BERKELEY CITY COUNCIL AGENDA & RULES COMMITTEE SPECIAL MEETING

MONDAY, NOVEMBER 29, 2021
2:30 P.M.

Committee Members:

Mayor Jesse Arreguin, Councilmembers Sophie Hahn and Susan Wengraf
Alternate: Councilmember Lori Droste

PUBLIC ADVISORY: THIS MEETING WILL BE CONDUCTED EXCLUSIVELY THROUGH VIDEOCONFERENCE AND TELECONFERENCE

Pursuant to Government Code Section 54953(e) and the state declared emergency, this meeting will be conducted exclusively through teleconference and Zoom videoconference. The COVID-19 state of emergency continues to directly impact the ability of the members to meet safely in person and presents imminent risks to the health of the attendees. Therefore, no physical meeting location will be available.

To access the meeting remotely using the internet: Join from a PC, Mac, iPad, iPhone, or Android device: Use URL https://us02web.zoom.us/j/85877795250. If you do not wish for your name to appear on the screen, then use the drop down menu and click on "rename" to rename yourself to be anonymous. To request to speak, use the “raise hand” icon on the screen.

To join by phone: Dial **1-669-900-9128 or 1-877-853-5257 (Toll Free)** and Enter Meeting ID: **858 7779 5250.** If you wish to comment during the public comment portion of the agenda, press *9 and wait to be recognized by the Chair.

Written communications submitted by mail or e-mail to the Agenda & Rules Committee by 5:00 p.m. the Friday before the Committee meeting will be distributed to the members of the Committee in advance of the meeting and retained as part of the official record. City offices are currently closed and cannot accept written communications in person.

AGENDA

Roll Call

Public Comment

Review of Agendas

1. **Approval of Minutes: November 15, 2021**
2. **Review and Approve Draft Agenda:**
   a. 12/14/21 – 6:00 p.m. Regular City Council Meeting
3. **Selection of Item for the Berkeley Considers Online Engagement Portal**
4. **Adjournments In Memory**

Scheduling

5. **Council Worksessions Schedule**
6. **Council Referrals to Agenda Committee for Scheduling**
7. **Land Use Calendar**

Referred Items for Review

8. **Discussion Regarding Impact of COVID-19 (novel coronavirus) on Meetings of Legislative Bodies**
9. **Preliminary Analysis of Return to In-Person Meetings of City Legislative Bodies**

Unscheduled Items

10. **Discussion Regarding Design and Strengthening of Policy Committee Process and Structure (Including Budget Referrals)**
11. **Strengthening and Supporting City Commissions: Guidance on the Development of Legislative Proposals**

Items for Future Agendas

- **Discussion of items to be added to future agendas**

Adjournment – Next Meeting Monday, January 3, 2022

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Additional items may be added to the draft agenda per Council Rules of Procedure.

Rules of Procedure as adopted by Council resolution, Article III, C3c - Agenda - Submission of Time Critical Items

Time Critical Items. A Time Critical item is defined as a matter that is considered urgent by the sponsor and that has a deadline for action that is prior to the next meeting of the Council and for which a report prepared by the City Manager, Auditor, Mayor or council member is received by the City Clerk after established deadlines and is not included on the Agenda Committee's published agenda.

If the Agenda Committee finds the matter to meet the definition of Time Critical, the Agenda Committee may place the matter on the Agenda on either the Consent or Action Calendar.

The City Clerk shall not accept any item past the adjournment of the Agenda Committee meeting for which the agenda that the item is requested to appear on has been approved.

Written communications addressed to the Agenda Committee and submitted to the City Clerk Department by 5:00 p.m. the Friday before the Committee meeting, will be distributed to the Committee prior to the meeting.

This meeting will be conducted in accordance with the Brown Act, Government Code Section 54953 and applicable Executive Orders as issued by the Governor that are currently in effect. Members of the City Council who are not members of the standing committee may attend a standing committee meeting even if it results in a quorum being present, provided that the non-members only act as observers and do not participate in the meeting. If only one member of the Council who is not a member of the committee is present for the meeting, the member may participate in the meeting because less than a quorum of the full Council is present. Any member of the public may attend this meeting. Questions regarding this matter may be addressed to Mark Numainville, City Clerk, (510) 981-6900.

COMMUNICATION ACCESS INFORMATION:
To request a disability-related accommodation(s) to participate in the meeting, including auxiliary aids or services, please contact the Disability Services specialist at (510) 981-6418 (V) or (510) 981-6347 (TDD) at least three business days before the meeting date.

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I hereby certify that the agenda for this special meeting of the Berkeley City Council was posted at the display case located near the walkway in front of the Maudelle Shirek Building, 2134 Martin Luther King Jr. Way, as well as on the City's website, on November 24, 2021.

Mark Numainville, City Clerk

Communications

Communications submitted to City Council Policy Committees are on file in the City Clerk Department at 2180 Milvia Street, 1st Floor, Berkeley, CA, and are available upon request by contacting the City Clerk Department at (510) 981-6908 or policycommittee@cityofberkeley.info.
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BERKELEY CITY COUNCIL AGENDA & RULES COMMITTEE SPECIAL MEETING MINUTES

MONDAY, NOVEMBER 15, 2021
2:30 P.M.

Committee Members:

Mayor Jesse Arreguin, Councilmembers Sophie Hahn and Susan Wengraf
Alternate: Councilmember Lori Droste

PUBLIC ADVISORY: THIS MEETING WILL BE CONDUCTED EXCLUSIVELY THROUGH VIDEOCONFERENCE AND TELECONFERENCE

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To join by phone: Dial **1-669-900-9128 or 1-877-853-5257 (Toll Free)** and Enter Meeting ID: **853 6330 7835.** If you wish to comment during the public comment portion of the agenda, press *9 and wait to be recognized by the Chair.

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Roll Call: 2:32 p.m. All present.

Public Comment – 4 speakers

Review of Agendas

1. **Approval of Minutes: November 1, 2021**
   Action: M/S/C (Wengraf/Arreguin) to approve the minutes of 11/1/21.
   Vote: All Ayes.

2. **Review and Approve Draft Agenda:**
   a. 11/30/21 – 6:00 p.m. Regular City Council Meeting
   Action: M/S/C (Arreguin/Wengraf) to approve the agenda of November 30, 2021 with the changes noted below.
   Vote: All Ayes.
   - *Item Added: Fire Code Amendments (City Manager) – added to Consent*
   - *Item 16 Age-Friendly (Arreguin) – Councilmember Wengraf added as a co-sponsor*
   - *Item 18 Habitot (Bartlett) – Councilmember Harrison added as a co-sponsor*
   - *Item 19 Building Electrification (Harrison) – Revised item submitted*
   - *Item 20 ADU Ordinance (City Manager) – Scheduled for 12/14/2021*
   - *Item 25 Crime Suppression Unit (Taplin) – Referred to Public Safety Committee; Councilmember Wengraf added as a co-sponsor*
   - *Item 26 BMC Chapter 12.01 (Harrison) – Referred to the Facilities, Infrastructure, Transportation, Environment & Sustainability Committee; Councilmember Hahn added as a co-sponsor*
   - *Item 27 BUSD Service Requests (Hahn) – Moved to 11/30/21 Consent Calendar; Councilmember Harrison added as a co-sponsor*
   - *Item 28 Pedestrian Safety (Wengraf) – Moved to 11/30/21 Consent Calendar; Revised item submitted*

3. **Selection of Item for the Berkeley Considers Online Engagement Portal**
   - None Selected

4. **Adjournments In Memory** – None

Scheduling

5. **Council Worksessions Schedule** – received and filed

6. **Council Referrals to Agenda Committee for Scheduling** – received and filed

7. **Land Use Calendar** – received and filed

Referred Items for Review

8. **Discussion Regarding Impact of COVID-19 (novel coronavirus) on Meetings of Legislative Bodies**
   Action: 0 speakers. No action taken.

9. **Preliminary Analysis of Return to In-Person Meetings of City Legislative Bodies**
   Action: 3 speakers. No new information to provide. No action taken.

10. **Discussion of Changes to Rules of Procedure for Budget Referrals**
    Action: 0 speakers. Brief update from Councilmember Hahn regarding discussions with the City Manager and next steps. Item continued to next meeting on the Unscheduled list and renamed to be broader in scope.

Unscheduled Items

11. **Strengthening and Supporting City Commissions: Guidance on the Development of Legislative Proposals**

Items for Future Agendas

- **None**

Adjournment

Action: M/S/C (Arreguin/Wengraf) to adjourn the meeting.
Vote: All Ayes.

Adjourned at 3:39 p.m.

I hereby certify that the foregoing is a true and correct record of the Agenda and Rules Committee meeting held on November 15, 2021.

_____
Mark Numainville
City Clerk

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DRAFT AGENDA

BERKELEY CITY COUNCIL MEETING

Tuesday, December 14, 2021
6:00 PM

JESSE ARREGUIN, MAYOR

Councilmembers:

DISTRICT 1 – RASHI KESARWANI
DISTRICT 2 – TERRY TAPLIN
DISTRICT 3 – BEN BARTLETT
DISTRICT 4 – KATE HARRISON
DISTRICT 5 – SOPHIE HAHN
DISTRICT 6 – SUSAN WENGRAF
DISTRICT 7 – RIGEL ROBINSON
DISTRICT 8 – LORI DROSTE

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Live audio is available on KPFB Radio 89.3. Live captioned broadcasts of Council Meetings are available on Cable B-TV (Channel 33) and via internet accessible video stream at http://www.cityofberkeley.info/CalendarEventWebcastMain.aspx.

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*To join by phone: Dial **1-669-900-9128 or 1-877-853-5257 (Toll Free)** and enter Meeting ID: **<<INSERT MEETING ID HERE>>**. If you wish to comment during the public comment portion of the agenda, Press *9 and wait to be recognized by the Chair.*

Please be mindful that the teleconference will be recorded as any Council meeting is recorded, and all other rules of procedure and decorum will apply for Council meetings conducted by teleconference or videoconference.

To submit a written communication for the City Council's consideration and inclusion in the public record, email council@cityofberkeley.info.

This meeting will be conducted in accordance with the Brown Act, Government Code Section 54953. Any member of the public may attend this meeting. Questions regarding this matter may be addressed to Mark Numainville, City Clerk, (510) 981-6900. The City Council may take action related to any subject listed on the Agenda. Meetings will adjourn at 11:00 p.m. - any items outstanding at that time will be carried over to a date/time to be specified.

Preliminary Matters

Roll Call:

Ceremonial Matters: *In addition to those items listed on the agenda, the Mayor may add additional ceremonial matters.*

City Manager Comments: *The City Manager may make announcements or provide information to the City Council in the form of an oral report. The Council will not take action on such items but may request the City Manager place a report on a future agenda for discussion.*

Public Comment on Non-Agenda Matters: *Persons will be selected to address matters not on the Council agenda. If five or fewer persons wish to speak, each person selected will be allotted two minutes each. If more than five persons wish to speak, up to ten persons will be selected to address matters not on the Council agenda and each person selected will be allotted one minute each. The remainder of the speakers wishing to address the Council on non-agenda items will be heard at the end of the agenda.*

Consent Calendar

The Council will first determine whether to move items on the agenda for "Action" or "Information" to the "Consent Calendar", or move "Consent Calendar" items to "Action." Three members of the City Council must agree to pull an item from the Consent Calendar for it to move to Action. Items that remain on the "Consent Calendar" are voted on in one motion as a group. "Information" items are not discussed or acted upon at the Council meeting unless they are moved to "Action" or "Consent".

No additional items can be moved onto the Consent Calendar once public comment has commenced. At any time during, or immediately after, public comment on Information and Consent items, any Councilmember may move any Information or Consent item to "Action." Following this, the Council will vote on the items remaining on the Consent Calendar in one motion.

For items moved to the Action Calendar from the Consent Calendar or Information Calendar, persons who spoke on the item during the Consent Calendar public comment period may speak again at the time the matter is taken up during the Action Calendar.

Public Comment on Consent Calendar and Information Items Only: *The Council will take public comment on any items that are either on the amended Consent Calendar or the Information Calendar. Speakers will be entitled to two minutes each to speak in opposition to or support of Consent Calendar and Information Items. A speaker may only speak once during the period for public comment on Consent Calendar and Information items.*

Additional information regarding public comment by City of Berkeley employees and interns: Employees and interns of the City of Berkeley, although not required, are encouraged to identify themselves as such, the department in which they work and state whether they are speaking as an individual or in their official capacity when addressing the Council in open session or workshops.

Consent Calendar

1. **Resolution Making Required Findings Pursuant to the Government Code and Directing City Legislative Bodies to Continue to Meet Via Videoconference and Teleconference**
   From: City Manager
   Recommendation: Adopt a Resolution making the required findings pursuant to Government Code Section 54953(e)(3) and determining that as a result of the continued threat to public health and safety posed by the spread of COVID-19, City legislative bodies shall continue to meet via videoconference and teleconference, initially ratified by the City Council on September 28, 2021, and subsequently reviewed and ratified on October 26, 2021 and November 16, 2021.
   Financial Implications: To be determined
   Contact: Farimah Brown, City Attorney, (510) 981-6950

2. **Resolution Reviewing and Ratifying the Proclamation of Local Emergency Due to the Spread of a Severe Acute Respiratory Illness Caused by a Novel (New) Coronavirus (COVID-19)**
   From: City Manager
   Recommendation: Adopt a Resolution reviewing the need for continuing the local emergency due to the spread of a severe acute respiratory illness caused by a novel (new) coronavirus (COVID-19) and ratifying the Proclamation of Local Emergency issued by the Director of Emergency Services on March 3, 2020, initially ratified by the City Council on March 10, 2020, and subsequently reviewed and ratified by the Council on April 21, 2020, June 16, 2020, July 28, 2020, September 22, 2020, November 17, 2020, December 15, 2020, February 9, 2021, March 30, 2021, May 25, 2021, July 20, 2021, September 14, 2021, and November 9, 2021.
   Financial Implications: To be determined
   Contact: Farimah Brown, City Attorney, City Attorney's Office (510) 981-6998

3. **Minutes for Approval**
   From: City Manager
   Recommendation: Approve the minutes for the council meetings of November 2 (closed), November 4 (special), November 9 (closed and regular), November 16 (closed and regular), November 18 (closed) and November 30 (closed and regular).
   Financial Implications: None
   Contact: Mark Numainville, City Clerk, (510) 981-6900

Consent Calendar

4. Extension of Interim Director of Police Accountability Appointment
From: City Manager
Recommendation: Adopt a Resolution extending the appointment of Katherine J. Lee as Interim Director of Police Accountability and approving an employment contract to be effective January 1, 2022 at an annual salary of $182,260.65.
Financial Implications: See report
Contact: Dee Williams-Ridley, City Manager, (510) 981-7000

5. Protiviti Government Services: Using General Services Administration (GSA) Vehicle for Professional Services Purchase Orders
From: City Manager
Recommendation: Adopt a Resolution authorizing the City Manager to issue purchase orders with Protiviti Government Services for the purchase of professional services using the General Services Agency's (GSA) purchasing vehicle no. GS-35F-0280X for an amount not to exceed $70,000 through November 8, 2022.
Financial Implications: General Fund - $70,000
Contact: Matthai Chakko, City Manager's Office, (510) 981-7000

6. Formal Bid Solicitations and Request for Proposals Scheduled for Possible Issuance After Council Approval on December 14, 2021
From: City Manager
Recommendation: Approve the request for proposals or invitation for bids (attached to staff report) that will be, or are planned to be, issued upon final approval by the requesting department or division. All contracts over the City Manager's threshold will be returned to Council for final approval.
Financial Implications: General Fund - $960,000
Contact: Henry Oyekanmi, Finance, (510) 981-7300

7. Contract: RLH & Associates for Providing Temporary Governmental Financial Consulting Services for the Finance Department
From: City Manager
Recommendation: Adopt a Resolution authorizing the City Manager to execute a contract, with any amendments, with RLH Associates for providing temporary governmental financial consulting as required by the Finance Department for an initial term of two years. The total not to exceed contract amount is $150,000.
Financial Implications: General Fund - $150,000
Contact: Henry Oyekanmi, Finance, (510) 981-7300

Consent Calendar

8. Contract: Valdes and Moreno for Professional Services for the Microbond Financing Pilot Program
From: City Manager
Recommendation: Adopt a Resolution authorizing the City Manager to execute a contract, with any amendments, with Valdes and Moreno for professional services needed to establish and administer full-services consulting and other services related to a Microbond Financing Program. The total not to exceed amount is $150,000.
Financial Implications: General Fund - $150,000
Contact: Henry Oyekanmi, Finance, (510) 981-7300

9. Contract: Gainey Scientific for Project Management & Consulting
From: City Manager
Recommendation: Adopt a Resolution authorizing the City Manager to execute a contract and any amendments with Ganey Scientific. (Contractor) to provide project management and consulting services for the Fire Department (Department) from September 13, 2021 to August 31, 2022 in an amount not to exceed $300,000 with an option to extend for an additional two years, for a total contract amount not to exceed $900,000.
Financial Implications: See report
Contact: Abe Roman, Fire, (510) 981-3473

10. Revenue: FY2022 Federal COVID-19 Funding from HHS CARES Act Provider Relief Fund
From: City Manager
Recommendation: Adopt a Resolution authorizing the City Manager or her designee to accept payments from the Health and Human Services (HHS) CARES Act Provider Relief Fund and to execute any resultant revenue agreements and amendments to conduct and implement mitigation strategies in response to COVID-19 in the estimated amount of $80,000 for FY 2022.
Financial Implications: See report
Contact: Abe Roman, Fire, (510) 981-3473

11. Revenue Contract: Funding from an Instructional Service Agreement with Los Positas College to support Fire Department Training
From: City Manager
Recommendation: Adopt a Resolution authorizing the City Manager or her designee to enter an Instructional Service Agreement (ISA) with Los Positas Community College (LPC) to provide contract instruction, assessment, and counseling services from July 20, 2021, to July 19, 2024 for an amount not to exceed $250,000 per fiscal year.
Financial Implications: See report
Contact: Abe Roman, Fire, (510) 981-3473

Consent Calendar

12. Contract: Statewide Prevention and Early Iintervention Project Participation Agreement - California Mental Health Services Authority
From: City Manager
Recommendation: Adopt a Resolution authorizing the City Manager or her designee to execute a Participation Agreement and any amendments with the California Mental Health Services Authority (CalMHSA) to allocate Mental Health Services Act (MHSA) funds in the amount of $65,956 to participate in the Statewide Prevention and Early Intervention (PEI) Project, for a total amount not to exceed $65,956 through June 30, 2022.
Financial Implications: See report
Contact: Lisa Warhuus, Health, Housing, and Community Services, (510) 981-5400

13. Contract: 2022 Community Services Block Grant
From: City Manager
Recommendation: Adopt a Resolution authorizing the City Manager or her designee to accept the Community Services Block Grant (CSBG) Contract Number 22F-5001 for the amount of $274,202 to provide services for low-income people for the period January 1, 2022 to May 31, 2023.
Financial Implications: See report
Contact: Lisa Warhuus, Health, Housing, and Community Services, (510) 981-5400

14. Resoultion Authorizing an Amendment to the Micellaneous CalPers Contract Pursuant to California Government Code 20516
From: City Manager
Recommendation: Adopt a Resolution revising Resolution No 70,081 N.S to initiate a process to amend the contract between the Board of Administration, California Public Employees' Retirement System and the City Council for the City of Berkeley pursuant to California Government Code 20516 to effectuate changes to the cost sharing agreement between the City and Unrepresented PEPRA members in the Unrepresented Employees Group.
Financial Implications: See report
Contact: Donald E. Ellison, Human Resources, (510) 981-6800

15. Contract 32100185 Amendment: Digital Hands for Endpoint Detection and Response (EDR) Monitoring
From: City Manager
Recommendation: Adopt a Resolution authorizing the City Manager to amend contract number 32100185 with Digital Hands, for Cybersecurity Event Monitoring and Security Information and Event Management (SIEM), increasing the previously authorized contract amount by $381,137, for a total not to exceed amount of $996,117.00 from December 15, 2021 to June 30, 2024.
Financial Implications: IT Cost Allocation Fund - $381,137
Contact: LaTanya Bellow, City Manager's Office, (510) 981-7000

Consent Calendar

16. Contract: Alcor Solutions, Inc. for Managed Services and Upgrade Support of the SerivceNow Application
From: City Manager
Recommendation: Adopt a Resolution authorizing the City Manager to execute a contract and any amendments with Alcor Solutions, Inc. to provide managed support services and upgrade support for the ServiceNow application from July 1, 2022 to June 30, 2024 for an amount not-to-exceed $300,000.
Financial Implications: IT Cost Allocation Fund - $300,000
Contact: LaTanya Bellow, City Manager's Office, (510) 981-7000

17. Contract No. 31900197 Amendment: Accela, Inc. for Software Maintenance
From: City Manager
Recommendation: Adopt a Resolution authorizing the City Manager to amend Contract No. 31900197 with Accela, Inc., for software maintenance, increasing the amount by $133,420 for a total not to exceed $2,192,611 from December 12, 2011 to June 30, 2023.
Financial Implications: Various Funds - $133,420
Contact: LaTanya Bellow, City Manager's Office, (510) 981-7000

18. Contract No. 114159-1 Amendment: Tyler Technologies, Inc. for Professional Services and Computer Aided Dispatch (CAD) Software
From: City Manager
Recommendation: Adopt a Resolution authorizing the City Manager to amend Contract No. 114159-1 with Tyler Technologies, Inc. for additional professional services and an extension of the Computer Aided Dispatch (CAD) software, increasing the amount not-to-exceed by $733,720 for a total contract value not-to-exceed $2,288,950, and extending the term of the contract through June 30, 2024.
Financial Implications: Various Funds - $733,720
Contact: LaTanya Bellow, City Manager's Office, (510) 981-7000

19. Donation: New Fencing for a Dog Park at Aquatic Park
From: City Manager
Recommendation: Adopt a Resolution accepting a cash donation in the amount of $26,566 to install fencing for a dog park at Aquatic Park.
Financial Implications: See report
Contact: Scott Ferris, Parks, Recreation and Waterfront, (510) 981-6700

20. Contract: Cumming Management Group, Inc. for Project Management Services for the African American Holistic Resource Center
From: City Manager
Recommendation: Adopt a Resolution authorizing the City Manager to execute a not-to-exceed $900,000 contract with the Cumming Management Group, Inc. for project management services for the African American Holistic Resource Center (AAHRC) for a contract period of January 3, 2021 through June 30, 2025.
Financial Implications: Various Funds - $900,000
Contact: Scott Ferris, Parks, Recreation and Waterfront, (510) 981-6700

Consent Calendar

21. Contract: Get IT Tech – New Electronic Gate System at the Waterfront
From: City Manager
Recommendation: Adopt a Resolution authorizing the City Manager or her designee to execute a contract with Get IT Tech to provide a new electronic gate system at the Waterfront in an amount not-to-exceed of $100,000, which includes a contract amount of $91,748.67 and a 9% contingency in the amount of $8,251.33, rescinding Resolution No. 69,929-N.S.
Financial Implications: Marina Fund - $100,000
Contact: Scott Ferris, Parks, Recreation and Waterfront, (510) 981-6700

22. Contract: Best Contracting Services, Inc. for Fire Station No.3 Re-Roofing Project at 2710 Russell Street. Specification No.20-11408
From: City Manager
Recommendation: Adopt a Resolution:
1. Approving plans and specifications for the Fire Station No.3 Re-roofing Project, Specification No.20-11408;
2. Accepting the bid of Best Contracting Services, Inc. as the lowest responsive and responsible bidder; and
3. Authorizing the City Manager to execute a contract and any amendments, extensions or other change orders until completion of the project in accordance with the approved plans and specifications, for an amount not to exceed $326,733.
Financial Implications: Capital Improvement Fund - $326,733
Contact: Liam Garland, Public Works, (510) 981-6300

23. Purchase Order: Arata Equipment Company for one 18-yard Rear Loader
From: City Manager
Recommendation: Adopt a Resolution satisfying requirements of City Charter Article XI Section 67.2 allowing the city to participate in Sourcewell (formerly NJPA) bid procedures and authorize the City Manager to execute a purchase order for one 18-yard rear loader with Arata Equipment Company in an amount not to exceed $345,000.
Financial Implications: General Fund - $345,000
Contact: Liam Garland, Public Works, (510) 981-6300

24. Ratification of Police Accountability Board's Standing Rules
From: Police Accountability Board
Recommendation: Review and approve Standing Rules of the Police Accountability Board.
Financial Implications: None
Contact: Katherine Lee, Interim Director of Police Accountability, (510) 981-4950

Consent Calendar

25. Authorization for Additional Public Works Commission Meeting in 2021
From: Public Works Commission
Recommendation: Adopt a Resolution authorizing one additional meeting of the Public Works Commission in 2021.
Financial Implications: None
Contact: Joe Enke, Commission Secretary, (510) 981-6300

Council Consent Items

26. Allocating Remainder of Berkeley Relief Fund
From: Mayor Arreguin (Author)
Recommendation: Adopt a Resolution accepting a $28,142.38 payment from the East Bay Community Foundation of funds raised by the Berkeley Relief Fund and authorizing the City Manager to allocate these funds to the following:
$10,000 to the Starry Plough Pub and Music Venue
$18,142.38 to the Eviction Defense Center for the Housing Retention Program
Financial Implications: Berkeley Relief Fund - $28,142.38
Contact: Jesse Arreguin, Mayor, (510) 981-7100

27. Eleventh Annual Martin Luther King Jr. Celebration: City Sponsorship and Relinquishment of Council Office Budget Funds to General Fund and Grant of Such Fund
From: Mayor Arreguin (Author)
Recommendation: 1. Adopt a Resolution co-sponsoring the 11th Annual Martin Luther King Jr. Celebration Breakfast on January 17, 2022.
2. Adopt a Resolution approving the expenditure of an amount not to exceed $500 per Councilmember including $500 from Mayor Arreguin, to the Berkeley Rotary Endowment, the fiscal sponsor of the 11th Annual Martin Luther King Jr. celebration, with funds relinquished to the City's general fund for this purpose from the discretionary Council Office Budgets of Mayor Arreguin and any other Councilmembers who would like to contribute.
Financial Implications: See report
Contact: Jesse Arreguin, Mayor, (510) 981-7100

28. Resolution in Support of Bay Adapt: Regional Strategy for a Rising Bay
From: Mayor Arreguin (Author)
Recommendation: Adopt a Resolution in support of Bay Adapt: Regional Strategy for a Rising Bay.
Financial Implications: See report
Contact: Jesse Arreguin, Mayor, (510) 981-7100

Council Consent Items

29. Budget Referral: Pedestrian Crossing Improvements at Ashby and Acton From: Councilmember Taplin (Author)
Recommendation: That the City Council refers to the FY2023 budget process the funding of Rectangular Rapid Flashing Beacons (RRFB) at Ashby Avenue and Acton Street.
Financial Implications: See report
Contact: Terry Taplin, Councilmember, District 2, (510) 981-7120

30. Budget Referral: Russell Street Bicycle and Pedestrian Improvements From: Councilmember Taplin (Author)
Recommendation: That the City Council refers to the FY2023 budget process the funding of the following bicycle and pedestrian improvements along Russell Street:
Traffic Circle at Russell & King Street
Cycle Track Crossing at Russell & San Pablo Avenue
Pedestrian Hybrid Beacons at Russell & Sacramento Street
Financial Implications: See report
Contact: Terry Taplin, Councilmember, District 2, (510) 981-7120

31. Commit the City of Berkeley to a Just Transition from the Fossil Fuel Economy
(Reviewed by the Facilities, Infrastructure, Transportation, Environment & Sustainability Policy Committee)
From: Councilmember Taplin (Author), Councilmember Bartlett, Councilmember Hahn, and Mayor Arreguin (Co-Sponsors)
Recommendation: Adopt a resolution (1) committing the City of Berkeley to a Just Transition from the fossil fuel economy, that secures a livable future for all Berkeleyans, combats environmental racism, ensures access to good paying jobs, and cultivates economic and social prosperity for Berkeley in the 21st century and beyond and (2) requiring that all Council reports related to climate include a Just Transition section.
Policy Committee Recommendation: On June 2, 2021, the Facilities, Infrastructure, Transportation, Environment & Sustainability Policy Committee took the following action: M/S/C (Harrison/Robinson) to send the item to Council with a positive recommendation as submitted in the supplemental material and further revised to include a recommendation that all Council reports related to climate include a just transition section.
Financial Implications: None
Contact: Terry Taplin, Councilmember, District 2, (510) 981-7120

32. Reaffirming the City Council's Endorsement of a Carbon Fee and Dividend From: Councilmember Taplin (Author)
Recommendation: Readopt Resolution No. 67,595–N.S urging the United States Congress to enact a national revenue-neutral carbon tax and send a copy of the resolution to Representative Barbara Lee, Senator Dianne Feinstein and Senator Alex Padilla urging them to take action.
Financial Implications: None
Contact: Terry Taplin, Councilmember, District 2, (510) 981-7120

Council Consent Items

33. Letter to UC President Michael Drake in Support of Student Researchers United-UAW
From: Councilmember Robinson (Author)
Recommendation: Send a letter to UC President Drake and Provost Michael Brown in support of the full recognition of the Student Researchers United-UAW labor union.
Financial Implications: None
Contact: Rigel Robinson, Councilmember, District 7, (510) 981-7170

34. Support for H.R. 4194: The People's Response Act
From: Councilmember Taplin (Author)
Recommendation: Adopt a Resolution supporting H.R. 4194, the People's Response Act, which would create a Division of Community Safety and provide grants to local governments, state governments, and community-based organizations to support non-carceral approaches to public safety. Furthermore, send a letter of support to Representative Cori Bush, Representative Barbara Lee, Senator Alex Padilla, and Senator Dianne Feinstein.
Financial Implications: None
Contact: Rigel Robinson, Councilmember, District 7, (510) 981-7170

Action Calendar

The public may comment on each item listed on the agenda for action as the item is taken up. For items moved to the Action Calendar from the Consent Calendar or Information Calendar, persons who spoke on the item during the Consent Calendar public comment period may speak again at the time the matter is taken up during the Action Calendar.

The Presiding Officer will request that persons wishing to speak use the "raise hand" function to determine the number of persons interested in speaking at that time. Up to ten (10) speakers may speak for two minutes. If there are more than ten persons interested in speaking, the Presiding Officer may limit the public comment for all speakers to one minute per speaker. Speakers are permitted to yield their time to one other speaker, however no one speaker shall have more than four minutes. The Presiding Officer may, with the consent of persons representing both sides of an issue, allocate a block of time to each side to present their issue.

Action items may be reordered at the discretion of the Chair with the consent of Council.

Action Calendar – Public Hearings

Staff shall introduce the public hearing item and present their comments. This is followed by five-minute presentations each by the appellant and applicant. The Presiding Officer will request that persons wishing to speak use the "raise hand" function to be recognized and to determine the number of persons interested in speaking at that time.

Up to ten (10) speakers may speak for two minutes. If there are more than ten persons interested in speaking, the Presiding Officer may limit the public comment for all speakers to one minute per speaker. Speakers are permitted to yield their time to one other speaker, however no one speaker shall have more than four minutes. The Presiding Officer may with the consent of persons representing both sides of an issue allocate a block of time to each side to present their issue.

Each member of the City Council shall verbally disclose all ex parte contacts concerning the subject of the hearing. Councilmembers shall also submit a report of such contacts in writing prior to the commencement of the hearing. Written reports shall be available for public review in the office of the City Clerk.

Action Calendar – Public Hearings

35. Response to City Council Action on October 26, 2021 regarding Short Term Referral for Amendments to Accessory Dwelling Unit (ADU) Ordinance
From: City Manager
Recommendation: Conduct a public hearing and, upon conclusion, adopt the first reading of a local Accessory Dwelling Unit (ADU) Ordinance [Berkeley Municipal Code (BMC) Chapter 23.306] and amendments to relevant Defined Terms [BMC Chapter 23.502.020] in the Zoning Ordinance.
Financial Implications: None
Contact: Jordan Klein, Planning and Development, (510) 981-7400

36. Response to City Council Action on October 26, 2021 regarding Short Term Referral for Amendments to Accessory Dwelling Unit (ADU) Ordinance to Address Public Safety Concerns
From: City Manager
Recommendation: Conduct a public hearing and, upon conclusion, adopt the first reading of a local Ordinance enacting Chapter 12.99 (Accessory Dwelling Units in Wildfire Hazard Areas) Accessory, and amending (BMC) Chapter 23.306.
Financial Implications: None
Contact: Jordan Klein, Planning and Development, (510) 981-7400

37. Proposed Ordinance Rescinding Ordinance 7,788-N.S. and Amending Paragraph 'NN' of Berkeley Municipal Code Section 19.48.020 ("Amendments to the California Fire Code") to Restore Language Which Existed Prior to October 26, 2021
From: City Manager
Recommendation: Conduct a public hearing and upon conclusion adopt the second reading of an Ordinance which rescinds Ordinance 7,788-N.S. and modifies the language of Paragraph 'NN.' of Berkeley Municipal Code Section 19.48.020 ("Amendments to the California Fire Code) by adopting a building standard which is more restrictive than that standard currently contained in the California Fire Code and restores language which existed prior to October 26, 2021.
Financial Implications: None
Contact: Abe Roman, Fire, (510) 981-3473

38. Public Hearing: Implement Residential Preferential Parking (RPP) Program on the 1600 Block of Lincoln Street
From: City Manager
Recommendation: Conduct a public hearing and upon its conclusion, adopt a Resolution amending Resolution No. 56,508-N.S. Section 25E by adding a subsection to implement Residential Preferential Parking (RPP) on both sides of the 1600 block of Lincoln Street in Area E.
Financial Implications: See report
Contact: Liam Garland, Public Works, (510) 981-6300

Action Calendar – New Business

39. FY 2021 Year-End and FY 2022 First Quarter Budget Update
From: City Manager
Recommendation: Discuss and determine the funding allocations for FY 2022 based on the FY 2021 Excess Equity and Excess Property Transfer Tax for the following: 1) the General Fund Reserves 2) City Manager Budget Recommendations and 3)the Council Budget Referrals approved during FY 2022 to be considered in November 2021.
Financial Implications: See report
Contact: Rama Murty, Budget Office, (510) 981-7000

40. Amendment: FY 2022 Annual Appropriations Ordinance
From: City Manager
Recommendation: Adopt first reading of an Ordinance amending the FY 2022 Annual Appropriations Ordinance No. 7,779–N.S. for fiscal year 2022 based upon recommended re-appropriation of committed FY 2021 funding and other adjustments authorized since July 1, 2021, in the amount of $177,309,914 (gross) and $163,076,585 (net).
Financial Implications: See report
Contact: Rama Murty, Budget Office, (510) 981-7000

41. City of Berkeley's 2022 State and Federal Legislative Platform
From: City Manager
Recommendation: Adopt a Resolution approving the City of Berkeley's 2022 State and Federal Legislative Platform.
Financial Implications: See report
Contact: Dee Williams-Ridley, City Manager, (510) 981-7000

42a. Street Maintenance and Rehabilitation Policy and Five-Year Paving Plan
From: City Manager
Recommendation: Adopt a Resolution updating the Street Maintenance and Rehabilitation Policy and Five-Year Paving Plan.
Financial Implications: See report
Contact: Liam Garland, Public Works, (510) 981-6300

42b. Companion Report: Public Works Commission Recommendation for the Five-Year Paving Plan
From: Public Works Commission
Recommendation: Adopt a Resolution that recommends approval of the Five-Year Paving Plan version 12A ("Arterial Alternative") for FY2023 to FY2027.
Financial Implications: See report
Contact: Roger Miller, Commission Secretary, (510) 981-6700

Action Calendar – New Business

43a. Adopt-a-Spot Program Development Recommendations

From: Public Works Commission and Parks and Waterfront Commission

Recommendation: That Council adopt a Resolution to support and fund two new full-time dedicated Volunteer Coordinators to run an expanded Adopt-a-Spot program and coordinate new programs for youth volunteers, and funding for operational expenses should be included.

The programs shall promote participation and civic pride by providing a unified portal for all programs across all departments, and incorporate many of the Program Elements outlined below. The Coordinators shall build on recent efforts by Public Works staff to fortify the existing programs for storm drains and traffic circles and incorporate existing programs from the Parks & Rec department. In addition, the Adopt-a-Spot program shall be expanded and improved upon to support additional community engagement opportunities that can include, but are not limited to, restoring native habitat to promote biodiversity (including a Bee City USA liaison), litter removal, vegetation maintenance, graffiti removal, tree planting/watering/monitoring, monitoring sidewalk conditions, adoption of homeless encampments, coordinating volunteers for emergency situations, beautification efforts, and other ideas that the Berkeley community may wish to support and organize around.

Some features of the program are beyond the scope of our Commissions' visibility and will need to be finalized by Council and Staff. However, the following recommendations are offered:

Budget Commitment - to ensure success, the two new positions must be dedicated to volunteer coordination. Sharing of responsibilities across staff or financing only a single or half-time position should be avoided as it likely wouldn’t meet the needs of the community. If at least one dedicated position cannot be supported the role of Volunteer Coordinator should be given to a third-party or community non-profit group.

Program Design - the Volunteer Coordinators may work with interns and the community to define program features and details of implementation, which could include a phased approach (alternatively, the City could hire a consultant to outline the program),

Reporting Structure - options include Parks Rec & Waterfront, Public Works, Office of Sustainability, or the City Manager’s office (alternatively, the position could be shared across departments)

Supporting Tools - begin with the fewest but most necessary initial features. For example, policies and waivers, outreach tools such as a robust city webpage presence including dynamic maps and signage to recruit, volunteer reporting mechanisms to ensure compliance and track activity, volunteer appreciation events to build community, etc.

Financial Implications: See report

Contact: Roger Miller, Commission Secretary, (510) 981-6700, Joe Enke, Commission Secretary, (510) 981-6300

Action Calendar – New Business

43b. Companion Report: Adopt A Spot Program Development Recommendations
From: City Manager
Recommendation: Staff appreciates the thoughtful and important Parks and Waterfront and Public Works Commissions (Joint Commission Report) Adopt-a-Spot recommendation and recommends referring it to the FY2023-FY2024 budget process for consideration with other worthy requests.
Financial Implications: See report
Contact: Scott Ferris, Parks, Recreation and Waterfront, (510) 981-6700, Liam Garland, Public Works, (510) 981-6300

Council Action Items

44. Referral to the City Manager to Streamline Accessory Dwelling Unit (ADU) Permit Review and Approval *(Reviewed by the Land Use, Housing and Economic Development Policy Committee)*
From: Councilmember Rashi Kesarwani (Author) and Councilmembers Susan Wengraf, Lori Droste, and Ben Bartlett (Co-Sponsors)
Recommendation: Refer to the City Manager to streamline the Accessory Dwelling Unit (ADU) permitting process in order to reduce staff time spent on review and enhance customer service. Further, assess effectiveness of process improvements specified below by reviewing over time: the number of ADUs permitted, average amount of staff time spent on ADU permit review, and permit fee levels.
Recommend that the City Manager develop for Planning staff use an ADU Universal Checklist and accompanying user-friendly webpage:
ADU Universal Checklist. A clear set of universal guidelines and construction requirements should be developed among staff from Planning (both Land Use and Building and Safety Divisions), Fire, and Public Works Departments that is easy to follow in order to eliminate (or significantly reduce) the need for multiple departments to review ADU permit applications and for multiple rounds of review by the same department. The Universal Checklist should be a single document utilized by (1) all City staff to review ADU permit applications and (2) by customers to understand code requirements and development standards. The Universal Checklist should enable all City staff and customers to have the same clear understanding of all of the requirements that, if adhered to, would expedite the permitting process and lead to lower permit fees over time. *Progress To Date:* Recently, the City of Berkeley's Planning Department has added both a Single-Family ADU/JADU Checklist and a Multi-Family ADU Checklist which clearly delineate development standards as adopted by the State of California, effective January 1, 2020. An ADU Universal Checklist would take these checklists one step farther by including current amendments to Berkeley's local ADU ordinance (once adopted) as well as the full list of fire and safety code requirements.
Accompanying User-Friendly Webpage. As a companion to the ADU Universal Checklist, the City should also create a user-friendly webpage for customers (and prospective customers) with up-to-date information that provides clarity and greater certainty about the process and expected timeline for the creation of an ADU or Junior ADU, which is within a main dwelling unit.

At a minimum, the webpage should include: A list of relevant fees and expected payment amounts for permits, inspections, and other requirements;
Plan requirements, worksheets, and projected timelines for each step of the process; and Consolidated up-to-date state and local regulations that are easy to understand.
Progress To Date: The City now has a dedicated webpage that contains: A Graphic Summary; Table of our local ADU ordinance; An ADU flow-chart detailing allowable development standards; A Single-Family ADU/JADU Checklist; A Multi-Family ADU Checklist; Deed Restrictions Forms; A list of Impact Fees.
Additional information that could prove useful to prospective residents, builders and architects includes: Links to fire safety and emergency access requirements; A list of site conditions that do not warrant easy installation of an ADU; A list of Frequently Asked Questions; Additional frequently requested Planning and Development forms, such as our Tree Protection Instructions and Creek Protection Instructions forms, and our Public Works Engineering forms pertaining to Curbs, Gutters, Sidewalks and Driveway Approaches listed elsewhere on the City of Berkeley website; Information about financing options; and Links to additional resources, such as The Casita Coalition, an organization that disseminates information on policies and programs, best practices, and resources throughout the state.
Recommend that the City Manager consider adoption of the following two best practices: Pre-Approved ADU Design Plans. Consider development of (1) free ADU designs available to download--of varying sizes and styles--that already conform to all City and state requirements and safety codes; and/or (2) a list of vendors with architectural designs, construction drawings, or pre-fabricated units that have already been approved by the City.
ADU Ally. Consider creation of a single point of contact e-mail address dedicated to serving those interested in ADU construction, along the lines of an “ADU Ally.” The ADU Ally would be a customer-facing staff person(s) who is an expert on all current state and local ADU regulations and acts as an ally to customers through the planning and building process. Currently, our Planning Department does have a team of planners with an expertise in ADU laws and requirements, although the public lacks an easy and efficient way to access this team.
Policy Committee Recommendation: On November 4, 2021 the Land Use, Housing and Economic Development policy committee took the following action: M/S/C (Droste/Robinson) Qualified positive recommendation with direction for the item to be updated to include progress already made in this area as described by the Planning Director.
Financial Implications: See report
Contact: Rashi Kesarwani, Councilmember, District 1, (510) 981-7110

Action Calendar – Policy Committee Track Items

45. Health Care Facility Oversight
From: Councilmember Bartlett (Author)
Recommendation: Refer to the City Manager and the Community Health Commission an assessment of the breadth of regulatory control the City of Berkeley can exert on skilled nursing facilities, and create a process of accountability if complaints are found to be substantiated that threaten, or could potentially escalate to the point of threatening, the wellbeing of patients and/or violate federal, state, or local law; the business license of the offending facility will be suspended until the skilled nursing facility submits a report demonstrating rectification of the situation.
Financial Implications: See report
Contact: Ben Bartlett, Councilmember, District 3, (510) 981-7130

46. Consideration of Expansion of Paid Parking to Support the Parking Meter Fund and Improved Pedestrian and Bicycle Facilities
From: Councilmember Hahn (Author)
Recommendation: 1. Refer to the City Manager and the Transportation Commission to consider the extension of paid metered parking to include all days of the week, paralleling the calendar for off-street parking garages.
2. Consider a pilot, phasing-in, and/or exempting certain areas, and conduct broad outreach to merchants, faith-based and other institutions and organizations, neighborhood groups, and others potentially supported or impacted by change.
3. Consider allocation of potential additional revenues to help offset losses to the Parking Meter Fund incurred during COVID. Once the Fund has recovered, consider allocations to support pedestrian and bicycle facilities to help achieve Berkeley's Climate Action and Vision Zero goals on an accelerated basis.
Financial Implications: See report
Contact: Sophie Hahn, Councilmember, District 5, (510) 981-7150

Information Reports

47. City of Berkeley, State Tobacco Prevention Program (STPP) Overview
From: City Manager
Contact: Lisa Warhuus, Health, Housing, and Community Services, (510) 981-5400

Public Comment – Items Not Listed on the Agenda

Adjournment

NOTICE CONCERNING YOUR LEGAL RIGHTS*: If you object to a decision by the City Council to approve or deny a use permit or variance for a project the following requirements and restrictions apply: 1) No lawsuit challenging a City decision to deny (Code Civ. Proc. §1094.6(b)) or approve (Gov. Code 65009(c)(5)) a use permit or variance may be filed more than 90 days after the date the Notice of Decision of the action of the City Council is mailed. Any lawsuit not filed within that 90-day period will be barred. 2) In any lawsuit that may be filed against a City Council decision to approve or deny a use permit or variance, the issues and evidence will be limited to those raised by you or someone else, orally*

or in writing, at a public hearing or prior to the close of the last public hearing on the project.

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Communications to the City Council 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 the City Council, 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 to the City Clerk Department at 2180 Milvia Street. 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 City Clerk Department for further information.

Any writings or documents provided to a majority of the City Council regarding any item on this agenda will be posted on the City's website at http://www.cityofberkeley.info.

Agendas and agenda reports may be accessed via the Internet at
http://www.cityofberkeley.info/citycouncil

COMMUNICATION ACCESS INFORMATION:
To request a disability-related accommodation(s) to participate in the meeting, including auxiliary aids or services, please contact the Disability Services specialist at (510) 981-6418 (V) or (510) 981-6347 (TDD) at least three business days before the meeting date.

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Office of the Director
of Police Accountability

CONSENT CALENDAR
December 14, 2021

To: Honorable Mayor and Members of the City Council

From: Katherine J. Lee, Interim Director of Police Accountability

Subject: Ratification of Police Accountability Board's Standing Rules

RECOMMENDATION
Review and approve Standing Rules of the Police Accountability Board.

FISCAL IMPACTS OF RECOMMENDATION
None.

CURRENT SITUATION AND ITS EFFECTS
The Police Accountability Board ("Board") was established by Measure II, amending the City Charter to create a new structure for civilian oversight of the Berkeley Police Department. The City Council appointed Board members in June 2021 and the Board began meeting the following month. According to Article XVIII, Section 125 (13)(c) of the City Charter, "The Board shall establish rules of procedure governing the conduct of business, which shall be subject to ratification by the City Council."

At its first meeting, held July 7, 2021, the Board adopted temporary Standing Rules. At subsequent meetings, the Board discussed permanent Standing Rules and, at its October 27, 2021 meeting, approved a set of Standing Rules (Attachment 1) for which the Board now seeks the Council's approval.

BACKGROUND
The Police Accountability Board is independent of the City Manager and answerable directly to the City Council. Article XVIII, Section 125 of the City Charter sets forth duties and obligations of the Board with respect to how the Board operates and its subject matter jurisdiction.

City Charter Article XVIII, Section 125 (13)(e) states that, unless otherwise specified, rules of procedure governing the conduct of the Board must comply with the Commissioners' Manual. The Board's Standing Rules elaborate upon some of the procedural rules of the Commissioners' Manual, such as those governing the election of a Chair and Vice-Chair, submission of agenda items, and meeting procedures. Additionally, the Board's Standing Rules establish procedures for powers granted under the City Charter, such as review of Departmental policies, appointment of members of

the public to subcommittees, and commendations of Berkeley Police Department personnel.

The Board voted unanimously at its October 27, 2021 meeting to approved the Standing Rules appearing as Attachment 1. Moved/Second: Calavita/Harris; Ayes – Calavita, Chang, Harris, Leftwich, Levine, Mizell, Moore, Owens, Ramsey; Noes – none; Abstentions – none; Absent – none.

ENVIRONMENTAL SUSTAINABILITY AND CLIMATE IMPACTS
None.

RATIONALE FOR RECOMMENDATION
The City Charter directs the Police Accountability Board to adopt rules of procedure that are subject to ratification by the City Council.

ALTERNATIVE ACTIONS CONSIDERED
None.

CONTACT PERSON
Katherine J. Lee, Interim Director of Police Accountability, Office of the Director of Police Accountability, 510-981-4950.

Attachments:
1: Police Accountability Board Standing Rules, approved October 27, 2021

Pending City Council approval

Police Accountability Board
Standing Rules
Approved Oct. 27, 2021

A. PURPOSE

These Standing Rules are established by the Police Accountability Board to ensure transparency and efficiency of our operations.

B. AMENDMENTS AND REVISIONS

Amendments and revisions to these Standing Rules shall be adopted by a majority vote of the Board, except that the Board may not adopt rules that conflict with the enabling Charter amendment (Measure II) or the Commissioners' Manual.

C. AGENDA ITEMS – REGULAR MEETINGS

Individual Board members shall submit agenda items to the Board secretary by 12:00 noon one week before the meeting date.

D. COMMUNICATIONS

Individual Board members shall submit communications to be included in the agenda packet to the Board secretary by 12:00 noon one week before the meeting date to ensure inclusion in the packet. Communications received after this deadline and before 3:00 p.m. on the meeting day will be distributed via email and/or hard copy at the meeting. If communications are received after 3:00 p.m. on the meeting day, the Board secretary will make every effort, but cannot guarantee, to have hard copies available at the meeting.

E. MEETING PROCEDURES

1. Items shall be introduced by the Board member or staff member who proposed the item. The Chair shall then allow an initial period for discussion by recognizing Board members in rotation to ensure that each Board member has the opportunity to speak before a Board member is allowed to speak again. Board members are allowed a maximum of two minutes to speak each time they are given the floor.
2. After a motion on the item is made and seconded, the Chair will recognize the maker of the motion, and then the seconder, to speak. After that, the Chair will recognize Board members in rotation, giving each Board member the opportunity to speak before a Board member is allowed to speak again. Board members are allowed a maximum of one minute to speak each time they are given the floor, and must confine their remarks to the merits of the motion. The Chair may give the maker of the motion an additional minute to speak before putting the matter to a vote.

3. A pending motion may be modified by a “friendly amendment”; that is, by a proposed amendment that is accepted by the maker and seconder of the motion.
4. Action on a motion may be by either voice or general consent. In either case, the Chair shall repeat, or ask the Board secretary to repeat, the motion before the action.
5. Guest speakers who are not on the agenda may address the Board only by general consent, or upon a formal motion.
6. None of these procedural rules shall supersede the procedures set forth in Robert’s Rules of Order.

F. PUBLIC COMMENT

1. Public comment shall be agendized near the beginning and at the end of each Board meeting. The Chair, subject to the consent of the Board, may determine the time limit for each speaker and the total number of speakers.
2. Before an agenda item is heard, the Chair or Vice-Chair may poll members of the public present to determine if a significant number of them wish to speak on a particular agenda item. If so, the Chair or Vice-Chair may move that public comment on that item can be heard just before the item.

G. POLICY COMPLAINTS AND REVIEWS

1. A request for the Board to review a BPD policy, practice, or procedure may be initiated by a member of the public by filing a policy complaint on a form provided by the Office of the Director of Police Accountability, and is considered a “policy complaint.”
   a) Policy complaints should be reviewed by staff and brought to the Board for discussion and action within 30 days of filing or the next regular meeting of the Board if the 30 days has expired.
   b) Additionally, a public comment period shall be agendized immediately preceding consideration of the policy complaint, limited to comments on that complaint. Policy complainants will be allowed to speak for five minutes. Other members of the public will be allowed up to three minutes; the time allotted is subject to the discretion of the Chair, who will consider the number of persons wishing to speak. Board members may ask policy complainants brief questions. The BPD will be given an opportunity to respond to the Board. The Board may accept the policy complaint upon a majority vote.
2. The Board may initiate a review of a BPD policy, practice, or procedure upon a majority vote.
3. a) For policy complaints or policy reviews, Board members shall then determine how to proceed. Possible actions include, but are not limited to: considering the issue as a whole Board, assigning a Board member to research the issue, asking staff to investigate or research the issue, or establishing a

subcommittee. If a subcommittee is created it will seek BPD involvement in its policy review and, upon completing its review, will present its conclusions and recommendations to the full Board.

b) The full Board may recommend to the BPD, City Manager, or City Council that the BPD adopt a new policy, revise an existing policy, or take no action. Upon conclusion, a policy complaint shall be formally closed by a majority vote of the Board.

H. REGULAR MEETINGS

Regular meetings shall be held on the second and fourth Wednesday of the month, except in the months of August, November, and December. The Board shall not meet in August, and shall meet only on one Wednesday of the month in November and December. Exceptions shall be made when a meeting day falls on a religious holiday.

Regular meetings shall commence at 7:00 p.m., and shall be held at a location or locations as may be determined by the Board, or virtually via teleconference when allowed by an emergency order.

I. ELECTIONS

1. Elections shall be held during the second January meeting of each year. During the Board meeting preceding the election meeting, the nomination of the Chair will precede the nomination of the Vice-Chair, and the following nomination process will be followed for each office:
   a) The presiding Chair declares the nomination process open.
   b) A Board member nominates another Board member or themself. A Board member must be present in order to be nominated and may decline the nomination.
   c) The nomination is seconded (the nomination fails if there is no second).
2. At the second January meeting of the year, the following election process will be followed for each office:
   a) Additional nominations shall occur in accordance with section I.1.
   b) Each nominee is allowed two (2) minutes to express their reason for seeking the position. A nominee may decline this opportunity.
   c) Board members pose questions to each candidate.
   d) The presiding Chair calls for a roll vote and then announces the winner, except in the following circumstances:
      i. If there is only one nominee for a position, the presiding Chair may seek or move a vote by acclamation.
      ii. If a tie occurs among nominees, the presiding Chair will conduct a second round of voting, including any additional nominations.

iii. If a clear winner is still not identified after a second round of voting, the presiding Chair will conduct a coin toss to break the tie and determine a winner. The Board secretary will assign “heads” and “tails.”

3. The Board secretary will record the maker and the second of the nomination motion as well as the total votes and results per office.
4. The outgoing Chair and Vice-Chair will be given the opportunity to make 2-minute departing statements after the election process takes place. The newly-elected Chair and Vice-Chair will assume their positions at the end of the meeting.

J. APPOINTMENT OF MEMBERS OF THE PUBLIC TO SUBCOMMITTEES

1. In accordance with the City Charter, the Chair may appoint members of the public to subcommittees in which they have expressed an interest. Such appointments are subject to approval of the Board. Members of the public seeking to serve on a subcommittee must: a) be residents of the City of Berkeley; and b) present themselves at a Board meeting before or at the time of the appointment and speak on the public record on their intent to serve and what they will bring to the subcommittee work and deliberations.
2. Members of the public appointed to subcommittees are non-voting members and may not be selected to be the subcommittee Chair
3. Board members must constitute a majority of membership of any subcommittee, but a subcommittee may convene and conduct business even if Board members are not a majority of subcommittee members present. However, a quorum of voting members must be present to convene a meeting.
4. The term of appointment for members of the public appointed to subcommittees shall not exceed the life of the subcommittee. If a subcommittee must be reauthorized, any members of the public serving on the subcommittee must be reappointed by the Chair, subject to the approval of the Board.
5. A public member of a subcommittee who is absent from two consecutive subcommittee meetings is automatically removed from the subcommittee, but may be reinstated by the Chair if good cause for the absences is shown.
6. The Chair, subject to the approval of the Board, may remove a member of the public from a subcommittee for good cause. Examples of good cause are: failure to work cooperatively with subcommittee members; unruly or disruptive behavior at meetings; or failure to participate in the work of the subcommittee.
7. All actions by the Chair to appoint, reappoint, or remove a member of a public to or from a subcommittee shall occur at a Board meeting.

K. MUTUAL AID AGREEMENTS

The Board shall constitute a mutual aid subcommittee no later than the first meeting in February of each year to review the compendium of agreements made between the BPD and other law enforcement entities. The Board or the subcommittee may determine which agreements to review.

L. COMMENDATIONS OF BERKELEY POLICE DEPARTMENT PERSONNEL

1. The Board regularly receives copies of communications praising Berkeley Police Department (BPD) personnel for noteworthy service; these commendations are both external (from members of the public) and internal (from fellow BPD or City of Berkeley employees). This process shall be used when the Board desires to bestow additional recognition upon those BPD personnel, or when a Board member on his or her own initiative wants the Board to recognize BPD personnel.
2 The Board may commend or otherwise honor with a special award or recognition an individual sworn officer or civilian employee of the BPD, or a group of officers and/or employees of the BPD, such as a team or division.
3. The Board secretary shall agendize commendations the Board receives from the BPD periodically, as received. A Board member wishing to initiate a commendation or other honor from the Board shall submit the proposal to the Board secretary for placement on the Board agenda in accordance with Section C of these rules. The proposal shall include the name of the person or group to be honored, and a description of the noteworthy action.
4. For the Board to issue a commendation or other honor, the BPD officer, employee, or group must be found to have performed an extraordinary service or performed in an extraordinary manner that meets one or more of the following criteria:
   a) Exceptional valor, bravery, or heroism;
   b) Superior handling of a difficult situation;
   c) An action or performance that is above and beyond typical duties;
   d) Extraordinary compassion, empathy, or kindness.
5. A motion to commend or otherwise honor BPD personnel shall include the act or incident giving rise to the honor and describe how it meets the above criteria. The motion must receive a majority of affirmative votes of Board members present at the meeting to pass.
6. Following the meeting, the Board secretary shall communicate the Board's action in writing to the City Council, and shall also forward the commendation to the Chief of Police, with a request that the commendation or other honor be placed in the personnel file of each sworn officer or civilian employee commended.

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Office of the City Manager

CONSENT CALENDAR
December 14, 2021

To: Honorable Mayor and Members of the City Council

From: Public Works Commission

Submitted by: Margo Schueler, Chairperson, Public Works Commission

Subject: Authorization for Additional Public Works Commission Meeting in 2021

RECOMMENDATION
Adopt a Resolution authorizing one additional meeting of the Public Works Commission in 2021.

FISCAL IMPACTS OF RECOMMENDATION
None.

CURRENT SITUATION AND ITS EFFECTS
The Public Works Commission requests approval to hold a Special Meeting on December 16, 2021, in addition to regularly scheduled Commission meetings, for the purpose of discussing 2022 Work Plan recommendations of its successor, the Transportation and Infrastructure Commission. Submission of this report for authorization of the additional meeting was approved by the Public Works Commission at its October 7, 2021 meeting. It was moved to approve by Freiberg, and seconded by Nesbitt. The other Commissioners present, Hitchen, Schueler, and Napoli, also voted to approve the additional meeting.

BACKGROUND
Resolution No. 68,258-N.S. governs the number of meetings for boards and commissions and places the Public Works Commission in Category B with a maximum of 10 meetings per year. In 2021, the Commission is scheduled to hold 10 regular monthly meetings from January through November, except for August.

ENVIRONMENTAL SUSTAINABILITY AND CLIMATE IMPACTS
There are no identifiable environmental impacts or opportunities associated with this report.

RATIONALE FOR RECOMMENDATION
The additional meeting requested for December is an opportunity for the Commission to review and recommend activities, initiatives, and assignments for incorporation into the 2022 work plan of the proposed Transportation and Infrastructure Commission. The

work planning of the Commission advances the City Strategic Plan Priority Goal of providing state-of-the art, well maintained infrastructure, amenities, and facilities.

ALTERNATIVE ACTIONS CONSIDERED
None.

CITY MANAGER
The City Manager concurs with the content and recommendations of the Commission's Report.

CONTACT PERSON
Joe Enke, Secretary, Public Works Commission and Manager of Engineering, Public Works, (510) 981-6411

Attachments:
1: Resolution

RESOLUTION NO. ##,###-N.S.

AUTHORIZING ADDITIONAL MEETING FOR THE PUBLIC WORKS COMMISSION

WHEREAS, Resolution No. 68,258-N.S. stipulates how many annual meetings are allowed for Berkeley's commissions and places the Public Works Commission in Category B, with a maximum of 10 meetings per year; and

WHEREAS, the Public Works Commission plans to hold another additional meeting in December to develop its Work Plan for 2022.

NOW THEREFORE, BE IT RESOLVED by the Council of the City of Berkeley that the Council authorizes one additional meeting in 2021 for the Public Works Commission.

Office of the Mayor

CONSENT CALENDAR
December 14, 2021

To: Members of the City Council

From: Mayor Jesse Arreguín

Subject: Allocating Remainder of Berkeley Relief Fund

RECOMMENDATION
Adopt a Resolution accepting a $28,142.38 payment from the East Bay Community Foundation of funds raised by the Berkeley Relief Fund and authorizing the City Manager to allocate these funds to the following:

- $10,000 to the Starry Plough Pub and Music Venue
- $18,142.38 to the Eviction Defense Center for the Housing Retention Program

BACKGROUND
In March 2020, at the beginning of the COVID-19 Shelter in Place restrictions, the City Council established the Berkeley Relief Fund. The initial $3 million provided by the City Council to capitalize the fund was supplemented by over $1.5 million in private donations that were held in custodial trust by the East Bay Community Foundation (EBCF). These funds were used to support 700 small businesses, including 251 restaurants, 142 retail establishments, 85 personal services and 222 other businesses, 63 arts organizations, and 214 families with rent assistance. Most of the funds have now been spent, with $78,142.38 remaining and being held at EBCF. Of those funds, $50,000 has been reserved for the COVID-19 Business Damage Mitigation Fund, with $28,142.38 currently unallocated.

This item requests that Council formally accept remaining unallocated grant funds from the East Bay Community Foundation and disburse remaining funding to the following organizations: The Starry Plough for $10,000 and Eviction Defense Center for $18,142.38.

Unlike most live-performance venues, the Starry Plough Pub and Music Venue is classified as a restaurant/bar and up until recently did not have non-profit tax exempt status. Despite being a part of Berkeley's cultural life for over 40 years, this business designation made them ineligible for the COVID-19 Arts Continuity Grant funding which provided larger awards than those provided to small businesses. In fact, the Starry Plough received a $2,500 Business Continuity Grant in 2020, whereas their neighbor, La Pena, which has a restaurant connected to it, but is classified as a cultural venue received a $24,000 Arts Continuity Grant. The Starry Plough has been closed for 20 months and is struggling to reopen. Because the Starry Plough is in a unique situation

compared to other businesses and live-performance venues this item requests that they receive a supplemental COVID-19 Continuity Grant to bring them closer to the amounts provided to arts organizations.

The Eviction Defense Center's Housing Retention Program has been instrumental to providing financial stability to tenants who have been impacted by COVID-19. Grants of up to $10,000 are available, and there still is demand for such grants. Providing an additional $18,142.38 to this program could support two or more households in need of rental assistance.

FINANCIAL IMPLICATIONS
$28,142.38 from the Berkeley Relief Fund, held custodially by the East Bay Community Foundation

ENVIRONMENTAL SUSTAINABILITY
There are no environmental impacts associated with the recommendations in this report.

CONTACT PERSON
Mayor Jesse Arreguín 510-981-7100

RESOLUTION NO. ##,###N.S.

ALLOCATING REMIANING FUNDS OF THE BERKELEY RELIEF FUND FROM THE EAST BAY COMMUNITY FOUNDATION TO THE STARRY PLOUGH PUB AND MUSIC VENUE AND EVICTION DEFENSE CENTER

WHEREAS, Berkeley's businesses and nonprofits have been severely impacted by the COVID-19 pandemic, experiencing extreme reductions of revenue; and

WHEREAS, on March 17, 2020, the City of Berkeley helped to launch the Berkeley Relief Fund by allocating $3 million to grant programs for businesses, nonprofits, arts organizations and renters impacted by the pandemic; and

WHEREAS, the generous residents, business community, and philanthropists of Berkeley have contributed over $1.5 million to the Berkeley Relief Fund to support the community's recovery from the pandemic and the associated economic crisis; and

WHEREAS, staff from the Office of Economic Development launched the Business Continuity Grant program to provide grant funding to businesses and nonprofits that have experienced revenue losses due to the pandemic, and received 1,058 applications; and

WHEREAS, over the past twenty months, these funds have been used to support 700 small businesses, including 251 restaurants, 142 retail establishments, 85 personal services and 222 other businesses, 63 arts organizations, and 214 families with rent assistance; and

WHEREAS, the East Bay Community Foundation is prepared to transfer to the City of Berkeley the remaining $28,142.38 payment of funds held for the Berkeley Relief Fund, which will be deposited into Fund 363- One Time Grant, No Capital Expenditures; and

WHEREAS, the Starry Plough Pub and Music Venue received just a $2,500 Continuity Grant in 2020 because they are classified as a restaurant and not as a live-performance venue, despite being principally a music venue with a bar and restaurant as an incidental use; and

WHEREAS, demand still exists for the Eviction Defense Center's Housing Retention program has been instrumental to providing financial stability to tenants who have been impacted by COVID-19.

NOW THEREFORE, BE IT RESOLVED by the Council of the City of Berkeley that a $28,142.38 payment from the East Bay Community Foundation be accepted to finance grant payments to assist businesses and tenants impacted by the COVID19 pandemic.

BE IT FURTHER RESOLVED that the City Manager is authorized to allocate this funding as follows:

- $10,000 to the Starry Plough Pub and Music Venue
- $18,142.38 to the Eviction Defense Center's Housing Retention Program

Office of the Mayor

CONSENT CALENDAR
December 14, 2021

To: Honorable Members of the City Council

From: Mayor Jesse Arreguín

Subject: Eleventh Annual Martin Luther King Jr. Celebration: City Sponsorship and Relinquishment of Council Office Budget Funds to General Fund and Grant of Such Fund

RECOMMENDATION

1. Adopt a Resolution co-sponsoring the 11th Annual Martin Luther King Jr. Celebration Breakfast on January 17, 2022.

2. Adopt a Resolution approving the expenditure of an amount not to exceed $500 per Councilmember including $500 from Mayor Arreguin, to the Berkeley Rotary Endowment, the fiscal sponsor of the 11th Annual Martin Luther King Jr. celebration, with funds relinquished to the City's general fund for this purpose from the discretionary Council Office Budgets of Mayor Arreguin and any other Councilmembers who would like to contribute.

BACKGROUND

The annual Martin Luther King Jr Celebration, which first started in 2012, strives to bring together a diverse group of East Bay residents to celebrate and continue the work of Dr. Martin Luther King Jr. The purpose of this event is to bring the faith based, business, university, youth and civic communities together to celebrate the life and dreams of Dr. King and to honor adult and youth leaders in our community.

We are proposing that City Councilmembers make individual grants of up to $500 to the Berkeley Rotary Endowment to commemorate and honor Dr. Martin Luther King Jr. The event is being held on January 17, 2022.

FINANCIAL IMPLICATIONS

No General Fund impact; $500 is available from Mayor Arreguin's Office Budget discretionary accounts.

ENVIRONMENTAL SUSTAINABILITY

There are no environmental impacts associated with the recommendations in this report.

CONTACT PERSON

Mayor Jesse Arreguín 510-981-7100

Attachments:
1: Resolution for City Sponsorship
2: Resolution for Council Expenditures

RESOLUTION NO. ##,###-N.S.

CITY SPONSORSHIP OF THE 11TH ANNUAL DR. MARTIN LUTHER KING JR. CELEBRATION

WHEREAS, the Ninth Annual Dr. Martin Luther King Jr. Celebration will take place on January 17, 2022; and

WHEREAS, the purpose of this event is to bring the faith based, business, university, youth and civic communities together to celebrate the life and dreams of Dr. King and to honor adult and youth leaders in our community; and

WHEREAS, historically the Berkeley City Council has generously provided sponsorship for this event.

NOW THEREFORE, BE IT RESOLVED by the Council of the City of Berkeley that the City of Berkeley hereby co-sponsors the 11th Annual Dr. Martin Luther King Jr. Celebration, has permission to use the City's name and logo in the event's promotional materials and signage naming the City of Berkeley as a co-sponsor solely for the purpose of the City indicating its endorsement of the event.

BE IT FURTHER RESOLVED that this co-sponsorship does not: (1) authorize financial support, whether in the form of fee waivers, a grant or provision of City services for free; (2) constitute the acceptance of any liability, management, or control on the part of the City for or over the MLK Jr Celebration; or (3) constitute regulatory approval of the event.

RESOLUTION NO. ##,###-N.S.

AUTHORIZING THE EXPENDITURE OF SURPLUS FUNDS FROM THE OFFICE EXPENSE ACCOUNTS OF THE MAYOR AND COUNCILMEMBERS FOR A GRANT TOPROVIDE PUBLIC SERVICES FOR A MUNICIPAL PUBLIC PURPOSE

WHEREAS, Mayor Jesse Arreguin has surplus funds in his office expenditure account; and

WHEREAS, a California non-profit tax exempt corporation, the Berkeley Rotary Endowment, seeks funds in the amount of $500 to provide the following public services to publicly commemorate and honor the contributions of Dr. Martin Luther King Jr.; and

WHEREAS, the provision of such services would fulfill the following municipal public purpose of bringing the communities across the City, including, but not limited to faith based, business, university, youth and civic communities, together to celebrate the life and dreams of Dr. King and to honor adult and youth leaders in our community.

NOW THEREFORE, BE IT RESOLVED by the Council of the City of Berkeley that funds relinquished by the Mayor and Councilmembers from their Council Office Budget up to $500 per office shall be granted to the Berkeley Rotary Endowment to fund the following services of bringing the communities across the City, including, but not limited to faith based, business, university, youth and civic communities, together to celebrate the life and dreams of Dr. King and to honor adult and youth leaders in our community.

CITY OF BERKELEY
OFFICE OF THE MAYOR

CONSENT CALENDAR
December 14, 2021

To: Honorable Members of the City Council

From: Mayor Jesse Arreguín

Subject: Resolution in Support of Bay Adapt: Regional Strategy for a Rising Bay

RECOMMENDATION
Adopt a Resolution in support of Bay Adapt: Regional Strategy for a Rising Bay.

BACKGROUND
The Bay Adapt Joint Platform (Attachment 1) is the result of a stakeholder-led process to determine the best ways for the Bay Area to become regionally resilient to rising sea levels. While the Bay's shoreline constitutes one-third of the California coastline, the Bay Area will likely experience two-thirds of the negative economic impacts due to the flooding caused by rising sea levels absent adequate measures to adapt and protect people, places, and habitat. In the face of this challenge, the Bay Area must protect and energize vulnerable and historically marginalized frontline communities, enhance and restore an ecosystem that is already deeply affected by human activities, and reduce flood risks for existing built infrastructure along the vast bay shoreline. Implementing Bay Adapt will reduce flood risks for communities, businesses, infrastructure, and habitat, increase technical assistance for local governments and funding for adaptation, protect natural areas and wildlife, recognize and equitably support low-income, frontline communities, robustly integrate adaptation into community-focused local plans, and accelerate permitting and project construction of local adaptation projects.

ENVIRONMENTAL IMPACT
Increasingly frequent and severe impacts of climate change in the Bay Area do not conform to our governments' jurisdictional boundaries or the planning and regulatory authorities of any one agency or organization. Bay Adapt begins to address these challenges by laying out a set of guiding principles, priority actions, and vital tasks that public, private, and nonprofit organizations, including local governments with land use authorities, can voluntarily implement in a coordinated and collaborative manner to adapt faster, better, and more equitably to a rising San Francisco Bay.

FINANCIAL IMPLICATIONS
Financial implications to the City of Berkeley will be addressed through subsequent initiatives that support Bay Adapt: Regional Strategy for a Rising Bay.

CONTACT PERSON
Jesse Arreguín, Mayor, (510) 981- 7100

ATTACHMENTS
1. Bay Adapt: Regional Strategy for a Rising Bay - Joint Platform (October 2021)

RESOLUTION NO. ##,###-N.S.

SUPPORT OF BAY ADAPT: REGIONAL STRATEGY FOR A RISING BAY

WHEREAS, climate change is accelerating rising sea levels, increasing storm frequency and intensity, and moving groundwater toward the surface. The confluence of more intense winter storms, extreme high tides, and higher runoff, with higher sea levels, will increase the frequency and duration of shoreline flooding long before areas are permanently inundated by sea level rise alone; and

WHEREAS, a major storm within the next decade in the Bay Area could result in temporary flooding impacts to 13,000 existing housing units and 70,000 planned housing units, 28,000 socially vulnerable residents, 104,000 existing jobs and 85,000 planned jobs, and 20,000 acres of wetlands habitat that may become permanently inundated within 40 years; and

WHEREAS, there are multiple local, regional, state, and federal government agencies with authority over the Bay and its shoreline, and while local governments have broad authority over shoreline land use they have limited resources to address climate change adaptation; and

WHEREAS, individual local actions, absent a regional context in which to make policy decisions, will lead to a “tragedy of the commons”; and

WHEREAS, the San Francisco Bay Area is a vibrant, diverse, ecologically unique, innovative, and pioneering region that will be deeply and deleteriously affected by climate change without tremendous effort and investments to adapt to a constantly changing shoreline. The San Francisco Bay shoreline constitutes approximately one-third of the California coastline, but the Bay Area is estimated to experience two-thirds of the negative economic impacts due to the flooding that would occur absent adequate measures to adapt and protect people, places, and habitat; and

WHEREAS, the Bay Area region’s most socioeconomically vulnerable frontline communities are at the greatest risk of exposure to climate threats, and the impacts of historic and ongoing social and economic marginalization will compound the risks posed by flooding to those communities by reducing a community’s or individual’s ability to prepare for, respond to, and/or recover from a flood event; and

WHEREAS, the Bay ecosystem is already stressed by human activities that have drastically lowered its adaptive capacity, and climate change will further alter that ecosystem by inundating or eroding remaining wetlands, changing sediment dynamics, altering species composition, increasing the acidity of Bay waters, changing freshwater flows and/or salinity, altering the food web, and impairing water quality. Moreover, further loss of tidal wetlands will increase the risk of shoreline flooding; and

WHEREAS, flood damage to vital shoreline development, public infrastructure, and facilities such as neighborhoods, commercial centers, airports, seaports, regional transportation facilities, landfills, contaminated lands, and wastewater treatment facilities

absent adaptation will require costly repairs and likely will result in the interruption or loss of vital services, large-scale social dislocation, and degraded environmental quality; and

WHEREAS, the increasingly frequent and severe impacts of climate change in the Bay Area do not conform to jurisdictional boundaries or the planning and regulatory authorities of any one agency or organization; and

WHEREAS, in 2019, BCDC, in collaboration with a Leadership Advisory Group composed of 35 Bay Area public, private, and non-profit leaders, embarked on the development of "Bay Adapt," a consensus-driven strategy for regional sea level rise adaptation. The Leadership Advisory Group includes representatives from numerous public agencies, including the Association of Bay Area Governments/Metropolitan Transportation Commission (MTC/ABAG), San Francisco Bay Regional Water Quality Control Board, State Coastal Conservancy, Caltrans, BARC, BART, East Bay Regional Parks, US Army Corps of Engineers, San Francisco Bay Restoration Authority, San Francisco Public Utility Commission, Marin County, and BCDC, as well as environmental justice, environmental, business, scientific, civic, organizations, local government and flood manager networks, and academia; and

WHEREAS, in 2020 and 2021, hundreds of stakeholders participated in the creation of the "Bay Adapt Joint Platform" through nine Leadership Advisory Group meetings, two public forums, many expert Working Group meetings, ten community and stakeholder focus groups, over 50 presentations to local governments around the region, and a month-long public feedback opportunity; and

WHEREAS, the Bay Adapt Joint Platform lays out a set of guiding principles, priority actions, and vital tasks whose implementation will enable the region, and most notably local governments, to adapt faster, better, and more equitably to a rising San Francisco Bay. If fulfilled, it will reduce flood risks for communities, businesses, infrastructure, and habitat; increase technical assistance for local governments and funding for adaptation; protect natural areas and wildlife; recognize and equitably support low-income, frontline communities; robustly integrate adaptation into community-focused local plans; and, accelerate permitting and project construction of local adaptation projects; and

WHEREAS, the Bay Adapt Leadership Advisory Group supports the Joint Platform and many members agreed to help implement it at its October 2021 meeting, the BARC Governing Board endorsed it on September 17, 2021, and BCDC adopted the Joint Platform on October 21, 2021; and

WHEREAS, implementing the Joint Platform's many and varied actions and tasks goes beyond the capacity of any single organization or jurisdiction, requires strong and diverse leadership and participation in all aspects of its implementation, and a broad coalition of stakeholders share responsibility for the success of the tasks outlined in the Joint Platform.

NOW, THEREFORE, BE IT RESOLVED, that the City of Berkeley supports the Bay Adapt Joint Platform, a regional strategy for a rising Bay, including the guiding principles, actions, and tasks contained within, and looks forward to championing and supporting the implementation of Bay Adapt to ensure that it serves Berkeley and the Bay Area as a whole in achieving resilient and equitable adaptation to sea level rise.

BAY ADAPT

Regional Strategy for A Rising Bay

October 2021

JOINT PLATFORM

BAY ADAPT

Regional Strategy for A Rising Bay

Joint Platform

October 2021

Contents

Photo credits | Page 2 from top to bottom: Jaclyn Mandoske (BCDC), Schyluer Olsen (BCDC), Jaclyn Mandoske (BCDC); Page 3 Illustration by Sophia Zaleski.

Getting ready for sea level rise

The Bay is rising. The time to come together to act is now.

For most of the eight million of us who live around San Francisco Bay, sea level rise seems like a sleeper issue. As we walk the dog along our favorite waterfront, the waves don't seem any taller. As we wait in traffic at the Bay Bridge toll plaza, the water level looks the same as ever. After a storm, however, those trying to traverse Corte Madera's Lucky Drive, Sonoma's Highway 37, or San Jose's 237 underpass are noticing more water. Sea level rise is already here and starting to affect our highways and commutes; another foot or two will seriously impact our homes, jobs and safety.

It's subtle, but the Bay, fed by a swelling Pacific and melting glaciers and ice sheets, is growing faster than you think. The rise is slow and steady now, but around 2040 scientists project it will speed up. By then, in the time it will take a current pre-schooler to graduate from college, it will be too late to start to prepare for the water that will be rising onto our airport runways and into our shoreline streets. And though you can't see it, the groundwater table is also rising under your feet – pushed up as the Bay pushes in. Before long a big storm—like the train of atmospheric river events that drenched us over and over in 2017—will bring water into our basements and BART stations, onto our bridge approaches, our ballparks, and even release decades of toxic pollution into our groundwater.

Going into another California drought and devastatingly dry fire season, it's easy to push sea level rise to the back of our minds. But the San Francisco Bay Area metropolitan region stands to be one of the hardest hit coastal areas in North America. Sea level rise will be worse here than other places for a variety of reasons relating to our unique ocean conditions, atmospheric changes, and Pacific geography—and the fact that we've built our roads and homes right up to the edge of nearly every shore. Impacts are influenced by our history of toxic dumping and exclusionary land use practices. We've done the studies - we know what's at risk when it comes to our people, our homes, our habitats, and our commutes. The threat is no longer vague. It's past time for us to get ready.

At Risk of Flooding by 2060*

28,000 socially vulnerable **residents**

1,900 residents living near **contaminated sites**

13,000 **existing housing** units and another **70,000** **new housing** units

104,000 **existing jobs** and another **85,000** **new jobs**

20,000 acres of **wetlands**, lagoon and tidal marsh habitat

5 million daily highway **vehicle** trips

60,000 daily rail **commuters**

*Impacts from flooding that could occur at 48" Total Water Level from the ART Bay Area Regional Sea Level Rise Vulnerability and Adaptation Study. According to California State Guidance, under the H++ scenario, which represents the highest risk and least likely scenario, sea level rise could reach 46.8" by 2060, which corresponds to ART's 48" TWL scenario. Under the Likely Range, or Low-Risk Aversion high-emissions scenario, 48"of sea level rise will not occur until 2120. Photo courtesy of the King Tides Project.

Community members enjoy the waterfront at Heron's Head park in San Francisco. Photo by the Port of San Francisco licensed under CC BY 2.0.

Preparing for the flooding, erosion, disruptions and losses to come – whether our home, business, commute, or favorite picnic area – is something we all have to do together. Whatever the best local solution, we have to consider our neighbors. If well-to-do waterfront towns build sea walls, the Bay will just find the next weak spots on the shore and flow there. That town next door may have a smaller tax base or more elderly or vulnerable residents. If we leave them unprotected, families will be forced to move away from their homes, schools and places of worship - their communities - sometimes with no place else to go. Waiting for the aftermath of this slow-moving disaster will just cost the region more later in emergency services, habitat loss, building repairs, and lost family time and productivity.

Many of our families came to this region for its freedoms, natural beauty, diverse cultures and myriad opportunities. Over the decades we've grown even more diverse, and ever more activist as we battle to save our local creek, or stop devastating air pollution, or fight for equity. We're restoring wetlands around the Bay, and taxing ourselves to do it, enhancing a natural first line of defense against flooding. So as we face down the advancing Bay we don't have to start from scratch. Your city, your county, your regional government is already working on it. Now it's time for everyone to join the effort.

As we face down the advancing Bay we don't have to start from scratch. Your city, your county, your regional government is already working on it. Now it's time for everyone to join the effort.

There's no way around the need to think and plan like a region - the water that's coming knows no boundaries. Space for solutions is limited. Together, we can adapt to the increasingly scary checklist of challenges in the Bay Area. But we won't get this done, and minimize the cost we pay in damage to lives and property, if we don't act now, together.

Sea level rise as an equity challenge

Tackling disproportionate impacts on vulnerable communities.

While everyone will feel the impacts of sea level rise to some degree, many factors have led to disproportionate flooding and sea level rise vulnerability for low-income communities across the Bay Area and the nation. A 2019 study by the National Academy of Sciences on urban flooding in the US revealed the populations that are most vulnerable to flooding are nonwhite, non-native English speakers, elderly, poor, chronically ill, uninsured, and renters[1].

While it is broadly accepted that environmental racism has been an overarching theme for civilizations throughout history, it is critical to understand the patterns of racial injustice that formed today's cities and towns. After Emancipation, white decision-makers forced African Americans into undesirable areas that experienced frequent flooding, unhealthy air, and unsanitary water and sewerage conditions. Industry and chemical plants were regularly constructed close to predominantly Black neighborhoods, which led to lingering pollution and high rates of cancer within these communities. In the Bay Area, this often meant pushing nonwhite communities to the marginalized and often toxic Bay shoreline. These discriminatory and deadly practices continued for several decades.

Equity is the fair and just distribution of financial and institutional resources to address impacts across communities that stand to be adversely affected by those impacts, and commitment to include those communities in the development, prioritization, and implementation of adaptation policies, programs, and services.

Definition of equity provided by West Oakland Environmental Indicators Project and the Pacific Institute.

Community members participating in the Oakland Shoreline Leadership Academy. Photo by Jordan Greedy.

1 Committee on Urban Flooding in the United States (2019). *Framing the Challenge of Urban Flooding in the United States*, National Academy of Sciences. https://www.nationalacademies.org/our-work/urban-flooding-in-the-united-states

Nuestra Casa's Parent Academy provides programs for community members and has begun environmental justice community trainings. Screenshot courtesy of Nuestra Casa.

Working *with* and listening *to* community voices.

Recognizing the critical importance of community voices and perspectives on the development of the Joint Platform, the Bay Adapt team partnered with Nuestra Casa in East Palo Alto and Vallejo Housing Justice Coalition in Vallejo to conduct a series of community focus groups. Community members were introduced to flooding issues specific to their communities and invited to share their experiences, concerns, and priorities for their communities.

In East Palo Alto, community voices were represented by African American, Pacific Islander, and Latinx cohorts, while in Vallejo, community voices were represented by residents involved in a range of local organizations such as housing, climate change, environmental justice, and others. Bay Adapt recognizes that these community meetings provided an essential first step in building trust with communities, and that continued participation and partnerships must continue to advance equitable adaptation outcomes for the region.

> *"We know we need action, but we're not ready and we don't know what to do. We need to get to solutions."*
>
> *- East Palo Alto Community Member*

Residents of these communities have often attended countless public meetings and focus groups to discuss concerns in their communities with engineers, planners, and other government staff, but these professionals are rarely trained or experienced in equitable community engagement. Historically, attempts to inform meaningful solutions for environmental justice problems have been met with lack of accountability by local and regional agencies, leading to high levels of distrust between communities and governments.

The cumulative impact of underinvestment coupled with lack of government accountability over the decades has led to an extremely disproportionate and inequitable situation for the residents of these communities.

This cycle adds insult to the daily injury of living in marginalized space and is exhausting to communities that are already struggling to meet their daily needs.

A landmark moment for the environmental justice movement occured in 1994, when President Clinton signed Executive Order 12898, a federal action to address environmental justice and included a formalized definition (the definition can be found in BCDC's report Toward Equitable Shorelines: Environmental Justice and Social Equity at the San Francisco Bay). This definition underpins the ethos that should be imbued in any sea level rise planning process or solution.

What is Bay Adapt?

A regional strategy for a rising bay.

Adapting to sea level rise will require a broad range of planning, policy, community, and project decisions that promote the protection of people, infrastructure, and natural systems. In such a diverse and engaged region, adaptation will also require balancing many interests and needs, ranging from the health of the most vulnerable residents and the Bay ecosystem to local economic growth and jobs, services, housing, and recreational opportunities.

Much adaptation will and should occur at the local city or county levels, where adaptation planning is already accelerating. However, we live in a highly networked region where impacts in one area, and responses to them, have cascading effects around the Bay. A coordinated approach across the region can reduce unintended consequences and greatly enhance local efforts. Collective action can be expedited by shared goals that help communities find and enact their own solutions. No one agency, jurisdiction or community can or should go it alone.

For the past five years, the Bay Area has been thinking about this problem in earnest. Forward-thinking planners, scientists and activists have already laid some important groundwork, and pinpointed the areas and communities that will be most at risk. Since 2019, Bay Adapt has worked to establish regional agreement on the actions necessary to protect people and the natural and built environments from rising sea levels.

Bay Adapt was convened by the San Francisco Bay Conservation and Development Commission (BCDC), a state agency, in partnership with a broad range of Bay Area leaders. The principles, actions, goals, and tasks in this document—a Joint Platform for adaptation—were developed in close collaboration among BCDC staff, a large Leadership Advisory Group, and hundreds of stakeholders.

We envision a Bay Area that is resilient and adaptive far into the future. As the region grows and changes, such resilience can only be achieved by supporting collaborative action, fostering greater equity among residents, and sustaining the unique ecosystems we all rely upon and thrive within.

Co-creating the Joint Platform.

In 2019, BCDC convened a Leadership Advisory Group (LAG) made up of a diverse group of Bay Area leaders from public agencies, interest groups, community-based organizations, and academia. Throughout 2020 and 2021, stakeholders participated in dozens of working group and small committee meetings to discuss and shape the Platform. The Platform was also informed by two public forums, ten community and stakeholder focus groups, over 50 presentations to boards and groups around the region, and an Environmental Justice Caucus convened regularly throughout the process. In other words, this platform, and the ideas in it, belong to everyone, and seek to serve everyone, now and into the future.

This platform, and the ideas in it, belong to everyone, and seek to serve everyone, now and into the future.

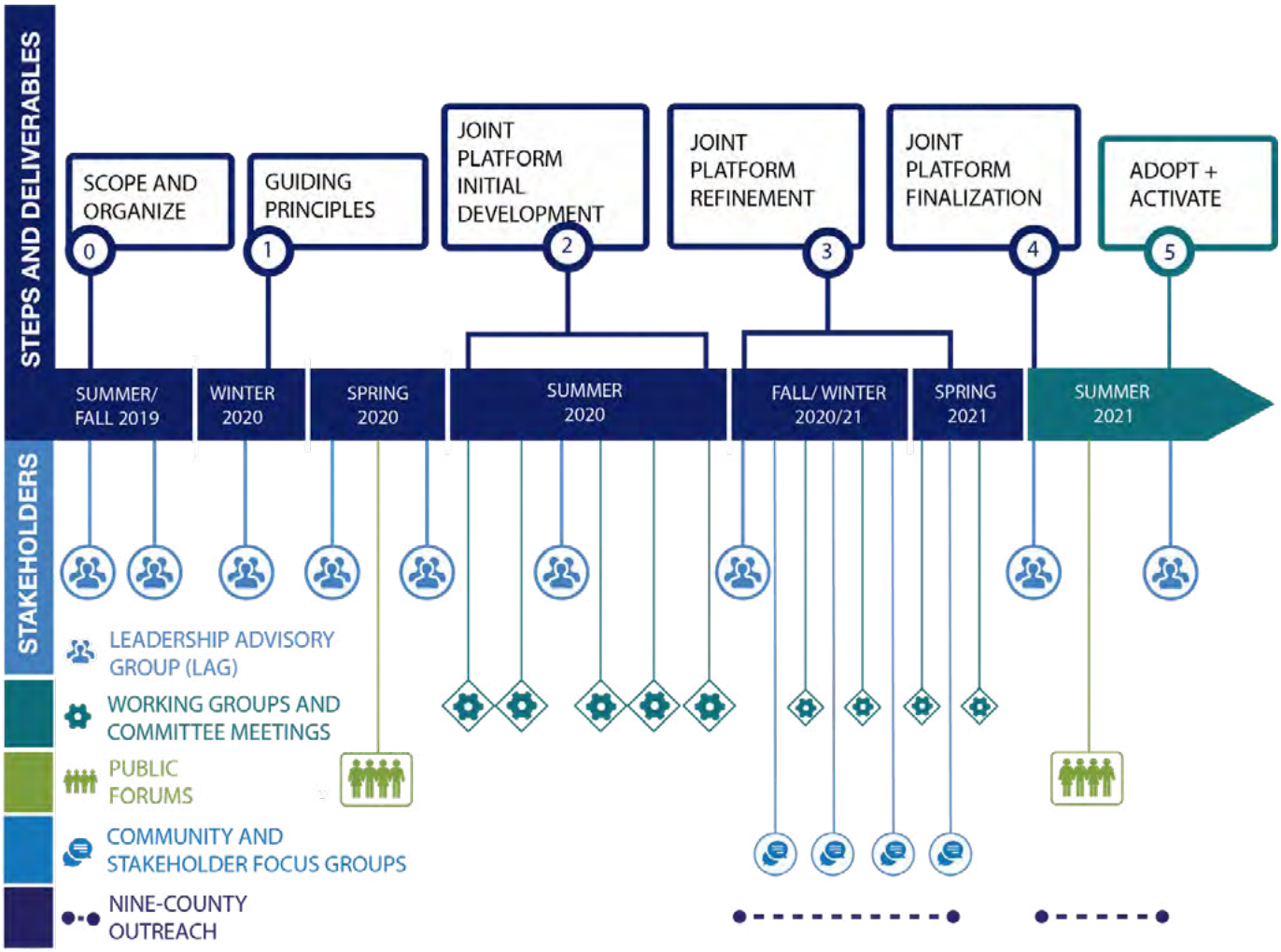


Figure 1 | The Bay Adapt process kicked off in late summer 2019. The development of the Joint Platform started in early summer 2020, convening hundreds of stakeholders to brainstorm and refine the series of actions and tasks laid out in the final Joint Platform. Over this time period, Bay Adapt also facilitated multiple working groups, committee meetings, public forums, community and stakeholder focus groups, and conducted extensive outreach throughout the nine-county Bay Area. Implementation of the tasks begins in Fall 2021.

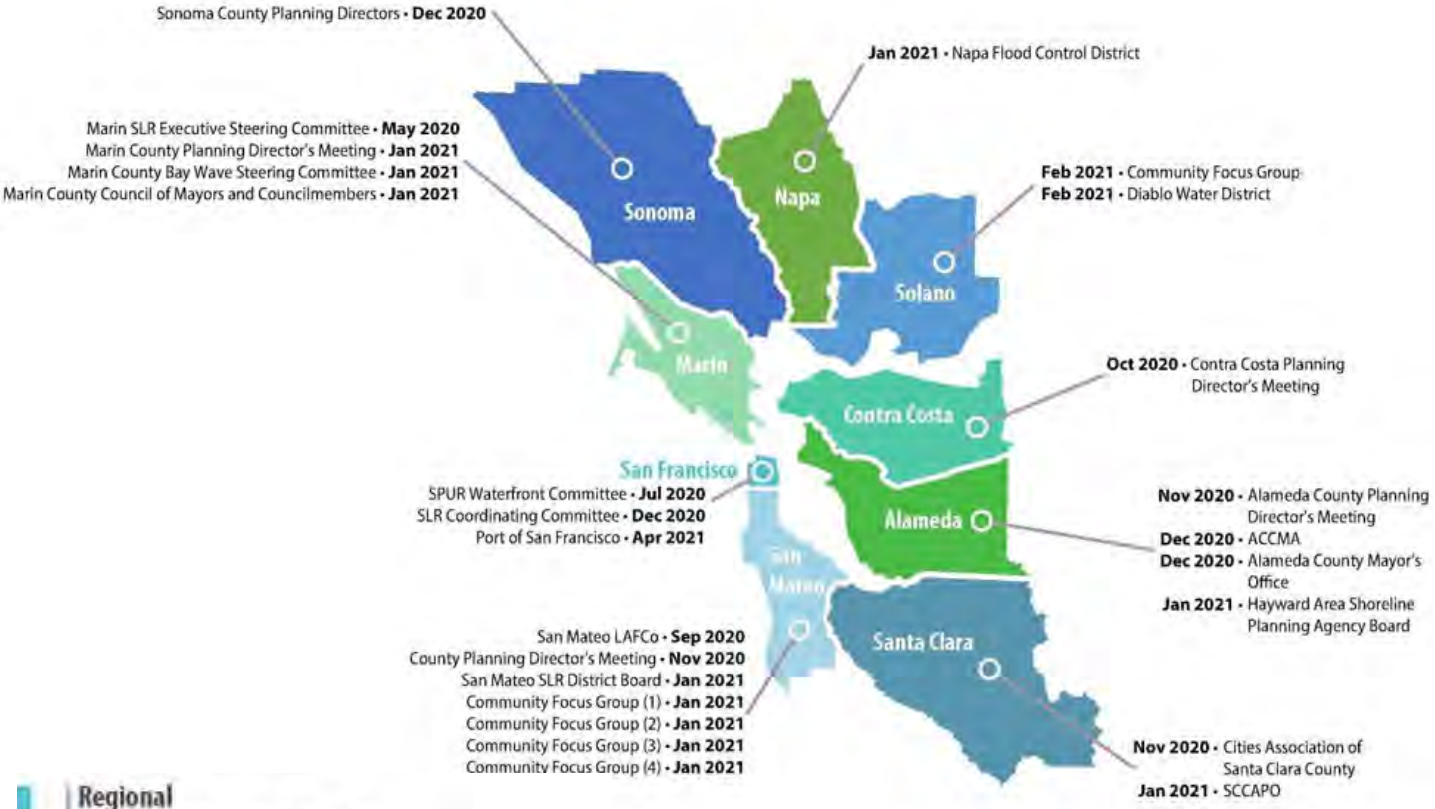


Figure 2 | Summary of the presentations and focus groups BCDC staff led throughout the Bay Adapt process between 2019 and 2021. Staff engaged with a wide variety of community members, local staff, elected officials, and special interest stakeholders throughout the engagement process.

Community forums on sea level rise risks in East Palo Alto.
Photo by Jaclyn Mandoske, BCDC.

Prioritizing and elevating equity in Bay Adapt.

In an effort to ensure equity perspectives were present and included in the leadership of Bay Adapt, invitations were extended to at least five environmental justice-focused organizations to join the LAG, comprising the Environmental Justice (EJ) Caucus. The EJ Caucus received a small honorarium for their participation.

The EJ Caucus kicked off by providing a training to the LAG on EJ principles. During this training, LAG members explored how to embed principles on environmental justice, equity and inclusion into Bay Adapt's planning process, the Joint Platform, and in implementation. EJ Caucus members also provided leadership to Working Groups and met with BCDC's Environmental Justice Manager to provide input and feedback before and after each LAG meeting.

However, all of the equity practices and benefits outlined in the Joint Platform will not be achieved if the agencies and other stakeholders implementing the actions don't fundamentally change their practices to explicitly ensure that equity is front and center. Agencies and stakeholders need to deeply understand the factors that have led to inequity and commit to ongoing training to learn and improve a new essential set of skills and work directly with EJ communities in order to achieve equity benefits.

Without this commitment, the region will continue to repeat the same inequities as our predecessors. Bay Adapt is an opportunity to set a new, more equitable course for climate adaptation.

Two critical themes emerged during discussions with the EJ Caucus and other community leaders:

- The need for **fair and equitable funding for community partners**, including targeted employment and economic opportunities for diverse frontline community members; and
- **Capacity building, administrative support, and technical training and assistance** are essential to realizing truly equitable adaptation planning.

Setting the foundation for the Joint Platform.

Rather than specifying individual projects, the Joint Platform lays out guiding principles that inform overarching region-wide actions, goals and tasks. Its aim is to overcome barriers, accelerate keys to success, and share targets to help the region achieve:

- **Flood protection and reduced flood risk** for communities, businesses, infrastructure, and habitat.
- Robust integration of adaptation into **community-focused local plans**.
- Recognition, elevation, and support for **frontline communities.**
- Accelerated permitting and **faster project construction** for priority adaptation projects.
- **Technical assistance** for local governments to plan and implement projects faster.
- **More funding** for adaptation that is easier to get.
- **Metrics** for deciding what makes the best kind of adaptation plan or project (equitable, efficient, multi-benefit, nature-based, and coordinated with others) and for tracking local and regional progress.

Engaging the entire region in collective action requires clear agreement on the path forward and checks and balances to ensure no voice is left unheard, and no community left behind. This Platform provides that roadmap for adaptation.

The Joint Platform will help the Bay Area engage in faster, better, and more equitable adaptation to a rising Bay.

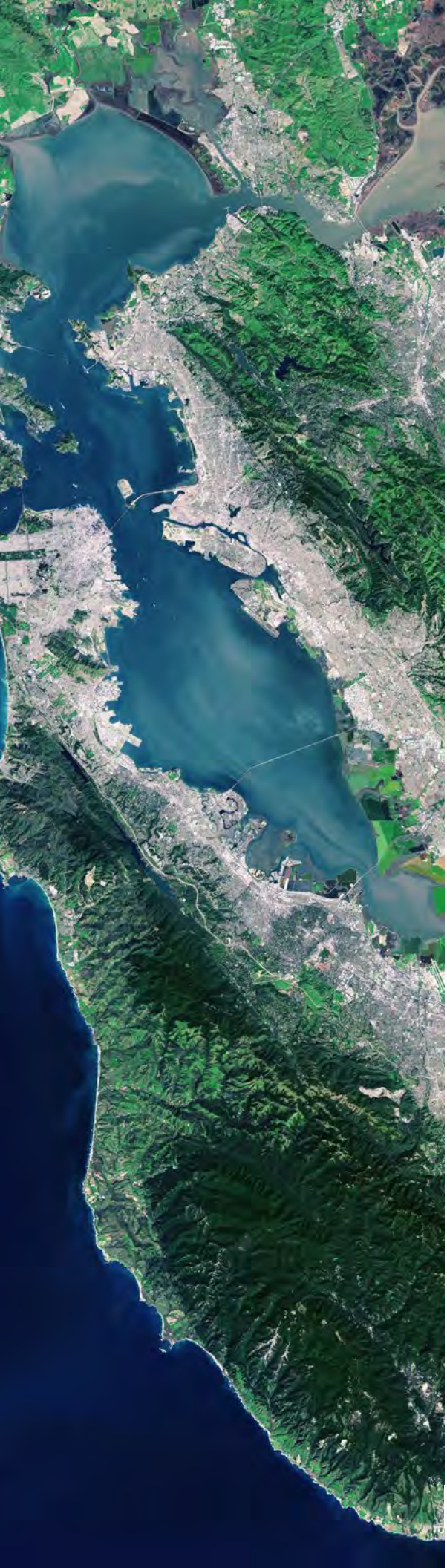
Sea level rise in our regional plans.

Plan Bay Area 2050 is the region's long-range strategic plan focused on the interrelated elements of housing, the economy, transportation and the environment. Adopted in Fall 2021, Plan Bay Area 2050 is the first multi-topic plan of its kind to question what the future will look like in the face of sea level rise and other natural hazards. How will these threats impact housing, transportation, environmental, and economic goals? What are the consequences if we don't plan ahead?

Starting with Horizon, Plan Bay Area 2050's preliminary research and analysis phase, MTC/ABAG integrated the best available sea level rise mapping into imagining the impacts of sea level rise within the 2050 timeline of the plan. To address areas of near-term sea level rise impacts, Plan Bay Area incorporated an Adapt to sea level rise strategy, mapping protections on vulnerable portions of the shoreline and calculated at $19 billion need for adaptation over the next thirty years.

Plan Bay Area 2050's Implementation Plan, which sets the strategic direction to advance strategies in the next five years, identifies key actions that MTC/ABAG and its partners should take to adapt the region to sea level rise. While these actions are compatible with Bay Adapt's tasks and will be implemented in partnership with Bay Adapt, they are part of a larger, multi-element plan and do not go into the level of detail on sea level rise that Bay Adapt does.

Plan Bay Area has been, and will continue to be, a critical tool for region-wide resilient land use decisions as sea levels rise. The Plan will continue to grow to become a comprehensive plan that brings in key regional topics, and will incorporate the best available science and regional sea level rise planning envisioned by Bay Adapt. MTC/ABAG will continue to be a key partner for planning, funding, and implementing adaptation solutions in the Bay.



Where do we start?

Preserving what we care about.

The Bay Area is the most culturally and geographically diverse region in the United States, with people of color comprising 59% of our population. More than 75% of residents believe that racial diversity is what makes the Bay Area such a great place to live. Our region is also called the "Bay Area" for a reason — the Bay is the defining characteristic of our geography and defines so much of our economy, infrastructure, and lives.

Residents cherish the beautiful blue expanse of San Francisco Bay, and their ability to walk beside it, sail over it, and gaze across its open horizons. With its diverse habitats—beaches, wetlands, grasslands, tidal flats, lagoons and more—the Bay supports hundreds of species, ranging from critically endangered salmon and marsh mice to charismatic sea lions, busy beavers, and wayward whales. Thanks to decades of careful stewardship and public investments in shoreline parks and habitats, the West Coast's largest Estuary is both more habitable and healthier for humans and wildlife alike.

Our diversity of people and habitats also supports one of the most innovative economies in the world. The Bay Area is a hub of technology, industry, agriculture, services, and more, though this has created significant challenges in income equality.

Within this context is both diversity and inequity. Across our communities, cities, and counties, we have different histories, different challenges and different opportunities. Deciding which climate change adaptation options are right for each community can be complex. Many people contribute to making these decisions, and lots of considerations go into deciding what the right solutions may be for each particular waterfront.

If we are to prepare ourselves fully for sea level rise throughout the region, cities and counties must work with local communities and the state and federal governments to make decisions about what should—and shouldn't—exist along the shoreline in the future.

San Francisco Bay Area. Photo courtesy of NASA satellite imagery.

Centering and protecting people, habitats, and wildlife.

The risks from sea level rise, and the resources necessary to address those risks, are unequally distributed among communities and ecosystems across the Bay Area.

In order to understand community vulnerability to sea level rise, BCDC's Adapting to Rising Tides (ART) Program leverages existing research on socioeconomic characteristics that may reduce ability to prepare for, respond to, or recover from a hazard event or impacts from environmental burdens. It has identified potential impacts to communities from current and future flooding including:

- Loss of property and income; displacement from their communities.
- Disrupted access to medical care and other critical services.
- Loss of power and utilities.
- Spread of disease and worsened pre-existing health conditions.
- Physical and mental distress resulting from the flooding of homes and infrastructure.

The Bay has also long been a dumping ground for polluted waste and industrial sites are still located along many parts of the shoreline. In addition to flood impacts, sea level rise may mobilize pollution as flooding becomes more prevalent, spreading to communities and ecosystems at an unprecedented rate.

All of these impacts are often disproportionately distributed to populations with certain existing socioeconomic vulnerabilities. Additionally, these populations tend to be highly sensitive to impacts, leading to potentially devastating implications from even minor flooding.

Natural ecosystems are also disproportionately impacted by sea level rise. When given a choice between an endangered salmon and a farm, a wetland or a vineyard, a nesting island or a waterfront hotel, it can be difficult

Vulnerable Communities Exposed to Sea Level Rise Around the Bay

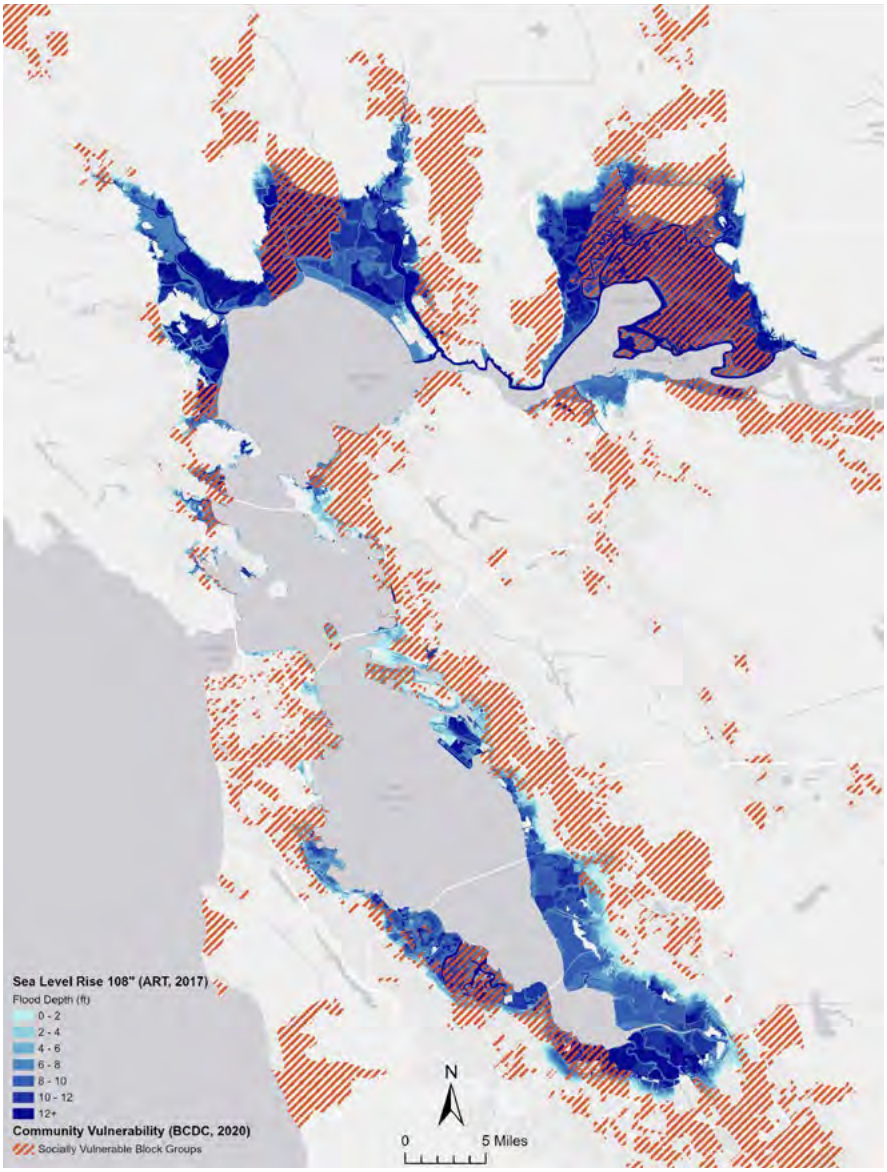


Figure 3 | Map of census block groups considered socially vulnerable in their ability to plan for, respond to, and recover from natural hazards (orange hash) and flooding depth and inundation from 108 inches of sea level rise (blue). Data from ART Bay Area Regional Sea Level Rise Vulnerability and Adaptation Study: Chapter 2.6 Vulnerable Communities (March 2020).

Communities Exposed to Contamination and Sea Level Rise Around the Bay

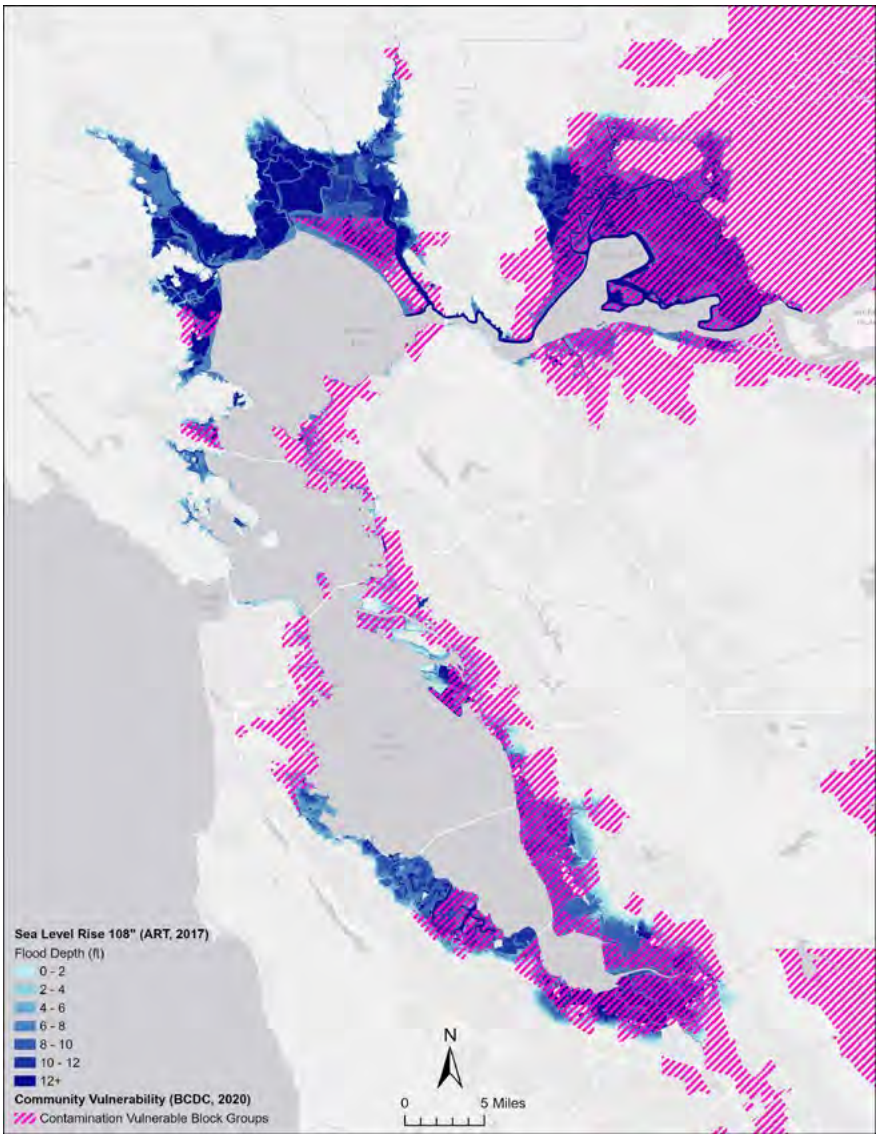


Figure 4 | Map of census block groups considered contamination vulnerable based on subset of Cal Enviro Screen 3.0 indicators impacted by flooding and flooding depth and inundation from 108 inches of sea level rise (blue). Data from ART Bay Area Regional Sea Level Rise Vulnerability and Adaptation Study: Chapter 2.6 Vulnerable Communities (March 2020).

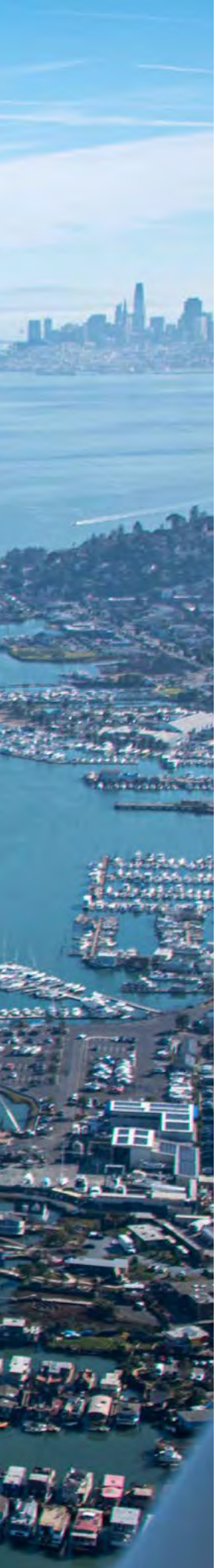
for wildlife and open space to prevail in the battle over human priorities and money. Preserving shoreline habitats will require prioritizing sediment to built up wetlands and providing room for habitats to migrate upslope. But sediment is limited and many wetlands abut development and levees.

The health of Bay ecosystems is inextricably linked to our way and quality of life. We continue to learn how nature protects people from natural disasters and improves public health. But as water levels rise coastal habitats risk being drowned and lost. Both nature, and people, will suffer.

Our efforts now will affect the health and livability of the Bay Area for generations.

The Joint Platform places a high value on both the region's diverse people and its ecosystems. Throughout the formation of the Joint Platform, a coalition of community advocates, environmental activists, and adaptation practitioners have made clear that cleaning toxic sites and reducing future pollution is a priority for our region. The resulting document explicitly acknowledges the disproportionate risks and burdens on communities of color and other historically marginalized populations, and tasks in the Joint Platform begin to outline how our region can begin to right generations of wrongdoing through elevating the role of vulnerable communities in developing solutions, filling in knowledge gaps about the challenges they face, mapping hazardous sites, and more. With people at the center of solutions, the Bay region can be a national model for equity in resilience planning.

The Joint Platform tasks also prioritize natural habitats to support a healthy, resilient Bay. Going green, meaning prioritizing nature-based strategies for shoreline adaptation as much as possible, is already a regional priority. Taking actions to support healthy Bay ecosystems now and as sea levels rise is essential, not only for the many other benefits they provide but as they are also our first —and most at risk —line of defense from rising seas. Our efforts now will affect the health and livability of the Bay Area for generations.



Guiding Principles of the Joint Platform

Support socially vulnerable communities

Actively ensure that socially vulnerable communities don't just bounce back in the face of sea level rise, but "bounce forward" by providing additional resources and support to areas where socially vulnerable communities live, work, and play and reducing negative impacts to these communities. Climate change will disproportionately impact marginalized communities with fewer resources.

Put nature first whenever possible

Prioritize natural infrastructure solutions that benefit ecosystems and the health of the Bay as well as people, especially in the near-term. Adapting to rising sea level will require a mix of green and gray infrastructure. Working with nature, instead of against it, can produce better results for both people and wildlife.

Solve interconnected problems at the same time

Prioritize adaptation actions that maximize regional risk reduction to flooding and sea level rise and minimize tradeoffs within the context of other regional priorities such as housing, economy, social equity, habitat protection, and other climate risks. Sea level rise and flooding is just one of several regionally interconnected crises facing the Bay Area.

Practice inclusive, community-led governance and decision-making

Remove barriers and enhance capacity to increase transparent, coordinated decision-making among community members and organizations and local, regional, state, and federal governments that acknowledges and leverages the unique roles, responsibilities, and authorities at each scale. Adaptation outcomes will better protect the entire region when all interests, including those who know their neighborhoods and communities best, contribute and collaborate in reducing risk.

Support existing efforts but plan for the long term

Support, encourage, and learn from early innovators charting a new course for the region, especially for wetland restoration, while maintaining a long-term vision for more complex planning and investments. Early action is important for regional learning, setting precedents, and shorter-term flood control, and widespread or significant capital investments require careful and collaborative planning.

Pick the right strategy for the right place at the right time

Ensure that local and regional investment strategies to address flooding and sea level rise are grounded in local needs, conditions, and plans, and are phased to allow for uncertainty, flexibility, and iteration. The Bay is a collection of distinct places with unique physical and social conditions and there is no "one size fits all" solution – or timeline - to address climate-related impacts.

The San Francisco Bay connects nine counties and millions of people together. Photo SF Baykeeper, Cole Robb Most, and LightHawk.

What does adaptation look like?

Developing targeted solutions.

In climate change, adaptation is different from mitigation, which are the ways we try to reduce our carbon footprint. Adaptation refers to making changes to how we live in the face of change to reduce hazards and increase resilience to future conditions.

In the Joint Platform, adaptation specifically means the plans and projects that either prepare us for sea level rise or alter our shorelines to reduce its impacts.

In some cases, we will adapt by restoring natural wetlands to absorb more water and buffer us from storms, while in other places when nature-based solutions are not feasible, we will build higher protections, such as seawalls, to keep water out. We may also avoid building new roads or homes in areas that are likely to flood or provide migration space for wetland habitats. Sometimes adaptation may even require removing things that are already built out of harm's way. Adaptation also will spur innovative solutions as we learn how to co-exist with more water in the future.

The adaptation solutions we choose in one part of the Bay are inextricably linked to everywhere else along the shoreline. Since the Bay is an interconnected system, flood protection measures in one location of the Bay may increase the risk of flooding in other areas. It is critical that we consider shoreline solutions as a whole Bay, rather than on a project-by-project basis.

Bay Adapt helps to set the stage for successful adaptation region-wide. While each community will need to decide which approach is best now and over time, the actions in Bay Adapt help support multiple adaptation approaches within the larger regional context we need to think about before it's too late.

Regional Hot Spots Around the San Francisco Bay

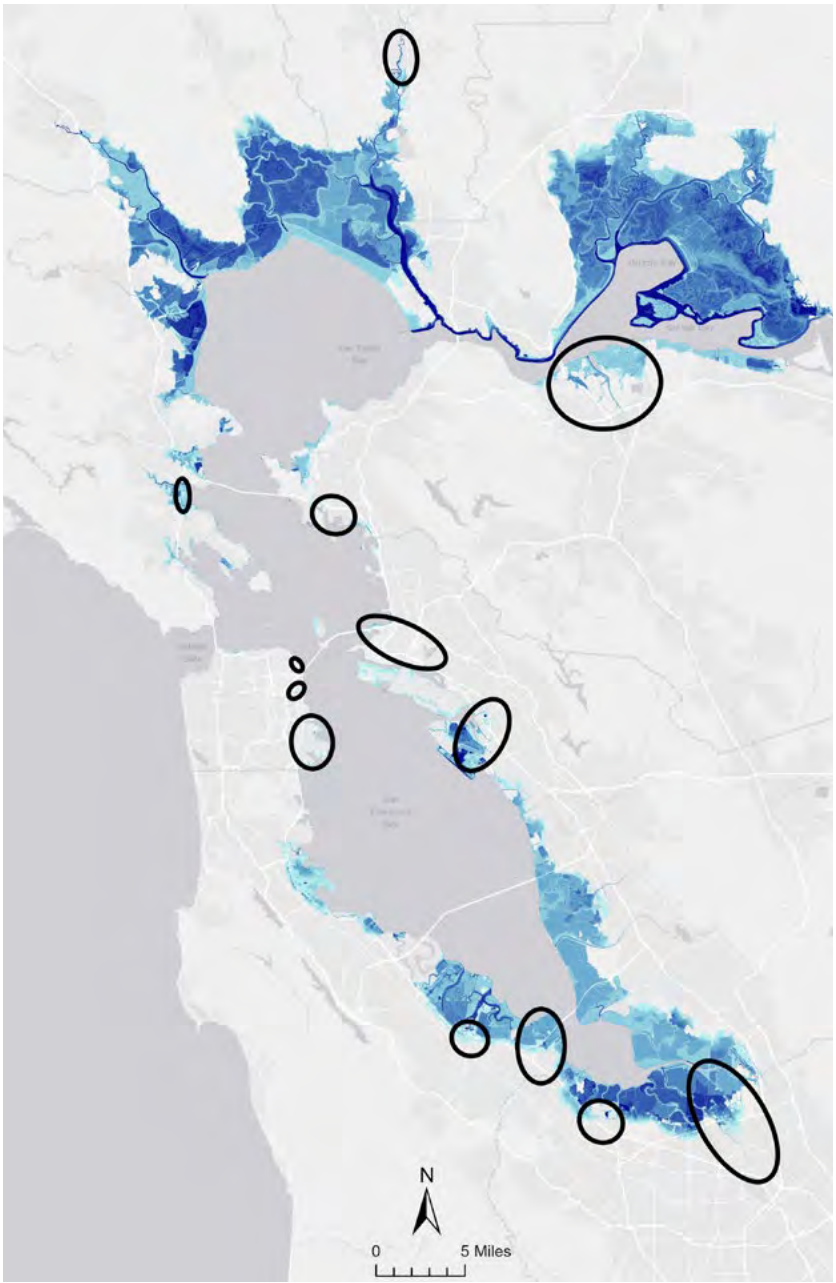


Figure 5 | Regional "hot spots" identify areas in the region with highest consequences from flooding at 108" TWL to both vulnerable communities, transportation networks, and urban growth areas or open space. Data from ART Bay Area Regional Sea Level Rise Vulnerability and Adaptation Study: (March 2020).

Adaptation Actions that Prepare

- Actions that help us set the stage to make decisions about what to do next that are equitable, inclusive, and based on science, local knowledge and values, such as increasing information or community capacity.
- Changes to regulatory environments, political settings, land use, or other contexts for decision-making that improve the outcomes of adaptation decisions.
- Agreement on a shared approach about who makes decisions, what informs those choices, and how we plan and fund those decisions equitably to addresses disproportionate impacts on the most vulnerable.

Adpatation Actions that Protect, Accommodate, Avoid or Retreat

- Actions that change the physical characteristics of the shoreline, such as integrating natural ecosystems (green infrastructure) and/or building engineered structures (gray infrastructure) to protect shorelines from flooding.
- Projects that accommodate flooding such as preserving transition zones for wetlands, elevating structures, or using flood resistant materials.
- Efforts to retreat from the shore, such as removing existing development or avoiding placing new development in areas at risk of flooding.

Sea level rise will change our way of life in the Bay Area dramatically. Our daily commutes, the goods and services we depend on, the places where we live and work, the natural spaces that provide habitats and make the Bay Area a beautiful place to live, will all be affected. The Bay Adapt Joint Platform's 6 Guiding Principles, 9 actions and 21 tasks suggest a way forward for us all.

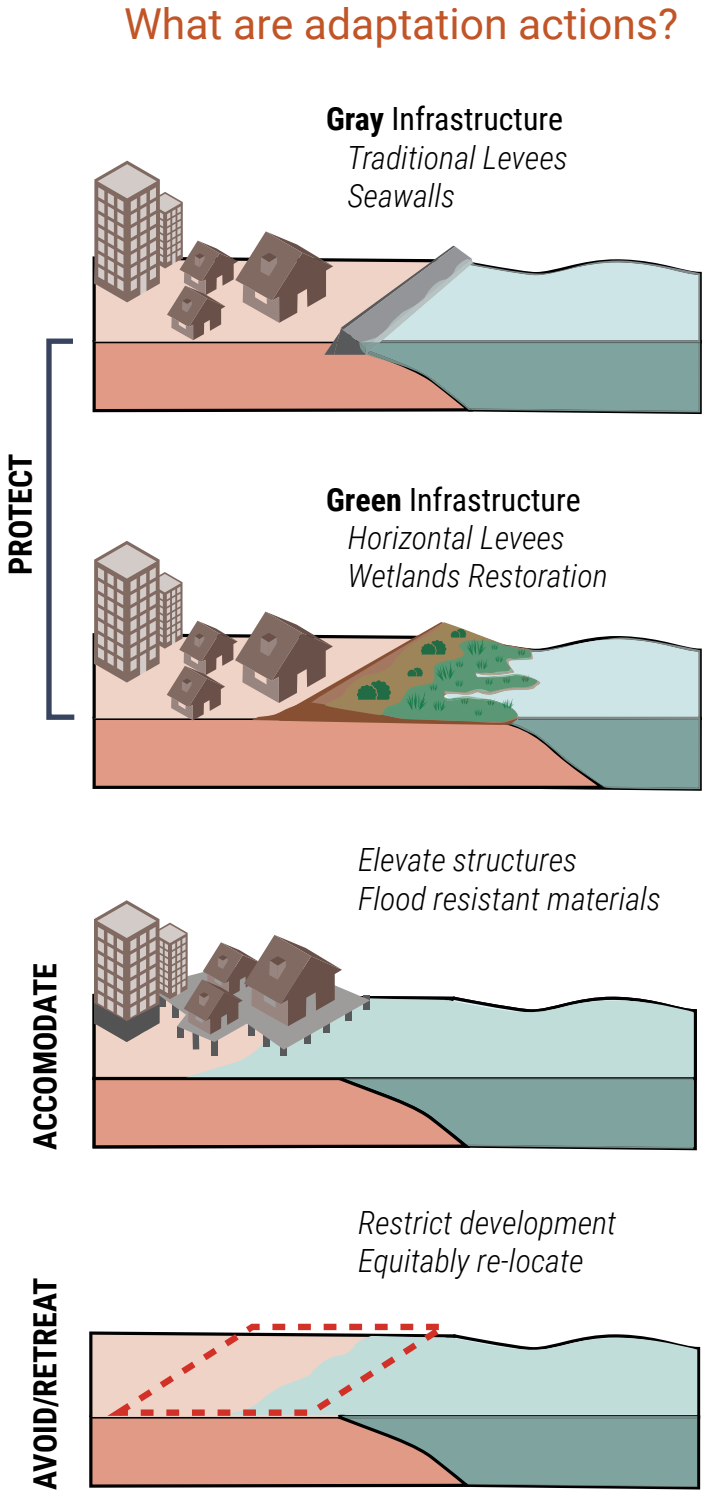


Figure 6 | Different adaptation approaches facilitated by the actions in Bay Adapt seek to prepare the region to equitably respond to sea level rise, while also strengthening implementation and ensuring lessons are learned over time.

The Joint Platform

9 actions, 21 tasks, 1 region *moving forward together*

PEOPLE

Action 1: Collaborate on a "One Bay" vision to adapt to rising sea levels.

Task 1.1: Create a long-term regional vision rooted in communities, bay habitats, and the economy.

Task 1.2: Lay the foundation for a proactive regional legislative agenda.

Action 2: Elevate communities to lead.

Task 2.1: Improve how communities and public agencies learn from each other and work together.

Task 2.2: Fund the participation and leadership of community-based organizations (CBOs) and frontline communities in adaptation planning.

INFORMATION

Action 3: Broaden public understanding of climate change science and impacts.

Task 3.1: Tell local and regional stories about people and places adapting to climate change.

Task 3.2: Weave climate literacy into school programs.

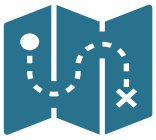
Action 4: Base plans and projects on the best science, data, and knowledge.

Task 4.1: Align research and monitoring with information gaps.

Task 4.2: Make scientific data, information, and guidance easier to use.

Task 4.3: Increase access to technical consultants for local adaptation partners.

PLANS



Action 5: Align local and regional plans into a unified adaptation approach.

Task 5.1: Provide incentives for robust, coordinated adaptation plans.

Task 5.2: Align state-mandated planning processes around adaptation.

Action 6: Figure out how to fund adaptation.

Task 6.1: Expand understanding of the financial costs and revenues associated with regional adaptation.

Task 6.2: Establish a framework for funding plans and projects.

Task 6.3: Help cities and counties expand ways to fund adaptation planning and projects.

PROJECTS

Action 7: Refine and accelerate regulatory approvals processes.

Task 7.1: Accelerate permitting for equitable, multi-benefit projects.

Task 7.2: Assess environmental regulations and policies that slow down progress on projects.

Action 8: Fund and facilitate faster adaptation projects.

Task 8.1: Incentivize projects that meet regional guidelines.

Task 8.2: Encourage collaboration among people doing projects in the same places.

Task 8.3: Facilitate faster construction of nature-based projects.

PROGRESS

Action 9: Track and report progress to guide future actions.

Task 9.1: Measure regional progress using metrics and share results.

Task 9.2: Monitor and learn from pilot projects.

PEOPLE

As we adjust the way we live, work, and play to adapt to a changing climate, we must act together with a true regional vision and ensure that this transition does not reinforce pre-existing inequities. Who will lead who will decide, and how do we all get on the same page? Frontline communities that feel the most acute impacts from sea level rise have local knowledge critical for equitable solutions. Likewise, legislators in Sacramento and Washington need to hear our collective voice loud and clear—two-thirds of the State's total sea level rise impacts will occur in the Bay Area, so our collective voice must be strong.

People learning about shoreline restoration. Photo by LEJ from Estuary News from March 2021.

ACTION 1

Collaborate on a "One Bay" vision to adapt to rising sea levels.

Goals:

- A shared vision for regional adaptation that reflects the Bay Area's diverse conditions and communities.
- A proactive legislative agenda supporting sustained Bay Area adaptation.

TASK 1.1: Create a long-term regional vision rooted in communities, bay habitats, and the economy.

Engage communities and stakeholders in envisioning a resilient future shoreline, relying on grassroots input from start to finish. Using Bay Adapt's Guiding Principles to guide the process, it should define and articulate what successful adaptation should like at ground level, and around the Bay, beginning in the most at-risk frontline communities.

The vision must be built on a deep understanding of communities' unique social, cultural, economic, and physical needs and be developed through a participatory, transparent, and iterative process and create opportunities for diverse stakeholders to learn about each other and have conversations.

The vision must also be built on regional environmental, housing, transportation, recreation, economic and other priorities, including visions already established for these sectors, such as in Plan Bay Area 2050 or the San Francisco Estuary Blueprint.

The vision should be expressed through multiple deliverables that will be utilized throughout many other tasks included in the Joint Platform, including:

- A "vision statement" for the Bay shoreline that sets a long-term picture of successful adaptation.
- Regional and sub-regional objectives, tied to measurable metrics (such as safety, equity, a functioning and thriving ecosystem, reuse of sediment resources, shoreline access, and economic growth), to be used for tracking progress in Task 9.1.
- Specific regional and sub-regional strategies, actions, and an assessment of priority project locations, types, and timelines, building off existing analysis such as on vulnerable communities, Bay interconnectedness, and the Adaptation Atlas. This can be used in conjunction with the above guidelines to incentivize and prioritize the right kinds of actions in the right locations.
- Guidelines, evaluation methodologies, and technical modeling capacities for evaluating local plans and projects for funding and other incentives that align with desired outcomes (Tasks 5.1, 6.2, and 8.1).

How the regional vision can inform Joint Platform actions

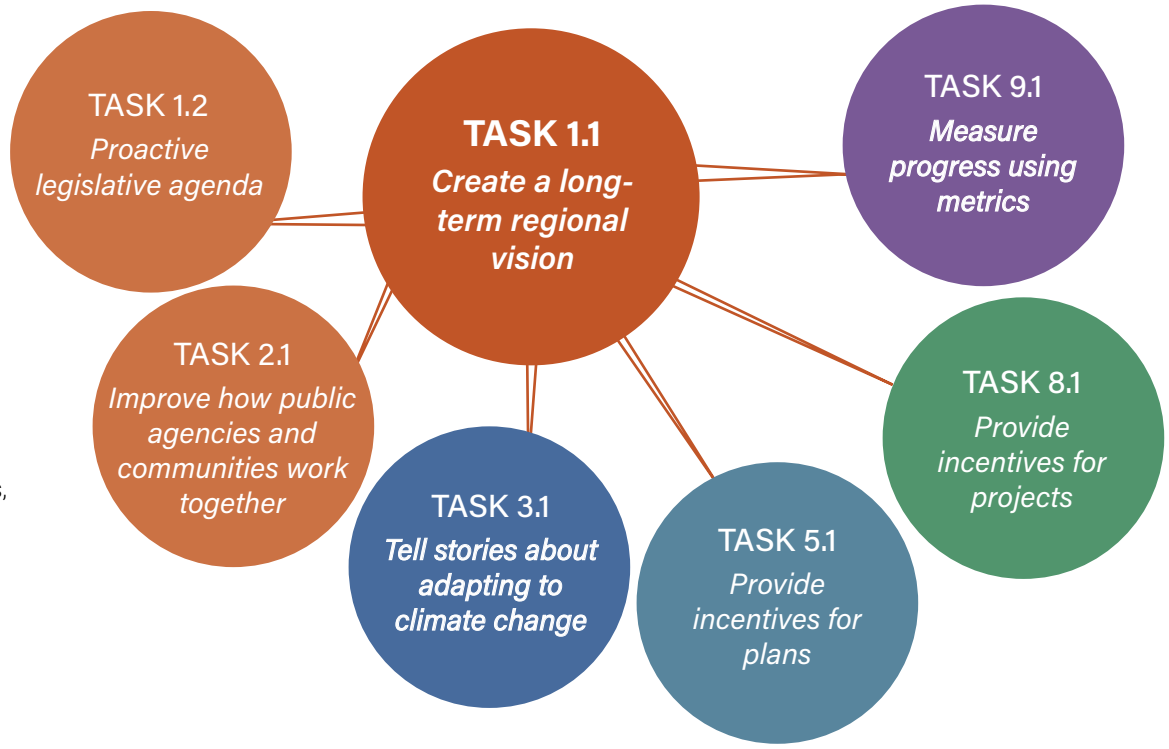


Figure 7 | Many different tasks outlined in the Joint Platform flow from the vision, guidelines, and metrics outlined in Task 1.1, either directly or indirectly.

TASK 1.2: Lay the foundation for a proactive regional legislative agenda.

Build a unified advocacy voice for Bay Area adaptation needs. In the short term (next two years), pilot a legislative working group to work toward consensus on regional priorities and shared criteria for future legislation while taking advantage of opportunities within current state and federal legislative sessions. Foster relationships with state and federal legislators to lay the groundwork for future legislation. Build support for the nine-county Bay Area as the focus for new regional climate adaptation programs. In the mid-term (2-4 years), build support for multi-year sources of funding for a wide range of adaptation activities, such as a regional ballot measure. Identify and collectively advocate for additional regional priorities that would require legislation, such as regulatory changes, planning guidance, new fiscal authorities, and funding support. In the long term (5+ years), coordinate, update and communicate legislative needs on a biennial basis, such as through an annual legislative agenda.

Action 1 Benefits

EQUITY
Elevates frontline community voices in long-term regional visioning and advocacy.

ENVIRONMENT
Elevates environmental advocacy voices in long-term regional visioning and advocacy.

ECONOMY
Elevates business and economic voices in long-term regional visioning and advocacy.

ACTION 2

Elevate communities to lead.

Goals:

- Adaptation grounded in local vision and needs.
- Increased capacity of community members, especially those historically excluded from decision-making, to contribute to the process.
- Long-term funding that supports sustained community leadership and equitable partnerships among communities and governments.

TASK 2.1: Improve how communities and public agencies learn from each other and work together.

Build community capacity to influence government and support a region-wide training program led by communities and geared towards government to shift values towards place-based expertise. Adopt and share best practices for equity-focused adaptation decision-making throughout the region. Ensure that best practices nurture meaningful relationships, center community concerns and priorities, and make community and social benefits clearer.

Support community leaders in raising awareness and capacity within their own communities. Host trainings for communities on sea level rise risks, adaptation options, community storytelling, and best practices for engaging effectively with governments. Whenever possible, choose community-based organizations (CBOs) or community members to lead trainings geared toward government and communities.

Training topics for agency staff may include general environmental justice and local histories, community mapping, culturally appropriate communication, meaningful community engagement at all phases of planning, use of community benefit agreements, alternative approaches to traditional cost-benefit analyses that elevate community value, and measuring successful engagement.

"Conversations and decisions are being made without the community's input. How do we make sure that people's stories and perspectives are at the forefront?"

- East Palo Community Focus Group Participant

Ideas for the Bay Area

***The Greenlining Institute**, an Oakland-based advocacy group, has created a guidebook to help users embed equity in a meaningful way in climate adaptation and community resilience policies and programs. Access the Guidebook.*

*A coalition of community organizations in East Oakland partnered with the City of Oakland to secure a **Transformative Climate Communities** grant for local equitable climate planning. City staff and community groups collaborated on the scope of work, goals, and budget for the project. The resulting community-driven plan led to a $28 million implementation grant. Access the Plan.*

*The **West Oakland Environmental Indicators Project** received a Restoration Authority grant to lead a Shoreline Leadership Academy to raise the capacity of local frontline community residents to engage and lead in climate adaptation. Participants are paid for their time to develop plans for the shoreline while increasing their knowledge and participation.*

*The **Resilient Communities Initiative** created an equity checklist and sample partnering agreement that could be a model for successful future partnerships. Access them Here.*

*The **Bay Area Regional Health Inequities Initiative (BARHII)** recently released a new report on best practices for community engagement to create healthy and resilient communities. This report can serve as a resource for governments. Access it Here.*

Community forum in East Palo Alto on rising sea level. Photo by Jaclyn Mandoske, BCDC.

TASK 2.2: Fund the participation and leadership of CBOs and frontline communities in adaptation planning.

Establish a stable and ongoing funding program to support frontline communities and CBOs as full partners and leaders in adaptation planning. Use the funding to build and sustain community capacity to participate in decision-making as described in Task 2.1. Support CBO operating expenses, staffing, stipends for community representatives in planning processes and meetings, and expenses associated with participation such as transportation, food, and childcare. Also fund the community-led training programs identified in Task 2.1.

Consider state budget or bond allocations, legislation, grants, development fees, or regional funding measures as sources of funding. Equity initiatives could receive a dedicated percentage of any resilience-focused funding, for example. Other initiatives to increase community access to funds could include supporting collaborative grant-writing, or streamlining the process for governments or industry partners to contract with CBOs (such as setting up a bench of CBOs available for fee-based consulting and managing those contracts on behalf of the CBOs).

> *"It is harder to ask communities to engage on something that they have not been involved in shaping. You need representatives with direct experience and engagement in these communities, what they want, and agency staff typically doesn't have that."*
>
> *- Bay Adapt EJ Caucus Member*

Action 2 Benefits

EQUITY
Elevates frontline community members as key decision-makers and compensates them for their time and expertise.

ENVIRONMENT
Prioritizes natural resources that people value, promoting local stewardship.

ECONOMY
Prioritizes local businesses and jobs, keeping local economies thriving.

INFORMATION

Cities, landowners, residents and students all need to understand how the latest science on sea level rise applies to their lives and decisions. Understanding risks, consequences, options, and tradeoffs enables everyone to be part of the solution. We also need ways to share our stories, struggles, and successes as we confront climate change and learn to adapt. Stories of individual and shared experiences of change are the foundation of future action. But where do we find and keep up with the latest science and these evolving stories? And how do we share the best of them?

BCDC staff presenting to stakeholders on sea level rise vulnerability. Photo by Jaclyn Mandoske, BCDC.

ACTION 3

Broaden public understanding of climate change science and impacts.

Goals:

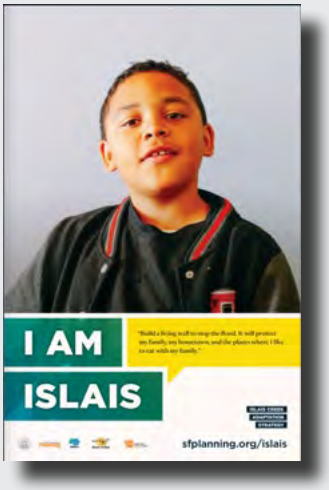
- Increased climate literacy in the region's general public.
- Communities and youth who are better prepared to plan and implement adaptation solutions.
- More value placed on community history and first-hand experience.

TASK 3.1: Tell local and regional stories about people and places adapting to climate change.

Launch a sustained storytelling campaign to amplify awareness of climate change, sea level rise impacts, and Bay health in the Bay Area. Listen and learn from residents' direct experiences and empower them to advance their own solutions for climate adaptation. Encourage youth, neighborhoods, and frontline communities to shape and share their own stories. Base stories on local successes and hopeful narratives about what makes the Bay Area special, including the Bay's unique natural ecosystems and culture of environmental and social activism. Allow communities to share their stories of concern, risk, needs, and loss in order to center these narratives and base future adaptation planning on mitigating these challenges. Share stories widely, and make them available on diverse platforms – newspapers, radio, television, social media, neighborhood news apps, and the web. Use these stories to train local government staff about the communities they serve and increase trust between communities and local staff (coordinated with the trainings outlined in Task 2.1).

Ideas for the Bay Area

As part of the **Islais Creek Adaptation Strategy,** *the San Francisco Planning Department developed a magazine,* **I Am Islais**, *that provided a platform for residents and stakeholders to speak about sea level rise in the neighborhood and how it would affect their lives. Platforms like these allow residents to have their voices heard.*



Middles schoolers from Oakland learn about rain catchment systems. Photo courtesy of Estuary News from March 2019.

TASK 3.2: Weave climate adaptation literacy into school programs.

Support partnerships between public and private schools and community-based organizations (especially those led by youth and frontline community members) to educate students about the health and future of the Bay and ways to adapt to climate change. Share adaptation visions, solutions, and local pilot projects showcasing innovation with teachers, students, school districts and parent associations. Support schools so they can get more involved as partners in educating their local communities about rising sea levels and as leaders in elevating the importance of climate action and adaptation. Help schools offer both climate-literate curricula and career pipeline opportunities based in diversity and inclusivity. Consider partnerships with local employers to connect training with local jobs. Provide our future decision-makers and workforce with the knowledge and experience to tackle climate problems with equitable and innovative solutions.

Ideas for the Bay Area

The **Mycelium Youth Network** *partnered with The Exploratorium and BCDC to engage local youth in the science, political issues, and civic processes involved in responding to climate change and its impacts on infrastructure and people. The collaboration produced* **Water Is Life**, *a program that offered an in-depth analysis of water justice issues with a specific focus on sea level rise and how it will impact the entire Bay Area. The program reached 150 students at several Title I schools around the Bay Area, including Leadership High School and Mission High School in San Francisco, and Elmhurst United Middle School in Oakland. Learn More Here.*

The **San Mateo County Environmental Literacy Program** *works with school districts, community-based environmental literacy partners, educators, and youth to actively integrate environmental sustainability into school communities, classrooms, and programs. Learn More Here.*

Action 3 Benefits

EQUITY
Empowers frontline community members by increasing awareness of climate risks, sharing stories about their own communities, and engaging youth in schools.

ENVIRONMENT
Raises awareness of the health and future of the Bay and its resources and the value of natural and nature-based solutions in addressing rising sea levels.

ECONOMY
Reduces likelihood of economic damage by flooding by building public support for adaptation measures; prepares youth to enter climate resilience careers.

ACTION 4

Base plans and projects on the best science, data, and knowledge.

Goals:

- Data and research tailored to the region's specific needs.
- Accessible science, analysis, and monitoring information.
- User-friendly technical support.

TASK 4.1: Align research and monitoring with information gaps.

Partner with academics, scientists, and communities to fill information gaps through original research, data collection, analysis, and monitoring. Tailor the interpretation of science to the audience or user, ranging from the general public to academics. Curate and archive information for use and updates across decades. Align with similar statewide initiatives but ensure data is tailored to the Bay Area.

From a technical perspective, identified information needs include:

- Enhanced regional flood modeling related to multiple hazards (such as groundwater, watershed, riverine/tidal, subsidence, erosion).
- Expanded networks of water elevation monitoring stations for real-time updates to the rate and timing of sea level rise in the Bay.
- Expanded open data initiatives to facilitate sharing.
- Standard operating procedures for validating and nominating data for common use.
- More research on the cost and suitability of adaptation strategies for different Bay conditions.
- Identification of potential wetland migration pathways.
- Tracking, sharing, and integrating data from various sectors to spotlight opportunities to reuse sediment.
- Research on the equitable distribution of burdens and benefits of adaptation.
- More explicit research on the impacts and consequences of contaminated sites as they intersect with flooding and/or rising groundwater and strategies for mitigating these impacts.

Solicit and value local knowledge from residents, particularly in frontline communities, and use it to inform research needs and priorities and to confirm and validate academic research. Prioritize co-production of data and tools with communities through community-based asset mapping and storytelling or participatory science to form a more complete data picture.

Ideas for the Bay Area

Created in 2000, the **California Ocean Science Trust** *recognizes the value of independent science and the opportunity to better connect the wealth of scientific expertise in academia with policy and management decisions in the state. The Ocean Science Trust seeks and provides funding for ocean resource science projects and encourages coordinated, multi-agency, multi-institution approaches to ocean resource science. It can serve as a model for how to connect real-world planning and policy needs with scientific and academic research but be adapted for the unique needs and constraints of the Bay Area. Learn More Here.*

The **Wetlands Regional Monitoring Program** *(WRMP) is convening stakeholders from a broad range of backgrounds and expertise to develop a regional monitoring program for wetlands in the Bay Area. The program aims to use wetland habitat data to improve the efficiency of permitting and monitoring wetland restoration projects and to evaluate the condition of the tidal marsh ecosystem at a regional scale. Learn More Here.*

CALIFORNIA OCEAN SCIENCE TRUST

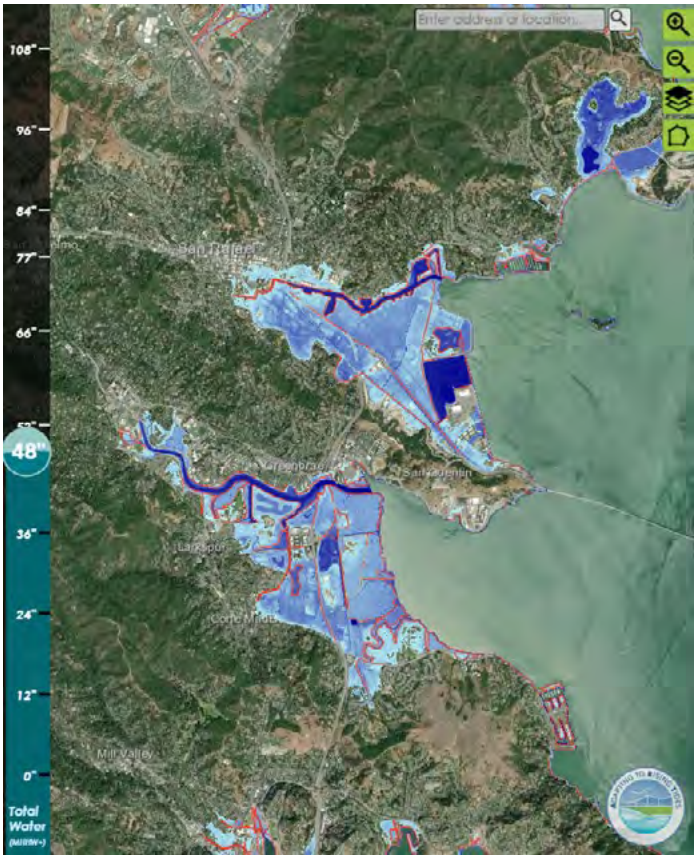
TASK 4.2: Make scientific data, information, and guidance easier to access and use.

Help users creating adaptation plans and projects understand where, when, and how to use climate science and planning tools. Facilitate widespread access to, and understanding of, technical information and guidance. Improve and ease access to the most relevant information.

Establish or support an independent Climate Science Consortium that provides high-quality science translation tailored to the Bay Area's needs and fed by the research outlined in Task 4.1.

Also offer a separate technical assistance "storefront" to support plans and projects that provides users:

- Standardized, up-to-date scientific data, such as common flood models and sea level rise projections, as created by the Climate Science Consortium.
- Best available science white papers on specific issues, as curated or developed by the Climate Science Consortium.
- Individualized consultations via a professional help desk network.
- How-to guidance on the steps of assessing vulnerability and developing adaptation plans.
- Adaptation plan and project examples and case studies.
- Tools for evaluating adaptation options.
- Funding and financing assistance.
- Lecture series, conferences, trainings, working groups, and/or workshops.
- Access to a technical consultant bench (Task 4.3).



The Adapting to Rising Tides Bay Shoreline Flood Explorer is a tool developed by BCDC to explore current and future flooding scenarios. This information is available at explorer.adaptingtorisingtides.org.

How science and planning assistance can assist other Joint Platform actions

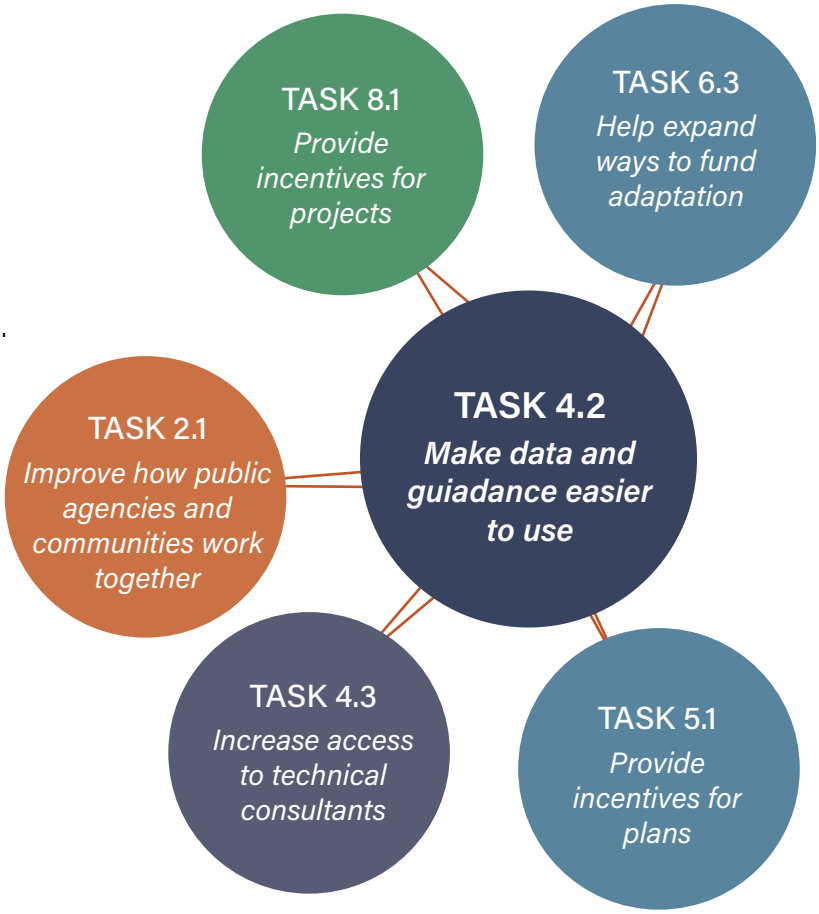


Figure 8 | Many different tasks outlined in the Joint Platform should connect to and coordinate with the technical assistance outlined in Task 4.2; however, they are not included in the task because they have technical assistance as their secondary function and/or have a natural home elsewhere.

Levee breach in the Montezuma wetlands restoration project.
Photo courtesy of the Montezuma wetlands project.

TASK 4.3: Increase access to technical consultants for local adaptation partners.

Establish a region-wide consultant bench that cities, counties, and others can tap for technical services. Use regional planning and project guidelines (Task 1.1) to articulate common technical needs in region-wide RFPs for consultants to serve on the bench. Also use guidelines to guide evaluation of proposals from potential consultants. Contract with consultants to be "on call" for cities and counties, as needed. Simplify and manage contracting processes for users when accessing a consultant. Vet consultant-led goods and services to ensure they align with the region's vision and objectives.

Ideas for the Bay Area

MTC/ABAG's Housing Technical Assistance (TA) Consultant Bench *is an effort to recruit and vet multiple consultants with various skill sets to support local planning at favorable rates and facilitate access to consultant resources, achieve economies of scale, and reduce costs. This bench supports regional TA efforts and local jurisdictions can use it to connect with specialized resources on a wide range of issues and services using their SB2, LEAP, REAP, and PDA planning funds.* *Learn More Here.*

Action 4 Benefits

EQUITY
Elevates local knowledge and needs in the development of data to inform decision-making and ensures data transparency and accessibility to communities.

ENVIRONMENT
Improves guidance, data, and feedback on projects that preserve and enhance habitats and on natural and nature-based solutions to increase implementation of these projects.

ECONOMY
Increases information and better planning and project processes to expedite shoreline protection projects.

PLANS

Now is the time to plan for carrying out the region's adaptation vision and seeking the billions of dollars needed to pay for it. As shoreline communities incorporate adaptation into local plans, we must ensure that those plans contribute to a "One Bay" solution, whose goals and objectives are shared across cities, counties and the region. Decisions in one community, municipality or new development can displace costs and impacts to others. How can we help locals make successful, coordinated plans? And how will we pay for new initiatives?

Community engagement for Plan Bay Area 2050. Photo by Karl Nielsen.

ACTION 5

Align local and regional plans into a unified adaptation approach.

Goals:

- Local plans that are coordinated across the region, and incentivized by expanded adaptation funding.
- Improved and coordinated state planning requirements for adaptation plans and projects.

TASK 5.1: Provide incentives for robust, coordinated local adaptation plans.

Utilize collectively-developed plan guidelines and minimum requirements (Task 1.1), tied to financial incentives (Task 6.2), to develop strong local and community-driven adaptation plans that also contribute to regional goals and align with current state guidelines for adaptation plans. Incentives should include funding to develop the plans. Plans should also include planned projects that contribute to regional goals (Task 8.1).

Guidelines should be developed with the input of many stakeholders but may provide:

- Guidance on how to prioritize and include vulnerable communities in sea level rise planning, including best practices for community engagement and community-led adaptation planning processes.
- Common minimum short and long-term sea level rise climate projections for planning.
- Standard flood data sets.
- Regionally-appropriate strategies for protecting natural areas, frontline communities, public access, regional transportation links, and other critical regional assets.
- Guidance on how and where to prioritize nature-based solutions along the shoreline where feasible and appropriate.
- Land use guidance, such as how to plan for habitat migration with sea level rise.
- Guidance on how to plan for long-term implications of sea level rise beyond current planning horizons.
- Guidance on how to connect sea level rise planning to other critical topics, including public and environmental health, emergency response, and housing considerations.

Assistance on applying the guidelines should be available through regional technical assistance programs (Task 4.2).

Wetlands and development near Highway 37. Map data ©2019 by Google Earth Pro.

TASK 5.2: Align state-mandated planning processes around adaptation.

Assess the state's myriad planning requirements beyond adaptation (such as those for housing, emergency response, local hazard mitigation, social equity, and climate action) through the lens of adaptation planning for conflicts, redundancies, and synergies. Jointly advocate for updated legislation to coordinate these requirements. Also create opportunities and incentives at the state level for cross-jurisdictional planning to improve the siloed scope of local plans that are often limited to jurisdictional boundaries.

Ideas for the Bay Area

The **San Francisco Bay Shoreline Adaptation Atlas** *has extensively evaluated the Bay shoreline to identify the most appropriate adaptation strategies for the unique physical characteristics shared by different "Operational Landscape Units" around the Bay. It identifies where nature-based approaches can help create a resilient shoreline with multiple benefits and where these solutions can work together across the interconnected Bay to avoid unintended impacts in neighboring locales. The Adaptation Atlas can provide a guide toward appropriate plans and projects in different locations around the Bay to ensure that the most appropriate strategies are considered in any given location. See it Here.*

Action 5 Benefits

EQUITY
Rewards planning processes that value inclusive engagement and equitable outcomes.

ENVIRONMENT
Rewards planning processes that value long-term protection of Bay habitats and prioritization natural and nature-based adaptation outcomes.

ECONOMY
Rewards planning processes that value the protection of jobs, businesses, and infrastructure.

The East Bay Shoreline looking towards Emeryville and Oakland. Photo by Andre Perrin-Martinez.

ACTION 6

Figure out how to fund adaptation.

Goals:

- Clear assessment of the region's adaptation funding needs.
- Identification of local and regional funding sources and financing tools.
- Mechanism for prioritizing and distributing funds for adaptation over the next several decades.

TASK 6.1: Expand understanding of the financial costs and revenues associated with regional adaptation.

Reduce unknowns and uncertainties related to the costs of adaptation. Start by expanding on the existing MTC/ABAG Sea Level Rise Needs and Revenue Assessment, which supports Plan Bay Area 2050 and also advocates for more state and federal funding. Build on and improve the assessment's calculations of what it may cost the region to adapt to sea level rise as well as the cost of inaction. As part of this calculation, consider both actual costs of current projects and the anticipated costs of untested or new construction or restoration techniques, as well as the costs for pre-construction phases of projects such as engagement, planning, and land acquisition or post-construction costs such as monitoring and maintenance. Consider when future funds may be needed as sea levels rise and impacts accelerate. Also develop a more in-depth understanding of possible revenue from related special assessments, taxes, and fees to refine estimates of the potential funding gap.

Ideas for the Bay Area

The **San Francisco Bay Restoration Authority** *is a regional agency created to fund shoreline projects that will protect, restore, and enhance San Francisco Bay through the allocation of funds raised by the Measure AA parcel tax. This parcel tax generates $25 million in grants annually for wetland restoration projects throughout the region. The Restoration Authority is overseen and staffed by representatives from several Bay Area government agencies with various types of expertise and authority. The Restoration Authority could either be expanded to fund a wider variety of adaptation projects or could serve as a model for a new adaptation-focused finance authority for the Bay.* Learn More Here.

SAN FRANCISCO BAY
RESTORATION AUTHORITY

TASK 6.2: Establish a framework for funding plans and projects.

Develop and implement a framework or process to aggregate, generate, and distribute adaptation funding for communities, plans and projects. Use guidelines developed in Task 1.1 to direct funding to incentivize successful local planning (Task 5.1), and to evaluate and assign funding to proposed adaptation projects included in such plans (Task 8.1). Consider modeling the process on the MTC/ABAG Transportation Project Performance framework, in which partners nominate local projects for evaluation based on specific criteria and then prioritize them for funding. Actively advocate for adaptation funding for the region (Task 1.2) and consider spearheading new regional taxes, fees, or other financing mechanisms to fund plans and projects.

> *"How can we see future things happening if we can't even fix our streets and drains?"*
>
> *- East Palo Community Focus Group Participant*

How the funding framework can assist other Joint Platform actions

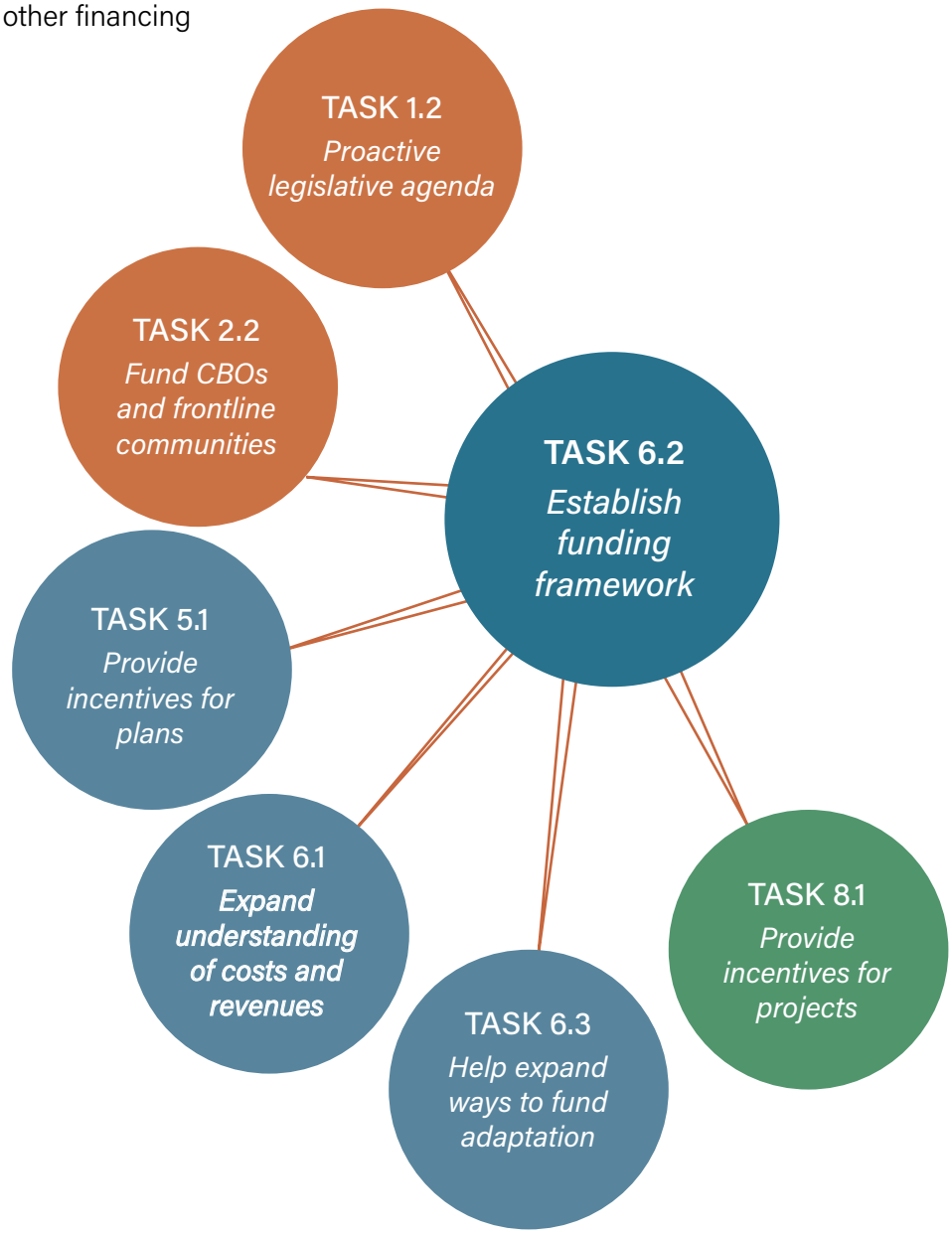


Figure 9 | Many different tasks outlined in the Joint Platform should be considered in the funding framework outlined in Task 6.2; however, they are not included in the task because 6.2 focuses on the *creation* of the funding framework while the related tasks rely on the *outcomes* of the funding framework.

Isais Creek in San Francisco. Photo by SF Baykeeper, Robb Most, and LightHawk.

TASK 6.3: Help cities and counties expand ways to fund adaptation planning and projects.

Provide local governments with expertise and assistance to generate additional funds by identifying, evaluating, and applying local financing tools and to apply for other sources of funds for local adaptation needs (above and beyond any regional funds identified in Task 6.2). Work with cities and counties to identify their needs and match the myriad federal, state, regional, and local funding sources to local needs for planning, community engagement, project implementation and costly project resources (i.e. sediment). Help local governments understand grant requirements and shape projects to fit them. Assist with project cost-benefit analysis, grant writing, and fulfilling reporting requirements. This assistance should be provided through the regional technical assistance storefront outlined in Task 4.2.

Ideas for the Bay Area

There are several existing resources that can help serve as the foundation for the services outlined in Task 6.3:

- **Finance Guide for Resilient by Design Bay Area Challenge Design Teams**, *NHA Advisors, 2018*
- **Paying for Climate Adaptation in California**, *AECOM, 2018*
- **Climate Adaptation Finance and Investment in California**, *Routledge Focus, 2018*
- **Adaptation Finance Challenges: Characteristic Patterns Facing California Local Governments and Ways to Overcome Them**, *California Natural Resources Agency, 2018*
- ***The* California Grants Portal** *is an access portal to all grants and loans offered on a competitive or first-come basis by California state agencies. Learn more here.*
- ***The* Funding Wizard,** *hosted and maintained by the California Air Resources Board, is a searchable database of grants geared toward sustainability projects, including climate change mitigation and adaptation. Learn more here.*

Action 6 Benefits

EQUITY
Outlines a process to pay for adaptation that does not rely on a community's wealth, advocacy skills, or grant-writing success to fund plans and projects.

ENVIRONMENT
Identifies ways to prioritize long-term protection of Bay habitats and natural and nature-based adaptation outcomes in funding decisions.

ECONOMY
Increases funding for shoreline projects and protection of key assets critical to the region's economic health.

PROJECTS

Getting adaptation projects approved and built can be challenging. Permitting and construction should accelerate, not hold back, resilient shoreline adaptation projects that value ecosystems and people, align with the region's vision and funding priorities, and apply innovative approaches. Measures to smooth and speed regulatory approvals for multi-benefit projects are important. Other measures can help facilitate place-based collaboration around project development and remove logistical challenges to construction.

Conceptual drawing of the Islais Hyper-Creek project from Resilient By Design.

ACTION 7

Refine and accelerate regulatory approvals processes.

Goals:

- Less time and fewer resources spent on permitting adaptation projects so they can be constructed ahead of sea level rise.
- Updated laws, regulations, and policies that reflect the changing shoreline.

TASK 7.1: Accelerate permitting for equitable, multi-benefit projects.

Dedicate a multi-agency group to work collaboratively on permits for adaptation projects that reflect regional guidelines and have been identified as regional priorities (see *Ideas for the Bay Area* at right for a possible model or forum). Achieve smoother, speedier regulatory approvals that don't compromise environmental protections, transparency, or community engagement by:

- Using standard, transparent criteria and checklists (linked to Task 1.1. guidelines) to evaluate candidate projects for eligibility for accelerated permitting.
- Providing opportunities for proactive coordination and collaboration between agencies and project proponents and sharing criteria and checklists with project proponents early in their design process.
- Improving coordination across agencies and between potential project proponents and regulators before projects are even designed (such as regular engagement with the groups

Ideas for the Bay Area

The **San Francisco Bay Restoration Regulatory Integration Team (BRRIT)** *is a multi-agency team dedicated to improving the permitting of multi-benefit habitat restoration projects and associated flood management and public access in and along San Francisco Bay. The BRRIT consists of staff from state and federal regulatory agencies who work closely with project proponents from the pre-permit application stage through permit completion. However, the BRRIT is a small team that reviews only a limited number of habitat projects and has a limited scope. The BRRIT could be expanded to cover additional green or hybrid shoreline protection projects, or a similar team could be created to handle projects that provide regional adaptation benefit but do not meet current BRRIT criteria.*

BRRIT Partners

(TASK 7.1 *continued)*

outlined in Task 8.2).

- Establishing a dispute resolution process among permitting agencies.
- Conducting CEQA and permitting concurrently.
- Enhancing the technical knowledge of permitting staff (via working groups and by tapping outside expertise).
- Increasing regulatory capacity for permit review.

TASK 7.2: Assess environmental regulations and policies that slow down progress on projects.

Review plans and laws, including BCDC's Bay Plan, RWQCB's Basin Plan, the California Endangered Species Act, California Environmental Quality Act, National Environmental Policy Act, Federal Clean Water Act, and Federal Endangered Species Act, to pinpoint policies that may unintentionally impede permitting or construction of adaptation projects. Starting with local and regional plans and policies, develop consensus on recommended policy changes that balance original intent with changing conditions due to sea level rise, and help facilitate multi-benefit projects. The scope of the review could include:

- Clarifying or creating new policies on climate change.
- Identifying conflicting regulatory mandates.
- Identification of "regulatory gaps," such as wetland migration space that is not currently protected.
- Clarifying design standards for nature-based projects.
- Integrating data from pilot projects into planning for new projects.
- Reevaluating restrictions on Bay fill for shoreline protection.
- Reevaluating criteria for dredged material disposal to incentivize beneficial reuse over in-Bay or ocean disposal.
- Reevaluating contaminant criteria for beneficial reuse.
- Identifying more funding sources for sediment delivery to beneficial reuse sites and other adaptation projects.
- Updating land use policies to allow for habitats to migrate upland.
- Permitting that allows for temporary impacts to achieve long-term adaptation goals.
- Ensuring that construction work windows provide the expected benefit to special status species.
- Addressing the short and long-term impacts of turbidity plumes in water.
- Strengthening requirements around long-term monitoring of adaptation outcomes to inform regulatory and policy updates.

Ideas for the Bay Area

In 2016, BCDC completed **Policies for a Rising Bay,** *which outlines the policy issues identified in the Commission's laws and policies in light of new challenges, including sea level rise. The report identifies four policy issues where BCDC's policies were found to be inadequate regarding risks associated with rising sea levels, including:*

1. *Fill for Resilience and Adaptation - Habitat Restoration and Protection*
2. *Fill for Resilience and Adaptation - Innovative Shoreline Solutions*
3. *Environmental Justice and Social Equity*
4. *Adaptive Management*

In 2019, BCDC adopted its **Fill for Habitat** *and* **Environmental Justice Bay Plan Amendments** *that formally amended its regulatory program to address these policy gaps.*

Wetlands along the San Jose shoreline during King Tides in December 2019. Photo by SF Baykeeper, Robb Most, and LightHawk.

Action 7 Benefits

EQUITY
Rewards projects that value inclusive engagement and equitable outcomes.

ENVIRONMENT
Rewards projects that value long-term protection of Bay habitats and natural and nature-based adaptation outcomes.

ECONOMY
Rewards projects that protect jobs, businesses, and infrastructure.

ACTION 8

Fund and facilitate faster adaptation projects.

Goals:

- Accelerated and funded projects that advance the regional adaptation vision.
- More efficient construction processes for multi-benefit, equitable shoreline adaptation projects.

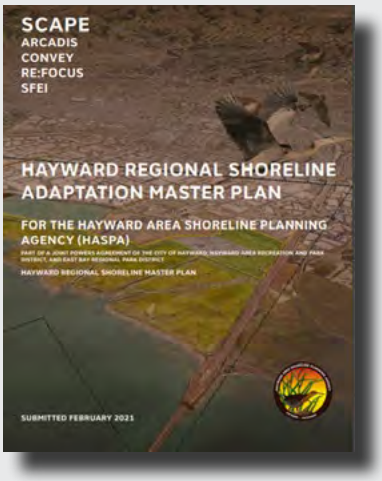
TASK 8.1: Incentivize projects that meet regional guidelines.

Jump start critical local projects that also contribute to regional goals using collectively developed plan guidelines and minimum requirements (Task 1.1), tied to financial incentives (Task 6.2) and permitting incentives (Task 7.1). Projects eligible for financial incentives should be included in successful local plans that follow compatible guidelines (Task 5.1).

Guidelines should be developed with the input of many stakeholders but may provide:

- Guidance on how to prioritize and include vulnerable communities in sea level rise projects, such as through robust and meaningful community engagement in the project planning process.
- Evaluation of the degree to which a project protects the health of the bay and local ecosystems, and considers space for habitat migration.
- Evaluation of project impacts on flooding or wave erosion in other areas of the Bay, and guidance for best practices to avoid unintended consenquences in an interconnected Bay system.
- Evaluation of project impacts on natural areas, frontline communities, public access, and other consequences to neighbors or the region, such as displacement.
- Use of an equitable cost-benefit analysis that values frontline communities and other non-monetary benefits.
- Adaptive project plans that consider flooding above and beyond the design level or flooding that occurs more rapidly than planned.

Guidelines should be made easily accessible via regional technical assistance programs (Task 4.2).



Ideas for the Bay Area

The **Hayward Area Shoreline Planning Agency Joint Powers Authority** *brings together the City of Hayward, East Bay Regional Parks District, and Hayward Area Recreation and Parks District and works with the Hayward Area Shoreline Citizens Advisory Committee to coordinate agency planning activities and adopt and carry out policies for the improvement of the Hayward Shoreline. It has recently completed and adopted a Shoreline Master Plan that outlines adaptation measures to prepare for sea level rise.* Read it Here.

TASK 8.2: Encourage collaboration among people doing projects in the same places.

Establish place-based, ongoing work groups to coordinate large-scale, multi-jurisdictional plans and projects. Provide a forum for building relationships among agencies, project proponents, and communities, enhancing communication, transparency, and synergies among diverse players, and connecting communities to projects they care about.

Create local visions tied to the regional vision (Task 1.1) and share best practices for project design, governance, and delivery. Use a neutral, third-party facilitator to facilitate these groups and help ensure a balance of voices, achieve consensus on common project goals, resolve challenges and conflicts, identify and nurture of project champions, and broker community benefits agreements. Consider formalizing these structures such as in the Hayward example (above) to accelerate project funding, development and construction across jurisdictional boundaries.

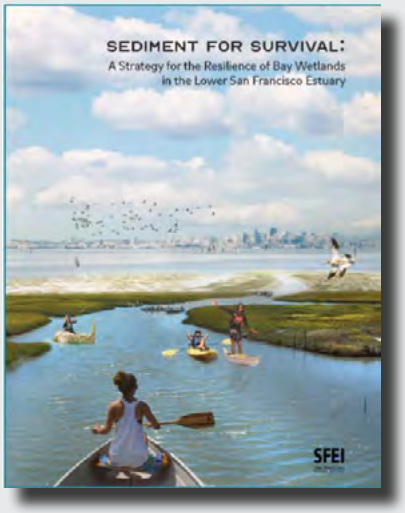
South Bay Salt Ponds restoration project. Photo by San Francisco Restoration Authority.

TASK 8.3: Facilitate faster construction of nature-based projects.

Increase the capacity of contractors to build multi-benefit or nature-based projects. Establish training programs on techniques and approaches to construct natural and nature-based shoreline projects for contractors, aligned with regional project guidelines (Task 1.1) and informed by monitoring data (Task 9.2). Coordinate the use of the limited regional supply of fill across the region and improve fill logistics (e.g. stockpiling, contaminant testing, delivery, etc). Strengthen partnerships with regulated communities. Expand RFP and State bond proposition language to make funding such complex projects more flexible.

Improve construction bidding and contracting processes by:

- Demystifying project costs.
- Contracting earlier in the design process (via construction management general contracts).
- Incentivizing contracts with local or equity-focused businesses.
- Incentivizing the reduction of construction impacts on communities.



Ideas for the Bay Area

Sediment for Survival, *published by the San Francisco Estuary Institute in 2021, analyzes current data and climate projections to determine how much natural sediment may be available for tidal marshes and mudflats and how much supplemental sediment may be needed under different future scenarios, and offers a strategy for sediment delivery that will enable wetlands to survive a changing climate and provide benefits to people and nature for many decades to come. This report can form the foundation for a region-wide conversation about how to meet the region's future sediment needs for nature-based shoreline adaptation projects.* Read it Here.

Action 8 Benefits

EQUITY
Advocates for community voices in projects; supports construction practices that minimize impacts to communities and support local businesses.

ENVIRONMENT
Expands the ability of contractors to build natural and nature-based solutions.

ECONOMY
Facilitates cross-pollination early on, resulting in multi-benefit projects with shared costs; supports construction practices that support local businesses.

PROGRESS

The cycle of adaptation never stops. Science evolves and we learn lessons from existing projects, often requiring updates to our plans and policies. But how do we know if our efforts have been successful, and whether everything is working out as planned? Tracking and learning from our successes and failures will allow the region to adjust course, celebrate progress, maintain transparency, and adapt to uncertainty. Accountability for how well we achieve our collective adaptation goals goes hand-in-hand with future support for this critical work.

People visiting recreational trails near the Palo Alto Baylands. Photo by Jitze Couperus licensed under CC BY 2.0.

ACTION 9

Track and report progress to guide future actions.

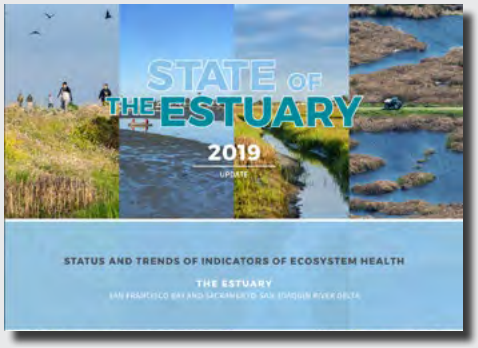
Goals:

- A process for gathering feedback and measuring progress on local and regional adaptation efforts.
- Clarity on how to adapt plans and projects to changing conditions and outcomes.
- Enhanced monitoring of nature-based projects to better understand the benefits and challenges of an ecosystems approach to adaptation.

TASK 9.1: Measure regional progress using metrics and share results.

Regularly check and report on adaptation progress based on the established and shared regional metrics identified in Task 1.1. Metrics should measure the difference between today's "baseline"—the region's current risk profile and adaptation status—and changes related to adaptation activities, or other measures of long-term sustainability. Also consider collecting qualitative reports, such as narratives and community feedback.

Resulting "report cards" should be transparent and understandable (through visually compelling online dashboards) to partners, stakeholders and the public. When appropriate, they should suggest ways to increase alignment with the regional vision, such as changes to incentives (Tasks 5.1 and 8.1), funding models (Task 6.2), technical assistance programs (Task 4.2), or the legislative agenda (Task 1.2).



Ideas for the Bay Area

*The **State of the Estuary** report tracks indicators and trends that measure the San Francisco Estuary's ecological health. Likewise, the Delta Stewardship Council's **Delta Plan Performance Measures** uses several metrics to measure, progress, and track performance across the coequal goals of a reliable water supply for California and a healthy Delta ecosystem. It uses an easy-to-access, graphics-rich online interface to illustrate performance measure information and data to ensure transparency around the Delta Plan's goals and performance measures. This website and the metrics it tracks could be a model for how the Bay Area could transparently track its adaptation goals and progress.*

Creosote-treated pilings at the Red Rocks warehouse site in Richmond. Photo by Marilyn Latta, State Coastal Conservancy.

TASK 9.2: Monitor and learn from pilot projects.

Monitor pilot projects to identify lessons learned and update or establish guidance based on these lessons. Expand and support existing monitoring programs, such as the Wetland Regional Monitoring Program and the San Francisco Bay National Estuarine Research Reserve, to increase the context for learning and adaptation. Use monitoring to update and refine best practices for innovative, multi-benefit projects covered in regional vision (Task 1.1), funding criteria (Task 6.2), technical assistance guidance (Task 4.2), and permitting processes (Task 7.1).

Ideas for the Bay Area

*Pilot projects don't have to be limited to nature-based solutions. The **San Francisco Bay Area Rapid Transit District (BART)** can serve as a model for other agencies pursuing adaptation. With limited funding and resources, BART has conducted a number of pilot projects to evaluate resiliency risks and develop adaptation solutions. Pilot findings have been used to inform BART capital projects of risks. As a pilot outcome, BART requires in the BART Facilities Standards (BFS) that capital projects account for SLR risk in their designs. BART's approach to leverage existing data and partnerships to maximize pilot outcomes are examples of practices that can be shared and benefit other agencies.*

Action 9 Benefits

EQUITY
Ensures accountability for equity and community-focused adaptation outcomes.

ENVIRONMENT
Ensures accountability for nature-based, ecosystem, and habitat-based adaptation outcomes; monitoring and reporting will improve the design, permitting, funding, and construction of nature-based adaptation strategies.

ECONOMY
Ensures accountability for job and housing growth adaptation co-benefits; monitoring of pilot projects will lead to more efficient and effective projects and expedited protection for critical assets.

Bay Adapt Implementation Chart

Draft as of October 2021

		GOVERNMENT												NON-GOVERNMENTAL ORGANIZATIONS														
		BCDC	*RW QCB*	*MTC/ ABAG*	*SFEP*	*SCC*	*BARC*	*Cal-trans*	*DSC*	*Other State*	*NOAA*	*US-ACE*	*Other Federal*	*Local Juris.*	*Bay-CAN*	*SFEI*	*CHAR G*	*Nor-Cal RN*	*WOE-IP*	*Explor-atorium*	*Green-belt Alliance*	*CBOs*	*EJ Advo*	*Enviro Orgs*	*Busi-ness*	*Priv Phil*	*Aca-demia*	*Media**	*Education/ Cultural Orgs*	**CO-LEADS IDENTIFIED**
PEOPLE	Task 1.1: Create a long-term regional vision rooted in communities, bay habitats, and the economy.	L	·	••	••	·	·	••						L	·	••	·				••	L	·	·	·		••		••	BCDC, Local Jurisdiction(s), CBO(s)
	Task 1.2: Lay the foundation for a proactive regional legislative agenda.	••		••			L							••	••	••	••						••	••	••					BARC
	Task 2.1: Improve how communities and public agencies learn from each other and work together.	••	L	••	••	••	••		·		••			••	L			L	L			·	·			••				RWQCB, BayCAN, Norcal Resilience Network, WOEIP
	Task 2.2: Fund the participation and leadership of CBOs and frontline communities in adaptation planning.	••		••	••		L							••	••			L	L			·				••				BARC, Norcal Resilience Network, WOEIP
INFORMATION	Task 3.1: Tell local and regional stories about people and places adapting to climate change.	·		·	••	·	L							••	••					L		••				••		L		BARC, Exploratorium, Media*
	Task 3.2: Weave climate literacy into school programs.	·								·				••												••	·		••	TBD
	Task 4.1: Align research and monitoring with information gaps.	••	L		••			·	••		••		••	·	L	L	••					••	·	·	·		••			RWQCB, BayCAN, SFEI
	Task 4.2: Make scientific data, information, and guidance easier to access and use.	L	••	L	••	••			••		••		••	·	L	L	••						·	·	·		·			BCDC, MTC/ABAG, BayCAN, SFEI
	Task 4.3: Increase access to technical consultants for local adaptation partners.			L	L	••								·	••	••	••					·								MTC/ABAG, SFEP
PLANS	Task 5.1: Provide incentives for robust, coordinated adaptation plans.	••		••		••	·								••	••	·													TBD
	Task 5.2: Align state-mandated planning processes around adaptation.	·		••						·				••	••															TBD
	Task 6.1: Expand understanding of the financial costs and revenues associated with regional adaptation.	L	••	L			••							·			·										·			BCDC, MTC/ABAG
	Task 6.2: Establish a framework for funding plans and projects.	L		L	·	••	·	·				·		·								·	·	·	·					BCDC, MTC/ABAG
	Task 6.3: Help cities and counties expand ways to fund adaptation planning and projects.	·		L	·	••	·	••						·	••															MTC/ABAG
PROJECTS	Task 7.1: Accelerate permitting for equitable, multi-benefit projects	L	L		L	••			·			••		·			·					·	·	·	·					BCDC, RWQCB, SFEP
	Task 7.2: Assess environmental regulations and policies that slow progress on projects.	L	L		L	••			·			••		·			·					·	·	·	·					BCDC, RWQCB, SFEP
	Task 8.1: Incentivize projects that meet regional guidelines.	·	·	••	••	••		••				••	••				·					·								TBD
	Task 8.2: Encourage collaboration among people doing projecs in the same places.	••	••	••	••	L	••	·	·					••	••	L	·					••					·			SCC, SFEI
	Task 8.3: Facilitate faster construction of nature-based projects.	••	·		L	••		·	·			·		·		••	·					·	·	·	·					SFEP
PROGRESS	Task 9.1: Measure regional progress using metrics and share results.	L		••	L		••							·		L						·	·	·	·		·			BCDC, SFEP, SFEI
	Task 9.2: Monitor and learn from pilot projects.	••	L	·	••	••			·		·	·		·			·					·	·	·			••			RWQCB
	*Tasks Assigned as **Lead***	**7**	**5**	**5**	**5**	1	3	0	0	0	0	0	0	**1**	**3**	**4**	0	2	2	1	0	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	
	*Tasks Assigned to **Participate***	8	3	9	9	11	4	3	2	0	3	3	3	**7**	8	5	4	0	0	0	2	**3**	**1**	**1**	**1**	**4**	**3**	**0**	**2**	
	*Tasks Assigned to **Advise***	5	2	2	2	2	4	4	6	2	1	3	0	**11**	1	0	8	0	0	0	0	**10**	**10**	**9**	**8**	**0**	**5**	**0**	**0**	

Key
- L Lead
- •• Participate
- • Advise

*May include KneeDeepTimes, KQED, and Joint Venture/SFEP Bay Area Regional Communications Team

Acronyms

BCDC
Bay Conservation and Development Commission

RWQCB
Regional Water Quality Control Board

MTC/ABAG
Metropolitan Transportation Commission Association of Bay Area Governments

SFEP
San Francisco Estuary Partnership

SCC
State Coastal Conservancy

BARC
Bay Area Regional Collaborative

Caltrans
California Department of Transportation

DSC
Delta Stewardship Council

NOAA
National Oceanic and Atmospheric Association

USACE
US Army Corp of Engineers

Local Jurisdictions
City and County Government

BayCAN
Bay Area Climate Action Networkl

SFEI
San Francisco Estuary Institute

CHARG
Coastal Hazards Adaptation Resilience Group

Norcal RN
NorCal Resilience Network

WOEIP
West Oakland Environmental Indicators Project

CBOs
Community Based Organizations

EJ Advo
Environmental Justice Advocacy Organizations

Enviro Orgs
Environmental Organizations

Business
Businesses, Associations, and Civic Advocacy

Pri Phil
Private Philanthopy

Academia
Universities or research

Bay Adapt process and Leadership Advisory Group (LAG)

Bay Adapt was convened by the San Francisco Bay Conservation and Development Commission (BCDC) in partnership with a broad range of Bay Area leaders that comprise the Leadership Advisory Group (LAG). The LAG consists of leaders from public agencies, interest groups, community-based organizations, and academia and provides strategic direction, feedback, and leadership in implementing the Joint Platform actions.

The strategies in this document were developed by BCDC staff with nearly 100 stakeholders who participated in hundreds of hours of working group meetings. The strategies were also informed by one Public Forum, ten Community and Stakeholder Focus Groups, an Environmental Justice (EJ) Caucus which was convened regularly throughout the process, and many presentations to other region-wide existing groups consisting of local government staff and elected officials.

For a summary of feedback from the Public Forum, Community and Stakeholder Focus Groups, and a list of outreach presentations, visit the Bay Adapt website at www.bayadapt.org.

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Acronyms

Acronym	*Description*
ABAG	Association of Bay Area Governments
BARC	Bay Area Regional Collaborative
BARHII	Bay Area Health Inequities Initiative
BART	Bay Area Rapid Transit
BayCAN	Bay Area Climate Adaptation Network
BCDC	SF Bay Conservation and Development Commission
BRRIT	Bay Restoration Regulatory Integration Team
CHARG	San Francisco Bay Regional Coastal Hazards Adaptation Resiliency Group
EBRPD	East Bay Regional Parks District
MTC	Metropolitan Transportation Commission
NERR	National Estuarine Research Reserve
NOAA	National Oceanic and Atmospheric Administration
RWQCB	Regional Water Quality Control Board
SCC	State Coastal Conservancy
SFEI	San Francisco Estuary Institute
SFEP	San Francisco Estuary Partnership
SFBRA	San Francisco Bay Restoration Authority
SFPUC	San Francisco Public Utilities Commission
USACE	U.S. Army Corps of Engineers
WOIEP	West Oakland Environmental Indicators Project

BERKELEY CITY COUNCILMEMBER
TERRY TAPLIN
DISTRICT 2

CONSENT CALENDAR
December 14th, 2021

To: Honorable Mayor and Members of the City Council

From: Councilmember Terry Taplin

Subject: Budget Referral: Pedestrian Crossing Improvements at Ashby and Acton

RECOMMENDATION

That the City Council refers to the FY2023 budget process the funding of Rectangular Rapid Flashing Beacons (RRFB) at Ashby Avenue and Acton Street.

CURRENT SITUATION AND ITS EFFECTS

As a "High-Injury Street" under Berkeley's Vision Zero Action Plan and Pedestrian Plan, Ashby Avenue is among the most dangerous streets in the entire city.[1] As a state highway that runs east-west along the entirety of Berkeley, Ashby attracts high volumes of vehicle traffic. The importance of Ashby Avenue as a connection to residential and commercial parts of Berkeley make it an important street for pedestrians and cyclists as well. The high speed of automobiles on Ashby, however, has resulted in a regular stream of tragic deaths and injuries on the street over the years.

Berkeley's Pedestrian Plan singles out Ashby Avenue from San Pablo to Shattuck as a street in need of prioritized investment and pedestrian safety improvements. Among the numerous recommendations for Ashby Avenue in the Pedestrian Plan, a Rectangular Rapid Flashing Beacon (RRFB) at Acton Street[2] is one that should be pursued as soon as possible. This intersection currently has a crosswalk with pedestrian yield signs, but an RRFB would be an important enhancement of this pedestrian crossing.

FISCAL IMPACTS

Staff time, an estimated $50,000 for installation of Rectangular Rapid Flashing Beacons, and an estimated $50,000 for 10 years of maintenance.[3]

ENVIRONMENTAL IMPACTS

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[1] https://www.cityofberkeley.info/uploadedFiles/Public_Works/Level_3_-_Transportation/2020%20Pedestrian%20Plan%20Chapter%203%20adopted.pdf

[2] https://www.cityofberkeley.info/uploadedFiles/Public_Works/Level_3_-_Transportation/2020%20Pedestrian%20Plan%20Chapter%203%20adopted.pdf

[3] https://www.cityofberkeley.info/uploadedFiles/Public_Works/Level_3_-_Transportation/Berkeley-Bicycle-Plan-2017_AppendixF_Facility%20Design%20Toolbox(1).pdf

Establishing a network of safe streets for pedestrians and bicycles, promoting bicycle literacy, and distributing bicycles to those in need incentivize nonautomobile travel, reducing greenhouse gas emissions. The City estimates that transportation-related emissions accounts for approximately 60% of our community's total annual greenhouse gas emissions.[4] By encouraging alternatives to car transportation by making pedestrian and cyclist infrastructure safer and more accessible, these improvements stand to lower the emissions from our community's dominant source of carbon emissions.

CONTACT
Terry Taplin, Councilmember, District 2, (510) 981-7120

[4] https://www.cityofberkeley.info/Clerk/City_Council/2018/12_Dec/Documents/2018-12-06_WS_Item_01_Climate_Action_Plan_Update_pdf.aspx

BERKELEY CITY COUNCILMEMBER
TERRY TAPLIN
DISTRICT 2

CONSENT CALENDAR
December 14th, 2021

To: Honorable Mayor and Members of the City Council

From: Councilmember Terry Taplin

Subject: Budget Referral: Russell Street Bicycle and Pedestrian Improvements

RECOMMENDATION

That the City Council refers to the FY2023 budget process the funding of the following bicycle and pedestrian improvements along Russell Street:

- Traffic Circle at Russell & King Street
- Cycle Track Crossing at Russell & San Pablo Avenue
- Pedestrian Hybrid Beacons at Russell & Sacramento Street

CURRENT SITUATION AND ITS EFFECTS

In November 2021, the City Council deliberated on and chose its top six priorities for the next two-year budget cycle. In order of importance, the Council chose infrastructure, public safety, houselessness, transportation, housing, and economic recovery. The fulfilment of Berkeley's Bicycle Plan, which aims to establish a network of streets where bicycle transportation is safe and convenient with access to the whole city, is explicitly in line with three of the Council's top four priorities — infrastructure, public safety, and transportation.

This intersection of priorities that the Bicycle Plan offers makes the funding of its numerous recommendations an important opportunity for the Council to focus on in the coming years. The centerpiece of the Bicycle Plan, a network of "Bicycle Boulevards", includes a West-East Bicycle Boulevard running along Russell Street from Mabel Street to Claremont Boulevard, connecting southwest Berkeley to central Berkeley and Elmwood.[1] This Bicycle Boulevard, while recently updated with quick-build traffic diverters, is in need of serious investments in the improvements recommended by the Bicycle Plan in order to reach its full potential. The recommendations, ranging from traffic circles and crossing improvements to bike lane enhancements, while obviously infrastructure, also act on the Council's new public safety and transportation priorities by strengthening the safety and ease of passage along Russell Street.

[1] https://www.cityofberkeley.info/uploadedFiles/Public_Works/Level_3_-_Transportation/Berkeley-Bicycle-Plan-2017_Ch5_ProposedBikewayNetwork.pdf

Beyond Council's new priorities, regular and unsparing investments in the improvements laid out by the Bicycle Plan for the entire city are essential for Berkeley to meet its climate and Vision Zero goals. In order to reduce Berkeley's greenhouse gas emissions, non-car travel must become the default mode-share in Berkeley as soon as possible. Council cannot expect this to happen unless bicycle travel is safe, easy, and well funded. Furthermore, Berkeley's Vision Zero goal of zero traffic deaths and severe injuries by 2028 is only achievable when infrastructure that improves the safety of pedestrians and cyclists is prioritized for funding.[2]

FISCAL IMPACTS

Staff time and an estimated $360,000[3] for the following improvements:

- $50,000 for one Traffic Circle
- $60,000 for Cycle Track Crossing
- $250,000 for Pedestrian Hybrid Beacons

ENVIRONMENTAL IMPACTS

Establishing a network of safe streets for pedestrians and bicycles, promoting bicycle literacy, and distributing bicycles to those in need incentivize nonautomobile travel, reducing greenhouse gas emissions. The City estimates that transportation-related emissions accounts for approximately 60% of our community's total annual greenhouse gas emissions.[4] By encouraging alternatives to car transportation by making pedestrian and cyclist infrastructure safer and more accessible, these improvements stand to lower the emissions from our community's dominant source of carbon emissions.

CONTACT

Terry Taplin, Councilmember, District 2, (510) 981-7120

[2] https://www.cityofberkeley.info/uploadedFiles/Public_Works/Level_3_-_Transportation/Berkeley_Vision_Zero_Action_Plan_Approved_03102020.pdf

[3] https://www.cityofberkeley.info/uploadedFiles/Public_Works/Level_3_-_Transportation/Berkeley-Bicycle-Plan-2017_AppendixE_Project%20Recs%20Priorities(1).pdf

[4] https://www.cityofberkeley.info/Clerk/City_Council/2018/12_Dec/Documents/2018-12-06_WS_Item_01_Climate_Action_Plan_Update_pdf.aspx

BERKELEY CITY COUNCILMEMBER
TERRY TAPLIN
DISTRICT 2

CONSENT CALENDAR
December 14, 2021

To: Honorable Mayor and Members of the City Council

From: Councilmember Terry Taplin (Author), Councilmember Ben Bartlett, Councilmember Sophie Hahn, and Mayor Jesse Arreguín (Co-Sponsors)

Subject: Commit the City of Berkeley to a Just Transition from the Fossil Fuel Economy

RECOMMENDATION

Adopt a resolution (1) committing the City of Berkeley to a Just Transition from the fossil fuel economy, that secures a livable future for all Berkeleyans, combats environmental racism, ensures access to good paying jobs, and cultivates economic and social prosperity for Berkeley in the 21st century and beyond and (2) requiring that all Council reports related to climate include a Just Transition section.

POLICY COMMITTEE RECOMMENDATION

On June 2, 2021, the Facilities, Infrastructure, Transportation, Environment & Sustainability Policy Committee took the following action: M/S/C (Harrison/Robinson) to send the item to Council with a positive recommendation as submitted in the supplemental material and further revised to include a recommendation that all Council reports related to climate include a just transition section.

BACKGROUND

Climate Change is Here

At this moment, our atmosphere has a higher concentration of carbon dioxide than ever before in human history. This concentration, and the fossil fuel emissions that have caused it, is rapidly making our planet into a hotter and more volatile place for all of its inhabitants. Estimates of the degree of warming that we can expect over the course of the next century vary and are contingent on how policymakers respond to the growing threat in the next decade. Still, there is enormous consensus that a certain amount of warming is inevitable and that rising sea levels, higher frequency of extreme weather events, declining public health, and economic volatility will certainly follow. With estimates ranging from increases in temperature between 1.4 and 5.8 degrees Celsius

by 2100, global warming will have severe impacts at even the most modest of estimates.[1]

Here in the Bay Area, we are already seeing a wide range of impacts including more extreme El Niño seasons some years, dramatic droughts in other years, a decline in coastal fog, 8 inches of sea-level rise, and more intense fire seasons in the rest of the state which have regularly brought smoke and ash to Berkeley.[2] These effects, which are already impossible to ignore, are just the beginning. The future will bring deeper and longer droughts, unreliable precipitation, an overall increase in temperature, and as much as 3 meters of sea-level rise by 2100.[3] On top of the weather and climate-related impacts, projections paint a grim picture for national economies under extreme warming scenarios. The reach of global warming will leave no stone unturned, with consequences for agriculture, trade, and industry internationally and at the national and local levels. At the national level, estimates currently project -0.1 to 1.7% GDP loss at 1.5 degrees Celsius of warming, 1.5 to 5.6% loss at 4 degrees, and 6.4 to 15.7% loss at 8 degrees.[4] All who call Berkeley and the Bay Area home are feeling the early impacts of climate change and will continue to be affected as warming intensifies, but not all effects are felt equally across demographic groups.

Unequal Impacts: Environmental Racism and Economic Dangers

Poor Americans and people of color have always had a relationship with their environments characterized by poor health and unique exposures to environmental hazards and extreme weather conditions, often in ways designed and perpetuated by government policies that seek to segregate and discriminate against people of color. As the effects of climate change intensify in the coming decades, this relationship will only be exacerbated as extreme weather, declining public health, and economic devastation disproportionately harm poor Americans and drag more and more into poverty. As the economy takes on damage, the unemployment rate will rise and bring the poverty rate up with it.[5] Economic damage at the scale of climate change will subject millions more to the poor health, extreme weather vulnerabilities, and general ruin that is all but guaranteed for those who enter the coming decades already in impoverished conditions. The fight against climate change

[1] https://www.nature.com/articles/nature04188

[2] https://www.energy.ca.gov/sites/default/files/2019-11/Reg_Report-SUM-CCCA4-2018-005_SanFranciscoBayArea_ADA.pdf

[3] https://www.energy.ca.gov/sites/default/files/2019-11/Reg_Report-SUM-CCCA4-2018-005_SanFranciscoBayArea_ADA.pdf

[4] https://science.sciencemag.org/content/356/6345/1362

[5] https://www.aeaweb.org/articles?id=10.1257/089533006776526102

The disparate impacts of extreme weather between racial and economic groups have been repeatedly demonstrated in recent history, with dire warnings for Berkeley's approach to climate resilience. In the summer of 1995, a year when global temperatures had already increased by nearly half a degree Celsius above pre-industrial levels, Chicago, Illinois was hit by a record-breaking heat wave.[6] "Temperatures reached 106 degrees; the heat index, or experienced heat, climbed to 120 degrees; uncommonly 'high lows' (daily low temperatures that were themselves dangerously high), sparse cloud cover, and a dearth of cooling winds kept the city broiling, without relief, for a full week"[7]. After a week of intense heat, "medical examiners confirmed that over five-hundred Chicagoans had died directly from the heat, public health workers reported over seven-hundred deaths in excess of the weekly average, and hospitals registered thousands of visits for weather-related problems"[8]. The entire Chicago area felt the 1995 heat wave, but the effects of this extreme weather event were not leveled evenly across the entire area of the event. It was reported very quickly during and after the event that the victims of the heat wave were mostly elderly, poor, and Black[9]. The more fragile health of the elderly makes the raised vulnerability of older residents of Chicago less of a surprise, but the disproportionately poor and Black victimhood during this disaster further demonstrates the incredible exposure these groups have during extreme weather events.

The unequal effects of the 1995 heat wave in Chicago were neither wholly natural nor apolitical despite occurring in the early years of global climate change. The disproportionate victimhood of poor people of color in this case occurred as a result of political decisions. On top of the financial conditions that limit healthcare access and quality air-conditioning in the homes of the groups that ended up most vulnerable to the heat wave, the Chicago and Illinois government also acted in ways that led to an excess of deaths among elderly, poor, and Black residents during the heat crisis. The Chicago Police Department's own senior assistance unit was neglected to be activated at all and the Department of Human Services failed to contact isolated seniors or transport them to any of the few public cooling centers that the city erected.[10] State and local governments have demonstrated both a lack of preparedness for extreme weather events and a bias against poor people and people of color in the few preparation policies they do have. Governments can learn from their mistakes, but they must do so in a way that moves faster than escalating global warming. The impacts of environmental racism and the unique relationship between poverty and ecological hazards has continued to this day and will continue under more and more extreme

[6] https://link.springer.com/article/10.1023/A:1006995507723
[7] https://link.springer.com/article/10.1023/A:1006995507723
[8] https://link.springer.com/article/10.1023/A:1006995507723
[9] https://journals.sagepub.com/doi/abs/10.1177/000312240607100407?
[10] https://link.springer.com/article/10.1023/A:1006995507723

climate change. Chicago's 1995 heat wave is just one example among many demonstrating the ways in which climate change has already begun to exacerbate poverty and racism in the United States.

Beyond the unique vulnerability of people of color and the poor to climate change, the deeply embedded nature of fossil fuels in our economy means that the jobs of many in Berkeley are dependent on carbon-emitting industries. While Berkeley may not be home to any coal mines, oil refineries, or other industries widely associated with climate change, Berkeley's economy is no less reliant on fossil fuel extraction and combustion. Transitioning off of fossil fuels will inevitably mean existing jobs and businesses will have to radically change or cease to exist at all. Berkeley's transition must take into account the economic consequences of all of its climate initiatives, not to stifle what the City must do to curb climate change, but to ensure that the workers most proximate to those economic consequences are supported as we rework our economy for a carbon neutral world. The transition off of fossil fuels can ignore the economic realities of the dramatic changes that are necessary to fight warming no more than it can ignore the unequal threat that climate change poses to the poor and people of color.

On a broader scale, studies indicate that a national transition to a 100%-renewable energy sector would likely result in the loss of around 3.9 million jobs while creating 5.9 million jobs.[11] Exact job loss and gain forecasts in Berkeley are unknown, but it stands to reason that the job impacts will be comparable to the national figures if the transition is done proactively. The net gain in employment opportunities from the fossil fuel transition provides an optimistic vision for the transition, but does not mean that the road to net-zero will be easy. Not every lost job will be immediately accompanied by the creation of a new job, nor is it guaranteed that those who lose their job will automatically be offered employment in newly created industries or that those new jobs will offer the same wages and benefits as the jobs that are lost. Governments, including the City of Berkeley, must play an active role in ensuring that their transitions provide a net-gain in quality, good-paying jobs and that those who lose their job to the transition are prioritized for newly created jobs. Job losses are not a reason not to transition off of fossil fuels. To secure a prosperous future and save millions of lives, the transition must continue at an aggressive pace. Reckoning with future job losses, however, will help ensure that those losses are overshadowed by the benefits of the transition and that an ample supply of new jobs are available for all.

Governments have a small window that they can and should take advantage of to justly transition their economies, industries, and infrastructures to net-zero carbon emissions. This is the bare minimum, and will only stop the most extreme levels of climate change

[11] http://web.stanford.edu/group/efmh/jacobson/Articles/I/USStatesWWS.pdf

towards the end of this century. A properly planned and justly executed transition should stand to be an economic opportunity for Berkeley rather than an economic downturn.Berkeley must recognize what is coming, and the unique vulnerabilities of people of color and the poor, and enact policies to mitigate damages to these communities from warming and the transition to carbon neutrality.

What is a Just Transition?

At varying levels, the consumption of fossil fuels is immersed in every aspect of daily life in modern society. Shifting our entire way of life towards carbon-neutrality will require significantly more than changing our energy sources to renewables. The truly comprehensive embeddedness of fossil fuels in our lives means that achieving net-zero fossil fuel emissions within just a few decades will be difficult, but not necessarily equally difficult for everyone.

Due to historic discrimination, impoverishment, and proximity to environmental hazards, people of color and poor people are disproportionately vulnerable to the impacts of climate change. In rebuilding our economy, policymakers at every level must be intentional in ensuring that the fossil-free economy of the future does not reproduce the same inequities and societal harms of today. There are wrong ways to fight the climate crisis. Governments can achieve net-zero emissions in such a way that enriches those who profited off of fossil fuel extraction and consumption and protects the already well-off from warming while abandoning the historically disadvantaged to the ravages of extreme weather and economic chaos. The transition away from fossil fuels must ensure that the vulnerable in our society are protected from both the turbulence of restructuring our entire economy and the effects of global warming that are already set in stone. “After centuries of global plunder, the profit-driven industrial economy rooted in patriarchy and white supremacy is severely undermining the life support systems of the planet. Transition is inevitable. Justice is not.”[12] The environmental justice movement calls this approach to the climate crisis a “Just Transition.”

The Climate Justice Alliance, a climate organization at the forefront of the fight for a Just Transition, lays out the following Just Transition principles:

> **A Just Transition moves us toward Buen Vivir**
> Buen Vivir means that we can live well without living better at the expense of others. Workers, community residents, women and Indigenous Peoples around the world have a fundamental human right to clean, healthy and adequate air, water, land, food, education and shelter. We must have just relationships with each other and with the natural world, of which we are a part. The rights of peoples, communities and nature must supersede the rights of the individual.

[12] https://climatejusticealliance.org/wp-content/uploads/2018/06/CJA_JustTransition_Principles_final_hi-rez.pdf

A Just Transition creates Meaningful Work

A Just Transition centers on the development of human potential, creating opportunities for people to learn, grow, and develop to their full capacities and interests. We are all born leaders, and a regenerative economy supports and nurtures that leadership. In the process, we are transforming ourselves, each other, our communities, and our society as a whole. Meaningful work is life-affirming.

A Just Transition upholds Self Determination

All peoples have the right to participate in decisions that impact their lives. This requires democratic governance in our communities, including our workplaces. Communities must have the power to shape their economies, as producers, as consumers, and in our relationships with each other. Not only do we have the right to self determination, but self determination is one of our greatest tools to realize the world we need. The people who are most affected by the extractive economy — the frontline workers and the fenceline communities — have the resilience and expertise to be in the leadership of crafting solutions.

A Just Transition equitably redistributes Resources and Power

We must work to build new systems that are good for all people, and not just a few. Just Transition must actively work against and transform current and historic social inequities based on race, class, gender, immigrant status and other forms of oppression. Just Transition fights to reclaim capital and resources for the regeneration of geographies and sectors of the economy where these inequities are most pervasive.

A Just Transition requires Regenerative Ecological Economics

Just Transition must advance ecological resilience, reduce resource consumption, restore biodiversity and traditional ways of life, and undermine extractive economies, including capitalism, that erode the ecological basis of our collective well-being. This requires a re-localization and democratization of primary production and consumption by building up local food systems, local clean energy, and smallscale production that are sustainable economically and ecologically. This also means producing to live well without living better at the expense of others.

A Just Transition retains Culture and Tradition

Capitalism has forced many communities to sacrifice culture and tradition for economic survival. It has also defaced and destroyed land held as sacred. Just Transition must create inclusionary spaces for all traditions and cultures, recognizing them as integral to a healthy and vibrant economy. It should also make reparations for land that has been stolen and/or destroyed by capitalism, colonialism, patriarchy, genocide and slavery.

A Just Transition embodies Local, Regional, National and International Solidarity

A Just Transition must be liberatory and transformative. The impacts of the extractive economy knows no borders. We recognize the interconnectedness of our communities as well as our issues. Therefore, our solutions call for local, regional, national and global solidarity that confronts imperialism and militarism.

A Just Transition builds What We Need Now

> We must build the world we need now. This may begin at a local small scale, and must expand to begin to displace extractive practices. We must build and flex the muscles needed to meet our communities' needs.[13]

Embarking on a Just Transition would make Berkeley a leader on climate action done right, but existing Just Transition examples from around the world can provide much guidance. In Poland, a 75% decline in coal mining jobs was coupled by a mining social package and special privileges for mining communes. Canada's efforts to phase out coal-powered electricity have been accompanied by a national stakeholder task force that has travelled the country to hear from Canadians on how to justly shepherd the transition. Egypt's fuel price increases were paired with minimum wage boosts, food stipends, and progressive taxation.[14]

Here in Berkeley, there are a number of policies that the City may take up in pursuit of a Just Transition. In the realm of mitigating climate change, the retrofitting of residential buildings for electrification and enhanced energy efficiency is a necessary – and expensive – component of any transition towards a sustainable Berkeley. Estimates suggest that all-electric single-family homes can "reduce annual GHG emissions by 33 - 56% in 2020 and by 76 – 88% in 2050 compared to a natural gas-fueled home."[15] Residential emissions can also be reduced through the densification of our community and a long-term shift away from single-family homes as a primary form of living, but Berkeley's existing stock of single-family homes isn't just going to go away.[16] Retrofitting and electrifying our existing housing stock is important, but is too expensive a lift for the City to expect or require all homeowners to go about alone.[17] A Just Transition in building electrification would involve the City dedicating its own resources as well as engaging the state and federal governments to fund retrofits and support residential homeowners through the process of electrifying their homes.

While Berkeley has been at the forefront of guaranteeing a generous minimum wage, any Just Transition must ensure that all workers in Berkeley earn a living wage into the future as the global economy is shaken by the impacts of climate change. On top of the direct economic impacts of climate change, the ongoing shift in employment opportunities toward gig-based and contractor work that does not always guarantee a living wage and good benefits presents a threat to the livelihoods of workers in Berkeley and elsewhere. On a warming planet with rapidly intensifying weather conditions, access to food, shelter, and quality healthcare will be more important – and more precarious – than ever before. Local and state policies, such as ensuring that minimum wage laws apply to app-based contract work[18], will go a long way in a warming-afflicted

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[13] https://climatejusticealliance.org/wp-content/uploads/2018/06/CJA_JustTransition_Principles_final_hi-rez.pdf

[14] https://www.iisd.org/articles/just-transition-examples

[15] https://www.ethree.com/wp-content/uploads/2019/04/E3_Residential_Building_Electrification_in_California_April_2019.pdf

[16] https://www.pnas.org/content/117/32/19122

[17] https://www.nahb.org/-/media/NAHB/nahb-community/docs/committees/construction-codes-and-standards-committee/home-innovation-electrification-report-2021.pdf?_ga=2.114118479.990433442.1620163394-283412800.1620163394

[18] https://cities-today.com/seattle-passes-minimum-wage-for-rideshare-drivers/

future towards shoring up the health and economic stability of workers. Additionally, Berkeley's Living Wage Ordinance, which ensures "that businesses in a contractual relationship with the City pay their employees a wage that can support a family at, or above, the poverty level"[19], is an important labor policy that can be upheld and even strengthened as economic stresses require more support for employees on the part of employers. Beyond the active role that Berkeley's City government must play in ensuring a Just Transition, workers themselves need to be empowered to ensure that the sweeping economic changes of the transition to a sustainable economy does not leave them behind. Berkeley must, at every turn, protect the rights of workers to organize and bargain collectively and support the efforts of workers in the private-sector to assert their rights in every instance possible.

There is a wealth of potential policies in academic literature and real-world examples that the City Council can draw upon in enacting a Just Transition for Berkeley. "Smart growth" strategies offer effective and just climate mitigation and adaptation policies that Berkeley can draw upon to effectively manage its transition off of fossil fuels and foster economic opportunities for the City. These include planning for a denser city, preserving green spaces, discouraging new construction in areas at risk of extreme weather conditions such as wildfires, upgrading stormwater systems, and generally encouraging energy efficient land use patterns.[20] There is an expansive world of policy opportunities for Berkeley to draw on in envisioning and pursuing a fossil-free Berkeley that protects frontline communities, expands worker rights, and fosters a more prosperous future for our city in the face of this crisis.

RATIONALE FOR RECOMMENDATION

In 2006, Berkeley residents voted in favor of Measure G, which committed the City of Berkeley to reduce its emissions by 80% below 2000 levels by 2050. The City Council, staff, and the community subsequently worked in tandem to develop the Berkeley Climate Action Plan, which lays out the City's path to achieving the stated goal on Measure G.[21] In 2018, the City Council voted to declare a Climate Emergency citing an "existential Climate Emergency that threatens our city, state, nation, civilization, humanity, and the natural world."[22] Both the establishment of the Berkeley Climate Action Plan and the declaration of a Climate Emergency put the City leagues ahead of other cities, states, and even the country on initiating climate action, but we're still nowhere near enough.

[19]https://www.cityofberkeley.info/Finance/Home/Vendors__Living_Wage_Ordinance.aspx#:~:text=Effective%20July%201%2C%202021%2C%20the,of%20not%20less%20than%20%2419.67.

[20]https://www.epa.gov/smartgrowth/smart-growth-and-climate-change#:~:text=Smart%20growth%20policies%20contribute%20to,effects%20of%20a%20changing%20climate

[21] https://www.cityofberkeley.info/climate/

[22]https://www.cityofberkeley.info/uploadedFiles/Council_2/Level_3_-_General/Climate%20Emergency%20Declaration%20-%20Adopted%2012%20June%202018%20-%20BCC.pdf

At the state level, California's environmental efforts place it well ahead of most other states. Even California's efforts, however, are insufficient at best and ineffective at reducing emissions at worst.[23] The City of Berkeley must lead the state and the country both in aggressive and ambitious climate legislation that gets us to net-zero carbon emissions as soon as possible as well as climate mitigation and adaptation efforts that overcome and reverse historic environmental racism and lessen the economic turbulence that will accompany reshaping our economy in the coming decades so that all working Berkeleyans have the right to a good job and secure future. Past and future efforts to reach net-zero fossil fuel emissions must be examined in an active pursuit of a Just Transition for Berkeley.

ENVIRONMENTAL IMPACTS
This proposal advances and enhances Berkeley's climate goals.

FISCAL IMPACTS
None.

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ATTACHMENTS
1. Resolution
2. California's Fourth Climate Change Assessment: San Francisco Bay Area Region Report
3. Climate Justice Alliance: Just Transition Principles

[23] https://www.kqed.org/science/1972957/state-auditor-says-california-air-regulator-overstated-emission-reductions

RESOLUTION NO. ##,###-N.S.

COMMIT THE CITY OF BERKELEY TO A JUST TRANSITION FROM THE FOSSIL FUEL ECONOMY

WHEREAS, in Berkeley, fossil fuel-driven global warming has already caused sea level rise, droughts, extreme weather conditions, and longer and more intense fire seasons, and

WHEREAS, business-as-usual fossil fuel emissions will lead to major increases in temperature, more dramatic droughts, more frequent extreme weather, and up to 3 meters of sea level rise, and

WHEREAS, historic inequities and environmental racism leave people of color and the poor in a uniquely vulnerable position when faced with dramatic warming, economic turbulence, and extreme weather, and

WHEREAS, the transition off of fossil fuels will have inevitable economic consequences including the loss of jobs and industries that are reliant on fossil fuel extraction and consumption, and

WHEREAS, a proactively planned and equitably executed transition away from the fossil fuel economy can be an opportunity to correct historic wrongs and boost Berkeley's economy,

NOW THEREFORE, BE IT RESOLVED, that the City Council commits the City of Berkeley to a Just Transition to net-zero carbon emissions that secures a livable future for all Berkeleyans, combats environmental racism and the unique vulnerabilities of people of color, and ensures that all Berkeleyans have access to good paying jobs free from the fossil fuel economy, and

BE IT FURTHER RESOLVED, that all City Council reports relating to climate be required to include a Just Transition section wherein the Just Transition impacts of climate-related items are outlined and discussed.

CALIFORNIA'S FOURTH
CLIMATE CHANGE
ASSESSMENT

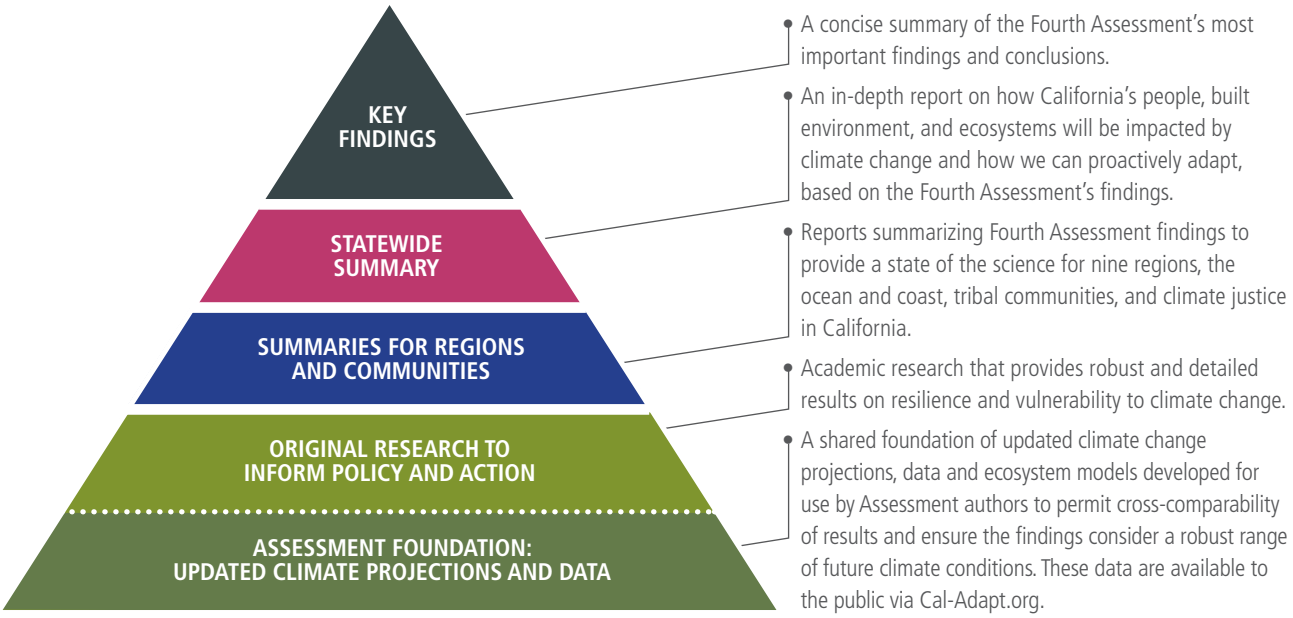
San Francisco Bay Area Region Report

Coordinating Agencies:

Introduction to California's Fourth Climate Change Assessment

California is a global leader in using, investing in, and advancing research to set proactive climate change policy, and its Climate Change Assessments provide the scientific foundation for understanding climate-related vulnerability at the local scale and informing resilience actions. The Climate Change Assessments directly inform State policies, plans, programs, and guidance to promote effective and integrated action to safeguard California from climate change.

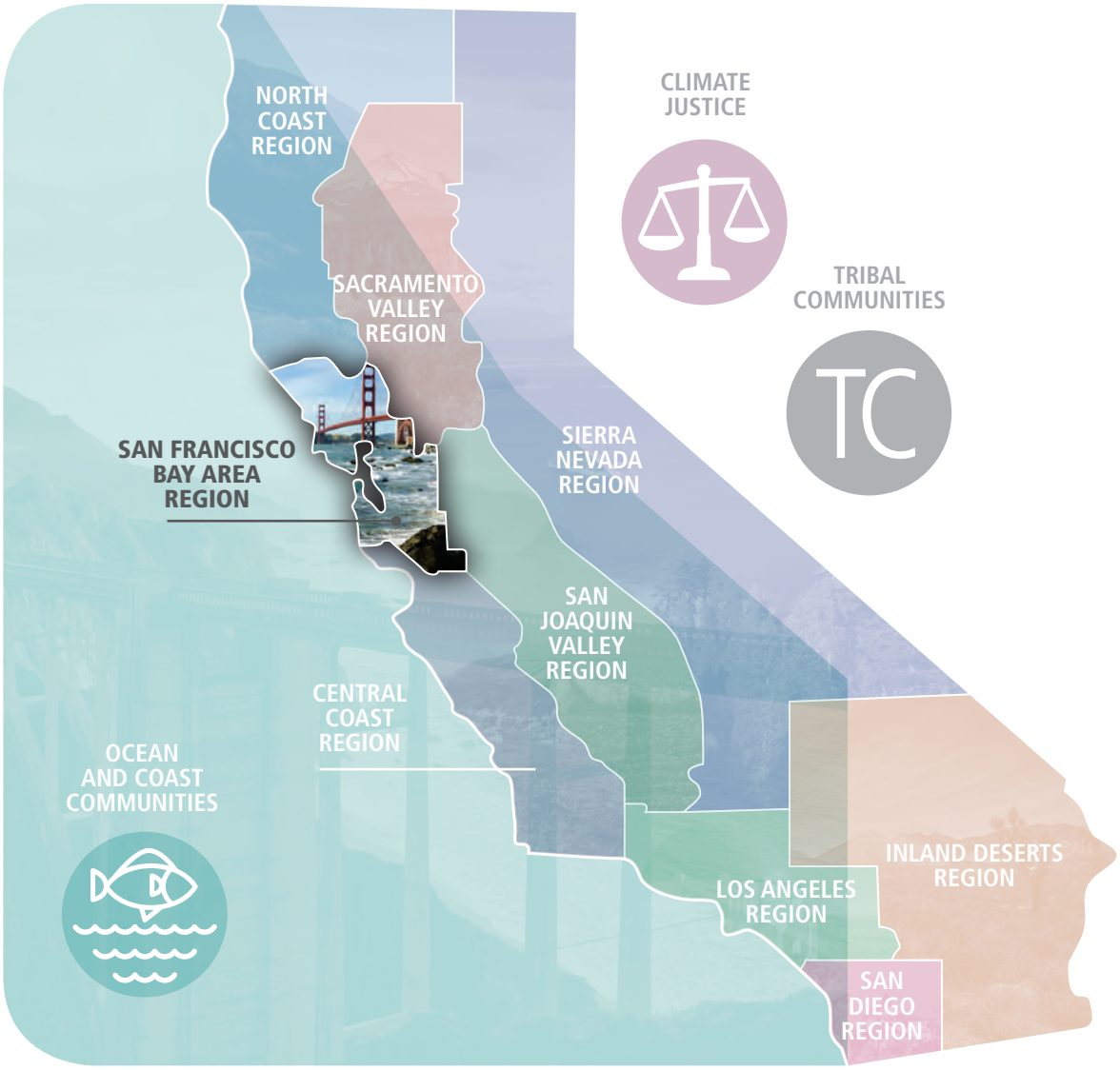
California's Fourth Climate Change Assessment (Fourth Assessment) advances actionable science that serves the growing needs of state and local-level decision-makers from a variety of sectors. This cutting-edge research initiative is comprised of a wide-ranging body of technical reports, including rigorous, comprehensive climate change scenarios at a scale suitable for illuminating regional vulnerabilities and localized adaptation strategies in California; datasets and tools that improve integration of observed and projected knowledge about climate change into decision-making; and recommendations and information to directly inform vulnerability assessments and adaptation strategies for California's energy sector, water resources and management, oceans and coasts, forests, wildfires, agriculture, biodiversity and habitat, and public health. In addition, these technical reports have been distilled into summary reports and a brochure, allowing the public and decision-makers to easily access relevant findings from the Fourth Assessment.



All research contributing to the Fourth Assessment was peer-reviewed to ensure scientific rigor as well as, where applicable, appropriate representation of the practitioners and stakeholders to whom each report applies.

For the full suite of Fourth Assessment research products, please visit: www.ClimateAssessment.ca.gov

San Francisco Bay Area Region



The San Francisco Bay Area Region Summary Report is part of a series of 12 assessments to support climate action by providing an overview of climate-related risks and adaptation strategies tailored to specific regions and themes. Produced as part of California's Fourth Climate Change Assessment as part of a pro bono initiative by leading climate experts, these summary reports translate the state of climate science into useful information for decision-makers and practitioners to catalyze action that will benefit regions, the ocean and coast, frontline communities, and tribal and indigenous communities.

The San Francisco Bay Area Region Summary Report presents an overview of climate science, specific strategies to adapt to climate impacts, and key research gaps needed to spur additional progress on safeguarding the San Francisco Bay Area Region from climate change.

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Table of Contents

Highlights from the SF Bay Area Report

The San Francisco Bay Area spans nine counties and 100 cities and towns with a population of more than 7 million people and a $750 billion economy (~30% of California's total). The Mediterranean climate, with mild, wet winters and a warm, sun-drenched summer, supports extraordinary biological diversity and a thriving wine and dairy industry. This report examines the potential impacts of 21st century climate change on the physical climate, social systems and built environment, and natural and agricultural systems of the Bay Area. The geography of the region sets the stage for understanding how rising temperatures, changes in precipitation and fog, and rising sea levels will impact the region (section 1). We then examine projected impacts on social systems and infrastructure, from coastal flooding to wildfire and public health, with attention to the effects of social inequity on the vulnerability and resilience of local communities (section 2). Finally, we examine the impacts of climate change on biodiversity and open space conservation, and the effects on agriculture, with a focus on vineyards and rangelands (section 3). Where possible, we summarize proposed climate mitigation and adaptation strategies in a regional context to highlight potential actions and solutions necessary to meet these diverse challenges.

The impacts of climate change are already being felt in the San Francisco Bay Area and Northern California.

- Overall, the Bay Area's average annual maximum temperature increased by 1.7°F (0.95 °C) from 1950-2005.
- Several studies suggest that coastal fog along the California coast, so critical to our Bay Area climate, is less frequent than before.
- Sea level in the Bay Area has risen over 20 centimeters (8 inches) in the last 100 years.
- The powerful 2015-16 El Niño, one of the three largest in the historical record, resulted in winter wave energy that was over 50% larger than the typical winter in the Bay Area, driving unprecedented outer coast beach erosion.
- The 2012-2016 California drought led to the most severe moisture deficits in the last 1,200 years and a 1-in-500 year low in Sierra snowpack. The 2012-2016 record low snowpack resulted in $2.1 billion in economic losses and 21,000 jobs lost in the agricultural and recreational sectors statewide and exacerbated an ongoing trend of groundwater overdraft.

These changes are projected to increase significantly in the coming decades over the region.

- Even with substantial global efforts to reduce greenhouse gas emissions, the Bay Area will likely see a significant temperature increase by mid-century. By the end of the century, the difference between lower and higher global emissions scenarios will make a major difference in how much Bay Area temperatures rise.
- Precipitation in the Bay Area will continue to exhibit high year-to-year variability - "booms and busts" - with very wet and very dry years. The Bay Area's largest winter storms will likely become more intense, and potentially more damaging, in the coming decades. Under a high emissions scenario, average Sierra Nevada snowpack is projected to decline by nearly 20% in the next 2-3 decades, 30% to 60% in mid-century and by over 80% in late century.

- Future increases in temperature, regardless of whether total precipitation goes up or down, will likely cause longer and deeper California droughts, posing major problems for water supplies, natural ecosystems, and agriculture.
- California's Fourth Climate Change Assessment projects median sea level rise between 0.74 m (RCP 4.5) and 1.37 m (RCP8.5) for 2100 along the California coast. However, recent science studies, using advanced models and ice sheet observations, suggest the possibility of extensive loss from Antarctic ice sheets in the 21st century — possibly producing sea level rise by 2100 that could approach 3 meters.
- Even with high levels of emissions reductions, research now suggests that at least 2 meters of sea level rise is inevitable over the next several centuries due to the lag of sea level rise in response to increasing global temperatures.

Changes in temperature, precipitation, and sea level rise will produce substantial impacts on Bay Area social systems and the built environment.

- The three-way relationship between land use, transportation infrastructure, and energy systems — all of which are vulnerable to climate impacts — is perhaps the most critical interdependence in determining the future growth and prosperity of the Bay Area.
- Future land use decisions will significantly influence the Bay Area's efforts to address climate change, affecting building and transportation energy, urban water demand, and wildfire ignitions. For example, the critical lack of affordable housing in the core of the region is forcing households further south, north, and inland, with negative energy and environmental consequences. At the same time, building energy demand is higher in inland regions (warmer summers/cooler winters) so reducing Bay Area energy consumption will strongly depend on where new housing and business growth are located.
- Much of the Bay Area's transportation system — airports, roads, and railways — is concentrated along the bay where flooding from sea level rise and storm surge is a major vulnerability.
- The Bay Area electrical grid is vulnerable to power outages during wind and wildfire events while much of our natural gas transmission system is located along waterways and will be impacted by flooding from sea level rise and extreme storm events.
- Warmer summers will increase summer energy demand across the region, with the largest increase expected in coastal cities as air conditioning adoption grows there.
- Climate impacts — such as earlier melting of snowpack, increasing seawater intrusion into groundwater, increased rates of evapotranspiration, and levee failures or subsidence that contaminate Delta supplies — will affect both the quantity of water available and the quality of supplies.
- Wastewater treatment plants, historically located along bay shorelines where effluent discharge was convenient, are now highly vulnerable to future sea level rise. Rising bay water and groundwater levels will also increase salinity intrusion and subsurface flooding. Climate change will require improved stormwater management in the Bay Area as extreme storm events increase in size and frequency.
- Bay Area public health is threatened by a number of climate-related changes, including more extreme heat events, increased air pollution from ozone formation and wildfires, longer and more frequent droughts, and flooding from sea level rise and high-intensity rain events.

- High levels of socioeconomic inequity in the Bay Area create large differences in the ability of individuals to prepare for and recover from heat waves, floods, and wildfires. Financial resources as well as improved social structures are important to enhance community resilience and reduce these disparities.
- Heat waves pose increased health risks due to urban heat islands and lack of local experience and cooling infrastructure (air conditioning) in bayside cities. These risks are compounded for low-income communities.
- Natural infrastructure can play an important role in climate change adaptation, enhancing biodiversity and ecosystem services while reducing societal risks.
- While bayside communities are on the front lines for future flood risk, many may have limited ability or resources to pursue adaptation strategies. Without inclusive engagement among communities, disparities in economic and political power will undermine regional solutions and leave communities acting independently, with highly variable results for resilience and community health.

Climate change will produce substantial impacts on Bay Area natural and managed resource systems.

- The future climate of the Bay Area will become less suitable for evergreen forests — redwoods and Douglas fir — and more favorable for hot adapted vegetation such as chaparral shrub land.
- The ability of vegetation to respond to the rapidly changing conditions in the 21st century is poorly understood. It is possible that vegetation will be increasingly "out of sync" with climate and vulnerable to heat and drought.
- The most threatening effect of climate change to Bay Area wildlife is the impact of rising sea levels on wetlands because of the limited potential for wetlands to move inland and become established. At the same time, less rainfall, more summer heat, and increased drought will hurt amphibians and reptiles, while heat and wildfires may negatively affect upland birds, mammals, amphibians, and reptiles. Some wildlife species may need to shift locations as the vegetation they inhabit transforms with a changing climate.
- The Bay Area's mild climate and accessible open spaces are vital to the region's quality of life. Regional conservation efforts, including coordinated open space protection design and implementation of landscape corridors, climate-smart conservation, and restoration practices, will enhance success in a changing climate.
- In the Bay Area, future fire activity will be driven by both changes in urban development and in climate. Land use planning, together with fire-safe building standards and near-building vegetation management, are important strategies for managing future fire risk to people and structures.
- Forests can play an important role in carbon sequestration. Fuel and fire management will be critical, as fire is the primary source of carbon loss from forests. Recently, carbon loss from fires exceeded carbon uptake by vegetation in California.
- Nearly every aspect of Bay-Delta ecosystems will be affected by climate change as a result of rising sea levels, increases in air temperatures, changes in precipitation, changes in sediment supply and more. All natural areas of the shore will need to adapt or transform.

- The interruption of natural processes over the past 200 years as the region has developed has decreased natural Bay-Delta resiliency. A dynamic, resilient ecosystem has become a rigid landscape with brittle features that will have trouble adapting. New approaches that use natural shoreline infrastructure, like beaches, marshes, and mudflats, together with managed retreat where necessary, can create more resilient shorelines that respond well to changing conditions.
- Nearly 70% of California's existing area of wine production will be vulnerable under future climate change projections by mid-century. Wine grape production in the Bay Area could be vulnerable to extreme temperatures and temperature-related water scarcity.
- The sensitivity of Bay Area rangeland vegetation to precipitation dynamics makes these ecosystems particularly vulnerable to climate change. Changes in rainfall regimes are also likely to affect plant production and associated patterns in soil carbon and greenhouse gas production. Grazing and rangeland management practices can play a significant role in enhancing soil moisture and belowground carbon sequestration. Current research highlights the potential role of compost together with grazing on California pasturelands as a targeted strategy to increase carbon sequestration.

A growing number of Bay Area local governments, regional agencies, nonprofits, and private sector stakeholders are taking actions that advance climate adaptation and resilience.

- Projects include comprehensive vulnerability assessments, plans for infrastructure improvements, new governance structures, and actual on-the-ground projects to address sea level rise, drought and other climate impacts.
- Examples include Resilient by Design: Bay Area Challenge, the Sonoma County Regional Climate Authority, Adaptation to Rising Tides, the Bay Area Regional Reliability Project, Bay Area Regional Health Inequities Initiative (BARHII), San Francisco Climate & Health Profile, RISeR SF Bay, Marin County C-SMART, Sea Change San Mateo County, Climate Ready North Bay, and the San Francisco Bay Restoration Authority.

Introduction

The San Francisco Bay Area spans nine counties and 100 cities and towns with a population of more than 7 million people and a $750 billion economy (~30% of California's total). The Mediterranean-type climate, with mild, wet winters and a warm sun-drenched summer, supports extraordinary biological diversity and a thriving wine and dairy industry. The amenable climate is one factor that has drawn people from across the U.S. and all corners of the globe, contributing to the growth of the region's economy and the rise of Silicon Valley. San Francisco was the gateway to the Gold Rush, and that spirit of opportunity and innovation has permeated California culture and been reflected in continuing cycles of boom and bust. Economic growth has been accompanied by social inequity and accompanying disparities in health, education, and job opportunities. The current housing crisis has reflected that disparity with waves of displacement unfolding across the region.

FIGURE 1

The Bay Area, as defined for the Fourth Assessment. Note that the eastern half of Solano County is included in the Sacramento Valley report.

This report examines the potential impacts of 21st century climate change on the physical climate, social systems, and built environment, and natural and agricultural systems of the Bay Area. The geography of the region, adjacent to the cool Pacific Ocean and wrapped around San Francisco Bay, sets the stage to understand how rising temperatures, changes in precipitation and fog, and rising sea levels will impact the region. We then examine projected impacts on social systems and infrastructure, from coastal flooding to wildfire and public health, with attention to the effects of social inequity on the vulnerability and resilience of local communities. Lastly, we examine impacts of climate change on biodiversity and open space conservation, and the effects on agriculture, with a focus on vineyards and rangelands. Where possible, we summarize proposed climate mitigation and adaptation strategies in a regional context to highlight potential actions and solutions necessary to meet these diverse challenges.

Regional Climate Science

With its diverse microclimates, highly variable rainfall, dependency on snow-fed mountain water supply, extensive shorelines, and propensity for wildfire, it is not surprising that the physical climate of the Bay Area is changing in complex ways. This first section examines recent historical trends in temperature, precipitation, snowpack, extreme storms, drought, and sea level, as well as their projected changes over the course of the 21st century and key uncertainties, such as the changing role of fog in shaping microclimates.

Except where noted, the temperature and precipitation data we present are drawn from the downscaled daily products prepared for California's Fourth Climate Change Assessment by Pierce et al. (2018), using a statistical downscaling technique known as Localized Constructed Analogues (LOCA) (Pierce et al. 2014). Pierce et al. (2018) downscaled daily temperature and precipitation projections from 32 global climate models (GCMs) over California to a spatial resolution of 1/16° (around 6 kilometers, or 3.7 miles). The dataset includes observationally based historical data covering 1950-2005 that were used to train the statistical model, as well as historical downscaled data sets from the GCMs covering the same period. It also includes future projections spanning from 2006 to 2100 based on two greenhouse gas emissions scenarios - Representative Concentration Pathways (RCP) 4.5 and 8.5. RCP4.5 represents a mitigation scenario where global CO_2 emissions peak by 2040, while RCP8.5 represents a business-as-usual scenario where CO_2 emissions continue to rise throughout the 21st century (van Vuuren *et al.* 2011). A subset of 10 downscaled GCMs were shown to adequately sample changes across the entire ensemble of 32 models, and results from this 10-member ensemble are used for figures in this report. Public access to the downscaled data, along with mapping and other visualization tools, can be found at Cal-Adapt[1]. We also draw insight and data from a larger literature, including the National Climate Assessment and the IPCC 5th Assessment Report, to inform the confidence with which various aspects of the climate system are expected to change. These datasets are described in more detail where they are presented below.

Where applicable, we note key uncertainties and model limitations, as well as phenomena for which there is a high degree of confidence. Projection uncertainties can arise from a number of factors including the representation of physical processes in models, model resolution, and natural variability in the climate system. For instance, while theory suggests that storm tracks will shift northward as a result of climate change, the global climate model runs used to drive LOCA downscaled products do not show such a trend for North America (Collins *et al.* 2013) and are likely too coarse to detect any such changes less than 100 kilometers (about 60 miles) with confidence. Moreover, it is important to remember that the actual climate and weather experienced contains elements of both natural and human factors. For instance, annual mean precipitation in the Western U.S. is naturally highly variable, meaning that it is difficult to detect climate change-driven trends. On the other hand, there is high confidence that temperatures are rising and trends that are directly associated with temperature, such as decreased snowpack and more intense extreme precipitation events, can be characterized with greater confidence.

Methods for downscaling global climate models to finer spatial scales introduce an additional layer of uncertainty. Different downscaling procedures may, in general, produce different results due to biases in regional climate models or limitations of statistical assumptions. LOCA belongs to a class of statistical downscaling methods that use historic

1 www.cal-adapt.org

patterns as a basis to infer finer scale outcomes in space and time from Global Climate Models. However, future climate change might lead to dynamic changes in the local patterns of circulation that would not be captured by such statistical approaches. For instance, the observed trend of greater fog frequency over the ocean yet less frequency over land could be pointing to future changes in fog and sea breeze that would alter the temperature differential between the coast and inland areas. Such changes would not be captured in Global Climate Models (because they are too coarse) or in LOCA downscaling (because it is based on historic spatial patterns). Changes in fog and sea breeze in the Bay Area remain an active area of research as discussed in the fog section below.

Temperature

HIGHLIGHTS

- Overall, the Bay Area average annual maximum temperature increased by 1.7°F (0.95 °C) from 1950 to 2005.
- Even with substantial global efforts to reduce greenhouse gas emissions in the coming decades, the Bay Area will likely see a significant increase in temperature by mid-century.
- By the end of the century, the difference between lower and higher global emissions scenarios will make a major difference in how much Bay Area temperatures rise.
- While all parts of the Bay Area are projected to get warmer, inland areas will heat up more than coastal areas.
- Warming near the coast will be affected by changes in fog and sea breeze, but the influence of climate change on these highly localized features of the Bay Area climate is poorly understood at this time.

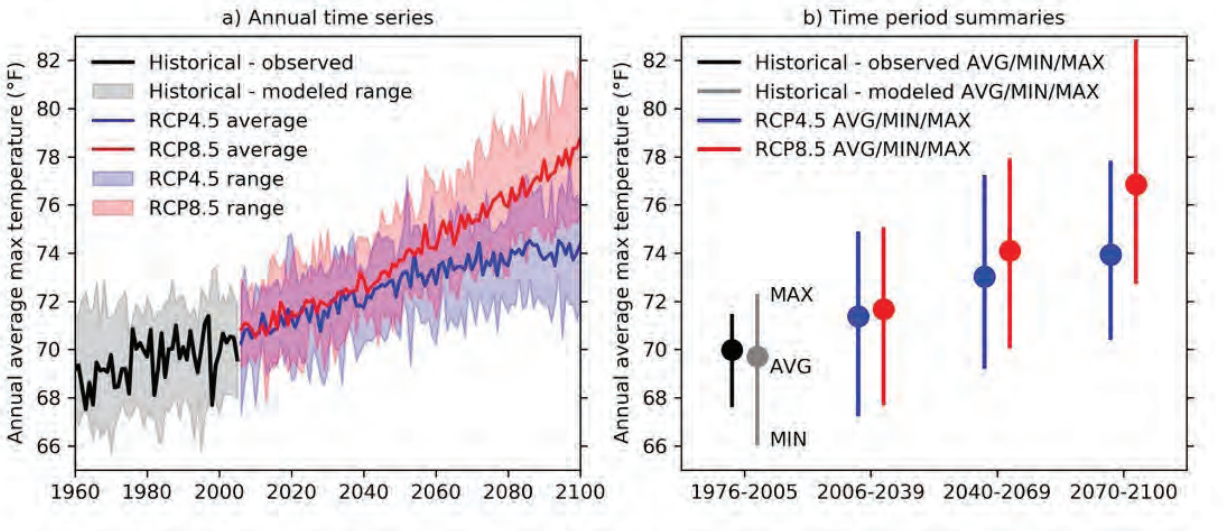
The Bay Area is characterized by a Mediterranean-type climate, defined by its cool, wet winters and warm, dry summers. Unique microclimates are created by regional topography, oceanic currents, fog exposure, and onshore winds (Cayan & Peterson 1993; Kottek *et al.* 2006). The combination of these processes acts like a natural air conditioner resulting in low interannual and daily temperature variability compared with much of California (O'Brien *et al.* 2013; Torregrosa *et al.* 2014, 2016). However, over the 20th century, some studies suggest that eastern Pacific summertime fog has declined substantially (Johnstone & Dawson 2010), and the influence of climate change on historical and future changes in fog prevalence remains an unresolved issue (see Fog section, below).

Regardless, increased surface temperatures have increased summertime cooling costs for residents of the Bay Area, especially at night when onshore winds diminish (Gershunov & Guirguis 2012). In addition, the built environment has played a role in shaping the local climatology of the San Francisco Bay Area, mainly through the effects of the urban heat island, which can be moderated by urban forestry and the cooling effects of irrigation in urban landscapes. For instance, landscape irrigation practices are estimated to reduce daytime summer temperatures across the urbanized portions of the Bay Area by an average of 1.8°F (1.0 °C) (Vahmani & Jones 2017).

Figure 2 highlights the annual average maximum surface temperature trend (annual average of the highest temperature on each day of the year) across the nine counties of the region produced from LOCA downscaling for California's Fourth Assessment (Pierce *et al.* 2018). Annual average maximum temperatures remained within the

relatively narrow range of 67.5°F to 71.9°F (19.7 °C to 22.2 °C) over the period 1950-2005, with an overall average maximum temperature of 69.5°F (20.1 °C). The estimated upward trend of 1.7°F (0.95 °C)in the Bay Area over this period is consistent with the global mean temperature change attributable to anthropogenic influences over a similar timeframe (Bindoff *et al.* 2013). By mid-century (2040-2069), the projected mean annual maximum temperature for the Bay Area, across multiple climate models, exceeds the maximum historical annual mean, regardless of which emissions trajectory is chosen. Thus, even with significant efforts to mitigate climate change (RCP4.5), the Bay Area will likely see annual mean warming on the order of approximately 3.3°F (1.8 °C) by mid-century. This increment increases to 4.4°F (2.4 °C) warming by mid-century under the high-emissions RCP8.5 scenario. The difference between emissions scenarios becomes more apparent by end of century (2070-2100), when the multi-model average shows warming on the order of 4.2°F (2.3 °C) for RCP4.5 and 7.2°F (4.0 °C) for the RCP8.5 scenario.

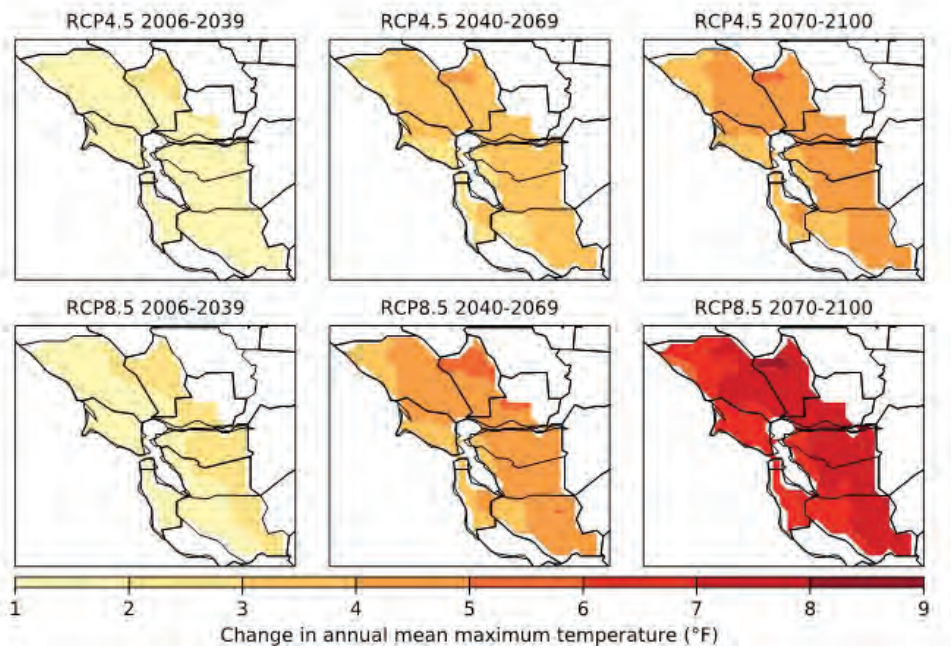
FIGURE 2



Observed historical (black), modeled historical (grey), and projected future (RCP4.5 - blue, RCP8.5 - red) annual average maximum temperature over the Bay Area. (a) Annual time series of data (future projections begin in 2006), with solid lines representing observed annual mean in the historical period and model-averages in the future. Shading represents the spread across models. (b) Summary of multi-year average (circles) and spread (vertical lines) across four time periods: 1975-2005 (historical), 2006-2039 (early-21st century), 2040-2069 (mid-21st century), and 2070-2100 (late-21st century). Note that the spread of values in panel b is smaller for the observed historical data compared to both the modeled historical data and modeled future data because the modeled quantities reflect model-to-model variability in addition to year-to-year variability, whereas the observed historical data only reflects year-to-year variability. Unit is °F.

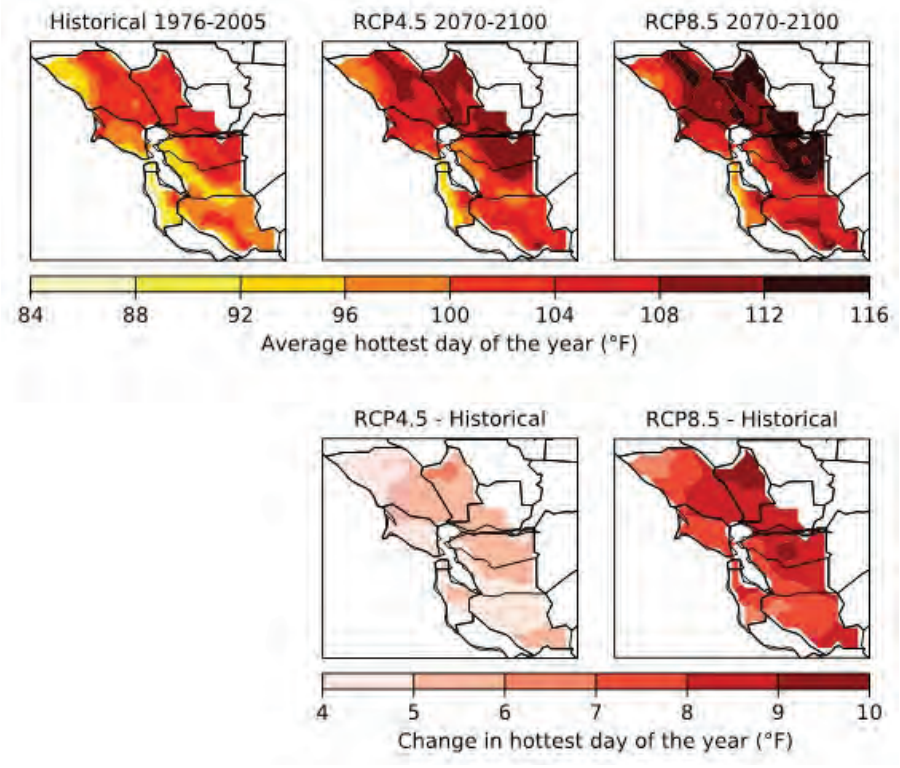
Changes in annual mean maximum temperatures do not convey information about changes in heat extremes, which typically occur over the course of one to several days, nor do they convey spatial differences in the pattern of warming across the sub-regions and microclimates of the Bay Area. Figure 3 shows the spatial change in the annual mean of maximum daily temperatures across the nine counties under RCP4.5 and RCP8.5. Coastal cooling processes, such as fog and onshore winds, buffer some of the surface temperature increase in regions close to the coast and San Francisco Bay whereas regions further inland warm at a faster rate. However, as noted elsewhere in the report, the LOCA downscaling procedure does not explicitly account for potential changes in the characteristics of local phenomena such as fog and sea breeze. Thus, the maps shown in Figures 3 and 4 reflect an assumption that current fog and sea breeze patterns remain the same relative to larger scale temperature conditions in the future. The differential warming signal between the coast and inland areas is also apparent in Figure 4, which highlights the average change in the hottest day of the year. Under RCP8.5, the average hottest day of year is projected to increase by a minimum of 6.3°F (3.5 °C) near the coast up to 10°F (5.6 °C) further inland. Under RCP4.5, warming trends for the average hottest day of year reduce to 3.9°F (2.2 °C) near the coast up to 6.4°F (3.6 °C) further inland.

FIGURE 3



Spatial patterns of projected model-average change in annual mean maximum temperature (unit: °F) under RCP4.5 and RCP8.5 for three time periods: 2006-2039 (early-21st century), 2040-2069 (mid-21st century), and 2070-2100 (late 21st-century). Unit is °F.

FIGURE 4



Top row: Average hottest day of the year in the historical (1976-2005) period, and in the late-21st century (2070-2100) under RCP4.5 and RCP8.5. Bottom row: change (late-21st century minus historical) in the hottest day of the year under RCP4.5 and RCP8.5. Unit is °F. All data are derived from LOCA.

Precipitation, Drought and Snowpack

HIGHLIGHTS

- Precipitation in the Bay Area will continue to exhibit high year-to-year variability - "booms and busts" - with very wet and very dry years.
- Our largest storms, called "atmospheric rivers," contribute on average 40% of the Sierra snowpack and can also produce heavy rainfall and substantial flood risk.
- The Bay Area's largest winter storms will likely become more intense, and potentially more damaging, in the coming decades.
- Future increases in temperature, regardless of whether *total* precipitation goes up or down, will likely cause longer and deeper California droughts, posing major problems for water supplies, natural ecosystems, and agriculture.
- The 2012-2016 California drought led to the most severe moisture deficits in the last 1,200 years and a 1-in-500 year low in Sierra snowpack. Importantly, paleoclimatic records show that mega-droughts spanning multiple decades have occurred in California's past.
- Consecutive years of low or no snowpack are especially worrisome. The 2012-2016 record low snowpack resulted in $2.1 billion in economic losses, 21,000 jobs lost in the agricultural and recreational sectors statewide and exacerbated an ongoing trend of groundwater overdraft.
- Under a high emissions scenario, average Sierra Nevada snowpack is projected to decline by nearly 20% in the next 2-3 decades, 30% to 60% in mid-century, and by over 80% in late century.

California precipitation is the most episodic in the nation, often with relatively long duration between storms (Dettinger *et al.* 2011). As a result, large, discrete storms provide a substantial fraction of California's rainy season total precipitation, and annual precipitation is highly variable from year to year. There are two emerging perspectives on how climate change is affecting precipitation in California. On one hand, any changes in annual mean precipitation that occur are currently expected to be relatively small compared to the range of natural variability experienced in the region (USGCRP 2017). On the other hand, atmospheric theory and climate models both indicate that the largest individual storms are becoming more intense with climate change (Pall *et al.* 2017; Prein *et al.* 2017; Risser & Wehner 2017), and there is some evidence that this might also be accompanied by more frequent extremely dry precipitation periods, as well as more frequent "whiplash" events that swing from extremely dry to extremely wet conditions in California (Swain *et al.* 2018), further enhancing variability in a system already characterized by "booms and busts." We describe these changes in both mean annual precipitation and extreme events further below.

Mean Precipitation Changes

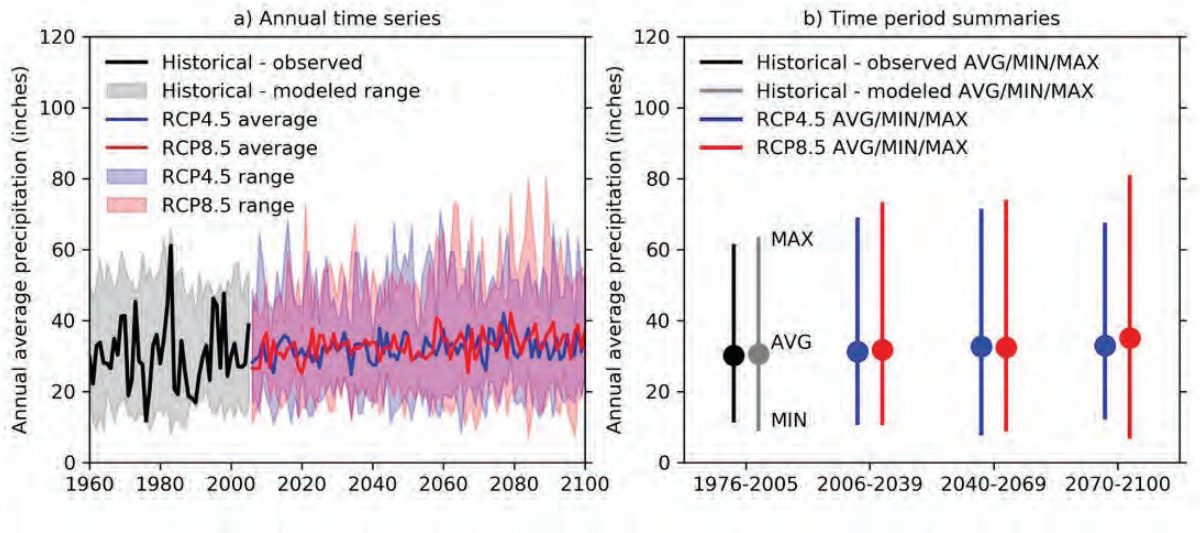
The high variability of mean annual precipitation in California makes it difficult to detect a strong signal in future projections of annual precipitation. Moreover, the physical processes that lead to regional precipitation change as a result of global climate change are complex and vary by region, leading to a higher degree of model uncertainty

compared to projections of temperature change. As the planet warms, the atmosphere holds more water, but the consequences for rainfall vary across the globe (Allen & Ingram 2002; Collins *et al.* 2013). Across North America, even under the strongest emissions scenario (RCP8.5), little change is projected for summer and fall precipitation, but larger changes may occur in winter and spring (USGCRP 2017). In general, precipitation in northern regions is projected to increase while precipitation in the southern regions, especially the Southwest, is projected to decrease. California straddles the boundary between these regions, contributing to the high uncertainty about future precipitation that has been reported through several generations of climate modeling (i.e., IPCC AR3, AR4, and AR5; Collins *et al.* 2013).

This relatively small signal in mean annual precipitation relative to variability can be seen in the downscaled LOCA data for mean annual precipitation in the Bay Area as seen in Figure 5. Mean annual precipitation ranged considerably from year to year over 1950-2005, from 11.7 inches to 61.1 inches (29.7 cm to 155 cm). Thus, while the multi-model average projections do show a small increase in annual precipitation (i.e. 2.5 inches (6.4 cm) per year in RCP4.5 and 4.6 inches (11.7 cm) per year in RCP8.5 by end of century (2070-2100) relative to the baseline period of 1976-2005), these changes are nearly imperceptible relative to the high interannual variability, with a range of almost 50 inches (130 cm) in total rainfall between the driest and wettest years in the historical record.

There is also concern that even if statewide mean precipitation does not change, there could be important local changes due to a northward shift in storm tracks as large-scale patterns of atmospheric circulation are expected to shift away from the equator toward the poles in a warmer climate. The degree to which this phenomenon will impact regional precipitation within California is still poorly understood. We note that the coarse horizontal resolution (~100-200km) of the global climate models used as input to the LOCA downscaling procedure may be too large to resolve such a shift, in which case the shift would not be reflected in downscaled climate data products based on them. The IPCC WG1 AR5 (Collins *et al.* 2013) reveals that end-of-21st century winter storm track shifts under the RCP8.5 forcing scenario are small and not statistically robust in the Eastern Pacific basin. Although these projected shifts are larger in the Western Pacific, North Atlantic, and throughout the Southern Hemisphere, confidence in these projections off the coast of California is *low* due to model limitations.

FIGURE 5



Observed historical (black), modeled historical (grey), and projected future (RCP4.5 - blue, RCP8.5 - red) annual average precipitation over the Bay Area. (a) Annual time series of data (future projections begin in 2006), with solid lines representing observed annual mean in the historical period and model-averages in the future. Shading represents the spread across models. (b) Summary of multi-year average (circles) and spread (vertical lines) across four time periods: 1976-2005 (historical), 2006-2039 (early-21st century), 2040-2069 (mid-21st century), and 2070-2100 (late-21st century). Unit is inches.

Extreme Precipitation Events — Historical and Projections

Generally, the largest California storms are what have recently been dubbed "atmospheric rivers" as they carry more water than seven to 15 Mississippi Rivers combined (Ralph & Dettinger 2011) and often bring an end to drought conditions (Dettinger 2013). These storms result in heavy rainfall over a narrow area (Gimeno *et al.* 2014). Moreover, they contribute an average of 40% of the annual snowpack in California (Guan *et al.* 2013). However, they also present substantial flood risk, especially for the Russian River (Ralph *et al.* 2006) and the Sierra Nevada region, where they account for 50% of rain-on-snow events despite representing only 17% of all precipitation events (Guan *et al.* 2016).

Several lines of evidence point to an enhancement of precipitation extremes due to climate change, although the degree of enhancement is an active area of research. The extreme precipitation literature in recent years has focused on how anthropogenic climate change will impact the magnitude and frequency of extreme storm events through what is known as the Clausius-Clapeyron relationship, which describes the increased capacity of the atmosphere to hold moisture as it warms. One hypothesis holds that if the atmosphere can hold more moisture, the potential for more extreme precipitation should increase as well (Allen & Ingram 2002). This hypothesis is supported by recent

global climate model simulations (Kharin *et al.* 2013); however, climate models at these horizontal resolutions (i.e., ~100-200 km) fail to reproduce observed extreme precipitation amounts (Wehner *et al.* 2010, 2014), especially atmospheric rivers that make landfall in California (Dettinger 2011). The implication for projected changes in extreme precipitation is unclear but several recent analyses suggest that certain storm types may yield precipitation increases substantially in excess of what the Clausius-Clapeyron relationship might predict (Pall *et al.* 2017; Prein *et al.* 2017; Risser & Wehner 2017). A recent analysis of precipitation extremes focused specifically on California corroborates this finding of enhanced wet extremes under climate change and also indicates higher occurrence of extremely low precipitation periods, as well as greater occurrence of "whiplash" events in which extremely dry periods are followed by extremely wet periods (Swain *et al.* 2018).

Consistent with global climate models, the downscaled LOCA projections show an increase in the magnitude of large precipitation events. Figure 6 shows changes in the average wettest day of the year for the nine counties of the Bay Area. Historically, the greatest precipitation events in the Bay Area have occurred in the coastal mountains of northern Sonoma County. Percent increases in the largest precipitation events (measured in inches of rain per day) range from 6% to 21% in RCP4.5 and as high as 37% in RCP8.5 by end of century.

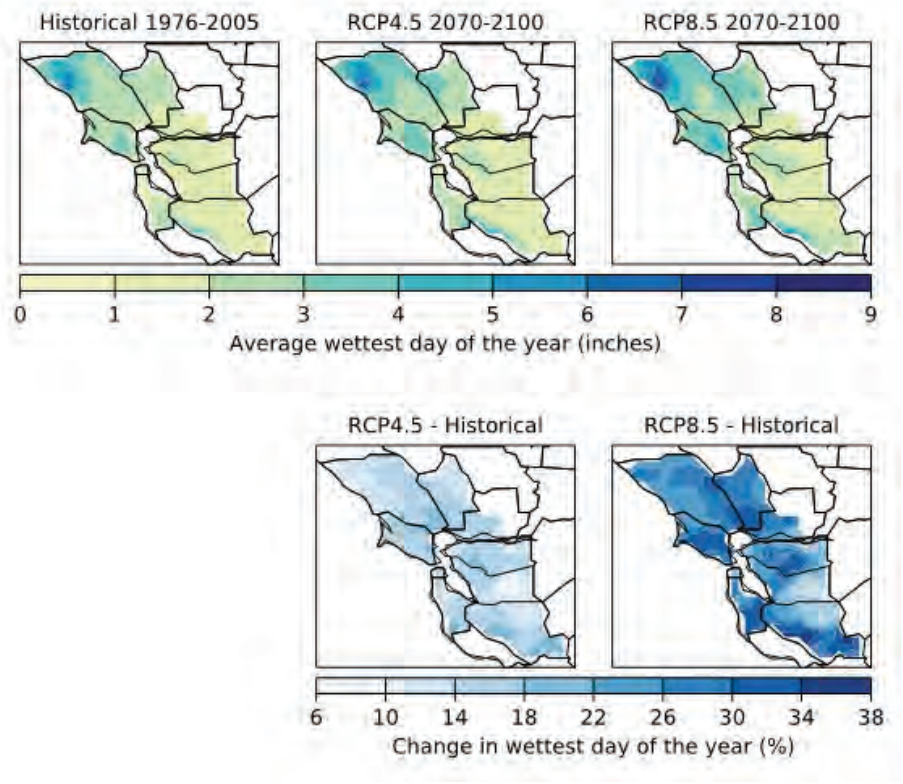
Another way to measure changes in extreme precipitation is to calculate the change in return frequency of a storm of a particular magnitude. For instance, using data prepared for the IPCC WG1 AR5 by Kharin et al. (2013), we estimate that under RCP8.5, what is currently considered a 20-year return frequency one-day storm event for the Bay Area would increase in frequency by a factor of three or more by end of century. In other words, a once-in-20-year storm would become a once-in-seven-year or more frequent storm. Similarly, Swain et al. (2018) estimate that a once-every-200-year sequence of storms comparable to that which caused the great California flood of 1862 could occur every 40-50 years by 2100 under a high emissions scenario (RCP8.5).

BOX 1: IS THAT AN ATMOSPHERIC RIVER I HEAR COMING?

New $19 million advanced weather radar system for the Bay Area

Bay Area water districts are teaming up with USGS and Scripps to develop and deploy a fabulous new Bay Area weather monitoring system that will provide critical data for flood control and water supply issues during our big atmospheric river events. Being able to accurately forecast exactly where the storms will make landfall and how long they will linger over an area will provide a tremendous boost to water and flood managers. Current systems have allowed for 7-day forecasting, which limits preparations on the ground, but the new system will eventually expand to 14- and 21-day advance notices.

FIGURE 6



Top row: Average wettest day of the year in the historical (1976-2005) period and in the late-21st century (2070-2100) under RCP4.5 and RCP8.5. Unit is inches. Bottom row: Change (late-21st century minus historical) in the wettest day of the year under RCP4.5 and RCP8.5. Unit is percent. All data are derived from LOCA.

Drought and Snowpack

To formally quantify drought, or a prolonged period of water deficit, four main indices have been created over the last several decades including: meteorological, soil moisture, hydrological and, most recently, snow (Van Loon 2015). Each index quantifies drought with a unique lens focused on impacts on agriculture, drinking water, ecosystems, energy, and industry and/or recreation. The occurrence of drought is not uncommon in California (Griffin & Anchukaitis 2014) largely due to persistent atmospheric ridges (high pressure systems over the Pacific Ocean; Swain *et al.* 2016) and extreme and intermittent precipitation (Dettinger 2013). The 2012-2016 California drought was a prime example of the implications of atmospheric ridging as it led to the most severe moisture deficits in the last

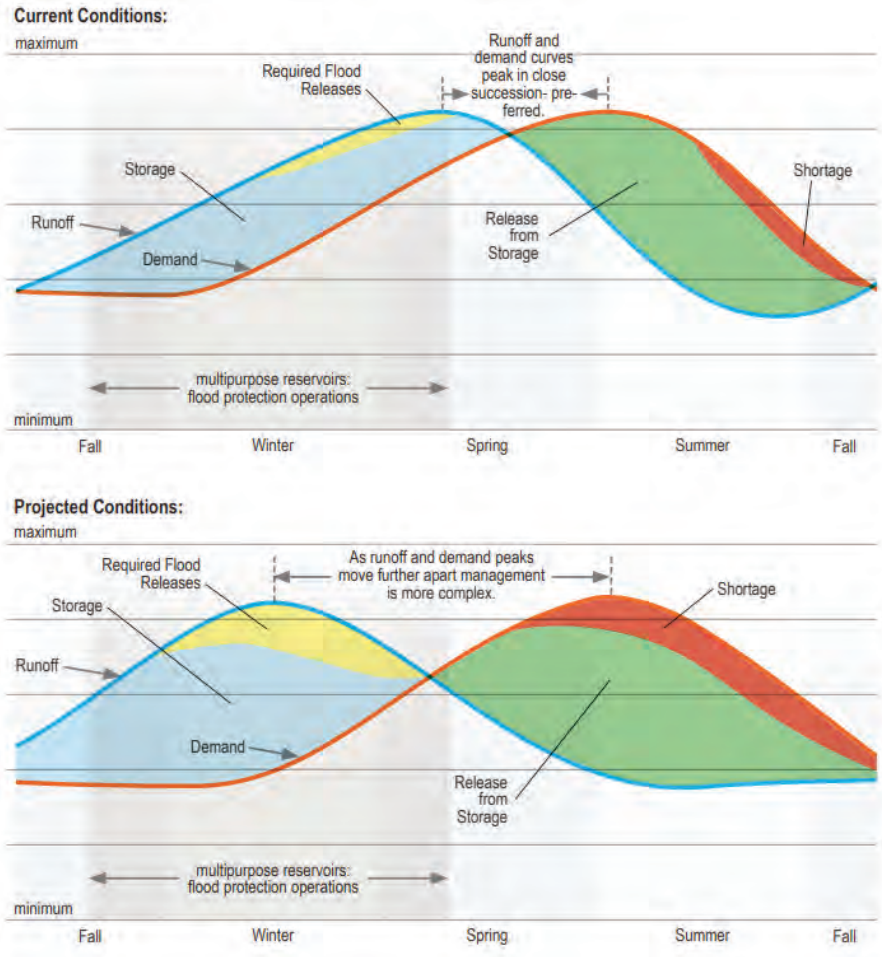
1,200 years (Griffin & Anchukaitis 2014) and a 1-in-500 year low in Sierra Nevada snowpack (Belmecheri *et al.* 2016). The 2012-2016 drought was associated with significant declines in groundwater across the state, particularly in the Central Valley region[2], continuing a long-term overdraft trend that tends to accelerate during periods of drought[3]. Paleoclimatic records have shown that even longer periods of drought, i.e., mega-droughts or persistent droughts that span decades to centuries, have occurred in California's past (Malamud-Roam *et al.* 2007; Cook *et al.* 2010). In recent years, the contribution of anthropogenic climate change to the intensity and persistence of drought has been a major topic of interest (Diffenbaugh *et al.* 2015; Mann & Gleick 2015; Seager *et al.* 2015; Swain 2015; Cheng *et al.* 2016; Angélil *et al.* 2017). Most of the studies have concluded that current and future increases in temperature, regardless of changes in precipitation, raise the probability of enhanced drought magnitude and duration in California (Wehner *et al.* 2017). This has major implications on California's agricultural industry and water supply through modifications in snowpack, soil moisture, and evapotranspiration.

Water storage in mountain snowpack is an important feature that alleviates seasonal fluctuations in rainfall. The snowpack of the Sierra Nevada acts like a natural reservoir by increasing California surface water storage by ~72% in addition to man-made surface reservoirs (Dettinger & Anderson 2015). Approximately 60% of Bay Area water supply is sourced in the Sierra Nevada (Bay-Area-IRWMP n.d.) and Sierra snowmelt provides 40% of the annual water to the San Francisco Bay Delta (Cloern *et al.* 2011). Further, mountain snowpack acts to delay the rate of release of water to man-made surface reservoirs into the summer, when precipitation is low and water demand is high (California Department of Water Resources 2015) (Figure 7). Therefore, snow drought, or consecutive years of low-to-no snowpack, has become a major topic of interest over the last decade (Harpold *et al.* 2017). This was made apparent in the drought period of 2012-2016 when the combination of warm temperatures and low precipitation led to record low Sierra Nevada snowpack (5% of normal) with economic impacts felt throughout the agricultural and recreational industries (i.e., $2.1 billion and 21,000 jobs lost) and a mandatory statewide surface water use reduction of 25% (Mote *et al.* 2016).

2 https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Data-and-Tools/Files/Statewide-Reports/Fall-2017-Groundwater-Level-Data-Summary.pdf

3 http://www.ppic.org/wp-content/uploads/JTF_GroundwaterJTF.pdf

FIGURE 7

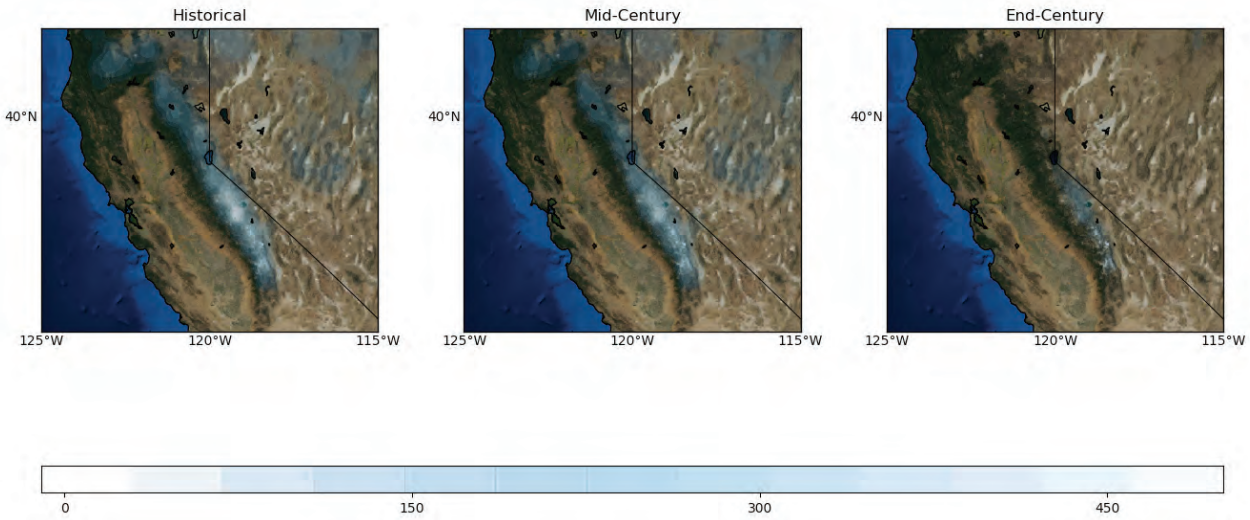


Top row: Current water supply surplus (blue shading) and demand deficit (green) curves with yellow (red) areas highlighting flood release loss (shortages). Bottom row: Same as top row, however with climate change projected onto the water supply surplus and demand deficit curves. Source: Adapted from the California Department of Water Resources (2015) report on "California Climate Science and Data for Water Resources Management."

Decline in Sierra Nevada snowpack has occurred over the last half-century (Mote *et al.* 2018) and is *very likely* to continue given the physics of climate change (Wehner *et al.* 2017). This was shown in the most recent National Climate Assessment (USGCRP 2017) where a *high confidence* was attributed to an earlier spring melt and reduced snowpack in Western U.S. states as the climate continues to warm (Wehner *et al.* 2017). This is because as surface temperatures continue to rise, the historical location of the freezing line in mountains will move upslope, snow will persist for shorter durations at low elevation, and more storms will fall as rain rather than snow (Pierce & Cayan 2013). Although snowpack decline is *very likely*, the changes will be heterogeneous in both time and space. Conventional global climate model simulations, such as those used for the IPCC, are unable to realistically represent mountainous regions due to limited spatial resolution in current models. This makes it difficult to infer snowpack change at scales where decisions are made (e.g., watershed regions). Therefore, to properly evaluate this decline, the use of regional downscaling techniques is necessary.

An intercomparison of several regional climate downscaling strategies was conducted by Rhoades et al. (2018) for the major mountain ranges of the Western U.S., including the California Sierra Nevada. By 2040-2065, average Sierra Nevada snowpack was shown to decline by 30 to 60% under a business-as-usual emission scenario across the various regional downscaling methods. Using a new downscaling technique, the authors also found that average Sierra Nevada snowpack could decline by 19% by 2025-2050 and amplify to an 83% decline by 2075-2100 (Figure 8) (Rhoades *et al.* 2018). The effect of future warming on snowpack during periods of drought is of particular concern. With increased warming, the decline in Sierra Nevada snowpack seen during the 2012-2016 drought could be exacerbated by 60 to 85% if it occurred at end-century (Berg & Hall 2017). The changes in Sierra Nevada snowpack will undeniably pressure California to preemptively invest in climate adaptation measures such as alternative water storage, water-use efficiency, and updated reservoir storage operations. Without these preemptive measures, there is *very high confidence* that reoccurring and persistent hydrological drought will define California's future (Wehner *et al.* 2017).

FIGURE 8



The figure highlights a new variable-resolution global climate model simulation of average winter snowpack in the California Sierra Nevada over a historical period (left), at mid-century (middle) and at end-century (right) under a business-as-usual emissions scenario (Rhoades et al. 2018). Units are mm of snow water equivalent (SWE) averaged over the winter months of December, January and February (DJF). Source: Adapted from Figure 8.2 in the National Climate Assessment 4 by Hari Krishnan at Lawrence Berkeley National Laboratory

Fog

HIGHLIGHT

- Several studies suggest that coastal fog along the California coast, so critical to our Bay Area climate, is less frequent than before. However, the causes of this decline and implications of climate change are complicated because coastal fog formation is the result of a delicate moving balance between heat and humidity from three different sources: ocean, air, and land.

Coastal fog in the San Francisco Bay Area has been such a regular summer feature that songs are written about it, pilots taking off and landing at SFO keep a watchful eye on delays caused by it, and the phenomenon is even recognized by its twitter handle #KarltheFog. Several lines of evidence suggest that coastal fog along the California coast and other coastal upwelling zones is less frequent than before. However, the story is complicated because the dynamics of coastal fog formation and disappearance are the result of a delicate moving balance between heat and humidity from three different sources: ocean, air, and land. This balance is in turn driven by upstream processes

important to fog such as the high-pressure winds causing cold water upwelling, Arctic-cooled ocean currents that lead to changing fog frequency, and turbulence that mixes the moister fog layer into the drier air layer above. These factors change the thickness and timing of the fog and the highly localized offshore and onshore movements of fog across complex topography (Koračin *et al.* 2014; Torregrosa *et al.* 2016; Clemesha *et al.* 2017a).

Some of these interactions are strongly affected by warming climates but how they all work together under changing climate conditions is not yet well understood. Planet wide changes in air patterns can cause strong change in fog at our local level, such as the resilient atmospheric ridge that parked warm dry air over California in August 2017, shutting down the usual pattern of onshore coastal fog advection into coastal ecosystems (see also September 2010 event) (Kaplan *et al.* 2017; Swain *et al.* 2018).

Long term observations of fog come from airport and ship records (Dorman *et al.* 2017) and are being augmented with satellite remote sensed data (Rossow & Dueñas 2004). Using 60 years of Arcata and Monterey airport data, Johnstone and Dawson (2010) derived a temperature-based statistical method to estimate coastal fog frequencies for the last century, which showed a 33% reduction in coastal fog. Periodic increases of coastal fog have been associated with the warm phase of the Pacific Decadal Oscillation (Witiw & Ladochy 2015), an ocean temperature index. The one dynamic simulation model for California coastal fog that exists (O'Brien *et al.* 2013) shows a long term trend of 12- 20% reduction in coastal fog over the model's 1900-2070 period. Although the model improves on regional climate models by including important turbulence processes, it did not include several feedbacks and processes that may be important for the future of fog, such as coastal upwelling and shifts in the center of summertime high pressure zones.

Fog is also affected by local conditions. Recent analyses of coastal fog in Southern California showed fog is reduced near heavy urban areas (Williams *et al.* 2015) and affected by pollution (LaDochy & Witiw 2012). Urban surfaces warm during the day, causing warmer nighttime air temperatures that prevent fog droplets from forming until the air rises high enough and cools (adiabatically) for condensation to occur. Reductions in summertime coastal fog have also been observed in other regions such as Hokkaido, Japan (Sugimoto *et al.* 2013), Kiril Islands, Russia (Zhang *et al.* 2015), and Central Europe (Egli *et al.* 2017). An opposite trend of increasing fog and low clouds in the South China region is attributed to an increase in heavy pollution that prevents rain formation (Fu & Dan 2018). Reductions in non-marine Central Valley tule fog have been correlated with lower levels of NOx and other air pollutants (Herckes *et al.* 2015; Gray *et al.* 2016).

In California, summertime fog and low clouds can move deep into northwest-oriented valleys that are well positioned to receive the summer northwestern winds that help form fog and move it inland (Torregrosa *et al.* 2016). Some of the state's most productive agricultural regions benefit from these inland incursions of fog such as the Salinas Valley, where fog moves more than 75 kilometers inland and protects lettuce and strawberries from sunburn, or the wine grape-growing regions of Sonoma and Napa, where fog penetrates inland through the San Francisco Bay and over the Petaluma Gap.

Species restricted to the coastal zone, such as coast redwood trees, grow in forests that can get up to a third of their water from fog (Burgess & Dawson 2004). The discovery that plants in fog-filled forests can take in water through their leaves (Dawson 1998) changed our understanding of fog's contribution to ecosystems. Fog drip can be lifesaving to salmonids in low flow coastal streams that would otherwise dry out during the late Mediterranean dry season. In

the high fog areas of the Santa Cruz Mountains, Sawaske and Freyberg (2015) found summer streamflow increases of 100% during fog events and increase of up to 200% with a two-day lag. Shade from summertime fog and low clouds cools coastal systems with a cascading effect: less heat (Walker & Anderson 2016) reduces the rate of plant evapotranspiration (Chung *et al.* 2017), which reduces the use of subsurface water reserves by plant roots (Burgess & Dawson 2004), leaving more water in the system (Flint *et al.* 2013). When fog disappears in late summer, it can exacerbate the climatic water deficit for entire watersheds leading to fire-ready tinder conditions and increased electrical demand as air conditioners are turned on for relief from the heat.

The importance of fog to California's water and energy balance and to human and wildlife well-being is receiving increased attention and study (Torregrosa *et al.* 2014; Clemesha *et al.* 2017b). Research on climate change impacts to fog (Wang & Ullrich 2018), the relationship between fog, species, and ecosystem resilience (Burns 2017), and even the geoengineering technique of increasing marine clouds to cool the planet (Ahlm *et al.* 2017) will help to improve forecasts of future trends and understanding of coastal fog impacts on California (Koračin 2017).

Wildfire

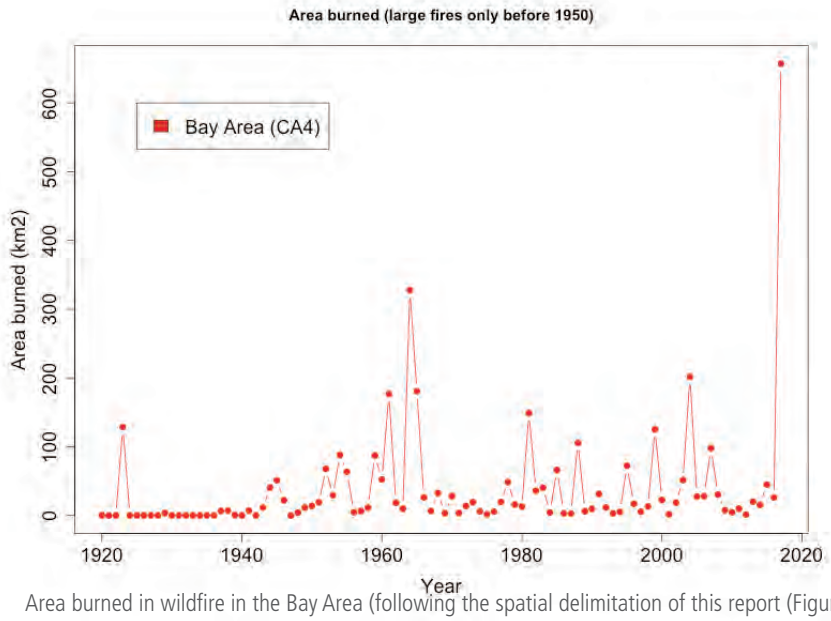
HIGHLIGHTS

- In the Bay Area, future fire activity will be driven by both changes in urban development and changes in climate.
- Warming temperatures combined with expansion of the wildland-urban interface are projected to increase fire risk in most of the Bay Area, though risks may decline in some areas as they become more heavily urbanized.
- Land use planning, together with fire-safe building standards and near-building vegetation management, are important strategies for managing future fire risk to people and structures.

Wildland fire is a recurrent feature of ecosystems in semi-arid climates throughout the world, including the American West and California. The Mediterranean-type climate of California (and climatically similar regions in other parts of the world) is especially fire prone, as the winter rains support vigorous plant growth and the summer dry season dries out the vegetation, making it exceedingly flammable. Hot and dry conditions, combined with offshore winds in autumn (Santa Anas in Southern California, Diablo winds in Northern California) create high risk conditions that rapidly spread fires. Fire ignitions in California are primarily due to human activity, and the dry fuels and climate contribute to higher risk of rapid fire spread. While attention to wildfire has mostly focused on the Sierra Nevada and Southern California, the large and destructive fires in the Bay Area and North Coast, particularly in 2015 and 2017, have rapidly shifted attention to the ongoing risks in these regions.

State and federal agencies have pursued aggressive policies of fire suppression, both for protection of timber resources but increasingly to protect human life and infrastructure as fires ignite and spread in areas with high population density. As is well documented in the Sierra Nevada, fire suppression can contribute to fuel buildup (i.e., dense forests where fire can spread more easily to the canopy) (Agee & Skinner 2005). There is also strong evidence that anthropogenic climate change, especially rising temperatures and periodic droughts, have made substantial contributions to the increase in area burned in wildfires in the America West (Westerling *et al.* 2006; Abatzoglou & Williams 2016). Like storms and hurricanes, however, it is difficult to pinpoint the contribution of climate change to the occurrence or severity of any individual fire event.

FIGURE 9



Area burned in wildfire in the Bay Area (following the spatial delimitation of this report (Figure 1). Cumulative areas derived from FRAP (1920-2016) and GeoMac[4] (2017).

4 https://www.geomac.gov/

Analysis of the Fire and Resource Assessment Program (FRAP) fire history database[5] shows recurring years with high wildfire activity (in terms of area burned) in the Bay Area (Fig. 9). Prior to 2017, the peak year was 1964, due to the large Hanly fire and the smaller Nuns and Roadside #42 fires; the perimeters of these three fires were eerily similar or contained within the 2017 Tubbs, Nuns and Atlas fires, respectively. The North Bay fires of October 2017 burned more than twice the area of any previous year, following close on the heels of the large and destructive Lake County fires of 2015. As of 2018, six of the top 20 most destructive fires in California history (in terms of buildings lost) have occurred in the Bay Area (Table 1).

TABLE 1

RANK	FIRE	DATE	COUNTY	ACRES	STRUCTURES	DEATHS
1	Tubbs	October 2017	Sonoma	36,807	5,643	22
2	Tunnel	October 1991	Alameda	1,600	2,900	25
4	Valley	September 2015	Lake, Napa, Sonoma	76,067*	1,955	4
6	Nuns	October 2017	Sonoma	54,382	1,355	2
11	Atlas	October 2017	Napa, Solano	51,624	781	6
15	Berkeley	September 1923	Alameda	130	584	0

Bay Area fires ranked in the top 20 most destructive fires in California history, in terms of structures burned. Source: CalFire.
*Note: Most of the acreage burned was in Lake County, outside of the Bay Area as defined here.

Climate change and future wildfire activity: Projections of future fire activity depend on our understanding of what controls wildfire historically in each region, how those controls may change in the future, and the ranges of uncertainty associated with key variables. At relatively broad scales, climate affects fire regimes in two different ways, either by altering vegetation growth rates (e.g., fuel accumulation) or through changes in fire season length and severity (e.g., fuel flammability and fire weather) (Krawchuk & Moritz 2014). At finer scales, recent studies demonstrate that fire exhibits a "hump-shaped" response to human development, with fire activity peaking in the wildland-urban interface (WUI) due to increased ignitions and dropping off both in more urbanized areas and in less developed rural regions and open space (Syphard *et al.* 2007; Butsic *et al.* 2015; Mann *et al.* 2016). Thus, future patterns of land use together with climate change are crucial for assessing what fire regimes may emerge in the coming decades.

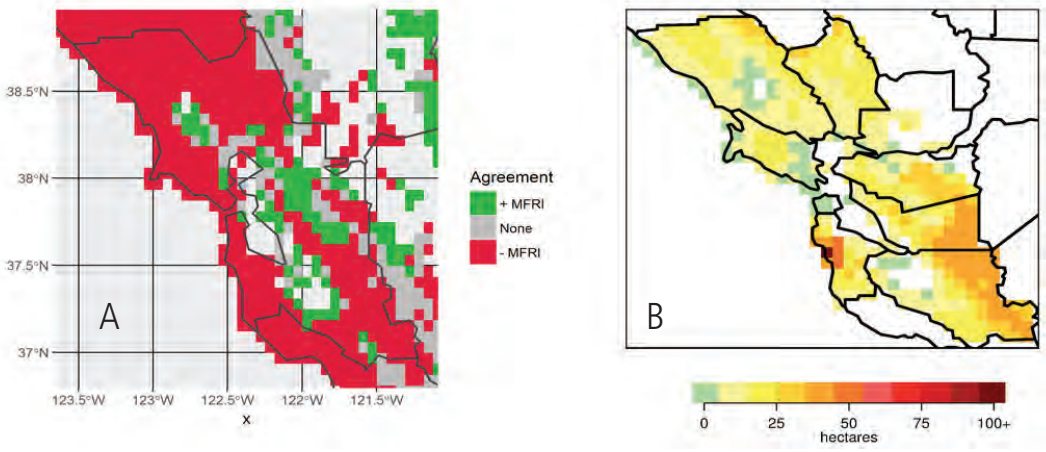
5 http://frap.fire.ca.gov/data/frapgisdata-sw-fireperimeters_download

The impact of climate change on future fire activity has been the focus of considerable research in California and elsewhere (Krawchuk & Mortiz 2012). Where fires are fuel limited (as in the desert), changes in fire depend on whether future climates have higher or lower rainfall. In the Bay Area, although there is a strong moisture gradient from the coast inland, fire is not generally fuel limited. As a result, there are more consistent projections of increased fire activity (i.e., more frequent or greater area burned), due to a warmer climate (Figure 10).

Projections of the impact of development and land use change are less well developed. These effects are incorporated in two modeling studies for the Bay Area (Mann *et al.* 2016; Westerling 2018). While the studies are not directly comparable, Mann et al. suggest that future fire activity will be driven as much by changes in human development as by changes in climate. Continued development will likely dampen fire probabilities in areas closest to high-density human development, while potentially increasing fire risk where development expands in the wildland-urban interface. Westerling (2018) projected increased fire probability in most of the Bay Area, especially the dry hills around Mt. Hamilton, with reduced fire risk near urban areas and development corridors.

Given the importance of land use patterns, additional work is needed to understand their importance relative to changes in climate. It is also worth noting that local human development is under society's direct control, meaning that land use planning may be the most effective tool for managing future fire risk to human life and infrastructure. Continued building in the wildland-urban interface exposes more structures to fire risk and also alters fire probabilities. On the other hand, improved building codes and management of defensible space around structures can significantly reduce losses when fires do occur.

FIGURE 10



Projections for future changes in wildfire. A) Predictions for increase (red) or decrease (green) in fire frequency (2026-2050, compared to baseline of 1976-2000), showing areas of agreement across an ensemble of climate models (Mann et al. 2016). B) Composite projections from Westerling (Westerling 2018) for mid-century (2035-2064) average annual area burned under RCP 4.5 (results for RCP 8.5 are very similar).

Sea Level Rise

HIGHLIGHTS

- Sea level in the Bay Area has risen over 20 centimeters (8 inches) in the last 100 years.
- The regional signal of SLR is complicated at the local level by highly variable rates of vertical land movement across the Bay Area due to seismic effects, sediment compaction, marsh accretion, and groundwater fluctuations.
- California's Fourth Climate Change Assessment projects median sea level rise of 0.74 m (RCP 4.5) and 1.37 m (RCP8.5) for 2100 along the California coast.
- Recent science studies, using advanced models and ice sheet observations, suggest the possibility of extensive loss from Antarctic ice sheets in the 21st century — possibly producing sea level rise by 2100 that could approach 3 meters. California's Fourth Climate Change Assessment finds, under the RCP 8.5 scenario, that extremely high SLR by 2100 (as high as 2.87m at San Francisco) is plausible with very low probability.
- Even with high levels of emissions reductions, research now suggests that at least 2 meters of sea level rise is inevitable over the next several centuries due to time lags in response to increasing global temperatures.
- The powerful 2015-16 El Niño, one of the three largest in the historical record, resulted in winter wave energy that was over 50% larger than the typical winter in the Bay Area, driving unprecedented outer coast beach erosion.

Numerous studies have documented the acceleration of global (i.e., eustatic) sea level rise (SLR) during the latter part of the 20th century and early 21st century, with rates of ~1-2 mm/yr prior to 1990 as much as tripling to ~3 mm/yr during the satellite altimetry era (1993-present) (Jevrejeva *et al.* 2014; Dangendorf *et al.* 2017). Regional rates of SLR are highly variable in space and time, depending on ocean and atmospheric circulation patterns, gravitational and deformational effects due to land-based ice mass changes, and tectonics and other drivers of vertical land motion (NRC 2012).

Historical SLR rates in the San Francisco Bay Area are well documented. The Ft. Point tide gauge adjacent to the Golden Gate has the longest tide record in North America (1855-present), with a long-term rate of SLR of 1.94 mm/yr (1897-2016). Other tide gauges across the region report similar results, including Redwood City (1.99 mm/yr, 1974-2016), Alameda (0.72 mm/yr from 1939-2016) and Port Chicago (1.58 mm/yr, 1976-2016) within San Francisco Bay, and Pt. Reyes (1.98 mm/yr, 1975-2016) along the outer coast (NOAA 2018). Moderate variability among these observations (with Alameda being a significant outlier) could be attributed to factors such as record length, local vertical land motion, and datum issues.

Importantly, each of the Bay Area tide gauges shows significant acceleration since 2011. These observations are consistent with the satellite altimetry-observed West Coast acceleration of SLR from 2011-2015 due, at least in part, to a shift in low frequency climate variability in the Pacific as well as a strong El Niño peaking in fall of 2015 (Hamlington *et al.* 2016). This recent acceleration of regional SLR follows decades of dynamical SLR suppression across the U.S. West Coast, possibly related to the mode of the Pacific Decadal Oscillation (PDO) (Bromirski *et al.* 2011). It is unclear how long this recent trend of higher than eustatic rates of SLR will continue for the San Francisco Bay Area but will

largely depend on the patterns of shorter (e.g., ENSO) and longer (e.g., PDO) modes of climate variability that drive regional circulation patterns.

The regional signal of SLR is further complicated at the local level by highly variable rates of vertical land motion across the Bay Area due to co-seismic and intra-seismic land movement, sediment compaction, marsh accretion, and groundwater fluctuations. Extensive groundwater pumping in the Santa Clara Valley from 1916-1966 led to as much as 1 meter of subsidence along the shoreline of South San Francisco Bay, leading to the periodic flooding of low-relief land adjacent to the bay (Poland & Ireland 1988). Some of the submerged land has been recovered over the last several decades due to more responsible groundwater pumping practices (Schmidt & Bürgmann 2003), resulting in recent uplift of 1-2 mm/yr (Shirzaei *et al.* 2017).

Despite active tectonics, the largest recent vertical rates of change measured in the Bay Area are due to non-tectonic processes, particularly the consolidation of bay mud and artificial fill that comprise a large proportion of the land lining the Bay Area's shoreline. For example, InSAR data show that the northwestern tip of Treasure Island dropped ~20 mm/yr from 1992-2000 (Ferretti *et al.* 2004), and subsidence of up to 10 mm/yr occurred along mud-dominated shoreline areas, such as the San Francisco waterfront, San Francisco International Airport, and Foster City, though most subsidence rates in the Bay Area are less than 2 mm/yr (Bürgmann *et al.* 2006; Shirzaei & Bürgmann 2018). The recent launching of the Sentinel-1A (2014) and Sentinel-1B (2016) satellites equipped with advanced synthetic aperture radar (SAR) antenna sensors will allow for greater resolution of vertical land motion rates across the Bay Area (Shirzaei *et al.* 2017), and more precise integration of these changes into coastal flood projections (Ballard *et al.* n.d.; Barnard *et al.* 2014; Shirzaei & Bürgmann 2018).

Projected SLR over the course of the 21st century is being thoroughly discussed as part of the Fourth Assessment, and therefore only a brief summary is provided here. The National Research Council study (NRC 2012), which incorporated steric and dynamic ocean components of SLR, mountain glacier and ice sheet loss, and vertical land motion, projected 92 centimeters of relative SLR for the San Francisco Bay by 2100 (range 42-166 centimeters). More recent California-focused SLR projections, including California's Fourth Climate Change Assessment (Pierce *et al.* 2018) and "Rising Seas in California" (Ocean-Protection-Council 2018) have incorporated advanced models and observations of ice sheets, suggesting the possibility of more extensive loss from Antarctica in the 21st century than previously considered (DeConto & Pollard 2016), along with a probabilistic approach to support risk assessment (Kopp *et al.* 2014). These more recent efforts have not produced a marked change in the median projections of sea level rise by 2100; e.g., the Fourth assessment projects 0.74 m (RCP 4.5) and 1.37 m (RCP8.5) for California in general, and the Ocean Protection Council projects 0.49 m (RCP 2.6) and 0.76 m (RCP8.5) for San Francisco Bay. However, they do indicate that SLR by 2100 of ~3 meters is physically plausible. For example, under the RCP8.5 scenario, California's Fourth Climate Change Assessment projects a 0.1% and 5% chance of sea level rise reaching 2.87 m and 2.41 m by 2100, respectively (Pierce *et al.* 2018). Sweet et al. (2017) have integrated this latest SLR science into continuous probabilistic projections across North America, including San Francisco Bay, and placed them in the context of a flood risk framework, with similar upper-end SLR projections (Sweet *et al.* 2017). Median SLR projections have not changed markedly in recent years and significant uncertainty remains in terms of the timing of SLR projections (based in large part on uncertainty in emissions pathways). Even with net zero future emissions, research now suggests that at least ~2 meters of sea level is inevitable over the next several centuries due to the lag in

response time of SLR with temperature; current emission trajectories in the 21st century would commit the oceans to 9 meters of SLR eventually (Clark *et al.* 2016).[6]

Wave Conditions and El Niño: The potential changes in long-period wave energy (i.e., swell) are primarily a concern for the exposed open coast although there is some swell penetration into the Central Bay, and Hanes and Erikson (2013) documented a peak in wave energy along Crissy Field during outer coast, southwest swell events. Increases in wave heights over the last several decades have been documented along portions of the U.S. West Coast (Allan & Komar 2006; Wingfield & Storlazzi 2007; Menéndez *et al.* 2008), including the region adjacent to the Bay Area (Hanes & Erikson 2013), but these trends have more recently been found to be largely insignificant when adjusted for buoy hardware modifications (Gemmrich *et al.* 2011). The use of Global Climate Models (GCMs) to determine the future wave climate shows a projected poleward migration of storm tracks and generally a slight decrease in wave heights for the outer coast of the Bay Area (and California in general) compared to the historical record (Graham *et al.* 2013; Erikson *et al.* 2015). This future projection is consistent with the observed multi-decadal trend of poleward Hadley cell expansion since 1979 and, therefore, the location of the sub-tropical jet stream (Hu & Fu 2007). However, we note that the poleward shift in storm tracks is not consistent across all GCMs (Collins *et al.* 2013).

Periodic El Niño events exert a dominant control on coastal hazards across the region, driven by seasonally elevated water levels as high as 30 centimeters above normal, and, on average, 30% larger winter wave energy (Barnard *et al.* 2015). The powerful El Niño of 2015-16, one of the three largest in the historical record, resulted in elevated water levels of 10-20 cm and winter wave energy that was over 50% larger than the typical winter in the Bay Area, driving unprecedented outer coast beach erosion (i.e., landward shoreline retreat) that was 98% higher than normal (Barnard *et al.* 2017). The frequency and magnitude of future El Niño events, combined with SLR, will be a key driver of coastal vulnerability in the coming decades, including influencing nuisance flooding patterns due to the combination of seasonally elevated sea levels with background sea level rise. Research to date on future El Niño patterns is largely inconclusive (Collins *et al.* 2010), although a recent study suggests a potential doubling in the frequency of extreme El Niño events (Cai *et al.* 2014), such as those that occurred in 1982-83, 1997-98, and 2015-16.

6 More information on the specific impacts climate change will have on California's Ocean and Coast – including sea level rise, rising temperatures, and rising ocean acidity – can be found in a companion Fourth Assessment report (California's Ocean and Coast Summary Report 2018).

Social Systems and Built Environment

In this section, we consider the threats to social systems and the built environment in the Bay Area that are created by climate change. We examine energy consumption, including both buildings and vehicle charging; energy distribution, including electricity, natural gas, and transportation fuels; land use; infrastructure and services that support transportation and urban water resources; and direct and indirect impacts on public health in the region. In each of these areas, we describe the specific vulnerabilities that manifest in the Bay Area and note cases where Bay Area vulnerability is more or less than that for the state as a whole.

Throughout this section, we emphasize the risks for vulnerable communities, which are particularly pronounced for certain climate stressors in the Bay Area. These vulnerable populations include but are not limited to: low-income individuals and families, people of color, women, the young, the elderly, people with disabilities, people with existing health issues including mental health issues, people with limited-English proficiency (LEP), immigrants and refugees, agricultural workers and day laborers, traditional communities, people who are or have been incarcerated, people without a high school education, and other groups or a combination of groups. These populations will often not only feel the immediate impacts of climate change more significantly, but also are less able to adapt to climate changes or recover from their impacts.

Finally, it is important to note that a complex set of interdependencies underlie these vulnerabilities. An understanding of these feedbacks and dependencies across infrastructure and social systems is critical to assessing how California's social and built environments will respond in the coming century. Examples of interdependencies developed further below include the links between (1) land use, transportation infrastructure and traffic, energy consumption, and air pollution; or (2) water resources, energy consumption, and public health. In the subsections that follow, we consider each component individually and examine how it is likely to be impacted by different aspects of climate change. Within each section, we also include a brief discussion of the interdependencies that would influence outcomes within the segment under consideration. This structure does not do justice to the highly integrated aspects of social and built systems in California, but it begins to convey the complexity that must be addressed.

Transportation Infrastructure

HIGHLIGHTS

- The three-way relationship between land use, transportation infrastructure, and energy systems—all of which are vulnerable to climate impacts—is perhaps the most critical interdependence in determining the future growth and prosperity of the Bay Area.
- Much of the Bay Area's transportation system—airports, roads, and railways—is concentrated along the bay where flooding from sea level rise and storm surge is a major vulnerability.
- Disruptions to the transportation system from flood events will occur at critical links, such as highways and rail lines serving the port of Oakland, as well as low-lying roadways that connect the region's bridges and highways.

Nearly 7.2 million people live in the Bay Area, and regional residents take more than 21 million total trips on an average weekday (MTC & Caltrans 2008). In 2007, more than 82% of all trips were made by automobile, and most of the remainder were made by bus or rail transport. The Bay Area has 620 miles of freeways, 800 miles of state highways, and 19,000 miles of local roadways owned and maintained by Bay Area cities and counties (MTC & Caltrans 2008). The region's rail network has more than 600 miles of track and moves both freight and passengers (BCDC 2009). Dedicated trackways exist for Bay Area Rapid Transit (BART), the San Francisco Municipal Transportation Agency (MUNI), Sonoma-Marin Area Rail Transit (SMART), and the Valley Transportation Authority (VTA) light rail system in San Jose and the Silicon Valley. All other tracks (e.g., Amtrak, Caltrain, ACE) are shared by passenger and freight service, leading to substantial congestion. In addition, over the next 50 years, freight demand is expected to increase up to 350% (MTC 2007; BCDC 2009).

The greatest impact of climate change for the U.S. transportation system will be the flooding of roads, railways, and airport runways in coastal areas (NRC 2008), as well as sea level rise and storm surges. San Francisco Bay has approximately 1,000 miles of shoreline, and airports, roads, and railways throughout the region are concentrated along the coastline. That means coastal flooding to transportation systems is a major vulnerability (see above for a summary of sea level rise projections). Sea level rise will also be accompanied by sizable wind waves (Cayan *et al.* 2008). For example, very high seas and storm surge caused hundreds of millions of dollars in storm and flood damage around San Francisco Bay in 1997–1998 (Ryan *et al.* 1999).

To understand the effect of sea level rise on the Bay Area transportation network, Biging et al. (2012) created a high resolution digital elevation model (DEM) using data from Lidar, an airborne technology that provides very precise measurements of land surface elevation. In addition, they developed a digital surface model (DSM) of vegetation, buildings, bridges, and other infrastructure to better calculate the risk of flooding by sea level shifts and storm surges. To visualize potential inundation, they considered sea level rise scenarios in increments up to 1.4 meters, plus the equivalent of a 100-year storm event. Peak water level is modeled to an upper level that is in excess of 4 meters to visualize the extent to which transportation features and facilities become inundated. Results for the Port of Oakland (Figure 11) (Biging *et al.* 2012) are presented here to demonstrate the combined effect of progressive sea level rise and extreme storm events on inundation. With just modest sea level rise (0.5 meters), the approach to the Bay Bridge (upper portion of Figure 11) and portions of interstates 880 and 980 (running through the center-right of Figure 11) are compromised by inundation. As sea levels progress to 1.0 meters of rise (yellow) and 1.4 meters of rise (red), the inundated regions expand. At these higher sea levels, new transportation arteries

FIGURE 11

Inundation scenarios for the Port of Oakland. This delineates the area at risk of a 100-year flood event under different sea level rise elevations (none or 0 m, 0.5 m, 1.0 m, and 1.4 m). Source: Biging et al. 2012.

aren't necessarily cut, but the depth and duration of inundation will proportionally increase with rising sea levels. The result is that the Port of Oakland's vulnerability lies primarily in the links between the port and the terrestrial transportation network, which are fundamental to the port's functioning.

In addition, Biging et al. (2012) quantified the impact of sea level rise and storm events on the transportation network of the greater Bay Area by examining travel time between key nodes (high connectivity nodes) of the highway system. Figure 12 illustrates the greatest impact on individual links in the sample network by mapping the increase in access time to neighboring nodes. The results show that disruptions are greatest between east-west linkages, compared to north-south connections, and the overall regional network itself breaks down in several locations as key nodes become inaccessible. Travel times will increase significantly although much of the regional system remains accessible via secondary roadways further inland and not adjacent to areas of inundation.

BOX 2: 9 FABULOUS SLR DESIGNS FOR 9 BAY AREA COMMUNITIES

Resilient By Design: Bay Area Challenge

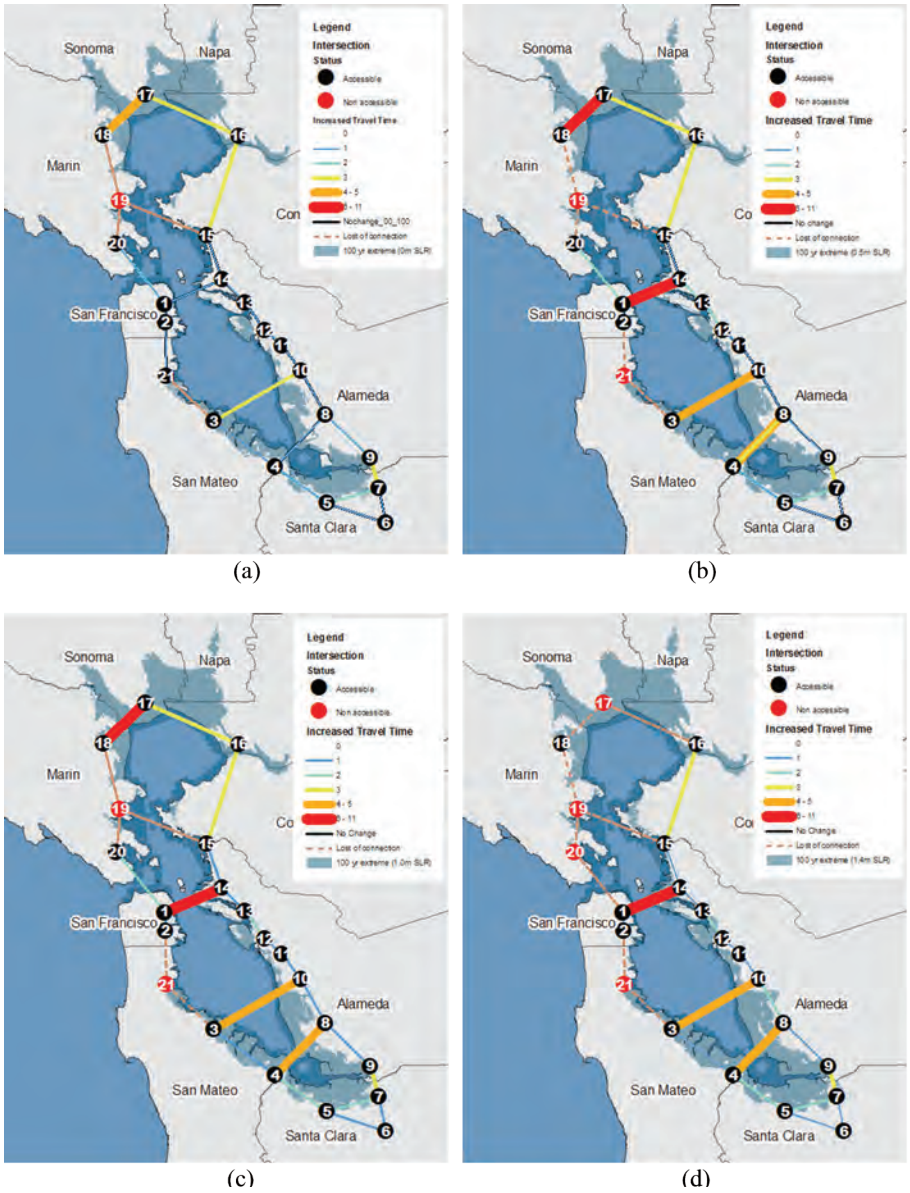
Financed through a $5 million grant from the Rockefeller Foundation, Resilient By Design (RBD) was a year-long collaborative design challenge bringing local, national, and international experts together with local residents and public officials. The result is nine innovative and community-based solutions that will strengthen the Bay Area's resilience to sea level rise, severe storms, flooding, and earthquakes. RBD was inspired by and modeled on the Resiliency By Design competition in the New York City area after Superstorm Sandy.

After receiving 51 submissions and undergoing an extensive jury process, RBD selected 10 winning Design Teams to participate in the Bay Area Challenge. The teams include designers, urban planners, architects, engineers, and other resilience experts with local, regional, national, and international expertise. In Phase 2, the 10 teams spent two months touring potential project sites and meeting with community organizations and local government leaders. From this intensive research phase, 10 sites were selected and matched with the 10 teams for five months of collaborative planning and design. Finally, the proposed projects were presented and judged in May 2018. Now, Bay Area stakeholders are turning to the task of financing and implementing these innovative futures.

Interdependence with Other Sectors

In addition to the direct disruption of the transportation network by inundation, the transportation infrastructure is also vulnerable to disruptions in the energy sector, particularly the electrical grid and fuel delivery. Over the longer term, land use and population shifts will be a critical driver of the efficacy of the transportation network and will also simultaneously dictate energy consumption by the transportation system. As discussed below, low-income households are increasingly being displaced inland, increasing demands on the transportation infrastructure to carry this population to employment or medical care in the urban centers of the Bay Area. At the same time, the functioning of the transportation system will affect shifts in population and employment distributions throughout the region. This three-way relationship between land use, transportation infrastructure, and energy systems is perhaps the most critical interdependence in determining the future trajectory of the San Francisco Bay Area.

FIGURE 12



Increased travel time (ratio of impaired to normal travel times) between near neighbor intersections after a 100-year extreme event with different sea-level rise scenarios (none or 0 m, 0.5 m, 1.0 m, and 1.4 m). Source: Biging et al. 2012.

Land Use and Community Development

HIGHLIGHTS

- Future land use decisions will significantly influence the Bay Area's efforts to address climate change, affecting building and transportation energy, urban water demand, and wildfire ignitions.
- Land use choices can also exacerbate climate risks by creating urban heat islands, changing runoff following extreme rain events and other factors.
- The critical lack of affordable housing in the core of the region is forcing households further south, north, and inland, with negative energy and environmental consequences.
- Regional equity issues will be exacerbated in the coming decades as lower income and minority households disproportionately live in the least desirable locations with higher vulnerability to climate and other environmental risks.

Land use in the Bay Area, in which we include housing and non-residential buildings and development, is evolving rapidly due to the interaction of markets and policies. Market forces of particular relevance to the Bay Area include housing supply, real estate prices, increases in population, and employment and growth in high-tech industries and incomes. Policies include both local land use plans and zoning regulations and regional efforts such as Plan Bay Area (see Box 3).

A fundamental crisis for the future of the Bay Area is the lack of affordable housing in the core of the Bay Area, except for a few neighborhoods which are bayfront, at low elevation, and at high risk of current and future flooding. This lack of affordable quality housing, and the climate threat to the housing of that type that does exist, is forcing households further south, north, and inland, in some cases as far as the Central Valley, to find housing they can afford. The movement of "Bay Area" residents further from the urban core increases commuting time and distances, with economic and environmental consequences.

Because of the close connection between the distribution of residents throughout the region and commute distances, transportation and land use are tightly linked. This has always been the case for the Bay Area, raising concerns about disruption due to seismic risk. Now, however, natural risks arising from climate change, including increased flood and fire frequency and magnitude, must be featured in long-term decision-making and planning. Models in support of Plan Bay Area (Box 3) are already incorporating the interaction between transportation, real estate, and climate change risks.

BOX 3: TACKLING CLIMATE CHANGE, SEA LEVEL RISE, AND RESILIENCE THROUGH INTEGRATED PLANNING

Raising the Bar on Regional Resilience

Resilience planning is fast becoming a priority for the Bay Area with its low-lying shorelines susceptible to flooding and rising sea levels, as well as its active earthquake faults and social inequity issues compounded by an affordable housing crisis. Resilience is commonly defined as the ability to recover from setbacks and adapt to change (Ovans 2015). A resilient Bay Area would be well-positioned to manage and respond to the uncertainties and physical hazards associated with the Bay Area's geographic setting and changing climate while protecting vulnerable communities, critical infrastructure, and the natural environment.

With the July 2017 adoption of Plan Bay Area 2040 — including new commitments to resilience-building actions — the region is at an important crossroads where research, planning, design, and management activities focused on resilience are coming together both in policy and on the ground. The plan's adoption is one of several milestones reached in 2017 that demonstrate both how far the region has come and the opportunities ahead to raise the bar on the resiliency of the Bay Area's transportation system and other critical infrastructure, urbanized areas, and environmental systems.

The first milestone in 2017 was the assembly of a critical mass of research and analysis on vulnerability to sea level rise and flooding all around the bay by local and regional partners through the Bay Area Regional Collaborative (BARC) and other efforts. Some of this work — led by the San Francisco Bay Conservation and Development Commission's Adapting to Rising Tides program (BCDC ART) and the Association of Bay Area Government's (ABAG) Resilience Program — identified four areas of vulnerability related to sea level rise and flooding in need of more than just local attention. These regional level vulnerabilities include transportation infrastructure, fragile housing, disadvantaged communities, and natural areas and parklands close to shore.

A second 2017 milestone is the use of this information to identify six actions in Plan Bay Area 2040 (the region's state-mandated Sustainable Communities Strategy) that would help the region address vulnerabilities in an integrated way. These six actions address regional governance, resilient housing, funding, social equity, mitigation, and other issues arising from climate adaptation planning on a regional level. The substance of these actions reflects coordinated work on the part of BARC, BCDC, ABAG, and the Metropolitan Transportation Commission (MTC), as well as the California State Coastal Conservancy and the San Francisco Estuary Partnership. These actions include the completion of a regional assessment that identifies the most vulnerable transportation assets, communities, and natural areas and begins to develop appropriate strategies to address those vulnerabilities in a phased approach. This work is being funded through a grant from Caltrans, with matching funds from the Bay Area Toll Authority (BATA), a strong indication that transportation agencies are seeking solutions to make the region more resilient.

A third 2017 milestone is the launch of the Resilient by Design | Bay Area Challenge, which is now engaging 10 multi-disciplinary design teams in addressing resilience challenges at 10 project locations around the bay. The results, to be completed in summer 2018, will add to the region's toolbox of options for forging more resilient shorelines, cities, and communities.

An important component of integrating resilience planning across the region will be informing the development of the next Sustainable Communities Strategy, a process scheduled to take place between now and 2021. The Sustainable Communities Strategy integrates land use and transportation planning to meet aggressive greenhouse gas reduction targets (required to be updated every five years by Metropolitan Planning Organizations in California through State Bill 375). While Plan Bay Area 2040 is the current version of the state-mandated Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS), just approved in July 2017, the next version may take a different form. Over the next two years, regional partners will be laying the

groundwork for enhancing this regional planning process so that it more strongly supports multi-hazard, multi-benefit initiatives and strategies that increase the Bay Area's resilience.

Strengthening local and regional resilience through this existing, state-mandated planning process is particularly important since the resulting plans commit the region to focusing growth and development in specific places within the metropolitan Bay Area. The RTP/SCS also prioritizes transportation investments over the next 20 to 30 years. When considered together, and in light of new information about their vulnerability to flooding, sea level rise and other hazards, choices made around these areas identified for future growth and investments will be central to the Bay Area's overall resilience.

In addition, Plan Bay Area 2040's strong focus on the housing affordability crisis highlights the particular vulnerability of people already living within the economic margins of our costly region. Both the affordability and safety of regional housing options are critical components of resilience. This became even more evident in October 2017, when the region lost 3,000 homes within one week in Sonoma, Napa, and Solano counties to devastating wildfires, leaving thousands homeless and many unable to find affordable replacement or temporary housing.

Addressing climate change in the context of regional resilience is a complex challenge for those charged with integrating planning across nine counties, more than a hundred cities, and myriad local jurisdictions and special districts. Clearly, the region must continue to accelerate mitigation of climate impacts by reducing greenhouse gas emissions and improving air quality, activities which the Bay Area Quality Management District, MTC, and ABAG have led for many years. At the same time, the region must work to ensure our longstanding and future residents have safe and affordable places to live. Strengthening our urban and natural infrastructure, ensuring public safety, and growing our regional resilience equitably will require a partnership across regional agencies, local jurisdictions, and non-governmental organizations. They'll also need to work with residents, businesses, designers, builders, academics, health professionals, and others in the community.

Equity issues will be significant as lower income and minority households disproportionately live on the least desirable land, and frequently have higher degrees of vulnerability to environmental risks. At the same time, low-income communities and communities of color are often left out of land use planning and decision-making. This long-term vulnerability is made acute by the fact that these communities may not be sufficiently connected to institutions and agencies that can help them after a climate event.[7] In contrast, we note that high-priced real estate on the urban edge and with views can be among the most vulnerable in the Bay Area to wildfire risk, as occurred in the 1991 Tunnel Fire in the Oakland hills.

7 More details on Climate Justice issues – including the disproportionate impacts and barriers to adaptation faced by several California communities – can be found in a companion Fourth Assessment that covers Climate Justice and Climate Equity issues in-depth (Climate Justice Summary Report 2018).

Interdependence with Other Sectors

Land use in the Bay Area is tightly linked with almost all other considerations of climate change impacts. In fact, it is arguable that population shifts (geographically or in terms of total numbers) may be just as important as (or even more important) climate factors in establishing the future trajectory for the social and built systems of the Bay Area. Shifts in land use will influence energy demand, transportation demand and congestion, public health, and even urban water demand. Further, changes in Bay Area land use will feedback into climate risks, through the creation of urban heat islands, and changes in the runoff response to precipitation potentially exacerbating urban flooding and shifts in the sediment supply to the San Francisco Bay ecosystem.

Urban Water

HIGHLIGHTS

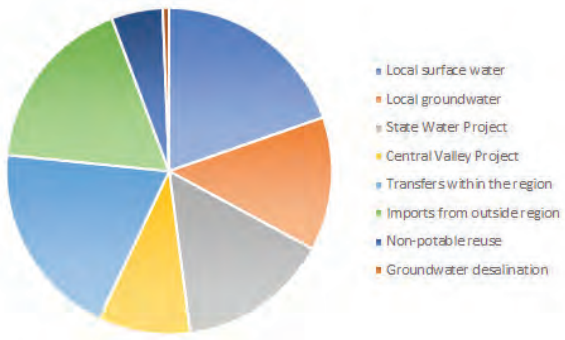
- The Bay Area's water agencies rely on a diverse portfolio of local and imported sources. The reliability of these sources will vary dramatically in both the short and long term as the climate changes.
- Climate impacts — such as earlier melting of snowpack, increasing seawater intrusion into groundwater, increased rates of evapotranspiration, and levee failures or subsidence that contaminate Delta supplies — will affect both the quantity of water available and the quality of supplies.
- Wastewater treatment plants, historically located along bay shorelines where effluent discharge was convenient, are now highly vulnerable to future sea level rise.
- Rising bay water and groundwater levels will also increase salinity intrusion and subsurface flooding. If this groundwater intrudes into sewer systems, treatment processes will become more expensive and wastewater recycling capabilities will be reduced.
- Climate change will require improved stormwater management in the Bay Area as extreme storm events increase in size and frequency.

Urban water systems include the infrastructure and institutions required to: (1) provide, manage and treat water supplies for potable and non-potable uses; (2) collect, treat, and discharge or recycle wastewater; and (3) manage, and, if necessary, treat stormwater after rain events. Historically, these functions often have been planned and operated separately. Increasingly, however, California urban water agencies recognize the need to view all water as a resource and are moving toward more interdependent systems, commonly referred to as "One Water" systems, as interconnections in the following discussion illustrate.

Climate Effects on Water Supply

The Bay Area has 376 community water systems (CWS) (Ekstrom *et al.* 2018). Of those, over 70 are classified as urban water agencies that provide wholesale and retail water supplies. These suppliers rely on a diverse portfolio of sources, including local surface water, groundwater, the State Water and Central Valley Projects, other water imported from outside the region (especially the Sierra Nevada via Hetch Hetchy and Mokelumne Aqueducts), water transferred within the region, groundwater desalination, and water reuse. Figure 13 shows the mix of sources used by urban water suppliers as reported in each agency's 2015 Urban Water Management Plan. Note that this figure aggregates over the entire region, and reliance on local sources is considerably higher in some sub-regions (e.g., Marin and Sonoma Counties) and considerably less in others (e.g., San Francisco).

FIGURE 13



2015 Water Supplies to the Bay Area. Source: Cumulative values from 2015 Urban Water Management Plans for each agency.

The reliability of these sources in both the short and long term will vary dramatically. Hydrologic changes affecting the amount and location of precipitation and snowpack in California's mountainous regions will stress existing storage reservoirs, impacting surface supply, imported water, and water transfer availability, especially in the summer and fall. While many strategies to address scarcity are similar for imported and local supplies (e.g., water recycling), the impacts of climate change on the available quantities of surface water could be different for local supplies (e.g., Marin, Sonoma) than those originating from the Sierras (e.g., San Francisco), as changes in local precipitation patterns are different than changes in snowpack and snowmelt. Recent and potential political decisions may affect the quantity and reliability of Bay Area supplies, including changes to water rights (e.g., to protect environmental flows), the fate of the Delta Tunnels, and implementation of the Sustainable Groundwater Management Act (SGMA) of 2014. Institutional structure can also affect supply reliability. Two-thirds of the region's CWS can be classified as small, self-sufficient (S3) systems that serve less than 10,000 people and are not connected to state or federal water projects (Ekstrom *et al.* 2018). Therefore, S3 systems tend to have fewer resources and alternatives in times of scarcity. In the recent drought (2011-2016), these S3 systems were more likely to experience reliability issues due to water shortage and more likely to address these issues with short-term coping strategies (e.g., outdoor watering restrictions) than with substantial or transformational changes (e.g., developing new water supply). Though there are a large number of S3 systems, they serve a very small portion of the population (<2%) in the highly urbanized Bay Area. Also, some of these systems identified as S3 may be connected to the Hetch Hetchy system and are therefore not be entirely self-reliant.

Climate change will exacerbate reliability concerns as it could potentially affect the quantity of water available and the quality of supplies (e.g., earlier melting of snowpack); increasing seawater intrusion into groundwater; levee failures, either structural or due to subsidence of the levees themselves (Brooks *et al.* 2018) that contaminate Delta supplies). Twenty climate change scenarios were evaluated to determine the economic and hydrologic effects on water supply in

California (Herman, J. *et al.* 2018). Some results, including average water availability and optimal supply portfolios, are reported on a statewide basis. However, costs associated with climate change-related water shortages are reported regionally and, in the Bay Area, may be as high as $200 million per year in extreme conditions.

Reliability concerns can be mitigated with more diverse water supply portfolios, additional water storage infrastructure above and belowground, and innovative groundwater management. Strategies for increasing supply reliability are being pursued by individual agencies and as part of a regional effort called the Bay Area Regional Reliability (BARR) partnership made up of several large water suppliers serving six counties (see Box 4). Alternatives under consideration by BARR and other Bay Area agencies include: expanding storage and conveyance infrastructure; increasing non-potable water recycling; implementing potable reuse and/or seawater desalination; promoting groundwater augmentation, banking, and conjunctive use; constructing interties between systems to enable additional water transfers; and harvesting stormwater.

Reducing water demand can also increase reliability. In 2015, water consumption in the region was 104 gallons per capita per day (gpcd), about 20% lower than the statewide average for urban water agencies that year. For individual agencies, it ranged from 56 to 204 gpcd. (Water consumption in 2015 was lower than a typical year because an executive order required urban water agencies to reduce water use as an emergency drought response.) For comparison, per capita water consumption in Singapore is around 40 gpcd and in Germany is just over 30 gpcd. In Israel and Australia, countries with similar climates to California, water consumption averages about 65 and 90 gpcd, respectively. (Note: Water demands vary by necessity due to, for example, climate and economic drivers. Further, data for consumption rates were obtained through diverse online sources and the underlying accounting methods may not be consistent.) The relatively low per-capita water use in much of the Bay Area reduces the potential for cost-effective conservation at the low end of the reported values. This may explain why water agencies in this region report lower reliance on demand management in times of water shortage than most other regions (Ekstrom *et al.* 2018). Finally, we note that without adequate management, water demand may increase due to climate change-related warmer temperatures, especially for outdoor irrigation or cooling.

Climate Effects on Wastewater

An estimated 200 billion gallons of wastewater are generated in the Bay Area per year (*SF RWQCB staff summary report* 2011). Most wastewater in the region is collected and discharged to San Francisco Bay, directly or indirectly, with a few agencies discharging to the Pacific Ocean (Figure 14). Much of the discharge from inland wastewater treatment plants (WWTPs) shown in the graphic ultimately flows to the San Francisco Bay through surface water channels. Some WWTPs have limits on their discharge volumes. For example, some North Bay plants are not allowed to discharge to the Russian River in the summer to protect public health when recreational uses are common.

The San Francisco Bay ecosystem sits at the center of the region and is a strong driver of policies that limit discharges by volume and quality. Currently, no stringent limitations have been placed on nutrient discharge into the bay due to the fact that the bay ecosystem is limited by other factors, specifically grazing (mostly benthic) and low light levels due to high suspended sediment concentrations. A study of water quality in the bay has indicated a trend toward lower sediment concentrations and clearer waters (Wright & Schoellhamer 2004), as the gold mining sediment pulse works its way through the reservoir and river systems of the Central Valley and San Francisco Bay. If this

trend continues, low light conditions may no longer limit ecosystem growth, raising the potential for eutrophication (excessive plant and algae growth due to high nutrient concentrations) in the bay ecosystem.

This trend would be compounded by a shift in the physics of the bay toward a more persistently stratified condition (Cloern *et al.* 2011), which could be caused by longer, hotter heat waves or increases in precipitation. A more stratified bay would allow phytoplankton to grow at the surface, unchecked by the species that consume them, reinforcing the risk of eutrophication. The future trajectory of the bay ecosystem is uncertain, but if eutrophication occurs, nutrient discharges from WWTPs may need to be limited. Implementation of nutrient reduction technologies at WWTPs would take years to decades and would come at great regional cost. There is currently significant investment in applied research to understand and project future ecosystem conditions, specifically to determine whether WWTPs will need to invest in strategies to reduce nutrient discharges.

Water reuse is being implemented in partnerships between water and wastewater agencies both to reduce the environmental implications of discharging wastewater to the San Francisco Bay and to provide drought-resilient, local water supply. Water agencies in the region project that non-potable reuse will double by 2035, reducing discharges to the bay by an additional 20 billion gallons (10%) per year. In addition, the BARR partnership (Box 4) is evaluating three potable reuse projects that would use advanced methods to treat water to drinking water standards before it is used for groundwater recharge. Demand management strategies that reduce water consumption may potentially reduce wastewater volumes and reuse in the future.

BOX 4: TAKING A REGIONAL APPROACH TO BAY AREA WATER SUPPLY RELIABILITY

Bay Area Regional Reliability Project (BARR)

The Bay Area's largest water agencies are working together to develop a regional solution to improve water supply reliability for over 6 million area residents and thousands of businesses and industries. The BARR partners include Alameda County Water District, Bay Area Water Supply and Conservation Agency, Contra Costa Water District, East Bay Municipal Utility District, Marin Municipal Water District, San Francisco Public Utilities Commission, Santa Clara Valley Water District, and Zone 7 Water Agency. The BARR Partners have joined forces to leverage existing facilities and, if needed, build new ones to bolster regional water supply reliability. The benefits of a ***regional*** approach include:

- Addressing climate resiliency needs
- Facilitating the transfer of water supplies during critical periods of drought or following natural disasters
- Bolstering emergency preparedness
- Leveraging existing infrastructure investments
- Enhancing overall water supply reliability

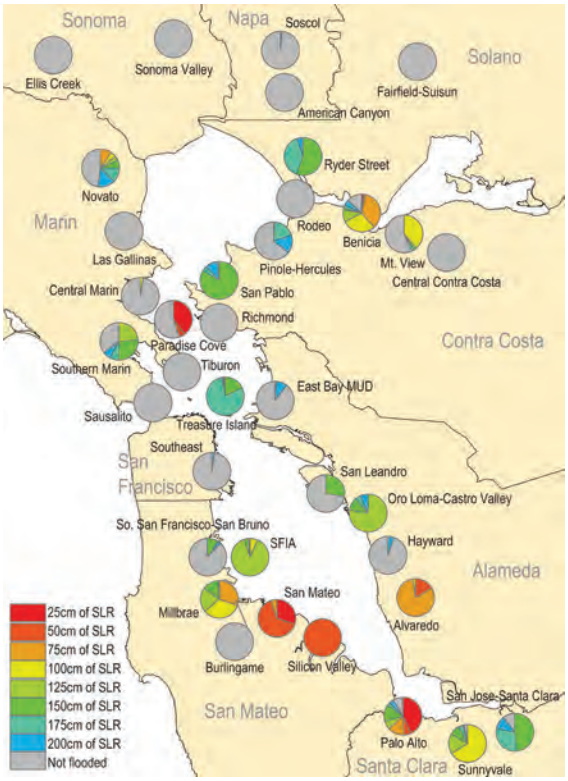
The 176-page BARR Drought Contingency Plan serves as the first phase of the BARR project. The DCP differs from planning efforts in the past because it focuses on the Bay Area as a region as opposed to individual agencies and integrates all of the required elements into one document.

Many of the region's WWTPs are located along bay shorelines and discharge treated effluents directly to San Francisco Bay waters (Figure 14). While convenient historically, this placement now makes WWTPs vulnerable to inundation if the sea level rises. Using CoSMoS (Barnard *et al.* 2014) model simulations of bay water levels responding to a range of future sea level and tidal forcing, Hummel et al. (2018) found that that WWTPs in the South Bay are most immediately vulnerable to coastal flooding disruption, but other sites, such as Benicia, Paradise Cove, San Pablo, and Southern Marin, are also vulnerable but on longer timelines (Figure 14). The large costs of protecting, retrofitting, or relocating this critical infrastructure must be considered in capital investment plans for these facilities.

Although the results summarized in Figure 14 are based purely on coastal flooding, Hummel et al. (2018) also projected the influence of rising groundwater tables on inundation of WWTPs. Accounting for this flooding mechanism leads to more inundation of WWTPs in the central and northern portions of the Bay Area than appears in Figure 14, over a similar timeframe. As an additional risk, rising bay water and groundwater levels are also associated with increased salinity intrusion into the subsurface, threatening drinking water supplied from these aquifers. If saline groundwater intrudes into sewer systems, the treatment costs associated with wastewater recycling will increase.

WWTPs in the Bay Area are making efforts to mitigate their contributions to climate change. Several agencies that digest sludge anaerobically have implemented programs to augment their digesters with other organic wastes (e.g., slaughterhouse and dairy waste, food waste) to increase their production of methane (natural gas). The East Bay Municipal Utility District, for example, produces electricity with their methane. Though methane burning releases CO_2 as a waste product, this is considered a carbon neutral energy source as it reuses a waste product and offsets purchases of electricity from more carbon-intensive sources.

FIGURE 14



Wastewater treatment plants (WWTPs) in the San Francisco Bay Area. Pie graphs show for each facility the fraction of its footprint that will be inundated for the specified level of sea level rise; colors are cumulative so that the inundation fraction at 100 centimeters is represented by the portion of the pie associated with 25, 50, 75 and 100 centimeters. Many of the region's WWTPs are located along bay shorelines and discharge treated effluents directly to San Francisco Bay waters. Note: Only those facilities on the shorelines of San Francisco Bay are shown here; those on the outer coast are not included. Source: Hummel el at. 2018.

Climate Effects on Stormwater

For much of the region, stormwater is managed through separate sewers from wastewater. San Francisco, however, operates a combined system where wastewater and stormwater are collected and treated through the same infrastructure. Influent volumes to San Francisco's two wastewater treatment plants can be seven times greater during significant rain events (SFPUC 2014). These dramatic shifts in both the quantity and composition of the influent can overwhelm the treatment process and lead to discharges of untreated wastewater to the bay or Pacific Ocean. Other municipalities that operated separate sanitary and storm sewer systems can also experience significant fluctuations in influent volumes and composition to their wastewater treatment plants due to leaks, which allow inflow of stormwater into the collection pipes and manholes with similar results (EBMUD 2013).

Climate change will affect stormwater management in the Bay Area due to changes in the frequency and severity of storm events (see Precipitation section, above). Urban flooding could become more severe, although potentially less frequent, and could vary significantly from year to year. Cities such as San Francisco and Berkeley are investing in green infrastructure (e.g., porous pavements, bioswales, rain gardens) to collect and manage stormwater on a small scale to provide flexible, integrated stormwater management, dampening the flooding and sewer overflow risks associated with storm events. Some water agencies, including the Santa Clara Valley Water District, are planning to expand larger-scale stormwater collection as a potential source of water supply in the future.

Interdependencies with Other Sectors

Population growth is expected in inland communities as individuals and households seek affordable housing. This growth of the inland population, independent of rising temperatures, will lead to increased irrigation and cooling water consumption; warmer climates will contribute further to increased water demand. Public health would be at risk if the water system was significantly disrupted, either due to a lack of potable water or through failures in wastewater treatment systems. Beyond that, the interdependencies that involve the Bay Area water systems are less extensive than in the other sectors discussed in this section, except for some basic dependence of water delivery and wastewater treatment on energy grids, and vice versa.

Energy Distribution

HIGHLIGHTS

- The Bay Area electrical grid is vulnerable to power outages during wind and wildfire events.
- Much of our natural gas transmission system is located along waterways and will be impacted by flooding from sea level rise and extreme storm events.
- California's transportation fuel sector, which distributes oil from refineries to end users, will be increasingly exposed to extreme weather events such as flooding and wildfire.

The generation and distribution of electricity throughout the Bay Area are driven by the need to supply sufficient energy for consumption, which is dominated by buildings and, increasingly, vehicle charging. Distribution of energy resources throughout the region (1/3 of the region's electricity is generated outside of the region) is supported by networked infrastructure systems, including those that distribute electricity, natural gas, and other fuels (BAAQMD 2017). The nature of networked infrastructure systems creates particular vulnerabilities to environmental disruptions, where a local disruption (such as would occur due to flooding or fire) cascades through the infrastructure systems to create a regional impact. Understanding the local-regional interactions created by the infrastructure networks is critical to regional resilience.

Electrical Grid

The electrical grid in the Bay Area consists of both above and belowground links to households and businesses, which leaves neighborhoods and subregions vulnerable to outages during wind and wildfire events. Under scenarios of climate change, extreme storm events with stronger winds may become more frequent, and urban wildfires most certainly will. The combined effect is that aboveground elements of the electrical grid will face more frequent and severe threats in the coming decades.

Natural Gas Distribution

In the Bay Area, extreme storm events coupled with long term sea level rise (SLR) present critical risks for networked infrastructure. In California, the natural gas transmission system is just such an at-risk critical infrastructure structure, with much of it located along the state's waterways and thus vulnerable to greater frequency, duration, and depth of inundation. Such inundation may result in increased buoyancy or pressure forces, erosion, debris flows, disruption of supporting materials, and saline conditions. These conditions have the potential to accelerate structural failures and potentially threaten the functionality of California's natural gas transmission system as a whole.

While household and business electrification are emerging trends in the Bay Area, we remain dependent on an uninterrupted supply of natural gas, both for the economy and the well-being of the region's population. Natural gas supplies meet nearly one-third of California's total energy requirements and natural gas-fired generation is the dominant source of electricity in the state, accounting for 43% of all generation in 2012 (CEC 2014).

Recent work (Radke *et al.* 2016) characterized the vulnerability of the natural gas transmission system to SLR by simulating where assets are likely to be affected by inundation and collaborating with asset operators to analyze the risks that this inundation poses to their system. This analysis integrated geographic information systems (GIS) and a state-of-the art hydrodynamic model, 3Di, to simulate the location and depth of potential inundation in California under realistic extreme storm events coupled with various increments of SLR. Overlaying the resulting inundation projections with the location of natural gas led to the identification of vulnerable locations.

During a near 100-year storm event with no sea level rise, approximately 41 kilometers (26 miles) of PG&E's transmission pipelines are predicted to be inundated. (PG&E voluntarily assessed the risk such inundation poses to their assets and helped inform efforts to design mitigation strategies). This more than doubles to approximately 96 kilometers (60 miles) with a SLR of 0.5 meters and doubles again to 193 kilometers (120 miles) at a SLR of 1.0 m. Finally, when SLR reaches 1.41 meters, the amount of inundated PG&E pipeline increases a further 1.6 times to 308

kilometers (191 miles). However, a simulated SLR of 1.0 meters inundates only 28 km (17 miles) of transmission pipeline to Peak Water Levels (PWLs, which are the highest total water level achieved in the simulation) of more than 2.5 meters and much less, approximately 5 kilometers (3 miles) of more than 3.5 meter PWLs. Although the extent of pipeline inundated is substantial, the amount experiencing deep PWLs is quite small. A simulated SLR of 1.41 meters exposes approximately 53 kilometers (33 miles) of pipeline to PWLs of more than 2.5 meters and approximately 30 kilometers (18 miles) to PWLs of more than 3.5 meters.

As a result, even if a near 100-year storm event may be considered catastrophic for some infrastructure, it may not have a catastrophic effect on natural gas pipeline infrastructure. From a reliability (systemwide) perspective, the worst-case scenario of 1.4 meters in sea level rise with storm surges poses a long-term threat to the PG&E transmission assets. PG&E made a preliminary estimate that the annual cost of natural gas transmission upgrade may be approximately $4 to $7 million and that only about 37 kilometers (23 miles) of transmission pipeline would need to be replaced and secured with a concrete coating. In addition, approximately another 19 kilometers (12 miles) may need to be anchored in place with concrete footings, and less than 1 kilometer (0.6 mile) of pipeline may need to be deactivated. Therefore, the SLR of 1.41 meters plus a near 100-year storm event scenario does not pose a catastrophic threat to the natural gas transmission system as managed by PG&E.

Transportation Fuels Distribution

California's transportation fuel sector (TFS), which distributes oil from its source to end users, will increasingly be exposed to extreme weather events including flooding and wildfire under climate change. Radke and Biging (2018) organized the TFS into a physically and organizationally connected, multi-sector network. Using this network, they projected and analyzed climate change-induced flooding and wildfire exposure at both coarse and fine spatial resolutions, across multiple temporal horizons and climate scenarios, resulting in an assessment of the TFS's exposure and vulnerability. Statewide, the results show that California's TFS assets are minimally exposed to coastal flooding but will suffer increasing exposure due to rising sea levels. Higher proportions of TFS assets are exposed to wildfire (e.g., 28% of refineries in a 5-year period). Direct heat exposure can disrupt fuel distribution, and in extreme instances permanently damage infrastructure. Understanding where wildfires occur, with what frequency, and with what intensity is crucial information to plan for a resilient TFS.

For the Bay Area, fine resolution simulations (Radke *et al.* 2018) indicate that TFS assets in low-lying, flat, and coastal areas, such as the San Francisco Bay Area and the Sacramento-San Joaquin Delta, are vulnerable to coastal flooding. Using 50-meter (164-foot) resolution coastal flood models, Radke et al. (2018) show that a relatively small proportion of each TFS asset type is exposed to any depth of coastal flooding in the state. Docks and terminals are the most exposed assets with on average 12.2% and 11.9% (respectively) flooded between 2000 and 2100, whereas only 0.92% of the state's gas stations are exposed. From the 2000-2020 period to the 2080-2100 period, the exposed proportions of assets increase from 0.44-9.00% (in 2000-2020) to 1.99-21.60% (in 2080-2100). Additionally, increased proportions of the assets are exposed to more severe levels of flooding later in the century. During the 2000-2020 period, 0.01-5.16% of the assets are exposed to extreme flooding with depth greater than 2.0 meters, and these proportions increase to 0.21-6.10% during the 2080-2100 period.

Wildfire threat varies geographically, and Radke et al. (2018) make use of the projections by Westerling (2018) for a regional analysis that estimates the amount of area burned by large (> 1000 acres or 1.56 square miles) future

wildfires. These projections were used to determine which regions and TFS assets in California are potentially threatened by large wildfire events. In a complementary analysis, Radke and Biging (2018) also pursued high spatial resolution analysis (5 meters or 16.4 feet) to assess wildfire hazard with fine precision at the individual asset level. By identifying the wildfire heat exposure hazards, TFS asset managers can assess their own vulnerabilities and damage scenarios, develop targeted risk mitigation strategies, and prepare for wildfire events where firefighters cannot control wildfires around the asset. While the detailed interaction between fire risk and TFS assets analyzed by Radke and Biging (2018) focused on assets in the Sierra foothills, supply lines extend this vulnerability into the San Francisco Bay Area.

Radke et al. (2018) conclude that product pipelines and central distribution terminals are the most critical assets within the TFS network from the perspective of climate vulnerabilities. Their statewide analysis identifies that docks, terminals, and refineries are the most exposed TFS assets to coastal flooding, whereas roads and railroads are the most exposed assets to wildfire. In response, stakeholders are planning to adopt hardening measures, such as improvements on physical infrastructure, as well as resiliency actions, including improvements to behavioral responses at the organizational level. Fine spatial resolution exposure projections are also effective tools to facilitate stakeholder discussions. The fact that many low-income and under-represented communities sit near TFS facilities reinforces the community vulnerabilities through the effects of multiple stressors and limited resources to making preventative investments.

Interdependence with Other Sectors

Radke et al. (2018) concluded that the TFS network depends on supporting inter-connected sectors such as electricity and gas, and that the vulnerability of the TFS network has two external impacts beyond disruption of its own operations: (1) failures in the TFS network disrupt the transportation systems that rely on it for fuel delivery; and (2) disruptions to transportation fuel delivery will place increased pressure on the state's emergency management infrastructure, both through the direct risks associated with TFS failure and through reduced capacity due to a lack of fuel delivery.

Energy Consumption and Distributed Generation

HIGHLIGHTS

- Warmer summers will increase summer energy demand across the region, with the largest increase expected in coastal cities as air conditioning adoption grows there. Warmer winters will lead to decline in winter heating demand.
- Building energy demand is higher in inland regions (warmer summers/cooler winters), so reducing Bay Area energy consumption will strongly depend on where new housing and business growth are located.
- Increasing building energy efficiency and resilience at a regional level will be challenging due to large numbers of older houses, multi-family housing units, and small office buildings.
- Changes in daily and seasonal energy demand, coupled with increased reliance on solar and wind energy, create novel challenges in management of the electrical grid.
- Since transportation accounts for 40% of the Bay Area's GHG emissions, reducing vehicular fossil fuel consumption through both adoption of zero-emission vehicles and by reducing vehicle miles traveled is crucial, a shift that will also produce substantial public health benefits. The shift to electric vehicles will require large investments and innovations in charging infrastructure.

This section examines the demand side of Bay Area energy usage. We consider the energy needs for buildings and vehicles separately, and highlight the expansion of PV installation and its value for building and vehicle energy needs.

Building Design, Smart Buildings

One striking feature of the Bay Area is the age of the building stock[8]. Nearly half of the housing stock was built before 1969, years before the first building codes became law in 1974 (BayREN 2017). Older homes often lack insulation, and most have single-paned windows and can benefit from energy-saving retrofits. Another important element is that the Bay Area has over 700,000 housing units with five or more units in multifamily buildings. This represents 25% of Bay Area housing units and almost a quarter of statewide multifamily units. Multi-family housing is difficult to retrofit because tenants do not own the unit and building owners have little incentive to invest in upgrades. The Bay Area is home to about 62,000 office, retail, hotel, and industrial buildings. The great majority of these buildings (over 90%) are less than 25,000 square feet. These buildings are part of the Small and Medium Business sector and can be difficult to successfully reach for retrofit. Large owner-occupied and government buildings are more accessible for energy efficiency retrofit programs.

Considering anticipated trends in both summer and winter temperatures, we can anticipate how building energy demand for cooling (air-conditioning electricity demand, summer months) and heating (natural gas demand, winter months) will evolve in the coming century. Warmer summers will increase summer energy demand across the region

8 This section draws heavily on data from the Bay Area Regional Energy Network. The BayREN is a collaboration of the nine Bay Area counties led by the Association of Bay Area Governments. Bay Area Regional Energy Network. BayREN Energy Efficiency Business Plan 2018-2025. Jan. 2017.

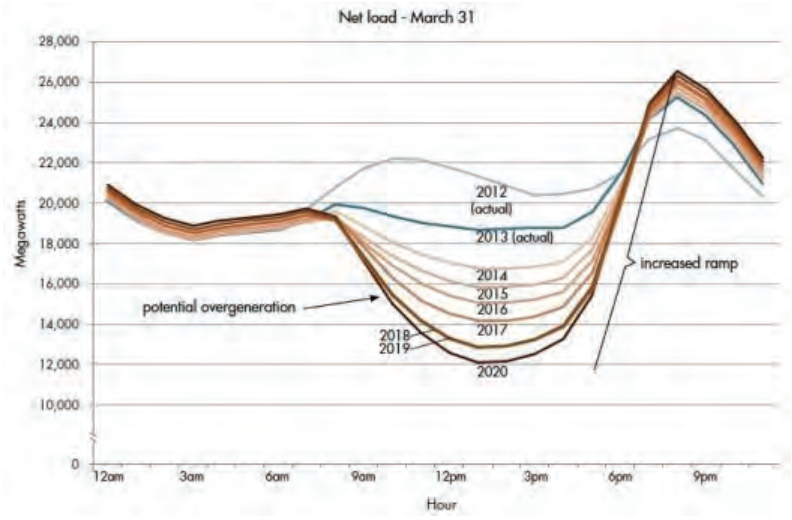
(Auffhammer 2018), with the most pronounced increase occurring in coastal urban settings as air conditioning adoption grows in these communities (see further discussion below in the context of public health). Milder winter temperatures will decrease winter energy demands (Auffhammer 2018), and the most pronounced effect is likely to occur in inland suburban and exurban regions; the moderating effect of the Pacific Ocean on winter temperatures in coastal regions result in low heating demand under current climates.

A key element of California's energy and environmental policies for buildings is to invest in retrofits and move toward zero net energy (ZNE) buildings. In such units, on a source energy basis, the actual annual consumed energy is less than or equal to the on-site renewable generated energy. The Bay Area's mild climate provides a good location for ZNE buildings - over a dozen ZNE commercial buildings have been built in the region (New Buildings Institute 2016). One notable site, the Zero Net Energy Center in San Leandro, is a training facility for electric workers (Zero-Net-Energy-Center n.d.). The building is designed with advanced energy efficiency to achieve ZNE. The site features natural daylighting with operable skylights, exterior windows, and solar light tubes. The building also uses advanced controls integrated with natural ventilation and passive cooling. The efficient design allows the roof to provide all of the space needed for the photovoltaics (PV) to support ZNE performance.

A related trend in the Bay Area is the growing capability of solar PV systems. In fact, San Francisco alone has more than 6500 buildings with PV systems. Unfortunately, less than 1% of these systems can be used if there is a power outage, which could be caused by emergencies such as earthquakes, distribution circuits overheating, or fires. A recent Department of Energy-funded study led by SF Environment (the city's sustainability office) and supported by the Lawrence Berkeley National Laboratory developed guidelines to improve the use of existing PV systems during an electric outage for resilience and community microgrids.[9]

While the number of ZNE buildings and the greater use of PV systems reduce greenhouse gas (GHG) emissions in the Bay Area, the impacts on the timing of electric loads are problematic. Homes and commercial buildings with PV systems create a sharper ramp-up in the late afternoon, as sunlight decreases, contributing to the so-called "Duck curve." Figure 15 shows California's net load curve (net load is defined as the

FIGURE 15



California's Duck Curve showing the daily cycle of net energy load.

Source: https://www.caiso.com/documents/flexibleresourceshelprenewables_fastfacts.pdf

9 https://sfenvironment.org/solar-energy-storage-for-resiliency

energy required from non-renewable sources to supplement on-site renewable generation). The electric system is difficult to manage with such a steep afternoon ramp. This problem is growing and by 2025 will occur not only in spring, but in every month of the year (Alstone *et al.* 2016).

A recent study explored how to mitigate problems related to the Duck curve, in particular by using more electricity in the middle of the day or overnight and less in the late afternoon, thus shifting the daily load curve (Alstone *et al.* 2016). Public service announcements and variable pricing are two mechanisms for shifting individual and household electricity consumption. Buildings can also eventually provide demand response from dynamic and demand-responsive lighting, heating, and cooling. This can be achieved by more time-differentiated pricing as well as fast demand response to adjust building loads dynamically. Another element of this trend is the strong push toward electrification of buildings.

Several cities in the Bay Area (San Jose, San Francisco, Palo Alto) have pledged to reduce their carbon emissions by more than 80% by 2050[10] and the University of California has pledged a zero-emission building footprint by 2025. One key method to reach these GHG goals is to electrify buildings. Natural gas for space and water heating often accounts for greater levels of GHG than electricity use in California. As we move toward using electric heat pumps for cooling as well as space and water heating, we need to ensure these loads are controllable and do not result in the Duck curve having an even steeper afternoon ramp. The evolving Internet of Things supports the control of emerging electric loads. New technology to measure, control, and integrate building end-use loads is developing quickly. In particular, collection and analysis of smart meter data offer new insights into energy use trends.

Electric Vehicle Adoption and Charging Infrastructure

Transportation accounts for about 40% of the Bay Area's GHG emissions[11]. Consequently, reducing California's vehicular fossil fuel consumption through adoption of zero-emission vehicles (ZEVs) (or reducing vehicle miles traveled, see Land Use section, below) is crucial for reducing California's GHG emissions. For the Bay Area, the important role that automobile emissions play in reducing the region's air quality means that a shift to ZEVs will have associated public health benefits. Making ZEVs affordable and convenient for people in the Bay Area will require thoughtful and strategic investments by both public and private sectors.

For the purpose of discussion in this section, we consider the general group of plug-in electric vehicles (PEVs), which replace internal combustion engines with electrochemical batteries and electric motors, to be divided into battery electric vehicles (BEVs) and plug-in hybrid electric vehicles (PHEVs), which still use small amounts of fossil fuel as backup. The economic cost and driving range of PEVs are primarily dictated by battery technology. Over the past 10 years, we have witnessed PEV battery prices fall from 1000 USD/kWh to about 250 USD/kWh (Nykvist & Nilsson 2015). These declining costs, albeit crucial to enabling PEV adoption, are not the only necessary ingredient for transitioning California's fleet to ZEVs. We also require a robust EV charging infrastructure to fuel these vehicles.

There are two distinct categories of non-residential PEV charging infrastructure: *destination charging* and *fast charging*. Destination charging refers to infrastructure placed at destinations, such as homes, work, or shopping centers. These chargers are distributed throughout urban areas and typically achieve a full charge in several hours.

10 https://www.sierraclub.org/ready-for-100/commitments

11 http://www.baaqmd.gov/research-and-data/emission-inventory

Fast charging refers to infrastructure placed along intercity corridors, e.g., between the Bay Area and Southern California. These fast chargers can provide a partial charge in less than one hour, to complete the trip. Both categories of PEV charging infrastructure are required to transition California's transportation fleet.

An integrated approach to PEV charging infrastructure planning requires consideration of both energy and transportation systems, since total ("well to wheel") GHG emissions for PEVs must include emissions created by the electric power generators used to charge the vehicles (Tamayao *et al.* 2015). Consequently, if the objective is to minimize GHG emissions due to transportation, then planning EV charging infrastructure must be considered in tandem with the electric power infrastructure. Recent research has focused on planning EV fast charging stations by jointly analyzing the transportation and electric power networks (Zhang *et al.* 2016, 2017). This work provides one of the first comprehensive approaches to understanding EV charging infrastructure planning across this interdisciplinary boundary.

The implementation of destination charging requires infrastructure to be developed and installed at commercial locations, such as shopping centers, hotels and business parks. Adding EV chargers to these locations can significantly increase electric bill costs, particularly the demand charges associated with peak usage. Demand charges comprise a significant portion of commercial and industrial customers' total electricity costs, typically between 30% and 70%. Adding EV chargers to these sites can significantly increase these costs, further challenging the transition to PEV transportation.

A compelling solution to each of the aforementioned issues is "smart charging." Smart charging refers to automatically controlled charging of PEVs that reshape their power consumption to provide benefits to the PEV infrastructure owner and/or grid operator. At the household level, for example, peak charge structures can create incentives to redistribute demand to periods when regional demand is low. Smart charging can also be applied to minimize the well-to-wheel GHG emissions, by shifting charging to times when the highest percentage of low-carbon electricity sources are online. Recent work has included proof-of-concept computations that scheduled large fleets of PEVs to flatten the Duck curve described in the previous section (Le Floch *et al.* 2016).

A robust PEV charging infrastructure is not yet available. Although significant funds are being allocated to build EV charging infrastructure, such as $100 million per year from California's Alternative and Renewable Fuel and Vehicle Technology Program (ARFVTP, www.energy.ca.gov/altfuels/) and $800 million distributed over 10 years from the Volkswagen settlement for ZEV projects in California, whether the state will efficiently plan and operate this infrastructure remains an open question. To accelerate this transition, we require more investment into research and technology around smart charging and PEV infrastructure planning tools. Moreover, pilot projects should provide open source data to enable rapid scaling and learning. Finally, economically disadvantaged communities often can experience the greatest benefit from ZEV transportation, due to low operational costs and benefits for local air quality. Mechanisms to provide these communities with equitable access must be investigated.

Interdependence with Other Sectors

Future energy demand will be impacted by climate and has important interdependence with land use, transportation and public health. Of particular importance from the perspective of building energy consumption are geographic shifts in population and employment. Building energy demand is higher in inland regions, due to both warmer

summers and cooler winters relative to the coast, so energy consumption in the employment and commercial sector will strongly depend on future regional development. At the same time, shifts in residential distributions may increase or decrease commute times, depending on the trajectory for the region and where densification does or doesn't occur. Longer commutes will create increased energy demand for the transportation sector, but this must be interpreted relative to building energy consumption. Finally, investments in building climate control are critical to reduce public health risks from heat waves, discussed below with reference to the 2017 heat wave in San Francisco.

We conclude this section by noting that each of these steps towards adaptation, whether in buildings or in vehicles, requires the investment of additional resources versus alternative approaches. Low-income individuals and households will have limited capacity to electrify, and renters will have limited control over the structure and function of their homes or apartments. Widespread adoption in the region will therefore be limited by socioeconomic inequalities until and unless these energy-saving strategies become affordable for all.

BOX 5: FIRST COUNTY IN CALIFORNIA WITH ITS OWN CLIMATE AUTHORITY

Sonoma County Regional Climate Protection Authority (RPCA)

Sonoma County's RCPA was formed in 2009 to provide a formal collaborative structure on climate protection for nine cities and multiple countywide agencies. The RCPA helps its stakeholders to set goals, pool resources, and create partnerships across silos. It also coordinates local activities with state and federal entities. The RCPA is governed by a board of 12 elected officials — nine representing cities and three from the County Board of Supervisors — and provides an invaluable forum for in-depth discussions on climate planning, program management, and project delivery. The RCPA has developed Climate Action 2020 (countywide greenhouse gas reduction implementation program), produced a set of Climate Adaptation forums to educate and broaden support for building resilience, created Shift Sonoma County (transportation greenhouse gas reduction), and has assisted with numerous countywide projects such as Sonoma Clean Power and the innovative PAYS financing program for home water improvements. In 2014, the RCPA and the local governments of Sonoma County were designated Climate Action Champions by the White House, in recognition of their outstanding leadership in climate action.

Public Health

HIGHLIGHTS

- Bay Area public health is threatened by a number of climate-related changes, including more extreme heat events, increased air pollution from ozone formation and wildfires, longer and more frequent droughts, and flooding from sea level rise and high-intensity rain events.
- High levels of socioeconomic inequity in the Bay Area create large differences in the ability of individuals to prepare for and recover from heat waves, floods, and wildfires. Financial resources as well as improved social structures are important to enhance community resilience and reduce these disparities.
- Heat waves pose increased health risks due to urban heat islands and the lack of local experience and cooling infrastructure (air conditioning) in bayside cities. These risks are compounded for low-income communities.
- Hazardous waste sites across the region are at risk of flooding with future sea levels. Release of contaminants, particularly in low-income and densely populated communities, creates a serious and direct health risk.
- Climate-related disruption of the transportation network creates three key risks for public health: the capacity of people to evacuate and move away from danger; the difficulty in accessing hospitals and other health-related infrastructure; and the reduced ability of hospitals, clinics, and emergency responders to operate.

Long-term climate change creates a variety of direct and indirect threats to human health, but with geographic variability impacting the severity of each threat. Ekstrom and Moser (2012) outlined the threats for the San Francisco Bay area due to increased frequency and magnitude of extreme heat events, changes in precipitation (including both more intense events and the potential for longer and deeper droughts), and long-term sea level rise. Direct effects include a broad spectrum of heat-related diseases, ranging from heat exhaustion to heat stroke to death, and injuries and fatalities that result from severe weather. Indirect effects of climate change on human health arise from connections of climate and weather conditions with health responses. Examples include air pollution, pollen and allergens, water quality and harmful algal blooms, disease vectors (insects and rodents), and supply of water and food. As climate change transforms conditions for each of these elements, threats to human health emerge. In aggregate, if conditions deteriorate in a region or subregion, human migration will follow, as people seek new homes that can better support their health and well-being.

Health risks due to climate change are strongly influenced by broader issues related to community vulnerability and resilience. While it may be obvious that economic strength and financial resources are important to community preparedness and response, the role that social structures play in preparing communities is now emerging more clearly. An example of the role that social networks and supporting infrastructure can play is seen in the Chicago heat wave of 1995 (Klinenberg 1999). In that instance, the most important factor that reduced death rates in local communities was the presence of strong social networks ensuring that community members were looking out for each other.

Regardless of the particular type of event, it is understood that shifting conditions and increasing disruptions of normal activity by extreme environmental events can have negative effects on mental and emotional health. This risk is elevated among communities in which basic needs themselves are threatened by the changing climate. Social and economic factors impact both the exposure and ability of vulnerable communities to adapt to climate change, and as a result, health outcomes from heat, air quality, wildfires, etc., due to climate change are amplified and multiplied in these communities.

In the Bay Area, the threats of climate change for human health vary within the region, with coastal urban communities having different vulnerabilities than inland suburban and exurban communities due to differences in environmental conditions and the magnitude of climate change impacts. Further, socioeconomic variability is high in the Bay Area, which creates large inequities in the vulnerability to health risks associated with climate change. In the remainder of this section, we develop descriptions of individual and community health vulnerabilities by considering those processes that may be exacerbated by climate change.

Direct Impacts of Heat and Heat Waves in the Bay Area

More frequent, larger magnitude, and longer duration heat waves are already emerging as an important aspect of climate change in the Bay Area (see Regional Climate Science section, above). A key factor in surviving these events is the level of preparedness at both the local and community scale. Because of this, at the moment, coastal regions of the Bay Area are more at risk than inland communities due to differences in both individual acclimatization and investment in protective infrastructure (CNRA 2009). The risk for coastal communities in the Bay Area is exacerbated in urban settings (San Francisco and Oakland) due to the urban heat islands they create, which results in nighttime temperatures that do not cool as they would in natural conditions. Elevated nighttime temperatures, which can be as much as 22°F (12 °C) higher in urban settings (CNRA 2016), eliminate the physiological benefit of periodic cooling leading to cumulative heat effects and elevated risks of illness and death (Chan *et al.* 2001).

As an illustration of the devastating impacts of heat waves in Bay Area urban communities, we need look no further back than the fall of 2017. At the beginning of September, a series of all-time high temperature records were set in San Francisco and Oakland. These events overwhelmed the protective and social infrastructure in San Francisco, resulting in 6 deaths and 38 hospitalizations (Rodriguez 2017). During these heat events, temperatures are just as high or higher in inland suburban communities than they are at the coast, but the preparedness in the inland communities is greater. Not only are individuals in inland communities acclimated to hot temperatures, but more cooling infrastructure is available to protect against severe heat illness (i.e. air conditioning at home, work, stores, and community centers) (CNRA 2014). While some of this difference can be attributed to socioeconomic factors, the commitment of resources to cooling infrastructure and the acclimatization of individuals are due to the high frequency of hot days those communities face.

This vulnerability gap between inland and coastal communities suggests that increased investment in cooling infrastructure in coastal areas of the Bay Area will be an important component of climate adaptation. Nonetheless, the intermittent nature of heat events in the coastal urban communities means less widespread adoption of air conditioning, leaving them more vulnerable than their inland counterparts. This gap is compounded for low-income communities, in which individuals are unable to invest in these protective features, and community-based cooling center availability is likely to be very limited (Ekstrom & Moser 2012).

Impacts of Wildfire on Vulnerable Populations

Wildfires disproportionately impact vulnerable populations, due to health disparities, higher risk of job loss during economic downturns, and lower access to social resources, exacerbated by language barriers, lower internet access, and unwillingness to contact authorities for undocumented individuals (Cornwall *et al.* 2014). Renters and lower-income home owners generally have lower financial capacity to build or upgrade to fire-safe building codes and maintain defensible space, and have higher rates of uninsured or underinsured homes and belongings lost in fires (Cooley *et al.* 2012). The >5,500 structures lost in the Tubbs Fire represented about 5% of the housing stock for the city of Santa Rosa. In a region with elevated housing prices and low availability, these losses have caused considerable displacement, especially for low-income residents.

Air pollution from wildfire smoke, especially particulate matter, creates higher risks for children, elderly, and those suffering from respiratory illness (Lipsett *et al.* 2008). Burning structures and vehicles also release high levels of toxins (from building materials, paints and solvents, etc.) creating greater health risks compared to vegetation fires. Control of particulate matter pollution is a major factor that limits the scope and frequency of prescribed burning, especially near populated areas. However, more research is needed to determine if higher levels of prescribed burning would lead to a net reduction in health risks by reducing the risk of high severity wildfire and associated structure fires. Mechanical fuel treatments can achieve some of the same benefits as prescribed fire, without creating air pollution, and may offer the only viable option near populated areas (Moghaddas *et al.* 2018).

BOX 6: HELPING BAY AREA HEALTH DEPARTMENTS TAKE ON CLIMATE CHANGE

Bay Area Regional Health Inequities Initiative (BARHII)

After a major (and successful) effort with health, social, and environmental justice allies to move health equity issues into the Bay Area's first Sustainable Communities Strategy (Plan Bay Area), BARHII has expanded its focus to include building community resilience to the impacts of climate change.

To support the capacity-building of Bay Area health departments, BARHII has developed five two-page "Quick Guides" on why climate change is a public health and equity issue, the environmental and health co-benefits of climate change action, how to get involved in climate change action planning, and tangible steps to address climate change.

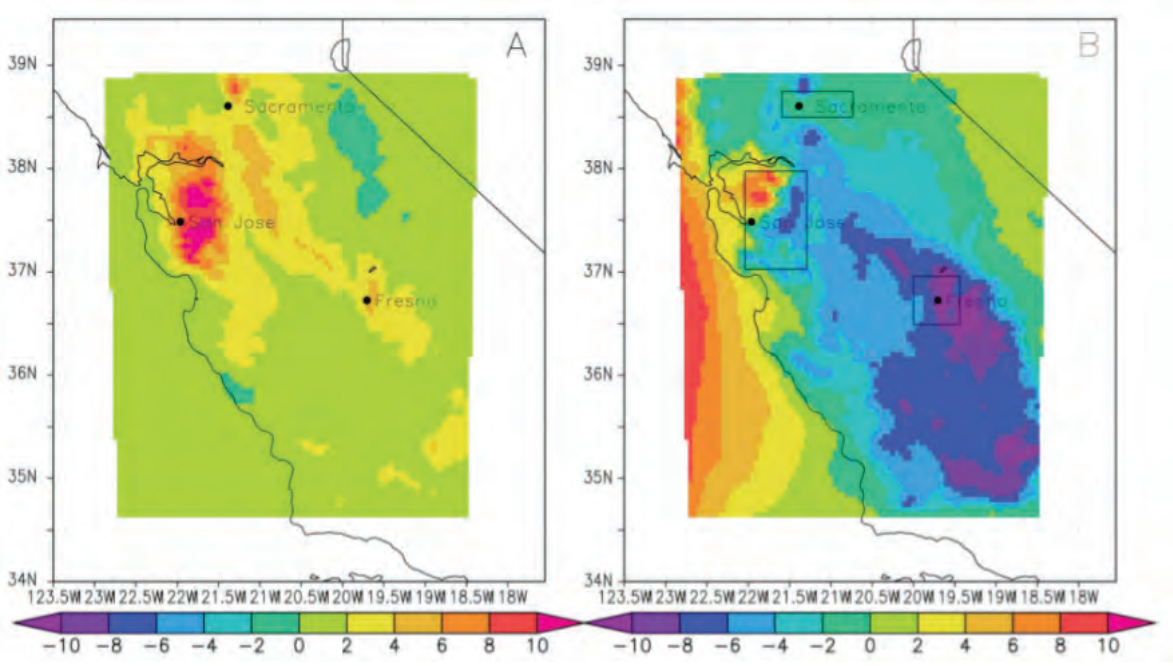
- Guide 1: Climate Change: What's Public Health Got to Do With It?
- Guide 2: Health and Equity Co-Benefits of Addressing Climate Change
- Guide 3: Climate Change and Health Equity
- Guide 4: How Public Health Can Address Climate Change
- Guide 5: Getting Involved in Climate Change Action Planning

Indirect Impacts of Climate Change on Health Due to Air Quality

Three factors dominate the landscape of air quality in the San Francisco Bay Area: (1) ozone pollution during the summer (and, increasingly, the fall); (2) particulate matter during the fall and winter; and (3) allergen production and distribution during the spring and summer. Vulnerable individuals and communities experience the impacts of these contaminants through asthma, lung disease and cardiovascular health risks (Bernard *et al.* 2001). While these risks exist today, we focus here on the direction and mechanisms by which climate change is likely to exacerbate them.

The reactions that create ozone are facilitated by higher ambient temperatures, leading to increases in near-ground and near-source ozone hot spots. While emissions that are the precursors to ozone production may decrease in the coming decades, the net effect for the Bay Area is expected to be an increase in ozone levels (Steiner *et al.* 2006) (Figure 16).

FIGURE 16



Change in ozone concentration (3 p.m. local time) for (a) combined climate effects; and (b) including emissions reductions. For the Bay Area, increases in ozone concentration mostly increase, except in the far southeast portions of the region, where reduced emissions dominate the increases due to climate factors. Source: Steiner et al. 2006

During the fall and winter months, the dominant consideration in Bay Area air quality conditions is the near-ground trapping of particulate matter by high pressure systems. Recent studies of global circulation have shown that the loss of arctic ice cover has resulted in a change in winter weather patterns. Historically, high pressure systems tended to alternate with low pressure systems over the Western United States on a synoptic timescale of 4-7 days. In recent years, however, high pressure systems have been locked in place over the Western United States for weeks, or even months, during the winter. This response to global climate conditions (termed the "ridiculously resilient ridge" of high pressure) (Swain 2015) not only creates drought conditions for California, but it also leads to deteriorating air quality in inland Bay Area communities due to the persistent trapping of particulate matter in inland valleys.

The combination of heat waves and persistent high-pressure systems during the fall months is leading to wildfires of increased frequency and magnitude. Urban wildfires in the region, and large wildfires to the north and east of the Bay Area, undermine air quality in the Bay Area through the creation and distribution of particular matter in the lower atmosphere, leading to increased hospitalizations and even deaths due to cardiovascular and asthma related emergencies (see further discussion below).

Direct Health Risks due to Extreme Weather Events and Sea Level Rise

The most pronounced risk of life in the Bay Area linked to climate change is likely to be due to wildfires during summer and fall and landslides or sudden flooding due to extreme precipitation and infrastructure failures during the winter. The wildfires in Fall 2017 in the Northern Bay Area (Santa Rosa, Sonoma, Napa County) killed 44 people and hospitalized 185. Prior to this event, the largest urban wildfire in the Bay Area was the 1991 Oakland-Berkeley Hills Fire, which killed 25 (Ekstrom & Moser 2012). As described in the Regional Climate Science section, and as discussed above in the context of land use changes, future heat conditions, combined with development at the urban edge, increases the risk of future wildfire events for human health and lives.

In Bay Area hills, the risk of landslides is a function of the interaction between precipitation and soil conditions (Collins *et al.* 2012), and seismic activity. Climate change creates increased likelihood of extreme precipitation and wildfire events; both create increased risk of slope failures for the coming century.

Sudden flooding events in the greater Bay Area are most likely to result from levee system failures, which are increasingly likely due to higher river flows, higher sea levels, and seismically poor levee structures. Exacerbating this risk is the expansion of impervious surfaces in Bay Area watersheds and the subsidence of bayfront lands to the point that many waterfront communities are already below mean high-water levels. Communities like Alviso in the South Bay or Bethel Island in the Sacramento-San Joaquin Delta are already vulnerable to levee failure-induced flood events. Urbanized lower watersheds, which surround San Francisco Bay, exacerbate the risk of dangerous flood events, as was evident in San Jose during the Coyote Creek flooding of early 2017 (Giwargis 2017).

For low-income residents and communities, risks of isolation and lost resources are elevated in flooding events. Due to the fact that these residents have a lower rate of car ownership than the general population, they are heavily reliant on public transportation and frequently have limited mobility during extreme weather events and emergencies. During climate disasters, such as Hurricane Katrina (New Orleans, 2005) and Hurricane Harvey (Houston, 2017), people who had cars were able to evacuate, and those without (who also had limited public transportation options available) were often unable.

Bayfront nuisance flooding, which is created by sea level rise and high tidal conditions, poses little direct physical threat to human health, although it may undermine regional health through interdependencies described below. A health risk does emerge, however, when considering the mobilization of contaminants, or the deterioration of water quality, in response to long-term change. In the Bay Area, there are dozens of hazardous waste sites at risk of nuisance flooding with future sea levels. The mobilization of these contaminants, particularly in densely populated communities, creates direct health risk due to exposure to metals and petrochemicals (Heberger *et al.* 2009).

From the perspective of drinking water, rising sea levels and more variable precipitation and river flows mean the freshwater supply for much of the Bay Area (and State) is at risk due to salt water intrusion, both into groundwater aquifers (Heberger *et al.* 2009) and into the Sacramento-San Joaquin Delta (Chua & Xu 2014).

Interdependencies with Other Sectors

Interdependencies among different parts of regional infrastructure create risks to human health. Regional infrastructure networks, particularly the transportation, fuel distribution, and power networks, support human function throughout the region, including health-related infrastructure such as hospitals, clinics, and pharmacies.

Disruption of the transportation network, as would occur due to flood or fire, creates two risks for public health: (1) the capacity of the system to evacuate from the event itself may be reduced; and (2) individuals may have difficulty accessing hospitals and other health-related infrastructure. Power and fuel distribution networks provide support for powering health infrastructure, and the capacity of hospitals, clinics, and emergency responders will be reduced by disruptions. Finally, disruptions to the water delivery or wastewater treatment systems would create risks to public health, particularly if the disruptions persisted for more than a few days.

BOX 7: FOCUSING ON VULNERABLE POPULATIONS

San Francisco Climate & Health Profile

San Francisco's Department of Public Health, with funding from the Centers for Disease Control and Prevention, developed a 44-page profile that identifies local climate impacts and associated potential health outcomes, highlighting populations and locations in the city especially vulnerable to these changing conditions.

By systematically using climate projections to prioritize the most critical health impacts and risk factors, the profile reveals essential information needed to take adaptation actions to protect San Francisco residents. By utilizing the best climate science available and engaging community partners to understand vulnerabilities and interventions for communities and populations at highest risk for illness, the profile helps to advance urban health and environmental justice in the climate and health field.

Although all San Franciscans will be affected by climate change, certain San Franciscans will be affected more than others. The profile shows that residents who live, work or recreate along San Francisco's waterfront are more vulnerable to flood risk. Those in areas with poor air quality or limited access to open space are vulnerable to heat-related hazards. In particular, the urban poor are most vulnerable to climate change as its impacts amplify socioeconomic and racial disparities. The degree to which an individual San Franciscan is impacted by climate change often depends on his or her age, race, income, language, educational

BOX 7: FOCUSING ON VULNERABLE POPULATIONS

attainment, housing conditions, and pre-existing physical conditions such as diabetes and mobility disabilities.

After analysis of environmental, demographic, and socioeconomic infrastructure and individual pre-existing indicators, the profile concludes that certain neighborhoods in San Francisco will be disproportionately affected by climate change: Chinatown & Downtown, Bayview Hunters Point, Soma, Excelsior, Crocker Amazon, Visitacion Valley, and Treasure Island.

HAZARD	CLIMATE IMPACT	HEALTH IMPACT
Heat	Average yearly temperature to increase between 4.1 and 6.2 degrees Fahrenheit by 2100	Heat-Related Illness
		• Dehydration
		• Heat Stroke
	Extreme Heat Days (over 85F) to increase by 15-40 by 2050 potentially 90 by 2100	Heat-Related Mortality
		• Heart Disease
		Air Quality Effects
	Increase in heat wave length and frequency	• Respiratory Illness
		• Asthma
		• Allergies
		Mental and Behavioral Health
Sea-level Rise	Sea-levels projected to rise between 7-15 inches by 2050, 25-46 inches by 2100	Fatal and Nonfatal Injury
		Water-borne Disease
		Mental and Behavioral Stressors
		Income Loss
Extreme Storms	As precipitation levels fluctuate year-to-year, in rainy years, the frequency and severity of extreme storms is predicted to increase	Fatal and Nonfatal Injury
		Water-borne Disease
		Mental and Behavioral Stressors
		Strain on public health infrastructure
		Income Loss
Drought	As precipitation levels fluctuate year-to-year, in dry years where the high-pressure system off the coast does not dissipate, the frequency and severity of droughts will increase	Food Insecurity
		• Malnutrition
		Air Quality / Allergens
		• Respiratory Illness
		• Asthma
		• Allergies
		Mental and Behavioral Health
		Income Loss

Natural Infrastructure

HIGHLIGHTS

- Natural infrastructure can play an important role in climate change adaptation, enhancing biodiversity and ecosystem services while reducing societal risks.
- Natural shoreline infrastructure includes options such as oyster beds, marshlands, and dune enhancement that reduce wave energy and shoreline erosion. In some locations, managed retreat may be the only viable option in the face of sea level rise.
- Urban parks and trees enhance cooling and provide shade and can strengthen social ties and local communities.
- The role of natural infrastructure to protect vulnerable communities may face tradeoffs related to displacement and public safety.

In this section, we discuss the role that natural infrastructure can play by providing indirect support for adaptation by either preserving the function of other infrastructure systems or through mitigating the extent of the event that other infrastructure systems must endure. We consider here two distinct types of natural infrastructure that are represented in the Bay Area: first we consider marsh and wetland habitats as an element of shoreline infrastructure and flood protection, and then we consider how urban green or open space may be protective against heat and other community risks.

Shoreline and Flood Protection Infrastructure

When considering the risk of bayfront flooding under scenarios of sea level rise, decision makers must face the multiple threats of sea- and bay-forced flooding (sea level variability plus tidal forcing), groundwater flooding (where the groundwater table emerges above the land surface), and watershed or stormwater flooding (precipitation and runoff). Integrated flood protection infrastructure must be developed with consideration of all of these sources of flooding, which may create the need for supplemental infrastructure systems.

For the Bay Area, the risks associated with sea level rise are of critical importance in the coming decades, including both tidal flooding (created by the daily high tides) and lower watershed flooding (interaction between bay water levels and flows in bay tributaries). The value of natural elements in these protective infrastructure systems lies in their ability to create a more resilient shoreline infrastructure and in the ecosystem benefits that may accrue from the habitats within the natural infrastructure elements (Newkirk *et al.* 2018). These benefits are described in more detail below, but we start with a discussion of the role that natural infrastructure would play in the primary goal of shoreline infrastructure, which is flood protection.

The first, and most important, aspect of shoreline planning and flood mitigation is determining where to place the protective shoreline infrastructure, and what areas are going to be protected from flooding by that infrastructure (Holleman & Stacey 2014; Wang *et al.* 2018). Controlling flood waters with infrastructure (regardless of whether it is engineered or natural) is a containment strategy; allowing flooding to proceed as it would naturally occur is a strategy of flood accommodation. Pursuing flood accommodation as a strategy in an urban environment will necessarily

require retreat – either out of a local region or vertically – or a fundamentally different type of community and its associated infrastructure systems, which can function while intermittently inundated. For any segment of protective shoreline infrastructure, the role that natural approaches can play should be considered within the local context, considering the specifics of the forcing and the needs of the community to be protected by the segment.

In a tidally dominated and urbanized estuary such as San Francisco Bay, the opportunity for truly natural shorelines around San Francisco Bay is relatively limited, due to the requirement that tidal marshes be allowed to progress inland and up the topographic gradient as sea levels rise. We note that this is in contrast to open coastal and beach environments, where natural features have steeper slopes and require less inland space for adjustment. For natural marsh shorelines to be allowed to evolve with forcing from sea level rise in an urbanized or otherwise developed community, retreat would be required. As such, this natural flood protection infrastructure approach, with natural processes allowing the shoreline to evolve in response to environmental variability, may consist primarily of retreat and restoration, and provide limited in-place flood protection for the existing waterfront communities.

For tidal and urbanized systems such as San Francisco Bay, unless a community pursues a flood accommodation strategy, the flood protection infrastructure must have an engineered or artificial element to them to constrain and alter the natural inundation patterns that would occur. The opportunity for natural infrastructure in San Francisco Bay therefore lies in hybrid approaches, in which natural elements are integrated into what would otherwise be engineered structures. The horizontal levee is an example: As seas rise, the fronting marshes in these structures will accrete sediment and their bed elevations will increase. In urban and developed regions that do not retreat, the marshes will not be able to progress landward, however, and the landward edge of the marsh will need to be an engineered structure to transition to lower elevations in the community.

With these limitations in mind, it is important to recognize that the use of natural features in engineered shorelines does bring with it a number of advantages and benefits (Newkirk *et al.* 2018). The presence of marsh or other vegetated habitat on the bay side of engineered structures reduces wave energy (Möller *et al.* 2014), which reduces the wave setup and hence the total water level that the engineered structure must endure. Further, the dissipation of wave energy by the marsh or other habitat leaves less wave energy impinging on the engineered infrastructure that is providing the flood protection. Thus, the use of natural habitats as a fronting feature to engineered structures can be an effective addition to the flood control infrastructure, reducing total water levels and wear-and-tear on engineered protections, creating a more resilient hybrid infrastructure system. Further, the development of natural habitats as a part of the shoreline protective infrastructure creates habitat benefits for Bay ecosystems, including support for endangered species, ecosystem diversity, and recreation.

Urban Green Space and Trees

The role of urban parks and green space in community resilience to climate change and environmental disruption includes both mitigating the effects of climate change itself and providing stronger social connections for the community to respond to events.

First, as noted in the Regional Climate Science section, the density of trees, green space, and irrigation can play an important protective role in urban communities by reducing the heat island effect by several degrees. As discussed above, higher temperatures, particularly during the nighttime, in urban communities increase the risk of heat-related

illness compared to suburban or rural communities. The presence of trees and parks provides a protective element against this risk factor.

Secondly, the presence of parks and open space can create social linkages in the community, even if only at the scale of tree-lined sidewalks or "parklets" (Klinenberg 1999). These social ties are a critical component in establishing the resilience of the community to environmental events, including those worsened by climate change. Using the Chicago heat wave of 1995 as a case study, Klinenberg established that the presence of sidewalks and inviting public space in one neighborhood resulted in strong social networks and a lower fatality rate than in an otherwise similar neighborhood. This type of "natural infrastructure" is frequently overlooked when discussing protective infrastructure because it is through the social system that the protection is achieved, and the social functions are enhanced by the open space.

Disadvantaged Communities

The advantages of natural infrastructure as protection from either flooding or heat-related risks associated with climate change may not be easily achieved in disadvantaged communities. From the perspective of vulnerable communities along the bay shoreline, a retreat-and-restore strategy for flood protection may achieve the same end point as would gentrification: community displacement. Further, urban green space is limited and tree density is small in disadvantaged communities (Jesdale *et al.* 2013), so targeted investment at a relatively large scale would be required to mitigate urban heat island effects. A lower cost opportunity may lie in creating inviting open space to facilitate strong social networks and to improve community resilience.

Economic Resilience

HIGHLIGHTS

- The disruption of Bay Area commerce by climate change will likely be most strongly influenced by inundation and flooding in bayside communities and commercial areas.
- While bayside communities are on the front lines for future flood risk, many of them have limited ability or resources to pursue adaptation strategies.
- Without inclusive engagement among communities, disparities in economic and political power will undermine regional solutions and leave communities acting independently, with highly variable results for resilience and community health.

In a recent interview with the San Jose Mercury News (Baron 2018), former Stanford President John Hennessey identified housing and transportation shortfalls as the biggest risks to the future sustainability of Silicon Valley. Both of these factors are strongly impacted by climate vulnerability and disruptions, as noted above in discussion of the transportation network and changes in land use. The disruption of Bay Area commerce by long-term climate change will likely be most strongly influenced by the interaction of sea level rise with extreme storm events, creating inundation and flooding in lower elevation communities and commercial areas. The "Risky Business" report

concluded that $62 billion worth of property and infrastructure are at risk under moderate (4 feet) end-of-century sea level rise scenarios. Some 160,000 Bay Area residents would face disruptions either at home or at work with sea level rise of just half the end-of-century value. (*Risky Business: The Economic Risks of Climate Change in the United States* 2015)

From a community impact perspective, it is instructive to examine similarities and differences among communities to understand the nature of their vulnerability to long-term sea level rise. Hummel et al. (2017) overlaid inundation projections with census data to define exposures, then used formal clustering analysis to identify similar communities based on variables with particular links to community resilience. The analysis led the authors to two general conclusions. First, communities that are clustered together are frequently not geographically proximate. For example, San Rafael's Canal District and East Palo Alto share many of the same socioeconomic factors that underpin community vulnerability. Secondly, clustering of communities varies significantly through time, with more similarities emerging as sea levels rise. For example, under current conditions, Foster City seems to be unique in the threat that it faces, but by the end of the century, three additional communities will face similar risks to their populations. These results may help to build regional resilience through improved communication about adaptation approaches.

Finally, we must acknowledge the key role that social equity and environmental justice must play in considerations of regional resilience for the Bay Area. There is wide disparity in the ability of Bay Area communities to invest in climate change adaptation, which reinforces a "go-it-alone" approach to shoreline management. Due to historical development patterns and regional investment, low elevation communities (the bayfront communities most susceptible to flooding) are also frequently disadvantaged. While these communities are on the front lines for future flood and inundation risk, they themselves have limited ability or incentive to pursue adaptation strategies. Further, their vulnerability is reinforced by this positioning, and experiences both within the region and beyond have led vulnerable communities to fear that adaptation strategies may increase the attractiveness of their communities to outside investors, resulting in displacement.

Taken together, regional resilience planning will necessarily integrate threats to infrastructure and social systems into discussions that engage all communities around the bayfront. Absent such inclusive discussions, disparities in economic and political power will undermine regional solutions and leave communities acting independently and individually, with highly variable results for resilience and community health.

BOX 8: CREATING A REGIONAL APPROACH FOR SEA LEVEL RISE

RISeR SF Bay — Resilient Infrastructure as Seas Rise (riser.berkeley.edu)

RISeR SF Bay is a silo-busting sea level rise project for the Bay Area looking at hydrodynamics, transportation, governance, and other critical topics. The RISeR team includes engineers from UC Berkeley, transportation experts from New York University Abu Dhabi, political scientists from UC Davis, and ocean and sea level rise experts from the U.S. Geological Survey. A stakeholder advisory group from the Bay Area's public, private, and nonprofit sectors provides important input and feedback for the project.

The first phase of the hydrodynamics work has created state-of-the-art modeling for the San Francisco Bay showing how sea level rise protection projects built in one county would affect water levels and flooding in nearby counties. RISeR is demonstrating that regionalism isn't just a good *idea* — regional collaboration and decision-making on sea level rise will be required to protect and enhance critical infrastructure, human health, and our natural systems. It is also showing how local cities might group themselves for collaborative planning.

Similarly, in RISeR's transportation modeling, the team is showing how flooding of a local segment of a single freeway can produce far-reaching traffic impacts on other sections of the Bay Area transportation network. Again, regional collaboration will be needed to address these regional issues.

In the governance area, RISeR is studying the complex network of actors engaged in Bay Area sea level rise planning and recommending a first set of steps to improve regional decision-making. This work also includes polling and other methods to better understand public knowledge and viewpoints on sea level rise solutions for the region.

BOX 9: COMPREHENSIVE SEA LEVEL RISE VULNERABILITY ASSESSMENTS: 4 BAY AREA COUNTIES

Marin County, San Mateo County, Alameda County & Contra Costa County

Four Bay Area counties have completed detailed, in-depth assessments of their vulnerability to flooding from sea level rise and extreme storm events. These assessments will provide the scientific basis to design, fund, and implement a wide range of strategies to protect infrastructure, natural systems, and human health.

Marin County actually has two assessments, C-SMART for its ocean-facing areas and BayWAVE for Marin's considerable shoreline along San Francisco Bay and San Pablo Bay. Collaboration: Sea level Marin Adaptation Response Team (C-SMART) now includes both the Vulnerability Assessment and the Adaptation Report which identifies options for adaptation strategies for West Marin. The BayWAVE (Marin Bay Waterfront Adaptation Vulnerability Evaluation) Vulnerability Assessment is an informational document that catalogs impacts with six different sea level rise scenarios across the entire bay shoreline.

San Mateo County's extensive countywide effort on sea level rise is called Sea Change San Mateo County and includes assessments, projects, and public engagement activities. Their 215-page Vulnerability Assessment covers both the coast and the bay and looks in-depth at built infrastructure, natural areas, and human communities. The assessment includes regional networked assets as well as local assets and points to specific future actions and research gaps.

Alameda County was the first Bay Area county (2011-2014) to create a comprehensive sea level rise vulnerability assessment as the pilot project for the Bay Conservation and Development Commission's Adapting to Rising Tides program. The project included agencies and organizations from Emeryville to Union City and assessed the vulnerability and risk of shoreline and community resources to sea level rise and storm events. The project led to strategies to help communicate and resolve these complex issues, as well as processes to integrate adaptation into local and regional planning and decision-making. It also jump-started new collaborative adaptation planning efforts including the Hayward Shoreline and Oakland/Alameda Resilience Studies, the Bay Area Transportation Climate Resilience focus area planning efforts, the Capitol Corridor Passenger Rail vulnerability assessment, and the East Bay Regional Park District planning effort.

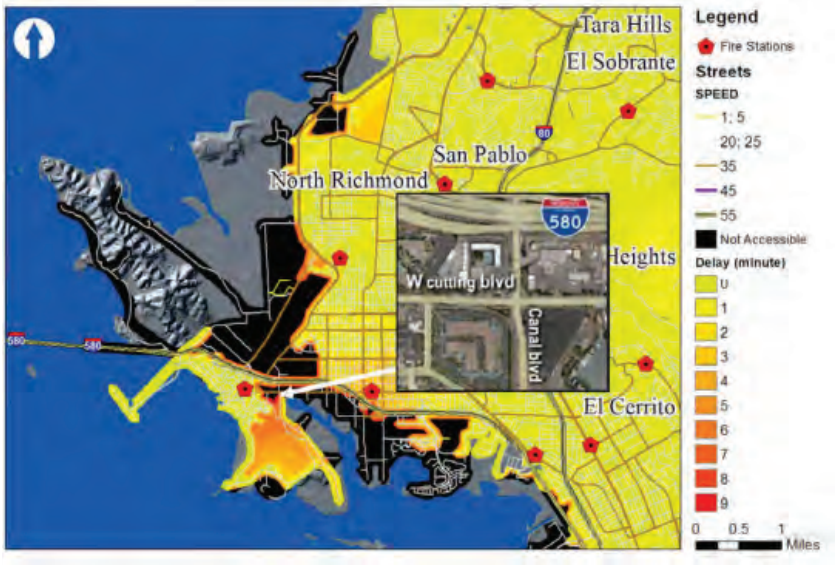
BCDC collaborated with Contra Costa County and local stakeholders on the Contra Costa County ART Project (2014-2016), covering a diverse shoreline from Richmond all the way to Bay Point. The project area, with its varying local topographies (from bluff to wetland to creek mouth), different types of land uses, diverse communities, and the presence of extensive rail and energy infrastructure, offered an excellent opportunity to better understand the diversity of vulnerabilities and consequences from current and future flooding. The project's Final Report includes assessment of 11 sectors as well as asset-scale evaluation of 15 representative assets.

Emergency Management

Immediate emergency response depends on the interaction between communication networks, transportation networks and public health and safety. Disruption of any of these systems by inundation events, landslides or wildfire would undermine emergency responses and leave populations vulnerable both during and immediately after an environmental event. Further, the reliability and safety of the region's housing stock should be evaluated in the context of emerging climate threats due to the fact that it is easier for a region to respond and recover from an emergency if the housing is habitable post-disaster.

The response time for emergency responders for specific communities under future inundation scenarios was explored by Biging et al (2012). Results for the city of Richmond for an end-of-century storm scenario (1.4 meters of sea level rise, 100-year storm event) are shown in Figure 17.

FIGURE 17



Delay in emergency response due to inundation of transportation network for Richmond, CA. Forcing scenario is 1.4 meters of sea level rise and a 100-year storm event. Areas shaded black are inaccessible due to the depth of inundation. Source: From Biging et al. 2012.

These results from Richmond are illustrative of the type of coupled response one can expect for bayfront communities. Emergencies due to environmental disruptions simultaneously undermine the infrastructure systems needed for the emergency response.

The emergency preparedness and response of vulnerable communities will be shaped by their specific socioeconomic conditions. In advance of any emergency event, low-income households are less likely to invest in preparedness. Thus, during extreme events, houses and structures may be less protected than others in the region and individuals may not be able to move to safety due to a lack of transportation or other resources. In the immediate aftermath of the event, those who rely on food banks, health care facilities, shelters, or churches may not be able to access these resources. Finally, longer-term community recovery may be inhibited by the fact that renters are less likely to have insurance. At the same time, households with limited English proficiency might not be able to understand emergency instructions or might not listen to emergency evacuation instructions because of fears regarding their immigration status.

Natural and Managed Resource Systems

The Bay Area is recognized as a hotspot of biodiversity within California and at a national scale (Myers *et al.* 2000). This diversity is supported by sharp climate gradients, rugged topography and heterogeneous soils, a big beautiful bay, and the majority of tidal wetlands in the state. These ecosystems provide "natural capital" for the region, including improved water quality and supply, carbon sequestration, outdoor recreation, flood control, and enhanced quality of life for a large urban and suburban population.

Plant and animal diversity and distributions in the Bay Area are strongly influenced by climate gradients. The most important of these are the coastal-inland gradient in temperature (including fog frequency and the inland penetration of the marine layer around San Francisco Bay), elevational gradients on local mountain ranges, and distinct rain shadows on the eastern slopes of the Coast Ranges. The Bay Area has about 3000 native plant taxa, with over 50 local endemics (i.e., species or subspecies found nowhere else in the world), and a diverse array of invertebrates and vertebrates occupying terrestrial, freshwater, estuarine, and marine environments.

Habitats and biodiversity of the Bay Area have been profoundly influenced by human activities, from the arrival of Native Americans 13,000 (or more) years ago, to the Spanish, the Gold Rush, and the expansion of urban areas and agriculture through the 20th century and into the 21st. Native Americans altered the California landscape by harvesting, hunting, and extensive burning (Anderson 2006).[12] The arrival of the Spanish brought intensive cattle grazing to California, and the introduction of European alien plants, many of which rapidly invaded and replaced native vegetation, particularly in grasslands and open oak woodlands. Aquatic and coastal ecosystems around the San Francisco Bay and estuary have been transformed by urbanization, dredging and levee construction, especially in the Delta, and the continued impacts of gold mining, dam construction, agriculture, and water diversions on fresh water flows, water quality, and sediment loads.

This section of the regional report draws on a previous report on the impacts of climate change on Bay Area ecosystems from California's Third Climate Change Assessment (Ackerly *et al.* 2012), updated with recent research and expanded discussion of agriculture, grazing lands, and aquatic habitats, including sea level rise impacts on the San Francisco Bay estuary.

12 Further information on how California's Tribal communities face unique threats from climate change – and how these communities are spearheading adaptation and mitigation efforts – can be found in a companion Fourth Assessment report (Tribal and Indigenous Communities Summary Report 2018).

Terrestrial Ecosystems

Impacts of Climate Change on Vegetation and Habitat Distributions

HIGHLIGHTS

- The future climate of the Bay Area will become less suitable for evergreen forests—redwoods and Douglas fir—and more favorable for hot adapted vegetation such as chaparral shrub land.
- Projected trends for grasslands are unclear and management (burning, grazing, etc.) will probably be more influential than climate change.
- The ability of vegetation to respond to the rapidly changing conditions in the 21st century is poorly understood. It is possible that vegetation will be increasingly "out of sync" with climate and vulnerable to heat and drought.

A recent high-resolution map of Bay Area vegetation distinguishes more than 25 major native vegetation types[13], from interior grasslands to coastal redwoods (Figure 18). The distribution of these vegetation types is strongly influenced by the climate gradients identified above, as well as local topographic effects due to solar radiation (south- vs. north-facing slopes), cold air drainages, wind on exposed ridges, and a complex mosaic of different soil types. In general, Bay Area vegetation consists of coniferous forests (redwood and Douglas fir) in the coolest and wettest environments (including areas of high fog influence); oak and other evergreen woodlands on deep soils and areas of moderate rainfall; shrublands on hotter and drier sites, especially steep slopes with thin soils; and grasslands scattered across the region under a wide range of climate conditions.

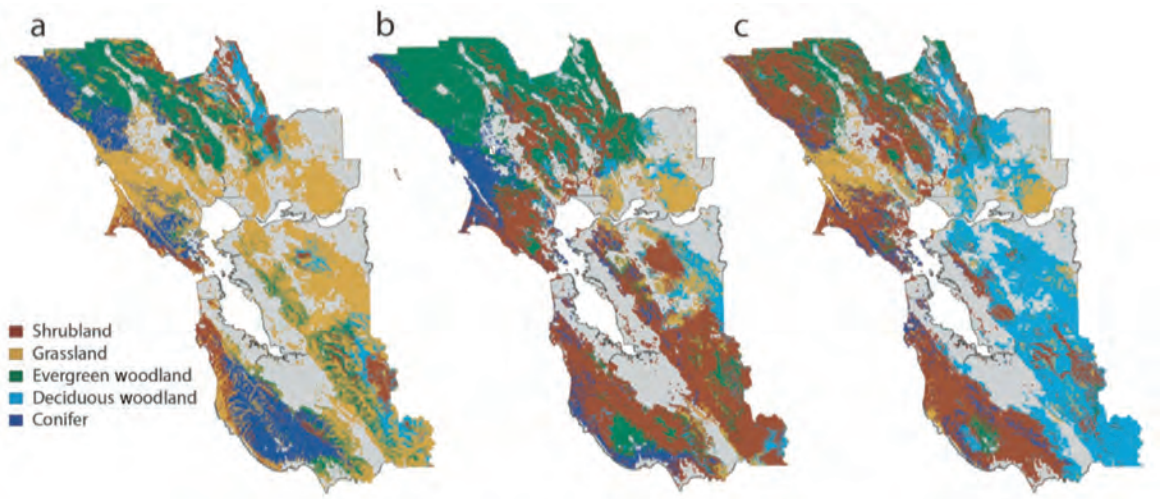
Future climates will be warmer, and increased temperatures will lead to greater summer aridity, even for future climates with increased winter rainfall (Ackerly *et al.* 2015). Several studies have projected the impacts of climate change on California vegetation at a statewide level (Lenihan *et al.* 2003, 2008; Stralberg *et al.* 2009; Shaw *et al.* 2011; Thorne *et al.* 2017) and in targeted studies of the Bay Area (Ackerly *et al.* 2015) (also see Chornesky et al. 2015). The studies use a variety of methods and different projections for future climates. Despite this range of methods, some consistent results emerge, offering broad guidelines for what to expect in the future.

Projections generally agree that conditions will become less suitable for evergreen conifer forests (redwoods and Douglas fir), and these impacts will be greater if rainfall declines (and, for redwoods, if fog frequency declines). Suitable conditions for these forests will contract toward the coast. Projections are less consistent for mixed evergreen forests and differ depending on the tree species. For example, coast live oak forests may be able to expand in the future, while cool and moist adapted forests such as tanoak, canyon live oak, and Oregon oak will likely decline (Ackerly *et al.* 2015). Projections are also uncertain for blue oak woodlands, with some models predicting the potential for expansion, especially under hotter and lower rainfall scenarios (Ackerly *et al.* 2015). There is general agreement that conditions will become more favorable for chamise chaparral shrubland, with the potential to expand from interior mountains toward the coast. On the other hand, cool adapted montane chaparral and coastal sage

13 Bay Area Open Space Council (2012) The Conservation Lands Network, http://www.bayarealands.org/

scrub are both projected to decline (Figure 18). Projections are least consistent for grasslands, and in many locations management activities (burning, grazing, etc.) are probably more important than climate in determining the distribution of grasslands.

FIGURE 18



Shifts in potential vegetation of the Bay Area, in response to climate change. Changes were modeled for major vegetation types (e.g. redwood forest, blue oak woodland) and aggregated for illustration. a) historical climates (1951-1980); b) ~7°F (4 °C) warmer with increased rainfall; c) ~7°F (4 °C) warmer with decreased rainfall. See text regarding caveats in interpreting projected changes. Source: Chornesky et al. 2015.

There are three critical considerations to keep in mind about these projections of future change in vegetation. First, all models based on community and vegetation type distributions assume that the currently observed types will persist into the future (Ferrier & Guisan 2006). Models of existing vegetation types do not allow for "non-analog" communities composed of new combinations of existing species, or for novel types invading from outside the region. This problem can be addressed in part through more detailed models of individual species responses. Second, all modeling studies are limited in their ability to make projections under novel climates, i.e., future climate conditions that fall entirely outside the range of conditions observed in the present day. The statewide models are useful in this regard, as conditions found further south and inland provide analogs for future climates in the Bay Area.

Finally, and most importantly, models of vegetation distributions generally rely on an assumption that plant distributions are in equilibrium with historical climate and will rapidly equilibrate to future climate change. The models inform us that the conditions suitable for different species and vegetation types may expand, contract, or shift across the region. But the actual changes will depend on seed dispersal (which can be very limited), interactions with other species including competitors, pathogens, dispersers, pollinators, and herbivores, and the time required for seedlings to grow to adulthood and establish viable populations.

Studies of changes following the ice ages suggest that vegetation can continue to shift for hundreds or thousands of years following a major change in climate. A critical concern in the face of rapid climate change is that vegetation may become "out of sync" with environmental conditions, exposed to levels of heat or drought outside the range of historical variability. This could lead to increased tree mortality, as observed in the 2012-2015 drought, or higher vulnerability to fire (see below); dead trees eventually decompose and release CO_2 to the atmosphere, further contributing to GHG emissions and future climate change.

Wildlife

HIGHLIGHTS

- The most threatening effect of climate change to Bay Area wildlife is the impact of rising sea levels on wetlands because of limited potential for wetlands to move inland and become established.
- Less rainfall, more summer heat, and increased drought will have negative impacts on amphibians and reptiles, while heat and wildfires may negatively affect upland birds, mammals, amphibians, and reptiles.
- Some wildlife species may need to shift locations as the vegetation they inhabit shifts with a changing climate. Barriers to movement are substantial due to habitat fragmentation and urbanization.

The estuaries, wetlands, riparian habitats, forests, ponds, and grasslands of the region are home to a surprisingly diverse array of native wildlife species (mammals, birds, reptiles, and amphibians) supported by the variability of Bay Area microclimates and physiography. For example, birds are the best-known taxa and more than 200 species have been found in the area (BAOSC 2011). Wildlife communities are composed of native species found in California's desert, Central Valley, Coast Ranges, and Pacific Northwest, as well as exotic species that have been introduced from around the world, accidentally or purposefully. The region also includes a large number of threatened or endangered vertebrates[14], listed under the federal and/or California Endangered Species Acts (see Appendix E) (BAOSC 2011) that persist primarily in protected areas within the region (seven mammals, eight birds, two amphibians, and three reptiles).

Climate change is one of many threats faced by wildlife in this urbanized region, including habitat destruction and modification, pollution, pathogens and disease, and predation and competition from nonnative species including domestic cats. A changing climate, however, could exacerbate some of these threats. For example, climate change has been suggested to enhance the spread of exotic disease, such as the chytrid fungus that has decimated amphibian populations (Pounds *et al.* 2006; Clare *et al.* 2016), as well as invasive species in terrestrial and aquatic environments (Hellmann *et al.* 2008; Rahel & Olden 2008).

Arguably the most threatening effect of climate change to wildlife in the Bay Area could come from rising sea levels. Sea level rise is predicted to be severe for the San Francisco Bay estuary from the combined effects of climate warming and land subsidence (see Sea Level Rise section, above). Moreover, there is limited potential in most

14 http://www.Bay Areawildlife.info/species/endangered.htm

locations for these wetlands to move inland and become established within the region. Species specializing in the vegetated portions of marshes may be most vulnerable, since they likely won't find vegetated habitat flooded at a depth that supports them. This might include threatened species, like the California Black Rail, the Light-footed Ridgway's rail, and the salt marsh harvest mouse, as well as many nonthreatened species, such as herons and egrets. On the other hand, subtidal and intertidal mudflats could increase with sea level rise and provide additional habitats for species such as migratory shorebirds (Thorne *et al.* 2018).

Uncertainty in climate predictions characterizes expectations for the future of Bay Area wildlife. However, some general scenarios can be considered. A warmer and drier climate predicted by some analyses would likely have important impacts on riparian wildlife. Streams and riparian areas are key conservation targets for many amphibians and reptiles in the San Francisco Bay region (BAOSC 2011). Decreased winter precipitation and more summer heat, as well as increased intensity of drought, are likely to negatively impact amphibians and reptiles throughout the region. A warmer, drier climate will also lead to increased intensity and frequency of wildfires. These could harm populations of upland birds, mammals, amphibians, and reptiles, especially those persisting in remnants of old-growth forest vegetation.

Some wildlife species may need to shift locations as the vegetation communities they inhabit shift with a changing climate. Enhanced landscape connectivity and habitat corridors are particularly important for more mobile animals. Vegetation shifts from climate change may not be large in the Bay Area (which is buffered by topographic heterogeneity and lower levels of warming compared to inland regions) and may occur slowly (see above). However, barriers to movement may be substantial, especially for amphibians and reptiles, which have limited dispersal.

Invertebrates

HIGHLIGHTS

- The Bay Area is home to a diverse invertebrate fauna. Local extinction of populations of Bay checkerspot butterflies are believed to be due to increasing variability in precipitation, though this cannot be attributed to anthropogenic climate change.
- Phenology, the timing of seasonal events, such as flowering, insect emergence, etc., is highly sensitive to climate and offers important opportunities for monitoring biotic responses and engaging citizen science.

The Bay Area is also home to diverse invertebrates (insects, spiders, etc.), including a number of threatened and endangered species[15] (mostly beetles and butterflies, as they are better studied, and the California freshwater shrimp which is endemic to streams in the North Bay).

Long-term studies of the federally threatened Bay checkerspot butterfly (*Euphydryas editha bayensis*) at Stanford's Jasper Ridge Biological Preserve and other locations in the Bay Area have served as a model for understanding effects of climate and topography on butterfly population dynamics. Checkerspot populations are very sensitive to the timing of larval emergence relative to the flowering time of their native food plants, and larval growth is also closely tied to thermal effects of topographic variation at very small spatial scales (Weiss *et al.* 1988; Weiss & Weiss 1998).

15 http://www.Bay Areawildlife.info/species/endangered.htm

Two of the Jasper Ridge study populations of Bay checkerspots went extinct in 1992 and 1998, and a demographic model strongly suggested that extinction was hastened by an increase in the variability in annual precipitation starting in the 1970s (McLaughlin *et al.* 2002). The later population to go extinct occupied a smaller area, but one with greater topographic heterogeneity, which buffered the impacts of precipitation by providing a greater range of microclimates. The increase in precipitation variability is consistent with projected effects of anthropogenic climate change, though it is not possible to attribute these individual extinction events to anthropogenic impacts.

The timing of seasonal events in plants and animals (known as phenology), such as flowering, hatching, migration timing, etc., is often sensitive to climate. Phenological shifts are important indicators of climate change, and timing mismatches between plants and their pollinators or fruit dispersers may lead to declines in either or both species. In central California, the first flights of butterfly species advanced by almost a month in some cases over the last three decades of the 20th century (Forister & Shapiro 2003). The study of phenology also offers excellent opportunities for community science, and several projects in the Bay Area engage students and community members as part of the California and National Phenology Projects (Charles 2013).

Open Space Protection and Climate-Smart Conservation

HIGHLIGHT

- The Bay Area's mild climate and accessible open spaces are vital to the region's quality of life. Regional conservation efforts, including coordinated open space protection design and implementation of landscape corridors, as well as climate-smart conservation and restoration practices, will enhance success in a changing climate.

With the Gold Rush and the ensuing rapid development of California (which has continued unabated to the present day), the Bay Area was rapidly transformed by logging for timber, bark, and charcoal, the growth of grazing and agriculture, especially related to the wine industry, and most important, by population growth and urbanization. As in other coastal zones, development has been concentrated around the coastline and the bay, leading to large-scale transformation of estuaries and salt marshes.

At the same time, San Francisco served as the heart of California's conservation movement, through its intimate role in conservation battles in the Sierra Nevada and early efforts in local land conservation. Big Basin Redwoods State Park (Santa Cruz County) became the first state park in 1902. Portions of Mt. Tamalpais, Mt. Diablo, the East Bay Hills, and other parcels were acquired for conservation prior to 1950, though formal protection came later in many cases. Large watersheds were set aside surrounding local reservoirs, some storing Sierra Nevada water in transit to the cities, such as Crystal Springs (San Mateo County) and Calaveras Reservoir (Santa Clara County). Development battles in Marin and Sonoma counties in the 1960s and 1970s led to the creation of numerous smaller parks and the preservation of extensive open space and agricultural land (Griffin 1998). These efforts included the creation of Point Reyes National Seashore (1962), one of the largest parks in close proximity to a major metropolitan area in the United States. In addition, the military kept large expanses of land off limits to development (e.g., the Presidio and Marin Headlands). Much of this land has now been converted to open space for public recreation and conservation.

As a result of these efforts, and many others by local, state and federal agencies, as well as non-governmental organizations and private landowners, approximately 25% of the Bay Area's 4 million acres are set aside in protected open space, either in fee title or under conservation easements (BAOSC 2011). Another 25% are urbanized, and approximately 50% are in working landscapes or natural vegetation that lacks formal protection. The mild climate and the accessible open spaces of the Bay Area are vital to the quality of life and the recreational activities of the region, representing a valuable component of the area's natural capital that is supported by native (and in some cases alien) biodiversity. The Bay Area, together with Cape Town, South Africa, probably represent the greatest concentrations in the world of native biodiversity in such close proximity to major metropolitan areas.

The Conservation Lands Network project (CLN) (BAOSC 2011) developed a prioritization for future land acquisition in the Bay Area, with the goal of protecting at least 50% of the area occupied by each major vegetation type in each subregion where they occur, and higher percentages of locations harboring threatened and endangered species and other targeted resources. The CLN has helped to coordinate conservation planning, and several priority locations have been protected in the years since it was released.

The original CLN project did not incorporate climate change into its prioritization scheme. In response to climate change, species movements and expanding or contracting habitats may undermine the conservation goals of the protected area network if species are no longer protected in parks where they once occurred. In response to this concern, conservationists have advocated for an approach of "conserving the stage," i.e., the physical setting and climate gradients that create the template for a diverse landscape, even if we cannot be confident of which species will occupy individual locations in the future (Lawler *et al.* 2015).

The rugged topography and steep climatic gradients of the Bay Area foster considerable habitat diversity within many parks and protected areas. This diversity of both species and physical conditions is expected to buffer impacts of climate change. The greater diversity of species means it is more likely that at least some native plants adapted to future conditions ("future winners") will be found within local landscapes. Heterogeneous conditions also allow species to find sites with suitable future conditions in close proximity, and more likely within natural dispersal distances. Persistent features, such as springs and other hydrologic refugia (McLaughlin *et al.* 2017) may be buffered from climate change impacts, facilitating the persistence of present day biota. However, general predictions are that species occupying cooler and moister locations in a landscape (e.g., north-facing slopes, deeper soils) will be threatened under warmer and drier futures, while those adapted to hot and dry locations (e.g., south facing slopes, thin soils) may spread across the landscape, resulting in homogenization of the biota and reduction of diversity.

Heller et al. (2015) evaluated the robustness of the CLN with respect to local climate gradients, and found that the proposed prioritization scheme, based on vegetation, was largely similar to the results that would be obtained by prioritizing the diversity of climate zones. This positive result largely arises because the plan distributed conservation priorities across the region by targeting vegetation types within 29 "landscape units" (mountain ranges, major valleys, etc.); the goal was to achieve at least 50% protection of each type in each region, with the result that the priorities are broadly distributed across regional gradients of climate and vegetation. CLN2.0 is currently in development, and will incorporate climate goals more explicitly, including maximizing topo-climate diversity and habitat connectivity for climate change adaptation.

A second major conservation priority in the face of conservation change is enhanced landscape connectivity and corridors, both for the traditional goals of enhancing wildlife movement and increasingly out of concern for facilitating species range shifts. To adapt to climate change, many of California's species will need to shift their distributions. Landscape planning for climate resilience should focus on maintaining and restoring habitat corridors that can facilitate species range shifts. Such corridors function by protecting climate refugia and places with slower rates of climate change and then linking protected areas to sites that will offer suitable conditions under future climates. To counter ongoing habitat loss and fragmentation and increase ecosystem resilience to climate change, it is urgent that the region speed up corridor implementation through land conservation and restoration. Targeted efforts to address regulatory barriers and incentives for resource agencies and private landowners could play an important role in this regard. Regional collaborations can create a common vision of connected landscapes, articulate the multiple benefits of corridors, build partnerships between stakeholders, and involve the public in corridor conservation. Scientific data, such as identifying animal movement paths and connectivity models are important for siting and justifying connectivity projects. California's Fourth Climate Change Assessment (Fourth Assessment) report "Climate-wise Landscape Connectivity: Why, How, and What Next" (Keeley *et al.* 2018) provides recommendations for selecting climate-wise modeling approaches and offers a framework to guide on-the-ground connectivity implementation.

These principles have been applied in the Bay Area-based "Building Habitat Connectivity for Climate Adaptation" project[16], integrating habitat mapping, threat assessment, and climate change projections to enhance connectivity and climate resilience in the Mayacamas to Berryessa Coast Ranges (Napa, Sonoma, Lake, and Mendocino counties). The project is evaluating terrestrial and riparian connectivity across the study region to generate linkages between existing protected areas, then determining climate connectivity across the protected area network by calculating the climate benefit offered by each linkage (e.g. connecting warmer to cooler locations).

The development of landscape-scale planning efforts for conservation and connectivity poses new challenges for leadership and cooperative action among public, NGO and private land owners, and government agencies from the local to federal level. While individual agencies may manage networks of protected areas, sometimes across large regions, the open space, parks, and preserves within local landscapes have an array of owners often with contrasting goals, obligations, and jurisdiction for resource stewardship. Land managers are recognizing they need more tools to sustain the health of the lands that have been acquired; public ownership or protected status alone does not necessarily equal resiliency and sustainability. New initiatives in cooperative landscape governance and stewardship are emerging in California[17] and elsewhere to tackle shared challenges posed by climate change, land use change, population growth and other factors. Looking ahead, the United States is expected to see an emergence of more nascent landscape-scale partnerships, as well as deepening levels of collaboration and integration among existing partners[18].

16 https://californialcc.org/projects/building-habitat-connectivity-climate-adaptation-s

17 http://landscapeconservation.org/california-landscape-stewardship-network/who-we-are/

18 The Center for Natural Resources and Environmental Policy at The University of Montana, http://naturalresourcespolicy.org/the-center/

While landscape-scale stewardship partnerships are not a new idea, those committed to long-term action at a regional or landscape level are still not widespread. Recent shifts within the field towards embracing these kinds of innovative partnerships mean that the time is right time to make a collaborative, landscape-scale approach the new norm for California. In the Bay Area, the Tamalpais Lands Collaborative — and its community-facing initiative OneTam — is an exemplary effort bringing municipal, county, state, and federal agencies together with a conservation-based NGO to focus on management of Mt. Tamalpais and surrounding lands in Marin County. Using a collective impact model, the NGO provides the backbone support to leverage this public-private partnership and scale the partners' resources to achieve restoration, stewardship, research, education, and sustainability goals. Within four years, OneTam has developed, prioritized, and is implementing collective conservation and stewardship goals through aggregating and analyzing hundreds of partner data sets, which establishes a baseline understanding of the mountain's overall ecological heath across jurisdictional boundaries.

A third priority for climate-smart conservation is adapting restoration practice to ensure success in a changing climate. One example is expanding planting palettes (e.g. the range of genotypes or species used in a project), utilizing a broad range of climate tolerances as well as species with diverse flowering and fruiting times to provide more resilience in food resources for animals. The latter principles are embodied in the climate-smart Students and Teachers Restoring a Watershed (STRAW[19]) program run by Point Blue Conservation Science underway in the San Francisco Bay Area. STRAW, a community-based restoration program, has restored 36 miles of stream with over 46,000 plants and 45,000 students. STRAW has integrated the climate-smart approach into restoration projects, with the goal of providing enhanced water quality and wildlife benefits, as well as added carbon sequestration of restored woody vegetation.

BOX 10: CO-CREATING CLIMATE SCIENCE PRODUCTS TO MEET LOCAL RESOURCE MANAGERS' LONG-TERM PLANNING NEEDS

Climate Ready North Bay

To create a framework for adapting to climate change, decision makers working in the Bay Area's watersheds need to define climate vulnerabilities in the context of local opportunities and constraints in water supply, land use suitability, wildfire risks, ecosystem services, and biodiversity. Climate Ready North Bay, a public-private initiative spearheaded by Sonoma County's Regional Climate Protection Authority and funded by the California Coastal Conservancy's Climate Ready program, provides a valuable case study of a facilitated engagement process that effectively bridges the science-management divide.

Climate Ready North Bay succeeded in generating an innovative set of customized, "actionable" data products grounded in site-specific management objectives. The success of the project hinged on all participants (staff from eight municipal entities across three counties and a team of six climate scientists) committing to an in-depth facilitated exchange over a two-year period.

19 http://www.pointblue.org/our-science-and-services/conservation-science/conservation-training/straw-program

The project tapped into high-resolution downscaled watershed data products developed by the Terrestrial Biodiversity Climate Change Collaborative co-chaired by UC Berkeley and the Pepperwood Preserve. By working directly with staff (local water districts, parks and open space districts, and planning agencies) from the very start of the process to define their resource-specific information needs, Climate Ready North Bay developed spatially-explicit data products to help local agencies advance key climate adaptation strategies. Generated products include maps, graphs, data sets, and summary technical reports customized to client jurisdictions and management concerns. For full project documentation and sample products, click here.

Lessons learned:

- Use an iterative process, an extended dialogue (12+ months) and multiple in-person exchanges.
- Frame resource-specific management questions at the project kickoff.
- Make sure managers participate in scenario selection to ensure relevancy and to learn why an ensemble approach is needed to capture model uncertainties.
- A critical member of the team is an "information broker" who speaks the languages of both "science" and "management" to facilitate discussions.
- Once results are available, managers need additional support from the technical team to scope how to translate results to specific planning applications.

Climate Ready North Bay provides a model of how to introduce municipal agencies to available climate science products and chart pathways for integrating those products into resource plans. Data packages are now being applied to multiple long-term resource plans (and on-line planning tools) including:

- Sonoma County Water Agency's climate adaptation plan
- Napa County's Groundwater Sustainability planning initiative
- Marin Municipal Water District's Urban Water Management Plan
- OneTAM's Mountain Health Scorecard
- Sonoma County Agricultural Preservation and Open Space District's Vital Lands initiative
- Sonoma Regional Conservation Partnership Program: Venture Conservation
- BAOSC Conservation Lands Network 2.0 and Explorer Tool
- Bay Area Greenprint
- TBC3's Bay Area Climate Smart Watershed Analysis

Forest Management, Fire Risk and Carbon sequestration

HIGHLIGHT

- Forests can play an important role in carbon sequestration. Fuel and fire management will be critical, as fire is the primary source of carbon loss from forests. Recently, carbon loss from fires exceeded carbon uptake by vegetation in California.

As noted above, fire is a recurrent event in the Bay Area, as in most of California. Native plants in California have evolved in the presence of fire and exhibit a range of life history strategies to promote post-fire regeneration. Some species, such as Bishop pine and some chaparral shrubs, are dependent on fire for regeneration from seed, and many species resprout from the base of the trunk or the larger branches following fire. As in the Sierra Nevada, fire suppression in the 20th century has led to the buildup of a dense understory of conifers, hardwoods, and shrubs in woodlands and forests throughout the region. At a landscape level, there is evidence that woodlands have expanded over the past 100+ years, while shrublands have declined, consistent with the effects of reduced fire frequencies (Evett *et al.* 2013). Douglas fir, the dominant native conifer in the region, is quite fire sensitive when young. In the absence of fire, the seedlings establish and grow rapidly under the canopy of other trees, eventually overtopping shrubs and hardwoods leading to vegetation conversion and reduction of habitat diversity.

The buildup of dense understories and higher density of small trees, especially conifers, enhance the risk of high severity fires under hot, dry, and windy conditions. While these negative effects of fire suppression are well documented in Sierra Nevada conifer forests, their impacts on fire in oak woodlands and mixed hardwood forests of the Coast Ranges are less well understood. In addition, tree mortality due to drought and sudden oak death (Metz *et al.* 2013) have increased densities of dead fuels and likely contributed to higher fire risk in the Bay Area. It is well established that vegetation removal, either by prescribed burning, herbivory (i.e., goats), or mechanical thinning, reduces the risk or severity of fire in the immediate vicinity of the treatments and can help to limit fire spread (Agee & Skinner 2005). Under moderate conditions, oak woodlands generally present low fire risk, and treatments that remove understory fuels further reduce risk of high severity fire. It is harder to determine how aggressive fuels management would alter fire behavior under extreme fire conditions, as experienced at the outset of the 2017 North Bay fires. High severity fire increases risk, even when it occurs far from populated areas, as the fire is more likely to grow and spread quickly; production of burning embers carried on the wind can lead to rapid spread beyond the immediate perimeter, and these are often the primary cause of ignition for structures. Fire behavior in mixed hardwoods is not well characterized in the current generation of fire models, and more research is needed to be able to evaluate future fire risks, especially under a changing climate, and the scale and type of fuels management that could effectively reduce risk to structure loss.

Forests also play a critical role in carbon sequestration, and the management of natural and working lands is one of the pillars of California's emissions reduction policies (FCAT 2018) (see discussion of rangelands below)[20]. Fire management is critical as fire is the primary source of carbon loss from forests and in the last decade losses exceeded carbon uptake at a statewide level (Gonzalez *et al.* 2015). Redwood forests are especially important as they have the highest aboveground carbon density of any ecosystem on earth (Van Pelt *et al.* 2016). With their disease resistant wood, large size, high densities, and the lower risk of fire along the coast, redwoods have an exceptional potential

20 https://www.arb.ca.gov/cc/pillars/pillars.htm

to sequester carbon for long periods of time. While the largest stands are found further north, redwoods make important contributions to Bay Area vegetation in the Santa Cruz mountains, Mt. Tamalpais in Marin County, and along the Sonoma County coast.

California has played an important role in the development of carbon offset protocols for sustainable forest management, creating an income stream for management actions that enhance carbon sequestration by participating in California's cap-and-trade market. One Bay Area forest—Preservation Ranch in Sonoma County—is currently a registered carbon offset project, receiving credits for enhanced annual sequestration of about 2% of the standing stock (i.e., sequestration credited to sustainable management practices, over and above the baseline scenario of forest growth in the absence of these practices). It is unknown, however, whether future climatic conditions will allow these forests to persist and sustain these sequestration levels. Climate change adaptation planning to facilitate range shifts and species conversions is generally lacking from forest management guidance (e.g., FCAT 2017). Given their conservation value and iconic status, we can probably assume protection of redwood forests in this region to be a priority. Even so, it is not clear yet how to buffer these ecosystems, and the carbon they store, from the compound effects of novel pathogens, climates and fire regimes simultaneously.

Aquatic Systems

HIGHLIGHTS

- Nearly every aspect of Bay-Delta ecosystems will be affected by climate change as a result of rising sea levels, increases in air temperatures, changes in precipitation, changes in sediment supply, and more. Natural areas of the shore will need to adapt or transform.
- The interruption of natural processes over the past 200 years as the region has developed has decreased natural Bay-Delta resiliency. A dynamic, resilient ecosystem has become a rigid landscape with brittle features that will have trouble adapting.
- New approaches that use natural shoreline infrastructure, like beaches, marshes, and mudflats, together with managed retreat where necessary, can create more resilient shorelines that respond well to changing conditions.

Delta Baylands and Coast

The San Francisco Bay-Delta estuary consists of highly valuable ecosystems. Californians depend on the Bay and Delta for fresh water supply, shoreline protection, water quality, food web productivity, biodiversity support, carbon sequestration, and recreation. The cities and other infrastructure of the Bay Area and Delta are built around the geography of the estuary, which both shows the importance of these ecosystems and makes the impacts of climate change to Bay-Delta tidal wetlands very relevant to people.

Although naturally resilient, these ecosystems are threatened by climate change. The interruption of natural processes over the past 200 years as the region has developed has decreased that resilience. San Francisco Bay is now highly urbanized, with billions of dollars of infrastructure built up to and on top of tidal wetlands (Heberger *et al.* 2012). Much of the shoreline is protected by a series of earthen berms and marshes, rather than by engineered levees (SFEI 2016). The Golden Gate watershed (approximately 40% of California's land) is highly modified, so that the sediment

and water flows that reach the estuary are very different from their natural patterns of timing and magnitude. Tidal wetland habitats have been fragmented and isolated (Goals Project 2015), and several endangered and otherwise protected species are found only in these marshes (see Wildlife section). In sum, a dynamic, resilient ecosystem has become a rigid landscape with many brittle features that cannot adapt and must instead be protected. Impacts to the various elements of the Bay-Delta ecosystem are detailed below, and at the end of this section we discuss approaches for restoring natural process and resilience while protecting people and property and upgrading infrastructure.

Nearly every aspect of Bay-Delta ecosystems is likely to be affected by climate change, including physical, chemical, and biological elements. Effects that will stem from increasing sea levels include: changes in precipitation patterns (including storm intensity and timing of runoff); changes in freshwater supply and management of that supply; changes in sediment supply; increases in air temperature; more severe drought; and infrastructure adjustments in response to climate change. Across the elevation gradient from shallow subtidal to the tidal-terrestrial transition zone, natural areas of the shore will necessarily adapt or transform.

At the highest elevations of the Bay-Delta ecosystem, which are closest to people and built infrastructure, is the estuarine-terrestrial transition zone. This zone is a critical area for ecological functions, supporting many endemic species, and for ecosystem services, acting as a buffer for the wetland and aquatic habitats of the bay (Goals Project 2015). The transition zone of today becomes the tidal wetlands of tomorrow as marshes migrate inland in keeping with sea level rise. Much of the transition zone is already developed; little of what is undeveloped is protected (SFEP 2015). Barriers like berms, levees, and seawalls minimize and eliminate the transition zone, foreclosing the opportunity for tidal wetlands to migrate inland. This means that tidal wetlands are squeezed between a rising sea and levees and will lose their ability to protect the shoreline and its infrastructure from flooding and erosion. The fluvial-tidal transition zone (where rivers and creeks enter the estuary) is a critical area with increased value for its functions and benefits and also with increased flooding problems in developed areas.

Slightly lower in elevation than the estuarine-terrestrial transition zone is the intertidal area. Tidal marsh is the dominant natural intertidal habitat of this estuary, and a large effort is being made to restore tidal marshes across the estuary (Goals Project 2015), especially with the recent funding of the San Francisco Bay Restoration Authority (http:// Bay Areayrestore.org/).

Mudflats are found in the lower intertidal zone. Mudflats and tidal marsh are both extremely productive, providing food for fish, marsh wildlife (including several threatened and endangered species - see Wildlife section), and millions of migratory and resident shorebirds. Marshes are also important for water quality in terms of nutrient cycling and contaminant sequestration and breakdown.

Both mudflats and tidal marsh play critical roles in protecting the shoreline behind them. These habitats attenuate waves, reducing erosion of the shoreline. Thus, developed areas with substantial intertidal habitats adjacent require less substantial engineered protection from sea level rise. Recent studies from around the nation have shown that these types of natural shoreline protection perform better than engineered solutions and cost less (Gittman *et al.* 2014; Smith *et al.* 2017).

These intertidal habitats are very resilient to sea level rise, given enough sediment supply that they can keep accreting vertically or enough space that they can migrate inland. However, sediment supplies have recently decreased (Schoellhamer 2011), and modeling results indicate that San Francisco Bay marshes may not be able to keep up with

sea level rise in the long term, unless management practices change (Stralberg *et al.* 2011; Schile *et al.* 2014). Thus, sediment management choices in the bay and its watersheds are critical to outcomes for intertidal habitats and the shorelines behind them.

Sediment delivery to the shore could be increased by infrastructure updates to dams, changes in reservoir management, changes in creek alignments near the bay, and flood risk management approaches. Management of freshwater is equally critical because brackish and freshwater tidal marshes are able to increase in elevation rapidly by creating peat. Evidence of historical freshwater tidal marsh accretion rates in the Delta (Drexler *et al.* 2009) and modeling results (Swanson *et al.* 2015) indicate that these marshes may be sustainable at the lower end of projected sea level rise rates later this century (OPC 2018), but their long-term persistence may be jeopardized at higher rates. Placement and delivery of freshwater around the shoreline should be viewed as a resource to create resilient, protective marshes. Most of the edge of the estuary is leveed, so intertidal areas have very little space to move inland (SFEI 2016).

Intertidal habitats that have been largely removed from the bay, particularly beaches, and (transitioning into the subtidal area) eelgrass and oyster beds, are also resilient elements of the shore that can help protect built infrastructure while adding habitat value. Efforts to restore these habitats are in the nascent stages and could happen faster and at a larger scale.

Novel and managed habitats are common throughout the historic intertidal zone of the estuary, and these managed ponds, leveed areas, duck clubs, deepened and widened channels, and flooded islands are largely a liability in terms of climate change. These areas are prevalent in North and South San Francisco Bay, Suisun Bay, and the Delta. Where land has been kept dry for agriculture and other uses, the land surface continues to subside as the ancient marshes underneath lose CO_2 to the atmosphere. This increases future flooding risk and well as increasing greenhouse gases in the atmosphere.

Failure of levees around subsided lands, as well as sea level rise alone, will cause the estuary to grow in size, drawing in more saline water. As the estuary becomes saltier, habitat will shift from brackish to salt and from fresh to brackish. This is already a problem for fresh water supply in the Delta. The gradient of fresh to salt water and fresh to salt marsh will migrate inland, prompting the need to plan ahead for where natural communities can be supported in the Delta and Central Valley, where wetlands have been largely removed in the past two centuries (SFEI-ASC 2014). Many so-called levees around the estuary are berms made of peat, rather than engineered structures (SFEI 2016). They fail regularly due to flooding and could fail at a large scale in an earthquake. Such a levee failure in the Delta would cause the limited volume of tidal water passing through the Carquinez Strait to be spread over a larger area, thus reducing tidal range and intertidal area.

The way that people respond to the changing climate will determine the fate of estuarine habitats. The relationship between constructed systems, management choices, and natural systems is critical. Removal and interruption of the natural flooding processes of rivers and tides have created the current rigid landscape that cannot adapt over time, is difficult to protect from climate change impacts, and provides few benefits beyond flood risk management. Further removal and interruption of natural processes by tidal barriers, sea walls, and other engineered structures will exacerbate the situation (see Natural Infrastructure section, above). However, new approaches that use natural infrastructure, like beaches, marshes, and mudflats, and different management practices, such as planned flooding

during certain times of the year, can create more resilient shorelines that can respond to changing conditions and provide multiple benefits (Newkirk et al. 2018). Hybrid natural and engineered solutions are likely to be necessary in many areas. Beyond choices at the shoreline, the management of rivers, creeks, reservoirs and stormwater in watersheds will also be critical. Sediment and water coming off the land are the building materials of estuarine habitats, and how they are delivered is of paramount importance.

Incorporating natural elements into shoreline adaptation and watershed management requires advance planning, as well as changes in policies, funding, and coordination. Because the natural systems of the estuary are large in scale and some natural processes take time to play out, planning to incorporate natural elements needs to be at a large enough scale and far enough ahead to consider the full system and its multiple benefits. Pilot projects are underway that show the feasibility and efficacy of these approaches, including realignment of San Tomas Aquino Creek for better sediment delivery, the redesign of SR 37 for flood risk management and reduced impact to intertidal habitats, restoration of oyster reefs for shoreline protection, and pulsed flows in the Yolo bypass to create food web productivity for fish.

Local residents support this focus on restoring the estuary as the climate continues to change. In a recent historic vote, Bay Area residents levied upon themselves the first regional parcel tax measure in California's history (Measure AA). It passed with 70% approval across the nine-county region and went into effect in 2017. This parcel tax will raise approximately $25 million annually, or $500 million over 20 years, to fund habitat restoration projects in the Bay Area, including flood control and shoreline access elements of those projects.

BOX 11: BIG MONEY FOR RESTORING THE BAY (WHAT A CONCEPT!)

Measure AA: The San Francisco Bay Restoration Authority

This $12/year parcel tax passed in 2016 by 70% of Bay Area voters is the first regional parcel tax in California history! The Authority is now handing out its first checks for bay wetlands restoration projects. The Authority will dispense $25 million each year for 20 years with a number of the projects expected to address sea level rise as part of their focus.

Projects that benefit disadvantaged communities are among Measure AA's priorities and, working with representatives of environmental justice groups on the Advisory Committee, the Restoration Authority adopted a new definition of an economically disadvantaged community that considers income-based metrics as well as environmental and other burdens.

The first funded projects include:

- Deer Island Wetlands (Marin) - $1 million
- Encinal Dune (Alameda) - $450,000
- India Basin remediation (San Francisco) - $5 million
- Lower Sonoma Creek (Sonoma) - $150,000
- Montezuma Wetlands (Solano) - $2 million
- North Bay wetland restoration (Sonoma, Marin) - $3 million
- San Leandro Treatment Wetland (Alameda) - $1 million
- South Bay Salt Pond Restoration Project (San Mateo, Alameda, Santa Clara) - $8 million
- South San Francisco Bay Shoreline Project (Santa Clara) - $4 million

Freshwater Systems

The ecology of freshwater systems and the dynamics of fish populations are tightly linked to water flows and water temperature, both of which are sensitive to climate change. Water flows in the Bay-Delta are directly coupled to winter precipitation, and the amount and timing of snowmelt in the Sierra Nevada. Rainfall is highly variable from year to year in California, and models project this variability may increase, with more extreme wet years and increased risk of drought; there is still considerable uncertainty, especially in central California, about whether average rainfall will increase or decrease (see Precipitation section, above). In the 3rd California Climate Change Assessment, Moyle et al. (2012) compiled a thorough estimate of the factors affecting the California fish fauna and ranked all members of that fauna, both native and alien, by their baseline vulnerability to extinction and by their sensitivity to climate change.

SALMONIDS

Salmonids have received considerable attention in relation to climate and conservation, reflecting their iconic life history and their long-standing economic importance. As the Delta is the entry point for populations throughout

the Central Valley and Sierra, potential impacts of climate change have widespread importance. In a recent review, Moyle et al. (2017) concluded that climate change is a major threat to salmon populations throughout California, and that the historic 2012-2016 drought contributed to continuing declines in recent years. The lack of cold water and low flows from Shasta Dam and other dams in the Central Valley contributed to the high mortality of eggs and fry (juvenile fish). The Russian River watershed, in Sonoma and Mendocino counties, is home to three threatened and endangered salmonid species: Chinook salmon (*Oncorhynchus tshawytscha*), coho salmon (*Oncorhynchus kisutch*), and steelhead (*Oncorhynchus mykiss*). Current efforts by the Sonoma County Water Agency to enhance habitat conditions for salmonids include improvements to reservoir reliability to maintain a cold water pool in Lake Mendocino through the summer for downstream juvenile steelhead rearing and into the fall for adult salmonid migration. This could help reduce the impact of drought on rearing and migrating salmonids.

Emergency efforts to protect salmon during the drought led to a focus on restoring the original portfolio of salmon's adaptive strategies to California's variable climate. This support would include better providing for all life stages; different life stages fare better in different years, so diverse strategies increase the likelihood that some will be appropriate for whatever conditions occur in a given year and place. Broadening the salmon's genotypic and phenotypic portfolio requires different hatchery management practices and improved quantities and access to habitats of diverse types used by different salmon life stages.

NON-SALMONID FISHES

A diverse array of non-salmonid fish occur in the Delta and have been carefully monitored for many years[21]. Changes in these populations, coupled with analysis of life histories, have been used to rank species from critically sensitive to least sensitive to climate change. The most vulnerable species are Sacramento Perch and Sacramento Splittail, whose populations spike in the wet years and decline precipitously in dry years. Delta Smelt and Tule Perch are also highly vulnerable species, although their dynamics are less dependent on annual rainfall. Both species are tolerant of high salinities, but exhibit low thermal tolerance (Swanson et al. 2000, Moyle 2002) and have been declining in recent years. No Delta smelt were captured in 2017. Precipitation patterns are not firmly agreed upon for California's future climate, but the increase in temperature is common to all local models, suggesting that these two species will be highly vulnerable to continued change.

Several exotic species have established themselves in the Delta. One of these, American Shad, has populations that fluctuate with rainfall, like some of the natives, suggesting greater vulnerability in a future climate. Others, including Mississippi Silverside, Striped Bass, and Largemouth Bass, have more steady population sizes and high thermal tolerances and appear to be quite resilient in the face of variable rainfall and warming temperatures.

MANAGEMENT IMPLICATIONS FOR RESIDENT NATIVE FISHES

California's native fish fauna is adapted to a highly variable climate. However, much of California's water development has aimed to reduce the impacts of this variable climate on water supply to farms and cities. As climate change progresses, or as historical variability in flows is restored, the resident species have the adaptations to take advantage of good conditions and spawn prodigiously. However, habitat change and invasive species reduce their ability to survive through the intervening dry years. Restoration of diverse habitats used by native fishes will likely improve

21 https://view.officeapps.live.com/op/view.aspx?src=https://www.fws.gov/lodi/juvenile_fish_monitoring_program/data_management/Metadata_Updated_September_09_2014.doc

their survival. Hydrologic isolation of some of the restored habitats could offer refuge from environmental hazards that are more intense in drier years and thereby enhance survival and protect populations.

BAY AREA RIVERS AND CREEKS

Climate change could impact Bay Area creeks and rivers in several ways. On the one hand, longer dry seasons and more frequent and severe droughts could greatly reduce the quantity and quality of water in waterways. Droughts and higher mean temperatures could reduce the quantity of water available for flow in creeks and rivers in the Bay Area. Instream flows may be affected by longer dry seasons; increased evaporation; greater water demands from riparian vegetation due to higher rates of evapotranspiration; increased direct diversion and groundwater pumping by adjacent property owners; and reduced contributions to flow from adjacent groundwater aquifers (Micheli *et al.* 2016). On the other hand, increased frequency and magnitude of extreme precipitation events could lead to more flooding and erosion (NBCAI 2013).

Catastrophic wildfires associated with climate change, such as those that occurred in the North Bay in 2017, increase the risk of delivering ash, debris, and sediment to waterways during subsequent rain events. Toxins, particularly from urban fires, can directly affect invertebrates, fish, amphibians, and other species[22]. Fine sediments can impact spawning habitat for threatened and endangered salmonids, such as Chinook salmon, coho salmon, and steelhead present in the Russian River watershed. Introduction of dissolved organic carbon and other contaminants could impact downstream water supply operations. For example, a catastrophic wildfire in the watershed upstream of Lake Sonoma, a reservoir located in the Russian River watershed, would impact the primary drinking water source for approximately 600,000 North Bay residents and could affect the Sonoma County Water Agency's ability to supply clean, safe drinking water (SCWA 2018). The Water Agency is developing a fire risk and water quality assessment as part of its climate adaptation planning process to better understand how wildfire could affect hydrology and water quality in the Russian River watershed.

Flooding is already a significant problem in some Bay Area communities. The Russian River, located in Sonoma and Mendocino counties, is a major source of flooding in Sonoma County, which contains the highest number of properties suffering repetitive flood losses of any community in California (SCHMP 2017). Atmospheric rivers play a large part in these flooding events and recent studies (see Regional Climate Science section, above) suggest that intense atmospheric rivers will occur more frequently as mean temperatures rise. The SCWA is working with the National Oceanic and Atmospheric Administration, Scripps Institution of Oceanography, and others to improve atmospheric river forecasting in region[23]. Additionally, SCWA is developing a new flood model for the Russian River as part of its climate adaptation planning process[24].

IMPACTS OF DROUGHT

The 2012-2016 drought produced, in intense form, several of the expected long-term effects of climate change. Reduced precipitation caused lower stream flows, including the complete drying of some stream reaches, and reduced lake and reservoir levels. Reduced snowfall caused higher water temperatures, flashier hydrographs, and lower summertime flows. Higher air temperatures caused higher water temperatures and more rapid evaporation. Higher water temperatures produce physiological stress on fish, greater disease susceptibility, and higher rates of

22 https://ca.water.usgs.gov/wildfires/wildfires-water-quality.html

23 http://www.scwa.ca.gov/aqpi/

24 http://cw3e.ucsd.edu/firo/

primary productivity, including harmful algal blooms. Additional impacts were caused by tree mortality in forests, sedimentation following wildfire and changes in outflow, and salinity in estuaries. Many of these impacts were immediate, while some are still affecting fish populations. Impacts to fish populations are likely to continue for years even if higher precipitation years return.

Bay Ecosystem

The open water and benthic components of the San Francisco Bay ecosystem have undergone a series of fundamental changes in the past century, starting with a sediment flux resulting from hydraulic mining and the Gold Rush, followed by an invasive species of clams. A series of changes are anticipated in the coming century. In this section, we start with a discussion of current conditions in the bay, and how those conditions were shaped by historical conditions and change. We then consider the coming century and how the ecosystem is likely to be transformed.

The San Francisco Bay ecosystem is quite high in nutrient concentrations, due to the high levels of wastewater and urban water returns to the bay. In the South Bay, nutrient concentrations are comparable to those observed in Chesapeake Bay, but San Francisco Bay does not experience the same eutrophication evident in the Chesapeake, due to a number of physical factors that limit growth in the system.

In San Francisco Bay today, phytoplankton growth is not limited by nutrient concentrations, but instead biomass is limited by the combination of low light levels and high grazing rates. Low light levels in San Francisco Bay are a result of high sediment concentrations, which are suspended from the bed by energetic tidal flows and surface waves. The extensive shallows of San Francisco Bay play an important role in maintaining these high concentrations. They are, in part, a result of the pulse of sediment that entered the bay following hydraulic mining and the Gold Rush, which continues to work its way through California's rivers and reservoir system to the bay.

The grazing of phytoplankton in San Francisco Bay is dominated by benthic clams, which have sufficient density in portions of the bay to filter the entire water column in less than 2-3 days. The particular species of clam that dominates the benthos was introduced from Asia in the ballast waters of ships in the 1980s, and now helps to control phytoplankton growth throughout the bay. Physically, the ability of a benthic species to effectively filter the entire water column depends on the bay mixing regularly, which occurs in San Francisco Bay as a result of strong tidal forcing in relatively shallow channels. This is another contrasting characteristic to Chesapeake Bay, which remains stratified (unmixed) for months, eliminating the possibility of benthic grazers acting to reduce the high biomass that develops as it eutrophies during the summer.

Looking to the future, the key concern is whether the current limitations on biomass (low light levels due to high sediment concentrations; extensive benthic grazing due to high clam populations and mixed conditions) may be relaxed, thus allowing much more extensive growth in the bay in response to high nutrient levels.

THE KNOWN UNKNOWNS

There are two key trends that may alter physical conditions in the bay, although the resulting changes in the ecosystem are uncertain. First, sediment concentrations are declining due to end of the post-Gold Rush hydraulic mining pulse. Recent analysis (Schoellhamer 2011) has indicated that there may be a significant decline in bay sediment concentrations in the coming century, which would result in higher light levels and more phytoplankton growth. The second key trend is toward more intense and longer heat waves, which will lead to thermally stratified conditions and

phytoplankton growth in the surface layer, including possibly harmful species (Cloern *et al.* 2011). There is uncertainty as to whether a threshold (and, if so, what the level of threshold) will be met in either case that would result in a transformation of the bay ecosystem. Ongoing research is attempting to determine the level of risk.

THE UNKNOWN UNKNOWNS

The introduction of the Asian clam species in the 1980s fundamentally altered the San Francisco Bay ecosystem. The coming century will almost certainly involve additional ecological disruptions with uncertain consequences. Increases in clam predators, for example, would reduce or eliminate the ability of the clams to filter the bay and limit phytoplankton biomass. The probability of some kind of ecological disruption in the coming century is quite high, but the details and the consequences of that disruption are, of course, unknown at present.

Agriculture

HIGHLIGHTS

- Nearly 70% of California's existing area of wine production will be vulnerable under future climate change projections by mid-century. Wine grape production in the Bay Area could be vulnerable to extreme temperatures and temperature-related water scarcity.
- The sensitivity of Bay Area rangeland vegetation to precipitation dynamics makes these ecosystems particularly vulnerable to climate change. Changes in rainfall regimes are likely to affect plant production and associated patterns in soil carbon and greenhouse gas production.
- Grazing and rangeland management practices can play a significant role in enhancing soil moisture and below-ground carbon sequestration. Current research highlights the potential role of compost together with grazing on California pasturelands as a targeted strategy to increase carbon sequestration.

Climate Change and Wine Grape Production in the San Francisco Bay Area

The Bay Area supports a diverse portfolio of crops (NASS 2012). While wine grapes are its most notable crop, 32,600 acres of field-grown vegetables[25] produce annual sales of $193.8 million[26]. An additional $4.2 million come from vegetables grown in protected conditions (i.e., tunnels, greenhouses) and $5.1 million in sales are produced from just 373 acres of berries. Production of horticulture and floriculture crops contributes $125.5 million in sales. Production of fruit and tree nuts contributes the greatest regional value, with $1.259 billion in annual sales, largely due to wine grape production. The North Bay first began producing wines in the early 20th century and has since become one of the world's premier growing regions. More recently, parts of the East and South Bay have also emerged as producers of high quality wines (Figure 19). The region's diverse climate allows a wide range of cultivars, but the usual suspects rise to the top (*Grape Crush Final Report 2016* 2017). Listed in decreasing acreage, the top five red varieties are Cabernet

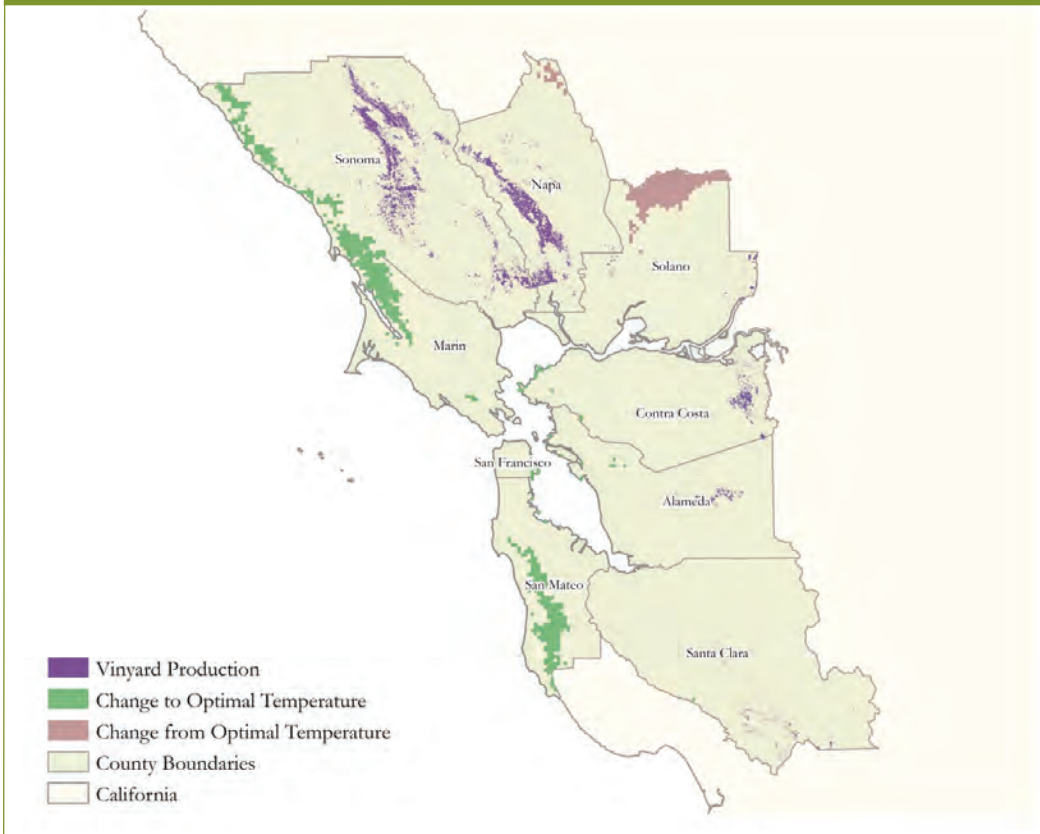
25 Includes seeds and transplants

26 Sales – Definition from USDA-NASS glossary: "Refers to both dollars ($) received and quantities of commodities (e.g., head or bushels) sold or removed from the operation. Includes landlord share and value of product removed under production contract. Depending upon the data series, may refer to marketings or cash receipts. Excludes government payments. Used alone, *sales* refers only to the data item."

Sauvignon, Pinot noir, Merlot, Zinfandel and Petite Sirah, with nearly similar acreage from Syrah, Petit Verdot, Malbec and Cabernet Franc. The top white varieties are Chardonnay, Sauvignon blanc and Pinot gris, and Gewurztraminer, with Viognier, Semillon, Chenin blanc and White Riesling coming in at a near tie.

Nearly 70% of California's existing area of wine production may be vulnerable under future climate change projections by mid-century (Hannah *et al.* 2013). Recent spatial analysis of grape production across California used mean summer mid-century temperature projections to identify potential regions of vulnerability for grapes (Elias *et al.* 2015). The historic mean summer temperatures where grapes were grown in California were used as an estimate of suitable temperature conditions for grape production. When temperatures increased beyond historic means where 95% of California wine grapes were grown, the area was considered a new temperature regime. Mean summer temperature increase caused more than 60,000 acres of varied land use in northern Solano and Napa counties to exceed the normal historic temperatures. In contrast, portions of Marin, Sonoma and San Mateo counties along the coast transitioned to typical mean summer temperatures where grapes are grown (Figure 19). Only northern Solano County had a small area presently growing grapes that is predicted to shift outside the 95% percentile of optimal temperatures.

FIGURE 19



Changes in climatic suitability for wine grapes Source: Elias et al. 2015.

The pattern of decreased inland suitability but increased coastal suitability has been reported independently (Hannah *et al.* 2013; Elias *et al.* 2015). While mean temperatures may have minimal impact on Bay Area grape production by mid-century, wine grape acreage in the Bay Area could be vulnerable to extreme temperatures and temperature-related water scarcity by mid-century. When the composition and acreage of the specialty crops in all of California's counties were evaluated for sensitivity at mid-century, the nine counties in the Bay Area ranked in the mid-level of sensitivity for summer and winter changes in temperature because wine grapes have the relative potential to tolerate such increases better than other specialty crops more susceptible to increasing temperatures at key phenological stages (Kerr *et al.* 2017). Despite anticipated vulnerabilities, loss of wine grape production from the region is unlikely due to the heavy investment in institutional knowledge, capital and land, infrastructure, and supply chains to support the industry (A. Walker, pers. comm.). The varieties of wine grapes grown in the Bay Area likely will have to shift to accommodate changes in resource availability and climate.

Vines planted today will have a 20- to 30-year lifespan; thus, mid-century climate projections provide the relevant context for current adaptation and investment decisions. In the absence of adaptation efforts, climate change will likely have strong consequences for long-term growth and production. Wine grapes are a woody perennial crop that establishes the buds for one growth season in the preceding season; thus, management and weather events in the preceding and current growth season can cumulatively impact production and vine balance (Celette *et al.* 2009; Ripoche *et al.* 2010). Alterations in flavor development and accumulation of sugars in grapes may result from increases in absolute temperature and in the differential between day and night temperatures (Spayd *et al.* 2002; Keller *et al.* 2010; Nicholas & Durham 2012). Risk of Pierce's disease may increase as the infection rate of *Xylella fastidiosa* and the survival of its vector, the mealy bug, will benefit from increasing winter temperatures (A. Walker, pers. comm.). Continued prophylactic management of trunk diseases will be imperative. Warmer winter temperatures already lead to earlier growth of vines in spring, increases in yield in some cases, and risk of later frost damage, although this risk may be mitigated by reduced frost incidence in the future. High temperatures (>95 °F or 35 °C) during bloom can also hinder subsequent fruit set.

Similar to other agricultural systems, practices like cover crops, compost, and no-till soil management can improve soil health. They promote soil organic matter, stability of soil aggregates, stable pools of soil organic matter (SOM), water infiltration, microbiological activity, weed suppression, and trends for reductions in nitrate leaching and net greenhouse gas emissions (Steenwerth & Belina 2008b, a; Garland *et al.* 2011; Verhoeven & Six 2014; Belmonte *et al.* 2016; Yu *et al.* 2017). This body of work on wine grapes and other specialty crops has been incorporated into the USDA-NRCS tools, COMET-Farm, and COMET-Planner to support growers in implementing conservation practices that will reduce greenhouse gas emissions and improve soil organic matter and other aspects of soil health (Zhu *et al.* 2015). A yet unexamined concern is the potential limit of soils in the region to provide long-term stabilization of soil organic matter using these conservation practices under increasing climatic temperatures and any changes in quantity and timing of irrigation and rainfall.

Cover crops, compost, and no-till practices that improve soil health can provide adaptation, but vegetation on the vineyard floor can compete with the vines (Ripoche *et al.* 2010). Fortunately, irrigated vines in California are to some extent decoupled from effects of vineyard floor management compared to dry farm grapes. For instance, impacts of annual cover crops on vine nutrition and yields were not evident in a drip irrigated 12-year-old vineyard over three years (Steenwerth *et al.* 2016). Should future rainfall patterns limit available water for irrigation and subsurface sources,

vine balance and nutrition will be more sensitive to vineyard floor management, and effects will likely be evident two to four years after implementation (Celette *et al.* 2009). Managing irrigation with surface renewal and supporting continued investment in integrated technologies such as sensors at the vine and remote sensing scales will aid growers in precise, site-specific irrigation management (e.g., GRAPEX[27])

Novel approaches to adaptation were highlighted at a recent joint meeting involving university researchers, USDA-ARS scientists, and wine industry members (National Grape and Wine Initiative, Portland, November 2017). Surface renewal was developed decades ago, but recent advancements are enabling its diffusion into the wine grape industry to finely manage deficit irrigation. Development of rootstock germplasm and evaluation of tolerances to disease, deficit irrigation, and salt- and chloride-affected water sources are underway (See work by A. Walker – UC Davis, A. McElrone – USDA/ARS). Preliminary examination of wastewater streams from wineries using potassium-based cleaners and municipalities indicates that they can be tolerated by vineyard soil types with little observed impact on vines and wines in California (Mosse *et al.* 2013; Weber *et al.* 2014; Buelow *et al.* 2015b, a; Hirzel *et al.* 2017) and other Mediterranean regions (Quayle *et al.* 2009; Laurenson *et al.* 2012). Sun exposure and heat loading can be adjusted through changes in vine training, trellis type, and row orientation at planting to reduce sun exposure and heat loading, although these are less ideal adaptive measures due to inflexibility and potentially significant costs (Spayd *et al.* 2002). Effects of trellis type on wine grape quality for current and emerging varieties are not well understood, and efficient techniques to reduce temperatures across whole vineyards must still be developed.

The wine grape industry, and agriculture in general, also must mitigate risks of climate change on human capital, such as retention and access to seasonal labor and maintaining safe working conditions in extreme conditions. Job losses in the agricultural sector will disproportionately impact low-income communities, and these workers have limited access to labor and occupational health protections, especially for the undocumented community (Shonkoff *et al.* 2009). At a national level, crop workers experience elevated risk of mortality from heat stroke (CDC 2008). These risks are much lower in the Bay Area due to the coastal climate, but the lack of preparation and experience with extremes can increase vulnerability to heat waves (see Public Health section, above).

Rangelands and Belowground Carbon Sequestration

Rangelands are the dominant cover type in California, covering approximately 23 million hectares or over 40% of the state (*Forest and Rangelands Assessment Program* 2010). Rangelands are defined as ecosystems with plant cover suitable for grazing that are dominated by grasses, grass-like plants, forbs, or shrubs. Bay Area rangelands are dominated by oak savanna and annual grassland ecosystems (grasslands are here defined as rangelands dominated by grasses and forbs). Rangelands can include native and introduced plant species (*Summary Report: 2007 National Resources Inventory* 2009). Throughout California, including the Bay Area, annual plant species, especially exotic grasses, are the most common vegetation type in rangelands (D'Antonio *et al.* 2007). In the Bay Area, rangelands cover approximately 1.7 million hectares, or 40% of the land area (CDC 2009).

California's rangelands play an important role in the beef cattle and dairy industries. Livestock and livestock products in California accounted for 25% of the state's gross agricultural cash receipts in 2015 *(California Agricultural Statistics Report 2015-2016* 2016*)* which amounted to $15.3 billion in 2014 and $12 billion in 2015. Dairy products are the

27 https://www.ars.usda.gov/northeast-area/beltsville-md/beltsville-agricultural-research-center/hydrology-and-remote-sensing-laboratory/docs/grapex/).

state's leading commodity. The California dairy industry was responsible for 18% of the annual dairy receipts of the US in 2015. In 2016, revenue from milk and cream amounted to $6.07 billion, while beef cattle revenue was $2.53 billion (*2016 Crop Year Report CDFA* n.d.). The Bay Area supports over 230,000 head of cattle ("USDA NASS" 2016). Marin and Sonoma counties are the largest dairying regions in the Bay Area with 2% of the state's dairy cows on 7% of the dairies ("CDFA California Dairy Statistics Annual 2016" 2016).

Bay Area rangelands experience a Mediterranean climate with cool wet winters and hot dry summers. Plant productivity in California's rangelands is tightly coupled with patterns in precipitation. The high inter-annual variability in rainfall leads to large inter-annual differences in aboveground biomass (e.g. forage) production (Huntsinger & Bartolome 2014). The sensitivity of rangeland vegetation to precipitation dynamics makes these ecosystems particularly vulnerable to climate change. Changes in rainfall regimes are likely to affect plant production and associated patterns in soil carbon and greenhouse gas production (Jackson *et al.* 2007; Ma *et al.* 2007; Chou *et al.* 2008; Grant *et al.* 2012; Schwalm *et al.* 2012).

Climate models yield varying results for precipitation in the Bay Area. Under a wetter future scenario, some Bay Area counties could see an increase in forage production (Shaw *et al.* 2011), depending upon how that rainfall is distributed (George *et al.* 2010). Timing of rainfall is important to the physiology and growth of California's annual grassland species, as well as soil carbon dynamics (Chou *et al.* 2008). An increase in summer rainfall events with climate change is likely to stimulate soil respiration (Xu & Baldocchi 2004; Baldocchi *et al.* 2006; Chou *et al.* 2008). Simulated increases in early and late season rainfall events (i.e., September and May–July) increased microbial activity and associated decomposition of carbon stored in soils (Chou *et al.* 2008). Increased rainfall during the rainy season had little effect on carbon pools and fluxes. Drought leads to low net primary production and can result in a significant net source of carbon to the atmosphere in California rangelands as microbial respiration exceeds plant carbon uptake (Xu & Baldocchi 2003; Ma *et al.* 2007). Drought can also increase plant mortality, particularly in oak woodlands, leading to lower carbon uptakes and higher soil respiration losses (Fellows & Goulden 2013). An increase in fire associated with droughts and higher temperatures is also likely to lead to large carbon losses from Bay Area rangelands.

The effects of increased temperature on rangeland ecosystems is unclear. In a modeling experiment, Chaplin-Kramer (2013) found increased forage production in most Bay Area rangelands, particularly toward the end of the century. However, periodic drought, which was assumed to occur two to four times over a 30-year period, led to dramatic declines in aboveground production in all areas except the North Bay (Chaplin-Kramer 2013). The model projections also predicted a shorter growing season, particularly in the South Bay, which could partially offset the benefits of increased growth.

Rangelands have the potential to have large soil carbon pools. Periods of low rainfall and the occurrence of dry seasons favor plant species with high carbon allocation to root biomass. High root biomass stocks tend to facilitate the development of carbon-rich soils. A meta-analysis of research on California's rangelands showed that soils stored about 140 megagrams of carbons per hectare in the top meter of the profile (Silver *et al.* 2010) (for comparison, above-ground carbon in grasslands is generally <2 megagram of carbon per hectare). Carbon stocks in surface soils (0-20 cm depth) were similar to those of Midwestern perennial grasslands, but when the top meter was considered, California's annual grasslands generally had lower soil carbon stocks than perennial systems. Owen and Silver (2015) reported soil carbon stocks that ranged from 60 ± 2 to 223 ± 6 Mg C ha^{-1} in the top 50 centimeters of soil on rangelands in Marin and Sonoma counties.

Soil carbon sequestration in rangelands has been proposed as a means to help mitigate climate change (Conant 2011; *CA Healthy Soils Initiative* 2016; Flint *et al.* 2018). Livestock manure is a common amendment on rangelands. A recent study of Bay Area rangelands showed that manure amendments significantly increased soil carbon stocks, but also stimulated the emissions of nitrous oxide (N_2O), a potent greenhouse gas (Owen & Silver 2015). Results suggested that rangelands are a net source of CO_2e[28] to the atmosphere under this management regime. Composting livestock manure with green waste, combined with grazing, can lower greenhouse gas emissions of organic matter amendments (DeLonge *et al.* 2013; Ryals & Silver 2013). Marin County rangelands experienced a net sink of approximately 1 Mg C ha^{-1} y^{-1} over the first three years following a single application of compost to surface soils (Ryals & Silver 2013; Ryals *et al.* 2014). There was no significant increase in N_2O emissions relative to untreated control plots. A lifecycle assessment model suggested that applying compost to only 5% of California's rangelands (an area equivalent to 68% of Bay Area's rangelands) could offset all of the annual livestock emissions for the state. Compost amendments significantly increased above and belowground net primary productivity over multiple years (Ryals & Silver 2013). Model output suggested that the net sink would persist for several decades (Ryals *et al.* 2015).

The effects of compost amendments on soil carbon storage was robust under different future climate change scenarios when modeled for seven locations across the state (Silver *et al.* 2018). Bay Area rangelands in Marin County showed a maximum increase of 6 Mg CO_2e ha^{-1} relative to untreated soils 15 years after compost application. The same magnitude of benefit occurred under both an RCP 4.5 and RCP 8.5 scenario. The model predicted a similar benefit in Solano County, with a slightly greater 15-year impact under the RCP 8.5 scenario (6.49 Mg CO_2e ha^{-1} relative to untreated soils) (Silver *et al.* 2018).

Soils high in organic matter stocks, and thus carbon content, can also play an important role in adaptation to climate change. Soil organic matter content plays an important role in the ecohydrology of rangelands. Organic matter generally holds more moisture than minerals in soils, and thus organic rich soils may be better buffered against drought. Bay Area rangelands that received organic matter amendments had higher water holding capacity than untreated soils (Ryals & Silver 2013). Flint et al. (2018), in a report for California's Fourth Climate Change Assessment, conducted a modeling study that suggested benefits of organic matter amendments would be widespread in California, with significant gains in water holding capacity and resilience to drought (Flint *et al.* 2018). They found that a 1% increase in soil organic matter content led to a 3.2% increase in soil moisture storage. When modeling with both a wetter and drier future climate scenario (both RCP 8.5), Flint et al. found that 97% of California's rangeland and cropland benefited hydrologically from compost application. Rangelands with a wetter climate, typical of Bay Area locations, were more likely to benefit from higher soil water storage than more arid regions.

28 CO2e refers to CO2 equivalents, a metric of the cumulative heat-trapping potential of gases emitted to the atmosphere, including methane, NOx, etc., in equivalent units of CO2 emissions.

Conclusion

The Bay Area faces a panoply of challenges triggered by a changing climate. The region also has a unique economic, political, and social fabric, buttressed by California's national and global leadership on climate change mitigation and adaptation. While the challenges loom large, novel ideas and innovations are rapidly emerging that could show the way to a resilient future. The pace of change in the physical environment that is projected in the coming decades will outpace any episode in recent human history, and a similarly unprecedented pace of societal change may be necessary in response. This report, along with the summary reports for other regions of California and the contributions of California's most recent Climate Change Assessment, provide the knowledge base to design and test adaptation strategies and identify uncertainties and knowledge gaps that will need to be addressed moving forward.

The joint effort by Bay Area scientists and stakeholders to produce this report can also serve as a foundation for an on-going science-to-action collaboration among academics, government officials and staff, community organizations, and the private sector. To start, the data and information contained here, along with guidance on how to interpret and apply it, can be distributed widely to inform decision-making at the regional and local levels. This can include slide decks, printed and web-based materials, social media, and other channels. It can spotlight the growing number of exciting solutions and innovative pilot projects that are being developed in our region to respond to the challenge of climate change.

Moreover, the new Bay Area Climate Adaptation Network (BayCAN) and its partners can use this report and related materials to engage the public and elected leaders for in-depth discussions on how the Bay Area will accelerate its work to build a strong and resilient Bay Area for all. This campaign can include school activities, community meetings, facilitated discussions in workplaces and faith-based communities, and other approaches. Finally, this process of engagement can identify the key information and knowledge gaps that will be the focus of the next rounds of climate adaptation research. In this way, the Bay Area Regional Report can be seen as the *beginning* of a deep partnership between academic experts and a broad range of regional stakeholders that will help build the equitable and resilient 21st century Bay Area.

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CLIMATE JUSTICE ALLIANCE
Just Transition Principles

This short paper aims to articulate the shared analysis & principles held by members of the Climate Justice Alliance, recognizing that a Just Transition will look different in different places.[1]

What Do We Mean By Just Transition?

> *"Just Transition is a principle, a process and a practice."*
> — Just Transition Alliance

Just Transition is a vision-led, unifying and place-based set of principles, processes and practices that build economic and political power to shift from an extractive economy[2] to a regenerative economy. This means approaching production and consumption cycles holistically and waste free. The transition itself must be just and equitable; redressing past harms and creating new relationships of power for the future through reparations. If the process of transition is not just, the outcome will never be. Just Transition describes both where we are going and how we get there.

History & Context

Just Transition strategies were first forged by labor unions and environmental justice groups, rooted in low-income communities of color, who saw the need to phase out the industries that were harming workers, community health and the planet; and at the same time provide just pathways for workers to transition to other jobs. It was rooted in workers defining a transition away from polluting industries in alliance with fence line and frontline communities.

The environmental justice (EJ) movement grew out of a response to the system of environmental racism where communities of color and low-income communities have been (and continue to be) disproportionately exposed to and negatively impacted by hazardous pollution and industrial practices. Its roots are in the civil rights movement, and are in sharp contrast to the mainstream environmental movement, which has failed to understand or address this injustice[3]. The EJ movement emphasizes bottom up organizing, centering the voices of those most impacted, and shared community leadership.

Building on these histories, members of the Climate Justice Alliance, many of whom are rooted in the environmental justice movement, have adapted the definition of Just Transition to represent a host of strategies to *transition whole communities*[4] to build thriving economies that provide dignified, productive and ecologically sustainable livelihoods; democratic governance and ecological resilience.

Some of the movement leaders who have built a strong foundation for just transition

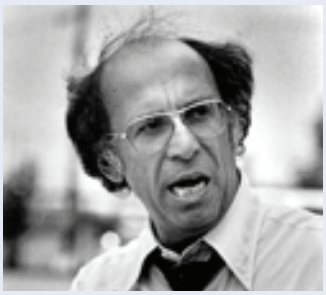
Connie Tucker, Southern Organizing Committee for Economic & Social Justice

Jose Bravo, Just Transition Alliance

Pam Tau Lee, Chinese Progressive Association

Richard Moore, Southwest Network for Environmental and Economic Justice and Los Jardines Institute

Tom Goldtooth, Indigenous Environmental Network



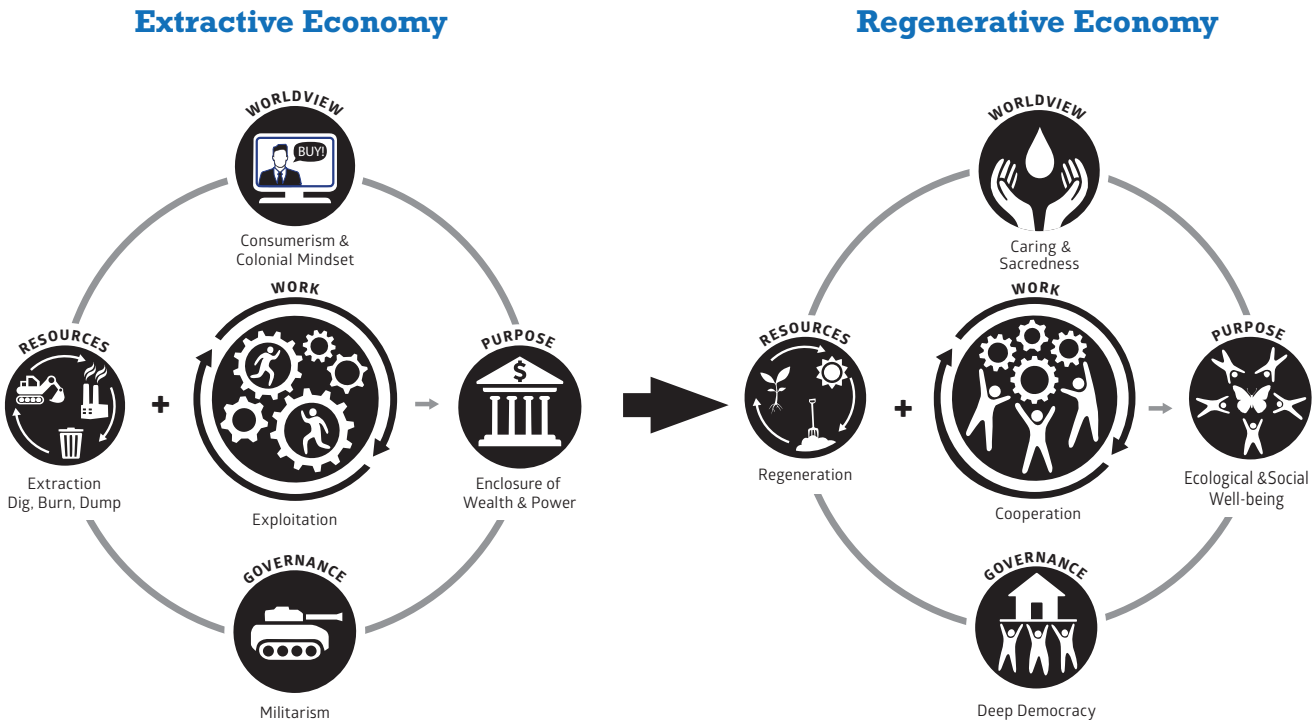
Tony Mazzocchi, Oil, Chemical & Atomic Workers International Union

Analysis, Framework and Strategy

After centuries of global plunder, the profit-driven industrial economy rooted in patriarchy and white supremacy is severely undermining the life support systems of the planet. Transition is inevitable. Justice is not.

We must build visionary economy that is very different than the one we now are in. This requires stopping the bad while at the same time as building the new. We must change the rules to redistribute resources and power to local communities. Just transition initiatives are shifting from dirty energy to energy democracy, from funding highways to expanding public transit, from incinerators and landfills to zero waste, from industrial food systems to food sovereignty, from gentrification to community land rights, from military violence to peaceful resolution, and from rampant destructive development to ecosystem restoration. Core to a just transition is deep democracy in which workers and communities have control over the decisions that affect their daily lives.

To liberate the soil and to liberate our souls we must decolonize our imaginations, remember our way forward and divorce ourselves from the comforts of empire. We must trust that deep in our cultures and ancestries is the diverse wisdom we need to navigate our way towards a world where we live in just relationships with each other and with the earth.



CJA Just Transition Principles

There are existing principles, including the Principles of Environmental Justice and Jemez Principles for Democratic Organizing, that have been important in guiding our work. The Just Transition principles below are an attempt to consolidate and synthesize various Just Transition principles from among CJA members and allies, built off the deep work and discussions amongst ourselves. Understanding that Just Transition will look different in different places, we believe a core set of shared principles can strengthen our collective work.

A Just Transition moves us toward Buen Vivir

Buen Vivir means that we can *live well* without *living better* at the expense of others. Workers, community residents, women and Indigenous Peoples around the world have a fundamental human right to clean, healthy and adequate air, water, land, food, education and shelter. We must have just relationships with each other and with the natural world, of which we are a part. The rights of peoples, communities and nature must supercede the rights of the individual.

A Just Transition creates Meaningful Work

A Just Transition centers on the development of human potential, creating opportunities for people to learn, grow, and develop to their full capacities and interests. We are all born leaders, and a regenerative economy supports and nurtures that leadership. In the process, we are transforming ourselves, each other, our communities, and our society as a whole. Meaningful work is life-affirming.

A Just Transition upholds Self Determination

All peoples have the right to participate in decisions that impact their lives. This requires democratic governance in our communities, including our workplaces. Communities must have the power to shape their economies, as producers, as consumers, and in our relationships with each other. Not only do we have the right to self determination, but self determination is one of our greatest tools to realize the world we need. The people who are most affected by the extractive economy — the frontline workers and the fenceline communities — have the resilience and expertise to be in the leadership of crafting solutions.

A Just Transition equitably redistributes Resources and Power

We must work to build new systems that are good for all people, and not just a few. Just Transition must actively work against and transform current and historic social inequities based on race, class, gender, immigrant status and other forms of oppression. Just Transition fights to reclaim capital and resources for the regeneration of geographies and sectors of the economy where these inequities are most pervasive.

A Just Transition requires Regenerative Ecological Economics

Just Transition must advance ecological resilience, reduce resource consumption, restore biodiversity and traditional ways of life, and undermine extractive economies, including capitalism, that erode the ecological basis of our collective well-being. This requires a re-localization and democratization of primary production and consumption by building up local food systems, local clean energy, and small-scale production that are sustainable economically and ecologically. This also means producing to *live well* without *living better* at the expense of others.

A Just Transition retains Culture and Tradition

Capitalism has forced many communities to sacrifice culture and tradition for economic survival. It has also defaced and destroyed land held as sacred. Just Transition must create inclusionary spaces for all traditions and cultures, recognizing them as integral to a healthy and vibrant economy. It should also make reparations for land that has been stolen and/or destroyed by capitalism, colonialism, patriarchy, genocide and slavery.

A Just Transition embodies Local, Regional, National and International Solidarity

A Just Transition must be liberatory and transformative. The impacts of the extractive economy knows no borders. We recognize the interconnectedness of our communities as well as our issues. Therefore, our solutions call for local, regional, national and global solidarity that confronts imperialism and militarism.

A Just Transition builds What We Need Now

We must build the world we need now. This may begin at a local small scale, and must expand to begin to displace extractive practices. We must build and flex the muscles needed to meet our communities' needs.

What Just Transition is NOT: Avoiding False Solutions

We understand that as frontline communities, we are often faced with navigating many contradictions. We have seen that the fight against climate change has now become a big business opportunity. In this context, it is important to recognize approaches that will only worsen our ecological and economic crises. We call these 'false solutions.' The following definitions of false solutions offer a political compass for our movements, knowing that we will engage more deeply in the nuances of various solutions in front of us in our regional and organizational contexts.

False Solutions extract & further concentrate wealth and political power

Carbon trading and other market-based incentives are presented as "economically and politically viable" strategies to address the climate crisis. Unfortunately, this makes the false and dangerous assumption that the laws of nature are subordinate to the laws of capitalism. These undemocratic mechanisms prioritize maximizing profit for those at the top at the expense of the earth and people. These do not move us toward a just transition.

False Solutions continue to poison, displace, and imprison communities

Nuclear, fracking, "clean coal", incineration and even prisons are offered as economic transition solutions to the climate crisis, but only continue to harm the health of people and the planet. The path of extracting, transporting, processing, and consuming these technologies is paved with communities riddled with cancer, reproductive and respiratory disease, among other devastating health impacts. These false solutions turn low-income communities, communities of color and indigenous communities into sacrifice zones. These do not move us toward a just transition.

False Solutions reduce the climate crisis to a crisis of carbon

The climate 'crisis' is a symptom of a deeper crisis: resource intensive industrial production of the dominant dig, burn, dump economy. Addressing only carbon emissions without challenging the growth-at-all-costs economy doesn't resolve the real crisis. This is not to say that carbon doesn't matter, but it is not the only thing that matters. Techno-fixes like titanium oxide cloud seeding or injecting carbon into the sea bottom are solutions for making money off of the climate crisis more than than they are solutions to the climate crisis. It is unclear that these technologies will even work. It is highly likely that they'll have unintended consequences. These efforts avoid the real solutions of reducing pollution at the source. These do not move us toward a just transition.

Solving the Climate Crisis: It is possible. It is necessary. There are no shortcuts.

There's no silver bullet. As we know, it will look different in different places. And let's remember: Transition is inevitable. Justice is not. Let's get to work.

Endnotes

1. The drafting process involved consolidating various principles developed by CJA member organizations -- Just Transition Alliance, Kentuckians for the Commonwealth, and Movement Generation -- and discussions by CJA pilot site anchor organizations. CJA staff developed a first draft and got feedback from CJA member organizations at the Growing Our Power national convening in St. Louis and through online comments. A drafting team made up of CJA members and staff, with additional input from the Steering Committee and Pilot Site reps, finalized this working draft.
2. By extractive economy, we mean an economy that relies on the extraction of labor, of natural resources, of culture and of community.
3. Robert D. Bullard, *Dumping in Dixie: Race, Class, and Environmental Quality* (Westview Press, 2000).
4. By whole communities, we mean to include workplaces, homes, schools, implying that we are workers, we are community members, we are whole people.

CLIMATE JUSTICE ALLIANCE

www.ourpowercampaign.org

Acknowledgements

CJA would like to acknowledge and show appreciation for the work and leadership of the Just Transition Alliance, the CJA Steering Committee, the CJA Pilot Site organizations, and of the drafting team: brandon king of Cooperation Jackson, Sara Pennington of Kentuckians for the Commonwealth, Mateo Nube of Movement Generation and Hannah Jones of the Center for Story-based Strategy.

Design Action Collective

BERKELEY CITY COUNCILMEMBER
TERRY TAPLIN
DISTRICT 2

CONSENT CALENDAR
December 14th, 2021

To: Honorable Mayor and Members of the City Council

From: Councilmember Terry Taplin

Subject: Reaffirming the City Council's Endorsement of a Carbon Fee and Dividend

RECOMMENDATION

Readopt Resolution No. 67,595–N.S urging the United States Congress to enact a national revenue-neutral carbon tax and send a copy of the resolution to Representative Barbara Lee, Senator Dianne Feinstein and Senator Alex Padilla urging them to take action.

BACKGROUND AND RATIONALE FOR RECOMMENDATION

In June of 2016, the City Council adopted a resolution calling on the United States Congress to enact a revenue-neutral tax on carbon-based fossil fuels.[1] This year, the Democratic Party took control of both chambers of Congress for the first time since 2011, making the passage of legislation on carbon fees and dividends possible for the first time since the City Council passed its resolution more than five years ago.

As proposed by the Citizens' Climate Lobby, carbon fees are "fees collected for the cost of burning fossil fuels; the dividends are the fees collected (minus administrative costs) and returned to Americans to spend as they see fit."[2] Under the status quo, the financial costs incurred for burning fossil fuels is incredibly low compared to the costs climate change will incur on the entire world. This policy is a financial mechanism to make it so that the economic costs of burning fossil fuels more closely reflect the true cost of each metric ton of carbon emissions for our planet and species. While not a fix-all for climate change, a carbon fee and dividend would function as one mechanism among the many that must be pursued to bring fossil fuel emissions to zero as soon as possible.

With President Biden in the White House and slim Democratic majorities in the House and Senate, the window for ambitious climate legislation may be closing after the 2022 midterms. While not impossible, Democrats in Congress cannot rely on retaining both chambers through President Biden's term and must pass climate change legislation like a carbon fee and dividend as soon as possible.

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[1] https://www.cityofberkeley.info/uploadedFiles/Planning_and_Development/Level_3_-_Commissions/Commission_for_Energy/EC%202016-05-25_Item%209b_Carbon%20Tax%20Reso.pdf

[2] https://citizensclimatelobby.org/basics-carbon-fee-dividend/

ENVIRONMENTAL SUSTAINABILITY
The goals of a national carbon tax is to accelerate the reduction of carbon emissions and transition to a green economy are consistent with the goals of Berkeley's Climate Action Plan.

FISCAL IMPACTS
None.

CONTACT
Terry Taplin, Councilmember, District 2, (510) 981-7120

ATTACHMENTS
1. Resolution No. 67,595–N.S

RESOLUTION NO. 67,595-N.S.

RESOLUTION URGING THE UNITED STATES CONGRESS TO ENACT A REVENUE NEUTRAL CARBON TAX

WHEREAS, the average surface temperature on Earth has been increasing steadily, with the ten warmest years ever recorded all occurring since 1998; and

WHEREAS, climate scientists overwhelmingly agree that an increase in greenhouse gases in the atmosphere—carbon dioxide (CO_2) in particular—is causing the increase in global temperature; and

WHEREAS, humans burning carbon-based fossil fuels— coal, oil, and natural gas—is the primary cause of the substantial and continuing increase of CO_2 in the atmosphere; and

WHEREAS, in May, 2013, the global atmospheric concentration of CO_2 reached 400 parts per million—the highest level in the last 800,000 years; and

WHEREAS, it's predicted that by 2100 average global temperature will be 2°F to 11.5°F higher than now depending on the level of future greenhouse gas emissions; and

WHEREAS, climate change caused by global warming-related greenhouse gas emissions including CO_2 already is leading to large-scale problems including ocean acidification and rising sea levels; more frequent, extreme, and damaging weather events such as heat waves, storms, heavy rainfall and flooding, and droughts; more frequent and intense wildfires; disrupted ecosystems affecting biodiversity and food production; and an increase in heat-related deaths; and

WHEREAS, we are approaching a dangerous threshold whereby, if it is crossed, humans will no longer be able to influence the course of future global warming, as tropical forests, peat bogs, permafrost and the oceans switch from absorbing carbon to releasing it; and

WHEREAS, the relentless increase in global atmospheric CO_2 concentration shows that broader, more powerful policies are needed to supplement local and regional efforts to reduce emissions; and

WHEREAS, burning fossil fuels also has embedded human health costs from releasing pollutants that cause lung disease, respiratory illnesses, and cancer; and

WHEREAS, presently the environmental, health, and social costs of CO_2 emissions are not included in prices paid for fossil fuels, but rather these externalized costs are borne directly and indirectly by all Americans and global citizens; and

WHEREAS, to begin to correct this market failure, the United States Congress can enact a national carbon tax on fossil fuels, based on the amount of CO2 the fuel will emit when burned; and

WHEREAS, for efficient administration, fossil fuels can be taxed once, as far upstream in the economy as practical, or at the port of entry into the United States; and

WHEREAS, a national carbon tax starting at a relatively low rate and increasing steadily over future years is a market-based solution that designed to minimally disrupt the economy while sending a clear and predictable price signal to businesses to develop and use non-carbon-based energy resources; and

WHEREAS, a national carbon tax would incentivize manufacturers, businesses, and consumers throughout the economy to produce and use less fossil fuel, and would spur investment in and deployment of clean energy resources and energy efficient processes, without favoring any particular technology, and would thereby reduce CO2 emissions to the atmosphere; and

WHEREAS, job creation from development of clean energy and energy efficiency businesses would expected to exceed job creation from further development of fossil fuel businesses; and

WHEREAS, according to Citizen’s Climate Lobby if 100% of carbon tax revenue is returned to households in equal shares, approximately two-thirds of Americans will break even or come out ahead, as their dividends match or exceed direct and indirect price increases due to the tax, protecting lower and middle income households; and

WHEREAS, border adjustments—carbon content-based tariffs on products imported from countries without comparable carbon pricing, and refunds to our exporters of carbon taxes paid—should maintain the competitiveness of U.S. businesses in global markets; and

WHEREAS, a national carbon tax may be implemented quickly and efficiently, and respond to the urgency of the climate crisis, because the federal government already has in place mechanisms, such as the Internal Revenue Service, needed to implement and enforce the tax, and already collects taxes from fossil fuel producers and importers; and

WHEREAS, a national carbon tax could make the United States a leader in mitigating climate change and in the clean energy technologies of the 21st Century, and would incentivize other countries to enact similar carbon taxes, reducing global CO2 emissions without the need for complex international agreements; and

WHEREAS, the goals of a national carbon tax to reduce CO2 emissions and transition to a green economy are consistent with state and local programs designed to mitigate climate change, such as California's AB32 and Berkeley’s Climate Action Plan and

WHEREAS, the market incentive provided by a steadily rising national carbon tax implemented in 2015 may result in significant and increasing near-term reductions in overall U.S. CO2 emissions, and thereby helping Berkeley to meet or exceed its own goals; and

WHEREAS, continued widespread use of fossil fuels and global climate change pose a present and growing risk to the health and welfare of Berkeley residents and to its economy, and a U.S. national, revenue-neutral carbon tax will significantly mitigate those risks and promote health and prosperity in our City, our region, and the world.

NOW THEREFORE, BE IT RESOLVED that the Berkeley City Council urges the United States Congress to enact without delay a revenue-neutral tax on carbon-based fossil fuels.

BE IT FURTHER RESOLVED that the tax should be collected once, as far upstream in the economy as practical, or at the port of entry into the United States; and, be it

BE IT FURTHER RESOLVED that the tax rate should start low and increase steadily and predictably, to achieve the goal of reducing U.S. CO2 emissions to 10% of 1990 levels by 2050; and, be it

BE IT FURTHER RESOLVED, that all tax revenue should be returned to households to protect low and middle income Americans from the impact of rising prices due to the tax; and, be it

BE IT FURTHER RESOLVED, that the international competitiveness of U.S. businesses should be protected by using border tariffs and tax refunds.

CITY COUNCILMEMBER
RIGEL ROBINSON
DISTRICT 7

CONSENT CALENDAR
December 14, 2021

To: Honorable Mayor and Members of the City Council

From: Councilmember Rigel Robinson

Subject: Letter to UC President Michael Drake in Support of Student Researchers United-UAW

RECOMMENDATION

Send a letter to UC President Drake and Provost Michael Brown in support of the full recognition of the Student Researchers United-UAW labor union.

BACKGROUND

In 2017, California passed SB 201, which grants students researchers full employment rights. During the pandemic, student researchers on UC campuses began to organize around common issues. On May 24th, 2021, Student Researchers United-UAW submitted cards representing a supermajority of student researchers seeking union representation. The California Public Employment Relations Board (PERB) verified that they achieved majority support. The UC was expected, therefore, to grant recognition to the new union. However, the UC has attempted to subvert PERB regulations and has refused full recognition, instead offering to only partially “recognize” SRU-UAW.

The UC has argued that Student Researchers paid with training grants and fellowships are not workers and do not have the right to unionize, and that only Student Researchers directly funded by the UC should be recognized. This spurious distinction, however, ignores the fact that Student Researchers report and take instructions from the same supervisors and perform the same duties regardless of their funding sources. The attempt to divide Student Researchers by funding is a ploy to undermine the union's strength and subvert state law that was passed with the clear intention of granting the specific workers in question the right to collective representation.

It is crucial that the UC immediately grant full recognition to SRU-UAW. Student Researchers have raised issues of insufficient compensation, discrimination, harassment, and excessive workloads that urgently need to be addressed. The UC's union busting ploy in attempting to divide Student Researchers is a distraction from these urgent matters and an insult to the hardworking people who perform the essential function that makes the UC a network of premier research institutions.

The Council would join more than 50 members of the State Legislature and 30 members of the California Congressional delegation in calling for full recognition of SRU-UAW.

2180 Milvia Street, Berkeley, CA 94704 ● Tel: (510) 981-7170 ● TDD: (510) 981-6903
E-Mail: RRobinson@cityofberkeley.info

FINANCIAL IMPLICATIONS
None.

ENVIRONMENTAL SUSTAINABILITY
No impact.

CONTACT PERSON
Councilmember Rigel Robinson, Council District 7, (510) 981-7170
Christine Youn, Intern

Attachments:
1: Letter
2: Other Letters from Legislators in Support of SRU-UHW (https://studentresearchersunited.org/legislative-support-for-sru-uaw)

December 12th, 2021

Michael Drake, President
University of California
1111 Franklin St., 12th Floor
Oakland, CA 94607

RE: Student Researchers United-UAW Recognition

Dear President Drake,

We are writing to strongly urge that you recognize and begin bargaining with Student Researchers United-UAW. Research is integral to the UC mission — that was reflected last year in the 3.7 billion dollars that the University of California received in federal research contracts and grant revenue. Student Researchers are leading the central work of the university in advancing knowledge while they are given insufficient financial compensation, working unreasonable hours, experiencing harassment, facing discrimination, and expected to pay increasingly unaffordable rents. Unions are needed to address these issues so that research can be carried out in the most efficient and equitable environment.

The UC should not deny Student Researchers the right to unionize. In 2017, California passed SB 201, which grants student researchers full employment rights. This includes the right to unionize. Refusing to recognize Student Researchers United-UAW as a formal labor union is refusing to acknowledge the Higher Education Employer-Employee Relations Act and exploiting Student Researchers' labor.

It is our understanding that the UC has disputed the composition of the bargaining unit, arguing that workers in certain job titles are merely students and not workers with the same arguments the UC made against SB 201. We urge you to swiftly drop this dispute and recognize Student Researchers United-UAW as the union for Student Researchers in all the titles in which they work.

We are in full support of Student Researchers United-UAW in their fight recognition and better pay and working conditions from the UC and hope to see the UC finally putting to practice what the California legislature has already mandated as Student Researchers deserve a better working environment.

Sincerely,
The Berkeley City Council

CC: Michael Brown, Provost & Executive Vice President

CITY COUNCILMEMBER
RIGEL ROBINSON
DISTRICT 7

CONSENT CALENDAR
December 14, 2021

To: Honorable Mayor and Members of the City Council

From: Councilmember Rigel Robinson

Subject: Support for H.R. 4194: The People's Response Act

RECOMMENDATION

Adopt a Resolution supporting H.R. 4194, the People's Response Act, which would create a Division of Community Safety and provide grants to local governments, state governments, and community-based organizations to support non-carceral approaches to public safety. Furthermore, send a letter of support to Representative Cori Bush, Representative Barbara Lee, Senator Alex Padilla, and Senator Dianne Feinstein.

BACKGROUND

H.R. 4194, the People's Response Act, would create a Division of Community Safety within the Department of Health and Human Services that funds and coordinates research, provides grants for developing and implementing approaches to community safety, and facilitates inter-agency collaboration on the federal level.

This bill intends to "transform public safety into a system of care rather than criminalization," doing so by simultaneously mobilizing federal resources and expanding resources available to local and state governments and community-based organizations interested in advancing alternative models of public safety. Grant funding can be used for a wide range of programs, including unarmed first responder agencies, violence prevention programs, infrastructure investments, health services, and other programs that address the root causes of poverty, mental illness, homelessness, and substance use. Specifically, the People's Response Act would provide:

- $7.5 billion in grant funding to state and local governments to fully fund public safety and improve crisis response.
- $2.5 billion to the First Responder Hiring Grant, enabling the hiring of social workers and peer support specialists.

Additionally, the People's Response Act lays out mechanisms for supporting the most impacted communities, such as giving funding priority to cities with disproportionate rates of poverty and incarceration; organizations that employ those directly impacted by the immigration and criminal justice systems; and organizations that have proven ties to the communities they serve.

2180 Milvia Street, Berkeley, CA 94704 ● Tel: (510) 981-7170 ● TDD: (510) 981-6903 ● E-Mail: RRobinson@cityofberkeley.info

This bill is of critical importance to the City of Berkeley and other municipalities dedicated to exploring alternatives to policing. As the City's Reimagining Public Safety Taskforce and Specialized Care Unit Taskforce work wraps up over the next year, we will be looking at both the City's available funds and additional grant programs to secure funding for implementation. Federal resources are crucial for continuing this work in cities across the country, as well as supporting community-based organizations who are key partners in supporting and implementing these alternative approaches.

FINANCIAL IMPLICATIONS
None.

ENVIRONMENTAL SUSTAINABILITY
No impact.

CONTACT PERSON
Councilmember Rigel Robinson, (510) 981-7170
Cyn Gómez, Intern

Attachments:
1: Letter of support
2: Resolution
2: Bill text https://www.congress.gov/bill/117th-congress/house-bill/4194/text?r=8&s=1

December 14, 2021

The Honorable Cori Bush
563 Cannon House Office Building
Washington, DC 20515

RE: City of Berkeley's Support for The People's Response Act

Dear Representative Cori Bush,

The Berkeley City Council would like to convey our full support for H.R. 4194, The People's Response Act — an important bill that would improve community safety, reduce reliance on the criminal justice system, and support the parallel efforts of local governments, state governments, and grassroots organizers.

The City of Berkeley, like many other municipalities across the country, is taking the necessary steps to reimagine public safety. We are heartened to see decisive action being pursued on the federal level that would not only funnel federal resources into a Division of Community Safety, but additionally provide much-needed funding to cities and community-based organizations to implement non-carceral programs on the local level. The resources provided by this bill would help develop and fund concrete implementation plans in Berkeley and across the country for critical programs such as mental health response, violence intervention and prevention, and unarmed first responders.

The People's Response Act responds to the calls for change in our country on a scale that is appropriate and needed. This progressive bill is one part of the solution to our broken, punitive system of public safety. We stand firmly in support of H.R. 4194 and thank you for this important piece of legislation.

Sincerely,

The Berkeley City Council

CC: Senator Dianne Feinstein
Senator Alex Padilla
Representative Barbara Lee

RESOLUTION NO. ##,###-N.S.

RESOLUTION IN SUPPORT OF H.R. 4194, THE PEOPLE'S RESPONSE ACT

WHEREAS, The People's Response Act aims to improve crisis response and public safety by encouraging and funding alternative models that address the root causes of crime, rather than relying on punitive enforcement; and

WHEREAS, the status quo has resulted in a system in which Black people make up 6% of the State of California's residents but 28% of the State's prison population, while Latinx people make up 38% of the State's residents but 41% of the prison population; and

WHEREAS, this bill responds to the reckoning that this country is facing for its inhumane immigration and carceral systems, police violence and bias, and lack of structural community supports, all of which disproportionately impact Black and brown communities; and

WHEREAS, The People's Response Act will establish a Division of Community Safety and award grants to local governments, state governments, and community-based organizations in order to develop and implement qualified approaches to community safety; and

WHEREAS, as a city dedicated to transforming its approach to public safety, the City of Berkeley supports much-needed increases to federal support that would empower cities to improve mental health and homelessness response, create supportive programs designed to lift people up from poverty, and implement alternatives to policing.

NOW THEREFORE, BE IT RESOLVED that the City of Berkeley supports H.R. 4194, The People's Response Act.

Public Works Commission

ACTION CALENDAR
December 14, 2021

To: Honorable Mayor and Members of the City Council

From: Public Works Commission

Submitted by: Margo Schueler, Chair, Public Works Commission

Subject: Public Works Commission Recommendation for the Five-Year Paving Plan

RECOMMENDATION

Adopt a resolution that recommends approval of the Five-Year Paving Plan version 12A ("Arterial Alternative") for FY2023 to FY2027.

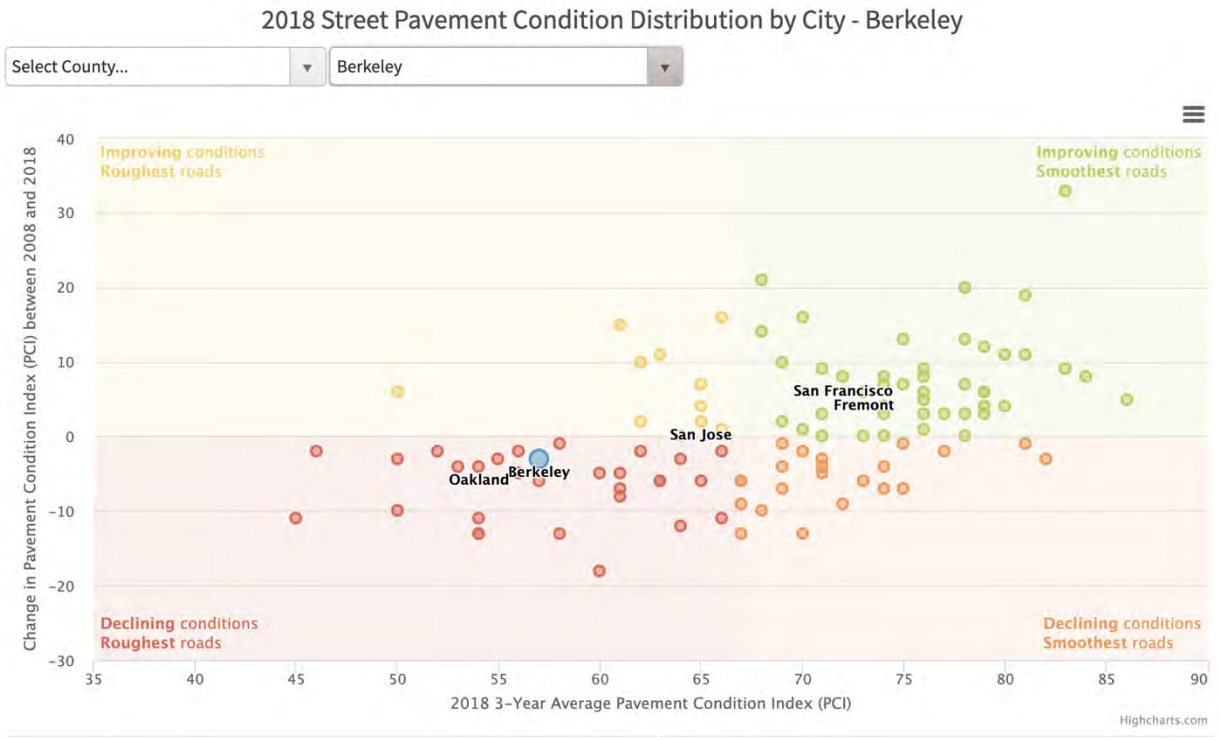
SUMMARY

The Public Works Commission (PWC) reviewed multiple 5-year paving plan options from staff and evaluated them based on their conformance with the existing Street Rehabilitation and Repair Policy. The commission specifically looked for the greatest value to the city by focusing on long contiguous stretches of paving on the primary transportation network - arterials, collectors, bus routes and bikeways. Of the plans reviewed, Plan 12A was the most in conformance and generally consistent with the current policy.

Plan 12A funds are distributed relatively equivalently across council districts, but equity is not addressed. The 5-year plan was not evaluated with an equity lens because there is no policy or direction on what areas or model should be used. Historically, it has been the practice of the City to evaluate equity in roadway investment in terms of equivalent allocation of financial resources and miles of roadway surfaced among the Council Districts. However, this does not result in equitable outcomes across the City.

The Public Works Commission has submitted a recommendation to the FITES Committee and City Council with a proposed update to the definition of equity. The leading definition would move the Public Works Department towards a results-oriented performance evaluation, where investments of resources are allocated in a way that seeks to provide equivalent PCI outcomes across all planning areas, rather than focusing purely on the monetary inputs.

As staff has reported, our streets will be in poor condition and failing at the end of the 5-year paving plan. In 2021 the citywide average PCI was 55.8. By 2027, at the current level of investment, the citywide PCI will be 49.1. Metropolitan Transportation Commission (MTC) defines a PCI below 50 as the lowest rating of "Poor" condition. We have among the worst road conditions in the Bay Area.



Our streets are in crisis and additional funding, innovation and clear prioritization in the management of our public right of way is critical to reversing the ever-worsening road conditions. Every year of delay or inaction the deferred maintenance is rapidly increasing the cost of roadway improvement.

The Commission continues to have significant concerns about the need to revise the policy so there is clear guidance to staff on how to prioritize the allocation of resources. The policy was last updated in 2009. It should be reviewed and updated to incorporate current thinking about using life cycle cost analysis, Vision Zero, equity, sustainable multi-benefit technologies, and other factors. With these considerations in mind, the updated policy should include new performance metrics that capture the diversity of objectives the City holds for our road network. In March 2021, PWC put forward a draft policy recommendation to FITES which we urge Council to act on in the immediate future.

The recommendation to approve the 5-year paving plan, and to forward it to Council was discussed by the Public Works Commission at its November 4, 2021 meeting.

Action: M/S/C (Erbe/Freiberg) to submit report to Council recommending approval of the Five-Year Paving Plan version 12A, for FY2023 to FY2027, as proposed by staff.
Vote: Ayes: Erbe, Freiberg, Constantine, Barnett, Hitchen, Schueler; Noes - None; Absent - None; Abstain - Nesbitt)

ALTERNATIVE ACTIONS CONSIDERED
None

CITY MANAGER REPORT

See companion report

CONTACT PERSON
Margo Schueler, Chair, Public Works Commission
Joe Enke, Commission Secretary, (510) 981-6300

Attachments:
1. Resolution

Attachment 1

RESOLUTION NO. ##,###-N.S.

APPROVAL OF THE FIVE-YEAR PAVING PLAN FOR FY 2023 TO FY2027

WHEREAS, the Street Rehabilitation and Repair Policy, Resolution No. 55,384-N.S. approved on May 22, 1990, requires there be a Five-Year Street Paving Plan for the entire City to be adopted by the City Council, and

WHEREAS, the City Council requests advice from the Public Works Commission on the Five-Year Paving Plan; and

WHEREAS, on November 4, 2021, the Public Works Commission voted to approve the Five-Year Paving Plan, submitting the FY 2023 to FY 2027 Five-year Paving Plan to City Council;

NOW THEREFORE, BE IT RESOLVED by the Council of the City of Berkeley that the FY 2023 to FY2027 Five-Year Paving Plan, is hereby adopted.

Public Works Commission
Parks and Waterfront Commission

CONSENT CALENDER
October 26, 2021

To: Honorable Mayor and Members of the City Council

From: Public Works Commission
Parks and Waterfront Commission

Submitted by: Margo Schueler, Chairperson
Gordon Wozniak, Chairperson

Subject: Adopt-a-Spot program development recommendations

RECOMMENDATION

That Council adopt a Resolution to support and fund two new full-time dedicated Volunteer Coordinators to run an expanded Adopt-a-Spot program and coordinate new programs for youth volunteers, and funding for operational expenses should be included.

The programs shall promote participation and civic pride by providing a unified portal for all programs across all departments, and incorporate many of the **Program Elements** outlined below. The Coordinators shall build on recent efforts by Public Works staff to fortify the existing programs for storm drains and traffic circles and incorporate existing programs from the Parks & Rec department. In addition, the Adopt-a-Spot program shall be expanded and improved upon to support additional community engagement opportunities that can include, but are not limited to, restoring native habitat to promote biodiversity (including a Bee City USA liaison), litter removal, vegetation maintenance, graffiti removal, tree planting/watering/monitoring, monitoring sidewalk conditions, adoption of homeless encampments, coordinating volunteers for emergency situations, beautification efforts, and other ideas that the Berkeley community may wish to support and organize around.

Some features of the program are beyond the scope of our Commissions' visibility and will need to be finalized by Council and Staff. However, the following recommendations are offered:

- **Budget Commitment** - to ensure success, the two new positions must be dedicated to volunteer coordination. Sharing of responsibilities across staff or financing only a single or half-time position should be avoided as it likely wouldn't meet the needs of the community. If at least one dedicated position cannot be

supported the role of Volunteer Coordinator should be given to a third-party or community non-profit group.

- **Program Design** - the Volunteer Coordinators may work with interns and the community to define program features and details of implementation, which could include a phased approach (alternatively, the City could hire a consultant to outline the program),
- **Reporting Structure** - options include Parks Rec & Waterfront, Public Works, Office of Sustainability, or the City Manager's office (alternatively, the position could be shared across departments)
- **Supporting Tools** - begin with the fewest but most necessary initial features. For example, policies and waivers, outreach tools such as a robust city webpage presence including dynamic maps and signage to recruit, volunteer reporting mechanisms to ensure compliance and track activity, volunteer appreciation events to build community, etc.

BACKGROUND

Council Referrals

City Council has expressed strong support for a robust Adopt-a-Spot program. Beginning in fall 2019 Council introduced the first of four separate Referrals to both the Public Works and Parks & Waterfront Commissions with the following dates: (1) April 23, 2019[1], (2) September 24, 2019[2], (3) November 12, 2019[3], and (4) February 23, 2021[4]. The Referrals mentioned a range of goals for the Adopt-a-Spot program, including, supporting city cleanup and maintenance efforts, addressing Vision 2050 storm water and watershed goals, promoting a thriving volunteer force to adopt and maintain traffic circles, creating and maintaining pollinator habitat and funding a City Liaison as part of a Bee City USA program, adopting encampments and street campers/RVs, and more.

History of Adopt-a-Park and Grant program

Berkeley has a history of supporting programs like Adopt-a-Spot and has even provided grants to incentivize participation. For at least ten years, beginning in FY93-94 with Resolution No. 57-557[5], and in response to a $1.5M refund from PERS, a popular mini-grant program was created and later supported by funds from the Park Tax[6]. Small grants were allocated to volunteer groups to assist in the development of small programs, not to exceed $3,500. The program was implemented through a Joint Committee with representatives from the Parks and Recreation Commission, Berkeley Partners for Parks and staff from the Parks and Recreation department. This mini-grant program provided a method for involving citizens and stimulating their interests in the care of parks and open space. The funds were to be used for materials, supplies and

[1] City Council Agenda, Regular Mtg, April 23, 2019, Item 33.
[2] City Council Agenda, Regular Mtg, September 24, 2019, Item 24.
[3] City Council Agenda, Special Mtg November 12, 2019, Item 1a.
[4] City Council Agenda, Regular Mtg, February 23, 2021, Item 24.
[5] Resolution No. 57,557-N.S., June 28, 1994
[6] City of Berkeley webpage, "Parks Mini-Grant Program"

general assistance. It was a very popular program that generated enthusiasm and nourished the community spirit through wide-ranging activities such as the installation of chess tables at San Pablo park, the creation of Halcyon Commons, dog waste dispensers and trail improvements in Cesar Chavez Park, a cultural exhibit on the Ohlone Greenway, and many more.

At a regular meeting of the Public Works Commission on July 1, 2021, it was M/S/C to send this item to Council for consideration: (Schuler/Erbe/U): Ayes: Barnett; Constantine; Erbe; Freiberg; Hitchen; Napoli; Nesbitt; Schuler; Noes: None; Absent: None.

At a regular meeting of the Parks and Waterfront Commission on August 11, 2021, it was M/S/C to send this item to Council for consideration: (McGrath/Wozniak/U): Ayes: Cox; Diehm; Kamen; Kawczynska; Landoni; McGrath; Srioudom; Wozniak; Noes: None; Absent: None.

CURRENT SITUATION AND ITS EFFECTS

Updates in Progress

As of June 2021 the City is working with UC Berkeley interns and currently interviewing for a CivicSpark[7] fellow to begin enhancing the Adopt-a-Spot program and unifying all volunteer opportunities within the City in one place. The table below outlines the current situation. However, several changes are in progress including website updates, creation of a GIS map showing all opportunities within the city (including Parks), updated volunteer agreement forms and procurement of safety vests and tools for volunteer use.

Current Volunteer Offerings

Berkeley currently has a set of volunteer opportunities available to the community through Public Works and Parks & Rec. The information about available programs is located on the City's website, on three separate webpages, and through programs housed in three different divisions. Two programs have their own logo. The table below illustrates the current organization of the programs.

[7] See the CivicSpark webpage for 2021-2022 Projects, "Adopt-A-Spot: Enhancing Public Works' Community Outreach, Volunteerism And Stormwater Quality" (https://civicspark.lgc.org/2021-22-projects/)

Public Works		Parks, Rec & Waterfront
Adopt-a-Spot		
GENERAL INFORMATION General Information **Adopt-a-Spot Volunteer Program** Adopt-a-Traffic Circle Adopt-a-Drain		
Traffic Circles	**Storm Drains**	**PRW Volunteer**
TRANSPORTATION Transportation Division	PUBLIC WORKS Department of Public Works **Adopt-a-Spot - Storm Drains**	RECREATION Recreation Division Become A PRW Volunteer! Sign up here to Volunteer

As illustrated in the table above, the Adopt-a-Spot program lives within the Public Works Department at this time. The top-level webpage is found on a page marked “General Information”. From there the user can click on either of two links to navigate to a webpage for Traffic Circles (which lives on a webpage of the Transportation Division) or Adopt-a-Drain (which lives on a webpage of the Public Works Department). The many programs associated with our Parks, Rec and Waterfront Department can be found on a separate webpage within the Recreation Division. Links to these webpages are listed here:

- (General Adopt-a-Spot) https://www.cityofberkeley.info/adoptaspot.aspx
- (Storm Drains) https://www.cityofberkeley.info/adoptadrain.aspx
- (Traffic Circles) https://www.cityofberkeley.info/adoptatrafficcircle.aspx
- (Parks, Rec & Waterfront) https://www.cityofberkeley.info/Parks_Rec_Waterfront/Recreation/Volunteer_Opportunities.aspx

Looking at the two Adopt-a-Spot programs within Public Works, forms such as Volunteer Agreement and Waivers must be printed, scanned (or photographed), and then emailed to the address (adoptaspot@cityofberkeley.info[8]). In addition, and in collaboration with the associated Task Force, helpful supporting materials are now

[8] This centralized email address, which includes a new logo, is a recent development after collaboration with the Traffic Circles Task Force.

available for Traffic Circles, including (1) a list of suggested plants (the Planting Guide), (2) the approval form for plants (Planting List; waived if plants chosen from the approved Planting Guide), and (3) a map of traffic circles location and availability (Map of Traffic Circles).

The 16 volunteer opportunities within Parks, Rec & Waterfront are organized by frequency (on-going vs. annual) and also include 2 links to suggest a project, as either an All Crew Day or Create Your Own, specified for weekdays only. Printable Application and Waiver forms and a phone number is listed. An online "Volunteer Application Form" is also available, with the general parks email listed at the top for possible follow-up contact.

Updating and merging all of these programs into a unified Adopt-a-Spot program, with a single City webpage that links to all volunteer opportunities, would facilitate the user experience by creating a kind of “one stop shopping”. For example, all volunteer opportunities, those under Public Works and Parks & Rec, can be listed on a single webpage. In addition, the print-and-submit forms can be replaced by online forms. The static map of traffic circle locations & availability can be replaced with a dynamic one. Once the volunteer coordinator positions are created and the City’s overall website is redesigned[9], additional programs and functionality can be added, as outlined in the section **Suggested Program Elements**, below.

RATIONALE FOR RECOMMENDATION

Goals of Program

The primary goal of a successful volunteer program is to positively engage the community. This can be done by creating a structure in which individuals are given the best possible opportunities to perform useful environmental maintenance work safely and efficiently, with a focus on equity. An easily accessible volunteer website which includes all participating departments, an interactive signup and data entry functions, and appropriate forms and information for the various types of tasks.

Volunteers can perform many basic maintenance tasks in our parks, on traffic circles, on landscaped areas, on drains, litter and trash pickup, and report on observed problem areas such as overgrown vegetation, and sidewalk hazards and obstructions. They can support the growing effort to provide native habitat to promote biodiversity. Youth volunteers can participate in summer job programs to gain experience and address needs identified by staff. Volunteers are not a substitute for the work of dedicated city staff, but there are often areas where additional hands can make a positive difference.

City Staff are responsible for city infrastructure and environmental features, and Volunteers clearly work under their ultimate direction. City workers already know what needs to be done, and how to do it, and they can establish clear policies and procedures for volunteers. A Volunteer program is successful when it builds upon existing staff efforts and priorities, so that the program is a clear benefit to employees.

[9] City Council Agenda, Regular Meeting, July 28, 2020, Item 15, Rolling Orange Redesigning Website

Risk management by the use of liability waivers, mandating best safety practices, and in some cases by direct Supervision is essential to ensure no one is injured while volunteering, and that the city has a strong legal defense if an accident were to occur.

The most successful programs actively highlight Volunteer activities, have a formal recognition component, and collect accurate data on the number of volunteer hours and projects completed to be included in official city documents and for public information. An annual event possibly including awards and prizes is a sure way to boost volunteer spirit and incentivize additional participants.

Finally, continually reaching out to the community with excellent communications, soliciting suggestions for new projects, and sincere feedback for Volunteers assures the future success of the program.

Precedent and Research
Our working group researched more than 30 Adopt-a-Spot programs nationwide. For each location we documented a wide variety of features. See Appendix M for the data spreadsheet. The cities we reviewed are listed below:

Adopt-a-Spot Programs Reviewed		
California Burlingame, CA Los Angeles, CA Marin County, CA Riverside, CA Santa Clara, CA San Francisco, CA San Mateo, CA Truckee, CA	**Other U.S. Cities** Boulder, CO Muncie, DE Fort Lauderdale, FL Carbondale, IL Indianapolis, IN Columbia, MO Minneapolis, MN Anne Arundel County, MD Prince George's, MD Minneapolis, MN Missoula, MT	Albuquerque, NM Santa Fe, NM Ferguson, PA Austin, TX Fort Worth, TX San Antonio, TX Hampton, VA Seattle, WA Madison, WI **Canada** Vancouver, BC

We found that many cities and local government agencies in the Bay Area and throughout the U.S. have created Adopt-a-Spot programs. San Francisco, Oakland, Marin County, City of Santa Clara, Pittsburg, and others maintain successful programs based on the basic principle of enlisting residents to volunteer and sign up for ongoing cleanup, maintenance and beautification of specific areas.

These city-led volunteer programs have many things in common, both structurally and in the type and scope of citizen participation. Logistically, the programs include a list (or clickable online map) of suggested spots, a liability waiver, a registration system, and staff support in providing tools, supplies, and waste disposal. The staff positions may be located in a variety of departments but the most common are Public Works and Parks & Rec.

Some of the most common adoptable "spots" in our peer research are listed here:

- Storm drains maintenance
- Litter & graffiti action, both patrolling and mitigating
- Greening, planting and maintenance, e.g. medians, traffic circles and street gardens
- Tree planting and watering
- Various civic art projects including decorating assets such as trash cans or utility boxes
- Trail maintenance and/or construction

When thinking about our community, programs could specifically target Berkeley's needs and values, such as:

- Installing and maintaining pollinator & native habitat gardens
- Monitoring, reporting and prioritizing found sidewalk defects
- Supporting encampments, campers and RVs
- Maintenance of off-leash dog areas
- Creation of city art, including murals

The Volunteer Coordinator can also serve as:

- Liaison for a Bee City USA program
- Liaison with the Ecology Center (e.g. Community Gardens, Recycling Efforts)
- Outreach and coordination of Cal Project Day
- Liaison with East Bay Regional Parks
- Liaison with other local non-profits

Suggested Program Elements
Flexibility & adaptability is critical for ongoing success of the program. The following elements are commonly found in programs in other cities. (See the Appendices for sample images.)

A. Administrative Elements

1. **Promotion:** Promotion is an important part of any citywide volunteer program and most cities have some means of accomplishing this through their websites, community bulletin boards, social media, monthly newsletters, or signs in other public spaces like parks.
2. **Recruiting & Onboarding:** A simple streamlined application process where each volunteer receives acknowledgement and information about the citywide volunteer program is necessary for success of the program. Setting expectations for the approval process, including a checklist and typical timeline of approval, can enhance usability.

3. **Liability & Waivers:** A means of addressing legal liability for the City is required. Most jurisdictions have legal waivers for volunteers that are completed when the volunteer is onboarded.
4. **Safety Rules & Training:** Related to liability, basic rules and safety training is an element of onboarding for volunteers in many cities. (e.g. Oakland's training project coordinators for Earth Month). Provide clear and up-to-date guidelines, sometimes in the form of a Volunteer Manual, so volunteers understand the scope of their involvement and the responsibilities of their participation.
5. **Recognition:** Volunteer recognition is important for retention and builds a sense of community. Other cities use items including signage in public areas, volunteer appreciation events or annual parties, volunteer of the month or top volunteer of the year, or certificates or cards recognizing volunteer contributions. More locally, East Bay Regional Parks has given out badges for events attended.

B. Operational Elements

1. **Mapping & Identification of Opportunities:** Dynamic and clickable citywide maps show "adopted" areas and those available for adoption. Layering within the maps allows volunteers to focus on different kinds of opportunities (e.g. drains vs. gardens)
2. **Single Point of Contact & Website:** Successful programs have some sort of "coordinator" position that provides a single point of contact for volunteers and this contact information is prominently listed on the website.
3. **Calendar of Events:** A centralized calendar listing volunteer events promotes participation and transparency. Calendar entries can hyperlink to event descriptions and digital sign-up. Color-coded sub-calendars by 'type' (e.g. litter, gardening, drains) can allow for easy sorting. Individual user accounts support customization.
4. **Tools, Supplies, & Support:** Tools for common programs - litter pickers, garbage bags, shovels, gloves, etc. - are often provided upon request, either for pickup or drop-off. Post-event garbage pick-up is often available, too.
5. **Tracking & Reporting:** Documenting volunteer time spent or accomplishments (e.g. # of trash bags filled) is a common feature of successful programs. These data can serve as quality control, to help ensure work is done, and quantify the total number of volunteer hours spent, which can be included in grant applications. Photos documenting regular maintenance of certain locations, like traffic circles or medians, can be submitted via a new digital portal.
6. **Problem Resolution:** With a volunteer program, problems and issues will arise and the volunteers need a means of relaying issues back to city staff. Utilization of the existing 311 or SeeClickFix could be used or another means of communication can help identify locations in need. Problem resolution between

persons, volunteers and/or the community, should be handled by a Volunteer Coordinator.

7. **Coordinating with external organizations:** Some volunteer groups and non-profits will remain independent of any City programs. The City's Volunteer Coordinators can serve as a liaison between residents with external groups, to promote volunteerism city-wide.
8. **Plant Lists and Seedlings:** A list of suggested plants can introduce volunteers to habitat plants that are native to the region, ones that meet potential requirements (e.g., height or water needs), and can facilitate approval of plant palettes. Some cities provide free plants to volunteers (and in some cases these plants are grown by other volunteers. See Appendix L, Madison WI)

Suggested Implementation Options
The preferred option is for one of the two new volunteer coordinators, the senior Coordinator, to design the program, engaging the interns and CivicSpark fellows to build out desired new tools. As a second option, or in the event that additional input or resources are needed, an outside consulting firm could be engaged to more clearly define and develop the program using best practices in existing public programs.

The expansion of the programs can be done in a phased manner, starting with existing ones, for example, adding online tools and materials, and then over time adding new kinds of “spots”, depending on community input and city goals.

The following departments, commissions and stakeholders should be engaged during the development of the program:

- Public Works Department
- Parks, Recreation and Waterfront Department
- Public Works Commission
- Parks and Waterfront Commission
- Traffic Circle Task Force
- Community Organizations that have historically worked with the City

Location of Program in the City
The Commissions did not reach a final recommendation about the location of the new Volunteer Coordinators. Their work will span a broad range of activities, functioning as a kind of "umbrella" position, supporting the work associated with many departments. For this reason, the best place to start the Adopt-a-Spot program may be in the City Manager’s Office, where the Customer Service Center and Online Service Center already exist. There is also a Fighting Graffiti program, which already solicits volunteers. On the other hand, since many of the volunteer efforts will require input from Parks or Public Works it may be best for the position to live in one of these departments or be split between them.

Not hiring dedicated coordinators and sharing the responsibilities of the program across multiple employees is greatly discouraged as some departments are short-staffed and team members already have full work loads. For comparison, the City of Oakland has four full time employees and two part-time trainees affiliated with their Adopt-a-Spot program. They are deployed by subject area, 1) parks; 2) creeks/storm drains; and 3) streets.

ENVIRONMENTAL SUSTAINABILITY AND CLIMATE CHANGE
A well-run Adopt-a-Spot program will help residents support many of the City's climate, safety and greening goals, including improving stormwater flows, reducing refuse that reaches the Bay, promoting safe and beautiful intersections, mitigating urban heat island effect, monitoring sidewalks for safety, and widespread planting of California-natives to increase urban ecology that supports pollinators and promotes public health.

ALTERNATIVE ACTIONS CONSIDERED
The Commissions discussed taking no action to expand the Adopt-a-Spot program but concluded that the benefits from funding a more robust program, with dedicated staff positions, far outweigh the program costs.

CITY MANAGER
Refer to the budget process.

FINANCIAL IMPLICATIONS

Funding
To ensure a successful Adopt-a-Spot program it is essential that two dedicated FTE positions be fully funded, a Volunteer Coordinator, who will function as the manager, and an entry-level position Coordinator who can coordinate year-round youth programs, or the equivalent. In addition, funds should be allocated for supporting materials, such as tools, vests, signs, litter pick-up materials, T-shirts, and an annual recognition and awards party.

At writing, it is estimated that $500,000 is needed to cover both fully-loaded FTEs and operational costs. There are two possible sources of funding: the General Fund and Special Revenue Funds.

At the end of FY21 the total revenue of the Discretionary General Fund was $196M. A fee of approximately 0.25% from this fund would cover all proposed program costs. However, the General Fund is susceptible to fluctuations, which could introduce uncertainty into the long-term health of the program and is not the Commissions' first choice.

The preferred alternative is to allocate a percentage of total revenue from four Special Revenue Funds in the Public Works and Parks departments, as these funds tend to be more stable and citizen engagement will directly benefit both these departments. At the end of FY21 the total revenue of these four funds was almost $100M. A fee of just half a percent - or 0.5% - from the four funds can cover all costs.

Revenue Adopted Update FY21 ($M)

$ 48.7	Zero Waste
27.7	Sewer
14.4	Parks Tax
5.0	Storm Water
---	---
$ 96M	TOTAL

0.5% of $96M = ~$500,000

Funding from the Special Funds is ideal because it's a more stable long-term source. But funding from the General Fund could also be a good strategy, if necessary.

CONTACT PERSON
Margo Schuler, Public Works Commission, (510) 528-1975
Erin Diehm, Parks and Waterfront Commission, (510) 666-0662

Attachments:
1: Resolution
2: Appendices

RESOLUTION NO. ##,###-N.S.

APPROVAL OF AN EXPANDED AND FULLY FUNDED ADOPT-A-SPOT PROGRAM TO POSITIVELY ENGAGE THE COMMUNITY, PROMOTE CIVIC PRIDE, and SUPPORT CLIMATE ACTION GOALS

WHEREAS, beginning in fall 2019 Council introduced the first of four separate Referrals to the Public Works and Parks and Waterfront Commissions with the following dates: (1) April 23, 2019, (2) September 24, 2019, (3) November 12, 2019, and (4) February 23, 2021; and

WHEREAS, the Referrals mentioned a range of goals for the Adopt-a-Spot program, including, supporting city cleanup and maintenance efforts, addressing Vision 2050 storm water and watershed goals, promoting a thriving volunteer force to adopt and maintain traffic circles, creating and maintaining pollinator habitat and funding a City Liaison as part of a Bee City USA program, adopting encampments and street campers/RVs, and more; and

WHEREAS, Berkeley has a long history of volunteerism and community participation, it is critically important to provide a robust program to manage and facilitate citizen efforts; and

WHEREAS, the two commissions conducted research and compiled succinct data in order to determine what was necessary for the successful implementation of this program; and

WHEREAS, we found that many cities and local government agencies in the Bay Area and throughout the U.S. have created robust and comprehensive Adopt-a-Spot programs; and

WHEREAS, a well-run Adopt-a-Spot program will help residents support many of the City's climate, safety and greening goals, including improving stormwater flows, reducing refuse that reaches the Bay, promoting safe and beautiful intersections, mitigating urban heat island effect, monitoring sidewalks for safety, and widespread planting of California-natives to increase urban ecology that supports pollinators and promotes public health; and

WHEREAS, on July 1, 2021 the Public Works Commission and on August 11, 2021, the Parks and Waterfront Commission voted to approve the implementation of an expanded Adopt-A-Spot program, as described above.

NOW THEREFORE, BE IT RESOLVED, that the Council of the City of Berkeley hereby adopts an expanded Adopt-a-Spot program, including two full-time Volunteer Coordinators (2 FTEs) and associated operational costs.

BE IT FURTHER RESOLVED, that the expanded Adopt-a-Spot program shall be paid for by a 0.5% fee on four Special Revenue Funds (Zero Waste, Sewer, Parks, and Storm Water) or, as an alternative, by an approximate 0.25% fee from the General Fund.

APPENDICES

Berkeley

A: Selected Materials from Berkeley's current Adopt-a-Spot program

Other Cities

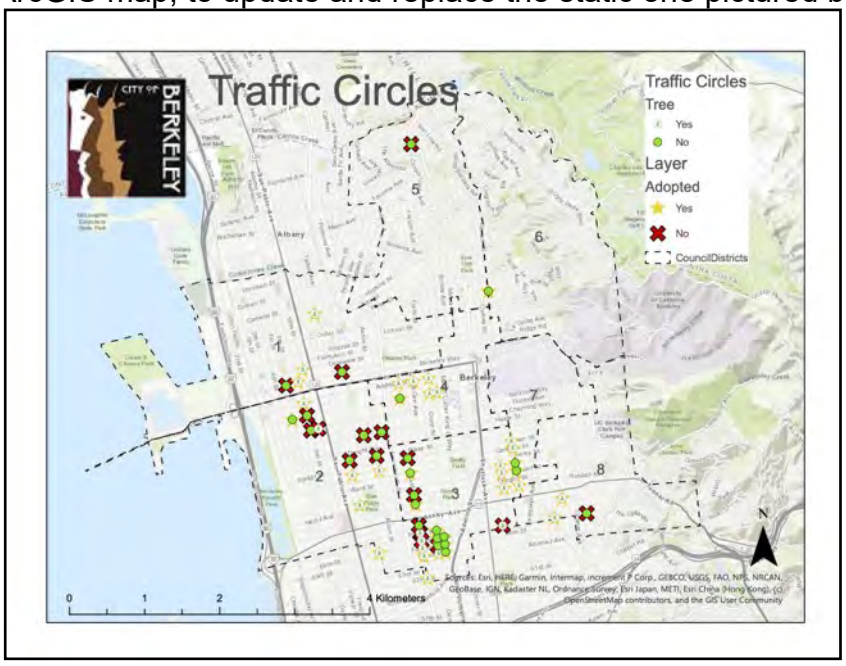
B: Signage
C: Clickable Maps
D: Videos
E: Calendars
F: Brochures
G: Online Grant Application
H: Online Program Application
I: Online Reporting
J: Volunteer Handbook
K: Volunteer Appreciation
L: Native Plants

Research

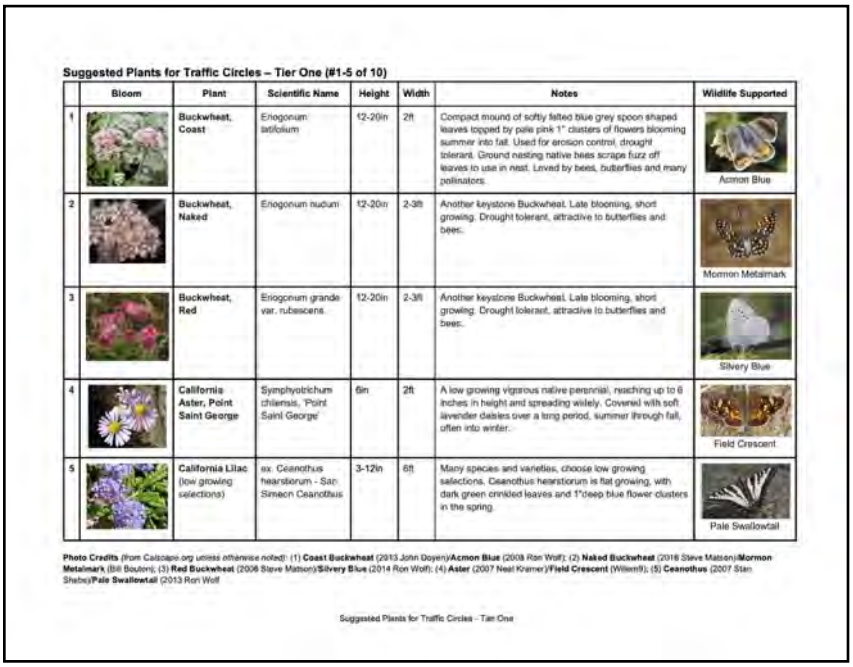
M: Screenshot of Google sheet with details for locations researched

Appendix A: Selected Materials from Berkeley's Adopt-a-Spot program for Traffic Circles
https://www.cityofberkeley.info/adoptatrafficcircle.aspx

Public Works staff shared some exciting news at the June 2021 meeting of the Public Works Commission. They're working with interns and fellows to create a dynamic ArcGIS map, to update and replace the static one pictured below (due Summer 2021).



Berkeley's Map of Traffic Circles - Identifies circles, adopted and available



Suggested Plants for Traffic Circles – Tier One (#1-5 of 10)

	Bloom	Plant	Scientific Name	Height	Width	Notes	Wildlife Supported
1		**Buckwheat, Coast**	Eriogonum latifolium	12-20in	2ft	Compact mound of softly felted blue grey spoon shaped leaves topped by pale pink 1" clusters of flowers blooming summer into fall. Used for erosion control, drought tolerant. Ground nesting native bees scrape fuzz off leaves to use in nest. Loved by bees, butterflies and many pollinators.	Acmon Blue
2		**Buckwheat, Naked**	Eriogonum nudum	12-20in	2-3ft	Another keystone Buckwheat. Late blooming, short growing. Drought tolerant, attractive to butterflies and bees.	Mormon Metalmark
3		**Buckwheat, Red**	Eriogonum grande var. rubescens	12-20in	2-3ft	Another keystone Buckwheat. Late blooming, short growing. Drought tolerant, attractive to butterflies and bees.	Silvery Blue
4		**California Aster, Point Saint George**	Symphyotrichum chilense, 'Point Saint George'	6in	2ft	A low growing vigorous native perennial, reaching up to 6 inches in height and spreading widely. Covered with soft lavender daisies over a long period, summer through fall, often into winter.	Field Crescent
5		**California Lilac** (low growing selections)	ex. Ceanothus hearstiorum - San Simeon Ceanothus	3-12in	6ft	Many species and varieties, choose low growing selections. Ceanothus hearstiorum is flat growing, with dark green crinkled leaves and 1"deep blue flower clusters in the spring.	Pale Swallowtail

Photo Credits (from Calscape.org unless otherwise noted): (1) **Coast Buckwheat** (2013 John Doyen)/**Acmon Blue** (2008 Ron Wolf); (2) **Naked Buckwheat** (2016 Steve Matson)/**Mormon Metalmark** (Bill Bouton); (3) **Red Buckwheat** (2006 Steve Matson)/**Silvery Blue** (2014 Ron Wolf); (4) **Aster** (2007 Neal Kramer)/**Field Crescent** (Willem9); (5) **Ceanothus** (2007 Stan Shebs)/**Pale Swallowtail** (2013 Ron Wolf

Suggested Plants for Traffic Circles - Tier One

Berkeley's Suggested plantings for traffic circles (1 of 4 pages, 20 plants total)
Focus is on CA natives that support butterflies, bees and birds.

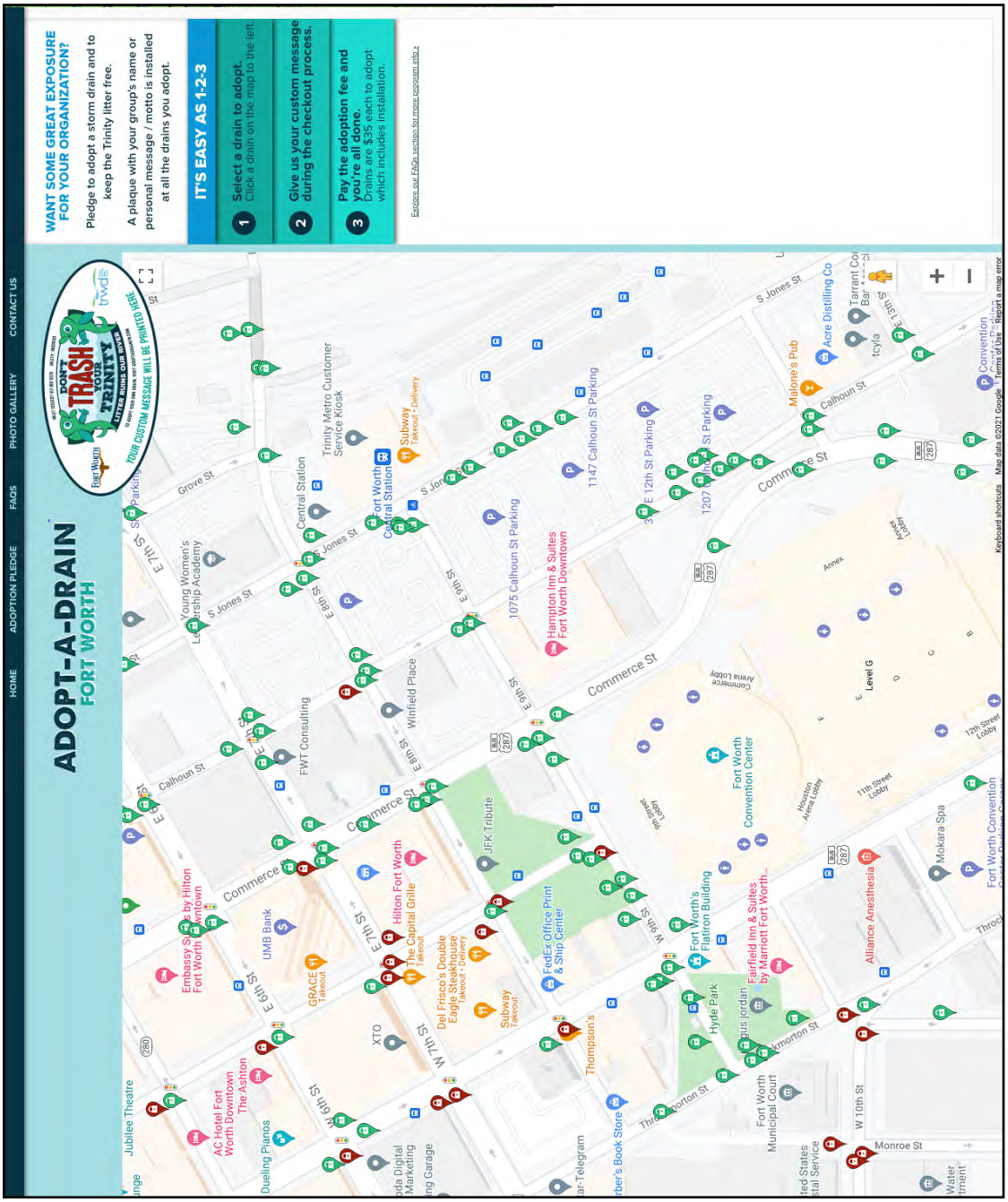
Appendix B: Examples of Signage
Signage identifies spots that are either available or already adopted, sometimes including the name of the adopting party. The signs are placed directly in the public space or marked on GIS maps, and help recruit new volunteers and acknowledge existing ones.

Examples of Adopt-a-Spot Signage		
Adopted		
 Indianapolis, IN	 Vancouver, Canada	 Muncie, DE
Available		
 Vancouver, Canada	 Truckee, CA	 Greene Co., OH
 Atlanta, GA	 Saginaw, TX	 Marin, CA

Appendix C: Examples of Clickable Maps

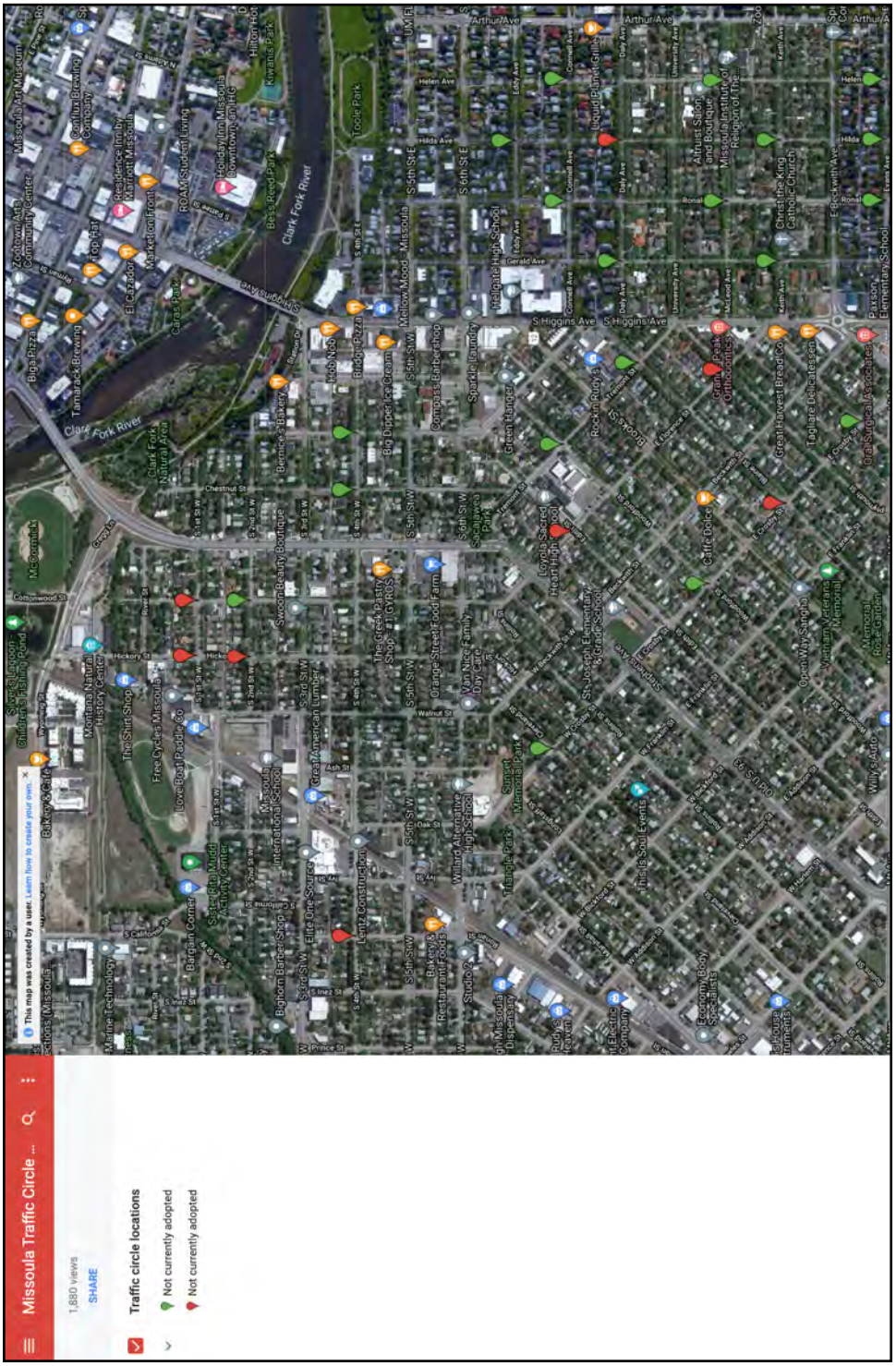
Usually color-coded to identify availability.

Storm Drains



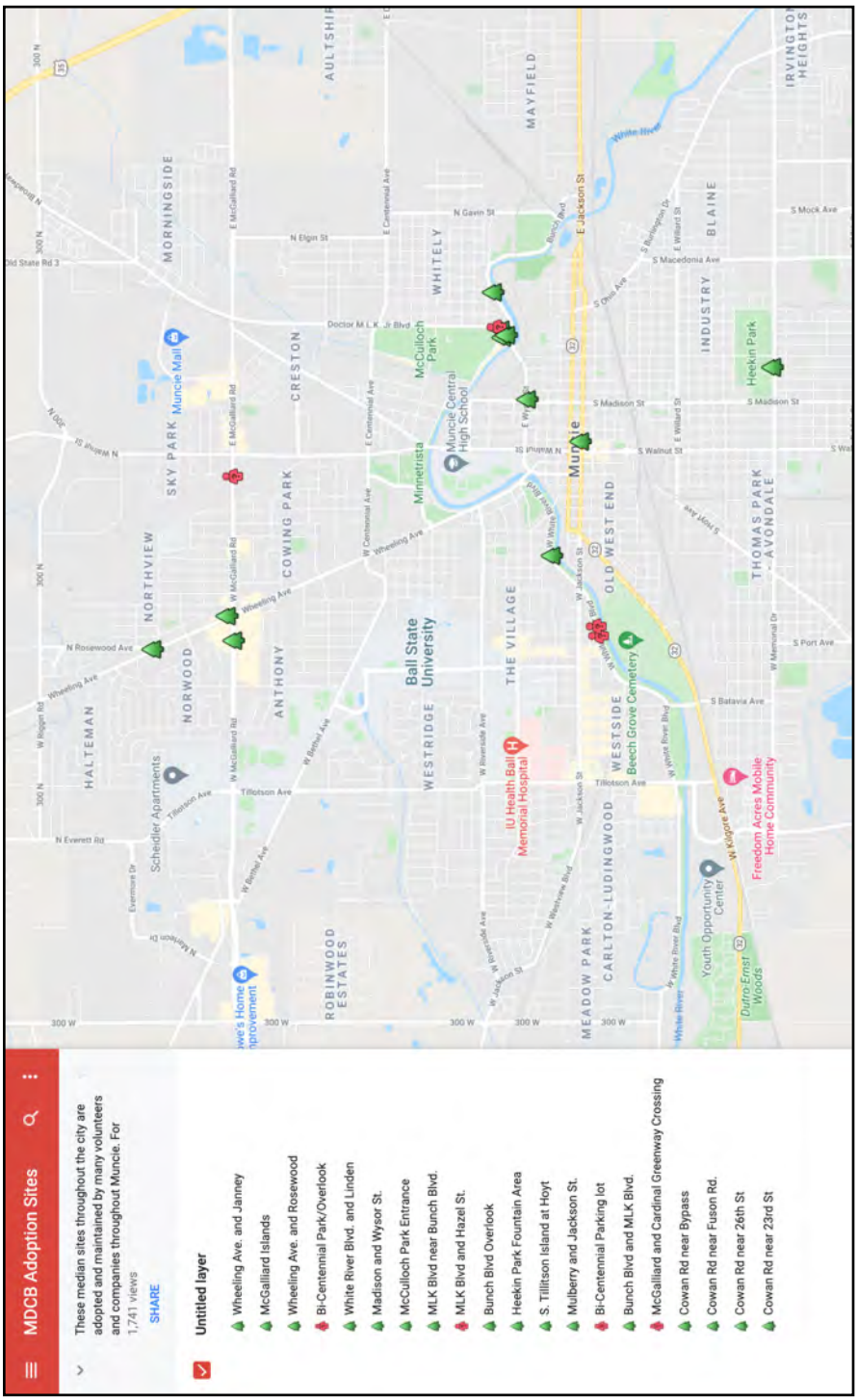
Fort Worth, TX - Adopt a Drain
Green ("unlocked") = available
Red ("locked") = adopted (name of adopting party - not published)

Traffic Circles



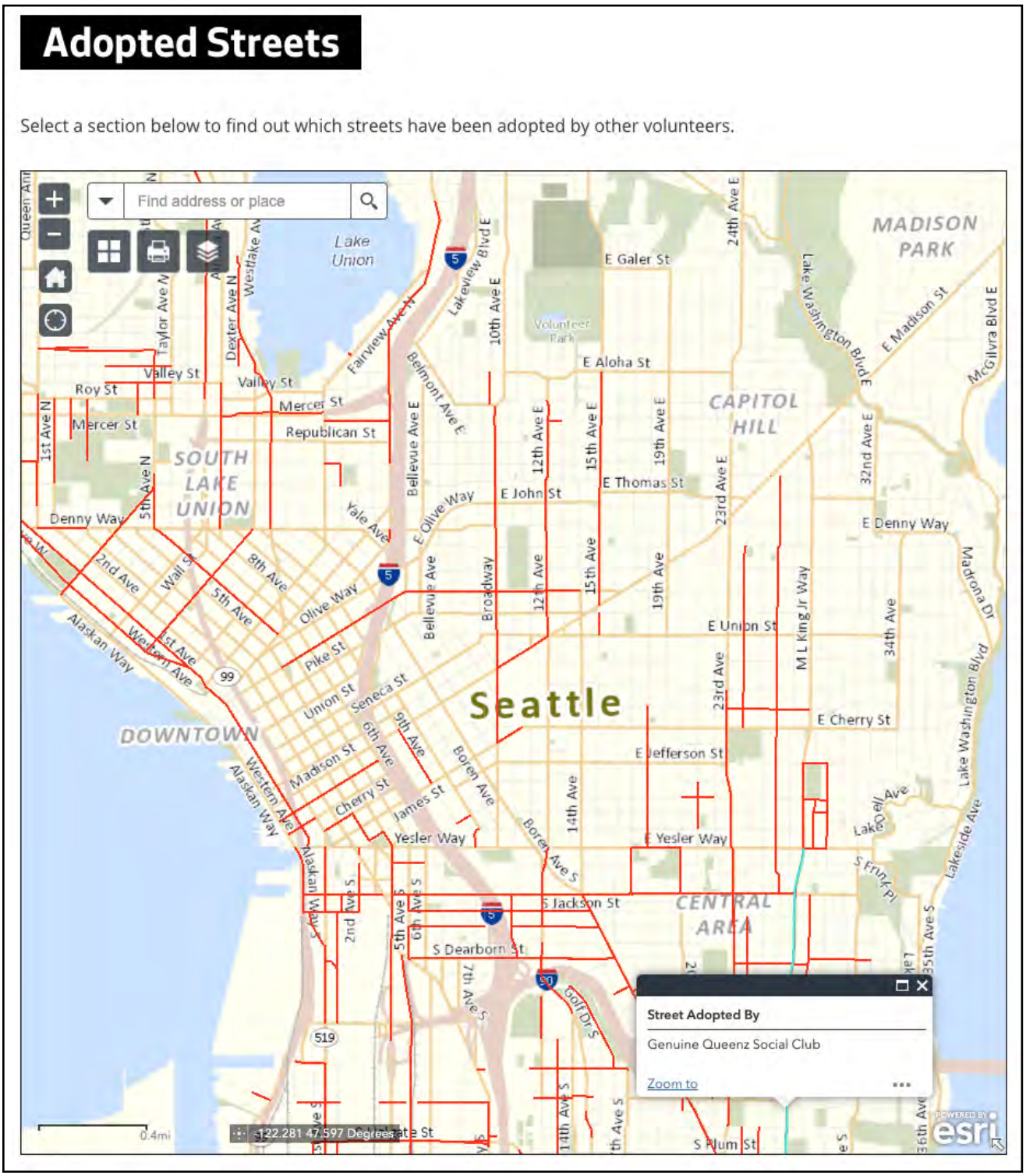
Missoula, MT - Adopt a Traffic Circle
Green = adopted (name of adopting party - published)
Red = available

Medians



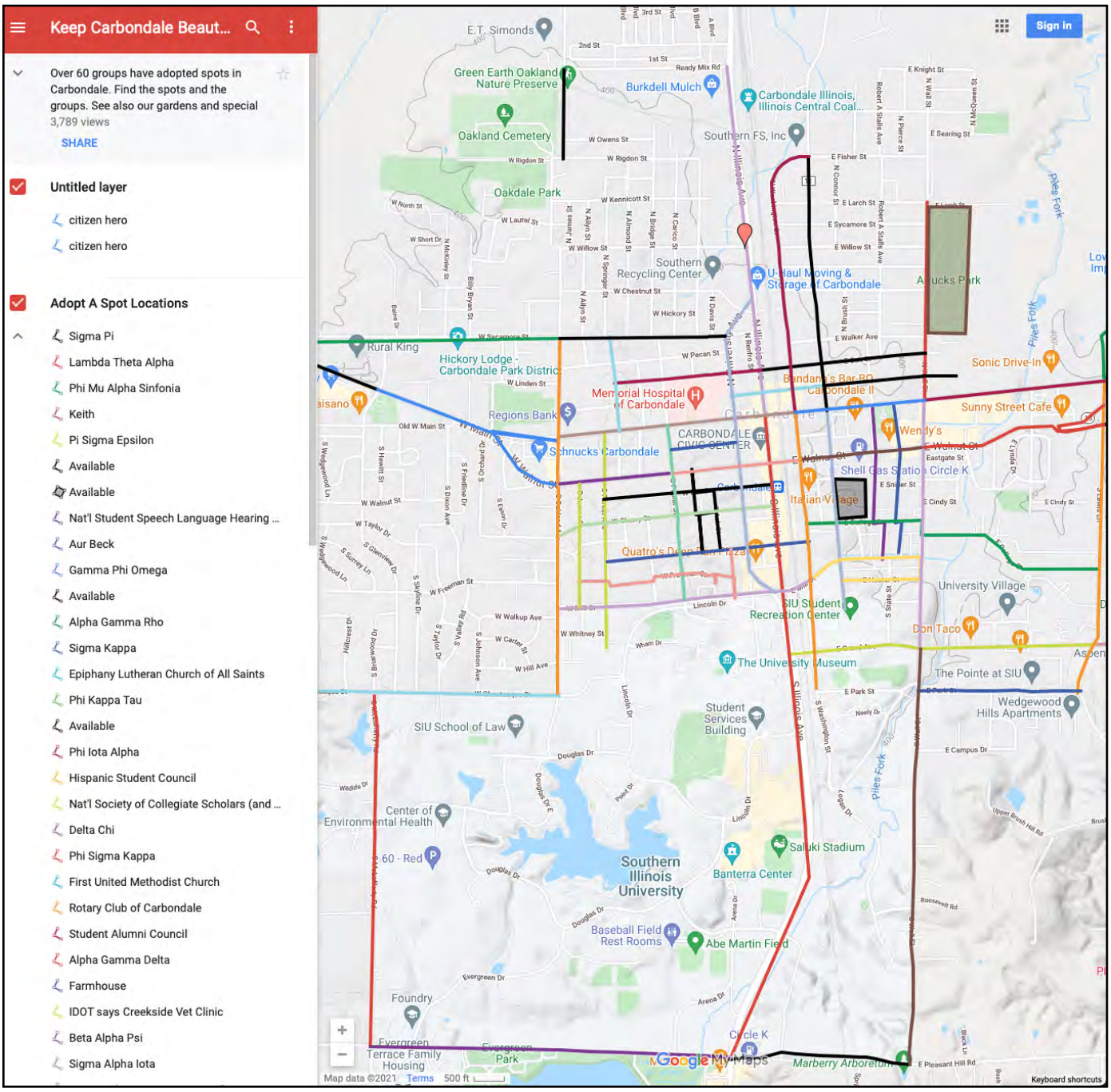
Muncie, Delaware - Adopt a Median
Green = adopted (name of adopting party - published)
Red = available

Streets



Seattle, WA - Adopt a Street
Red (turns **green** when clicked) = adopted (name of adopting party - published)

Litter



Carbondale, IL - Adopt-a-Spot (Keep Carbondale Beautiful)
Color-coded by adoptee, “Citizen Hero”. Many are fraternities and sororities.

Appendix D: Examples of Videos from Programs in Other Cities

General (1 min.)

San Angelo, TX - Adopt a Spot
Includes contact information for signing up

Drains (1 min. 21 sec.)

Riverside, CA - Adopt a Drain
Encourages volunteers to post photos to Facebook and Instagram

Litter (1 min 5 sec)

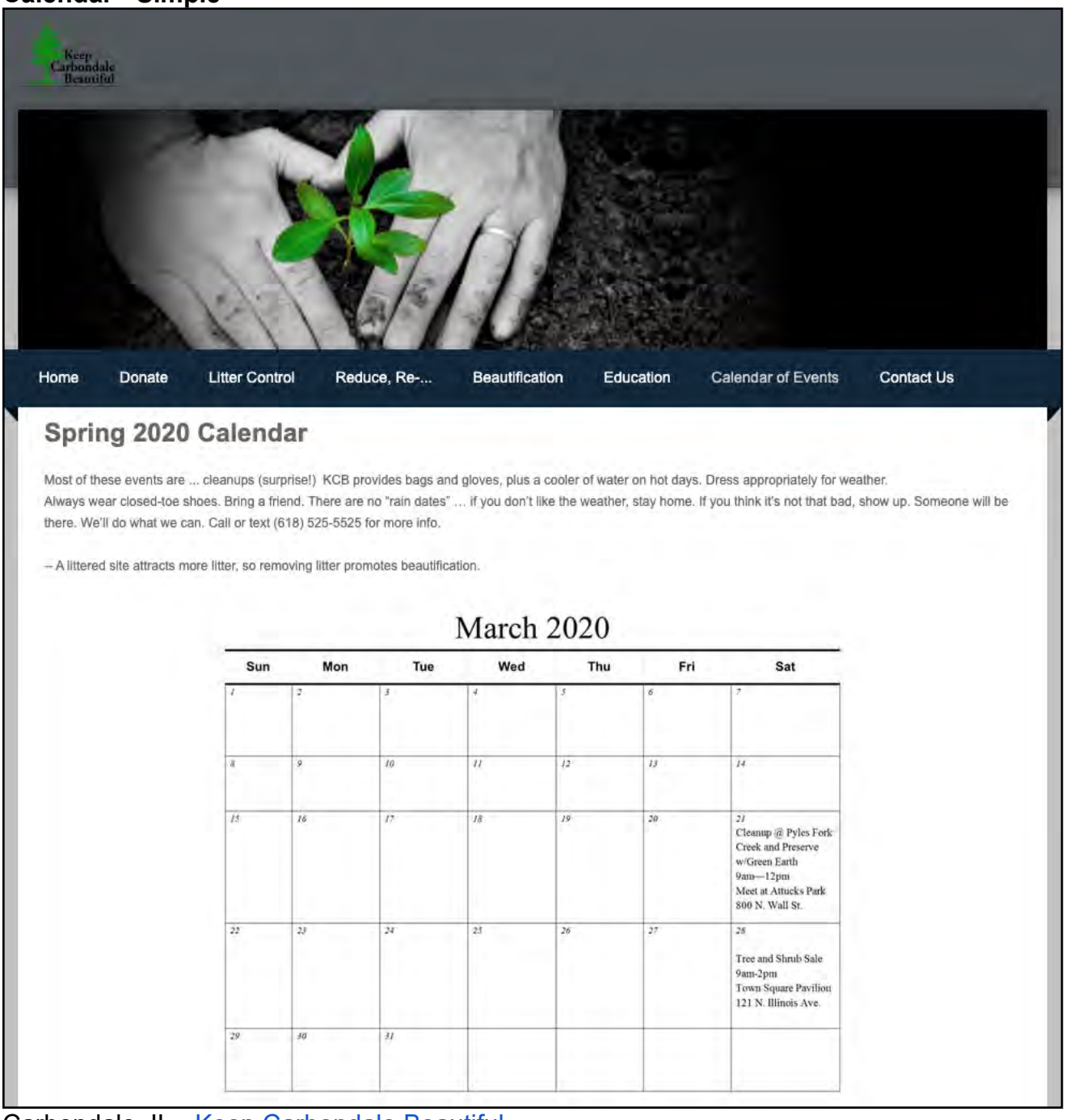
Hampton, VA - We Put Litter In Its Place #4
End of video gives contact information for signing up

Medians - News Segment (2 min. 26 sec.)

Albuquerque, NM - Adopt-a-Median
Includes city staff describing plans to expand program

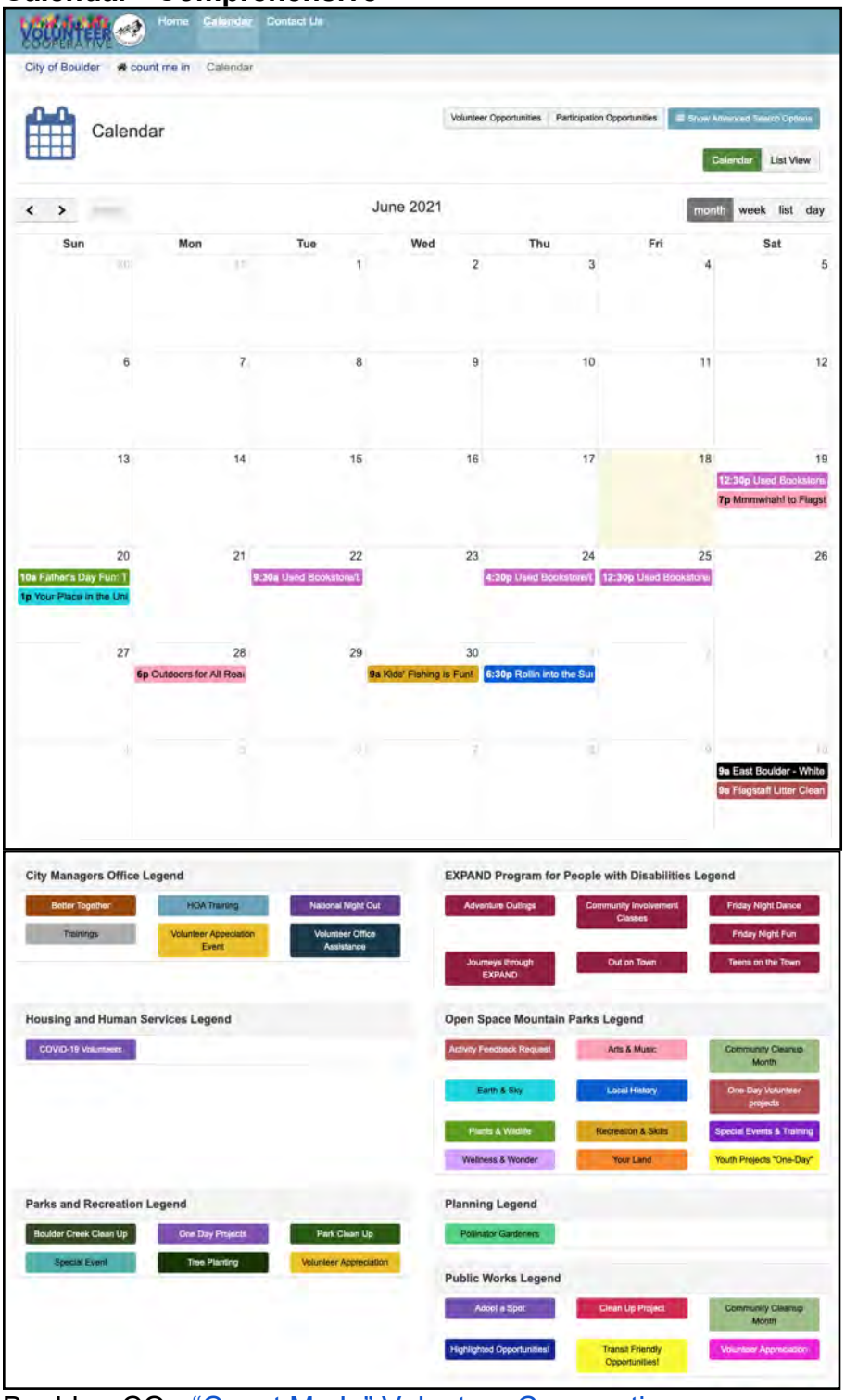
Appendix E: Examples of Calendars

Calendar - Simple



Carbondale, IL - Keep Carbondale Beautiful

Calendar - Comprehensive



Boulder, CO - [“Count Me In” Volunteer Cooperative]
Calendar for all city-sponsored events. Filters by event type, department and activity.

Appendix F: Examples of Brochures

Brochure - Medians/Rain Gardens

Adopt a Rain Garden

Rain gardens on publicly owned land capture storm run-off water, allowing plants to filter out pollutants before the water infiltrates the ground. They are located across Madison in parks and city land.

Volunteers perform seasonal clean-up by removing dead plant material and replenishing mulch. Maintenance tasks include weeding, litter removal and planting supplemental plants provided by the City as needed.

Benefits of Adopting a Median/Rain Garden

- Beautify your neighborhood.
- Help the environment.
- Meet your neighbors and grow your neighborhood or homeowners' association.
- Safety vests are fashionable! Get yours for free.
- Free mulch and monetary reimbursement for qualifying plant purchases.
- Play outside!
- Makes for a great service project.

Adopt a Median Program

www.cityofmadison.com/transportation/roadworks/adoptamedian

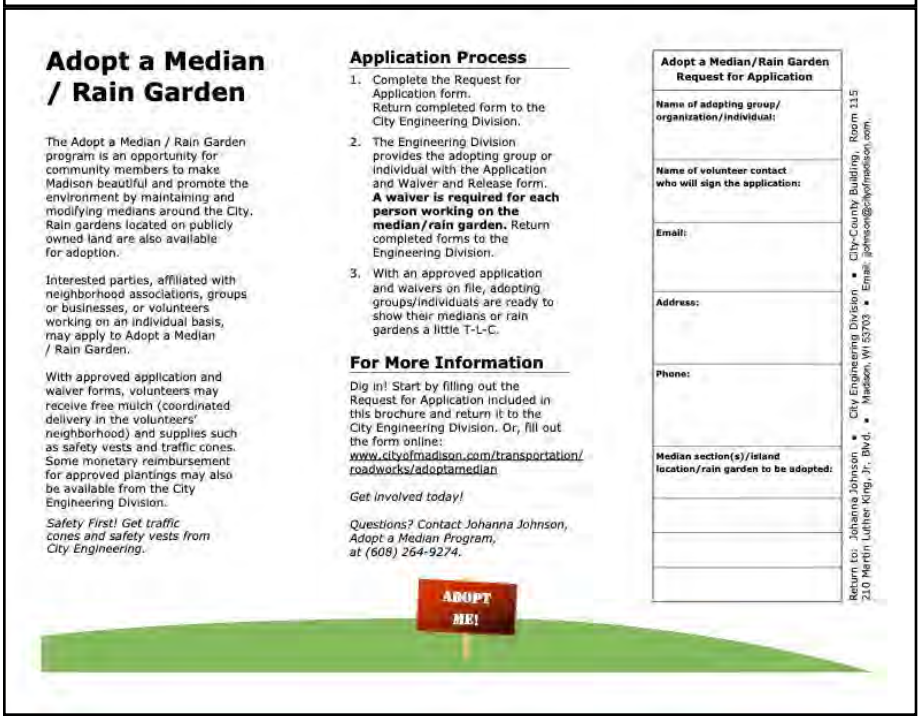
Johanna Johnson
Adopt a Median Program Coordinator
Phone: (608) 264-9274
Fax: (608) 264-9275
Email: jjohnson@cityofmadison.com

City of Madison Engineering Division
City-County Building, Room 115
210 Martin Luther King, Jr. Blvd.
Madison, WI 53703

Cover photo credit: Chuck Kime

Adopt a Median / Rain Garden Volunteer Opportunity

City of Madison
Engineering Division



Adopt a Median / Rain Garden

The Adopt a Median / Rain Garden program is an opportunity for community members to make Madison beautiful and promote the environment by maintaining and modifying medians around the City. Rain gardens located on publicly owned land are also available for adoption.

Interested parties, affiliated with neighborhood associations, groups or businesses, or volunteers working on an individual basis, may apply to Adopt a Median / Rain Garden.

With approved application and waiver forms, volunteers may receive free mulch (coordinated delivery in the volunteers' neighborhood) and supplies such as safety vests and traffic cones. Some monetary reimbursement for approved plantings may also be available from the City Engineering Division.

Safety First! Get traffic cones and safety vests from City Engineering.

Application Process

1. Complete the Request for Application form. Return completed form to the City Engineering Division.
2. The Engineering Division provides the adopting group or individual with the Application and Waiver and Release form. **A waiver is required for each person working on the median/rain garden.** Return completed forms to the Engineering Division.
3. With an approved application and waivers on file, adopting groups/individuals are ready to show their medians or rain gardens a little T-L-C.

For More Information

Dig in! Start by filling out the Request for Application included in this brochure and return it to the City Engineering Division. Or, fill out the form online: www.cityofmadison.com/transportation/roadworks/adoptamedian

Get involved today!

Questions? Contact Johanna Johnson, Adopt a Median Program, at (608) 264-9274.

ADOPT ME!

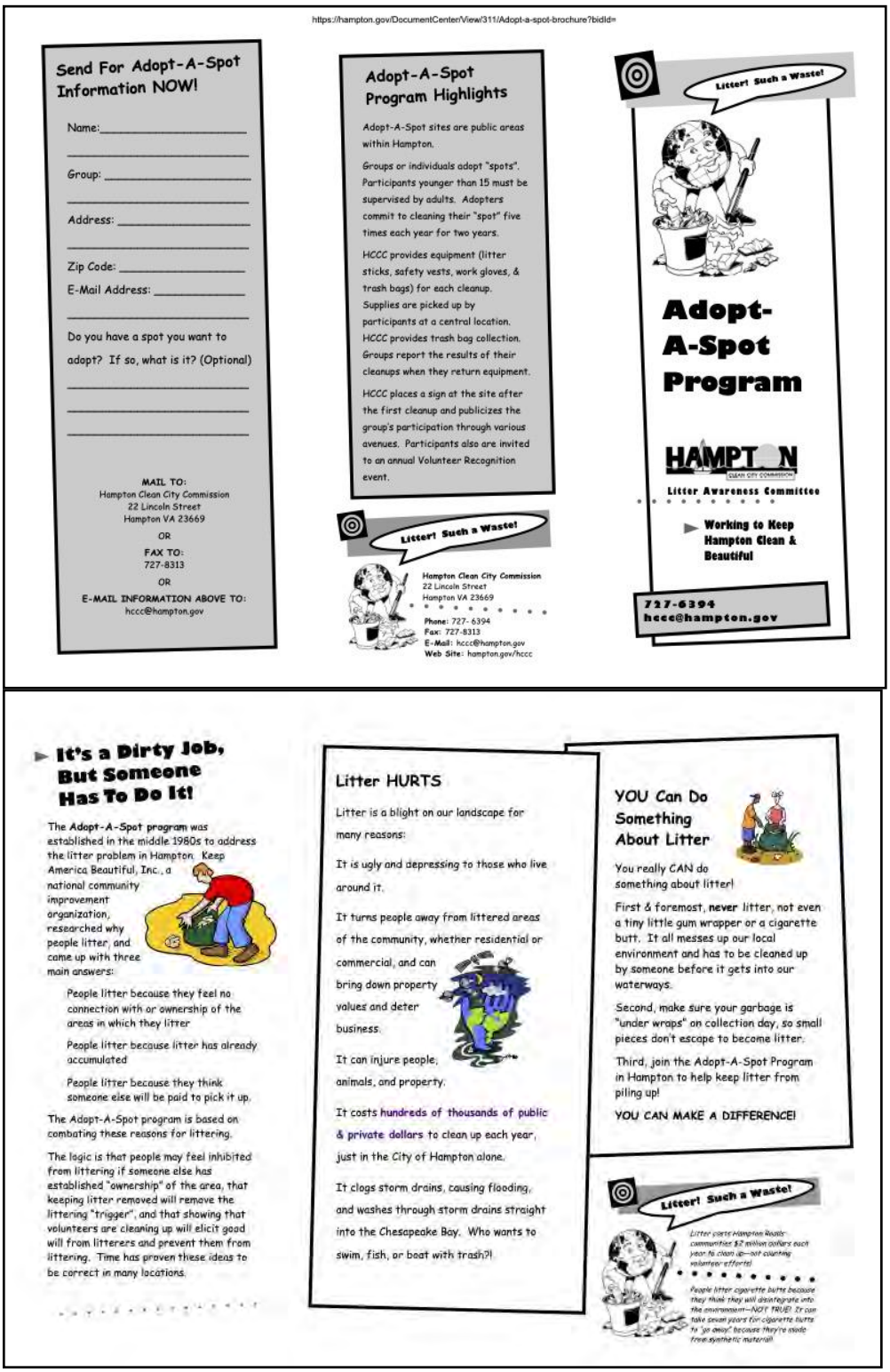
Adopt a Median/Rain Garden Request for Application

Name of adopting group/ organization/individual:
Name of volunteer contact who will sign the application:
Email:
Address:
Phone:
Median section(s)/island location/rain garden to be adopted:

Return to: Johanna Johnson ▪ City Engineering Division ▪ City-County Building, Room 115
210 Martin Luther King, Jr. Blvd. ▪ Madison, WI 53703 ▪ Email: jjohnson@cityofmadison.com

Madison, WI - Adopt-a-Median or Rain Garden
Tri-fold, includes application

Brochure - Litter



Hampton, VA - Adopt-a-Spot Litter program

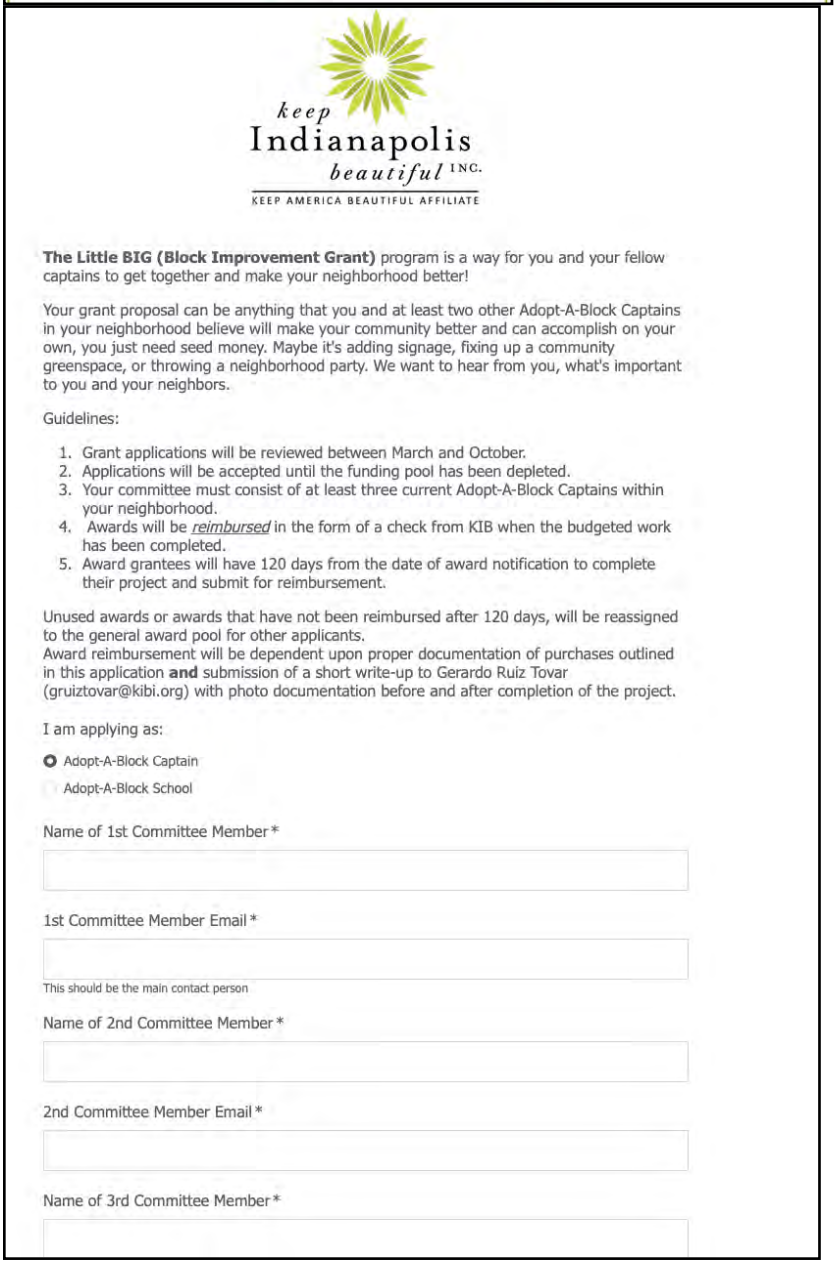
Appendix G: Example of Online Grant Application

LITTLE BIG AWARDS (ADOPT-A-BLOCK GRANTS)

Our Little BIG (Block Improvement Grant) Awards are grants of up to $500 for Adopt-A-Block Captains to coordinate with each other to make their neighborhoods better. Each applicant group must include at least three Adopt-A-Block Captains. This way we can span multiple blocks and help neighbors work together.

To read the grant details and apply, please click the link below.

LITTLE BIG GRANT APPLICATION



keep Indianapolis beautiful INC.

KEEP AMERICA BEAUTIFUL AFFILIATE

The Little BIG (Block Improvement Grant) program is a way for you and your fellow captains to get together and make your neighborhood better!

Your grant proposal can be anything that you and at least two other Adopt-A-Block Captains in your neighborhood believe will make your community better and can accomplish on your own, you just need seed money. Maybe it's adding signage, fixing up a community greenspace, or throwing a neighborhood party. We want to hear from you, what's important to you and your neighbors.

Guidelines:

1. Grant applications will be reviewed between March and October.
2. Applications will be accepted until the funding pool has been depleted.
3. Your committee must consist of at least three current Adopt-A-Block Captains within your neighborhood.
4. Awards will be *reimbursed* in the form of a check from KIB when the budgeted work has been completed.
5. Award grantees will have 120 days from the date of award notification to complete their project and submit for reimbursement.

Unused awards or awards that have not been reimbursed after 120 days, will be reassigned to the general award pool for other applicants.
Award reimbursement will be dependent upon proper documentation of purchases outlined in this application **and** submission of a short write-up to Gerardo Ruiz Tovar (gruiztovar@kibi.org) with photo documentation before and after completion of the project.

I am applying as:

- (•) Adopt-A-Block Captain
- ( ) Adopt-A-Block School

Name of 1st Committee Member *

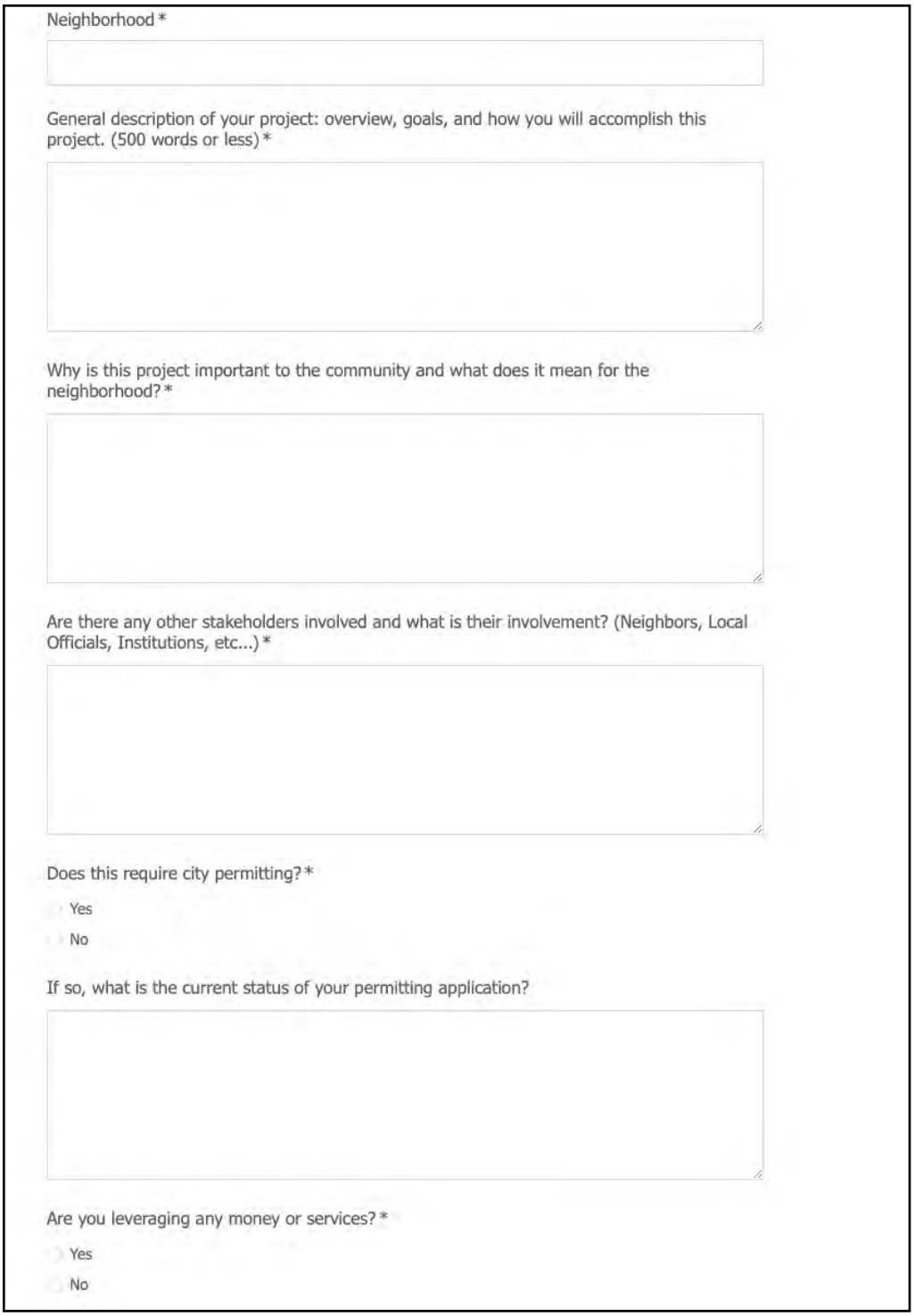
1st Committee Member Email *

This should be the main contact person

Name of 2nd Committee Member *

2nd Committee Member Email *

Name of 3rd Committee Member *



Neighborhood *

General description of your project: overview, goals, and how you will accomplish this project. (500 words or less) *

Why is this project important to the community and what does it mean for the neighborhood? *

Are there any other stakeholders involved and what is their involvement? (Neighbors, Local Officials, Institutions, etc...) *

Does this require city permitting? *

- Yes
- No

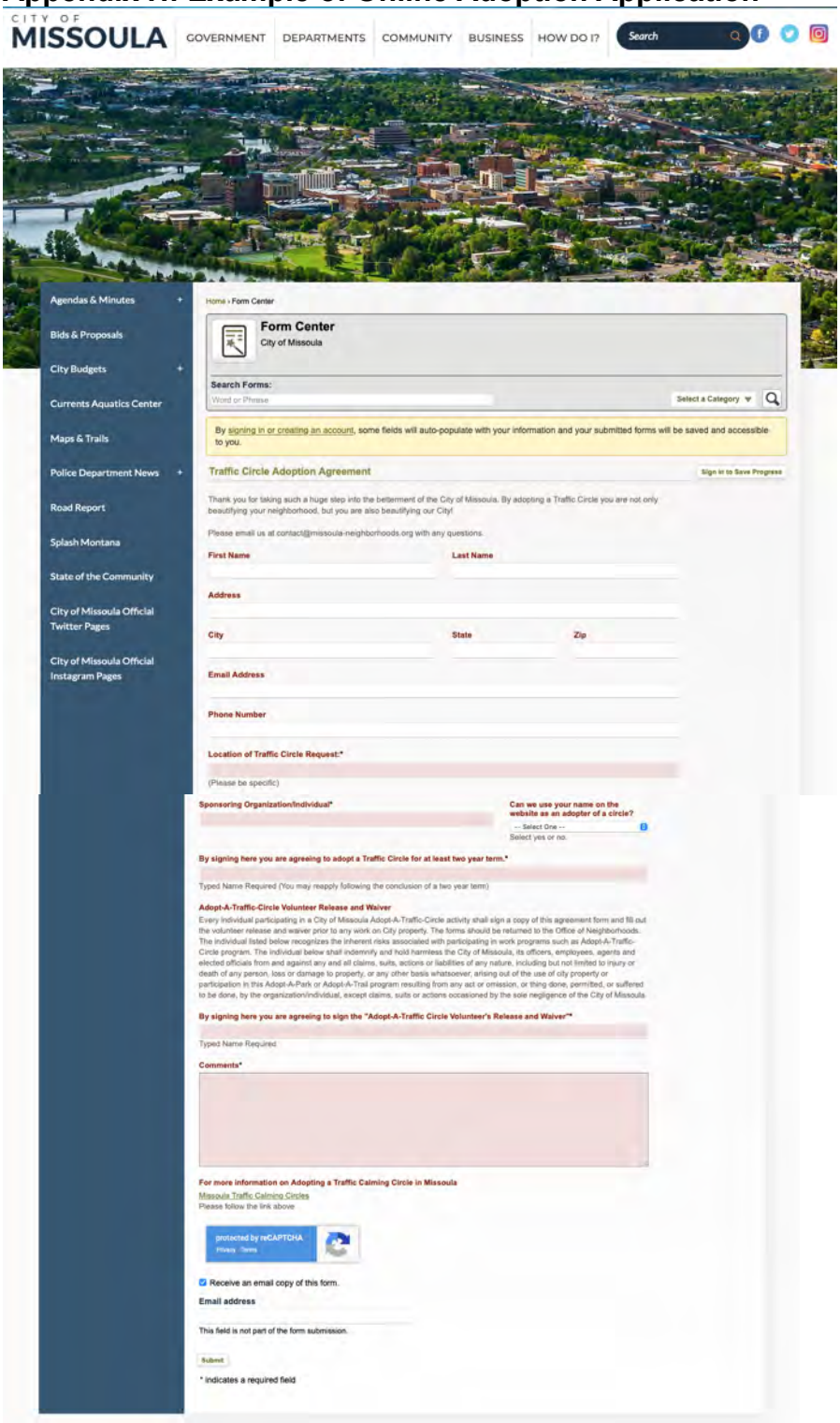
If so, what is the current status of your permitting application?

Are you leveraging any money or services? *

- Yes
- No

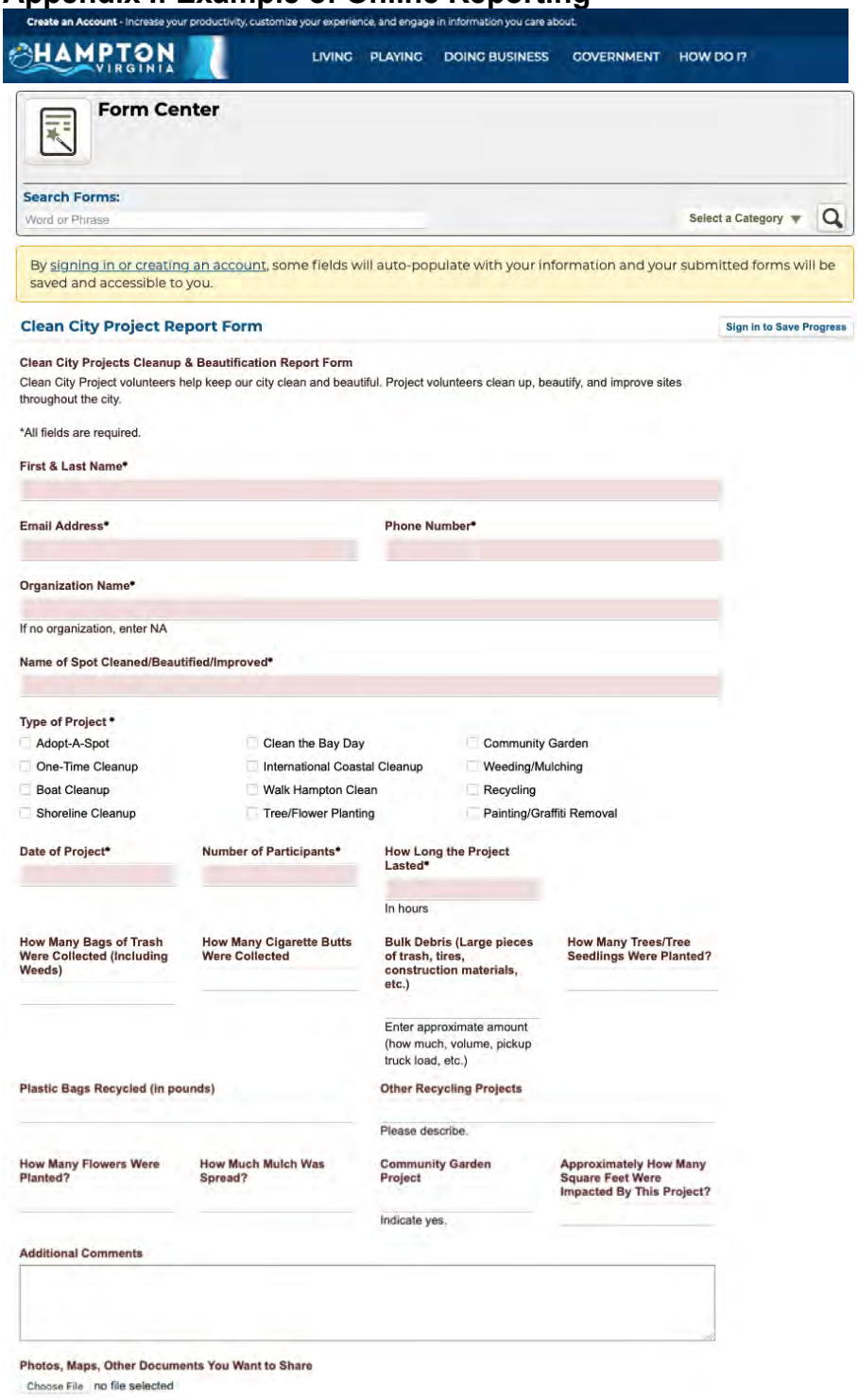
Indianapolis, IN - Adopt-a-Block - apply for grant online (up to $500)

Appendix H: Example of Online Adoption Application



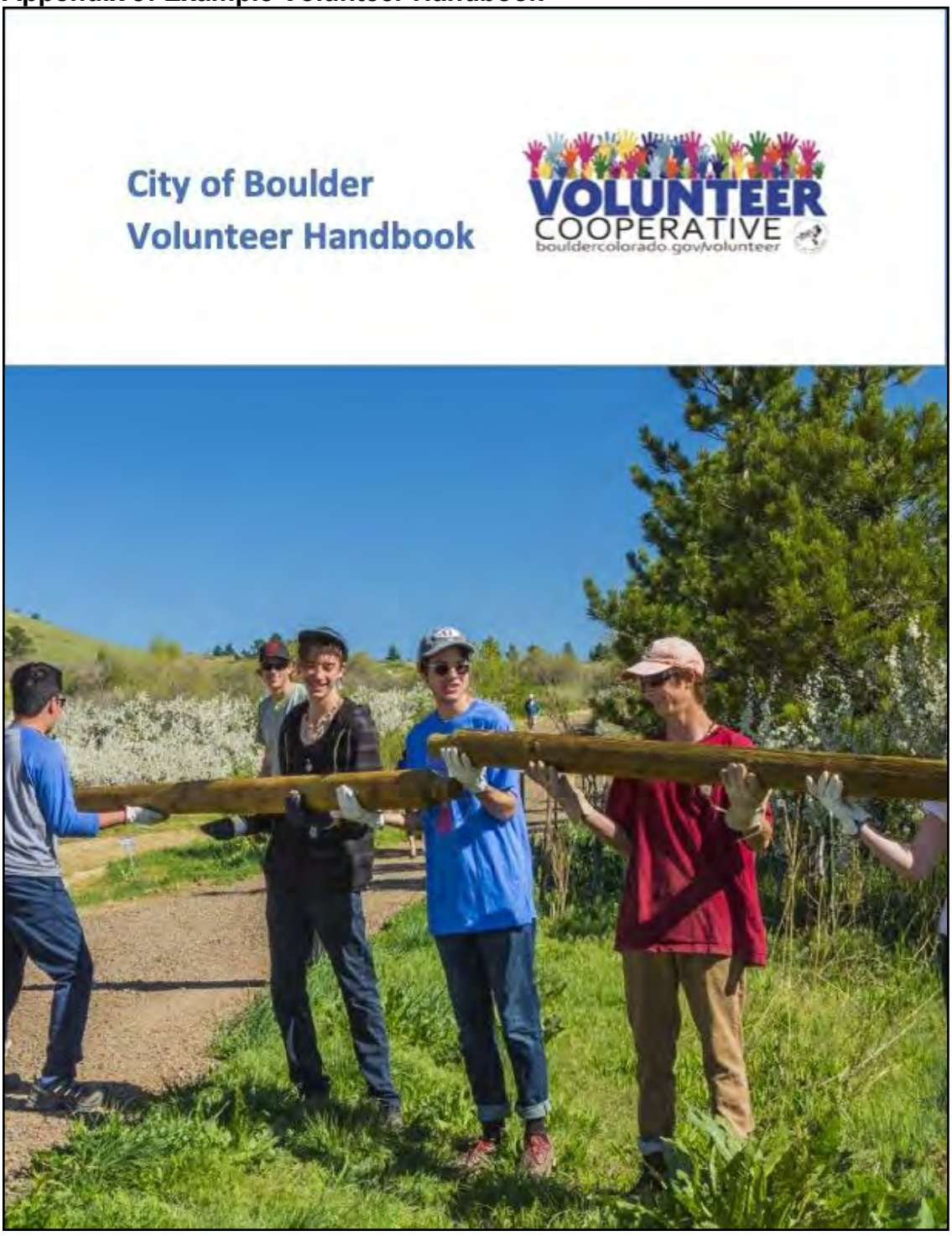
Missoula, MT -Traffic Circles - Application Form

Appendix I: Example of Online Reporting



Hampton, VA - Adopt-a-Spot - Reporting Form
For 16 available programs

Appendix J: Example Volunteer Handbook



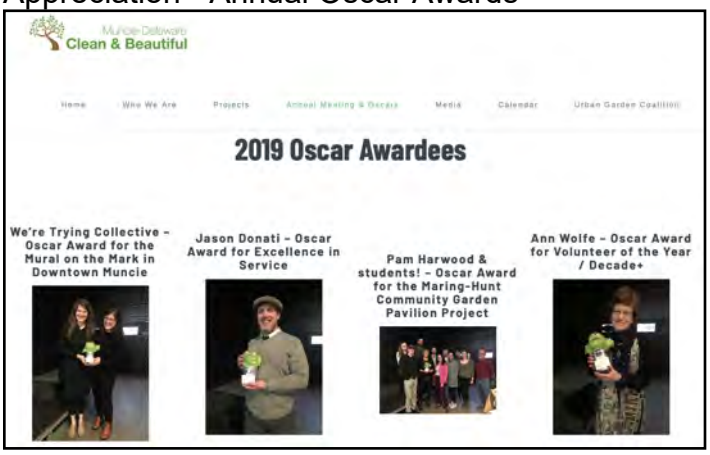
Boulder, CO - Volunteer Cooperative - Volunteer Handbook

Appendix K: Examples of Volunteer Appreciation

Appreciation - Annual Party and Awards

Boulder, CO - Volunteer Appreciation

Appreciation - Annual Oscar Awards



Muncie, DE - Annual "Oscar" Awards and Party

Annual Beautification Party and Award

Prince George's County, MD - Annual Beautification Award Ceremony (pg. 20)

Appreciation - Annual Award Recipients

Volunteer Recognition Award Recipients

The Annual Volunteer Recognition Luncheon celebrates the contributions of the County's

Retired and Senior Volunteer Program (RSVP) and Foster Grandparent Program participants. Each year, the event is held in May to commemorate Older Americans Month and celebrate the achievements made by older adults.

2019 Award Recipients

Grandpa Brenon Washington
Outstanding New Volunteer Award

Mr. Brenon Washington is a Foster Grandparent at Francis T. Evans Elementary School in Clinton, MD. He volunteers five days a week and is dedicated to making a difference in the lives of his 2nd graders, whom he works with daily, assisting them with their reading skills. The children mirror his enthusiasm for learning and are attentive when he speaks. Grandpa Washington is truly making a difference and is trying to recruit more male volunteers.

Diane Williams
Outstanding Service Award

Ms. Diane Williams has been a Foster Grandparent volunteer at H. Winship Wheatley Special Center, in Capitol Heights, for 12 years. Grandma Williams' Pre K class looks forward to her cherry "Good Morning" every day. She encourages the children to use their words and helps them with their social and emotional development. Ms. Williams has left a legacy that will live on in the lives of the children she has helped nurture.

Carolyn Hammiel
Volunteer Leadership Award

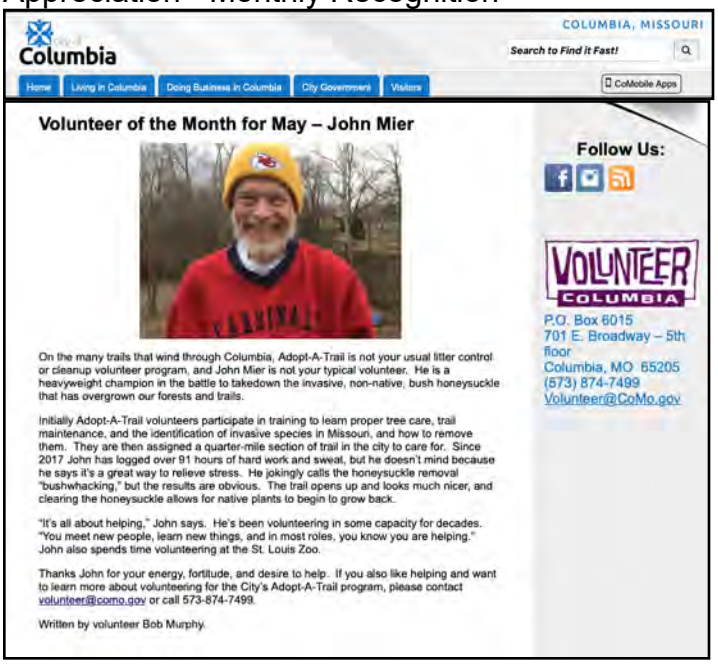
Grandma Carol volunteers at Avalon Elementary School in Fort Washington, MD, where she has helped a non-verbal student, in particular, through patience and love. Having had a daughter with developmental challenges, Grandma Carol has poured that same special grace and dedication with her student at Avalon Elementary. As a result, the student is now able to speak and form full sentences because of Ms. Hammiel's efforts. Grandma Carol is truly a leader and always gives 100% to her students.

Ms. Ernestine Vaughn
Ruby Peyton Award

Ms. Earnestine Vaughn volunteers at H. Wheatley Early Childhood Center in Capital Heights and has been an active volunteer for 15 years, working mainly with children on the autism spectrum. Described by school teachers as thoughtful, compassionate, dependable, strong and hands on - Grandma Vaughn has worked in some of the most challenging classrooms. She offers words of encouragement and is known to gently redirect behavioral situations into positive outcomes. Grandma Vaughn is a team player that brings a mature structure into the classroom.

Prince George's County, MD - Annual Volunteer Awards

Appreciation - Monthly Recognition



City of Columbia

COLUMBIA, MISSOURI

Search to Find it Fast!

Home | Living in Columbia | Doing Business in Columbia | City Government | Visitors | CoMobile Apps

Volunteer of the Month for May – John Mier

On the many trails that wind through Columbia, Adopt-A-Trail is not your usual litter control or cleanup volunteer program, and John Mier is not your typical volunteer. He is a heavyweight champion in the battle to takedown the invasive, non-native, bush honeysuckle that has overgrown our forests and trails.

Initially Adopt-A-Trail volunteers participate in training to learn proper tree care, trail maintenance, and the identification of invasive species in Missouri, and how to remove them. They are then assigned a quarter-mile section of trail in the city to care for. Since 2017 John has logged over 91 hours of hard work and sweat, but he doesn't mind because he says it's a great way to relieve stress. He jokingly calls the honeysuckle removal "bushwhacking," but the results are obvious. The trail opens up and looks much nicer, and clearing the honeysuckle allows for native plants to begin to grow back.

"It's all about helping," John says. He's been volunteering in some capacity for decades. "You meet new people, learn new things, and in most roles, you know you are helping." John also spends time volunteering at the St. Louis Zoo.

Thanks John for your energy, fortitude, and desire to help. If you also like helping and want to learn more about volunteering for the City's Adopt-A-Trail program, please contact volunteer@como.gov or call 573-874-7499.

Written by volunteer Bob Murphy.

Follow Us:

VOLUNTEER COLUMBIA

P.O. Box 6015
701 E. Broadway – 5th floor
Columbia, MO 65205
(573) 874-7499
Volunteer@CoMo.gov

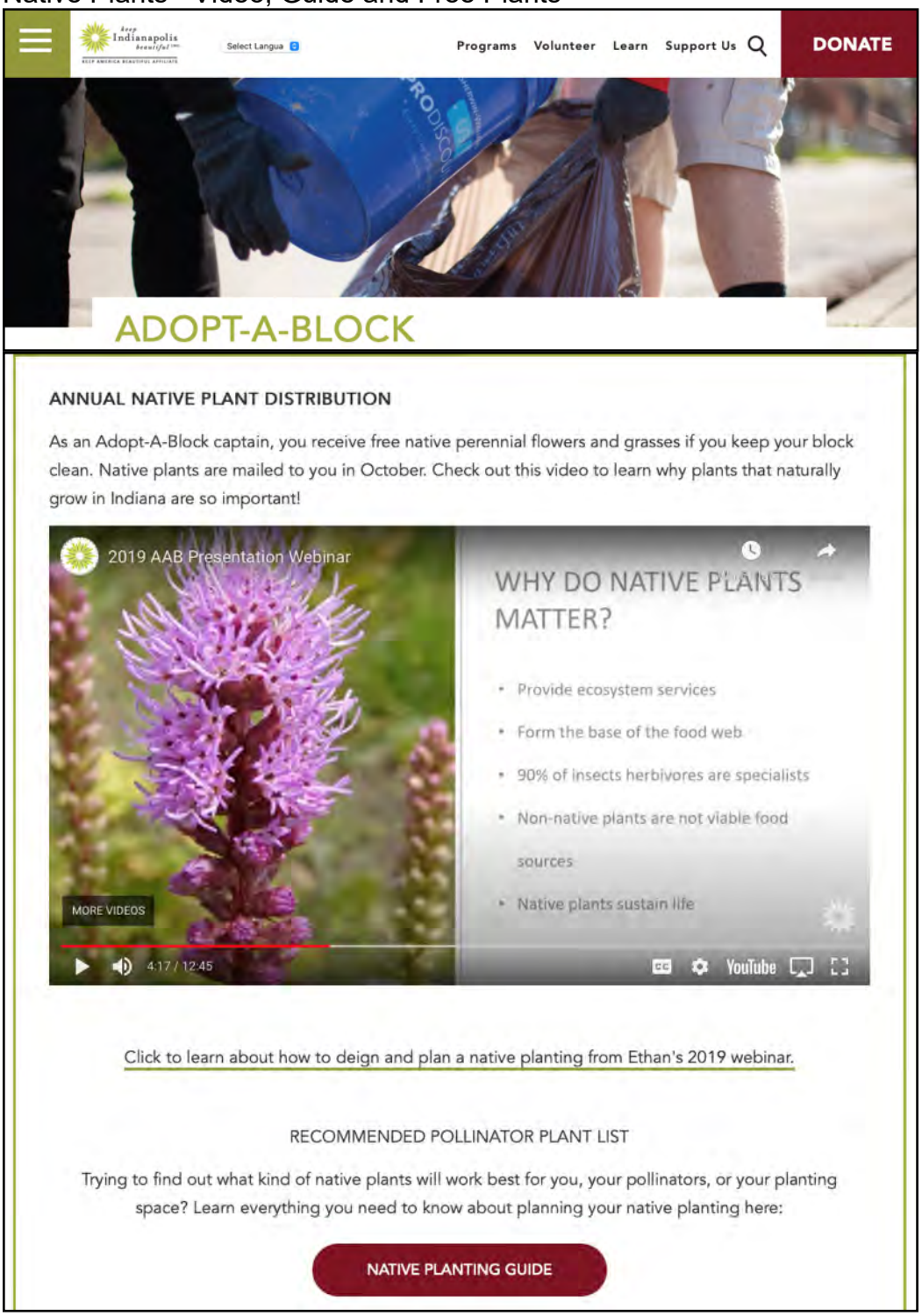
Columbia, MO - Volunteer of the Month

Appreciation - Quarterly Recognition

Santa Fe, NM - Keep Santa Fe Beautiful - Median of the Quarter

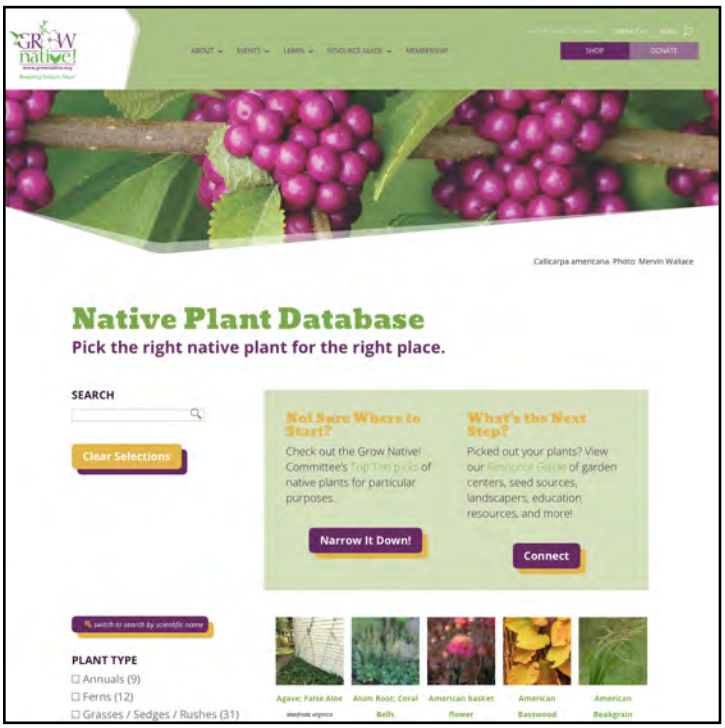
Appendix L: Examples of Native Plants

Native Plants - Video, Guide and Free Plants



Indianapolis, IN - Adopt a Block - Designing a Native Plant Garden

Native Plants - Database

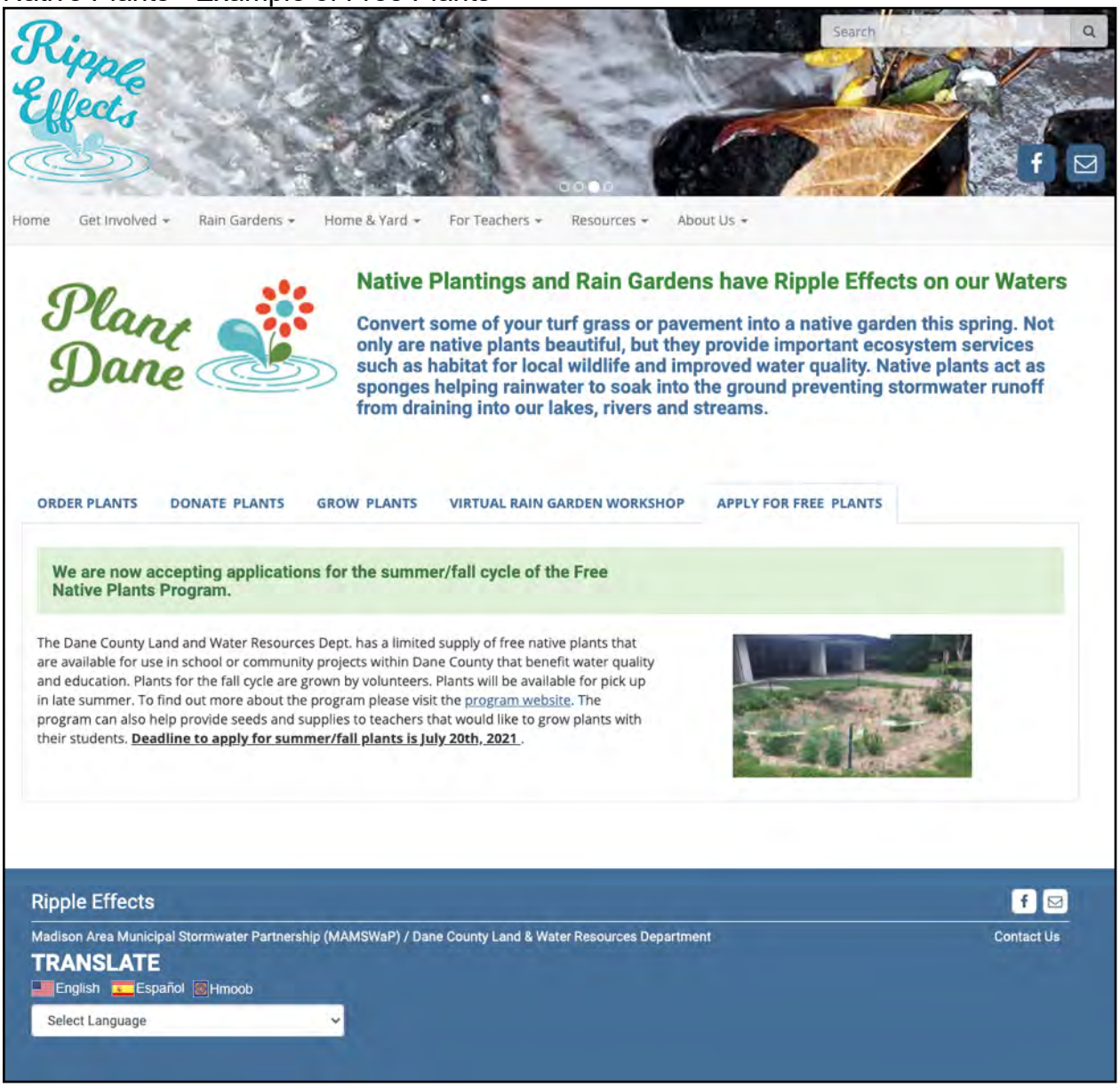


Columbia, MO - Adopt-a-Spot - Resources for Native Plantings - Missouri Prairie Foundation

Native Plants - Guide

Columbia, MO - Adopt-a-Spot - Resources for Native Plantings - Info from the Missouri Dept of Conservation

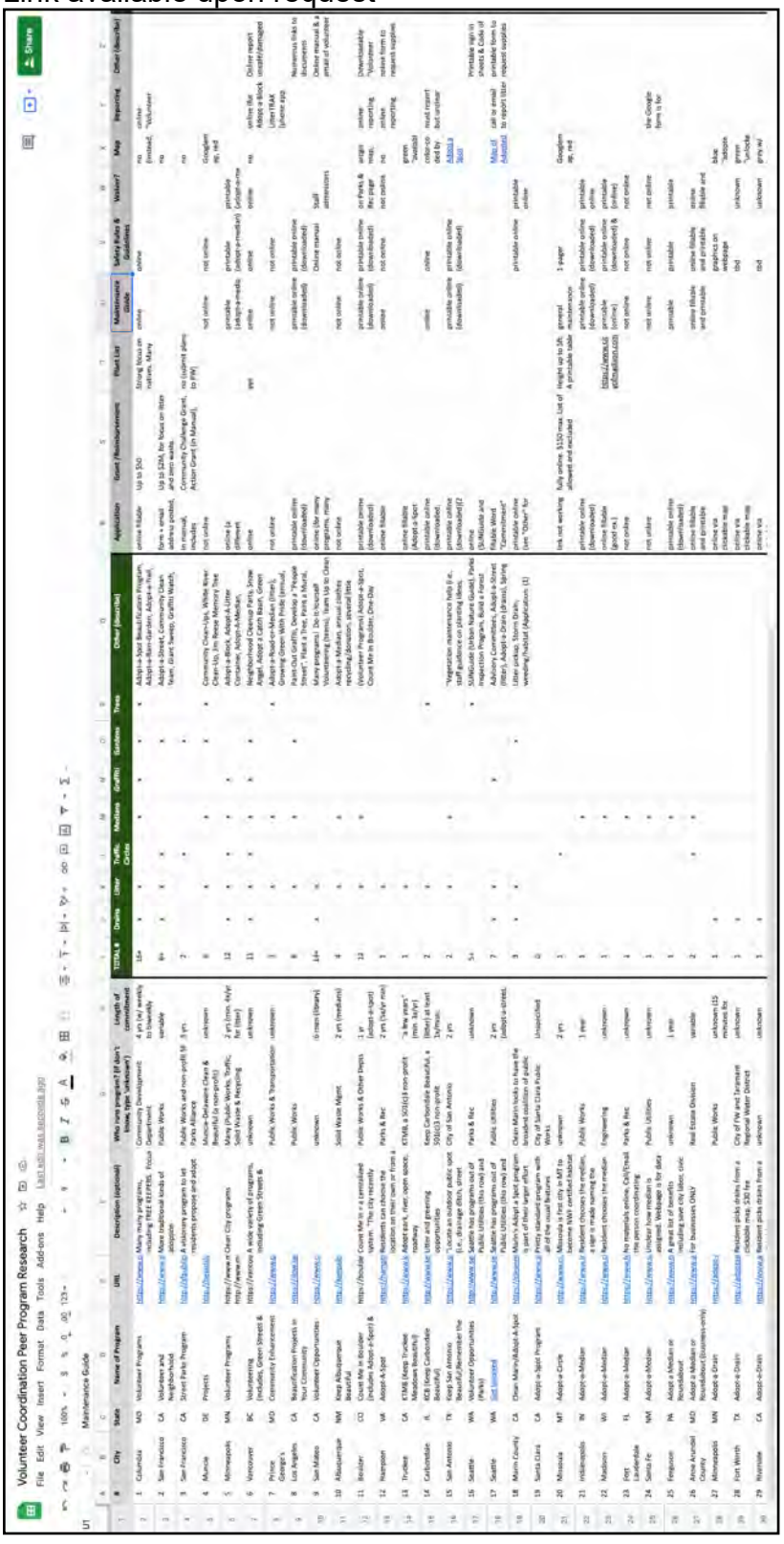
Native Plants - Example of Free Plants



[Madison, WI](#) - [Plants for Rain Gardens (Dane County)](#)
Opportunities to order, grow, donate, and request free plants (above)

Appendix M: Screenshot of spreadsheet used to capture details of Research

Link available upon request



Rashi Kesarwani
Councilmember District 1

CONSENT CALENDAR
December 14, 2021

TO: Honorable Mayor and Members of the City Council

FROM: Councilmember Rashi Kesarwani (Author) and Councilmembers Susan Wengraf, Lori Droste, and Ben Bartlett (Co-Sponsors)

SUBJECT: Referral to the City Manager to Streamline Accessory Dwelling Unit (ADU) Permit Review and Approval

RECOMMENDATION

Refer to the City Manager to streamline the Accessory Dwelling Unit (ADU) permitting process in order to reduce staff time spent on review and enhance customer service. Further, assess effectiveness of process improvements specified below by reviewing over time: the number of ADUs permitted, average amount of staff time spent on ADU permit review, and permit fee levels.

Recommend that the City Manager develop for Planning staff use an ADU Universal Checklist and accompanying user-friendly webpage:

- **ADU Universal Checklist**. A clear set of universal guidelines and construction requirements should be developed among staff from Planning (both Land Use and Building and Safety Divisions), Fire, and Public Works Departments that is easy to follow in order to eliminate (or significantly reduce) the need for multiple departments to review ADU permit applications and for multiple rounds of review by the same department. The Universal Checklist should be a single document utilized by (1) all City staff to review ADU permit applications and (2) by customers to understand code requirements and development standards. The Universal Checklist should enable all City staff and customers to have the same clear understanding of all of the requirements that, if adhered to, would expedite the permitting process and lead to lower permit fees over time.
  Progress To Date: Recently, the City of Berkeley's Planning Department has added both a Single-Family ADU/JADU Checklist and a Multi-Family ADU Checklist which clearly delineate development standards as adopted by the State of California, effective January 1, 2020. An ADU Universal Checklist would take these checklists one step farther by including current amendments

to Berkeley's local ADU ordinance (once adopted) as well as the full list of fire and safety code requirements.

- **Accompanying User-Friendly Webpage**. As a companion to the ADU Universal Checklist, the City should also create a user-friendly webpage for customers (and prospective customers) with up-to-date information that provides clarity and greater certainty about the process and expected timeline for the creation of an ADU or Junior ADU, which is within a main dwelling unit. At a minimum, the webpage should include:
    - A list of relevant fees and expected payment amounts for permits, inspections, and other requirements;
    - Plan requirements, worksheets, and projected timelines for each step of the process; and
    - Consolidated up-to-date state and local regulations that are easy to understand.

  Progress To Date: The City now has a dedicated webpage that contains:
        - A Graphic Summary Table of our local ADU ordinance
        - An ADU flow-chart detailing allowable development standards
        - A Single-Family ADU/JADU Checklist
        - A Multi-Family ADU Checklist
        - Deed Restrictions Forms
        - A list of Impact Fees

  Additional information that could prove useful to prospective residents, builders and architects includes:
        - Links to fire safety and emergency access requirements;
        - A list of site conditions that do *not* warrant easy installation of an ADU;
        - A list of Frequently Asked Questions;
        - Additional frequently requested Planning and Development forms, such as our Tree Protection Instructions and Creek Protection Instructions forms, and our Public Works Engineering forms pertaining to Curbs, Gutters, Sidewalks and Driveway Approaches listed elsewhere on the City of Berkeley website;
        - Information about financing options; and
        - Links to additional resources, such as The Casita Coalition, an organization that disseminates information on policies and programs, best practices, and resources throughout the state.

Recommend that the City Manager consider adoption of the following two best practices:

- **Pre-Approved ADU Design Plans**. Consider development of (1) free ADU designs available to download--of varying sizes and styles--that already conform to all City and state requirements and safety codes; and/or (2) a list of

vendors with architectural designs, construction drawings, or pre-fabricated units that have already been approved by the City.

- **ADU Ally**. Consider creation of a single point of contact e-mail address dedicated to serving those interested in ADU construction, along the lines of an "ADU Ally." The ADU Ally would be a customer-facing staff person(s) who is an expert on all current state and local ADU regulations and acts as an ally to customers through the planning and building process. Currently, our Planning Department does have a team of planners with an expertise in ADU laws and requirements, although the public lacks an easy and efficient way to access this team.

POLICY COMMITTEE RECOMMENDATION

On November 4, 2021 the Land Use, Housing and Economic Development policy committee took the following action: M/S/C (Droste/Robinson) Qualified positive recommendation with direction for the item to be updated to include progress already made in this area as described by the Planning Director.

CURRENT SITUATION AND ITS EFFECTS

The City's Process for Reviewing ADU Plans Is Not Efficient. Getting approval to construct an ADU remains one of the biggest challenges in their development. A survey of 752 new ADU builders in California found that 50 percent thought it was difficult to obtain the necessary permits to build their ADU, and they struggled with the length and complexity of the process.[1] Today, builders and homeowners report that building an ADU in Berkeley is costly, cumbersome, and frustrating. ADU plans submitted by applicants to the City's Permit Service Center are routed to multiple departments for review--a time-consuming process that requires review from multiple plan examiners and complicates the ADU process, as homeowners, and even architects, are often unaware of the rules of these other departments and have trouble navigating through the different requirements.[2] Further, the ADU plans are put in the same queue as other larger building projects, creating substantial wait times for approval. While the City recently created a webpage for ADUs, more work is needed to alert customers about the process, fees, and requirements for obtaining an ADU permit, enabling prospective customers to understand whether they are eligible to create an ADU and how to embark on the process. In fact, a number of jurisdictions have found that lack of awareness around ADUs and their permitting

[1] See Chapple, et. al., Implementing the Backyard Revolution: Perspectives of California's ADU Owners, 2021, Center for Community Innovation, Univ. of California, Berkeley: https://www.aducalifornia.org/wp-content/uploads/2021/04/Implementing-the-Backyard-Revolution.pdf

[2] See Chapple, et. al., ADUs in CA: A Revolution in Progress, 2020, Center for Community Innovation, Univ. of California, Berkeley: https://www.aducalifornia.org/wp-content/uploads/2021/05/ADU-Progress-in-California-Report-October-Version.pdf

2180 Milvia Street, Berkeley, CA 94704 ● Tel: (510) 981-7110 ● Fax: (510) 981-7111
E-Mail: Rkesarwani@cityofberkeley.info

requirements remains a critical barrier to their development. Homeowners often show up at the permitting counter unaware of certain building and engineering requirements, connection fees, and other local requirements that are not explicitly outlined in the code or in publicly accessible formats.[3] Enhancing the City's webpage could alert residents that the state has eliminated minimum lot size requirements for ADUs, for example, which could encourage more homeowners to consider building an ADU.

Inefficiency Leads to High Permit Fees. Currently, the City of Berkeley permitting fees are estimated at a flat rate (3-5 percent) of the job valuation.[4] Spending less staff time on permit reviews will result in lower fees over time. Construction costs in California are high and building an average-sized detached ADU typically runs upwards of $150,000. By creating greater certainty and a more streamlined process, customers will be better able to plan for financing their ADU.

Recent State Law Changes Have Made It Easier to Create ADUs. Recent changes to state law have made it easier for more homeowners to pursue ADU development, such as:

- ADUs are now required to be approved and permitted ministerially (AB 68, 2019)
- Elimination of minimum lot sizes for ADU development (AB 68, 2019)
- Exemption of ADU parking requirements under certain circumstances (SB 13, 2019)[5]

Best Practices From Other Local Jurisdictions Can Help to Increase ADU Production in Berkeley. Cities throughout the state are meeting an increasing demand among homeowners for ADUs by: revising their local ADU ordinance and simplifying zoning requirements, offering customer-friendly services, and streamlining the permit approval process, and Berkeley, too, has started down this path. Taken together, these actions have shortened processing time, increased consistency, and reduced homeowner expenses. In Berkeley, interest in creating an ADU is growing: a total of 119 permits were approved for the construction of ADUs in 2020, a number that has steadily grown over the last five years, as shown in Exhibit 1. However, to date, the City of Berkeley has not implemented ADU best practices related to customer-friendly services and streamlining the permit approval process, meaning that more

[3] See Chapple, et. al., ADUs in CA: A Revolution in Progress, 2020, Center for Community Innovation, Univ. of California, Berkeley: https://www.aducalifornia.org/wp-content/uploads/2021/05/ADU-Progress-in-California-Report-October-Version.pdf

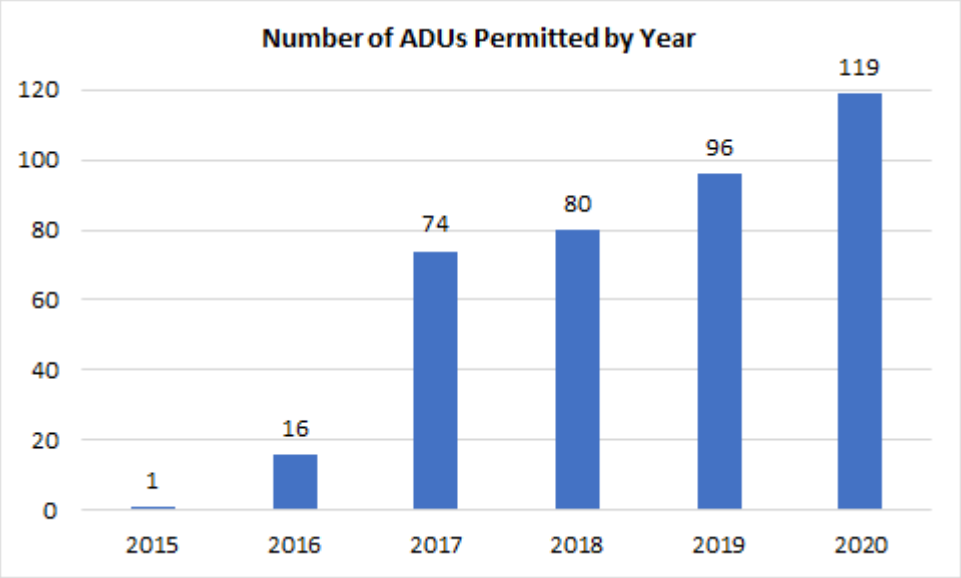
[4] See the City of Berkeley's Department of Planning and Development's Building Permit Fee estimator: https://www.cityofberkeley.info/PermitFeeEstimator.aspx

[5] For a complete discussion of statutory changes to California's ADU codes see the Department of Housing and Community Development's ADU Handbook, p. 23: https://www.hcd.ca.gov/policy-research/docs/adu_december_2020_handbook.pdf

2180 Milvia Street, Berkeley, CA 94704 ● Tel: (510) 981-7110 ● Fax: (510) 981-7111
E-Mail: Rkesarwani@cityofberkeley.info

could be done to increase the number of ADU permits issued annually. We note that Berkeley is currently in the process of amending its ADU ordinance to comply with new state law changes.[6]

Exhibit 1: Number of ADUs Permitted in the City of Berkeley Has Steadily Grown



Source: "Response to Short Term Referral for Amendments to the Accessory Dwelling Units (ADU) Ordinance and Related Definitions to Address Public Safety Concerns," Planning Commission Agenda Packet, April 7, 2020, https://www.cityofberkeley.info/uploadedFiles/Planning_and_Development/Level_3_-_Commissions/Commission_for_Planning/2021-04-07%20PC_Item%209.pdf.

Three Best Practices From Other Jurisdictions Recommended for Berkeley

- **ADU Universal Checklist and Accompanying User-Friendly Webpage**. The City of San Jose has become well known for its adoption of an ADU Universal Checklist (see attached) that reduces the amount of time that City staff spend reviewing ADU permits and answering customer questions. Prior to the creation of San Jose's Universal Checklist two years ago, ADU customers were required to work with four different departments (Building Development, Planning, Fire, and Public Works) to know the requirements and get their ADU permits approved--similar to the situation in Berkeley today. The Universal Checklist now provides a one-stop shop that lists all the requirements across all four City departments. This tool gives homeowners and builders clear guidance on what is required and simplifies the plan check

[6] See "Response to Short Term Referral for Amendments to the Accessory Dwelling Units (ADU) Ordinance and Related Definitions to Address Public Safety Concerns," Planning Commission Agenda Packet, April 7, 2021, https://www.cityofberkeley.info/uploadedFiles/Planning_and_Development/Level_3_-_Commissions/Commission_for_Planning/2021-04-07%20PC_Item%209.pdf

process. The initial effort to establish the Universal Checklist took three to four months of weekly meetings among staff from the four relevant departments, according to the San Jose Public Information Manager for the Department of Planning, Building and Code Enforcement Division. However, now that the Universal Checklist is in place, those same staff have more available time to devote to other projects, according to the Public Information Manager. San Jose began utilizing the Universal Checklist in early 2019 shortly before some changes to state ADU laws (such as AB 68) went into effect; that year saw a notable jump in annual applications to build ADUs--from 376 permit applications in 2018 to nearly double in 2019 at 688 permit applications, which the Public Information Manager attributes to changes in state law, streamlined permitting, and marketing both of these changes.[7]

The marketing and advertising of these changes were facilitated by a user-friendly webpage that includes links to additional webpages with full descriptions of:

- The ADU Universal Checklist
- ADU plan review and permit process
- Pre-approved ADUs and lists of vendors
- Fees for ADUs
- ADU fire requirements
- Parking requirements and exemptions
- State and local ADU ordinances and updates[8]

The ADU Universal Checklist and accompanying user-friendly webpage are simple tools that could help all parties to be clear about the requirements for receiving an ADU permit. Websites have been found to be effective in educating homeowners and increasing knowledge of local zoning and permitting processes.[9] There is also precedent for using customer-friendly checklists, as the City of Berkeley already has many examples listed on its website, in addition to the recently added Single-Family and Multi-Family ADU/JADU checklists, as shown in Exhibit 2.

Exhibit 2: Building Checklists Currently Available from Online Service Center

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[7] E-mail communication with Cheryl Wessling, San Jose's Public Information Manager, Department of Planning, Building and Code Enforcement Division, April 14, 2021.

[8] See City of San Jose's Department of Planning, Building and Code Enforcement ADU webpage: https://www.sanjoseca.gov/business/development-services-permit-center/accessory-dwelling-units-adus

[9] See Chapple, et. al., ADUs in CA: A Revolution in Progress, 2020, Center for Community Innovation, Univ. of California, Berkeley: https://www.aducalifornia.org/wp-content/uploads/2021/05/ADU-Progress-in-California-Report-October-Version.pdf

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Type of Checklist	Use
Code Compliance Checklists	Kitchens; Building Permits Submittals; Bathroom and Laundry; Decks, Porches, Stairs; Electric Vehicle Charging; Reach code low-rise residential; Reach code non-residential high rise and hotel/motel; Residential floor plan; Solar Photovoltaic; Windows and Doors
Energy Conservation Checklists	CalGreen residential; CalGreen non-residential
Stormwater Requirements Checklists	C.3 and C.6 projects; C.3.i projects
Land Use Planning Checklist	Landmark Alterations Submittal Checklists

Source: Online Service Center webpage, City of Berkeley website, https://www.cityofberkeley.info/Online_Service_Center/Home/Forms.aspx.

- **Pre-Approved ADU Design Plans.** Typically, homeowners interested in building ADUs must start their design from scratch, which creates lengthy and variable permitting processes. In fact, over 25 percent of new ADU builders in California found design constraints to be their top challenge.[10] To address this, numerous jurisdictions, including several in the Bay Area, have developed publicly accessible ADU design plans that are pre-approved by the jurisdiction's Planning and Building Departments, ranging from conceptual drawings to full sets of building plans, which greatly reduces the amount of staff time required to approve planning and building permits. This approach streamlines the process for issuing a permit, which reduces design costs for the customer, reduces staff time for City Departments, and increases consistency among all the approved permits. San Diego County[11] and the City of Encinitas[12], for example, both offer a set number of optional pre-approved ADU designs (free and available for download) of varying sizes and styles that can eliminate fees for hiring an architect and streamline some of the permitting processes. San Jose utilizes a slightly different model, in which it offers a list of vendors with pre-approved full sets of construction drawings that homeowners may use for a small fee to the architect. The primary benefit of pre-approved ADU design plans is that they reduce homeowner uncertainty and City staff only need to evaluate the site-specific elements to approve the

[10] See Chapple, et. al., Implementing the Backyard Revolution: Perspectives of California's ADU Owners, 2021, Center for Community Innovation, Univ. of California, Berkeley: https://www.aducalifornia.org/wp-content/uploads/2021/04/Implementing-the-Backyard-Revolution.pdf
[11] See San Diego County's Accessory Dwelling Units webpage: https://www.sandiegocounty.gov/content/sdc/pds/bldg/adu.html.html
[12] See City of Encinitas' Permit Ready ADU (PRADU) webpage: https://encinitasca.gov/pradu

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building permit, leading to a more efficient review and lower permit fees for the customer.[13]

- **ADU Ally**. The cities of Encinitas and San Jose both have dedicated staff whose sole responsibilities concern ADU development, providing staff responses to permitting requests and knowledgeable assistance steeped in state and local regulations.

BACKGROUND

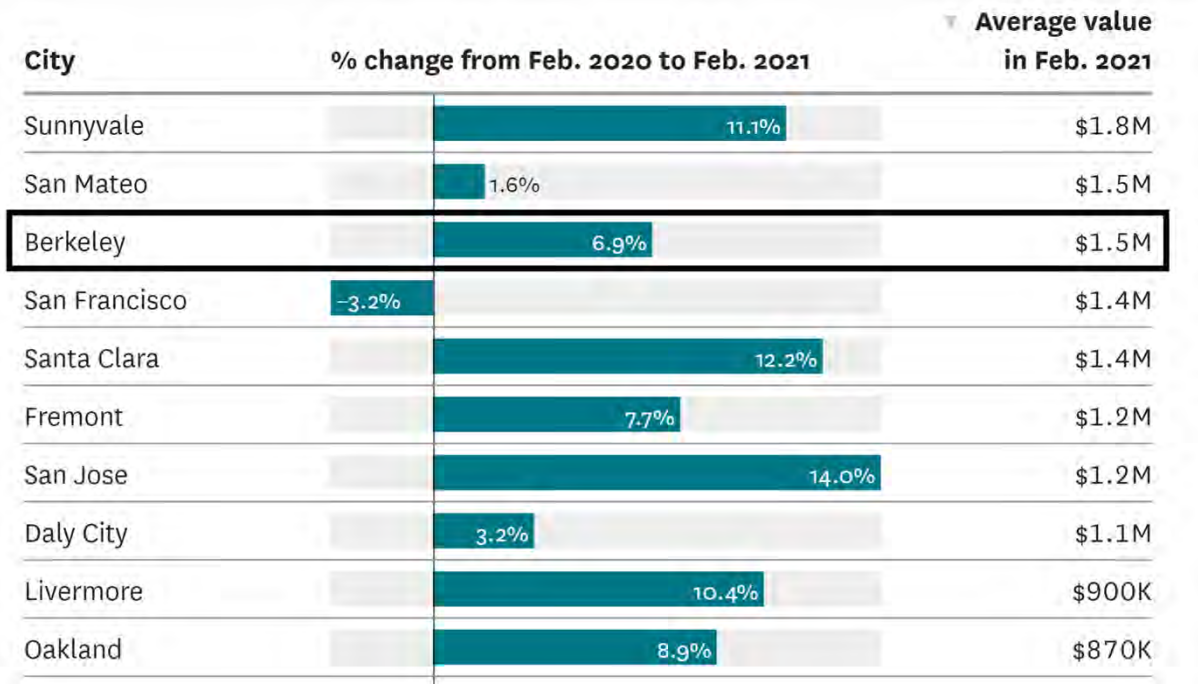
As Home Prices Climb, ADUs are a Form of "Naturally Occurring" More Affordable Housing. Home prices continue to climb across the Bay Area, and Berkeley now ranks as the third most expensive large Bay Area city, with an average home price of $1.45 million, as shown in Exhibit 3. The state of California has the third highest median home price in the country, after Hawaii and Washington, D.C.[14] ADUs and Junior ADUs (within the main dwelling) are currently the only avenues available to increase the number of units in many residential zones. ADUs, also known as backyard cottages, have been found to be a form of "naturally occurring" more affordable housing when compared to the monthly cost to rent or own a single-family home.[15]

Exhibit 3: Berkeley Home Prices are Third Highest Among Large Bay Area Cities

[13] See City of San Jose's Pre-approved ADU webpage: https://www.sanjoseca.gov/business/development-services-permit-center/accessory-dwelling-units-adus/adu-permit-plan-review-process/adu-single-family-master-plan-program. It should be noted that residents need to seek out the vendors and the designs are not free. San Jose also offers a process through which vendors can get their designs approved by the City and thus be added to the binder of pre-approved vendor designs.

[14] Experian, *Median Home Values by State*, Nov. 19, 2019, https://www.experian.com/blogs/ask-experian/research/median-home-values-by-state/.

[15] See both San Mateo County – April Report, *Affordability of Secondary Dwelling Units — 21 Elements,* April 9, 2014 (Used data from 2010- 2013): https://norcalapa.org/wp-content/uploads/2018/07/Affordability-of-Second-Units-April-2014.pdf; and Chapple, et. al., Yes in My Backyard: Mobilizing the Market for Secondary Units, 2012, Center for Community Innovation, Univ. of California, Berkeley, Page 10: https://communityinnovation.berkeley.edu/sites/default/files/yes_in_my_backyard_mobilizing_the_market_for_secondary_units.pdf?width=1200&height=800&iframe=true



Source: Zillow, as reported by Neilson, Susie, Sumida, Nami, "Every major Bay Area city has seen home values go up in the pandemic. Except for one," *The San Francisco Chronicle*, April 10, 2021, https://www.sfchronicle.com/local/article/Mapped-Real-estate-prices-soared-in-the-Bay-Area-16091650.php.

RATIONALE FOR RECOMMENDATION

The proposed recommendations for streamlining the review of ADU permit applications are intended to ensure that staff time is used efficiently, customers receive their permits in a timely manner at a competitive price, and that ultimately, these process improvements encourage more homeowners to create ADUs--a form of naturally-occurring more affordable housing that is greatly needed across the Bay Area and state.

It should be noted that senior staff in both City of Berkeley's Planning and Fire Departments were consulted in advance of submitting this council referral. On April 14, 2021, the District 1 office met with then Fire Chief David Brannigan and Fire Marshall Steven Riggs who both expressed support for providing better information to the public via our city website and commented that an ADU checklist with city-wide approved codes would indeed streamline the permitting process. Planning Director Jordan Klein was consulted the following day, on April 15th. He, too, expressed support for this referral, noting that he had wanted to initiate such process improvements himself, though often lacked the time to do so. Adding this referral to the department work plan will help ensure these improvements get put into practice.

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FISCAL IMPACT

Time-limited staff time from relevant departments (Planning, Fire, and Public Works) to develop standardized sets of requirements to satisfy all building codes and safety regulations. Additional staff time from the Planning Department would be required to implement related ADU streamlining recommendations. We note that over time the initial outlay of staff time would lead to more efficient processing of ADU permit applications.

ENVIRONMENTAL SUSTAINABILITY

Encouraging the creation of ADUs and Junior ADUs enables the City to make more efficient use of residential land that is generally located in close proximity to public transit. Studies show that infill development is an effective strategy for reducing greenhouse gas emissions by reducing vehicle miles traveled when compared to homes created in outlying undeveloped areas.

CONTACT PERSON

Councilmember Rashi Kesarwani, District 1 (510) 981-7110

Attachment:

City of San Jose ADU Universal Checklist

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CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY
Planning, Building and Code Enforcement

ADU Universal Checklist

Are you thinking about building an Accessory Dwelling Unit (ADU)? This checklist will help ensure that your lot qualifies for an ADU and that your concept conforms to zoning codes and fire safety equirements. Homeowners, designers, and construction professionals should all review this checklist before investing in building plans.

Instructions. You'll need to identify your property designations, which you can find at www.SJPermits.org. Tap "Permits & Property Information"; enter your address; and on the next screen, click on your property and select "Property Information." A list of designations will appear.

Let's get started with the checklist. You can get feedback from a City Planner by sending a completed ADU checklist and a rough ADU site plan to ZoningQuestions@sanjoseca.gov. If you need further help, contact the ADU Ally (see page 4).

QUESTION	YES	NO
PART 1. PROPERTIES THAT QUALIFY		
1. Do you have a San Jose address? This worksheet is only for properties in the City of San José jurisdiction. If you're not sure, you can confirm that a property is in San José at SJPermits.org (see above instructions). **2. Zoning.** Is the property in a residential zone that begins with R-1, R-2, R-M, or PD? Or, regardless of zoning, is the property in one of the following General Plan designations (find out at at SJPermits.org): - Residential Neighborhood or Mixed-Use Neighborhood or Mixed-Use Commercial - Urban Residential or Transit Residential or Rural Residential - Downtown or Urban Village If you have questions about a PD zone, speak with a Planner at 408-535-3555 during these service hours. **> Outcome:** If no, an ADU is not allowed. If yes, see the table below:		

Property Type	*Qualifying Units*
Single-family	Subject to standards, one ADU and one JADU may be allowed — see definitions, pages 2-4.
Duplex or Multifamily	Subject to standards (pages 2-4), two detached ADUs may be allowed. For a duplex, one attached ADU may also be allowed. For multifamily lots, a number of attached ADUs equivalent to up to 25% of existing units may also be allowed (for example, a building with 12 units may qualify for 3 attached ADUs).

PART 2. PROPERTY DESIGNATIONS		
3. Flood Zones. Is the property in Flood Zones A, AE, AH, or AO? *Properties in D or X zones are excluded from these requirements.* Find designation at SJPermits.org. Questions: Call 408-535-7803 or email floodzoneinfo@sanjoseca.gov **> Outcome:** If yes, see flood zone design requirements in Bulletin #211-ADU Plan Requirements, found at www.sanjoseca.gov/home/showdocument?id=39040		
4. Geohazard Zone. Is the property in a designated "geohazard" or "landslide" zone? Find designations at SJPermits.org. **> Outcome:** If yes, obtain a Geologic Hazard Clearance. Call Public Works at 408-535-7802 or email pwgeneralinfo@sanjoseca.gov		
5. Historic Designation. Is the property located in a Historic District identified on the California Register of Historic Resources? Find historic designations: www.sanjoseca.gov/HistoricResourcesInventory. **> Outcome:** If yes, simplified design standards will apply. Please speak with a Planner at 408-535-3555.		
6. Easements. Does the property have a dedicated easement? Easements are described in the title report that came with the purchase of your home, or contact a title company for a report copy. Tract and parcel maps at the County Surveyor Record Index tool at http://bit.ly/2ZhGjXc may show easements, but may be less accurate than a title report. **> Outcome:** If yes, you must comply with the requirements of the easements, which may include no construction allowed within the easement area.		

continued

PART 3. DEVELOPMENT STANDARDS - Per Municipal Code Section 20.30.150: http://bit.ly/33Knz6c

A great way to ensure your proposed ADU complies with the Zoning Code Development Standards is to meet with a City Planner. This free consultation can help you avoid designing plans that will NOT be approved. Come to the Permit Center and bring a completed Universal Checklist and a rough sketch of your property showing dimensions and the location of the main home and location of the proposed ADU. See full instructions for this consultation at www.sanjoseca.gov/ADUs.

QUESTION	YES	NO

7. Location. Is your proposed ADU located as follows?

Property Type	*Location Requirements*
Single-Family	**Attached ADU**: Must share a wall with main residence OR share a roof structure with main residence and be separated by no more than 10 feet. For an attached ADU in the front yard, the front door cannot be on same street-facing façade as that of the primary residence, with some exceptions (learn more by speaking with a Planner at 408-535-3555). **Detached ADU**: Must be in the rear yard or 45 feet from the front property line. Must have a minimum 6-foot separation from the main dwelling unit. May be a converted detached garage or accessory building OR may be built attached to a detached garage or accessory building. **Junior Accessory Dwelling Unit (JADU)**: Must locate entirely within the main home's existing footprint. You may have a JADU and a detached ADU. Both a JADU and attached ADU are not allowed.
Duplex or Multifamily	**Attached ADU**: Location is limited to a conversion of existing non-livable space, such as converting an attic, basement, garage, storage room, boiler room, or passageway. **Detached ADU**: Must be in the rear yard or 45 feet from the front property line, with a minimum 6-foot separation from the main building. The ADU may be a conversion of a detached garage or accessory building, or attached to a detached garage or accessory building. **JADU**: Not allowed.

> Outcome: If yes, your planned location for the ADU is in compliance. If no, your plans will not be approved.

8. Size. Is the size of the proposed ADU within the maximum limits as shown in the tables below AND does the proposed size account for the Rear Yard Coverage Limitation?

SINGLE-FAMILY LOTS	
Lot Size	*Maximum Floor Area Allowed*
Up to 9,000 sf	Detached ADU: 1,000 sf maximum
	Attached ADU: Size can be up to 800 sf OR up to 50% of the primary residence area without exceeding 1,000 sf. Example: For an 1,800 sf home, a 900 sf attached ADU is allowed.
9,000 sf and greater	Detached ADU: 1,200 sf maximum
	Attached ADU: Size can be up to 800 sf OR up to 50% of the primary residence area without exceeding 1,200 sf. Example: For an 2,400 sf home, a 1,200 sf attached ADU is allowed.
Any lot with a JADU	JADU: 500 sf maximum
	Detached ADU: 800 sf maximum
	Attached ADU: not allowed with a JADU

DUPLEX & MULTIFAMILY LOTS	
Lot Size	*Maximum Floor Area Allowed*
Any lot size	Detached ADU: 800 sf maximum
	Attached ADU: 800 sf maximum
	JADU: not allowed

How to calculate allowable square footage (sf): The square footage of all living areas (existing or proposed) connected by a door or other opening counts toward the total allowable square footage of the ADU.

Rear Yard Coverage Limitation. The rear yard is the area that extends from the rear lot line to the rear of the main home across the full width of the lot. The cumulative coverage of the rear yard by structures — including coverage by the ADU, accessory buildings, sheds, gazebos, or other structures — may not exceed 40% of the rear yard or 800 sq.ft., whichever is greater. Does your project comply with this rule?

> Outcome: If yes, your ADU size is in compliance. If no, your plans will not be approved.

continued

QUESTION	YES	NO

9. Setbacks. Does your proposed ADU comply with these rules for setbacks?

Property Type	*Location Requirements*
Single-family	**Attached ADU**: Same setback requirements as apply to the main dwelling unit. **Detached ADU**: - Must be set back 45 feet minimum from front property line. - Rear/side setbacks less than 3 feet may be subject to fire mitigation measures, see p. 4. - A second story OR new ADU with greater than 40% rear yard coverage must be set back 4 feet from both rear and side property lines.
Duplex or Multifamily	**Attached ADU**: Setbacks not applicable as the attached ADU is limited to a conversion of existing non-livable space. **Detached ADU**: - Must be in the rear yard or 45 feet from the front property line. - Rear/side setbacks: Minimum 4 feet, allows for up to 1-foot projection for eaves - A second story is not allowed on a detached ADU for duplex/multifamily properties.
Corner lots	A 10-foot setback is required on the street side.
Lots ½ acre or greater along riparian corridors	Minimum 100-foot setback required.
Decks, unenclosed entry landings, and second-story balconies	Minimum 15-foot rear/side setback required. May not locate along building walls nearest to rear and side property lines.

> Outcome: If yes, the setbacks for your ADU are in compliance. If no, your plans will not be approved.

10. Height. Does your proposed ADU comply with these height limitations?

Property Type	*Location Requirements*
Single-family	**Attached ADU**: Same height limitations as apply to the main dwelling unit. **Detached ADU**: One story: 18 feet maximum. Two-story: 24 feet maximum If the property includes a JADU, height of a detached ADU is 16 feet maximum per state law.
Duplex or Multifamily	**Attached ADU**: Limited to a conversion of existing non-livable space and must maintain existing height. **Detached ADU**: 16 feet maximum per state law

Outcome: If yes, the height of your ADU is in compliance. If no, your plans will not be approved.

11. Sleeping Area. Up to two bedrooms are allowed, and the maximum bedroom size is 400 sf. Does the sleeping area or bedroom/s planned for the ADU or JADU comply with these standards?

> Outcome: If yes, your layout for the sleeping area is allowed. If no, your plans will not be approved

12. Kitchen, Bathroom, Storage. Does your proposed ADU or JADU comply with these rules?

Kitchen - ADUs must have a sink, food preparation counter, storage, cabinets, and permanent cooking facilities such as a range or cooktop and oven. JADUs may have the same OR a small efficency kitchen with plug-in appliances.

Bathroom/s - For ADUs, up to two bathrooms are allowed, requiring a sink, toilet, and shower and/or bath facilities. For JADUs, sharing the bathroom with the main residence is allowed or one bathroom or a half bathroom is allowed.

Storage - A closet or other enclosed storage area cannot exceed 60 sq. ft.

> Outcome: If yes, your design is in compliance. If no, your plans will not be approved.

13. Second Story Window Sill Height. Sill height for any openings must be a minimum 5 feet from the floor for walls nearest to rear and side property lines. Does your project comply with this rule?

> Outcome: If yes, this window design is allowed. If no, the plans will not be approved.

14. Parking Requirements. Does your proposed ADU either provide a parking space OR qualify for an exemption?

Exemptions: Many ADUs qualify for a parking exemption in accordance with state law. Please see the Parking Requirements page at www.sanjoseca.gov/ADUs for a list of the exemption criteria.

Parking space location: If you are required to provide a parking space, it must be located on a surface free of mud or dust. It may be located within the front and side setbacks of the property, with a minimum driveway length of 18 feet.

Parking requirements after a garage conversion: If you converted a garage to an ADU, replacement parking for the main home is no longer required.

> Outcome: If yes, your proposed project is in compliance. If no, your plans will not be approved.

continued

PART 4. FIRE SAFETY & EMERGENCY ACCESS		
We will review your ADU project for compliance with the California Fire Code (CFC) so that projects are built for safety and ease of access during an emergency. For questions, call the Fire Prevention Bureau at 408-535-7750 or email SJFDPermitSpecialist@sanjoseca.gov		
QUESTION	**YES**	**NO**
15. Hydrant Water Flow. Is a minimum flow of 1,000 gpm at 20 psi available at the closest hydrant? Ask your Water Company for this information. Send an email with "ADU WATER FLOW REQUEST" in the subject line and present this information: ▪ Your name ▪ Street name and address of the project ▪ Nearest cross street to that location Submit the letter from the Water Company that contains this water flow data with your building permit application. **DON'T WAIT!** A top reason for permit issuance delays is not having this letter. Your water company will respond, so contact them today. Find Water Company contact information at the ADU Fire Requirements webpage: https://www.sanjoseca.gov/business/development-services-permit-center/accessory-dwelling-units-adus/adu-fire-requirements) **> Outcome:** If the flow is other than 1,000 gpm at 20 psi, Fire staff will review flow data and will evaluate if additional fire safety measures are required.		
16. Hydrant Proximity. Are all exterior walls of the ADU within 600 feet of a fire hydrant? On the Site Plan Vicinity Map for plan submittal, mark one or more locations of fire hydrants closest to the project. Indicate the distance from the hydrant/s to the farthest exterior wall of the ADU, using the minimum 3-foot clear path of travel. **> Outcome:** If no, your project may require a Fire Variance that entails additional safety measures. Call 408-535-7750 for direction. Find the Variance application at: www.sanjoseca.gov/Home/ShowDocument?id=9343		
17. Fire sprinklers. Is the primary residence protected by fire sprinklers? **> Outcome:** If yes, the ADU must have a fire sprinkler system.		
18. Fire sprinklers and attached ADUs. Is the project an attached ADU greater than 500 square feet AND does the overall gross floor area with the main unit exceed 3,600 square feet? **> Outcome:** If yes, the entire house and ADU are required to be protected with a fire sprinkler system.		
19. ADU Address. Does the ADU have its own address and is the address visible and legible from the street? Premises Identification guidelines: www.sanjoseca.gov/Home/ShowDocument?id=9323. On the Site Plan for plan submittal, show the address location on the primary dwelling unit and on the ADU. **> Outcome:** If no, please complete Form #302, found at: www.sanjoseca.gov/home/showdocument?id=25943		
20. ADU Access. Is the distance from the street curb of the lot to all portions of the proposed ADU no greater than 200 feet as measured along a minimum 3-foot clear path to all sides of the ADU? On the Site Plan for plan submittal, show the distance along the minimum 3-foot clear path from the front property line to the ADU's farthest exterior side or projection (such as eaves), whichever is farthest. **> Outcome:** If no, your project may require a Fire Variance that entails additional safety measures. Call 408-535-7750 for direction. Find the Variance application at: www.sanjoseca.gov/Home/ShowDocument?id=9343		
SECTION E. MISCELLANEOUS		
21. Tree Removal. Will constructing an ADU require removal of an ordinance-size or heritage tree? **> Outcome:** If yes, please see the City's rules for removing trees: www.sanjoseca.gov/treepermit		

ADU ALLY - HERE TO HELP YOU

Our ADU Ally is a staff member that will answer your questions; connect you to other staff who may be of assistance; and schedule your appointment for ADU plan submittal and review.

Email: adu.ally@sanjoseca.gov

Phone: 408-793-5302

Find more ADU information at www.sanjoseca.gov/ADUs

BEN BARTLETT
CITY COUNCILMEMBER, DISTRICT 3

CONSENT CALENDAR
December 14, 2021

To: Honorable Mayor and Members of the City Council
From: Councilmember Ben Bartlett
Subject: Health Care Facility Oversight

RECOMMENDATION

Refer to the City Manager and the Community Health Commission an assessment of the breadth of regulatory control the City of Berkeley can exert on skilled nursing facilities, and create a process of accountability if complaints are found to be substantiated that threaten, or could potentially escalate to the point of threatening, the wellbeing of patients and/or violate federal, state, or local law; the business license of the offending facility will be suspended until the skilled nursing facility submits a report demonstrating rectification of the situation.

BACKGROUND

The California Department of Public Health (CDPH) mandates that skilled nursing facilities provide 3.5 hours of patient care to each patient per day.[1] For instance, some care facilities in Berkeley are reported to have as few as 6 staffers serving 66 patients, meaning that even if the staff worked around the clock, at most they would be able to offer 2.1 staff hours per patient per day. In 2021 alone, the facility has received 12 complaints, but not a single one has been followed up by an enforcement action[2]. This is just a single example in an egregious pattern of lack of care met with lack of enforcement. In 2019, for example, skilled nursing facilities were found to violate an average of 23 federal and state laws per facility. Yet, in the 77 skilled nursing facilities across California, not a single regulation was enforced. As a result, there has been a history of negligence, mistreatment, and patient abuse within Californian care facilities.[3]

CURRENT SITUATION

The City has received numerous grievances from concerned community members over the quality of care in certain skilled nursing facilities in Berkeley. Community members complain of neglect, indifference, and harmful, negligent behavior with sometimes tragic consequences.

The City must address these hazards by creating internal procedures and policies designed to prevent further harmful acts. Precedence for license revocation policies can be found in other municipalities. For example, Chapter 6 Section 1.80 of Superior, Colorado Municipal Code states that business licenses can be suspended “when any activity conducted by the licensee, his or her employee or agent violates any federal, state or local rule, regulation or law.[4] The City

[1] https://canhrnews.com/guidelines-for-3-5-direct-care-service-hours-per-patient-day-dhppd-staffing-audits/
[2] https://www.cdph.ca.gov/Programs/CHCQ/LCP/CalHealthFind/Pages/SearchResult.aspx
[3] https://calmatters.org/health/2021/10/nursing-homes-oversight-california-hearing/
[4] https://library.municode.com/co/superior/codes/municipal_code?nodeId=CH6BULIRE

of Berkeley could adopt such an ordinance to shutter inept care facilities and deter improper conduct and mismanagement.

Furthermore, to ensure enforcement, the City could mandate that all complaints be forwarded to the Environmental Health Division to be reviewed in a timely manner. This would prevent a backlog of complaints and strengthen City follow-through.

The City of Berkeley needs to enforce strict regulations over the performance and conditions of skilled nursing care facilities to ensure that patients are not stripped of their right to quality care. As stated above, a particularly skilled nursing care facility received 12 complaints in 2021, but there was zero enforcement action taken against them. With this recommendation, there will be a strict standard that skilled nursing care facilities must meet to guarantee that issues are adequately addressed by the City of Berkeley. Furthermore, it provides safeguards to ensure that patients are not neglected by those assigned to look after them.

FINANCIAL IMPLICATIONS

Determine as part of City Manager and Commission response.
Suppose the City can regulate skilled nursing facilities (generally not a City role). In that case, there could be significant financial implications because there is currently no staff assigned to this work in the City.

COMMUNITY CONSULTATIONS

This item was informed by consultations with and complaints raised by community members.

CONTACT PERSONS

Councilmember Ben Bartlett	bbartlett@cityofberkeley.info
James Chang	jchang@cityofberkeley.info
Hillary Phan	510-981-7130
Jerry Wong	510-981-7135

Sophie Hahn
Councilmember District 5

CONSENT CALENDAR
December 14, 2021

To: Honorable Mayor and Members of the City Council

From: Councilmember Sophie Hahn

Subject: Consideration of Expansion of Paid Parking to Support the Parking Meter Fund and Improved Pedestrian and Bicycle Facilities

RECOMMENDATION

1. Refer to the City Manager and the Transportation Commission to consider the extension of paid metered parking to include all days of the week, paralleling the calendar for off-street parking garages.

2. Consider a pilot, phasing-in, and/or exempting certain areas, and conduct broad outreach to merchants, faith-based and other institutions and organizations, neighborhood groups, and others potentially supported or impacted by change.

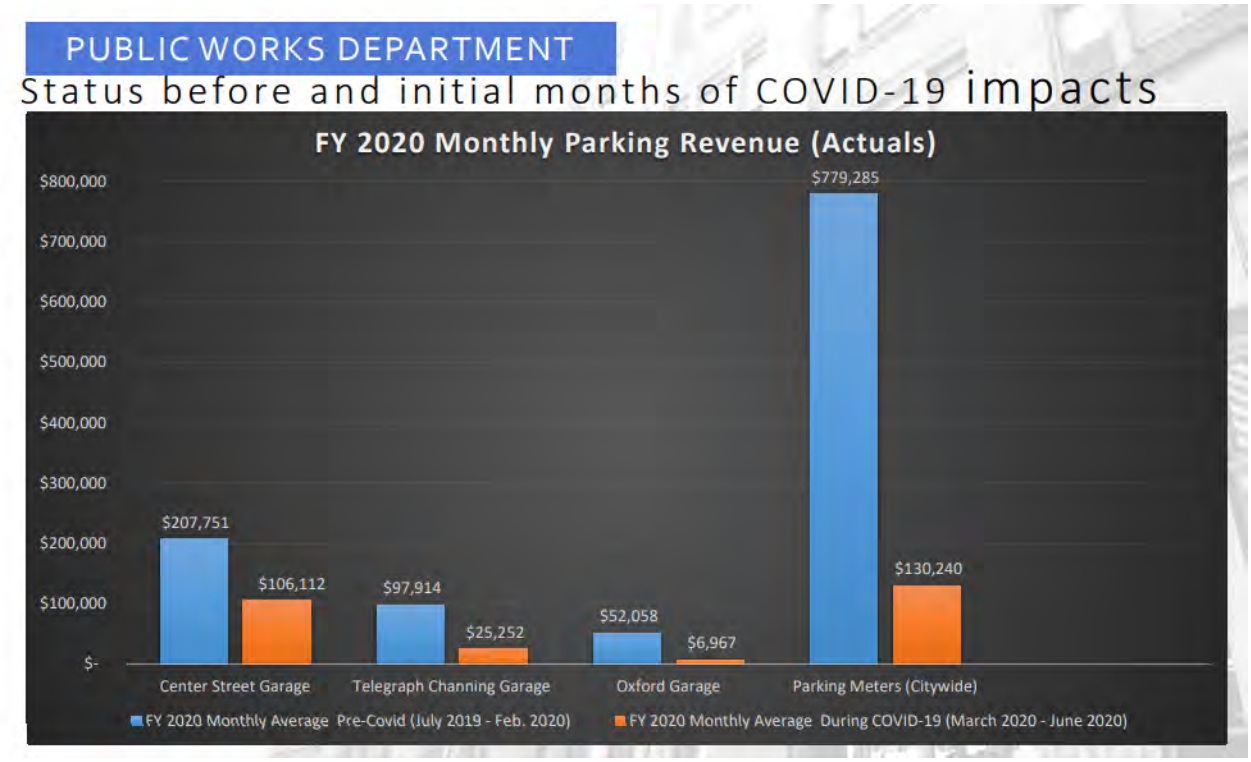
3. Consider allocation of potential additional revenues to help offset losses to the Parking Meter Fund incurred during COVID. Once the Fund has recovered, consider allocations to support pedestrian and bicycle facilities to help achieve Berkeley's Climate Action and Vision Zero goals on an accelerated basis.

CURRENT SITUATION AND ITS EFFECTS

Berkeley's Parking Meter Fund until FY 2020 was maintaining a healthy fund balance, averaging over $10M in income annually (2016-2019). Unfortunately, with the March 2020 shelter-in-place order to limit the spread of COVID-19, the fund experienced a significant shortfall, with decreased driving and parking and the temporary suspension of metered parking and enforcement. FY 2020 experienced a 30% decrease in revenue compared to FY 2019, and FY 2021 an approximately 70% decrease as compared to FY 2019. In FY 2021, the City Council authorized a $3.2M one-time General Fund allocation to address the impact of the pandemic to the fund. However, the Parking Meter Fund is projected to end FY 2022 with a negative fund balance that will be carried forward for a number of years, exacerbated by anticipated Capital expenditures in FY2023.

FORECAST OF PARKING METER FUND

Description/Account	FY 2019 Actual	FY 2020 Actual	FY 2021 Adopted	FY 2021 Revised	FY 2021 Projected	FY 2022 Proposed	FY 2023 Projected	FY 2024 Projected
Beginning Fund Balance	**$3,270,420**	**$4,990,946**	**$3,208,091**	**$3,208,091**	**$3,208,091**	**$2,957,810**	**($2,414,340)**	**($9,704,703)**
Revenues	**$10,381,386**	**$7,350,026**	**$11,061,390**	**$11,061,390**	**$3,229,346**	**$4,634,259**	**$8,575,838**	**$9,630,038**
Parking Metered	$9,987,286	$7,016,029	$10,636,205	$10,636,205	$2,928,336	$4,289,268	$8,222,602	$9,227,586
Point-to-Point Vehicle Share	$393,672	$307,505	$425,168	$425,168	$296,310	$344,991	$348,441	$397,609
All Other	$428	$26,492	$17	$17	$4,700	$ -	$4,795	$4,843
Expenditures	**$8,660,860**	**$9,132,881**	**$9,640,151**	**$10,254,513**	**$3,479,627**	**$10,006,409**	**$15,866,201**	**$10,162,967**
Personnel	$4,655,664	$5,019,203	$5,143,905	$5,179,017	$2,509,644	$5,450,176	$5,330,803	$5,544,035
Non-Personnel	$4,005,196	$4,113,678	$4,496,246	$5,075,496	$969,983	$4,556,233	$4,535,398	$4,618,932
Capital Projects	$ -	$ -	$ -	$ -	$ -	$ -	$6,000,000	$ -
Annual Surplus/Shortfall	**$1,720,526**	**($1,782,855)**	**$1,421,239**	**$806,877**	**($250,281)**	**($5,372,150)**	**($7,290,363)**	**($532,929)**
Ending Balance	**$4,990,946**	**$3,208,091**	**$4,629,330**	**$4,014,968**	**$2,957,810**	**($2,414,340)**	**($9,704,703)**	**($10,237,632)**



Source: Public Works Parking Enterprise Funds Balancing Report[1]

Currently, on-street and surface-lot metered parking is in force Monday through Saturday,[2] while off-street parking garages operate seven days a week.[3] Extending metered parking from six to seven days a week might result in an estimated $1M to $1.5M in additional revenues for the City, helping to alleviate current Fund deficits. In the long run, pursuant to BMC Sections 14.52.110 C, D and/or H, added revenues could be allocated to other priorities. Improvement of bicycle and pedestrian facilities would be

[1] https://www.cityofberkeley.info/uploadedFiles/Clerk/2020-11-12%20Budget%20Item%202f%20Parking.pdf

[2] https://www.cityofberkeley.info/parking-meters/#_onstreet

[3] https://www.cityofberkeley.info/Public_Works/Transportation/Off_Street_Parking_(Garages_and_Lots).aspx#CSG

an ideal use, with vehicle parking subsidizing mode shift and safety for more sustainable transportation options, consistent with the City's Climate Action and Vision Zero goals.

Extending metered parking to a full seven days/week would be a change for commercial districts and for institutions and organizations, in particular faith-based organizations, that have traditionally not been impacted by metered parking on Sundays. For this reason, exploring a pilot program, phasing-in, and/or exempting certain areas, and conducting broad outreach to merchants, faith-based and other institutions and organizations, neighborhood groups, and others potentially supported or impacted by change is of key importance.

BACKGROUND

City of Berkeley Parking meters (including pay-and-display stations) are "typically used to improve access, promote commercial activity, and discourage long-term car storage. The City may adjust a meter's hourly rate and/or limit the amount of time one may park in a metered parking space to encourage turnover and increase parking availability for short-term visitors and customers."[4]

Despite the known benefits of metered parking in commercial districts, Berkeley has maintained free street- and surface-lot parking on Sundays, with minimal to no parking enforcement or collections. Off-street garages, by contrast, operate a full seven days per week.

Section 14.52.030 of the Berkeley Municipal Code regulates the "time of operation of parking meters and pay-and-display stations" and provides that "the operation of parking meters and pay-and-display stations shall be effective between the hours of nine a.m. and six p.m. every day except Sundays." Allowing metered parking on Sundays would require amending Section 14.52.030.

Monies derived from parking meters may be used in the following manners, pursuant to Section 14.52.110, regulating the "Use of money deposited in parking meters and pay-and-display stations:"

> "Except as permitted under subdivision G below, all moneys collected from parking meters and pay-and-display stations in the City shall be placed in a special fund, which fund shall be used for the following purposes:
>
> A. For the purchasing, leasing, installing, repairing, maintaining, operating, removing, regulating and policing of parking meters and pay-

[4] https://www.cityofberkeley.info/parking-meters

and-display stations in the City and for the payment of any and all expenses relating or incidental thereto.

B. For the purchasing, leasing, acquiring, improving, operating and maintaining of off-street parking facilities in the City.

C. For the installation and maintenance of traffic control devices and signals.

D. For the painting and marking of streets and curbs required for the direction of traffic and the parking of motor vehicles.

E. For the proper regulation, control and inspection of parking and traffic upon the public streets.

F. To be pledged as security for the payment of principal of and interest on off-street parking revenue bonds issued by the City.

G. Additional Revenue deemed to be generated by the goBerkeley Pilot Program will be used to fund goBerkeley efforts, pursuant to Section 1012(b) of Intermodal Surface Transportation Efficiency Act of 1991, as amended, as agreed in the 2012 Cooperative Agreement between the City of Berkeley, the California Department of Transportation and the Federal Highway Administration.

H. Surplus money not utilized under subdivision A through F above may be transferred to the general fund. The City Manager or their designee may make an annual determination as to what is surplus based on the needs and obligations of the special fund and transfer such surplus to the general fund. (Ord. 7498-NS § 2, 2016: Ord. 7305-NS (part), 2013)"

Use of monies from the Parking Meter Fund for improved pedestrian and bike facilities is likely allowed pursuant to Subsections C and D above, which allow funds to be used for traffic control devices, signals, and street painting. Alternatively, Subsection H would allow funds to be transferred to the General Fund for these uses.

The City of Berkeley's Climate Action Plan's second goal is that "[p]ublic transit, walking, cycling, and other sustainable mobility modes are the primary means of transportation for Berkeley residents and visitors." Staff's July 2020 update on the Climate Action Plan emphasizes that in Berkeley's quest to continue reducing its GHG Emissions, the City's "biggest opportunity sector" is to advance opportunities "for people to safely walk, bike, take public transit, and electrify mobility options." "Transportation accounts for 59% of Berkeley's total 2018 GHG inventory. This is the largest sector of

GHG emissions and the most challenging to tackle. The City continues to work to get people out of cars by prioritizing walking and biking, and into less polluting modes of transportation."[5]

Berkeley has also adopted a Vision Zero Program to end traffic fatalities and severe injuries, most of which involve pedestrians and bicyclists. One of Vision Zero's seven goals is to "create safer transportation options for people who walk, bike, and take transit." Allocating additional Parking Meter Fund monies to support improved bike and pedestrian facilities would thus support both the City's Climate Action and Vision Zero goals.

This proposal is referred to both the City Manager and Transportation Commission (or its successor) to ensure opportunities for robust community input, including outreach to merchants, faith-based and other institutions and organizations, neighborhood groups, and others potentially supported or impacted by proposed change. A pilot, phasing-in, and/or exempting certain areas should also be considered.

ENVIRONMENTAL IMPACTS

Unlikely to have substantive impacts on greenhouse gas emissions, though some studies have demonstrated metered parking reduces time spent idling and searching for parking spots, which can have minor reductions to tailpipe emissions. Possible future investments in bicycle and pedestrian infrastructure funded from these new revenues would help us reach our Climate Action Goals sooner.

FINANCIAL IMPLICATIONS

Metered parking (on-street and in surface lots), currently in force from Monday through Saturday (except listed holidays), generates approximately $10M/year for the City of Berkeley (pre-COVID). Including Sundays in paid parking could increase revenues an estimated $1M - $1.5M per year. Parking enforcement would need to be extended to Sundays, offsetting some portion of income, but likely no more than for days when metered parking is already in force.

CONTACT PERSON

Councilmember Sophie Hahn Council District 5 510-981-7150

ATTACHMENTS

[5] https://www.cityofberkeley.info/Clerk/City_Council/2020/07_Jul/Documents/2020-07-21_Presentations_Item_5_(6pm)_Pres_CMO_pdf.aspx

1. Parking Enterprise Funds: Balancing Proposal https://www.cityofberkeley.info/uploadedFiles/Clerk/2020-11-12%20Budget%20Item%202f%20Parking.pdf
2. Siteline study on parking meters improving business: https://www.sightline.org/2012/03/28/is-metered-parking-boosting-business/

Date: **November 12, 2020**

To: **Budget & Finance Policy Committee**

From: **Liam Garland, Public Works Director**

Submitted By: **Sean O'Shea, Public Works Administrative & Fiscal Services Manager**

Subject: **Parking Funds – Public Works Balancing Proposal**

Summary

The COVID-19 pandemic has had a significant impact on the financial health of both the City's On-Street and Off-Street Parking Funds. Initial projections of impacts into FY 2021 were presented to Council as part of the budget gap discussions with departments throughout June. On October 8, 2020, staff presented status updates to the Budget & Finance Policy Committee on both parking funds, including revised projections that show both funds are generating significant deficits. This report presents a department proposal for balancing the parking program funds for FY 2021 and future years, and highlights additional balancing considerations.

Background

Before the Shelter-In-Place Order was issued on March 16, 2020, and normal parking operations halted, both the On-Street and Off-Street Parking Funds were on pace for healthy revenues in excess of expenditures. The status of both funds has changed dramatically post-COVID as both funds were impacted equally hard by cratering demand due to the shelter-in-place orders, subsequent business restrictions and changing parking customer behaviors. City garages have closed or severely reduced capacity due to demand and to save costs. Parking Meters were turned off through June, and are still below pre-COVID rates and demand. The falling revenue required significant use of fund balances and a commitment from the General Fund to cover the Center Street Garage Bond Debt Service payment for FY 2021. The staff report and presentation to the Budget and Finance Policy Committee on October 8, 2020 detailed the revenue and budget impacts.[1]

Public Works Balancing Proposal

The Public Works balancing proposal assumes a projected program deficit of ($7,752,445) for FY 2021. This includes the FY 2020 year end fund balance for the Off-Street (Garage) Parking Fund, which ended up negative at ($1,244,453) due to dramatically decreased revenue at city garages after the shelter-in-place order in March. The second component is a combined On-Street and Off-Street Parking Fund projected ($6,507,992) operating loss for FY 2021, based on updated expected revenues and planned expenditures.

While the bulk of this balancing proposal highlights recommended strategies to address fund deficits, this report will also present further capital needs that have additional impacts into FY 2022 and FY 2023. The deep revenue losses in FY 2020 and 2021 will cause the funds to significantly exhaust fund balance.

[1] https://www.cityofberkeley.info/uploadedFiles/Clerk/Report_Status%20of%20parking%20enterprise%20funds.pdf

For the Off-Street Parking Fund, a pre-COVID FY 2020 projected year end fund balance of $0.76M was totally depleted and ran negative ($1.24M) by the end of FY 2020. For the On-Street Parking Fund, the pre-COVID FY 2020 projected year end fund balance was $5.52M, but after the COVID-19 related revenue impacts, the actual fund balance was $3.21M. The consideration of fund balance is critical when looking beyond simply balancing the funds for FY 2021, as the fund balance for the On-Street Parking Fund contains $3.0M in funds reserved towards a $6.0M systemwide meter upgrade and replacement program. Use of existing reserves to balance current year budget will further deplete the funds available to upgrade the City's parking meters. Based on projected revenues for the rest of FY 2021 and into FY 2022/23, which assume there will not be a significant recurrence of COVID that shuts parking operations down again, the parking funds will begin to have net operating surpluses that will allow meet the garage to cover expenses and debt service but not enough to make up for the fund balance that was deployed to address deficits. This will either delay the meter replacement project several years until sufficient fund balance is attained within the parking funds, or could require General Fund budget supplementation beyond FY 2021 to allow the project to begin on schedule.

Revenue/Budget Augmentation and Use of Reserves

To try to solve the FY 2020-2021 deficit $7,752,445, Public Works looked at ways to responsibly increase revenue and supplement the adopted baseline FY 2021 parking budget. After review and analysis of the parking program, Public Works is proposing three solutions for a total of $3,615,067.50 in increased revenue along with appropriations of reserve and fund balance.

1) *Use of the Rate Stabilization Fund*: In setting up the Center Street Garage Bond, part of the terms included a requirement to create a reserve fund, to be used in case revenues dipped below the debt covenant ratio of 1.25. At bond issuance, a combined total $1,915,050 was transferred to this fund from the two parking funds. After consultation with the Finance Director and City Bond Counsel, city staff received assurance that these funds could be transferred back into the parking funds to augment operational budgets. Staff proposed transferring the full amount of $1,915,050 back into the parking funds for use in the FY2021 budget.

2) *On-Street Parking Fund Balance*: While the Off-Street Parking Fund ended FY 2020 with a negative fund balance, the On-Street Parking Fund ended FY 2020 with a $3,208,035 fund balance. This was significantly lower than the pre-COVID projected year end fund balance of $5.5M. This balance included $3.0M in resources that were planned to be used for the scheduled citywide Parking Meter Upgrade Project in FY 2023, which is currently estimated to cost $6.0M. The Public Works department has been setting aside $1.0M annually in operating surplus, part of the fund balance, towards this planned expenditure. To help balance the deficit, while also reserving some level of fund balance towards future obligations, Public Works proposes to appropriate half of the fund balance, $1,604,017.50, to address deficits.

3) *Increase Hourly Parking Rates by $0*.50/hour: After analysis of on-street parking usage in the downtown, beginning on November 1, Public Works has implemented a meter increase of $0.50/hour, for a new peak hourly rate of $3.00. This will result in an increase in projected revenue for the months of November and December of approximately $48,000/month, for a total revenue increase of $96,000. In January 2021, the rate increase would align with the Public

Works Department's previous assumptions for parking meter revenue, so no additional revenue beyond $96,000 can be projected at this time.

Expenditure Reductions

In addition to generating new revenue and using reserves, the Public Works Department reviewed its expenditure budget for opportunities to save costs within the two parking funds. After consideration, the proposed solutions propositions include $964,354.52 in reductions due to salary savings from vacancies, cost shifting salaries to other funds sources, and deferring a capital project. The most significant proposal for expenditure reductions, is a proposed cost-shift of Parking Enforcement Program support from the On-Street Parking Fund to the General Fund for FY 2021 in the amount of $3,240,688. The total expenditure savings to the parking funds would be $4,205,042.62.

1) *Cost Shift 0.77 FTE to other Public Works Funds*: Staff reviewed all Public Works positions funded by the Parking Funds for potential reallocation to other Public Works managed funds. Most positions are in direct support of the parking program, including parking maintenance, meter repair, meter collection, and parking program management and could not be appropriately cost shifted. Staff did identify a few administrative positions of which a portion of their salary and benefits are funded by the Parking Funds. The Parking Fund FTE allocation for all of these positions totals up to 0.77 FTE, and $81,298 in savings for the remainder of FY 2021, if the cost shift is implemented by December 2020.

2) *Vacancy Savings*: Public Works has had two recent vacancies at positions that are funded at least in part by Parking Funds, an Associate Management Analyst and Parking Meter Mechanic. The analyst position has been filled, but 4 months of savings were realized. The Parking Meter Mechanic position is projected to remain vacant for the remainder of FY 2021. The projected savings from those two positions in FY 2021 totals $173,056.62.

3) *Defer Construction of Telegraph-Channing Mall Elevator Construction*: The Telegraph – Channing Mall Garage Elevator replacement project is in the department capital plan for FY 2021. Staff proposes to defer the construction of this project to future years, but will keep a small portion for project design and a refined project cost estimate. The projected deferral of the construction cost is an estimated $710,000.

4) *Cost Shift FY 2021 Parking Enforcement Program to the General Fund:* Public Works analyzed all costs for staffing and non-personnel under its control, but a large part of the On-Street Parking Fund expenditure budget is not in Public Works, but with the Police Department's Parking Enforcement Program. The On-Street Parking Fund directly pays for 19.0 FTE in Parking Enforcement, in the amount of $2,527,215. The fund also pays for $703,473 in Parking Enforcement non-personnel costs, including a share of the annual lease payment for their leased facility, for a total of $3,240,688 in On-Street Parking Fund support for Parking Enforcement. Revenue from Parking Enforcement citations does not stay in the On-Street Parking Fund but is received into the city's General Fund. The proposal for FY 2021 is to allocate the total costs of the Parking Enforcement program, $3,240,688, to the General Fund. Assigning the costs of the Parking Enforcement program to the General Fund, rather than a transfer from

the General Fund to the On-Street Parking Fund, is beneficial in that will help with the Parking Funds bolster its debt service coverage ratio, by eliminating expenses from the calculation.

Alternatives Considered

Staff considered several other alternatives on both the revenue and expenditure side but is not recommending implementation at this time, either due to adverse budget impacts or very insignificant benefits.

1) *Telegraph-Channing Garage Closure:* Staff calculated the net savings of shutting down the Telegraph-Channing Garage for parking. Based on current parking revenue at the garage, the net monthly savings from reducing the Parking Management Fee for garage operations would be $29,151/month. This would be offset however, by greater costs from city staff at approximately $33,143/month, who would have to replace the parking management operator in servicing the facility. Services would be needed to remain open for the retail tenants in the mall, including opening and closing the facility, janitorial, security, and trash coordination.

2) *Center Street Garage Increase Monthly Parking:* Currently the garage has 90 'public' monthly parkers at $250/month, generating $22,500/month in revenue. Staff is not confident that given the parking environment, the current rate of $250/month would entice much new monthly parking. If the rate was decreased to incentivize garage parking, from $250/month to $150/month, this would result in a loss of revenue estimated at $9,000/month just from the current monthly parkers. In order to break even, the garage would need to add 54 new monthly parkers. This would have to be marketed to the Community and city staff, and it is unclear to Public Works how many new monthly parkers would be added. Even if that break-even demand was met, it would need to be exceeded greatly in order to generate greater revenue than the status quo. Any significant amount of new monthly parkers would require the garage to increase its current capacity limits. This would trigger additional costs from our Parking Management contract, which have been able to reduce due to limiting the capacity of the garage. These increased expenses would negate the revenue increases and potentially create a net operating loss.

3) *Elmwood Lot Monthly Parking:* Staff evaluated both closing the lot to save costs and offering limited monthly parking to boost revenue. Closing the lot entirely is not an option, it has to remain open for commercial trash access and there are 3 reserved spaces for businesses. Offering some monthly parking, potentially to merchants for employee parking, would ultimately make very little impact to the greater fund deficit. There are 39 available spaces, so if 20 were made available for monthly parking, at $100/month, for December through June 2021, it would generate only $14,000 in new revenue.

4) *Bond Insurance Payout:* Staff consulted with its Bond Counsel over possible use of insurance that was taken out for the Center Street Garage Bond. The only use of the coverage is to pay debt service if no other funding was available to do so. This payment of $1,910,050 was made in FY 2020 by the Parking Funds, and has been budgeted for payment out of the General Fund in FY 2021. Bond counsel informed the City that there are possible repercussions to future bond issuances if the city defaults on the bond and draws on the insurance. At this time, staff plans to

make the bond payment with General Fund in FY 2021 but will consider use of insurance in future fiscal years if deficits threaten the Parking Funds ability to make the bond payment or operational needs continue.

Future Capital Needs

The balancing proposal presented in this memorandum restores the Off-Street Parking Fund balance to $0, balances both Parking Funds operational shortfall for FY 2021 and retains a $1.6M year end fund balance in the On-Street Parking Fund. Looking ahead to FY 2022 and FY 2023, if revenue begins to return to pre-COVID levels, the two Parking funds will get to operational break-even. While this means that no General Fund assistance would be required to make the Center Street Garage Bond debt service payment or cover the cost of Parking Enforcement in those years, the parking funds will not earn revenue sufficient enough to fund its major capital replacement needs currently scheduled in FY 2021 and FY 2023. The fund balances used in FY 2020 and FY 2021 to cover operation costs will not be made up for several years.

The Telegraph Channing Garage Elevator Replacement project construction funding was scheduled to begin in FY 2021. It has been deferred in this budget balancing proposal to a future fiscal year. There is risk in deferring this project too long. The elevator is aging, requires frequent repairs, and is the only ADA access to the mall and garage beyond the first floor. The construction cost (currently estimated at $710,000) will have to get added to a future fiscal year budget, potentially as a General Fund budget request.

The Citywide Parking Meter Upgrade/Replacement project is estimated to cost $6.0M and is scheduled for FY 2023. Public Works has long planned an annual contribution to the On-Street Parking Fund balance at a rate of $1.0M/year through FY 2023 to fund the project. By FY 2023, those fund balances will have been completely depleted to cover parking program operations. In order to complete the meter upgrade/replacement on time, a General Fund budget request would be necessary. The critical issue for the meter upgrade is that when the cell network carriers upgrade their technology, our existing meters would go offline, and not be able to collect credit card revenue. This would hurt the program's revenue collecting ability, which is already under stress. The best estimate when network carriers will upgrade their technology is in 2023.

Combining those two major projects, there is an unfunded need in the Parking capital replacement program of approximately $6.71M, programmed for implementation by FY 2023. Beyond the $3.24M proposed for the General Fund in FY 2021 to cover the Parking Enforcement Program, Public Works is submitting for future consideration potential General Fund assistance to cover these major capital needs, until the Parking Funds are able to restore revenues.

PARKING ENTERPRISE FUNDS

BALANCING PROPOSALS

PUBLIC WORKS DEPARTMENT

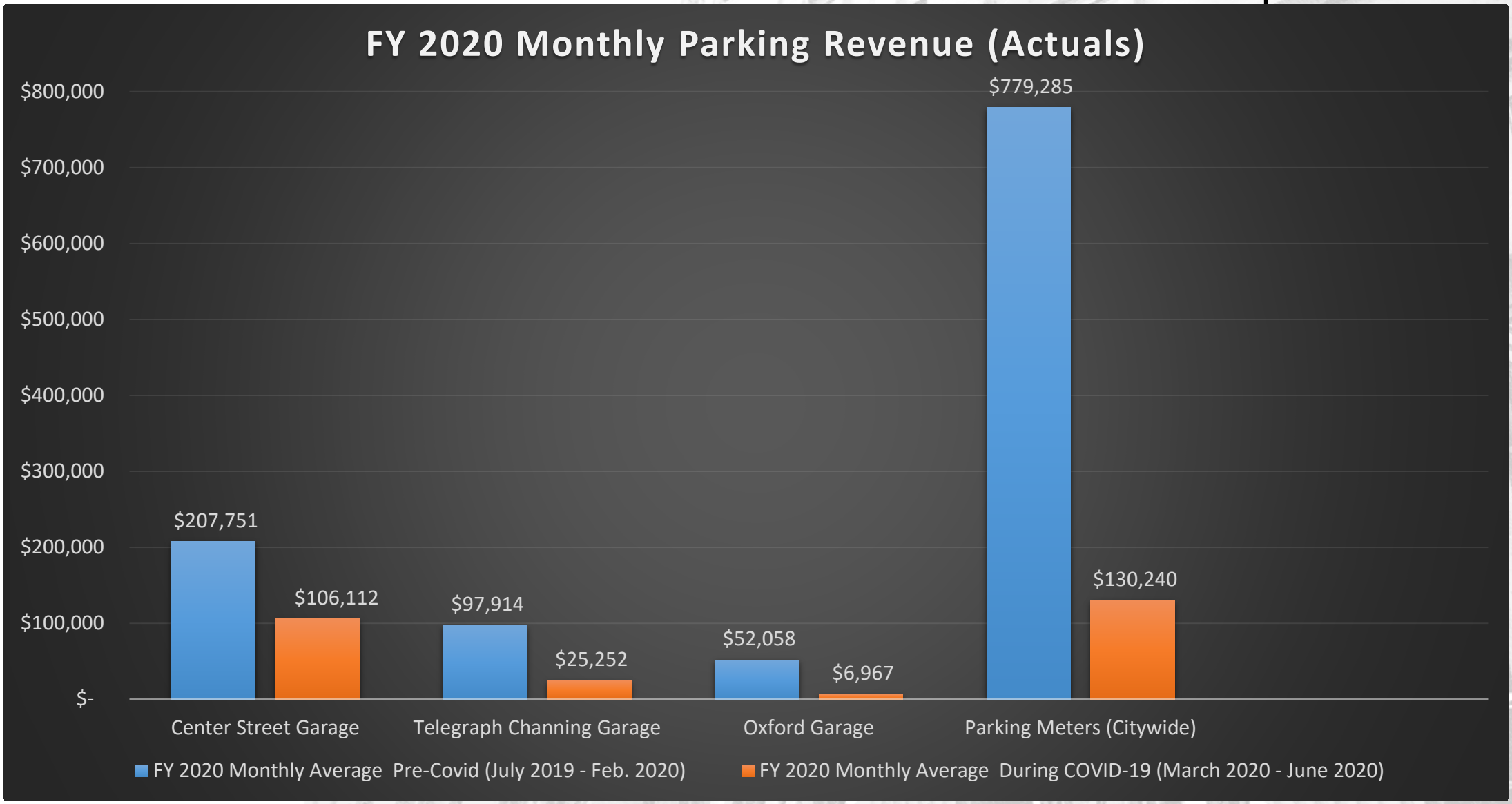
PUBLIC WORKS DEPARTMENT

OVERVIEW

- Review of Revenue Impacts and the Current and Projected Status of the Parking Enterprise Funds
- Revenue/Budget Augmentation/Use of Reserves Proposals
- Expenditure/Cost Saving Proposals
- Summary of FY 2021 Balancing Proposals
- Future Fiscal Year Program Shortfall

PUBLIC WORKS DEPARTMENT

Status before and initial months of COVID-19 impacts



PUBLIC WORKS DEPARTMENT

Current Revenue Status (FY 2020 Ending)

	FY 2020 Projected (pre-COVID-19)	FY 2020 Actuals (COVID-19 Impacts))	FY 2020 Revenue Loss
Center Street Garage	$ 2,493,011	$ 2,086,456	$ (406,555)
Telegraph Channing Garage	$ 1,175,417	$ 884,619	$ (290,798)
Oxford Garage	$ 624,699	$ 444,335	$ (180,364)
Parking Meters (Citywide)	$ 9,351,419	$ 6,755,240	$ (2,596,179)
Total	**$ 13,644,546**	**$ 10,170,650**	**$ (3,473,896)**

PUBLIC WORKS DEPARTMENT

FY 2021 Projected Revenue (Assumes COVID-19 Impacts through June 2021)

	FY 2021 Projected (if no COVID-19 impacts and using Pre-COVID-19 average)	FY 2021 Projected (Assumes Covid-19 Impacts thru June 2021)	FY 2021 Potential Revenue Loss (due to COVID-19)
Center Street Garage	$ 2,493,011	$ 1,325,969	$ (1,167,042)
Telegraph Channing Garage	$ 1,175,417	$ 584,307	$ (591,110)
Oxford Garage	$ 624,699	$ 238,644	$ (386,055)
Parking Meters (various locations)	$ 9,351,419	$ 4,326,460	$ (5,024,959)
Total	**$ 13,644,546**	**$ 6,475,380**	**$ (7,169,166)**

PUBLIC WORKS DEPARTMENT

BALANCING PROPOSALS
REVENUE AUGMENTATION/USE OF RESERVES

- Use of Rate Stabilization Fund:
  $1,915,050
- Fund Balance (On Street Parking Fund):
  $1,604,018
- Increase Hourly Parking Rates $0.50/hr:
  $96,000

PUBLIC WORKS DEPARTMENT

BALANCING PROPOSALS EXPENDITURE REDUCTIONS

- Cost Shift 0.77 FTE of PW administrative staff to other Funds: **($96,000)**
- Vacancy Savings 2 FTE - Associate Management Analyst and Parking Meter Mechanic: **($173,057)**
- Defer Construction of Telegraph-Channing Garage Replacement: **($710,000)**
- Cost Shift FY 2021 Parking Enforcement Program Costs to General Fund: **($3,240,688)**

PUBLIC WORKS DEPARTMENT

FY 2021 Balancing Summary

FY 2021 Off-Street Parking Fund Beginning Balance	$ (1,244,453.00)
FY 2021 Projected Combined ANNUAL SURPLUS/SHORTFALL (Rev - Exp)	$ (6,507,992.00)
Total Resources Needed to Address Deficit and Negative Cash Balance	**$ (7,752,445.00)**
Proposed Revenue Augmentation/Use of Reserves	**Amount**
Use of 50% of Parking Meter Fund FY 2021 Beginning Available Cash Balance	$ 1,604,017.50
Increase Hourly Parking Meter Rates by $0.50/hour	$ 96,000.00
Use of Rate Stabilization Fund	$ 1,915,050.00
FY 2021 Projected Total Revenue	**$ 3,615,067.50**
Proposed Expenditure Reduction (Cost Savings Strategies)	**Amount**
Cost shift 0.77 FTE equivalent to other PW funds	$ 81,298.00
Salary Savings due to vacancies (Assoc. Management Analyst and Parking Meter Mechanic)	$ 173,056.62
Delay Construction of Telegraph Channing Garage Elevator project to FY 2022	$ 710,000.00
Cost Shift the FY 2021 Parking Enforcement Program cost to the General Fund	$ 3,240,688.00
Total	**$ 4,205,042.62**
Total Resources Needed to Address Deficit and Negative Cash Balance	**$ (7,752,445.00)**
Proposed Revenue Augmentation	$ 3,615,067.50
Proposed Expenditure Reduction (Cost Savings Strategies)	$ 4,205,042.62
Total Proposed Balancing Measures	**$ 7,820,110.12**
Projected Balance after Proposals	**$ 67,665.12**
Total General Fund Allocation Needed to Address Deficit	**$ 3,240,688.00**

PUBLIC WORKS DEPARTMENT

Future Fiscal Year Shortfall/ General Fund Request Summary

General Fund Balancing Support*	FY 2021	FY 2022	FY 2023
Parking Enforcement Program	$3,240,688		
Telegraph - Channing Garage Elevator		$710,000	
Parking Meter Upgrade/Replacement			$6,000,000
New Proposal Summary	**$3,240,688**	**$710,000**	**$6,000,000**

General Fund Total FY 2021-2023	**$9,950,688**		
Possible General Fund Allocation FY 2021-2023	**$3,240,688**	**$3,355,000**	**$3,355,000**

**excludes Debt Service Coverage of $1,910,050 already budgeted in FY 2021*

Sightline INSTITUTE

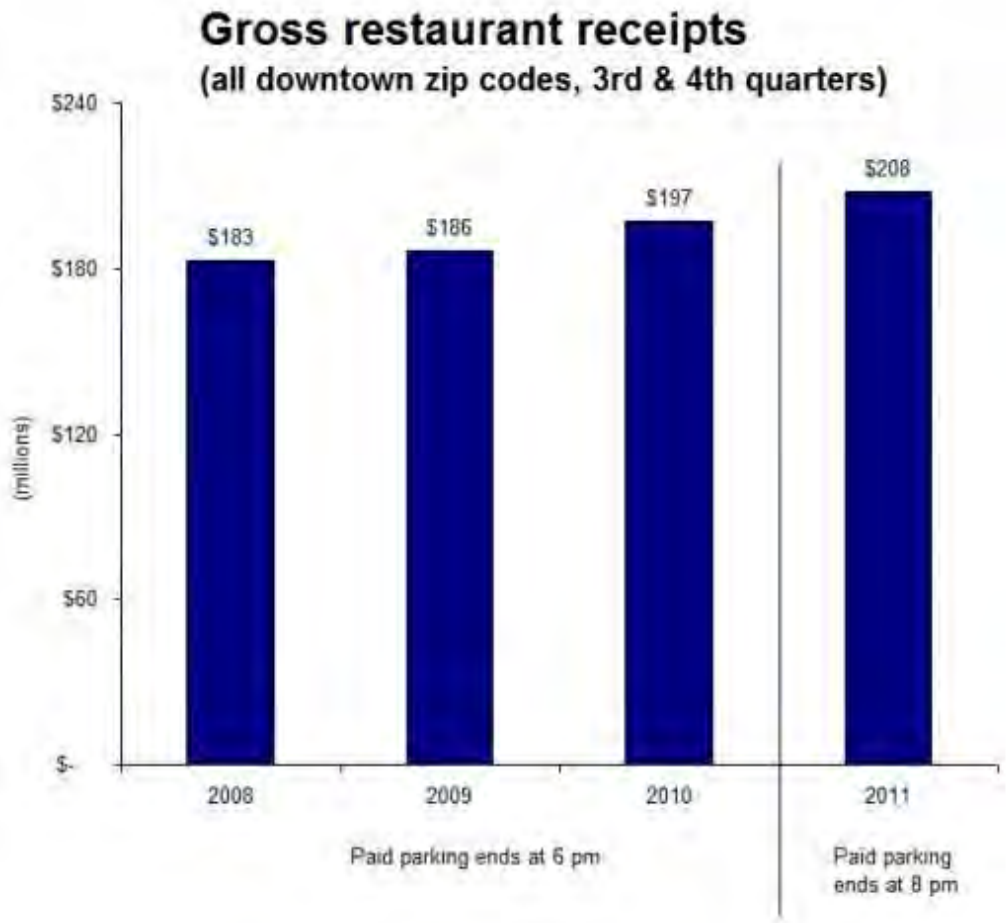
ARE PARKING METERS BOOSTING BUSINESS?

More evidence that business receipts rise with parking costs.

Author: **Eric de Place**
(@Eric_deP) on March 28, 2012 at 8:30 am

Over the weekend, Seattle's restaurant association took to the op-ed pages to complain about the City's parking policies downtown. As they tell it, changes in parking policy "hits them where it hurts our businesses the most: their wallets."

Yet as with so many discussions of parking, the restauranteurs' argument is long on conjecture but extremely short on hard data. A look at gross receipts figures for downtown restaurants shows precisely the opposite of what the business group alleges. Their wallets appear to be doing just fine:



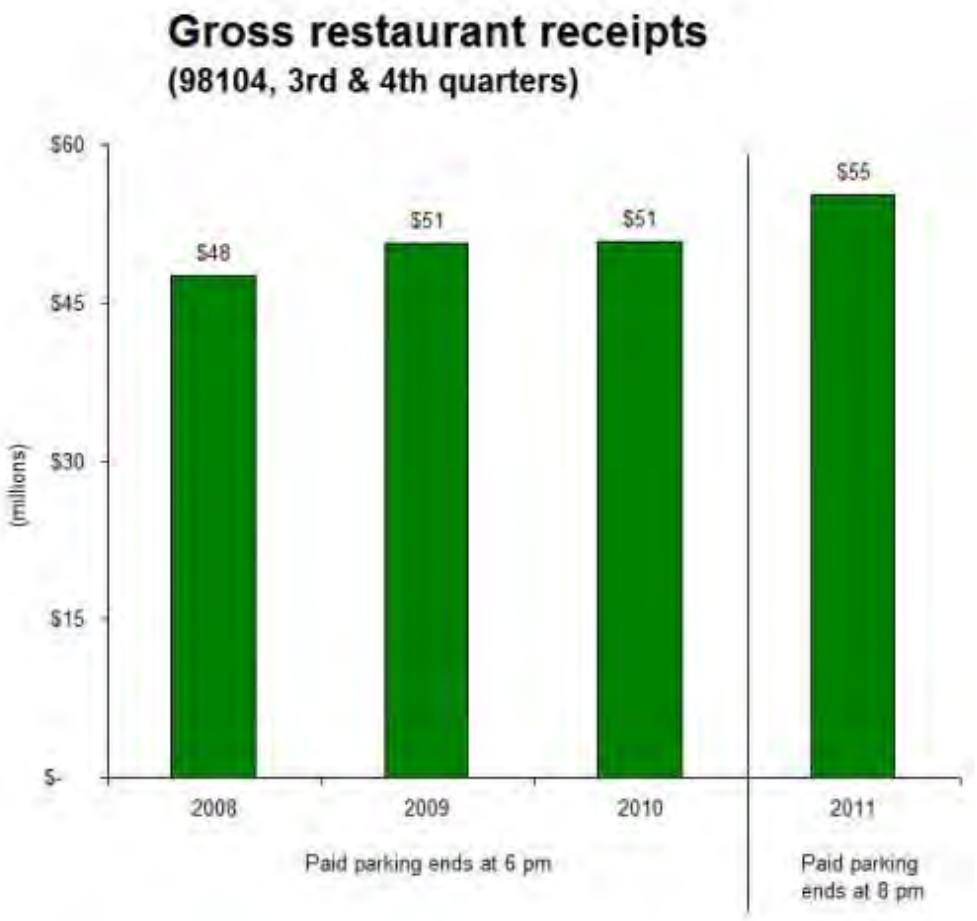
After paid parking hours were extended in mid-2011 **gross receipts for downtown restaurants climbed by 5.4 percent.**

The extension of metered parking from 6 to 8 pm went into effect in the middle of 2011, so by comparing the 3rd and 4th quarters of 2011 to the 3rd and 4th quarters of previous years we get a year-over-year comparison. To be sure, we should treat this analysis as preliminary, but the data we have so far suggest that in the era of higher parking costs business is practically booming.

On the one hand, it's easy to understand why restaurant owners worry. A lot of these businesses skate by on thin margins, and proprietors may feel that parking changes could put their livelihood at stake. But on the other hand, it's important to cross-check our beliefs with the data. And the data show that higher parking costs downtown have most definitely *not* led to a decline in overall sales.

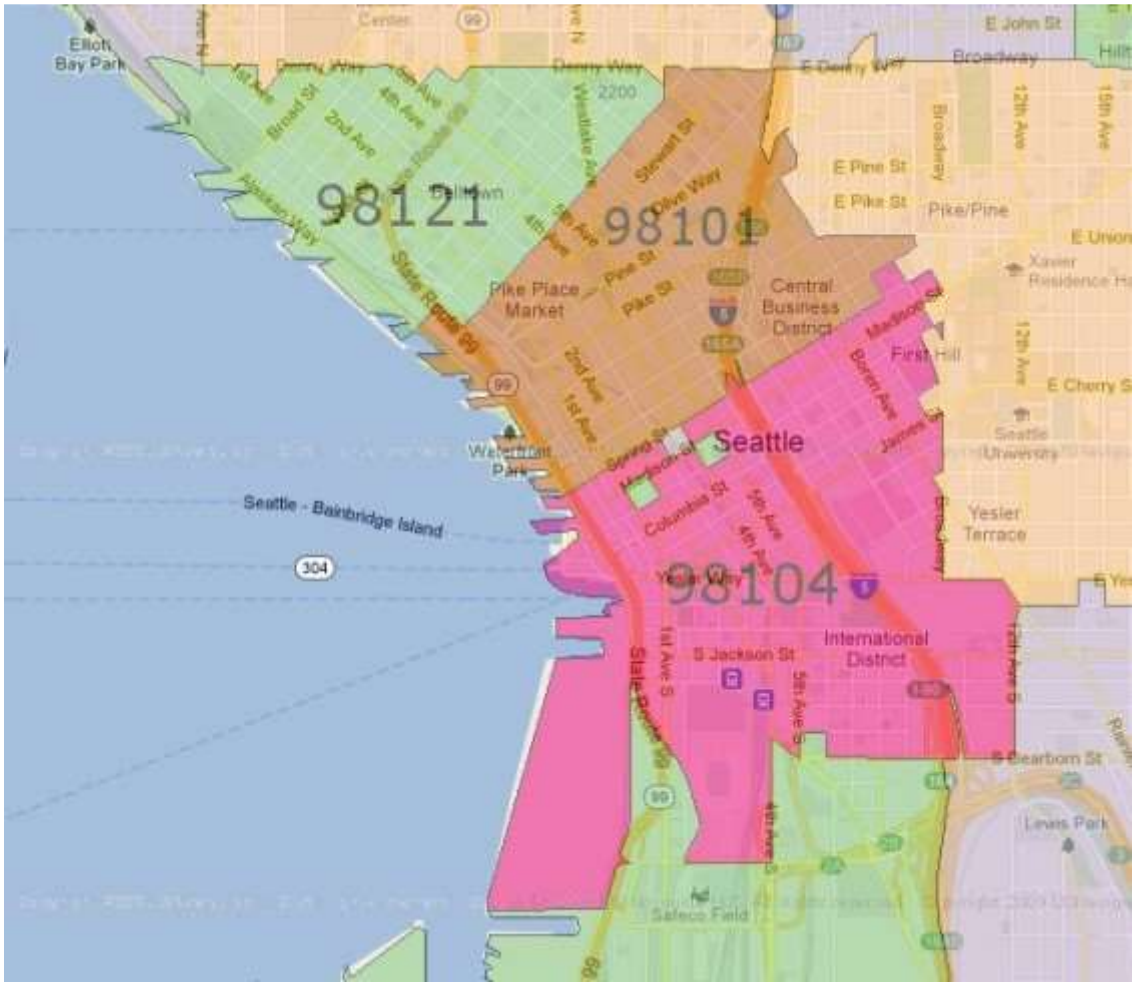
the car curbside until 8?) In fact, boosting business is exactly what Seattle set out to do when officials adjusted meter rates and extended paid hours downtown.

Given the numbers so far, it looks like the City got it right. Receipts notched up in each of the three downtown zip codes. Sales rose by 2.2 percent in 98101 and by 8.7 percent in 98121. In the 98104 zip code, which encompasses the Chinatown/International District that has been the subject of so much hand-wringing over parking policy changes, business is stronger yet:



In the 98104 zip code, **gross receipts spiked by nearly 9 percent** after the parking changes went into effect. So, contrary to all the hullabaloo (and criticism of my earlier post on the subject), there's little verifiable evidence that parking meters are driving business out of the southern part of downtown that includes Chinatown. If anything, the parking changes would seem to be *increasing* business.

Personally, I'm getting sick and tired of what seems like endless complaints about parking that are



When you've got enough data on your hands, it's usually possible to squint at it long enough to gin up some counter-story or oddity. But in this case, the receipts figures for downtown restaurants are reasonably clear: since paid parking hours were extended, business has increased, at least in aggregate. Plus, the aggregate data I'm reporting here is corroborated by the two other sources I've explored, sample data from the City for 14 establishments in Chinatown/International District and state Revenue Department data for the city as a whole.

In the future, I hope we can root our discussions in the actual numbers, and fewer data-free reactions from the restaurant association and *Seattle Times*. And if our debates about parking policy should ever graduate to the level of using actual numbers, then maybe we can start exploring more advanced topics like correlation and causation.

Notes: The data I use in the post refer to NAICS codes 722, 7221, 72211, 722110, 7222, 72221, 722211, and

parking rates also went up from $2.50 to $4.00 per hour and the changes took effect in April and May 2011. In Belltown, roughly consistent with 98121, parking rates declined from $2.50 to $2.00 per hour and the changes took effect in June and July 2011. In Chinatown/International District, a subset of 98104, parking rates did not change, but parking hours were extended starting in August 2011.

Eric de Place

Eric de Place, director of Thin Green Line, spearheads Sightline's work on energy policy. Known as a leading expert on coal, oil, and gas export plans in the Pacific Northwest, he is considered an authority on a range of issues connected to fossil fuel transport, including carbon emissions, local pollution, transportation system impacts, rail policy, and economics. He has researched and published more than four hundred articles, reports, and analyses on these proposals, and his work on fossil fuel transport has been cited by regional and national news media outlets more than a thousand times. His expertise makes him a highly sought-after expert in the field providing him with the opportunity to support allied groups, as well as educate media, elected officials, and the broader public on critical issues affecting our region. Eric is a talented speaker, presenter, and media spokesperson. In his increasingly scarce free time, he enjoys climbing the Northwest's peaks, tidepooling beaches with his kid, and solving the rest of the world's problems over a pint. Before coming to Sightline, he worked with the Northwest Area Foundation, developing strategies to alleviate poverty in rural communities. He has a master's degree in philosophy from the University of Notre Dame. Find his latest research here, email him at eric [at] sightline [dot] org.

For press inquiries and interview requests, please contact Steph Routh

Sightline Institute is a 501(c)3 non-profit organization and does not support, endorse, or oppose any candidate or political party.

Upcoming Worksessions – *start time is 6:00 p.m. unless otherwise noted*	
Scheduled Dates	
Dec. 7	1. WETA / Ferry Service at the Marina 2. Presentation by Bay Restoration Authority 3. Update: Zero Waste Rates & Priorities
January 20 (Thurs.)	1. Review and Update on City's COVID-19 Response 2. Public Works/Infrastructure Presentation
February 15	1. Homeless Services and Mental Health Services
March 15	1. Housing Element Update
April 19	1. Fire Department Standards of Coverage Study

Unscheduled Workshops
1. Cannabis Health Considerations 2. Alameda County LAFCO Presentation

Unscheduled Presentations (City Manager)
1. Civic Arts Grantmaking Process & Capital Grant Program 2. Civic Center – Old City Hall and Veterans Memorial Building (Tentative: Action Item) 3. Mid-Year Budget Report FY 2022

	City Council Referrals to the Agenda & Rules Committee and Unfinished Business for Scheduling
1.	**25. Surveillance Technology Report, Surveillance Acquisition Report, and Surveillance Use Policy for Automatic License Plate Readers** *(Continued from February 25, 2020. Item contains revised and supplemental materials) (Referred from the May 12, 2020 agenda.)* **From: City Manager** **Recommendation:** Adopt a Resolution accepting the Surveillance Technology Report, Surveillance Acquisition Report, and Surveillance Use Policy for Automatic License Plate Readers submitted pursuant to Chapter 2.99 of the Berkeley Municipal Code. **Financial Implications:** None Contact: Andrew Greenwood, Police, (510) 981-5900; Dave White, City Manager's Office, (510) 981-7000 ***Note:*** *Referred to Agenda & Rules for future scheduling.*
2.	**Adopt a Resolution Updating City of Berkeley Street Maintenance and Rehabilitation Policy** *(Reviewed by the Facilities, Infrastructure, Transportation, Environment & Sustainability Committee) (Continued from the June 1, 2021 meeting) (Referred from the July 13, 2021 meeting)* **From: Councilmember Harrison (Author), Councilmember Bartlett (Co-Sponsor), Councilmember Taplin (Co-Sponsor)** **Recommendation:** 1. Adopt a Resolution updating the City's Street Maintenance and Rehabilitation Policy dated June 1, 2021. 2. Refer the exploration of potential bonding and funding opportunities for improving the Paving Condition Index (PCI) of streets and creating a Paving Master Plan back to the Facilities, Infrastructure, Transportation, Environment & Sustainability (FITES) Committee for further review. *Policy Committee Recommendation: To move the Public Works supplemental item "City of Berkeley Street Maintenance and Rehabilitation Policy to Council" with a positive recommendation including amendments made during the meeting today, and ask Council to refer the exploration of potential bonding and funding opportunities for improving the PCI of streets and creating a Paving Master Plan back to the FITES Committee for further review.* **Financial Implications:** Staff time Contact: Kate Harrison, Councilmember, District 4, (510) 981-7140 **Note:** *Item referred to the Agenda & Rules Committee for future scheduling with the Five-Year Paving Plan.*

CITY CLERK DEPARTMENT WORKING CALENDAR FOR SCHEDULING LAND USE MATTERS BEFORE THE CITY COUNCIL			
Address	**Board/ Commission**	**Appeal Period Ends**	**Public Hearing**
NOD – Notices of Decision			
Public Hearings Scheduled			
1527 Sacramento St (second story addition)	**ZAB**		**2/22/2021**
2956 Hillegass Ave (addition to lawful non-conforming structure)	**ZAB**		**2/8/2021**
Remanded to ZAB or LPC			
1205 Peralta Avenue (conversion of an existing garage)	**ZAB**		
Notes			

11/18/2021

Office of the City Manager

SUPPLEMENTAL AGENDA MATERIAL

for Supplemental Packet 2

Meeting Date: **November 10, 2020**

Item Number: **20**

Item Description: **Annual Commission Attendance and Meeting Frequency Report**

Submitted by: **Mark Numainville, City Clerk**

The attached memo responds to issues and questions raised at the October 26 Agenda & Rules Committee Meeting and the October 27 City Council Meeting regarding the ability of city boards and commissions to resume regular meeting schedules.

Office of the City Manager

November 9, 2020

To: Mayor and Council

From: Dee Williams-Ridley, City Manager

Subject: Commission Meetings Under COVID-19 Emergency (Item 20)

This memo provides supplemental information for the discussion on Item 20 on the November 10, 2020 Council agenda. Below is a summary and update of the status of meetings of Berkeley Boards and Commissions during the COVID-19 emergency declaration and the data collected by the City Manager on the ability of commissions to resume meetings in 2021.

On March 10, 2020 the City Council ratified the proclamation of the Director of Emergency Services for a state of local emergency related to the COVID-19 pandemic. The emergency proclamation has been renewed twice by the Council and remains in effect.

On March 17, 2020 the City Council adopted Resolution No. 69,331-N.S. which placed limitations of the meetings of City legislative bodies, including all boards and commissions. The resolution allows for commissions to meet to conduct time-sensitive, legally mandated business with the authorization of the City Manager. Since that time, several commissions have obtained this approval and held meetings; many other commissions have not met at all since March.

The City Manager has periodically reviewed the status of commission meetings with the City Council Agenda & Rules Committee. Recently, at the October 12, 2020 Agenda & Rules Committee meeting, the City Manager presented a proposal to allow all commissions to meet under limited circumstances. The Committee voted to endorse the City Manager's recommendation.

Effective October 12, 2020, all City boards and commissions may meet once to develop and finalize their work plan for 2021 and to complete any Council referrals directly related to the COVID-19 pandemic response. A second meeting may be held to

complete this work with specific authorization by the City Manager. It is recommended that the meeting(s) occur by the end of February 2021.

Commissions that have been granted permission to meet under Resolution No. 69,331-N.S. may continue to meet pursuant to their existing authorization, and may also meet to develop their 2021 work plan.

Commissions that have not requested meetings pursuant to the Resolution No. 69,331-N.S. may meet pursuant to the limitations listed above.

In response to questions from the Agenda & Rules Committee and the Council, the City Manager polled all departments that support commissions to obtain information on their capacity to support the resumption of regular commission meetings. The information in Attachment 1 shows the information received from the departments and notes each commission's ability to resume a regular, or semi-regular, meeting schedule in 2021.

In summary, there are 24 commissions that have staff resources available to support a regular meeting schedule in 2021. Seven of these 24 commissions have been meeting regularly during the pandemic. There are five commissions that have staff resources available to support a limited meeting schedule in 2021. There are seven commissions that currently do not have staff resources available to start meeting regularly at the beginning of 2021. Some of these seven commissions will have staff resources available later in 2021 to support regular meetings. Please see Attachment 1 for the full list of commissions and their status.

With regards to commission subcommittees, there has been significant discussion regarding the ability of staff to support these meetings in a virtual environment. Under normal circumstances, the secretary's responsibilities regarding subcommittees is limited to posting the agenda and reserving the meeting space (if in a city building). With the necessity to hold the meetings in a virtual environment and be open to the public, it is likely that subcommittee meetings will require significantly more staff resources to schedule, train, manage, and support the work of subcommittees on Zoom or a similar platform. This additional demand on staff resources to support commission subcommittees is not feasible for any commission at this time.

One possible option for subcommittees is to temporarily suspend the requirement for ad hoc subcommittees of city commissions to notice their meetings and require public participation. Ad hoc subcommittees are not legislative bodies under the Brown Act and are not required to post agendas or allow for public participation. These requirements are specific to Berkeley and are adopted by resolution in the Commissioners' Manual. If it is the will of the Council, staff could introduce an item to temporarily suspend these

requirements which will allow subcommittees of all commissions to meet as needed to develop recommendations that will be presented to the full commission.

The limitations on the meetings of certain commissions are due to the need to direct staff resources and the resources of city legislative bodies to the pandemic response. Some of the staff assigned as commission secretaries are engaged in work with the City Emergency Operations Center or have been assigned new duties specifically related to the impacts of the pandemic.

Meeting frequency for boards and commissions will continue to be evaluated on a regular basis by the City Manager and the Health Officer in consultation with Department Heads and the City Council.

Attachments:
1. List of Commissions with Meeting Status
2. Resolution 69,331-N.S.

November 10, 2020 - Item 20
Supplemental Information

Boards and Commissions	Meetings Held Under COVID March - Oct	Regular Mtg. Date	Secretary	Dept.	Resume Regular Schedule in January 2021?	Note
Fair Campaign Practices Commission	9	3rd Thur.	Sam Harvey	CA	YES	Have been meeting regularly under COVID Emergency
Open Government Commission	6	3rd Thur.	Sam Harvey	CA	YES	Have been meeting regularly under COVID Emergency
Animal Care Commission	0	3rd Wed.	Amelia Funghi	CM	YES	
Police Review Commission	10	2nd & 4th Wed.	Katherine Lee	CM	YES	Have been meeting regularly under COVID Emergency
Disaster and Fire Safety Commission	4	4th Wed.	Keith May	FES	YES	
Community Health Commission	0	4th Thur.	Roberto Terrones	HHCS	YES	
Homeless Commission	0	2nd Wed.	Josh Jacobs	HHCS	YES	
Homeless Services Panel of Experts	5	1st Wed	Josh Jacobs	HHCS	YES	
Human Welfare & Community Action Commission	0	3rd Wed.	Mary-Claire Katz	HHCS	YES	
Mental Health Commission	1	4th Thur.	Jamie Works-Wright	HHCS	YES	
Sugar-Sweetened Beverage Product Panel of Experts	0	3rd Thur.	Dechen Tsering	HHCS	YES	
Civic Arts Commission	2	4th Wed.	Jennifer Lovvorn	OED	YES	
Elmwood BID Advisory Board	1	Contact Secretary	Kieron Slaughter	OED	YES	
Loan Administration Board	0	Contact Secretary	Kieron Slaughter	OED	YES	
Solano Avenue BID Advisory Board	2	Contact Secretary	Eleanor Hollander	OED	YES	
Design Review Committee	6	3rd Thur.	Anne Burns	PLD	YES	Have been meeting regularly under COVID Emergency
Energy Commission	0	4th Wed.	Billi Romain	PLD	YES	
Landmarks Preservation Commission	6	1st Thur.	Fatema Crane	PLD	YES	Have been meeting regularly under COVID Emergency
Planning Commission	3	1st Wed.	Alene Pearson	PLD	YES	Have been meeting regularly under COVID Emergency
Zoning Adjustments Board	11	2nd & 4th Thur.	Shannon Allen	PLD	YES	Have been meeting regularly under COVID Emergency
Parks and Waterfront Commission	4	2nd Wed.	Roger Miller	PRW	YES	
Commission on Disability	0	1st Wed.	Dominika Bednarska	PW	YES	
Public Works Commission	4	1st Thur.	Joe Enke	PW	YES	
Zero Waste Commission	0	4th Mon.	Heidi Obermeit	PW	YES	
Commission on the Status of Women	0	4th Wed.	Shallon Allen	CM	YES - LIMITED	Secretary has intermittent COVID assignments

November 10, 2020 - Item 20
Supplemental Information

Boards and Commissions	Meetings Held Under COVID March - Oct	Regular Mtg. Date	Secretary	Dept.	Resume Regular Schedule in January 2021?	Note
Commission on Aging	0	3rd Wed.	Richard Castrillon	HHCS	REDUCED FREQUENCY	Significant Dept. resources assigned to COVID response
Housing Advisory Commission	0	1st Thur.	Mike Uberti	HHCS	REDUCED FREQUENCY	Significant Dept. resources assigned to COVID response
Measure O Bond Oversight Committee	0	3rd Monday	Amy Davidson	HHCS	REDUCED FREQUENCY	Significant Dept. resources assigned to COVID response
Transportation Commission	2	3rd Thur.	Farid Javandel	PW	REDUCED FREQUENCY	Staff assigned to COVID response
Children, Youth, and Recreation Commission	0	4th Monday	Stephanie Chu	PRW	NO - SEPT 2021	Staff assigned to COVID response
Youth Commission	0	2nd Mon.	Ginsi Bryant	PRW	NO - SEPT 2021	Staff assigned to COVID response
Community Environmental Advisory Commission	0	2nd Thur.	Viviana Garcia	PLD	NO - JUNE 2021	Staff assigned to COVID response
Cannabis Commission	0	1st Thur.	VACANT	PLD	NO - JAN. 2022	Staff vacancy
Peace and Justice Commission	0	1st Mon.	VACANT	CM	NO	Staff vacancy
Commission on Labor	0	3rd Wed., alternate mor	Kristen Lee	HHCS	NO	Staff assigned to COVID response
Personnel Board	1	1st Mon.	La Tanya Bellow	HR	NO	Staff assigned to COVID response

RESOLUTION NO. 69,331-N.S.

RATIFYING THE RECOMMENDATIONS ISSUED BY THE DIRECTOR OF EMERGENCY SERVICES AND THE PUBLIC HEALTH OFFICER REGARDING MEETINGS OF BERKELEY LEGISLATIVE BODIES IN RESPONSE TO THE COVID-19 (NOVEL CORONAVIRUS) PANDEMIC

WHEREAS, on March 3, 2020, pursuant to Berkeley Municipal Code section 2.88.040, the City Manager, serving as the Director of Emergency Services, proclaimed the existence of a local emergency; and

WHEREAS, the proclamation was warranted by virtue of the extreme peril to the safety of persons and property in the City caused by pandemic in the form of the global spread of a severe acute respiratory illness caused by a novel (new) coronavirus ("COVID-19"), including confirmed cases in California and the San Francisco Bay Area, and presumed cases in Alameda County prompting the County to declare a local health emergency; and

WHEREAS, the proclamation of the Director of Emergency Services was ratified by the City Council on March 10, 2020; and

WHEREAS, the continued spread of COVID-19 and increase in community transmission cases in surrounding counties warrant further measures be taken by the City to protect the community; and

WHEREAS, the Public Health Officer has issued guidelines for limiting mass gatherings; and

WHEREAS, certain limitations on the meetings of legislative bodies in the City of Berkeley is warranted; and

WHEREAS, the continued essential functions of the City and certain legislative bodies must continue for time-sensitive, legally mandated actions; and

WHEREAS, the Director of Emergency Services presented recommendations to the Agenda & Rules Committee on March 12, 2020 regarding the meetings of legislative bodies; and

WHEREAS, the Agenda & Rules Committee recommended that said recommendations be forwarded to the City Council for acknowledgement and ratification.

NOW THEREFORE, BE IT RESOLVED by the Council of the City of Berkeley that the following recommendations issued by the Director of Emergency Services and the Public Health Officer regarding limitations and practices for legislative bodies of the City of Berkeley are hereby acknowledged and ratified:

Section 1. Boards and Commissions
Commissions listed below may continue to meet only if they have time-sensitive, legally mandated business to complete, as determined by the Director of Emergency Services. The City may consider teleconferencing for these commissions, if feasible.

Design Review Committee
Fair Campaign Practices Commission
Housing Advisory Commission (limited to quasi-judicial activities)
Joint Subcommittee on the Implementation of State Housing Laws
Landmarks Preservation Commission
Open Government Commission
Personnel Board
Planning Commission
Police Review Commission
Zoning Adjustments Board

Commissions in Category B shall not meet for a period of 60 days. This will be re-evaluated at the Agenda & Rules Committee meeting on April 13, 2020. A Commission in Category B may convene a meeting if it has time-sensitive, legally-mandated business to complete, as determined by the Director of Emergency Services.

Category B
Animal Care Commission
Cannabis Commission
Civic Arts Commission
Children, Youth, and Recreation Commission
Commission on Aging
Commission on Disability
Commission on Labor
Commission on the Status of Women
Community Environmental Advisory Commission
Community Health Commission
Disaster and Fire Safety Commission
Elmwood Business Improvement District Advisory Board
Energy Commission
Homeless Commission
Homeless Services Panel of Experts
Housing Advisory Commission
Human Welfare and Community Action Commission
Measure O Bond Oversight Committee
Mental Health Commission
Parks and Waterfront Commission
Peace and Justice Commission
Public Works Commission
Solano Avenue Business Improvement District Advisory Board
Sugar-Sweetened Beverage Product Panel of Experts

Transportation Commission
Youth Commission
Zero Waste Commission
Loan Administration Board

Section 2. City Council Policy Committees
The Agenda & Rules Committee and the Budget & Finance Committee may continue to meet to fulfill their legislative and advisory responsibilities. All other Policy Committees (Facilities, Infrastructure, Transportation, Environment & Sustainability, Public Safety, Land Use, Housing & Economic Development, and Health, Life Enrichment Equity & Community) are suspended indefinitely. The 120-day deadline to consider an item will be tolled during the suspension of business.

Section 3. City Council
For City Council meetings, the City will continue to advise and implement social distancing by limiting the capacity of the Council Chambers, providing an overflow room, attempting to limit the duration of the meeting, only conducting essential business, and limiting or suspending ceremonial items. The City will adhere to and implement the provisions of the Governor's Executive Order #N-25-20 related to the Brown Act and the utilization of technology to facilitate participation.

The foregoing Resolution was adopted by the Berkeley City Council on March 17, 2020 by the following vote:

Ayes: Bartlett, Davila, Droste, Hahn, Harrison, Kesarwani, Robinson, Wengraf, and Arreguin.

Noes: None.

Absent: None.

Jesse Arreguin, Mayor

Attest:
Mark Numainville, City Clerk

Office of the City Manager

October 22, 2020

To: Berkeley Boards and Commissions

From: Dee Williams-Ridley, City Manager

Subject: Commission Meetings During COVID-19 Emergency

This memo serves to provide a summary and update of the status of meetings of Berkeley Boards and Commissions during the COVID-19 emergency declaration.

On March 10, 2020, the City Council ratified the proclamation of the Director of Emergency Services for a state of local emergency related to the COVID-19 pandemic. The emergency proclamation has been renewed twice by the Council and remains in effect.

On March 17, 2020, the City Council adopted Resolution No. 69,331-N.S. which placed limitations of the meetings of City legislative bodies, including all boards and commissions. The resolution allows for commissions to meet to conduct time-sensitive, legally mandated business with the authorization of the City Manager. Since that time, several commissions have obtained this approval and held meetings; many other commissions have not met at all since March.

The City Manager has periodically reviewed the status of commission meetings with the City Council Agenda & Rules Committee. Recently, at the October 12, 2020, Agenda & Rules Committee meeting, the City Manager presented a proposal to allow all commissions to meet under limited circumstances. The Committee voted to endorse the City Manager's recommendation.

Effective October 12, 2020, all City boards and commissions may meet once to develop and finalize their work plan for 2021 and to complete any Council referrals directly related to the COVID-19 pandemic response. A second meeting may be held to complete this work with specific authorization by the City Manager. It is recommended that the meeting(s) occur by the end of February 2021.

Commissions that have been granted permission to meet under Resolution No. 69,331-N.S. may continue to meet pursuant to their existing authorization, and may also meet to develop their 2021 work plan.

Commissions that have not requested meetings pursuant to the Resolution No. 69,331-N.S. may meet pursuant to the limitations listed above.

To assist commissions with the development of their work plan and to provide the City Council with a consistent framework to review the work plans, the City Manager has developed the following items to consider in developing the work plan that is submitted to the City Council agenda.

Prompts for Commissions to use in work plan:

- What commission items for 2021 have a direct nexus with the COVID-19 response or are the result of a City Council referral pertaining to COVID-19?
- What commission items for 2021 are required for statutory reasons?
- What commission items for 2021 are required for budgetary or fund allocation reasons?
- What commission items for 2021 support council-adopted or voter-adopted mission critical projects or programs?
- What are the anticipated staff demands (above and beyond baseline) for analysis, data, etc., to support commission work in 2021 (baseline duties = posting agendas, creating packets, attend meetings, minutes, etc.)?

The limitations on commission meetings are due to the need to direct staff resources and the resources of city legislative bodies to the pandemic response. Many of the staff assigned as commission secretaries are engaged in work with the City Emergency Operations Center or have been assigned new specific duties related to the impacts of the pandemic.

Meeting frequency for boards and commissions will continue to be evaluated on a regular basis by the City Manager in consultation with Department Heads and the City Council. More frequent meetings by commissions will be permitted as the conditions under COVID-19 dictate.

Thank you for your service on our boards and commissions. The City values the work of our commissions and we appreciate your partnership and understanding as we address this pandemic as a resilient and vibrant community.

Attachments:
1. Resolution 69,331-N.S.
2. List of Commissions with Meeting Data

cc: Mayor and City Councilmembers
Senior Leadership Team

RESOLUTION NO. 69,331-N.S.

RATIFYING THE RECOMMENDATIONS ISSUED BY THE DIRECTOR OF EMERGENCY SERVICES AND THE PUBLIC HEALTH OFFICER REGARDING MEETINGS OF BERKELEY LEGISLATIVE BODIES IN RESPONSE TO THE COVID-19 (NOVEL CORONAVIRUS) PANDEMIC

WHEREAS, on March 3, 2020, pursuant to Berkeley Municipal Code section 2.88.040, the City Manager, serving as the Director of Emergency Services, proclaimed the existence of a local emergency; and

WHEREAS, the proclamation was warranted by virtue of the extreme peril to the safety of persons and property in the City caused by pandemic in the form of the global spread of a severe acute respiratory illness caused by a novel (new) coronavirus ("COVID-19"), including confirmed cases in California and the San Francisco Bay Area, and presumed cases in Alameda County prompting the County to declare a local health emergency; and

WHEREAS, the proclamation of the Director of Emergency Services was ratified by the City Council on March 10, 2020; and

WHEREAS, the continued spread of COVID-19 and increase in community transmission cases in surrounding counties warrant further measures be taken by the City to protect the community; and

WHEREAS, the Public Health Officer has issued guidelines for limiting mass gatherings; and

WHEREAS, certain limitations on the meetings of legislative bodies in the City of Berkeley is warranted; and

WHEREAS, the continued essential functions of the City and certain legislative bodies must continue for time-sensitive, legally mandated actions; and

WHEREAS, the Director of Emergency Services presented recommendations to the Agenda & Rules Committee on March 12, 2020 regarding the meetings of legislative bodies; and

WHEREAS, the Agenda & Rules Committee recommended that said recommendations be forwarded to the City Council for acknowledgement and ratification.

NOW THEREFORE, BE IT RESOLVED by the Council of the City of Berkeley that the following recommendations issued by the Director of Emergency Services and the Public Health Officer regarding limitations and practices for legislative bodies of the City of Berkeley are hereby acknowledged and ratified:

Section 1. Boards and Commissions
Commissions listed below may continue to meet only if they have time-sensitive, legally mandated business to complete, as determined by the Director of Emergency Services. The City may consider teleconferencing for these commissions, if feasible.

Design Review Committee
Fair Campaign Practices Commission
Housing Advisory Commission (limited to quasi-judicial activities)
Joint Subcommittee on the Implementation of State Housing Laws
Landmarks Preservation Commission
Open Government Commission
Personnel Board
Planning Commission
Police Review Commission
Zoning Adjustments Board

Commissions in Category B shall not meet for a period of 60 days. This will be re-evaluated at the Agenda & Rules Committee meeting on April 13, 2020. A Commission in Category B may convene a meeting if it has time-sensitive, legally-mandated business to complete, as determined by the Director of Emergency Services.

Category B
Animal Care Commission
Cannabis Commission
Civic Arts Commission
Children, Youth, and Recreation Commission
Commission on Aging
Commission on Disability
Commission on Labor
Commission on the Status of Women
Community Environmental Advisory Commission
Community Health Commission
Disaster and Fire Safety Commission
Elmwood Business Improvement District Advisory Board
Energy Commission
Homeless Commission
Homeless Services Panel of Experts
Housing Advisory Commission
Human Welfare and Community Action Commission
Measure O Bond Oversight Committee
Mental Health Commission
Parks and Waterfront Commission
Peace and Justice Commission
Public Works Commission
Solano Avenue Business Improvement District Advisory Board
Sugar-Sweetened Beverage Product Panel of Experts

Transportation Commission
Youth Commission
Zero Waste Commission
Loan Administration Board

Section 2. City Council Policy Committees
The Agenda & Rules Committee and the Budget & Finance Committee may continue to meet to fulfill their legislative and advisory responsibilities. All other Policy Committees (Facilities, Infrastructure, Transportation, Environment & Sustainability, Public Safety, Land Use, Housing & Economic Development, and Health, Life Enrichment Equity & Community) are suspended indefinitely. The 120-day deadline to consider an item will be tolled during the suspension of business.

Section 3. City Council
For City Council meetings, the City will continue to advise and implement social distancing by limiting the capacity of the Council Chambers, providing an overflow room, attempting to limit the duration of the meeting, only conducting essential business, and limiting or suspending ceremonial items. The City will adhere to and implement the provisions of the Governor's Executive Order #N-25-20 related to the Brown Act and the utilization of technology to facilitate participation.

The foregoing Resolution was adopted by the Berkeley City Council on March 17, 2020 by the following vote:

Ayes: Bartlett, Davila, Droste, Hahn, Harrison, Kesarwani, Robinson, Wengraf, and Arreguin.

Noes: None.

Absent: None.

Jesse Arreguin, Mayor

Attest:
Mark Numainville, City Clerk

Boards and Commissions	Meetings Held Under COVID Emergency (through 10/11)	Scheduled Meetings in October	Regular Mtg. Date	Secretary	Department
Zoning Adjustments Board	10	1	2nd & 4th Thur.	Shannon Allen	PLD
Police Review Commission	9	1	2nd & 4th Wed.	Katherine Lee	CM
Fair Campaign Practices Commission	8	1	3rd Thur.	Sam Harvey	CA
Design Review Committee	5	1	3rd Thur.	Anne Burns	PLD
Landmarks Preservation Commission	5	1	1st Thur.	Fatema Crane	PLD
Open Government Commission	5	1	3rd Thur.	Sam Harvey	CA
Homeless Services Panel of Experts	4	1	1st Wed	Brittany Carnegie	HHCS
Disaster and Fire Safety Commission	3	1	4th Wed.	Keith May	FES
Parks and Waterfront Commission	3	1	2nd Wed.	Roger Miller	PRW
Planning Commission	3		1st Wed.	Alene Pearson	PLD
Public Works Commission	3	1	1st Thur.	Joe Enke	PW
Civic Arts Commission	2		4th Wed.	Jennifer Lovvorn	OED
Solano Avenue BID Advisory Board	2		Contact Secretary	Eleanor Hollander	OED
Elmwood BID Advisory Board	1		Contact Secretary	Kieron Slaughter	OED
Joint Subcom. on Implementation of State Housing Laws	1		4th Wed.	Alene Pearson	PLD
Mental Health Commission	1		4th Thur.	Jamie Works-Wright	HHCS
Personnel Board	1		1st Mon.	La Tanya Bellow	HR
Transportation Commission	1	1	3rd Thur.	Farid Javandel	PW
Animal Care Commission	0		3rd Wed.	Amelia Funghi	CM
Cannabis Commission	0		1st Thur.		PLD
Children, Youth, and Recreation Commission	0		4th Monday	Stephanie Chu	PRW
Commission on Aging	0		3rd Wed.	Richard Castrillon	HHCS
Commission on Disability	0		1st Wed.	Dominika Bednarska	PW
Commission on Labor	0		3rd Wed., alternate mor	Nathan Dahl	HHCS
Commission on the Status of Women	0		4th Wed.	Shallon Allen	CM
Community Environmental Advisory Commission	0		2nd Thur.	Viviana Garcia	PLD
Community Health Commission	0		4th Thur.	Roberto Terrones	HHCS
Energy Commission	0		4th Wed.	Billi Romain	PLD
Homeless Commission	0		2nd Wed.	Brittany Carnegie	HHCS
Housing Advisory Commission	0		1st Thur.	Mike Uberti	HHCS
Human Welfare & Community Action Commission	0		3rd Wed.	Mary-Claire Katz	HHCS
Loan Administration Board	0		Contact Secretary	Kieron Slaughter	OED
Measure O Bond Oversight Committee	0		3rd Monday	Amy Davidson	HHCS
Peace and Justice Commission	0		1st Mon.	Nina Goldman	CM
Sugar-Sweetened Beverage Product Panel of Experts	0		3rd Thur.	Dechen Tsering	HHCS
Youth Commission	0		2nd Mon.	Ginsi Bryant	PRW
Zero Waste Commission	0		4th Mon.	Heidi Obermeit	PW

09

URGENT ITEM
AGENDA MATERIAL

Government Code Section 54954.2(b)
Rules of Procedure Chapter III.C.5

THIS ITEM IS NOT YET AGENDIZED AND MAY OR MAY NOT BE ACCEPTED FOR THE AGENDA AS A LATE ITEM, SUBJECT TO THE CITY COUNCIL'S DISCRETION ACCORDING TO BROWN ACT RULES

Meeting Date: **September 28, 2021**

Item Description: **Resolution Making Required Findings Pursuant to the Government Code and Directing City Legislative Bodies to Continue to Meet Via Videoconference and Teleconference**

This item is submitted pursuant to the provision checked below:

☐ Emergency Situation (54954.2(b)(1) - majority vote required)
Determination by a majority vote of the legislative body that an emergency situation exists, as defined in Section 54956.5.

☒ Immediate Action Required (54954.2(b)(2) - two-thirds vote required)
There is a need to take immediate action and the need for action came to the attention of the local agency subsequent to the agenda for this meeting being posted.

Once the item is added to the agenda (Consent or Action) it must be passed by the standard required vote threshold (majority, two-thirds, or 7/9).

Facts supporting the addition of the item to the agenda under Section 54954.2(b) and Chapter III.C.5 of the Rules of Procedure:

Assembly Bill 361 (Rivas) was signed by the Governor on September 16, 2021. This bill allows local legislative bodies to meet using videoconference technology while maintaining the Brown Act exemptions in Executive Order N-29-20 for noticing and access to the locations from which local officials participate in the meeting. Local agencies may only meet with the exemption if there is a state declared emergency.

The bill also requires that local legislative bodies meeting only via videoconference under a state declared emergency to make certain findings every 30-days regarding the need to meet in a virtual-only setting.

The agenda for the September 28, 2021 was finalized and published prior to the Governor signing AB 361 in to law. Thus, the need to take action came to the attention of the local agency after the agenda was distributed. This item qualifies for addition to the agenda with a two-thirds vote of the Council under Government Code Section 54954.2(b)(2).

Office of the City Attorney

CONSENT CALENDAR
September 28, 2021

To: Honorable Mayor and Members of the City Council
Madame City Manager

From: Farimah Faiz Brown, City Attorney

Subject: Resolution Making Required Findings Pursuant to the Government Code and Directing City Legislative Bodies to Continue to Meet Via Videoconference and Teleconference

RECOMMENDATION

Adopt a resolution making the required findings pursuant to Government Code Section 54953(e)(3) and determining that as a result of the continued threat to public health and safety posed by the spread of COVID-19, City legislative bodies shall continue to meet via videoconference and teleconference.

FISCAL IMPACT OF RECOMMENDATION

To be determined.

CURRENT SITUATION AND ITS EFFECTS

Pursuant to California Government Code section 8630 and Berkeley Municipal Code Chapter 2.88.040, on March 3, 2020, the City Manager, in her capacity as Director of Emergency Services, proclaimed a local emergency due to conditions of extreme peril to the safety of persons and property within the City as a consequence of the global spread of a severe acute respiratory illness caused by a novel (new) coronavirus (COVID-19), including a confirmed case in the City of Berkeley. As a result of multiple confirmed and presumed cases in Alameda County, the County has declared a local health emergency. On March 4, 2020, Governor Gavin Newsom issued a Proclamation of a State of Emergency due to the spread of COVID-19. On March 10, 2020, the City Council ratified the Proclamation of Local Emergency with the passage of Resolution No. 69-312.

On March 17, 2020, Governor Newsom signed Executive Order N-29-20, which suspended certain portions of the Ralph M. Brown Act (Cal. Gov. Code § 54950 et seq.) related to the holding of teleconferenced meetings by City legislative bodies. Among other things, Executive Order N-29-20 suspended requirements that each location from which an official accesses a teleconferenced meeting be accessible to the public.

These changes were necessary to allow teleconferencing to be used as a tool for ensuring social distancing. City legislative bodies have held public meetings via videoconference and teleconference pursuant to these provisions since March 2020. These provisions of Executive Order N-29-20 will expire on September 30, 2021.

COVID-19 continues to pose a serious threat to public health and safety. There are now over 4,700 confirmed cases of COVID-19 and at least 55 deaths in the City of Berkeley. Additionally, the SARS-CoV-2 B.1.617.2 ("Delta") variant of COVID-19 that is currently circulating nationally and within the City is contributing to a substantial increase in transmissibility and more severe disease.

As a result of the continued threat to public health posed by the spread of COVID-19, state and local officials continue to impose or recommend measures to promote social distancing, mask wearing and vaccination. Holding meetings of City legislative bodies in person would present imminent risks to the health and safety of the public and members of legislative bodies, and therefore public meetings cannot safely be held in person at this time

Assembly Bill 361 (Rivas), signed into law by Governor Newsom on September 16, 2021, amended a portion of the Brown Act (Government Code Section 54953) to authorize the City Council, during the state of emergency, to determine that, due to the spread of COVID-19, holding in-person public meetings would present an imminent risk to the health or safety of attendees, and therefore City legislative bodies must continue to meet via videoconference and teleconference. Assembly Bill 361 requires that the City Council must review and ratify such a determination every thirty (30) days. Therefore, if the Council passes this resolution on September 28, 2021, the Council will need to review and ratify the resolution by October 28, 2021.

This item requests that the Council review the circumstances of the continued state of emergency posed by the spread of COVID-19, and find that the state of emergency continues to directly impact the ability of the public and members of City legislative bodies to meet safely in person, that holding public meetings of City legislative bodies in person would present imminent risks to the health and safety of attendees, and that state and local officials continue to promote social distancing, mask wearing and vaccination. This item further requests that the Council determine that City legislative bodies, including but not limited to the City Council and its committees, and all commissions and boards, shall continue to hold public meetings via videoconference and teleconference, and that City legislative bodies shall continue to comply with all provisions of the Brown Act, as amended by SB 361.

BACKGROUND

On March 1, 2020, Alameda County Public Health Department and Solano County Public Health Department reported two presumptive cases of COVID-19, pending confirmatory testing by the Centers for Disease Control (CDC), prompting Alameda County to declare a local health emergency.

On March 3, 2020, the City's Director of Emergency Services proclaimed a local emergency due to the spread of COVID-19, including a confirmed case in the City of Berkeley and multiple confirmed and presumed cases in Alameda County.

On March 4, 2020, Governor Gavin Newsom issued a Proclamation of a State of Emergency due to the spread of COVID-19.

On March 10, 2020, the City Council ratified the Proclamation of Local Emergency. Since that date, there have been over 4,700 confirmed cases of COVID-19 and at least 57 deaths in the City of Berkeley.

On March 17, 2020, Governor Newsom signed Executive Order N-29-20 which suspended certain portions of the Ralph M. Brown Act (Cal. Gov. Code § 54950 et seq.) to allow teleconferencing of public meetings to be used as a tool for ensuring social distancing. As a result, City legislative bodies have held public meetings via teleconference throughout the pandemic. The provisions of Executive Order N-29-20 allowing teleconferencing to be used as a tool for social distancing will expire on September 30, 2021.

ENVIRONMENTAL SUSTAINABILITY AND CLIMATE IMPACTS
Not applicable.

RATIONALE FOR RECOMMENDATION
The Resolution would enable the City Council and its committees, and City boards and commissions to continue to hold public meetings via videoconference and teleconference in order to continue to socially distance and limit the spread of COVID-19.

ALTERNATIVE ACTIONS CONSIDERED
None.

CONTACT PERSON
Farimah Brown, City Attorney, City Attorney's Office (510) 981-6998
Mark Numainville, City Clerk, (510) 981-6908

Attachments:
1: Resolution Directing City Legislative Bodies to Continue to Meet Via Videoconference and Teleconference

RESOLUTION NO. –N.S.

RESOLUTION MAKING THE REQUIRED FINDINGS PURSUANT TO GOVERNEMNT CODE SECTION 54953(E)(3) AND DIRECTING CITY LEGISLATIVE BODIES TO CONTINUE TO MEET VIA VIDEOCONFERENCE AND TELECONFERENCE

WHEREAS, in accordance with Berkeley Municipal Code section 2.88.040 and sections 8558(c) and 8630 of the Government Code, which authorize the proclamation of a local emergency when conditions of disaster or extreme peril to the safety of persons and property within the territorial limits of a City exist, the City Manager, serving as the Director of Emergency Services, beginning on March 3, 2020, did proclaim the existence of a local emergency caused by epidemic in the form of the global spread of a severe acute respiratory illness caused by a novel (new) coronavirus ("COVID-19"), including confirmed cases in California and the San Francisco Bay Area, and presumed cases in Alameda County prompting the County to declare a local health emergency; and

WHEREAS, on March 10, 2020, the City Council ratified the Proclamation of Local Emergency with the passage of Resolution No. 69-312; and

WHEREAS, on March 4, 2020, Governor Gavin Newsom issued a Proclamation of a State of Emergency pursuant to the California Emergency Services Act, in particular, Government Code section 8625; and

WHEREAS, the Proclamation of a State of Emergency issued by Governor Newsom on March 4, 2020 continues to be in effect; and

WHEREAS, on September 16, 2021, Governor Newsom signed into law AB 361, which authorizes the City Council to determine that, due to the continued threat to public health and safety posed by the spread of COVID-19, City legislative bodies shall continue to meet via videoconference and teleconference; and

WHEREAS, the City Council does find that the aforesaid conditions of extreme peril continue to exist, and now include over 4,700 confirmed cases of COVID-19 and at least 55 deaths in the City of Berkeley; and

WHEREAS, the City Council recognizes that the SARS-CoV-2 B.1.617.2 ("Delta") variant of COVID-19 that is currently circulating nationally and within the City is contributing to a substantial increase in transmissibility and more severe disease; and

WHEREAS, as a result of the continued threat to public health posed by the spread of COVID-19, state and local officials continue to impose or recommend measures to promote social distancing, mask wearing and vaccination; and

WHEREAS, holding meetings of City legislative bodies in person would present imminent risks to the health and safety of the public and members of legislative bodies, and therefore public meetings cannot safely be held in person at this time; and

WHEREAS, the City Council will need to again review the need for the continuing necessity of holding City legislative body meetings via videoconference and teleconference by October 28, 2021.

NOW, THEREFORE BE IT RESOLVED by the Council of the City of Berkeley that, pursuant to Government Code section 54953, the City Council has reviewed the circumstances of the continued state of emergency posed by the spread of COVID-19, and finds that the state of emergency continues to directly impact the ability of the public and members of City legislative bodies to meet safely in person, that holding public meetings of City legislative bodies in person would present imminent risks to the health and safety of attendees, and that state and local officials continue to promote social distancing, mask wearing and vaccination; and

BE IT FURTHER RESOLVED that City legislative bodies, including but not limited to the City Council and its committees, and all commissions and boards, shall continue to hold public meetings via videoconference and teleconference; and

BE IT FURTHER RESOLVED that all City legislative bodies shall comply with the requirements of Government Code section 54953(e)(2) and all applicable laws, regulations and rules when conducting public meetings pursuant to this resolution.

OFFICE OF THE GOVERNOR

June 2, 2021

VIA EMAIL

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RE: Transition Period Prior to Repeal of COVID-related Executive Orders

Dear Mr. Knaus, Ms. Miller, Ms. Hurst, Ms. Preston, Ms. Heaton, Ms. King, Ms. Coleman, Ms. Blacet-Hyden, Mr. McCormick, Mr. Anderson, and colleagues,

Thank you for your correspondence of May 18, 2021, inquiring what impact the anticipated June 15 termination of the Blueprint for a Safer Economy will have on Executive Order N-29-20, which provided flexibility to state and local agencies and boards to conduct their business through virtual public meetings during the COVID-19 pandemic.

Please be assured that this Executive Order Provision will not terminate on June 15 when the Blueprint is scheduled to terminate. While the Governor intends to terminate COVID-19 executive orders at the earliest possible date at which conditions warrant, consistent with the Emergency Services Act, the Governor recognizes the importance of an orderly return to the ordinary conduct of public meetings of state and local agencies and boards. To this end, the Governor's office will work to provide notice to affected stakeholders in advance of rescission of this provision to provide state and local agencies and boards time necessary to meet statutory and logistical requirements. Until a further order issues, all entities may continue to rely on N-29-20.

We appreciate your partnership throughout the pandemic.

Regards,

Ana Matosantos
Cabinet Secretary

Department of Industrial Relations
STATE OF CALIFORNIA

NEWS RELEASE

Release Number: 2021-58

June 4, 2021

Standards Board Readopts Revised Cal/OSHA COVID-19 Prevention Emergency Temporary Standards

The revised Cal/OSHA standards are expected to go into effect no later than June 15

Sacramento — The Occupational Safety and Health Standards Board on June 3 readopted Cal/OSHA's revised COVID-19 prevention emergency temporary standards.

Last year, the Board adopted health and safety standards to protect workers from COVID-19. The standards did not consider vaccinations and required testing, quarantining, masking and more to protect workers from COVID-19.

The changes adopted by the Board phase out physical distancing and make other adjustments to better align with the state's June 15 goal to retire the Blueprint. Without these changes, the original standards, would be in place until at least October 2. These restrictions are no longer required given today's record low case rates and the fact that we've administered 37 million vaccines.

The revised emergency standards are expected to go into effect no later than June 15 if approved by the Office of Administrative Law in the next 10 calendar days. Some provisions go into effect starting on July 31, 2021.

The revised standards are the first update to Cal/OSHA's temporary COVID-19 prevention requirements adopted in November 2020.

The Board may further refine the regulations in the coming weeks to take into account changes in circumstances, especially as related to the availability of vaccines and low case rates across the state.

The standards apply to most workers in California not covered by Cal/OSHA's Aerosol Transmissible Diseases standard. Notable revisions include:

- **Face Coverings**:
  - Indoors, fully vaccinated workers without COVID-19 symptoms do not need to wear face coverings in a room where everyone else is fully vaccinated and not showing symptoms. However, where there is a mixture of vaccinated and unvaccinated persons in a room, all workers will continue to be required to wear a face covering.
  - Outdoors, fully vaccinated workers without symptoms do not need to wear face coverings. However, outdoor workers who are not fully vaccinated must continue to wear a face covering when they are less than six feet away from another person.
- **Physical Distancing**: When the revised standards take effect, employers can eliminate physical distancing and partitions/barriers for employees working indoors and at outdoor mega events if they provide respirators, such as N95s, to unvaccinated employees for voluntary use. After July 31, physical distancing

and barriers are no longer required (except during outbreaks), but employers must provide all unvaccinated employees with N95s for voluntary use.

- **Prevention Program**: Employers are still required to maintain a written COVID-19 Prevention Program but there are some key changes to requirements:
    - Employers must review the California Department of Public Health's Interim guidance for Ventilation, Filtration, and Air Quality in Indoor Environments.
    - COVID-19 prevention training must now include information on how the vaccine is effective at preventing COVID-19 and protecting against both transmission and serious illness or death.
- **Exclusion from the Workplace:** Fully vaccinated workers who do not have COVID-19 symptoms no longer need to be excluded from the workplace after a close contact.
- **Special Protections for Housing and Transportation:** Special COVID-19 prevention measures that apply to employer-provided housing and transportation no longer apply if all occupants are fully vaccinated.

The Standards Board will file the readoption rulemaking package with the Office of Administrative Law, which has 10 calendar days to review and approve the temporary workplace safety standards enforced by Cal/OSHA. Once approved and published, the full text of the revised emergency standards will appear in the Title 8 sections 3205 (COVID-19 Prevention), 3205.1 (Multiple COVID-19 Infections and COVID-19 Outbreaks), 3205.2 (Major COVID-19 Outbreaks) 3205.3 (COVID-19 Prevention in Employer-Provided Housing) and 3205.4 (COVID-19 Prevention in Employer-Provided Transportation) of the California Code of Regulations. Pursuant to the state's emergency rulemaking process, this is the first of two opportunities to readopt the temporary standards after the initial effective period.

The Standards Board also convened a representative subcommittee to work with Cal/OSHA on a proposal for further updates to the standard, as part of the emergency rulemaking process. It is anticipated this newest proposal, once developed, will be heard at an upcoming Board meeting. The subcommittee will provide regular updates at the Standards Board monthly meetings.

The Occupational Safety and Health Standards Board, a seven-member body appointed by the Governor, is the standards-setting agency within the Cal/OSHA program. The Standards Board's objective is to adopt reasonable and enforceable standards at least as effective as federal standards. The Standards Board also has the responsibility to grant or deny applications for permanent variances from adopted standards and respond to petitions for new or revised standards.

The California Division of Occupational Safety and Health, or Cal/OSHA, is the division within the Department of Industrial Relations that helps protect California's workers from health and safety hazards on the job in almost every workplace. Cal/OSHA's Consultation Services Branch provides free and voluntary assistance to employers to improve their health and safety programs. Employers should call (800) 963-9424 for assistance from Cal/OSHA Consultation Services.

Contact: Erika Monterroza / Frank Polizzi, Communications@dir.ca.gov, (510) 286-1161.

The California Department of Industrial Relations, established in 1927, protects and improves the health, safety, and economic well-being of over 18 million wage earners, and helps their employers comply with state labor laws. DIR is housed within the Labor & Workforce Development Agency

Office of the City Manager

June 1, 2021

To: Agenda & Rules Committee

From: Dee Williams-Ridley, City Manager

Subject: Preliminary Analysis of Return to In-Person Meetings of City Legislative Bodies

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Introduction

This memo responds to the request from the Agenda & Rules Committee on May 17, 2021 for information from the City Manager on the options and timing for a return to in-person meetings for City legislative bodies. The analysis below is a preliminary summary of the considerations and options for returning to in-person meetings.

With the onset of the COVID-19 pandemic, the shelter-in-place order, and the issuance of Executive Order N-29-20 ("Executive Order") in the spring of 2020, the City quickly adjusted to a virtual meeting model. Now, almost 15 months later, with the Blueprint for a Safer Economy scheduled to sunset on June 15, 2021, the City is faced with a new set of conditions that will impact how public meetings may be held in Berkeley. While the June 15, 2021 date appears to be certain, there is still a great deal of uncertainty about the fate of the Executive Order. In addition, the City is still awaiting concrete, specific guidance from the State with regards to regulations that govern public meetings and public health recommendations that will be in place after June 15, 2021.

For background, Executive Order N-29-20 allows legislative bodies to meet in a virtual setting and suspends the following Brown Act requirements:

- Printing the location of members of the legislative body on the agenda;
- Posting the agenda at the location of members of the legislative body that are remote; and
- Making publicly available remote locations from which members of the legislative body participate.

Meeting Options

There are three groups of City Legislative bodies that are considered in this memo

- City Council;
- City Council Policy Committees; and
- Boards and Commissions.

The three meeting models available are:

- In-person only;
- Virtual only; or
- Hybrid (in-person and virtual).

The scenarios below show the options available for each given set of facts.

Summary Recommendations of Meeting Options						
	Physical Distancing			**No Physical Distancing**		
	In-Person	**Hybrid**	**Virtual***	**In-Person**	**Hybrid**	**Virtual***
City Council	**X**	**X**	**X**	**X**	**X**	**X**
Policy Committees			**X**	**X**		**X**
Board and Commissions			**X**	**X**		**X**

** The ability to hold virtual-only meetings is dependent on the status of Executive Order N-29-20*

Currently, the Centers for Disease Control recommends physical distancing for unvaccinated persons. While the City and the community have made tremendous progress with regards to vaccination, the City would use the guidelines for unvaccinated persons when making determinations regarding public meetings.

Meeting Type Considerations

Our previous experience pre-pandemic and our experience over the past 15 months demonstrates that the City can conduct all in-person and all virtual meetings. However, the possibility of hybrid meetings presents new questions to consider. The primary concern for a return to in-person meetings using a hybrid model is the impact on the public experience and the legislative process.

> *Will the legislative body be able to provide a transparent, coherent, stable, informative, and meaningful experience for the both the public in attendance and virtually?*

Will the legislative body be able to conduct the legislative process in an efficient, coherent, and meaningful manner with the members split between in-person and virtual, and considering the additional delays and logistical challenges of allowing for public participation in a hybrid model?

For the City Council, testing has shown that the larger space and technology infrastructure at the Boardroom will allow the Council to conduct all three types of meetings (in-person, hybrid, virtual).

For Policy Committees and Commissions, only the “all virtual” or “all in-person” meetings are recommended. Preliminary testing has shown that the audio/visual limitations of the meeting rooms available for these bodies would result in inefficient and cumbersome management of the proceedings in a hybrid model. In addition, there are considerations to analyze regarding the available bandwidth in city facilities and all members having access to adequate devices. Continuing the all virtual model for as long as possible, then switching to an all in-person model when conditions permit provides the best access, participation, and legislative experience for the public and the legislative body.

Other Considerations

Some additional factors to consider in the evaluation of returning to in-person or hybrid meetings are:

- How to address vaccination status for in-person attendees.
- Will symptom checks and/or temperature checks at entry points be required?
- Who is responsible for providing PPE for attendees?
- How are protocols for in-person attendees to be enforced?
- Physical distancing measures for the Mayor and City Councilmembers on the dais.
- Installation of physical barriers and other temporary measures.
- Will the podium and microphone need to be sanitized after every speaker?
- High number of touch points in meeting rooms.
- Will chairs for the public and staff need to be sanitized if there is turnover during the meeting?
- Determining the appropriate capacity for meeting locations.
- The condition and capacity of meeting room ventilation system and air cycling abilities.
- How to receive and share Supplemental Items, Revisions, Urgent Items, and submissions by the public both in-person and virtually.
- Budget including costs for equipment, physical improvements, A/V, PPE, and sanitization.

Conclusion

As stated above, conditions are changing daily, and there is a high degree of uncertainty surrounding the future guidance, regulations, and actions at the state level. Planning, testing and analysis are already underway to prepare for an eventual return to in-person meetings. Staff will continue to monitor the evolving legislative and public health circumstances and advise the committee at future meetings.

Attachment:

1. Executive Order N-29-20

EXECUTIVE DEPARTMENT
STATE OF CALIFORNIA

EXECUTIVE ORDER N-29-20

WHEREAS on March 4, 2020, I proclaimed a State of Emergency to exist in California as a result of the threat of COVID-19; and

WHEREAS despite sustained efforts, the virus continues to spread and is impacting nearly all sectors of California; and

WHEREAS the threat of COVID-19 has resulted in serious and ongoing economic harms, in particular to some of the most vulnerable Californians; and

WHEREAS time bound eligibility redeterminations are required for Medi-Cal, CalFresh, CalWORKs, Cash Assistance Program for Immigrants, California Food Assistance Program, and In Home Supportive Services beneficiaries to continue their benefits, in accordance with processes established by the Department of Social Services, the Department of Health Care Services, and the Federal Government; and

WHEREAS social distancing recommendations or Orders as well as a statewide imperative for critical employees to focus on health needs may prevent Medi-Cal, CalFresh, CalWORKs, Cash Assistance Program for Immigrants, California Food Assistance Program, and In Home Supportive Services beneficiaries from obtaining in-person eligibility redeterminations; and

WHEREAS under the provisions of Government Code section 8571, I find that strict compliance with various statutes and regulations specified in this order would prevent, hinder, or delay appropriate actions to prevent and mitigate the effects of the COVID-19 pandemic.

NOW, THEREFORE, I, GAVIN NEWSOM, Governor of the State of California, in accordance with the authority vested in me by the State Constitution and statutes of the State of California, and in particular, Government Code sections 8567 and 8571, do hereby issue the following order to become effective immediately:

IT IS HEREBY ORDERED THAT:

1. As to individuals currently eligible for benefits under Medi-Cal, CalFresh, CalWORKs, the Cash Assistance Program for Immigrants, the California Food Assistance Program, or In Home Supportive Services benefits, and to the extent necessary to allow such individuals to maintain eligibility for such benefits, any state law, including but not limited to California Code of Regulations, Title 22, section 50189(a) and Welfare and Institutions Code sections 18940 and 11265, that would require redetermination of such benefits is suspended for a period of 90 days from the date of this Order. This Order shall be construed to be consistent with applicable federal laws, including but not limited to Code of Federal Regulations, Title 42, section 435.912, subdivision (e), as interpreted by the Centers for Medicare and Medicaid Services (in guidance issued on January 30, 2018) to permit the extension of

otherwise-applicable Medicaid time limits in emergency situations.

2. Through June 17, 2020, any month or partial month in which California Work Opportunity and Responsibility to Kids (CalWORKs) aid or services are received pursuant to Welfare and Institutions Code Section 11200 et seq. shall not be counted for purposes of the 48-month time limit set forth in Welfare an Institutions Code Section 11454. Any waiver of this time limit shall not be applied if it will exceed the federal time limits set forth in Code of Federal Regulations, Title 45, section 264.1.

3. Paragraph 11 of Executive Order N-25-20 (March 12, 2020) is withdrawn and superseded by the following text:

   Notwithstanding any other provision of state or local law (including, but not limited to, the Bagley-Keene Act or the Brown Act), and subject to the notice and accessibility requirements set forth below, a local legislative body or state body is authorized to hold public meetings via teleconferencing and to make public meetings accessible telephonically or otherwise electronically to all members of the public seeking to observe and to address the local legislative body or state body. All requirements in both the Bagley-Keene Act and the Brown Act expressly or impliedly requiring the physical presence of members, the clerk or other personnel of the body, or of the public as a condition of participation in or quorum for a public meeting are hereby waived.

   In particular, any otherwise-applicable requirements that

   (i) state and local bodies notice each teleconference location from which a member will be participating in a public meeting;

   (ii) each teleconference location be accessible to the public;

   (iii) members of the public may address the body at each teleconference conference location;

   (iv) state and local bodies post agendas at all teleconference locations;

   (v) at least one member of the state body be physically present at the location specified in the notice of the meeting; and

   (vi) during teleconference meetings, a least a quorum of the members of the local body participate from locations within the boundaries of the territory over which the local body exercises jurisdiction

   are hereby suspended.

   A local legislative body or state body that holds a meeting via teleconferencing and allows members of the public to observe and address the meeting telephonically or otherwise electronically, consistent with the notice and accessibility requirements set forth below, shall have satisfied any requirement that the body allow

members of the public to attend the meeting and offer public comment. Such a body need not make available any physical location from which members of the public may observe the meeting and offer public comment.

Accessibility Requirements: If a local legislative body or state body holds a meeting via teleconferencing and allows members of the public to observe and address the meeting telephonically or otherwise electronically, the body shall also:

(i) Implement a procedure for receiving and swiftly resolving requests for reasonable modification or accommodation from individuals with disabilities, consistent with the Americans with Disabilities Act and resolving any doubt whatsoever in favor of accessibility; and

(ii) Advertise that procedure each time notice is given of the means by which members of the public may observe the meeting and offer public comment, pursuant to subparagraph (ii) of the Notice Requirements below.

Notice Requirements: Except to the extent this Order expressly provides otherwise, each local legislative body and state body shall:

(i) Give advance notice of the time of, and post the agenda for, each public meeting according to the timeframes otherwise prescribed by the Bagley-Keene Act or the Brown Act, and using the means otherwise prescribed by the Bagley-Keene Act or the Brown Act, as applicable; and

(ii) In each instance in which notice of the time of the meeting is otherwise given or the agenda for the meeting is otherwise posted, also give notice of the means by which members of the public may observe the meeting and offer public comment. As to any instance in which there is a change in such means of public observation and comment, or any instance prior to the issuance of this Order in which the time of the meeting has been noticed or the agenda for the meeting has been posted without also including notice of such means, a body may satisfy this requirement by advertising such means using "the most rapid means of communication available at the time" within the meaning of Government Code, section 54954, subdivision (e); this shall include, but need not be limited to, posting such means on the body's Internet website.

All of the foregoing provisions concerning the conduct of public meetings shall apply only during the period in which state or local public health officials have imposed or recommended social distancing measures.

All state and local bodies are urged to use sound discretion and to make reasonable efforts to adhere as closely as reasonably possible to the provisions of the Bagley-Keene Act and the Brown Act, and other applicable local laws regulating the conduct of public meetings, in order to maximize transparency and provide the public access to their meetings.

IT IS FURTHER ORDERED that as soon as hereafter possible, this Order be filed in the Office of the Secretary of State and that widespread publicity and notice be given of this Order.

This Order is not intended to, and does not, create any rights or benefits, substantive or procedural, enforceable at law or in equity, against the State of California, its agencies, departments, entities, officers, employees, or any other person.

IN WITNESS WHEREOF I have hereunto set my hand and caused the Great Seal of the State of California to be affixed this 17th day of March 2020.

GAVIN NEWSOM
Governor of California

ATTEST:

ALEX PADILLA
Secretary of State