 2-4 units (not covered in the existing Soft-Story retrofit requirement). Allow this rebate for property taxes in any year or spread over multiple years, not just at the time of property transfer.
- Increase the rebate for multi-family housing upgrades, where such upgrades would serve the tenants directly. For example, installation of an electric vehicle charging station for tenant use. Allow this rebate for property taxes in any year or spread over multiple years, not just at the time of property transfer.
- Expand the program to include non-structural seismic improvements such as bracing heavy shelves. Non-structural damage typically causes more injuries than structural failure in US earthquakes. These types of improvements may be more feasible for renters to complete.
- Reallocate funds from this program towards other uses, such as:
 - Funding clean energy upgrades such as solar panels at Berkeley public schools and senior centers, which also serve as disaster shelters.
 - A pool of funding from which any resident, including renters, can apply for a grant to perform clean energy or seismic upgrades in their home.
 - Grants to organizations that serve low income, elderly, and disabled residents in helping them prepare for disasters, such as BDPNN and Easy Does It.
 - Grants for Red Cross installation of smoke alarms in low income homes
 - Creating a ‘rainy day fund’ to provide post-disaster housing and relocation assistance to low-income residents.
 - Expanding the neighborhood Community Emergency Supply Program to provide funds for fire hardening, vegetation management, neighborhood microgrids, public charging stations, or other community-based improvements.

The above alterations will make this program less efficient, because they will require more City staff time to manage and administer. I think that this is the price the city has to pay in order to not go on the same inequitable “least-resistance” path that other clean energy incentive programs suffer from.

Due to the urgent need for immediate action on climate change, I think the program expansion should move forward without these changes, but these changes should be added ASAP.

Thank you for considering these suggestions!

Chin, Khin

From: David Peattie <dave@bdpnnetwork.org>
Sent: Sunday, January 12, 2020 5:06 PM
To: Chin, Khin
Cc: Gradiva Couzin
Subject: Are You Prepared for the Next Power Outage

Hi Khin,

Happy new year!

To pass along to the CERT list and the Commission members. . . .

Here is a link to our upcoming event on energy storage alternatives (text is also below).

<https://bdpnnetwork.org/event/are-you-prepared-for-the-next-power-outage/>

If you could pass this along to other committee members and to any other relevant networks, that'd be great! Thanks.

I can bring flyers down to the two senior centers if you think that would be effective. Let me know.

David Peattie

Berkeley Disaster Prep Neighborhood Network

aka "The Network" | an all-volunteer 501(c)3 nonprofit

www.bdpnnetwork.org

(510) 508-7619

ARE YOU PREPARED FOR THE NEXT POWER OUTAGE?

January 30 @ 6:30 pm - 8:00 pm

BFUU 1606 Bonita Ave. at Cedar

ADA ramp entrance on Bonita side

Albany CERT member and CERT trainer Sam Freeman will present a seminar on alternatives to utility powered appliances and alternative power sources such as generators, batteries, and solar energy.

Some of the topics that will be covered are:

- Planned vs unplanned power outages
- Determining your emergency power needs.
- What alternative cooking, lighting, communications, and other devices are available to reduce or eliminate your need for utility power.
- What emergency power options such as generators, solar, and battery power are available, their advantages, disadvantages, and relative costs.
- Determining an overall emergency power plan for your residence.

Sam will show some of the many devices that are readily available to assist you during a power outage.

Venue

Berkeley Fellowship of Unitarian Universalists

*1606 Bonita Avenue
Berkeley, CA 9470*