

**City of Berkeley
Utility Undergrounding Subcommittee
of the
Public Works Commission**

MEETING AGENDA

Subject: Utility Undergrounding
Date: October 20, 2016, 4:00 – 5:30 pm
Location: Elm Conference Room
1947 Center Street, 4th Floor

1. Call to Order and Roll Call
2. Comments from the Public (3 minutes each speaker)
3. Discuss/Action:
 - A. Review the September 22, 2016 meeting notes (attached)
 - B. Status of projects with U.C. Berkeley's Goldman School of Public Policy
 - C. Discuss status update for December 13, 2016 Council meeting (attached)
 - D. Next meeting
4. Adjournment

An agenda packet is available for public review at the Engineering Division front desk.

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Acting Commission Secretary:

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Utility Undergrounding - meeting notes

Meeting Date/Time: September 22, 2016, 4:00 pm

Meeting Location: Elm conference room

Attending:

Affiliation	Team Member	Affiliation	Team Member
Public Works Commission (PWC)	Ray Yep ✓	Public Works Department	Phil Harrington
	Larry Henry		Tracy Clay
	Nic Dominguez ✓		Ken Emeziem ✓
Disaster & Fire Safety Commission (DFSC)	Bob Flasher	Harris & Associates	Rocco Colicchia
	Victoria Legg ✓		
	Paul Degenkolb ✓		
Transportation Commission (TC)	Tony Bruzzone ✓		
	Ben Gerhardstein		

✓ Indicates present at meeting

Meeting Notes

1. Subcommittee Chair Ray Yep called the meeting to order at 4:00 pm.
2. Public comments:
 - Sharon Eige attended from the public. She expressed concern about people in the hill areas being able to get from their homes to shelters in a major disaster. There is a need to identify arterial and collector streets.
 - Sam Ginsberg attended from the public. He has been inquiring with the city on whether Delaware and Virginia streets are collector streets.
3. The notes from the July 28, 2016 undergrounding subcommittee meeting were reviewed and amended that Bob Flasher and Paul Degenkolb attended.
4. Harris and Associates' (Harris) final report:
 - Harris had provided a final report dated July 22, 2016. Ken said that the commissioners could still provide review comments. Upon polling all the commissioners present, there were no further comments and we considered the Harris report completed.
 - There was discussion on whether to ask Harris to add the cost of undergrounding residential streets. It was decided to leave the report as is to be consistent with the Council referral request.
5. UC Berkeley Goldman School:
 - We discussed if the Goldman School needs anything else to formally accept our projects. It was decided that we should check with Jane Mauldon.
 - Ken said that the Public Works Department will not be able to provide a stipend for the students. Ray said that Larry is discussing this with Susan Wengraf.

- Ken said that the commissioners will need to be the project managers in working with the Goldman School.

6. Energy Commission:

- Ray mentioned that Tony recently arranged a meeting with Sachu Constantine. Sachu is on Berkeley's Energy Commission and works for the Center for Sustainable Energy. Ray asked if the commissioners would be supportive of adding Sachu to our undergrounding team for his expertise in micro-grids. All present agreed.

7. Utility service providers workshop:

- Ray mentioned that we had discussed organizing a workshop with utility service providers, such as PG&E, Comcast, AT&T, etc. It was decided to plan to hold the meeting in January 2017.

8. Next meetings:

- Ken mentioned that if the commissioners want to provide a status report to Council, there are the November 29 and December 13 Council meetings. The deadline for submitting the agenda item for the November 29th meeting is October 13th and the deadline for the December 13th meeting is October 27th.
- It was decided to move our October 27th sub-committee meeting to October 20th to allow time for review of the Council report. The meeting will be at 4:00 pm and Ken will reserve the conference room.
- The Council report shall include: a) program plan developed by our team, b) Harris' final baseline report, c) scope of work for the Goldman School, d) request to add the Energy Commission, and e) planning for a workshop with utility service providers.

The meeting was adjourned at 5:30 pm.

End of notes.



Draft 10/18/2016

CONSENT CALENDAR
December 13, 2016

To: Honorable Mayor and Members of the City Council
From: Public Works Commission, Disaster and Fire Safety Commission, and
Transportation Commission
Submitted by: Ray Yep, Chair, Utility Undergrounding Subcommittee
Subject: Progress Report for the Development of a Comprehensive Plan for the Funding of
Undergrounding Utility Wires in Berkeley

RECOMMENDATION

That Council approve the following work items:

1. An updated work plan to develop a comprehensive plan (the "Undergrounding Plan") for the funding of undergrounding utility wires in Berkeley. See Attachment A.
2. A baseline study for the development of an undergrounding program, prepared by Harris and Associates, dated July 22, 2016. See Attachment B.
3. An application to U.C. Berkeley's Goldman School of Public Policy to conduct Phase 2 studies for the development of an undergrounding program. See Attachment C.
4. Add the Energy Commission, utilizing their expertise in emerging technologies, to work on the development of an undergrounding program.
5. Hold a workshop with service providers, such as PG&E, AT&T, Comcast, in early 2017 to get their input on the development of an undergrounding program.

FISCAL IMPACTS OF RECOMMENDATION

There are no immediate fiscal impacts of the recommendation. There will be a need to fund a consultant study in Phase 3 of the work plan, if the study moves to that stage.

CITY POLICY

Berkeley has established policies that prioritize public safety and seek to create a ready, resilient and responsive community, and an infrastructure that responds to this policy objective.

BACKGROUND

The City Council, at their meeting on December 16, 2014, referred to the Public Works Commission, Disaster and Fire Safety Commission and Transportation Commission to develop a comprehensive plan for the funding of the undergrounding of utility wires on all major and collector streets in Berkeley. The major (arterial) and collector streets were identified as a priority for the movement of emergency vehicles and the evacuation of residents in the event of a major disaster. The commissions responded with a workplan and it was approved by Council on September 29, 2015. Since that time, substantial progress has been made. The

representatives from the three commissions have been meeting monthly. Key to our progress has been the development of a four phase program approach. In summary, these are:

- 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. This study has been completed.
- Phase 2: Work with U.C. Berkeley's Goldman School of Public Policy to conduct specialized studies. These studies will be conducted in the 2016 – 2017 school year. The results from the baseline study and Goldman school studies will be combined into an overall recommendation for Phase 3. Included in Phase 2 will be community outreach.
- Phase 3: Prepare a comprehensive funding and implementation plan for undergrounding utility wires in Berkeley. This is planned for March 2018 – March 2019.
- Phase 4: Implementation

This phased approach allows the public and the Council to have input at multiple points along the evaluation process.

Attached to this report is a baseline study prepared by Harris and Associates. In summary, the report estimated the cost to underground Berkeley's arterial and collector streets as follows:

	Length, miles	Ratio	Cost to underground
Arterial streets			
Currently undergrounded	12.5	49%	n/a
Not undergrounded	13.1	51%	\$42.9 million
Sub-total	25.6	100%	
Collector streets			
Currently undergrounded	11.3	31%	n/a
Not undergrounded	24.8	69%	\$91.9 million
Sub-total	36.1	100%	
Residential streets			
Currently undergrounded	10.8	7%	n/a
Not undergrounded	149.9	93%	TBD
Sub-total	157.7	100%	

The estimated cost to underground the remaining arterial and collectors streets is about \$135 million. The cost to underground residential streets was not included in this work scope. By extrapolating the cost of collector streets, the estimated cost for the 150 miles of residential streets will be in the range of \$550 million. These estimates are order of magnitude and are prepared without field surveys or detailed analysis.

Also attached to this report is the work scope to be conducted by U.C. Berkeley's Goldman School of Public Policy. In summary, the three study areas are:

Study Area 1 – Future Technologies

This component will evaluate how PG&E, service providers (such as Comcast, AT&T, etc.) and street lighting may change in the next 50 years. This will help with forecasting the type of undergrounding methods to be used and the type of above ground poles that will remain. .

Study Area 2 – Funding Alternatives

This component will evaluate the range of funding alternatives for Berkeley to consider in implementing an undergrounding program

Study Area 3 – Benefit/cost Analysis and social/geographic equity

This component will evaluate the benefits and costs of an undergrounding program. Also included will be considerations for social/geographic equity for implementation.

RATIONALE FOR RECOMMENDATION

The updated workplan more accurately reflects the project work scope and schedule to prepare the Undergrounding Plan. It incorporates input from the commissions, Public Works staff, and the consultant.

CITY MANAGER

TBD

CONTACT PERSON

Ray Yep, Public Works Commission
Bob Flasher, Disaster and Fire Safety Commission
Tony Bruzzone, Transportation Commission

Attachment A

WORK PLAN To prepare a comprehensive plan for the funding of undergrounding utility wires in Berkeley

Program Phases

The Berkeley City Council has asked the Public Works, Disaster and Fire Safety, and Transportation Commissions to develop a comprehensive plan for the funding of undergrounding utility wires in all major and collector streets in Berkeley. This is potentially a large undertaking with impacts on City policies, work priorities, resources to conduct the work, cost to perform the planning and engineering, and the need for community input. It would be prudent to conduct the planning in multiple phases. The following is a phased programmatic approach.

Phase 1: Prepare Baseline for the Undergrounding Program (Harris and Associates)

This phase will develop baseline information for the undergrounding program. The work shall focus on the arterial and collector streets in Berkeley. The work scope shall include:

- Summarize the history of undergrounding in Berkeley
- Develop preliminary cost estimate for undergrounding
- Review available funding alternatives
- Summarize what has been done in other cities
- Summarize the status of 20A, 20B, and 20C funding in Berkeley
- Summarize the pros/cons of undergrounding the arterial and collector streets
- Prepare a report of the findings

This work has been assigned to Harris and Associates. The schedule for Phase 1 is from March to July, 2016.

Phase 2: Conceptualize the Undergrounding Program

This phase will conceptualize some of the broad longer term issues facing the undergrounding program in Berkeley. This phase will be completed in two parts, as follows.

Phase 2A (Goldman School of Public Policy)

This phase will utilize the expertise of the U.C. Berkeley Goldman School of Public Policy in these key study areas:

Study Area 1 – Future Technologies and Social/Geographic Equity

This component will evaluate how PG&E, service providers (such as Comcast, AT&T, etc.) and street lighting may change in the next 50 years. This will help with forecasting the type of undergrounding methods to be used and the type of above ground poles that will remain. The work will involve talking with PG&E, utility providers, and research into technologies.

Also included shall be considerations for social/geographic equity for implementation. For example, the utility wires in the Berkeley hills are a hazard due to their proximity to earthquake faults and heavy vegetation. Undergrounding in these areas would not only protect the homes in the area, but the City as a whole. How would this and other examples be evaluated from a social/geographic equity viewpoint?

Study Area 2 – Funding Alternatives

This component will evaluate the range of funding alternatives for Berkeley to consider in implementing an undergrounding program. Included shall be:

- Range in cost of funding needs
- Long term bond financing
- Revenue generation potential from utility corridors
- Utility service charge funding
- Options for home owner funding
- Pros/cons of funding alternatives used by other cities
- Other

Study Area 3 – Benefit/Cost Analysis

This component will evaluate the benefits and costs of an undergrounding program. The benefits shall include:

- Value of greater emergency access in an emergency
- Value of avoided catastrophic financial losses from an emergency
- Value to property values
- Other

Traditional methods of calculating benefit/cost ratios shall be used.

This work shall be performed by the U.C. Berkeley Goldman School of Public Policy. The schedule for Phase 2 is from September 2016 to June 2017.

Phase 2B (Public Works Department and Commissions)

This phase will pull together the work done in Phase 1 and Phase 2A into a cohesive Concept Plan for Berkeley. It is at this point where decisions should be made on the feasibility of undergrounding in Berkeley and if future studies are warranted. A summary report shall be written for the City Council's consideration. Included in the report shall be the following:

- Objectives for undergrounding
- Summary of utility undergrounding completed in Berkeley
- Summary of undergrounding programs by other cities
- Future technologies of utility and service providers
- Potential undergrounding corridors and costs

- Community meetings and input from the public.
- Input from stakeholders.
- Recommendations for future studies, costs, schedule, and resources needed
- Decisions required of City Council and staff

The schedule for Phase 2B is from June 2017 to March 2018.

Phase 3: Comprehensive Funding and Implementation Plan

City Council approval of the Concept Plan is needed before moving forward with this phase. This phase will prepare a detailed Comprehensive Funding and Implementation Plan. The work scope shall include:

- Conduct a series of community meetings.
- Conduct a detailed evaluation of project funding and recommended actions.
- Prepare a detailed plan for implementation.
- Recommend organizational needs for implementation, including staffing and other resource needs.
- Prepare an overall program plan.
- City Council adoption of the Comprehensive Funding and Implementation Plan.
- Identification of voter requirements before proceeding.

The schedule for this phase shall be March 2018 to March 2019.

Phase 4: Program Implementation

This phase will implement the recommended undergrounding program. This will be a long term effort.

Attachment B

Baseline study for the development of an undergrounding program
Prepared by Harris and Associates, dated July 22, 2016

Attachment C

Subject: Project descriptions to U.C. Berkeley's Goldman School of Public Policy for Phase 2A – Conceptualize the Undergrounding Program

By: City of Berkeley's Public Works, Disaster and Fire Safety, and Transportation Commissions

The Berkeley City Council has asked the Public Works, Disaster and Fire Safety, and Transportation Commissions to develop a comprehensive plan for the funding of undergrounding utility wires in all major and collector streets in Berkeley. The following is Berkeley's phased programmatic approach.

Phase 1: Prepare Baseline for the Undergrounding Program (Harris and Associates)

This phase will develop baseline information for the undergrounding program. The work shall focus on the arterial and collector streets in Berkeley and include:

- Summarize the history of undergrounding in Berkeley
- Develop preliminary cost estimate for undergrounding
- Review available funding alternatives
- Summarize what has been done in other cities
- Summarize the status of 20A, 20B, and 20C funding in Berkeley
- Summarize the pros/cons of undergrounding the arterial and collector streets
- Prepare a report of the findings

Phase 2: Conceptualize the Undergrounding Program

This phase will conceptualize some of the broad longer term issues facing the undergrounding program in Berkeley. This phase will be completed in two parts, as follows.

Phase 2A (by Goldman School of Public Policy)

This phase will utilize the expertise of the U.C. Berkeley Goldman School of Public Policy in these key study areas:

Study Area 1 – Future Technologies

This component will evaluate how PG&E, service providers (such as Comcast, AT&T, etc.) and street lighting may change in the next 50 years. This will help with forecasting the type of undergrounding methods to be used and the type of above ground poles that will remain. The work will involve talking with PG&E, utility providers, and research into technologies.

Study Area 2 – Funding Alternatives

This component will evaluate the range of funding alternatives for Berkeley to consider in implementing an undergrounding program. Included shall be:

- Range in cost of funding needs
- Long term bond financing
- Revenue generation potential from utility corridors
- Utility service charge funding
- Options for home owner funding
- Pros/cons of funding alternatives used by other cities
- Other

Study Area 3 – Benefit/cost Analysis and social/geographic equity

This component will evaluate the benefits and costs of an undergrounding program. The benefits shall include:

- Value of greater emergency access in an emergency
- Value of avoided catastrophic financial losses from an emergency
- Changes to property values
- Possible health benefits from undergrounding power lines
- Aesthetic value of undergrounding power lines
- Other

Traditional methods of calculating benefit/cost ratios shall be used.

Also included shall be considerations for social/geographic equity for implementation. For example, the utility wires in the Berkeley hills are a hazard due to their proximity to earthquake faults and heavy vegetation. Undergrounding in these areas would not only protect the homes in the area, but the City as a whole. How would this and other examples be evaluated from a social/geographic equity viewpoint?

The work in Phase 2A shall be performed by the U.C. Berkeley Goldman School of Public Policy. The schedule for Phase 2A is from September 2016 to June 2017.

Phase 2B (by Public Works Department and Commissions)

This phase will pull together the work done in Phase 1 and Phase 2A into a cohesive Concept Plan for Berkeley. It is at this point where decisions should be made on the feasibility of undergrounding in Berkeley and if future studies are warranted. A summary report shall be written for the City Council's consideration. Included in the report shall be the following:

- Objectives for undergrounding
- Summary of utility undergrounding completed in Berkeley
- Summary of undergrounding programs by other cities
- Future technologies of utility and service providers
- Potential undergrounding corridors and costs
- Community meetings and input from the public.
- Input from stakeholders.

- Recommendations for future studies, costs, schedule, and resources needed
- Decisions required of City Council and staff

The schedule for Phase 2B is from June 2017 to March 2018.

Phase 3: Comprehensive Funding and Implementation Plan (by others)

City Council approval of the Concept Plan is needed before moving forward with this phase. This phase will prepare a detailed Comprehensive Funding and Implementation Plan. The work scope shall include:

- Conduct a series of community meetings.
- Conduct a detailed evaluation of project funding and recommended actions.
- Prepare a detailed plan for implementation.
- Recommend organizational needs for implementation, including staffing and other resource needs.
- Prepare an overall program plan.
- City Council adoption of the Comprehensive Funding and Implementation Plan.
- Identification of voter requirements before proceeding.

The schedule for this phase shall be March 2018 to March 2019.

Phase 4: Program Implementation (by City of Berkeley)

This phase will implement the recommended undergrounding program. This will be a long term effort.

The following are the Phase 2A project descriptions proposed to be conducted by U.C. Berkeley's Goldman School of Public Policy.

Phase 2A**Study Area 1 – Future Technologies****Project Description & Goals**

The City of Berkeley is investigating the cost and advisability of moving overhead wiring underground. This action will have a number of benefits, both in terms of a friendlier environment, and in increased safety for the city as a whole. However, the process is fairly expensive, and the construction process will be disruptive to the neighborhood while being undergrounded. The primary technologies being undergrounded are power (which includes power for street lighting), telephone, Internet and cable TV. At this time, the primary study area to consider is the undergrounding process on arterial and collector streets in Berkeley. A further discussion is also ongoing about undergrounding the remainder of the streets in Berkeley. As part of the investigation, we are looking into the benefit versus cost of the project, which raises a number of issues. One issue that has been raised is how future technologies will affect the long term value of the project.

The question should focus on how the technologies being undergrounded are likely to change in the next fifty years, how those changes could be enhanced or degraded by undergrounding. Suggestions for specific needs in undergrounding such as conduit size and utility vaults should be at least discussed. The possibility of technological changes which make undergrounding obsolete should also be studied. The primary technologies being undergrounded are power, Telephone, Internet and Cable TV however, if during the course of study other technologies emerge and are expected to reach wide spread adoption by municipalities those technologies should be considered in this undergrounding study i.e. fiber optic internet cables.

Technologies which should be considered should include, but not be limited to:

- The potential use of micro-grids and the impacts to power transmission lines.
- The trend to wireless internet service and the impacts to traditional and fiber optic cable transmission.
- Other

Please briefly describe the work of your organization/ department as it relates to the project. In what way is your organization in a position to take action based on findings of the IPA?

The Undergrounding Subcommittee of the Public Works Commission is tasked with preparing a recommendation to the Berkeley City Council on the advisability, cost and funding methods related to undergrounding utilities in Berkeley. This research report will be used as a basis for specific discussions within that recommendation. Final approval of the undergrounding project, along with specifics of how it will be accomplished will be up to the City Council, but will be guided by the recommendations from this and other research projects.

Descriptive Project Title, under 15 words

Determine the effect of new technologies on proposed utility undergrounding project.

Phase 2A**Study Area 2 – Funding Alternatives****Project Description & Goals**

The City of Berkeley is investigating the cost and advisability of moving overhead wiring underground. This action will have a number of benefits, both in terms of a friendlier environment, and in increased safety for the city as a whole. However, the process is fairly expensive, and the construction process will be disruptive to the neighborhood while being undergrounded. The primary technologies being undergrounded are power (which includes power for street lighting), telephone, Internet and cable TV. At this time, the primary study area to consider is the undergrounding process on arterial and collector streets in Berkeley. A further discussion is also ongoing about undergrounding the remainder of the streets in Berkeley. As part of the investigation, we are looking into the benefit versus cost of the project, which raises a number of issues. One of these issues is funding. This project will evaluate the range of funding alternatives for Berkeley to consider in implementing an undergrounding program.

Funding alternatives that have been discussed include:

- Range in the amount of funding needed
- Long term bond financing
- Transfer tax on real estate sales
- Revenue generation potential from utility corridors
- Utility service charge funding
- Options for homeowner funding
- Pros/cons of funding alternatives used by other cities
- Potential private sector funding options
- Any other options not included above, but which seem appropriate

Along with the sources of funding, there should be at least some evaluation of the equity of the funding. For instance, should the entire population be responsible for paying for the undergrounding even if parts of the city are not undergrounded? How does timing of the project (possibly a thirty-year project) affect this?

Please briefly describe the work of your organization/ department as it relates to the project. In what way is your organization in a position to take action based on findings of the IPA?

The Undergrounding Subcommittee of the Public Works Commission is tasked with preparing a recommendation to the Berkeley City Council on the advisability, cost and funding methods related to undergrounding utilities in Berkeley. This research report will be used as a basis for specific discussions within that recommendation. Final approval of the undergrounding project, along with specifics of how it will be accomplished will be up to the City Council, but will be guided by the recommendations from this and other research projects.

Descriptive Project Title, under 15 words

Evaluate sources and their pros and cons for funding the undergrounding of utilities in Berkeley.

Phase 2A**Study Area 3 – Benefit/Cost Analysis and Social/Geographic Equity****Project Description & Goals**

The City of Berkeley is investigating the cost and advisability of moving overhead wiring underground. This action will have a number of benefits, both in terms of a friendlier environment, and in increased safety for the city as a whole. However, the process is fairly expensive, and the construction process will be disruptive to the neighborhood while being undergrounded. The primary technologies being undergrounded are power (which includes power for street lighting), telephone, Internet and cable TV. At this time, the primary study area to consider is the undergrounding process on arterial and collector streets in Berkeley. A further discussion is also ongoing about undergrounding the remainder of the streets in Berkeley. As part of the investigation, we are looking into the benefit versus cost of the project, which raises a number of issues. Two issues are the evaluation of the overall benefits and costs of and social/geographic equity of an undergrounding program.

To assist in this project, a Benefit/Cost Analysis needs to be performed. The costs and benefits being evaluated should be looked at both in terms of the entire city, but also in terms of individual neighborhoods. The benefits shall include:

- Value of greater emergency access in an emergency
- Value of avoided catastrophic financial losses from an emergency
- Increase to property values
- Value of prevented power loss due to undergrounding
- Aesthetic value of undergrounding power lines
- Other

A consideration of the benefits to those areas already undergrounded may be possible if real estate sales in a particular neighborhood are studied before and after undergrounding but it gets complicated when one considers that every house is different. Berkeley, like the rest of the country, has had to work our way out of a recent housing bubble bust, and we haven't had significant power outages or disasters to compare one neighborhood to another. Traditional methods of calculating benefit/cost ratios shall be used, although alternatives may also be discussed.

Also included will be the social and geographic equity of any proposed undergrounding project. Where will the undergrounding have the greatest benefit to the city? Where will it have the least impact? What are the benefits and costs to the city as a whole, and what are the benefits and costs to the local neighborhood being undergrounded? If only part of the city is to be undergrounded, what benefits are gained by those not being undergrounded? For that matter, what have the benefits and costs of undergrounding been in those areas of Berkeley where it has already been accomplished?

Please briefly describe the work of your organization/ department as it relates to the project. In what way is your organization in a position to take action based on findings of the IPA?

The Undergrounding Subcommittee of the Public Works Commission is tasked with preparing a recommendation to the Berkeley City Council on the advisability, cost and funding methods related to

undergrounding utilities in Berkeley. This research report will be used as a basis for specific discussions within that recommendation. Final approval of the undergrounding project, along with specifics of how it will be accomplished will be up to the City Council, but will be guided by the recommendations from this and other research projects.

Descriptive Project Title, under 15 words

Perform a benefit vs. cost analysis of utility undergrounding in the city of Berkeley.