Appendix A

Notice of Preparation (NOP) and NOP Comments

Planning and Development Department
Land Use Planning Division

NOTICE OF PREPARATION OF A DRAFT ENVIRONMENTAL IMPACT REPORT FOR THE PROPOSED CITY OF BERKELEY HOUSING ELEMENT UPDATE

Notice is hereby given that the City of Berkeley is preparing a Draft Environmental Impact Report (EIR) for the City's Housing Element Update ("the project") and is requesting comments on the scope and content of the Draft EIR. The EIR is being prepared by the City of Berkeley, which is the Lead Agency for the project, in accordance with the California Environmental Quality Act (CEQA), the State CEQA Guidelines, and local CEQA guidelines.

In accordance with CEQA Guidelines section 15082, this Notice of Preparation (NOP) is being sent to the California State Clearinghouse, Alameda County Clerk, responsible agencies, trustee agencies, adjacent cities, and members of the public including individuals and organizations in order to solicit comments on the scope and content of the analysis in the EIR.

WRITTEN COMMENTS: Responses to this NOP and any questions or comments should be directed in writing to: *Grace Wu, Senior Planner, Land Use Planning Division, 1947 Center Street, 2nd Floor, Berkeley, CA 94704; or* GWu@cityofberkeley.info. Comments on the NOP must be received **on or before 5pm on Monday, February 21, 2022.** In addition, comments may be provided at the EIR Scoping Meeting (see details below). Comments should focus on significant environmental issues, reasonable alternatives, and mitigation measures.

EIR PUBLIC SCOPING MEETING: The City of Berkeley will conduct a public scoping session on **Wednesday, February 9, 2022** as part of a scheduled Planning Commission meeting to receive comments on the scope and contents of the EIR. The meeting will start at **7:00 PM** and be held via video and teleconference. Interested parties should check the Planning Commission website for information on how to join the meeting and to confirm the meeting date, time, and agenda: https://www.cityofberkeley.info/Clerk/Commissions/Commissions__Planning_Commission_Homepage.aspx The agenda will be posted by 5pm on Friday, February 4, 2022.

PROJECT TITLE: City of Berkeley 2023-2031 Housing Element Update

PROJECT LOCATION: The project, which is an update to the Housing Element of the General Plan, is applicable to the entire City of Berkeley (citywide). The City of Berkeley is located in the East Bay of the San Francisco Bay Area in northern Alameda County. Berkeley is bordered by the cities of Oakland and Emeryville to the south and the city of Albany and the unincorporated community of Kensington to the north, the Berkeley Hills (Contra Costa County) to the east, and the San Francisco Bay to the west. The city

encompasses approximately 17.2 square miles (approximately 7.2 of which is underwater in the San Francisco Bay) with a population of approximately 122,580 residents and 51,500 housing units. The city contains a combination of residential, commercial, and industrial development.

Interstate 580/880, San Pablo Avenue (SR-123), Sacramento Street, Martin Luther King Jr. Way, and Shattuck Avenue provide the major north-south routes through the city, as does Bay Area Rapid Transit (BART). Major east-west routes include Marin Avenue, University Avenue, and Ashby Avenue.

The regional setting and existing city limits are depicted on Figure 1.

PROJECT SPONSOR: City of Berkeley

PROPOSED PROJECT DESCRIPTION and BACKGROUND: The proposed project consists of a comprehensive update to the Housing Element and related edits to the City's General Plan Land Use Element and Berkeley Municipal Code.

The Housing Element is one of the seven state-mandated elements of the local General Plan and is required to be updated every eight years. The City of Berkeley is preparing the 2023-2031 Housing Element Update to comply with the legal mandate that requires each local government to identify adequate sites for housing to meet the existing and projected housing needs for varying income-levels in the community. It is intended to provide the city with a comprehensive strategy for promoting the production of safe, decent and affordable housing, and affirmatively furthering fair housing during the housing cycle. The Housing Element Update establishes goals, policies, and actions to address the existing and projected housing needs in Berkeley.

The goals, policies, and actions in the Housing Element are required to meet Berkeley's Regional Housing Needs Assessment (RHNA) allocation. Berkeley's latest RHNA allocation calls for 8,934 new housing units, including 3,854 new units for residents in the low- and very low-income categories. The City must demonstrate to the State Department of Housing and Community Development (HCD) that the City's Housing Element has adequate land capacity and implementing policies to accommodate its RHNA allocation. In addition, HCD recommends that cities identify a "buffer" of 15% to 30% above RHNA for lower- and moderate-income categories. Thus, overall, the City's zoning and other land use regulations must accommodate between approximately 9,750 and 10,500 new units.

To identify the housing sites to be included in the Housing Element, the City will identify suitable and available housing sites and their capacity, screen for vacant and underutilized parcels, evaluate and analyze sites, and calculate potential buildout.

In conjunction with the Housing Element Update, the City anticipates amendments to the General Plan including revising the Land Use Element to maintain consistency with the updated Housing Element. The Land Use Element revisions are to ensure consistency among all General Plan Elements upon implementation of the updated Housing Element.

More information about the proposed project can be found on the City's website:

https://www.cityofberkeley.info/housingelement/

PROBABLE ENVIRONMENTAL EFFECTS: Approval of the proposed Housing Element Update would not approve any physical development (e.g., construction of housing or infrastructure). However, the EIR will assume that such actions are reasonably foreseeable future outcomes of the Housing Element Update. As such, the EIR will evaluate the potential physical environmental impacts that could result from future actions for implementing the policies proposed under the Housing Element Update at a programmatic level, in accordance with CEQA Guidelines Section 15168.

The topical areas that will be addressed in the EIR are: Aesthetics, Air Quality, Biological Resources, Cultural Resources, Energy, Geology and Soils, Greenhouse Gas Emissions, Hazards and Hazardous Materials, Hydrology and Water Quality, Noise, Land Use and Planning, Population and Housing, Public Services and Recreation, Transportation, Tribal Cultural Resources, Utilities and Service Systems, and Wildfire.

The Draft EIR will also examine a reasonable range of alternatives to the proposed project, including the CEQA-mandated No Project Alternative and other potential alternatives that may be capable of reducing or avoiding potential environmental effects while meeting most of the basic objectives of the project. In addition, the EIR will address cumulative impacts, growth inducing impacts, and other issues required by CEQA.

Grace Wu, Senior Planner

Date of Distribution: January 21, 2022

Attachments: Figure 1: City of Berkeley Location Map

Figure 1 City of Berkeley Location Map

Imagery provided by Esri and its licensors © 2021.

City of Berkeley

N

Fig 1 Regional Location

EAST BAY
MUNICIPAL UTILITY DISTRICT

February 7, 2022

Grace Wu, Senior Planner
Land Use Planning Division
1947 Center Street, 2nd Floor
Berkeley, CA 94704

Re: Notice of Preparation of a Draft Environmental Impact Report for the Proposed City of Berkeley Housing Element Update, Berkeley

Dear Ms. Wu:

East Bay Municipal Utility District (EBMUD) appreciates the opportunity to comment on the Notice of Preparation of a Draft Environmental Impact Report for the Proposed City of Berkeley Housing Element Update, which encompasses the entirety of the City of Berkeley (City). EBMUD has the following comments.

WATER SERVICE

Effective January 1, 2018, water service for new multi-unit structures shall be individually metered or sub-metered in compliance with California State Senate Bill 7 (SB-7). SB-7 encourages conservation of water in multi-family residential, mixed-use multi-family and commercial buildings through metering infrastructure for each dwelling unit, including appropriate water billing safeguards for both tenants and landlords. EBMUD water services shall be conditioned for all development projects within the Housing Element Update that are subject to SB-7 requirements and will be released only after the project sponsor has satisfied all requirements and provided evidence of conformance with SB-7.

Main extensions that may be required to serve any specific developments within the Housing Element Update to provide adequate domestic water supply, fire flows, and system redundancy will be at the project sponsor's expense. Pipeline and fire hydrant relocations and replacements due to modifications of existing streets, and off-site pipeline improvements, also at the project sponsor's expense, may be required depending on EBMUD metering requirements and fire flow requirements set by the local fire department. When the development plans are finalized for individual projects within the Housing Element Update, project sponsors for individual projects should contact EBMUD's New Business Office and request a water service estimate to determine costs and conditions of providing water service to the development. Engineering and installation of new and relocated pipelines and services require substantial lead time, which should be provided for in the project sponsor's development schedule.

Project sponsors for individual projects within the Housing Element Update should be aware that EBMUD will not install piping or services in contaminated soil or groundwater

(if groundwater is present at any time during the year at the depth piping is to be installed) that must be handled as a hazardous waste or that may be hazardous to the health and safety of construction and maintenance personnel wearing Level D personal protective equipment. Nor will EBMUD install piping or services in areas where groundwater contaminant concentrations exceed specified limits for discharge to the sanitary sewer system and sewage treatment plants. The project sponsor must submit copies to EBMUD of all known information regarding soil and groundwater quality within or adjacent to the project boundary and a legally sufficient, complete, and specific written remediation plan establishing the methodology, planning and design of all necessary systems for the removal, treatment, and disposal of contaminated soil and groundwater.

EBMUD will not design piping or services until soil and groundwater quality data and remediation plans have been received and reviewed and will not start underground work until remediation has been carried out and documentation of the effectiveness of the remediation has been received and reviewed. If no soil or groundwater quality data exists, or the information supplied by the project sponsor is insufficient, EBMUD may require the project sponsor to perform sampling and analysis to characterize the soil and groundwater that may be encountered during excavation, or EBMUD may perform such sampling and analysis at the project sponsor's expense. If evidence of contamination is discovered during EBMUD work on the project site, work may be suspended until such contamination is adequately characterized and remediated to EBMUD standards.

WASTEWATER SERVICE

EBMUD's Main Wastewater Treatment Plant (MWWTP) and interceptor system are anticipated to have adequate dry weather capacity to accommodate the proposed wastewater flows for individual projects within the Housing Element Update and to treat such flows provided that the wastewater generated by the project meets the requirements of the EBMUD Wastewater Control Ordinance. However, wet weather flows are a concern. The East Bay regional wastewater collection system experiences exceptionally high peak flows during storms due to excessive infiltration and inflow (I/I) that enters the system through cracks and misconnections in both public and private sewer lines. EBMUD has historically operated three Wet Weather Facilities (WWFs) to provide primary treatment and disinfection for peak wet weather flows that exceed the treatment capacity of the MWWTP. Due to reinterpretation of applicable law, EBMUD's National Pollutant Discharge Elimination System (NPDES) permit now prohibits discharges from EBMUD's WWFs. Additionally, the seven wastewater collection system agencies that discharge to the EBMUD wastewater interceptor system ("Satellite Agencies") hold NPDES permits that prohibit them from causing or contributing to WWF discharges. These NPDES permits have removed the regulatory coverage the East Bay wastewater agencies once relied upon to manage peak wet weather flows.

A federal consent decree, negotiated among EBMUD, the Satellite Agencies, the Environmental Protection Agency (EPA), the State Water Resources Control Board (SWRCB), and the Regional Water Quality Control Board (RWQCB), requires EBMUD

and the Satellite Agencies to eliminate WWF discharges by 2036. To meet this requirement, actions will need to be taken over time to reduce I/I in the system. The consent decree requires EBMUD to continue implementation of its Regional Private Sewer Lateral Ordinance (www.eastbaypsl.com), construct various improvements to its interceptor system, and identify key areas of inflow and rapid infiltration over a 22-year period. Over the same time period, the consent decree requires the Satellite Agencies to perform I/I reduction work including sewer main rehabilitation and elimination of inflow sources. EBMUD and the Satellite Agencies must jointly demonstrate at specified intervals that this work has resulted in a sufficient, pre-determined level of reduction in WWF discharges. If sufficient I/I reductions are not achieved, additional investment into the region's wastewater infrastructure would be required, which may result in significant financial implications for East Bay residents.

To ensure that individual projects within the Housing Element Update contributes to these legally required I/I reductions, the lead agency should require the project sponsors comply with EBMUD's Regional Private Sewer Lateral Ordinance. Additionally, it would be prudent for the lead agency to require the following mitigation measures for individual projects within the Housing Element Update: (1) replace or rehabilitate any existing sanitary sewer collection systems, including sewer lateral lines to ensure that such systems and lines are free from defects or, alternatively, disconnected from the sanitary sewer system, and (2) ensure any new wastewater collection systems, including sewer lateral lines, for the project are constructed to prevent I/I to the maximum extent feasible while meeting all requirements contained in the Regional Private Sewer Lateral Ordinance and applicable municipal codes or Satellite Agency ordinances.

WATER RECYCLING

EBMUD's Policy 9.05 requires that customers use non-potable water, including recycled water, for non-domestic purposes when it is of adequate quality and quantity, available at reasonable cost, not detrimental to public health, and not injurious to plant, fish, and wildlife to offset demand on EBMUD's limited potable water supply. Appropriate recycled water uses include landscape irrigation, commercial and industrial process uses, toilet and urinal flushing in non-residential buildings, and other applications.

EBMUD's current recycled water infrastructure and services do not extend through the City limits, however, the City is located within the designated service boundaries of EBMUD's East Bayshore Recycled Water Project. As part of EBMUD's long term water supply planning, future expansion plans will extend recycled water to various locations within Berkeley and could potentially serve projects within the Housing Element Update. As EBMUD plans and implements its recycled water supply expansion to the City, EBMUD recommends that the City and project sponsors continue to coordinate closely with EBMUD. The project sponsors are required to provide an estimate of expected water demand for potential recycled water uses for each project in the Housing Element Update

to further explore the options and requirements relating to recycled water use. Accordingly, EBMUD will assess and consider the feasibility of providing recycled water to projects within the Housing Element Update for appropriate uses.

WATER CONSERVATION

Individual projects within the Housing Element Update presents an opportunity to incorporate water conservation measures. EBMUD requests that the City include in its conditions of approval a requirement that the project sponsor comply with Assembly Bill 325, "Model Water Efficient Landscape Ordinance," (Division 2, Title 23, California Code of Regulations, Chapter 2.7, Sections 490 through 495). The project sponsors should be aware that Section 31 of EBMUD's Water Service Regulations requires that water service shall not be furnished for new or expanded service unless all the applicable water-efficiency measures described in the regulation are installed at the project sponsor's expense.

If you have any questions concerning this response, please contact Timothy R. McGowan, Senior Civil Engineer, Major Facilities Planning Section at (510) 287-1981.

Sincerely,

David J. Rehnstrom
Manager of Water Distribution Planning

DJR:KTL:grd
sb22_032 City of Berkeley Housing Element Update Response

cc: City of Berkeley
2180 Milvia Street
Berkeley, CA 94704

STATE OF CALIFORNIA Gavin Newsom, Governor

NATIVE AMERICAN HERITAGE COMMISSION

January 26, 2022

Grace Wu
City of Berkeley
1947 Center Street, 2nd Floor
Berkeley, CA 94704

Re: 2022010331, City of Berkeley Housing Element Update Project, Alameda County

Dear Ms. Wu:

The Native American Heritage Commission (NAHC) has received the Notice of Preparation (NOP), Draft Environmental Impact Report (DEIR) or Early Consultation for the project referenced above. The California Environmental Quality Act (CEQA) (Pub. Resources Code §21000 et seq.), specifically Public Resources Code §21084.1, states that a project that may cause a substantial adverse change in the significance of a historical resource, is a project that may have a significant effect on the environment. (Pub. Resources Code § 21084.1; Cal. Code Regs., tit.14, §15064.5 (b) (CEQA Guidelines §15064.5 (b)). If there is substantial evidence, in light of the whole record before a lead agency, that a project may have a significant effect on the environment, an Environmental Impact Report (EIR) shall be prepared. (Pub. Resources Code §21080 (d); Cal. Code Regs., tit. 14, § 5064 subd.(a)(1) (CEQA Guidelines §15064 (a)(1)). In order to determine whether a project will cause a substantial adverse change in the significance of a historical resource, a lead agency will need to determine whether there are historical resources within the area of potential effect (APE).

CEQA was amended significantly in 2014. Assembly Bill 52 (Gatto, Chapter 532, Statutes of 2014) (AB 52) amended CEQA to create a separate category of cultural resources, "tribal cultural resources" (Pub. Resources Code §21074) and provides that a project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment. (Pub. Resources Code §21084.2). Public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource. (Pub. Resources Code §21084.3 (a)). **AB 52 applies to any project for which a notice of preparation, a notice of negative declaration, or a mitigated negative declaration is filed on or after July 1, 2015.** If your project involves the adoption of or amendment to a general plan or a specific plan, or the designation or proposed designation of open space, on or after March 1, 2005, it may also be subject to Senate Bill 18 (Burton, Chapter 905, Statutes of 2004) (SB 18). **Both SB 18 and AB 52 have tribal consultation requirements.** If your project is also subject to the federal National Environmental Policy Act (42 U.S.C. § 4321 et seq.) (NEPA), the tribal consultation requirements of Section 106 of the National Historic Preservation Act of 1966 (154 U.S.C. 300101, 36 C.F.R. §800 et seq.) may also apply.

The NAHC recommends consultation with California Native American tribes that are traditionally and culturally affiliated with the geographic area of your proposed project as early as possible in order to avoid inadvertent discoveries of Native American human remains and best protect tribal cultural resources. Below is a brief summary of portions of AB 52 and SB 18 as well as the NAHC's recommendations for conducting cultural resources assessments.

Consult your legal counsel about compliance with AB 52 and SB 18 as well as compliance with any other applicable laws.

NAHC HEADQUARTERS
1550 Harbor Boulevard
Suite 100
West Sacramento,
California 95691
(916) 373-3710
nahc@nahc.ca.gov
NAHC.ca.gov

AB 52

AB 52 has added to CEQA the additional requirements listed below, along with many other requirements:

1. Fourteen Day Period to Provide Notice of Completion of an Application/Decision to Undertake a Project: Within fourteen (14) days of determining that an application for a project is complete or of a decision by a public agency to undertake a project, a lead agency shall provide formal notification to a designated contact of, or tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, to be accomplished by at least one written notice that includes:

- **a.** A brief description of the project.
- **b.** The lead agency contact information.
- **c.** Notification that the California Native American tribe has 30 days to request consultation. (Pub. Resources Code §21080.3.1 (d)).
- **d.** A "California Native American tribe" is defined as a Native American tribe located in California that is on the contact list maintained by the NAHC for the purposes of Chapter 905 of Statutes of 2004 (SB 18). (Pub. Resources Code §21073).

2. Begin Consultation Within 30 Days of Receiving a Tribe's Request for Consultation and Before Releasing a Negative Declaration, Mitigated Negative Declaration, or Environmental Impact Report: A lead agency shall begin the consultation process within 30 days of receiving a request for consultation from a California Native American tribe that is traditionally and culturally affiliated with the geographic area of the proposed project. (Pub. Resources Code §21080.3.1, subds. (d) and (e)) and prior to the release of a negative declaration, mitigated negative declaration or Environmental Impact Report. (Pub. Resources Code §21080.3.1(b)).

- **a.** For purposes of AB 52, "consultation shall have the same meaning as provided in Gov. Code §65352.4 (SB 18). (Pub. Resources Code §21080.3.1 (b)).

3. Mandatory Topics of Consultation If Requested by a Tribe: The following topics of consultation, if a tribe requests to discuss them, are mandatory topics of consultation:

- **a.** Alternatives to the project.
- **b.** Recommended mitigation measures.
- **c.** Significant effects. (Pub. Resources Code §21080.3.2 (a)).

4. Discretionary Topics of Consultation: The following topics are discretionary topics of consultation:

- **a.** Type of environmental review necessary.
- **b.** Significance of the tribal cultural resources.
- **c.** Significance of the project's impacts on tribal cultural resources.
- **d.** If necessary, project alternatives or appropriate measures for preservation or mitigation that the tribe may recommend to the lead agency. (Pub. Resources Code §21080.3.2 (a)).

5. Confidentiality of Information Submitted by a Tribe During the Environmental Review Process: With some exceptions, any information, including but not limited to, the location, description, and use of tribal cultural resources submitted by a California Native American tribe during the environmental review process shall not be included in the environmental document or otherwise disclosed by the lead agency or any other public agency to the public, consistent with Government Code §6254 (r) and §6254.10. Any information submitted by a California Native American tribe during the consultation or environmental review process shall be published in a confidential appendix to the environmental document unless the tribe that provided the information consents, in writing, to the disclosure of some or all of the information to the public. (Pub. Resources Code §21082.3 (c)(1)).

6. Discussion of Impacts to Tribal Cultural Resources in the Environmental Document: If a project may have a significant impact on a tribal cultural resource, the lead agency's environmental document shall discuss both of the following:

- **a.** Whether the proposed project has a significant impact on an identified tribal cultural resource.
- **b.** Whether feasible alternatives or mitigation measures, including those measures that may be agreed to pursuant to Public Resources Code §21082.3, subdivision (a), avoid or substantially lessen the impact on the identified tribal cultural resource. (Pub. Resources Code §21082.3 (b)).

7. Conclusion of Consultation: Consultation with a tribe shall be considered concluded when either of the following occurs:

a. The parties agree to measures to mitigate or avoid a significant effect, if a significant effect exists, on a tribal cultural resource; or

b. A party, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached. (Pub. Resources Code §21080.3.2 (b)).

8. Recommending Mitigation Measures Agreed Upon in Consultation in the Environmental Document: Any mitigation measures agreed upon in the consultation conducted pursuant to Public Resources Code §21080.3.2 shall be recommended for inclusion in the environmental document and in an adopted mitigation monitoring and reporting program, if determined to avoid or lessen the impact pursuant to Public Resources Code §21082.3, subdivision (b), paragraph 2, and shall be fully enforceable. (Pub. Resources Code §21082.3 (a)).

9. Required Consideration of Feasible Mitigation: If mitigation measures recommended by the staff of the lead agency as a result of the consultation process are not included in the environmental document or if there are no agreed upon mitigation measures at the conclusion of consultation, or if consultation does not occur, and if substantial evidence demonstrates that a project will cause a significant effect to a tribal cultural resource, the lead agency shall consider feasible mitigation pursuant to Public Resources Code §21084.3 (b). (Pub. Resources Code §21082.3 (e)).

10. Examples of Mitigation Measures That, If Feasible, May Be Considered to Avoid or Minimize Significant Adverse Impacts to Tribal Cultural Resources:

a. Avoidance and preservation of the resources in place, including, but not limited to:

i. Planning and construction to avoid the resources and protect the cultural and natural context.

ii. Planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria.

b. Treating the resource with culturally appropriate dignity, taking into account the tribal cultural values and meaning of the resource, including, but not limited to, the following:

i. Protecting the cultural character and integrity of the resource.

ii. Protecting the traditional use of the resource.

iii. Protecting the confidentiality of the resource.

c. Permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or utilizing the resources or places.

d. Protecting the resource. (Pub. Resource Code §21084.3 (b)).

e. Please note that a federally recognized California Native American tribe or a non-federally recognized California Native American tribe that is on the contact list maintained by the NAHC to protect a California prehistoric, archaeological, cultural, spiritual, or ceremonial place may acquire and hold conservation easements if the conservation easement is voluntarily conveyed. (Civ. Code §815.3 (c)).

f. Please note that it is the policy of the state that Native American remains and associated grave artifacts shall be repatriated. (Pub. Resources Code §5097.991).

11. Prerequisites for Certifying an Environmental Impact Report or Adopting a Mitigated Negative Declaration or Negative Declaration with a Significant Impact on an Identified Tribal Cultural Resource: An Environmental Impact Report may not be certified, nor may a mitigated negative declaration or a negative declaration be adopted unless one of the following occurs:

a. The consultation process between the tribes and the lead agency has occurred as provided in Public Resources Code §21080.3.1 and §21080.3.2 and concluded pursuant to Public Resources Code §21080.3.2.

b. The tribe that requested consultation failed to provide comments to the lead agency or otherwise failed to engage in the consultation process.

c. The lead agency provided notice of the project to the tribe in compliance with Public Resources Code §21080.3.1 (d) and the tribe failed to request consultation within 30 days. (Pub. Resources Code §21082.3 (d)).

The NAHC's PowerPoint presentation titled, "Tribal Consultation Under AB 52: Requirements and Best Practices" may be found online at: http://nahc.ca.gov/wp-content/uploads/2015/10/AB52TribalConsultation_CalEPAPDF.pdf

SB 18

SB 18 applies to local governments and requires local governments to contact, provide notice to, refer plans to, and consult with tribes prior to the adoption or amendment of a general plan or a specific plan, or the designation of open space. (Gov. Code §65352.3). Local governments should consult the Governor's Office of Planning and Research's "Tribal Consultation Guidelines," which can be found online at: https://www.opr.ca.gov/docs/09_14_05_Updated_Guidelines_922.pdf.

Some of SB 18's provisions include:

1. Tribal Consultation: If a local government considers a proposal to adopt or amend a general plan or a specific plan, or to designate open space it is required to contact the appropriate tribes identified by the NAHC by requesting a "Tribal Consultation List." If a tribe, once contacted, requests consultation the local government must consult with the tribe on the plan proposal. **A tribe has 90 days from the date of receipt of notification to request consultation unless a shorter timeframe has been agreed to by the tribe.** (Gov. Code §65352.3 (a)(2)).
2. No Statutory Time Limit on SB 18 Tribal Consultation. There is no statutory time limit on SB 18 tribal consultation.
3. Confidentiality: Consistent with the guidelines developed and adopted by the Office of Planning and Research pursuant to Gov. Code §65040.2, the city or county shall protect the confidentiality of the information concerning the specific identity, location, character, and use of places, features and objects described in Public Resources Code §5097.9 and §5097.993 that are within the city's or county's jurisdiction. (Gov. Code §65352.3 (b)).
4. Conclusion of SB 18 Tribal Consultation: Consultation should be concluded at the point in which:
    a. The parties to the consultation come to a mutual agreement concerning the appropriate measures for preservation or mitigation; or
    b. Either the local government or the tribe, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached concerning the appropriate measures of preservation or mitigation. (Tribal Consultation Guidelines, Governor's Office of Planning and Research (2005) at p. 18).

Agencies should be aware that neither AB 52 nor SB 18 precludes agencies from initiating tribal consultation with tribes that are traditionally and culturally affiliated with their jurisdictions before the timeframes provided in AB 52 and SB 18. For that reason, we urge you to continue to request Native American Tribal Contact Lists and "Sacred Lands File" searches from the NAHC. The request forms can be found online at: http://nahc.ca.gov/resources/forms/.

NAHC Recommendations for Cultural Resources Assessments

To adequately assess the existence and significance of tribal cultural resources and plan for avoidance, preservation in place, or barring both, mitigation of project-related impacts to tribal cultural resources, the NAHC recommends the following actions:

1. Contact the appropriate regional California Historical Research Information System (CHRIS) Center (http://ohp.parks.ca.gov/?page_id=1068) for an archaeological records search. The records search will determine:
    a. If part or all of the APE has been previously surveyed for cultural resources.
    b. If any known cultural resources have already been recorded on or adjacent to the APE.
    c. If the probability is low, moderate, or high that cultural resources are located in the APE.
    d. If a survey is required to determine whether previously unrecorded cultural resources are present.

2. If an archaeological inventory survey is required, the final stage is the preparation of a professional report detailing the findings and recommendations of the records search and field survey.
    a. The final report containing site forms, site significance, and mitigation measures should be submitted immediately to the planning department. All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum and not be made available for public disclosure.
    b. The final written report should be submitted within 3 months after work has been completed to the appropriate regional CHRIS center.

3. Contact the NAHC for:
   a. A Sacred Lands File search. Remember that tribes do not always record their sacred sites in the Sacred Lands File, nor are they required to do so. A Sacred Lands File search is not a substitute for consultation with tribes that are traditionally and culturally affiliated with the geographic area of the project's APE.
   b. A Native American Tribal Consultation List of appropriate tribes for consultation concerning the project site and to assist in planning for avoidance, preservation in place, or, failing both, mitigation measures.

4. Remember that the lack of surface evidence of archaeological resources (including tribal cultural resources) does not preclude their subsurface existence.
   a. Lead agencies should include in their mitigation and monitoring reporting program plan provisions for the identification and evaluation of inadvertently discovered archaeological resources per Cal. Code Regs., tit. 14, §15064.5(f) (CEQA Guidelines §15064.5(f)). In areas of identified archaeological sensitivity, a certified archaeologist and a culturally affiliated Native American with knowledge of cultural resources should monitor all ground-disturbing activities.
   b. Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the disposition of recovered cultural items that are not burial associated in consultation with culturally affiliated Native Americans.
   c. Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the treatment and disposition of inadvertently discovered Native American human remains. Health and Safety Code §7050.5, Public Resources Code §5097.98, and Cal. Code Regs., tit. 14, §15064.5, subdivisions (d) and (e) (CEQA Guidelines §15064.5, subds. (d) and (e)) address the processes to be followed in the event of an inadvertent discovery of any Native American human remains and associated grave goods in a location other than a dedicated cemetery.

If you have any questions or need additional information, please contact me at my email address: Andrew.Green@nahc.ca.gov.

Sincerely,

Andrew Green

Andrew Green
Cultural Resources Analyst

cc: State Clearinghouse

ALAMEDA County Transportation Commission
1111 Broadway, Suite 800, Oakland, CA 94607 • 510.208.7400 • www.AlamedaCTC.org

February 9, 2022

Grace Wu, Senior Planner
City of Berkeley, Land Use Planning Division
1947 Center St, 2nd Floor
Berkeley, CA, 94704

SUBJECT: Response to the Notice of Preparation (NOP) of a Draft Environmental Impact Report for the City of Berkeley Housing Element Update

Dear Grace Wu,

Thank you for the opportunity to comment on the Notice of Preparation (NOP) of the Draft Environmental Impact Report (DEIR) for the City of Berkeley Housing Element Update. The project would include all 17.2 square miles of the City of Berkeley, located in northern Alameda County. The proposed comprehensive Housing Element Update will be based on the City's latest Regional Housing Needs Allocation which requires the City of Berkely's zoning and other land use regulations to accommodate between approximately 9,750 and 10,500 new units. The Housing Element Update will identify suitable and available housing sites by screening for vacant and underutilized parcels, evaluating sites and calculating the capacity of potential buildouts. The Land Use Element of the General Plan will be updated as needed to maintain consistency with the updated Housing Element.

The Alameda County Transportation Commission (Alameda CTC) respectfully submits the following comments:

Basis for Congestion Management Program (CMP) Review

- It appears that the proposed project will generate at least 100 p.m. peak hour trips over existing conditions, and therefore the CMP Land Use Analysis Program requires the City to conduct a transportation impact analysis of the project. For information on the CMP, please visit: https://www.alamedactc.org/planning/congestion-management-program/.

Use of Countywide Travel Demand Model

- The Alameda Countywide Travel Demand Model should be used for CMP Land Use Analysis purposes. The CMP requires local jurisdictions to conduct travel model runs themselves or through a consultant. The City of Berkeley and the Alameda CTC signed a Countywide Model Agreement on September 15, 2010. Before the model can be used for this project, a letter must be submitted to the Alameda CTC requesting use of the model and describing the project. A copy of a sample letter agreement is available upon request. The most current version of the Alameda CTC Countywide Travel Demand Model was updated in May 2019 to be consistent with the assumptions of Plan Bay Area 2040.

`

Impacts

- The DEIR should address all potential impacts of the plan on the Metropolitan Transportation System (MTS) roadway network.
  - MTS roadway facilities in the plan area include:
    - I-80/I-580 in Berkeley, Emeryville, and Albany
    - SR-24 in Berkeley and Oakland
    - SR 123/San Pablo Avenue in Berkeley, Emeryville, Albany, and Oakland
    - SR 13/Ashby Avenue in Berkeley and Oakland
    - University Avenue in Berkeley, and Shattuck Avenue, Telegraph Avenue, and Martin Luther King Jr. Boulevard in Berkeley and Oakland
  - For the purposes of CMP Land Use Analysis, the Highway Capacity Manual 2010 freeway and urban streets methodologies are the preferred methodologies to study vehicle delay impacts.
  - The Alameda CTC has *not* adopted any policy for determining a threshold of significance for Level of Service for the Land Use Analysis Program of the CMP.

- The DEIR should address potential impacts of the project on Metropolitan Transportation System (MTS) transit operators.
  - MTS transit operators potentially affected by the plan include: AC Transit, BART, and Capital Corridor
  - Transit impacts for consideration include the effects of project vehicle traffic on mixed flow transit operations, transit capacity, transit access/egress, need for future transit service, and consistency with adopted plans.

- The DEIR should address potential impacts of the plan to people biking and walking in and near the plan area, especially nearby roads included in the Countywide High-injury Network and major barriers identified in the Countywide Active Transportation Plan.
  - Impacts to consider on conditions for cyclists include effects of vehicle traffic on cyclist safety and performance, site development and roadway improvements, and consistency with adopted plans.

Mitigation Measures

- Alameda CTC's policy regarding mitigation measures is that to be considered adequate they must:
  - Adequately sustain CMP roadway and transit service standards;
  - Be fully funded; and
  - Be consistent with project funding priorities established in the Capital Improvement Program of the CMP, the Countywide Transportation Plan (CTP), and the Regional Transportation Plan (RTP) or the Federal Transportation Improvement Program, if the agency relies on state or federal funds programmed by Alameda CTC.

- The DEIR should discuss the adequacy of proposed mitigation measure according to the criteria above. In particular, the DEIR should detail when proposed roadway or transit route improvements are expected to be completed, how they will be funded, and the effect on service standards if only the funded portions of these mitigation measures are built prior to Project completion. The DEIR should also address the issue of transit funding as a mitigation measure in the context of the Alameda CTC mitigation measure criteria discussed above.

- Jurisdictions are encouraged to discuss multimodal tradeoffs associated with mitigation measures that involve changes in roadway geometry, intersection control, or other changes to the transportation network. This analysis should identify impacts to automobiles, transit, bicyclists, and pedestrians. The HCM 2010 MMLOS methodology is encouraged as a tool to evaluate these tradeoffs, but project sponsors may use other methodologies as appropriate for particular contexts or types of mitigations.

- The DEIR should consider the use of TDM measures, in conjunction with roadway and transit improvements, as a means of attaining acceptable levels of service. Whenever possible, mechanisms that encourage ridesharing, flextime, transit, bicycling, telecommuting and other means of reducing peak hour traffic trips should be considered.

Thank you for the opportunity to comment on this NOP. Please contact me at (510) 208 7484 or Chris G. Marks, Associate Transportation Planner at (510) 208-7453, if you have any questions.

Sincerely,

Cathleen Sullivan
Director of Planning

cc: Chris G. Marks, Associate Transportation Planner
Shannon McCarthy, Associate Transportation Planner

From: Alfred Twu
To: Wu, Grace
Subject: Housing Element scoping comments
Date: Friday, February 11, 2022 7:59:08 PM

Grace,

Here are my comments on the Housing Element scoping.

More capacity needed to meet the RHNA goals
In the last cycle, the current zoning led to about 2,943 units being built.

For this cycle, 4,370 units are expected to come from the "Additional Sites" not including BART, ADUs, and entitled projects. These additional sites have a capacity of 8,574 units. To have a better chance at meeting housing goals, especially since there is less remaining zoned capacity today than there was in the last cycle, more Potential Additional Sites should be identified.

Consider a larger-number-of-units alternative
The BART rezone draft EIR had an alternative with taller buildings that was found to be the environmentally superior alternative. Please also add a larger-number-of-units alternative to be studied.

Include Councilmember Taplin's proposed Affordable Housing Overlay
The RHNA process classifies all large high-density sites as Low Income, however, in practice in Berkeley these types of sites are used both for low income and high income housing. Adding an Affordable Housing Overlay to large low-density sites to allow high density affordable housing could provide more places for low income housing to go.

Consider rezoning R-1, R-1A, R-2 zones next to commercial zones and the North Berkeley BART to R-3 or R-4
The blocks next to the commercial zones areas have similarly excellent transit access, and have the added benefit of being quieter places to live than the commercial corridor itself.

Allow limited retail in residential zones
Retail in residential areas with limited operating hours (for example, 8 or 9pm close times) can reduce the need for driving to go shopping.

Gilman, Claremont, and North Shattuck should have additional capacity added
These are some of the highest income and opportunity areas in the city, and to affirmatively further fair housing, more capacity should be added here.

Thanks
Alfred

From: Kevin Burke
To: Wu, Grace
Subject: Housing element comment
Date: Friday, February 11, 2022 10:56:21 PM

I am a life long Bay Area resident and I am interested in moving to Berkeley.

I would appreciate if it was possible for Berkeley to add more housing so people can move in without people needing to move out or move into their cars. More housing will also mean more impact fees that can be used to add BMR housing, student housing, better quality roads, etc.

I support increasing density throughout Berkeley, especially in the wealthy areas, and making it legal to build fourplexes throughout the city with ministerial approval.

Kevin

--
Kevin Burke
phone: 925-271-7005 | kevin.burke.dev

From: Markus Feyh
To: Wu, Grace
Subject: Comments on Berkeley"s Housing Element
Date: Sunday, February 13, 2022 10:50:26 PM

Hello,

Please study increasing the density in the C-SA - South Area Commercial District, which would bring it in line with the most recently updated C-AC Adeline Corridor Commercial District zoning.

In addition, please study:
1. Removing the height restrictions between sub-areas (see Table 23.204-28. C-SA MAXIMUM BUILDING HEIGHT)
2. Increasing the lot coverage percentages (see Table 23.204-30. C-SA LOT COVERAGE STANDARDS FOR MIXED USE AND RESIDENTIAL-ONLY USES)
3. Reducing setbacks when abutting or confronting residential lots (see 23.204.150(E)(5))

Please also study merging C-SA into the C-AC Adeline Corridor Commercial District

Sincerely,
Markus Feyh

Feb 21, 2022

Jordan Klein
Department of Planning and Development
1947 Center Street, 3rd Floor
Berkeley, CA 94704

Director Klein,

East Bay for Everyone is a membership organization committed to building just cities through land use, transit and housing policy. We write to provide the following principles and policy suggestions as Berkeley prepares an update to its 6th Cycle Housing Element.

We also request that the Draft EIR (DEIR) explore the environmental consequences of the policies below where applicable, so that the scope of the EIR is broad enough to include any of these policies should Council choose to include them in the final Housing Element.

High Level Goals

1. Encourage new housing in affluent, high-resource neighborhoods and areas well-served by transit and bicycle infrastructure.
2. Development without displacement
    a. Ensure that any redevelopment of existing rent controlled housing includes robust protections for tenants, including compliance with right to return and no net loss provisions of SB 330.
3. Provide opportunities for longtime and multi-generational Berkeleyans to realize the increased value of their property without selling their property and leaving the city.
4. Create more ADA-accessible, family-sized and deed-restricted affordable units.
5. Create substantial quantities of lower-cost "missing middle" housing throughout Berkeley's lower-density neighborhoods.
    a. Small unit development permitted by-right makes providing ADU-like units more flexible and accessible to people with disabilities. Simple construction and permitting for multi-family housing opens urban home-building to smaller, local contractors, property owners, and land trusts.
    b. This "missing middle" housing type can satisfy moderate-income housing needs, allowing the city to concentrate affordable housing funds on the most needy.

6. Enable and encourage larger multifamily buildings on commercial and transit corridors.
7. Allow for a variety of housing types and sizes, including townhomes, small apartment buildings, and bungalow courts.

With these goals in mind, we suggest the following the policies for consideration within the draft housing element:

<u>Increased density along transit corridors, up to 8-12 stories</u>

- For commercial parcels near BART and along major bus corridors (lines 51, 6, 18, and 12), rezone for 6-8 stories of mixed-use housing.
- With the potential of cross-laminated timber construction, it may also be worth exploring 12-story buildings, particularly in Downtown and Southside. We expect local area plans to evaluate buildings taller than 12 stories.
- For single-family and duplex parcels within 0.5 miles of BART stations, consider midrise, mixed-use zoning for 4 to 5 stories rather than just missing middle.

<u>Increased "missing middle" housing throughout Berkeley neighborhoods</u>

- These revisions should apply in R-1, R-1A, R-2, R-2A, and MU-R zones citywide.
- Four (4) units on any lot that allows ADUs. A base zoning of 8 units if near transit, and up to 12 units near transit if the project includes 2 affordable units (50% density bonus). All approvals should be ministerial.
    - Due to fire and building codes, the maximum of 12 units would likely only be feasible on certain larger lots.
    - Four units trigger the ADA's requirement of at least one accessible unit.
    - Allow flexibility for the subdivision of existing non-conforming structures
    - No public hearings if the appearance from the street is unchanged.
    - One public hearing for input if appearance from the street changes significantly.
- Rules should be crafted with multiple housing types in mind: small apartment buildings, bungalow courts, and townhouses. Modular or pre-fabricated construction should be encouraged. Planning staff should consult with architects, engineers and contractors to conform policy design with current and expected building industry standards.
- As part of the code update, Planning could develop a pre-approved plan for a four-unit dwelling that would work on the vast majority of residential lots. Architectural ornamentation and exterior finishes can accommodate neighborhood and owner preference.
- Loosen development standards to be at least as permissive as ADU standards. Ensure that setback requirements and FAR do not interfere with the ability to build 4-12 units where allowed.
- Allow ministerial lot splits/condo mapping for newly-built units (not house conversions).
- Enforce Berkeley's demolition protections and SB 330 where applicable.

Citywide Affordable Housing Overlay

Berkeley City Council referred adoption of an Affordable Housing Overlay to the Housing Element process. The proposed overlay would allow for additional height and density of affordable housing developments anywhere in Berkeley, including lower-density neighborhoods, outside of the Very High Fire Hazard Severity Zone (VHFHSZ). This proposed AHO must be included for analysis in the DEIR.

Ministerial Approval Process

- Adopt an ordinance for fully ministerial approval of qualifying housing developments, modeled on the one recently adopted in Sacramento. This would facilitate faster and more cost effective construction of needed homes, while reducing the discretionary review burden on planning staff and planning commissions.
    - Qualifying developments should be zoning compliant. Berkeley may also consider as requirements a maximum development size (in Sacramento this is 200 units; square footage may make sense as an alternative) and electing for on-site Affordable Housing rather than an in-lieu fee.
- Include a menu of commonly chosen density bonus concessions that could be used in this ministerial process for qualifying developments.

Tenant Protections

- Audit enforcement of demolition protections, no net loss and right to return required by SB330 within the planning process. Incorporate these standards directly into Berkeley law, as well as permit application forms.
- Coordinate with Berkeley's Rent Board to provide clear processes for tenant right to return required by SB330.
- Create a local rental registry in order to capture rental data and enforce tenant protections, including demolition protections.

We look forward to continuing to engage with the City of Berkeley in the 6th Cycle Housing Element Update.

Sincerely,

Greg Magofña
Co-Executive
East Bay for Everyone

Sid Kapur
Chapter Lead
East Bay YIMBY

Appendix B

Special-Status Species in the Vicinity of the Project Area

Local, state, and federal agencies regulate special-status species and require an assessment of their presence or potential presence to be conducted on-site prior to the approval of any proposed development on a property. The potential occurrence table of special-status species is based upon known ranges, habitat preferences for the species, species occurrence records from the CNDDB species occurrence records from other sites in the vicinity of the project area, and previous reports for the Plan Area.

Table B-1 Special Status Plant Species and Sensitive Natural Communities Known to Occur or with Potential to Occur in the Vicinity of the Project Area

Scientific Name Common Name	Status Fed/State Global Rank/ State Rank CRPR	Habitat Requirements
Amsinckia lunaris bent-flowered fiddleneck	None/None G3/S3 1B.2	Annual herb. Cismontane woodland, coastal bluff scrub, valley and foothill grassland. Elevations: 10-1640ft. (3-500m.) Blooms Mar-Jun.
Arctostaphylos franciscana Franciscan manzanita	FE/None GHC/S1 1B.1	Perennial evergreen shrub. Coastal scrub. Serpentine outcrops in chaparral. Elevations: 195-985ft. (60-300m.) Blooms Feb-Apr.
Arctostaphylos imbricata San Bruno Mountain manzanita	None/SCE G1/S1 1B.1	Perennial evergreen shrub. Chaparral, coastal scrub. Rocky. Elevations: 900-1215ft. (275-370m.) Blooms Feb-May.
Arctostaphylos montana ssp. *ravenii* Presidio manzanita	FE/SCE G3T1/S1 1B.1	Perennial evergreen shrub. Chaparral, coastal prairie, coastal scrub. Open, rocky serpentine slopes. Elevations: 150-705ft. (45-215m.) Blooms Feb-Mar.
Arctostaphylos pacifica Pacific manzanita	None/SCE G1/S1 1B.1	Evergreen shrub. Chaparral, coastal scrub. Elevations: 1085-1085ft. (330-330m.) Blooms Feb-Apr.
Arctostaphylos pallida pallid manzanita	FT/SCE G1/S1 1B.1	Perennial evergreen shrub. Broadleafed upland forest, chaparral, cismontane woodland, closed-cone coniferous forest, coastal scrub. Grows on uplifted marine terraces on siliceous shale or thin chert. May require fire. Elevations: 605-1525ft. (185-465m.) Blooms Dec-Mar.
Arenaria paludicola marsh sandwort	FE/SCE G1/S1 1B.1	Perennial stoloniferous herb. Marshes and swamps. Openings, sandy. Elevations: 10-560ft. (3-170m.) Blooms May-Aug.
Astragalus tener var. *tener* alkali milk-vetch	None/None G2T1/S1 1B.2	Annual herb. Playas, valley and foothill grassland, vernal pools. Alkaline. Elevations: 5-195ft. (1-60m.) Blooms Mar-Jun.
Calochortus tiburonensis Tiburon mariposa-lily	FT/SCT G1/S1 1B.1	Perennial bulbiferous herb. Valley and foothill grassland. On open, rocky, slopes in serpentine grassland. Elevations: 165-490ft. (50-150m.) Blooms Mar-Jun.
Calystegia purpurata ssp. *saxicola* coastal bluff morning-glory	None/None G4T2T3/S2S3 1B.2	Perennial herb. Coastal bluff scrub, coastal dunes, coastal scrub, north coast coniferous fores. Elevations: 0-345ft. (0-105m.) Blooms (Mar)Apr-Sep.
Carex comosa bristly sedge	None/None G5/S2 2B.1	Perennial rhizomatous herb. Coastal prairie, marshes and swamps, valley and foothill grassland. Lake margins, wet places; site below sea level is on a Delta island. Elevations: 0-2050ft. (0-625m.) Blooms May-Sep.

Scientific Name Common Name	Status Fed/State Global Rank/ State Rank CRPR	Habitat Requirements
Carex praticola northern meadow sedge	None/None G5/S2 2B.2	Perennial herb. Meadows and seeps. Moist to wet meadows. Elevations: 0-10500ft. (0-3200m.) Blooms May-Jul.
Castilleja affinis var. *neglecta* Tiburon paintbrush	FE/SCT G4G5T1T2/S1S2 1B.2	Perennial herb (hemiparasitic). Valley and foothill grassland. Rocky serpentine sites. Elevations: 195-1310ft. (60-400m.) Blooms Apr-Jun.
Chloropyron maritimum ssp. *palustre* Point Reyes salty bird's-beak	None/None G4?T2/S2 1B.2	Annual herb (hemiparasitic). Marshes and swamps. Usually in coastal salt marsh with Salicornia, Distichlis, Jaumea, Spartina, etc. Elevations: 0-35ft. (0-10m.) Blooms Jun-Oct.
Chloropyron molle ssp. *molle* soft salty bird's-beak	FE/SCR G2T1/S1 1B.2	Annual herb (hemiparasitic). Marshes and swamps. In coastal salt marsh with Distichlis, Salicornia, Frankenia, etc. Elevations: 0-10ft. (0-3m.) Blooms Jun-Nov.
Chorizanthe cuspidata var. *cuspidata* San Francisco Bay spineflower	None/None G2T1/S1 1B.2	Annual herb. Coastal bluff scrub, coastal dunes, coastal prairie, coastal scrub. Sandy. Elevations: 10-705ft. (3-215m.) Blooms Apr-Jul(Aug).
Chorizanthe robusta var. *robusta* robust spineflower	FE/None G2T1/S1 1B.1	Annual herb. Chaparral, cismontane woodland, coastal dunes, coastal scrub. Gravelly (sometimes), sandy (sometimes). Elevations: 10-985ft. (3-300m.) Blooms Apr-Sep.
Cirsium andrewsii Franciscan thistle	None/None G3/S3 1B.2	Perennial herb. Broadleafed upland forest, coastal bluff scrub, coastal prairie, coastal scrub. Mesic, serpentinite (sometimes). Elevations: 0-490ft. (0-150m.) Blooms Mar-Jul.
Clarkia franciscana Presidio clarkia	FE/SCE G1/S1 1B.1	Annual herb. Coastal scrub, valley and foothill grassland. Serpentine outcrops in grassland or scrub. Elevations: 80-1100ft. (25-335m.) Blooms May-Jul.
Collinsia multicolor San Francisco collinsia	None/None G2/S2 1B.2	Annual herb. Closed-cone coniferous forest, coastal scrub. Serpentinite (sometimes). Elevations: 100-900ft. (30-275m.) Blooms (Feb)Mar-May.
Dirca occidentalis western leatherwood	None/None G2/S2 1B.2	Perennial deciduous shrub. Broadleafed upland forest, chaparral, cismontane woodland, closed-cone coniferous forest, north coast coniferous forest, riparian forest, riparian woodland. On brushy slopes, mesic sites; mostly in mixed evergreen and foothill woodland communities. Elevations: 80-1395ft. (25-425m.) Blooms Jan-Mar(Apr).
Eriogonum luteolum var. *caninum* Tiburon buckwheat	None/None G5T2/S2 1B.2	Annual herb. Chaparral, cismontane woodland, coastal prairie, valley and foothill grassland. Serpentine soils; sandy to gravaelly sites. Elevations: 0-2295ft. (0-700m.) Blooms May-Sep.
Eryngium jepsonii Jepson's coyote-thistle	None/None G2/S2 1B.2	Perennial herb. Valley and foothill grassland, vernal pools. Clay. Elevations: 10-985ft. (3-300m.) Blooms Apr-Aug.
Extriplex joaquinana San Joaquin spearscale	None/None G2/S2 1B.2	Annual herb. Chenopod scrub, meadows and seeps, playas, valley and foothill grassland. In seasonal alkali wetlands or alkali sink scrub with Distichlis spicata, Frankenia, etc. Elevations: 5-2740ft. (1-835m.) Blooms Apr-Oct.

Scientific Name Common Name	Status Fed/State Global Rank/ State Rank CRPR	Habitat Requirements
Fissidens pauperculus minute pocket moss	None/None G3?/S2 1B.2	Moss. North coast coniferous forest. Moss growing on damp soil along the coast. In dry streambeds and on stream banks. Elevations: 35-3360ft. (10-1024m.)
Fritillaria liliacea fragrant fritillary	None/None G2/S2 1B.2	Perennial bulbiferous herb. Cismontane woodland, coastal prairie, coastal scrub, valley and foothill grassland. Often on serpentine; various soils reported though usually on clay, in grassland. Elevations: 10-1345ft. (3-410m.) Blooms Feb-Apr.
Gilia capitata ssp. *chamissonis* blue coast gilia	None/None G5T2/S2 1B.1	Annual herb. Coastal dunes, coastal scrub. Elevations: 5-655ft. (2-200m.) Blooms Apr-Jul.
Gilia millefoliata dark-eyed gilia	None/None G2/S2 1B.2	Annual herb. Coastal dunes. Elevations: 5-100ft. (2-30m.) Blooms Apr-Jul.
Helianthella castanea Diablo helianthella	None/None G2/S2 1B.2	Perennial herb. Broadleafed upland forest, chaparral, cismontane woodland, coastal scrub, riparian woodland, valley and foothill grassland. Azonal soils, Partial shade (often), rocky (usually). Elevations: 195-4265ft. (60-1300m.) Blooms Mar-Jun.
Hemizonia congesta ssp. *congesta* congested-headed hayfield tarplant	None/None G5T2/S2 1B.2	Annual herb. Valley and foothill grassland. Grassy valleys and hills, often in fallow fields; sometimes along roadsides. Elevations: 65-1835ft. (20-560m.) Blooms Apr-Nov.
Hesperolinon congestum Marin western flax	FT/SCT G1/S1 1B.1	Annual herb. Chaparral, valley and foothill grassland. In serpentine barrens and in serpentine grassland and chaparral. Elevations: 15-1215ft. (5-370m.) Blooms Apr-Jul.
Heteranthera dubia water star-grass	None/None G5/S2 2B.2	Perennial herb (aquatic). Marshes and swamps. Alkaline, still or slow-moving water. Requires a pH of 7 or higher, usually in slightly eutrophic waters. Elevations: 100-4905ft. (30-1495m.) Blooms Jul-Oct.
Hoita strobilina Loma Prieta hoita	None/None G2?/S2? 1B.1	Perennial herb. Chaparral, cismontane woodland, riparian woodland. Serpentine; mesic sites. Elevations: 100-2820ft. (30-860m.) Blooms May-Jul(Aug-Oct).
Holocarpha macradenia Santa Cruz tarplant	FT/SCE G1/S1 1B.1	Annual herb. Coastal prairie, coastal scrub, valley and foothill grassland. Light, sandy soil or sandy clay; often with nonnatives. Elevations: 35-720ft. (10-220m.) Blooms Jun-Oct.
Horkelia cuneata var. *sericea* Kellogg's horkelia	None/None G4T1?/S1? 1B.1	Perennial herb. Chaparral, closed-cone coniferous forest, coastal dunes, coastal scrub. Old dunes, coastal sandhills; openings. Sandy or gravelly soils. Elevations: 35-655ft. (10-200m.) Blooms Apr-Sep.
Lasthenia conjugens Contra Costa goldfields	FE/None G1/S1 1B.1	Annual herb. Cismontane woodland, playas, valley and foothill grassland, vernal pools. Vernal pools, swales, low depressions, in open grassy areas. Elevations: 0-1540ft. (0-470m.) Blooms Mar-Jun.
Layia carnosa beach layia	FE/SCE G2/S2 1B.1	Annual herb. Coastal dunes, coastal scrub. On sparsely vegetated, semi-stabilized dunes, usually behind foredunes. Elevations: 0-195ft. (0-60m.) Blooms Mar-Jul.

Scientific Name Common Name	Status Fed/State Global Rank/ State Rank CRPR	Habitat Requirements
Leptosiphon rosaceus rose leptosiphon	None/None G1/S1 1B.1	Annual herb. Coastal bluff scrub. Elevations: 0-330ft. (0-100m.) Blooms Apr-Jul.
Lessingia germanorum San Francisco lessingia	FE/SCE G1/S1 1B.1	Annual herb. Coastal scrub. On remnant dunes. Open sandy soils relatively free of competing plants. Elevations: 80-360ft. (25-110m.) Blooms (Jun)Jul-Nov.
Lilaeopsis masonii Mason's lilaeopsis	None/SCR G2/S2 1B.1	Perennial rhizomatous herb. Marshes and swamps, riparian scrub. Tidal zones, in muddy or silty soil formed through river deposition or river bank erosion. In brackish or freshwater. Elevations: 0-35ft. (0-10m.) Blooms Apr-Nov.
Meconella oregana Oregon meconella	None/None G2G3/S2 1B.1	Annual herb. Coastal prairie, coastal scrub. Open, moist places. Elevations: 820-2035ft. (250-620m.) Blooms Mar-Apr.
Monolopia gracilens woodland woollythreads	None/None G3/S3 1B.2	Annual herb. Broadleafed upland forest, chaparral, cismontane woodland, north coast coniferous forest, valley and foothill grassland. Grassy sites, in openings; sandy to rocky soils. Often seen on serpentine after burns, but may have only weak affinity to serpentine. Elevations: 330-3935ft. (100-1200m.) Blooms (Feb)Mar-Jul.
Oenothera deltoides ssp. *howellii* Antioch Dunes evening-primrose	FE/SCE G5T1/S1 1B.1	Perennial herb. Inland dunes. Remnant river bluffs and sand dunes east of Antioch. Elevations: 0-100ft. (0-30m.) Blooms Mar-Sep.
Pentachaeta bellidiflora white-rayed pentachaeta	FE/SCE G1/S1 1B.1	Annual herb. Cismontane woodland, valley and foothill grassland. Open dry rocky slopes and grassy areas, often on soils derived from serpentine bedrock. Elevations: 115-2035ft. (35-620m.) Blooms Mar-May.
Plagiobothrys chorisianus var. *chorisianus* Choris' popcornflower	None/None G3T1Q/S1 1B.2	Annual herb. Chaparral, coastal prairie, coastal scrub. Mesic sites. Elevations: 10-525ft. (3-160m.) Blooms Mar-Jun.
Plagiobothrys diffusus San Francisco popcornflower	None/SCE G1Q/S1 1B.1	Annual herb. Coastal prairie, valley and foothill grassland. Historically from grassy slopes with marine influence. Elevations: 195-1180ft. (60-360m.) Blooms Mar-Jun.
Polemonium carneum Oregon polemonium	None/None G3G4/S2 2B.2	Perennial herb. Coastal prairie, coastal scrub, lower montane coniferous forest. Elevations: 0-6005ft. (0-1830m.) Blooms Apr-Sep.
Polygonum marinense Marin knotweed	None/None G2Q/S2 3.1	Annual herb. Marshes and swamps. Coastal salt marshes and brackish marshes. Elevations: 0-35ft. (0-10m.) Blooms (Apr)May-Aug(Oct).
Sanicula maritima adobe sanicle	None/SCR G2/S2 1B.1	Perennial herb. Chaparral, coastal prairie, meadows and seeps, valley and foothill grassland. Moist clay or ultramafic soils. Elevations: 100-785ft. (30-240m.) Blooms Feb-May.
Stebbinsoseris decipiens Santa Cruz microseris	None/None G2/S2 1B.2	Annual herb. Broadleafed upland forest, chaparral, closed-cone coniferous forest, coastal prairie, coastal scrub, valley and foothill grassland. Open areas in loose or disturbed soil, usually derived from sandstone, shale or serpentine, on seaward slopes. Elevations: 35-1640ft. (10-500m.) Blooms Apr-May.

Scientific Name Common Name	Status Fed/State Global Rank/ State Rank CRPR	Habitat Requirements
Streptanthus albidus ssp. *peramoenus* most beautiful jewelflower	None/None G2T2/S2 1B.2	Annual herb. Chaparral, cismontane woodland, valley and foothill grassland. Serpentine outcrops, on ridges and slopes. Elevations: 310-3280ft. (95-1000m.) Blooms (Mar)Apr-Sep(Oct).
Streptanthus glandulosus ssp. *niger* Tiburon jewelflower	FE/SCE G4T1/S1 1B.1	Annual herb. Valley and foothill grassland. Shallow, rocky serpentine slopes. Elevations: 100-490ft. (30-150m.) Blooms May-Jun.
Stuckenia filiformis ssp. *alpina* northern slender pondweed	None/None G5T5/S2S3 2B.2	Perennial rhizomatous herb (aquatic). Marshes and swamps. Shallow, clear water of lakes and drainage channels. Elevations: 985-7055ft. (300-2150m.) Blooms May-Jul.
Suaeda californica California seablite	FE/None G1/S1 1B.1	Perennial evergreen shrub. Marshes and swamps. Margins of coastal salt marshes. Elevations: 0-50ft. (0-15m.) Blooms Jul-Oct.
Trifolium amoenum two-fork clover	FE/None G1/S1 1B.1	Annual herb. Coastal bluff scrub, valley and foothill grassland. Sometimes on serpentine soil, open sunny sites, swales. Most recently cited on roadside and eroding cliff face. Elevations: 15-1360ft. (5-415m.) Blooms Apr-Jun.
Trifolium hydrophilum saline clover	None/None G2/S2 1B.2	Annual herb. Marshes and swamps, valley and foothill grassland, vernal pools. Mesic, alkaline sites. Elevations: 0-985ft. (0-300m.) Blooms Apr-Jun.
Triphysaria floribunda San Francisco owl's-clover	None/None G2?/S2? 1B.2	Annual herb. Coastal prairie, coastal scrub, valley and foothill grassland. On serpentine and non-serpentine substrate (such as at Pt. Reyes). Elevations: 35-525ft. (10-160m.) Blooms Apr-Jun.
Northern Coastal Salt Marsh	None/None G3/S3.2	Coastal salt marshes, alkaline flats. The USFWS Wetland Inventory (1996 national list) recognizes Sarcocornia pacifica as an OBL plant.
Northern Maritime Chaparral	None/None G1/S1.2	Varied topography. Soils are commonly shallow over colluvium and many kinds of bedrock.
Serpentine Bunchgrass	None/None G2/S2.2	All topographic locations. Soils may be deep with high clay content, loamy, sandy, or silty derived from mudstone, sandstone, or serpentine substrates.
Valley Needlegrass Grassland	None/None G3/S3.1	All topographic locations. Soils may be deep with high clay content, loamy, sandy, or silty derived from mudstone, sandstone, or serpentine substrates
Viburnum ellipticum oval-leaved viburnum	None/None G4G5/S3? 2B.3	Perennial deciduous shrub. Chaparral, cismontane woodland, lower montane coniferous forest. Elevations: 705-4595ft. (215-1400m.) Blooms May-Jun.

Table B-2 Special Status Animal Species Known to Occur or with Potential to Occur in the Vicinity of the Project Area

Scientific Name Common Name	Status Fed/State Global Rank/ State Rank CDFW	Habitat Requirements
Bombus crotchii Crotch bumble bee	None/ST G2/S1S2	Coastal California east to the Sierra-Cascade crest and south into Mexico. Food plant genera include Antirrhinum, Phacelia, Clarkia, Dendromecon, Eschscholzia, and Eriogonum.
Bombus crotchii Crotch bumble bee	None/ST G2/S1S2	Coastal California east to the Sierra-Cascade crest and south into Mexico. Food plant genera include Antirrhinum, Phacelia, Clarkia, Dendromecon, Eschscholzia, and Eriogonum.
Danaus plexippus pop. 1 monarch - California overwintering population	FC/None G4T2T3/S2S3	Winter roost sites extend along the coast from northern Mendocino to Baja California, Mexico. Roosts located in wind-protected tree groves (eucalyptus, Monterey pine, cypress), with nectar and water sources nearby.
Euphydryas editha bayensis Bay checkerspot butterfly	FT/None G5T1/S1	Restricted to native grasslands on outcrops of serpentine soil in the vicinity of San Francisco Bay. Plantago erecta is the primary host plant; Orthocarpus densiflorus and O. purpurscens are the secondary host plants.
Acipenser medirostris pop. 1 green sturgeon - southern DPS	FT/None G3T1/S1	Spawning site fidelity. Spawns in the Sacramento, Feather and Yuba Rivers. Presence in upper Stanislaus and San Joaquin Rivers may indicate spawning. Non-spawning adults occupy marine/estuarine waters. Delta Estuary is important for rearing juveniles. Spawning occurs primarily in cool (11-15 C) sections of mainstem rivers in deep pools (8-9 meters) with substrate containing small to medium sized sand, gravel, cobble, or boulder.
Archoplites interruptus Sacramento perch	None/None G2G3/S1 SSC	Historically found in the sloughs, slow-moving rivers, and lakes of the Central Valley. Prefers warm water. Aquatic vegetation is essental for young. Tolerates wide range of physio-chemical water conditions.
Eucyclogobius newberryi tidewater goby	FE/None G3/S3	Brackish water habitats along the California coast from Agua Hedionda Lagoon, San Diego County to the mouth of the Smith River. Found in shallow lagoons and lower stream reaches, they need fairly still but not stagnant water and high oxygen levels.
Spirinchus thaleichthys longfin smelt	FC/ST G5/S1	Euryhaline, nektonic and anadromous. Found in open waters of estuaries, mostly in middle or bottom of water column. Prefer salinities of 15-30 ppt, but can be found in completely freshwater to almost pure seawater.
Ambystoma californiense pop. 1 California tiger salamander - central California DPS	FT/ST G2G3T3/S3 WL	Lives in vacant or mammal-occupied burrows throughout most of the year; in grassland, savanna, or open woodland habitats. Need underground refuges, especially ground squirrel burrows, and vernal pools or other seasonal water sources for breeding.
Rana boylii foothill yellow-legged frog	None/SE G3/S3 SSC	Partly-shaded, shallow streams and riffles with a rocky substrate in a variety of habitats. Needs at least some cobble-sized substrate for egg-laying. Needs at least 15 weeks to attain metamorphosis.

Scientific Name Common Name	Status Fed/State Global Rank/ State Rank CDFW	Habitat Requirements
Rana draytonii California red-legged frog	FT/None G2G3/S2S3 SSC	Lowlands and foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation. Requires 11-20 weeks of permanent water for larval development. Must have access to estivation habitat.
Emys marmorata western pond turtle	None/None G3G4/S3 SSC	A thoroughly aquatic turtle of ponds, marshes, rivers, streams and irrigation ditches, usually with aquatic vegetation, below 6000 ft elevation. Needs basking sites and suitable (sandy banks or grassy open fields) upland habitat up to 0.5 km from water for egg-laying.
Masticophis lateralis euryxanthus Alameda whipsnake	FT/ST G4T2/S2	Typically found in chaparral and scrub habitats but will also use adjacent grassland, oak savanna and woodland habitats. Mostly south-facing slopes and ravines, with rock outcrops, deep crevices or abundant rodent burrows, where shrubs form a vegetative mosaic with oak trees and grasses.
Aquila chrysaetos golden eagle	None/None G5/S3 FP WL	Rolling foothills, mountain areas, sage-juniper flats, and desert. Cliff-walled canyons provide nesting habitat in most parts of range; also, large trees in open areas.
Athene cunicularia burrowing owl	None/None G4/S3 SSC	Open, dry annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation. Subterranean nester, dependent upon burrowing mammals, most notably, the California ground squirrel.
Circus hudsonius northern harrier	None/None G5/S3 SSC	Coastal salt and freshwater marsh. Nest and forage in grasslands, from salt grass in desert sink to mountain cienagas. Nests on ground in shrubby vegetation, usually at marsh edge; nest built of a large mound of sticks in wet areas.
Coturnicops noveboracensis yellow rail	None/None G4/S1S2 SSC	Summer resident in eastern Sierra Nevada in Mono County. Freshwater marshlands.
Egretta thula snowy egret	None/None G5/S4	Colonial nester, with nest sites situated in protected beds of dense tules. Rookery sites situated close to foraging areas: marshes, tidal-flats, streams, wet meadows, and borders of lakes.
Elanus leucurus white-tailed kite	None/None G5/S3S4 FP	Rolling foothills and valley margins with scattered oaks and river bottomlands or marshes next to deciduous woodland. Open grasslands, meadows, or marshes for foraging close to isolated, dense-topped trees for nesting and perching.
Falco peregrinus anatum American peregrine falcon	FD/SD G4T4/S3S4 FP	Near wetlands, lakes, rivers, or other water; on cliffs, banks, dunes, mounds; also, human-made structures. Nest consists of a scrape or a depression or ledge in an open site.
Geothlypis trichas sinuosa saltmarsh common yellowthroat	None/None G5T3/S3 SSC	Resident of the San Francisco Bay region, in fresh and salt water marshes. Requires thick, continuous cover down to water surface for foraging; tall grasses, tule patches, willows for nesting.
Haliaeetus leucocephalus bald eagle	FD/SE G5/S3 FP	Ocean shore, lake margins, and rivers for both nesting and wintering. Most nests within 1 mile of water. Nests in large, old-growth, or dominant live tree with open branches, especially ponderosa pine. Roosts communally in winter.

Scientific Name Common Name	Status Fed/State Global Rank/ State Rank CDFW	Habitat Requirements
Hydroprogne caspia Caspian tern	None/None G5/S4	Nests on sandy or gravelly beaches and shell banks in small colonies inland and along the coast. Inland freshwater lakes and marshes; also, brackish or salt waters of estuaries and bays.
Laterallus jamaicensis coturniculus California black rail	None/ST G3T1/S1 FP	Inhabits freshwater marshes, wet meadows and shallow margins of saltwater marshes bordering larger bays. Needs water depths of about 1 inch that do not fluctuate during the year and dense vegetation for nesting habitat.
Melospiza melodia pusillula Alameda song sparrow	None/None G5T2?/S2S3 SSC	Resident of salt marshes bordering south arm of San Francisco Bay. Inhabits Salicornia marshes; nests low in Grindelia bushes (high enough to escape high tides) and in Salicornia.
Melospiza melodia samuelis San Pablo song sparrow	None/None G5T2/S2 SSC	Resident of salt marshes along the north side of San Francisco and San Pablo bays. Inhabits tidal sloughs in the Salicornia marshes; nests in Grindelia bordering slough channels.
Rallus obsoletus obsoletus California Ridgway's rail	FE/SE G3T1/S1 FP	Salt water and brackish marshes traversed by tidal sloughs in the vicinity of San Francisco Bay. Associated with abundant growths of pickleweed, but feeds away from cover on invertebrates from mud-bottomed sloughs.
Sternula antillarum browni California least tern	FE/SE G4T2T3Q/S2 FP	Nests along the coast from San Francisco Bay south to northern Baja California. Colonial breeder on bare or sparsely vegetated, flat substrates: sand beaches, alkali flats, land fills, or paved areas.
Antrozous pallidus pallid bat	None/None G4/S3 SSC	Found in a variety of habitats including deserts, grasslands, shrublands, woodlands, and forests. Most common in open, dry habitats with rocky areas for roosting. Roosts in crevices of rock outcrops, caves, mine tunnels, buildings, bridges, and hollows of live and dead trees which must protect bats from high temperatures. Very sensitive to disturbance of roosting sites.
Corynorhinus townsendii Townsend's big-eared bat	None/None G4/S2 SSC	Occurs throughout California in a wide variety of habitats. Most common in mesic sites, typically coniferous or deciduous forests. Roosts in the open, hanging from walls & ceilings in caves, lava tubes, bridges, and buildings. This species is extremely sensitive to human disturbance.
Neotoma fuscipes annectens San Francisco dusky-footed woodrat	None/None G5T2T3/S2S3 SSC	Typically found in forest habitats with moderate to dense understory. Can occur in chaparral, riparian woodlands, and coniferous forests, particularly redwood. Builds middens out of grasses, leaves, and woody debris. This subspecies is found only in the San Francisco Bay region.
Nyctinomops macrotis big free-tailed bat	None/None G5/S3 SSC	Low-lying arid areas in Southern California. Need high cliffs or rocky outcrops for roosting sites. Feeds principally on large moths.
Reithrodontomys raviventris salt-marsh harvest mouse	FE/SE G1G2/S1S2 FP	Only in the saline emergent wetlands of San Francisco Bay and its tributaries. Pickleweed is primary habitat, but may occur in other marsh vegetation types and in adjacent upland areas. Does not burrow; builds loosely organized nests. Requires higher areas for flood escape.

Scientific Name Common Name	Status Fed/State Global Rank/ State Rank CDFW	Habitat Requirements
Scapanus latimanus parvus Alameda Island mole	None/None G5T1Q/SH SSC	Only known from Alameda Island. Found in a variety of habitats, especially annual and perennial grasslands. Prefers moist, friable soils. Avoids flooded soils.
Taxidea taxus American badger	None/None G5/S3 SSC	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. Needs sufficient food, friable soils and open, uncultivated ground. Preys on burrowing rodents. Digs burrows.

Appendix C

Eligibility Status of Housing Inventory Sites

Table C-1 Eligibility Status of Housing Inventory Sites

Address	APN	Date of Construction	Site Type	Eligibility Status
1207 10th Street	60-2354-15-3	1960	Pipeline	Unknown
2031 2Nd Street	56-1954-10	1957	Opportunity	Unknown
2116 5th Street	56-1959-17-5	1955	Opportunity	Unknown
2422 5th Street	56-1944-11	1914	Pipeline	Unknown
2431 5th Street	56-1943-19-1	1957	Opportunity	Unknown
1618 6th Street	57-2117-4-2	1968	Opportunity	Unknown
1650 6th Street	57-2117-9-3	1960	Opportunity	Unknown
1650 6th Street	57-2117-6-1	1976	Opportunity	Unknown
1650 6th Street	57-2117-5	1981	Opportunity	Unknown
1700 6th Street	58-2118-22-2	1977	Opportunity	Unknown
2325 6th Street	56-1941-19	1925	Pipeline	Unknown
2416 6th Street	56-1943-10-1	1928	Opportunity	Unknown
2022 7th Street	56-1966-6	1913	Opportunity	Unknown
2015 8th Street	56-1972-18	1918	Pipeline	Unknown
1930 9th Street	57-2092-7	1945	Opportunity	Unknown
2830 9th Street	53-1659-16-5	1910	Opportunity	Unknown
801 Addison Street	56-1961-16-1	1965	Opportunity	Unknown
1417 Addison Street	56-1996-12-3	1967	Opportunity	Unknown
1728 Alcatraz Avenue	52-1532-16	1965	Opportunity	Unknown
2714 Alcatraz Avenue	52-1563-179	1915	Pipeline	Unknown
2108 Allston Way	57-2030-1	1930	Opportunity	Unknown
901 Ashby Avenue	53-1641-9-5	1984	Opportunity	Unknown
1331 Ashby Avenue	53-1623-12-1	1920	Pipeline	Unknown
2001 Ashby Avenue	53-1591-18-3	1969	Pipeline	Unknown
2414 Ashby Avenue	52-1573-76-1	1910	Opportunity	Unknown
3009 Ashby Avenue	64-4235-8-4	1964	Opportunity	Unknown
3048 Ashby Avenue	64-4236-4	1963	Opportunity	Unknown
742 Bancroft Way	56-1945-1-2	1970	Opportunity	Unknown
2113 Bancroft Way	57-2029-7-2	1961	Opportunity	Unknown
2190 Bancroft Way	55-1893-1	1953	Opportunity	Unknown
1825 Berkeley Way	57-2063-11	1910	Pipeline	Unknown
1841 Berkeley Way	57-2063-6-1	1981	Opportunity	Unknown
1504 Bonita Avenue	59-2268-6-1	1924	Pipeline	Unknown
2068 Center Street	57-2026-4-12	1961	Opportunity	Unknown
2236 Channing Way	55-1888-27	1967	Pipeline	Unknown
2317 Channing Way	55-1884-6	1953	Pipeline	Unknown
3170 College Avenue	52-1410-16-1	1989	Opportunity	Unknown
2510 Durant Avenue	55-1876-23	1914	Opportunity	Unknown

Address	APN	Date of Construction	Site Type	Eligibility Status
2538 Durant Avenue	55-1876-21-1	1922	Pipeline	Unknown
2000 Dwight Way	55-1822-18	1924	Pipeline	Unknown
2012 Dwight Way	55-1822-21	1904	Pipeline	Unknown
2316 Dwight Way	55-1831-25	1950	Opportunity	Unknown
2750 Dwight Way	55-1850-3-3	1957	Opportunity	Unknown
2033 Emerson Street	53-1592-9	1900	Opportunity	Unknown
2210 Harold Way	57-2027-2-2	1938	Pipeline	Unknown
1157 Hearst Avenue	57-2086-14	1945	Pipeline	Unknown
1173 Hearst Avenue	57-2086-13	1927	Pipeline	Unknown
1035 Heinz Avenue	53-1661-20	1928	Opportunity	Unknown
1043 Heinz Avenue	53-1661-19	1922	Opportunity	Unknown
1550 Hopkins Street	60-2434-20-1	1951	Opportunity	Unknown
1601 Hopkins Street	60-2435-28-1	1978	Opportunity	Unknown
2000 Kittredge Street	57-2028-13	1974	Opportunity	Unknown
2150 Kittredge Street	57-2029-16	1981	Opportunity	Unknown
2176 Kittredge Street	57-2029-2-4	1963	Pipeline	Unknown
1711 M L King Jr Way	58-2170-17	1895	Pipeline	Unknown
1921 M L King Jr Way	57-2059-1-1	1928	Opportunity	Unknown
1933 M L King Jr Way	57-2059-12	1948	Opportunity	Unknown
2099 M L King Jr Way	57-2024-13	1938	Pipeline	Unknown
2105 M L King Jr Way	57-2022-9-2	1957	Opportunity	Unknown
2139 Oregon Street	53-1685-11	1924	Pipeline	Unknown
770 Page Street	59-2325-3-1	1943	opportunity	Unknown
920 Pardee Street	54-1747-11	1984	opportunity	Unknown
1013 Pardee Street	54-1745-18-4	1952	opportunity	Unknown
2105 Parker Street	55-1824-14	1908	opportunity	Unknown
3028 Regent Street	52-1574-44	1915	Pipeline	Unknown
2091 Rose Street	60-2455-67	1963	Opportunity	Unknown
1197 San Pablo Avenue	60-2410-5	1942	Opportunity	Unknown
1200 San Pablo Avenue	60-2354-2	1978	Pipeline	Unknown
1223 San Pablo Avenue	60-2405-27	1955	Opportunity	Unknown
1229 San Pablo Avenue	60-2405-24-1	1953	Opportunity	Unknown
1275 San Pablo Avenue	60-2405-21	1958	Opportunity	Unknown
1299 San Pablo Avenue	60-2405-20	1966	Opportunity	Unknown
1337 San Pablo Avenue	60-2404-20	1920	Opportunity	Unknown
1340 San Pablo Avenue	60-2353-9	1959	Opportunity	Unknown
1346 San Pablo Avenue	60-2353-10	1958	Opportunity	Unknown
1399 San Pablo Avenue	60-2404-18-1	1972	Opportunity	Unknown
1425 San Pablo Avenue	60-2396-15	1946	Opportunity	Unknown

Address	APN	Date of Construction	Site Type	Eligibility Status
1429 San Pablo Avenue	60-2396-14	1973	Opportunity	Unknown
1440 San Pablo Avenue	59-2331-2	1922	Opportunity	Unknown
1443 San Pablo Avenue	60-2395-16	1920	Opportunity	Unknown
1456 San Pablo Avenue	59-2331-3	1916	Opportunity	Unknown
1460 San Pablo Avenue	59-2331-4	1916	Opportunity	Unknown
1501 San Pablo Avenue	60-2395-17	1942	Opportunity	Unknown
1507 San Pablo Avenue	60-2395-33-1	1951	Opportunity	Unknown
1513 San Pablo Avenue	60-2395-31	1963	Opportunity	Unknown
1519 San Pablo Avenue	60-2395-29	1925	Opportunity	Unknown
1521 San Pablo Avenue	60-2395-28	1939	Opportunity	Unknown
1620 San Pablo Avenue	58-2128-3-1	1950	Opportunity	Unknown
1629 San Pablo Avenue	59-2287-25	1939	Opportunity	Unknown
1633 San Pablo Avenue	59-2287-24	1923	Opportunity	Unknown
1634 San Pablo Avenue	58-2128-8-1	1946	Opportunity	Unknown
1639 San Pablo Avenue	59-2287-21-2	1955	Opportunity	Unknown
1640 San Pablo Avenue	58-2128-10	1985	Opportunity	Unknown
1724 San Pablo Avenue	58-2127-9-1	1945	Opportunity	Unknown
1730 San Pablo Avenue	58-2127-12	1963	Opportunity	Unknown
1740 San Pablo Avenue	58-2127-14-3	1925	Pipeline	Unknown
1814 San Pablo Avenue	57-2087-3	1918	Opportunity	Unknown
1819 San Pablo Avenue	57-2086-29-3	1978	Opportunity	Unknown
1835 San Pablo Avenue	57-2086-25-1	1980	Pipeline	Unknown
1955 San Pablo Avenue	57-2085-15	1955	Opportunity	Unknown
2040 San Pablo Avenue	56-1978-8-2	1916	Opportunity	Unknown
2111 San Pablo Avenue	56-1982-2-1	1941	Opportunity	Unknown
2197 San Pablo Avenue	56-1983-40-1	1967	Opportunity	Unknown
2198 San Pablo Avenue	56-1977-13	1928	Pipeline	Unknown
2234 San Pablo Avenue	56-1976-15-1	1958	Opportunity	Unknown
2235 San Pablo Avenue	56-1983-31-3	1988	Opportunity	Unknown
2301 San Pablo Avenue	56-1926-21	1964	Opportunity	Unknown
2366 San Pablo Avenue	56-1933-24-3	1965	Opportunity	Unknown
2400 San Pablo Avenue	56-1932-4-1	1905	Opportunity	Historic
2407 San Pablo Avenue	56-1928-27-1	1953	Opportunity	Unknown
2424 San Pablo Avenue	56-1932-8-3	1962	Opportunity	Unknown
2546 San Pablo Avenue	54-1780-8-1	1980	Opportunity	Unknown
2603 San Pablo Avenue	54-1785-16	1925	Opportunity	Unknown
2613 San Pablo Avenue	54-1785-15	1925	Opportunity	Unknown
2617 San Pablo Avenue	54-1785-13	1955	Opportunity	Unknown
2619 San Pablo Avenue	54-1785-12	1925	Opportunity	Unknown

Address	APN	Date of Construction	Site Type	Eligibility Status
2625 San Pablo Avenue	54-1786-16	1961	Opportunity	Unknown
2641 San Pablo Avenue	54-1786-14-1	1958	Opportunity	Unknown
2246 San Pablo Avenue	56-1976-17	1989	Opportunity	Unknown
2720 San Pablo Avenue	54-1744-7	1945	Pipeline	Unknown
2727 San Pablo Avenue	54-1742-34	1926	Opportunity	Unknown
2729 San Pablo Avenue	54-1742-33	1926	Opportunity	Unknown
2733 San Pablo Avenue	54-1742-32	1948	Opportunity	Unknown
2734 San Pablo Avenue	54-1744-22-5	1955	Opportunity	Unknown
2795 San Pablo Avenue	54-1742-29	1926	Pipeline	Unknown
2830 San Pablo Avenue	53-1661-14	1958	Opportunity	Unknown
2832 San Pablo Avenue	53-1661-15-1	1966	Opportunity	Unknown
2835 San Pablo Avenue	53-1662-21	1947	Opportunity	Unknown
2839 San Pablo Avenue	53-1662-20	1948	Opportunity	Unknown
2840 San Pablo Avenue	53-1661-18-1	1928	Opportunity	Unknown
2843 San Pablo Avenue	53-1662-19	1947	Opportunity	Unknown
2849 San Pablo Avenue	53-1662-17-1	1948	Opportunity	Unknown
2959 San Pablo Avenue	53-1629-19-1	1948	Opportunity	Unknown
3000 San Pablo Avenue	53-1633-1-1	1925	Pipeline	Unknown
1550 Shattuck Avenue	59-2263-10-1	1960	Opportunity	Unknown
1607 Shattuck Avenue	58-2178-24-1	1940	Opportunity	Unknown
1720 Shattuck Avenue	58-2175-4	1947	Opportunity	Unknown
1730 Shattuck Avenue	58-2175-5	1967	Opportunity	Unknown
1748 Shattuck Avenue	58-2175-6	1923	Opportunity	Unknown
1848 Shattuck Avenue	57-2050-5	1964	Opportunity	Unknown
1926 Shattuck Avenue	57-2051-5	1989	Opportunity	Unknown
1950 Shattuck Avenue	57-2053-1	1921	Opportunity	Unknown
1974 Shattuck Avenue	57-2053-2	1921	Opportunity	Unknown
2000 Shattuck Avenue	57-2025-1	1948	Opportunity	Unknown
2020 Shattuck Avenue	57-2025-4	1955	Opportunity	Unknown
2024 Shattuck Avenue	57-2025-5-2	1920	Opportunity	Unknown
2120 Shattuck Avenue	57-2023-3	1930	Opportunity	Historic
2301 Shattuck Avenue	55-1893-16	1979	Opportunity	Unknown
2333 Shattuck Avenue	55-1893-12	1966	Opportunity	Unknown
2414 Shattuck Avenue	55-1896-2	1947	Opportunity	Unknown
2420 Shattuck Avenue	55-1896-3	1940	Opportunity	Unknown
2428 Shattuck Avenue	55-1896-4	1940	Opportunity	Unknown
2450 Shattuck Avenue	55-1897-6	1918	Opportunity	Unknown
2480 Shattuck Avenue	55-1897-1-3	1925	Opportunity	Unknown
2520 Shattuck Avenue	55-1822-4	1910	Opportunity	Unknown

Address	APN	Date of Construction	Site Type	Eligibility Status
2524 Shattuck Avenue	55-1822-5	1928	Opportunity	Unknown
2530 Shattuck Avenue	55-1822-6	1905	Opportunity	Unknown
2550 Shattuck Avenue	55-1821-1-1	1985	Opportunity	Unknown
2555 Shattuck Avenue	55-1824-16	1939	Opportunity	Unknown
2558 Shattuck Avenue	55-1821-3	1927	Opportunity	Unknown
2576 Shattuck Avenue	55-1821-4	1917	Opportunity	Unknown
2609 Shattuck Avenue	55-1825-19	1933	Opportunity	Unknown
2621 Shattuck Avenue	55-1825-15-2	1948	Opportunity	Unknown
2627 Shattuck Avenue	55-1826-20	1940	Opportunity	Unknown
2821 Shattuck Avenue	53-1685-20-1	1969	Opportunity	Unknown
2847 Shattuck Avenue	53-1686-20	1963	Opportunity	Unknown
2920 Shattuck Avenue	53-1590-5-1	1955	Opportunity	Unknown
3054 Shattuck Avenue	53-1594-2	1927	Opportunity	Unknown
2328 Telegraph Avenue	55-1878-3	1915	Pipeline	Unknown
2347 Telegraph Avenue	55-1877-11	1929	Opportunity	Unknown
2566 Telegraph Avenue	55-1837-2	1920	Opportunity	Unknown
2587 Telegraph Avenue	55-1839-19-1	1986	Opportunity	Unknown
2600 Telegraph Avenue	55-1836-6-3	1957	Opportunity	Unknown
2650 Telegraph Avenue	55-1835-9-1	1964	opportunity	Unknown
3030 Telegraph Avenue	52-1576-27-1	1964	Opportunity	Unknown
3031 Telegraph Avenue	52-1574-81	1955	Pipeline	Unknown
805 University Avenue	57-2097-1-6	1950	Opportunity	Unknown
811 University Avenue	57-2097-14-1	1952	Opportunity	Unknown
833 University Avenue	57-2096-10-1	1961	Opportunity	Unknown
907 University Avenue	57-2093-15-1	1988	Opportunity	Unknown
975 University Avenue	57-2092-9	1960	Opportunity	Unknown
1010 University Avenue	56-1973-6-1	1928	Opportunity	Unknown
1011 University Avenue	57-2089-12-1	1943	Opportunity	Unknown
1111 University Avenue	57-2085-26	1939	Opportunity	Unknown
1181 University Avenue	57-2085-8-1	1960	Opportunity	Unknown
1187 University Avenue	57-2085-7-2	1962	Opportunity	Unknown
1198 University Avenue	56-1979-1	1966	Opportunity	Unknown
1199 University Avenue	57-2085-7-1	1949	Opportunity	Unknown
1333 University Avenue	57-2073-8	1938	Opportunity	Unknown
1375 University Avenue	57-2073-4	1948	Opportunity	Unknown
1399 University Avenue	57-2073-2	1940	Opportunity	Unknown
1461 University Avenue	57-2072-6	1948	Opportunity	Unknown
1548 University Avenue	56-2003-24-1	1959	Opportunity	Unknown
1619 University Avenue	57-2070-9-1	1952	Opportunity	Unknown

Address	APN	Date of Construction	Site Type	Eligibility Status
1699 University Avenue	57-2070-3	1954	Opportunity	Unknown
1760 University Avenue	56-2011-25-1	1912	Opportunity	Unknown
1761 University Avenue	57-2061-6-1	1956	Opportunity	Unknown
1800 University Avenue	57-2016-18-1	1968	Opportunity	Unknown
1865 University Avenue	57-2060-2	1947	Opportunity	Unknown
1909 University Avenue	57-2059-10	1951	Opportunity	Unknown
1915 University Avenue	57-2059-9	1979	Opportunity	Unknown
1921 University Avenue	57-2059-8	1925	Opportunity	Unknown
1929 University Avenue	57-2059-7	1963	Opportunity	Unknown
2000 University Avenue	57-2025-13	1979	Pipeline	Unknown
2011 University Avenue	57-2053-14-2	1972	Opportunity	Unknown
2017 University Avenue	57-2053-11	1925	Opportunity	Unknown
2029 University Avenue	57-2053-8-1	1952	Opportunity	Unknown
2058 University Avenue	57-2025-19	1917	Opportunity	Unknown
2154 University Avenue	57-2034-12	1925	Opportunity	Historic
2109 Virginia Street	58-2178-18	1928	Opportunity	Unknown

Appendix D

Energy Modeling Results

City of Berkeley HE Operational Energy

Last Updated: 06/07/22

Populate one of the following tables (Leave the other blank):

Annual VMT		OR	Daily Vehicle Trips	
Annual VMT:	236,867,442		Daily Vehicle Trips:	
			Average Trip Distance:	

Fleet Class	Fleet Mix
Light Duty Auto (LDA)	0.555274
Light Duty Truck 1 (LDT1)	0.059572
Light Duty Truck 2 (LDT2)	0.187289
Medium Duty Vehicle (MDV)	0.120548
Light Heavy Duty 1 (LHD1)	0.022031
Light Heavy Duty 2 (LHD2)	0.005855
Medium Heavy Duty (MHD)	0.011319
Heavy Heavy Duty (HHD)	0.007376
Other Bus (OBUS)	0.000945
Urban Bus (UBUS)	0.000497
Motorcycle (MCY)	0.025792
School Bus (SBUS)	0.000881
Motorhome (MH)	0.002622

Fuel Economy (MPG) [1]	
Passenger Vehicles	24.1
Light-Med Duty Trucks	17.6
Heavy Trucks/Other	7.5
Motorcycles	44

Fleet Mix

Vehicle Type	Percent	Fuel Type	Annual VMT: VMT	Vehicle Trips: VMT	Fuel Consumption (Gallons)
Passenger Vehicles	*55.53%*	*Gasoline*	131,526,332	0.00	5,457,524
Light-Medium Duty Trucks	*36.74%*	*Gasoline*	87,027,230	0.00	4,944,729
Heavy Trucks/Other	*5.15%*	*Diesel*	12,204,832	0.00	1,627,311
Motorcycle	*2.58%*	*Gasoline*	6,109,285	0.00	138,847

Total Gasoline Consumption (gallons)	**10,541,101**
Total Diesel Consumption (gallons)	**1,627,311**

Sources:

[1] United States Department of Transportation, Bureau of Transportation Statistics. 2021. National Transportation Statistics. Available at: https://www.bts.gov/topics/national-transportation-statistics.

Appendix E

Greenhouse Gas Emissions Modeling Results

City of Berkeley Housing Element Operational (Single Family) - Bay Area AQMD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

City of Berkeley Housing Element Operational (Single Family)

Bay Area AQMD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	113.00	Dwelling Unit	36.69	203,400.00	323

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	64
Climate Zone	5			**Operational Year**	2031
Utility Company	User Defined				
CO2 Intensity (lb/MWhr)	135	**CH4 Intensity (lb/MWhr)**	0	**N2O Intensity (lb/MWhr)**	0

1.3 User Entered Comments & Non-Default Data

Project Characteristics - East Bay Community Energy is the primary electricity provider, for conservative analysis will use Bright Choice Plan (40 percent renewable)

Land Use - Based on EIR growth assumption of 113 single-family units and 323 new residents.

Construction Phase - Operational model, no construction

Off-road Equipment - Operational model, no construction

Trips and VMT - Operational model, no construction

Architectural Coating - BAAQMD Regulation 8 Rule 3, Nonflat Coating

Vehicle Trips - Default CalEEMod trip generation rates used

Woodstoves - Berkeley Natural Gas prohibition, BAAQMD Regulation 6 Rule 3: No woodburning devices

Area Coating - BAAQMD Regulation 8 Rule 3, Nonflat Coating

Energy Use - Assume 90 percent of development will not include natural gas pursuant to BMC Section 12.80 (natural gas ban)

Water And Wastewater - EBMUD Wastewater treatment plant 100 percent aerobic

City of Berkeley Housing Element Operational (Single Family) - Bay Area AQMD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Area Mitigation - BAAQMD Regulation 8 Rule 3, Nonflat Coating

Water Mitigation - Pursuant to CalGreen 20 percent indoor water use reduction

Energy Mitigation - Pursuant to Section 150.1(c)(14) of the 2019 Building Energy Efficiency Standards, low-rise residential up to 3 stories must install PV systems

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	150.00	100.00
tblArchitecturalCoating	EF_Residential_Exterior	150.00	100.00
tblAreaCoating	Area_EF_Nonresidential_Exterior	150	100
tblAreaCoating	Area_EF_Residential_Exterior	150	100
tblAreaMitigation	UseLowVOCPaintNonresidentialExteriorValue	100	150
tblAreaMitigation	UseLowVOCPaintResidentialExteriorValue	100	150
tblConstructionPhase	NumDays	55.00	1.00
tblEnergyUse	NT24E	6,155.97	6,845.71
tblEnergyUse	NT24NG	2,615.00	261.50
tblEnergyUse	T24E	45.71	9,534.91
tblEnergyUse	T24NG	35,976.14	3,597.64
tblFireplaces	FireplaceDayYear	11.14	0.00
tblFireplaces	FireplaceHourDay	3.50	0.00
tblFireplaces	FireplaceWoodMass	228.80	0.00
tblFireplaces	NumberGas	28.25	0.00
tblFireplaces	NumberNoFireplace	9.04	0.00
tblFireplaces	NumberWood	48.59	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblProjectCharacteristics	CO2IntensityFactor	0	135
tblTripsAndVMT	WorkerTripNumber	8.00	0.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	SepticTankPercent	10.33	0.00

City of Berkeley Housing Element Operational (Single Family) - Bay Area AQMD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

tblWoodstoves	NumberCatalytic	4.52	0.00
tblWoodstoves	NumberNoncatalytic	4.52	0.00
tblWoodstoves	WoodstoveDayYear	21.06	0.00
tblWoodstoves	WoodstoveWoodMass	956.80	0.00

2.0 Emissions Summary

City of Berkeley Housing Element Operational (Single Family) - Bay Area AQMD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2023											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maximum											**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2023											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maximum											**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)

City of Berkeley Housing Element Operational (Single Family) - Bay Area AQMD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

		Highest		

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area											0.0000	1.3706	1.3706	1.3100e-003	0.0000	1.4032
Energy											0.0000	147.7500	147.7500	4.5000e-004	4.3000e-004	147.8883
Mobile											0.0000	684.6657	684.6657	0.0410	0.0313	695.0092
Waste											27.5378	0.0000	27.5378	1.6274	0.0000	68.2236
Water											2.6048	3.4343	6.0391	8.9700e-003	5.6600e-003	7.9513
Total											**30.1426**	**837.2205**	**867.3631**	**1.6792**	**0.0374**	**920.4756**

City of Berkeley Housing Element Operational (Single Family) - Bay Area AQMD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area											0.0000	1.3706	1.3706	1.3100e-003	0.0000	1.4032
Energy											0.0000	23.2710	23.2710	4.5000e-004	4.3000e-004	23.4093
Mobile											0.0000	684.6657	684.6657	0.0410	0.0313	695.0092
Waste											27.5378	0.0000	27.5378	1.6274	0.0000	68.2236
Water											2.0839	2.9464	5.0302	7.1700e-003	4.5300e-003	6.5600
Total											**29.6216**	**712.2536**	**741.8753**	**1.6774**	**0.0362**	**794.6053**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**1.73**	**14.93**	**14.47**	**0.11**	**3.02**	**13.67**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Architectural Coating	Architectural Coating	1/2/2023	1/2/2023	5	1	

Acres of Grading (Site Preparation Phase): 0

City of Berkeley Housing Element Operational (Single Family) - Bay Area AQMD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 411,885; Residential Outdoor: 137,295; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	0	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Architectural Coating	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Architectural Coating - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total											**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

City of Berkeley Housing Element Operational (Single Family) - Bay Area AQMD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.2 Architectural Coating - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total											**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total											**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

City of Berkeley Housing Element Operational (Single Family) - Bay Area AQMD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.2 Architectural Coating - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total											**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

City of Berkeley Housing Element Operational (Single Family) - Bay Area AQMD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated											0.0000	684.6657	684.6657	0.0410	0.0313	695.0092
Unmitigated											0.0000	684.6657	684.6657	0.0410	0.0313	695.0092

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	1,066.72	1,078.02	966.15	2,434,250	2,434,250
Total	1,066.72	1,078.02	966.15	2,434,250	2,434,250

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Single Family Housing	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Single Family Housing	0.555274	0.059572	0.187289	0.120548	0.022031	0.005855	0.011319	0.007376	0.000945	0.000497	0.025792	0.000881	0.002622

City of Berkeley Housing Element Operational (Single Family) - Bay Area AQMD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Percent of Electricity Use Generated with Renewable Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated											0.0000	124.4790	124.4790	0.0000	0.0000	124.4790
NaturalGas Mitigated											0.0000	23.2710	23.2710	4.5000e-004	4.3000e-004	23.4093
NaturalGas Unmitigated											0.0000	23.2710	23.2710	4.5000e-004	4.3000e-004	23.4093

City of Berkeley Housing Element Operational (Single Family) - Bay Area AQMD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Single Family Housing	436083											0.0000	23.2710	23.2710	4.5000e-004	4.3000e-004	23.4093
Total												**0.0000**	**23.2710**	**23.2710**	**4.5000e-004**	**4.3000e-004**	**23.4093**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Single Family Housing	436083											0.0000	23.2710	23.2710	4.5000e-004	4.3000e-004	23.4093
Total												**0.0000**	**23.2710**	**23.2710**	**4.5000e-004**	**4.3000e-004**	**23.4093**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Single Family Housing	2.03281e+006	124.4790	0.0000	0.0000	124.4790
Total		**124.4790**	**0.0000**	**0.0000**	**124.4790**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Single Family Housing	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

City of Berkeley Housing Element Operational (Single Family) - Bay Area AQMD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated											0.0000	1.3706	1.3706	1.3100e-003	0.0000	1.4032
Unmitigated											0.0000	1.3706	1.3706	1.3100e-003	0.0000	1.4032

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping											0.0000	1.3706	1.3706	1.3100e-003	0.0000	1.4032
Total											**0.0000**	**1.3706**	**1.3706**	**1.3100e-003**	**0.0000**	**1.4032**

City of Berkeley Housing Element Operational (Single Family) - Bay Area AQMD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping											0.0000	1.3706	1.3706	1.3100e-003	0.0000	1.4032
Total											**0.0000**	**1.3706**	**1.3706**	**1.3100e-003**	**0.0000**	**1.4032**

7.0 Water Detail

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

City of Berkeley Housing Element Operational (Single Family) - Bay Area AQMD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	5.0302	7.1700e-003	4.5300e-003	6.5600
Unmitigated	6.0391	8.9700e-003	5.6600e-003	7.9513

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Single Family Housing	7.3624 / 4.64152	6.0391	8.9700e-003	5.6600e-003	7.9513
Total		**6.0391**	**8.9700e-003**	**5.6600e-003**	**7.9513**

City of Berkeley Housing Element Operational (Single Family) - Bay Area AQMD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Single Family Housing	5.88992 / 4.64152	5.0302	7.1700e-003	4.5300e-003	6.5600
Total		**5.0302**	**7.1700e-003**	**4.5300e-003**	**6.5600**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	27.5378	1.6274	0.0000	68.2236
Unmitigated	27.5378	1.6274	0.0000	68.2236

City of Berkeley Housing Element Operational (Single Family) - Bay Area AQMD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Single Family Housing	135.66	27.5378	1.6274	0.0000	68.2236
Total		**27.5378**	**1.6274**	**0.0000**	**68.2236**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Single Family Housing	135.66	27.5378	1.6274	0.0000	68.2236
Total		**27.5378**	**1.6274**	**0.0000**	**68.2236**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

City of Berkeley Housing Element Operational (Single Family) - Bay Area AQMD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

City of Berkeley Housing Element Operational (Multi-Family) - Bay Area AQMD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

City of Berkeley Housing Element Operational (Multi-Family)

Bay Area AQMD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Apartments Mid Rise	17,427.00	Dwelling Unit	458.61	17,427,000.00	42630
Condo/Townhouse	1,570.00	Dwelling Unit	98.13	1,570,000.00	4490

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	64
Climate Zone	5			**Operational Year**	2031
Utility Company	User Defined				
CO2 Intensity (lb/MWhr)	135	**CH4 Intensity (lb/MWhr)**	0	**N2O Intensity (lb/MWhr)**	0

1.3 User Entered Comments & Non-Default Data

Project Characteristics - East Bay Community Energy is the primary electricity provider, for conservative analysis will use Bright Choice Plan (40 percent renewable)

Land Use - Based on EIR growth assumption of 17,427 multi-family units, 1,570 condo/townhome units and 47,120 new residents. ADUs included as condo/townhouse for a conservative assumption.

Construction Phase - Operational model, no construction

Off-road Equipment - Operational model, no construction

Trips and VMT - Operational model, no construction

Architectural Coating - BAAQMD Regulation 8 Rule 3, Nonflat Coating

Vehicle Trips - Default CalEEMod trip generation rates used

Woodstoves - Berkeley Natural Gas prohibition, BAAQMD Regulation 6 Rule 3: No woodburning devices

Area Coating - BAAQMD Regulation 8 Rule 3, Nonflat Coating

Energy Use - Assume 90 percent of development will not include natural gas pursuant to BMC Section 12.80 (natural gas ban)

City of Berkeley Housing Element Operational (Multi-Family) - Bay Area AQMD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Water And Wastewater - EBMUD Wastewater treatment plant 100 percent aerobic

Area Mitigation - BAAQMD Regulation 8 Rule 3, Nonflat Coating

Water Mitigation - Pursuant to CalGreen 20 percent indoor water use reduction

Solid Waste -

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	150.00	100.00
tblArchitecturalCoating	EF_Residential_Exterior	150.00	100.00
tblAreaCoating	Area_EF_Nonresidential_Exterior	150	100
tblAreaCoating	Area_EF_Residential_Exterior	150	100
tblAreaMitigation	UseLowVOCPaintNonresidentialExteriorValue	100	150
tblAreaMitigation	UseLowVOCPaintResidentialExteriorValue	100	150
tblConstructionPhase	NumDays	660.00	1.00
tblEnergyUse	NT24E	3,054.10	3,743.84
tblEnergyUse	NT24E	3,795.01	4,484.75
tblEnergyUse	NT24NG	2,615.00	261.50
tblEnergyUse	NT24NG	2,615.00	261.50
tblEnergyUse	T24E	90.83	1,628.05
tblEnergyUse	T24E	42.95	4,847.25
tblEnergyUse	T24NG	5,828.01	582.80
tblEnergyUse	T24NG	18,214.40	1,821.44
tblFireplaces	FireplaceDayYear	11.14	0.00
tblFireplaces	FireplaceDayYear	11.14	0.00
tblFireplaces	FireplaceHourDay	3.50	0.00
tblFireplaces	FireplaceHourDay	3.50	0.00
tblFireplaces	FireplaceWoodMass	228.80	0.00
tblFireplaces	FireplaceWoodMass	228.80	0.00
tblFireplaces	NumberGas	2,614.05	0.00

City of Berkeley Housing Element Operational (Multi-Family) - Bay Area AQMD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

tblFireplaces	NumberGas	235.50	0.00
tblFireplaces	NumberNoFireplace	697.08	0.00
tblFireplaces	NumberNoFireplace	62.80	0.00
tblFireplaces	NumberWood	2,962.59	0.00
tblFireplaces	NumberWood	266.90	0.00
tblLandUse	Population	49,841.00	42,630.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblProjectCharacteristics	CO2IntensityFactor	0	135
tblTripsAndVMT	WorkerTripNumber	2,736.00	0.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWoodstoves	NumberCatalytic	348.54	0.00
tblWoodstoves	NumberCatalytic	31.40	0.00
tblWoodstoves	NumberNoncatalytic	348.54	0.00
tblWoodstoves	NumberNoncatalytic	31.40	0.00
tblWoodstoves	WoodstoveDayYear	14.12	0.00
tblWoodstoves	WoodstoveDayYear	14.12	0.00
tblWoodstoves	WoodstoveWoodMass	582.40	0.00
tblWoodstoves	WoodstoveWoodMass	582.40	0.00

2.0 Emissions Summary

City of Berkeley Housing Element Operational (Multi-Family) - Bay Area AQMD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2023											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maximum											**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2023											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maximum											**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)

City of Berkeley Housing Element Operational (Multi-Family) - Bay Area AQMD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

		Highest		

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area											0.0000	230.4107	230.4107	0.2195	0.0000	235.8988
Energy											0.0000	8,476.8888	8,476.8888	0.0184	0.0176	8,482.5917
Mobile											0.0000	65,977.8089	65,977.8089	3.9499	3.0134	66,974.5558
Waste											1,773.8609	0.0000	1,773.8609	104.8322	0.0000	4,394.6653
Water											437.9112	577.3504	1,015.2616	1.5072	0.9523	1,336.7322
Total											**2,211.7721**	**75,262.4588**	**77,474.2308**	**110.5273**	**3.9833**	**81,424.4437**

City of Berkeley Housing Element Operational (Multi-Family) - Bay Area AQMD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area											0.0000	230.4107	230.4107	0.2195	0.0000	235.8988
Energy											0.0000	8,476.8888	8,476.8888	0.0184	0.0176	8,482.5917
Mobile											0.0000	65,977.8089	65,977.8089	3.9499	3.0134	66,974.5558
Waste											1,773.8609	0.0000	1,773.8609	104.8322	0.0000	4,394.6653
Water											350.3289	495.3279	845.6568	1.2058	0.7619	1,102.8333
Total											**2,124.1898**	**75,180.4362**	**77,304.6260**	**110.2258**	**3.7929**	**81,190.5448**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**3.96**	**0.11**	**0.22**	**0.27**	**4.78**	**0.29**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Architectural Coating	Architectural Coating	1/2/2023	1/2/2023	5	1	

Acres of Grading (Site Preparation Phase): 0

City of Berkeley Housing Element Operational (Multi-Family) - Bay Area AQMD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 38,468,925; Residential Outdoor: 12,822,975; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	0	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Architectural Coating	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Architectural Coating - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total											**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

City of Berkeley Housing Element Operational (Multi-Family) - Bay Area AQMD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.2 Architectural Coating - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total											**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total											**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

City of Berkeley Housing Element Operational (Multi-Family) - Bay Area AQMD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

3.2 Architectural Coating - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total											**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

City of Berkeley Housing Element Operational (Multi-Family) - Bay Area AQMD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated											0.0000	65,977.8089	65,977.8089	3.9499	3.0134	66,974.5558
Unmitigated											0.0000	65,977.8089	65,977.8089	3.9499	3.0134	66,974.5558

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Mid Rise	94,802.88	85,566.57	71276.43	208,147,551	208,147,551
Condo/Townhouse	11,492.40	12,779.80	9859.60	26,428,968	26,428,968
Total	106,295.28	98,346.37	81,136.03	234,576,519	234,576,519

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Mid Rise	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3
Condo/Townhouse	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Mid Rise	0.555274	0.059572	0.187289	0.120548	0.022031	0.005855	0.011319	0.007376	0.000945	0.000497	0.025792	0.000881	0.002622
Condo/Townhouse	0.555274	0.059572	0.187289	0.120548	0.022031	0.005855	0.011319	0.007376	0.000945	0.000497	0.025792	0.000881	0.002622

5.0 Energy Detail

City of Berkeley Housing Element Operational (Multi-Family) - Bay Area AQMD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated											0.0000	7,517.2030	7,517.2030	0.0000	0.0000	7,517.2030
Electricity Unmitigated											0.0000	7,517.2030	7,517.2030	0.0000	0.0000	7,517.2030
NaturalGas Mitigated											0.0000	959.6858	959.6858	0.0184	0.0176	965.3887
NaturalGas Unmitigated											0.0000	959.6858	959.6858	0.0184	0.0176	965.3887

City of Berkeley Housing Element Operational (Multi-Family) - Bay Area AQMD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Mid Rise	1.47136e+007											0.0000	785.1746	785.1746	0.0151	0.0144	789.8405
Condo/Townhouse	3.27022e+006											0.0000	174.5112	174.5112	3.3400e-003	3.2000e-003	175.5482
Total												**0.0000**	**959.6858**	**959.6858**	**0.0184**	**0.0176**	**965.3887**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Mid Rise	1.47136e+007											0.0000	785.1746	785.1746	0.0151	0.0144	789.8405
Condo/Townhouse	3.27022e+006											0.0000	174.5112	174.5112	3.3400e-003	3.2000e-003	175.5482
Total												**0.0000**	**959.6858**	**959.6858**	**0.0184**	**0.0176**	**965.3887**

City of Berkeley Housing Element Operational (Multi-Family) - Bay Area AQMD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	1.06537e+008	6,523.7901	0.0000	0.0000	6,523.7901
Condo/Townhouse	1.6223e+007	993.4129	0.0000	0.0000	993.4129
Total		**7,517.2030**	**0.0000**	**0.0000**	**7,517.2030**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	1.06537e+008	6,523.7901	0.0000	0.0000	6,523.7901
Condo/Townhouse	1.6223e+007	993.4129	0.0000	0.0000	993.4129
Total		**7,517.2030**	**0.0000**	**0.0000**	**7,517.2030**

6.0 Area Detail

City of Berkeley Housing Element Operational (Multi-Family) - Bay Area AQMD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated											0.0000	230.4107	230.4107	0.2195	0.0000	235.8988
Unmitigated											0.0000	230.4107	230.4107	0.2195	0.0000	235.8988

City of Berkeley Housing Element Operational (Multi-Family) - Bay Area AQMD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping											0.0000	230.4107	230.4107	0.2195	0.0000	235.8988
Total											**0.0000**	**230.4107**	**230.4107**	**0.2195**	**0.0000**	**235.8988**

City of Berkeley Housing Element Operational (Multi-Family) - Bay Area AQMD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping											0.0000	230.4107	230.4107	0.2195	0.0000	235.8988
Total											**0.0000**	**230.4107**	**230.4107**	**0.2195**	**0.0000**	**235.8988**

7.0 Water Detail

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

City of Berkeley Housing Element Operational (Multi-Family) - Bay Area AQMD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	845.6568	1.2058	0.7619	1,102.8333
Unmitigated	1,015.2616	1.5072	0.9523	1,336.7322

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	1135.44 / 715.82	931.3557	1.3827	0.8736	1,226.2585
Condo/Townhouse	102.292 / 64.4883	83.9059	0.1246	0.0787	110.4737
Total		**1,015.2616**	**1.5073**	**0.9523**	**1,336.7322**

City of Berkeley Housing Element Operational (Multi-Family) - Bay Area AQMD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	908.351 / 715.82	775.7678	1.1061	0.6989	1,011.6900
Condo/Townhouse	81.8335 / 64.4883	69.8890	0.0997	0.0630	91.1433
Total		**845.6568**	**1.2058**	**0.7619**	**1,102.8333**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	1,773.8609	104.8322	0.0000	4,394.6653
Unmitigated	1,773.8609	104.8322	0.0000	4,394.6653

City of Berkeley Housing Element Operational (Multi-Family) - Bay Area AQMD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	8016.42	1,627.2608	96.1684	0.0000	4,031.4698
Condo/Townhouse	722.2	146.6001	8.6638	0.0000	363.1955
Total		**1,773.8609**	**104.8322**	**0.0000**	**4,394.6653**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	8016.42	1,627.2608	96.1684	0.0000	4,031.4698
Condo/Townhouse	722.2	146.6001	8.6638	0.0000	363.1955
Total		**1,773.8609**	**104.8322**	**0.0000**	**4,394.6653**

9.0 Operational Offroad

City of Berkeley Housing Element Operational (Multi-Family) - Bay Area AQMD Air District, Annual

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Appendix G

Noise Analysis

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 04/14/2022
Case Description: Berkeley Housing Element

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
50 Feet from Construction	Residential	65.0	65.0	65.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	50.0	0.0
Dozer	No	40		81.7	50.0	0.0
Jackhammer	Yes	20		88.9	50.0	0.0

Results

Noise Limits (dBA)

Noise Limit Exceedance (dBA)

Equipment	Calculated (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Excavator	80.7	76.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	81.7	77.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Jackhammer	88.9	81.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	88.9	84.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Groundborne Noise and Vibration Modeling

Notes
The reference distance is measured from the nearest anticipated point of construction equipment to the nearest structure. Last Updated: 09/29/2021

Variables	
V_{ref}	1E-06
Crest Factor (PPV/RMS)	4
Soil Type *(Choice: default, hard, or sands)*	default
n value	1.1

	Reference Level Inputs			
Equipment	**PPV_{ref} (in/sec)**	**Lv_{ref} (VdB)**	**RMS_{ref} (in/sec)**	**Reference Distance**
Impact Pile Driver	0.644	112	0.398	25
Sonic Pile Driver	0.17	105	0.178	25
Vibratory Roller	0.21	94	0.050	25
Hoe Ram	0.089	87	0.022	25
Large bulldozer	0.089	87	0.022	25
Caisson drilling	0.089	87	0.022	25
Loaded trucks	0.076	83	0.014	25
Jack hammer	0.035	79	0.009	25
Small bulldozer	0.003	58	0.001	25

	Vibration Level at Receiver			
Equipment	**Distance (feet)**	**PPV_x (in/sec)**	**Lv_x (VdB)**	**RMS_x (in/sec)**
Impact Pile Driver	25	0.6440	112	0.398
Sonic Pile Driver	25	0.1700	105	0.178
Vibratory Roller	25	0.2100	94	0.050
Hoe Ram	25	0.0890	87	0.022
Large bulldozer	25	0.0890	87	0.022
Caisson drilling	25	0.0890	87	0.022
Loaded trucks	25	0.0760	83	0.014
Jack hammer	25	0.0350	79	0.009
Small bulldozer	25	0.0030	58	0.001

	Vibration Contours		
	Distance to (feet)		
Equipment	**0.100 PPV**	**72.0 VdB**	**0.0080 RMS**
Impact Pile Driver	136	1645	872
Sonic Pile Driver	40	791	419
Vibratory Roller	49	250	133
Hoe Ram	22	120	64
Large bulldozer	22	120	64
Caisson drilling	22	120	64
Loaded trucks	19	79	42
Jack hammer	10	52	28
Small bulldozer	1	6	3

Sources

California Department of Transportation (Caltrans). 2020. Transportation and Construction Vibration Guidance Manual. April 2020. Available at: https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/tcvgm-apr2020-a11y.pdf

Federal Transit Administration (FTA). 2018. Transit Noise and Vibration Imapact Assessment Manual. September 2018. Available at: https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf

Groundborne Noise and Vibration Modeling

Notes
The reference distance is measured from the nearest anticipated point of construction equipment to the nearest structure. Last Updated: 09/29/2021

Variables	
V_{ref}	1E-06
Crest Factor (PPV/RMS)	4
Soil Type	
(Choice: default, hard, or sands)	default
n value	1.1

	Reference Level Inputs			
Equipment	**PPV_{ref} (in/sec)**	**Lv_{ref} (VdB)**	**RMS_{ref} (in/sec)**	**Reference Distance**
Impact Pile Driver	0.644	112	0.398	25
Sonic Pile Driver	0.17	105	0.178	25
Vibratory Roller	0.21	94	0.050	25
Hoe Ram	0.089	87	0.022	25
Large bulldozer	0.089	87	0.022	25
Caisson drilling	0.089	87	0.022	25
Loaded trucks	0.076	83	0.014	25
Jack hammer	0.035	79	0.009	25
Small bulldozer	0.003	58	0.001	25

	Vibration Level at Receiver			
Equipment	**Distance (feet)**	**PPV_x (in/sec)**	**Lv_x (VdB)**	**RMS_x (in/sec)**
Impact Pile Driver	50	0.3004	105	0.186
Sonic Pile Driver	50	0.0793	98	0.083
Vibratory Roller	50	0.0980	87	0.023
Hoe Ram	50	0.0415	80	0.010
Large bulldozer	50	0.0415	80	0.010
Caisson drilling	50	0.0415	80	0.010
Loaded trucks	50	0.0355	76	0.007
Jack hammer	50	0.0163	72	0.004
Small bulldozer	50	0.0014	51	0.000

	Vibration Contours		
	Distance to (feet)		
Equipment	**0.100 PPV**	**72.0 VdB**	**0.0080 RMS**
Impact Pile Driver	136	1645	872
Sonic Pile Driver	40	791	419
Vibratory Roller	49	250	133
Hoe Ram	22	120	64
Large bulldozer	22	120	64
Caisson drilling	22	120	64
Loaded trucks	19	79	42
Jack hammer	10	52	28
Small bulldozer	1	6	3

Sources

California Department of Transportation (Caltrans). 2020. Transportation and Construction Vibration Guidance Manual. April 2020. Available at: https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/tcvgm-apr2020-a11y.pdf

Federal Transit Administration (FTA). 2018. Transit Noise and Vibration Imapact Assessment Manual. September 2018. Available at: https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf

Groundborne Noise and Vibration Modeling

Notes
The reference distance is measured from the nearest anticipated point of construction equipment to the nearest structure. Last Updated: 09/29/2021

	Reference Level Inputs			
Equipment	PPV_{ref} (in/sec)	Lv_{ref} (VdB)	RMS_{ref} (in/sec)	Reference Distance
Impact Pile Driver	0.644	112	0.398	25
Sonic Pile Driver	0.17	105	0.178	25
Vibratory Roller	0.21	94	0.050	25
Hoe Ram	0.089	87	0.022	25
Large bulldozer	0.089	87	0.022	25
Caisson drilling	0.089	87	0.022	25
Loaded trucks	0.076	83	0.014	25
Jack hammer	0.035	79	0.009	25
Small bulldozer	0.003	58	0.001	25

	Vibration Level at Receiver			
Equipment	Distance (feet)	PPV_x (in/sec)	Lv_x (VdB)	RMS_x (in/sec)
Impact Pile Driver	75	0.1923	102	0.119
Sonic Pile Driver	75	0.0508	95	0.053
Vibratory Roller	75	0.0627	84	0.015
Hoe Ram	75	0.0266	77	0.007
Large bulldozer	75	0.0266	77	0.007
Caisson drilling	75	0.0266	77	0.007
Loaded trucks	75	0.0227	73	0.004
Jack hammer	75	0.0105	69	0.003
Small bulldozer	75	0.0009	48	0.000

	Vibration Contours		
	Distance to (feet)		
Equipment	0.100 PPV	72.0 VdB	0.0080 RMS
Impact Pile Driver	136	1645	872
Sonic Pile Driver	40	791	419
Vibratory Roller	49	250	133
Hoe Ram	22	120	64
Large bulldozer	22	120	64
Caisson drilling	22	120	64
Loaded trucks	19	79	42
Jack hammer	10	52	28
Small bulldozer	1	6	3

Variables	
V_{ref}	1E-06
Crest Factor (PPV/RMS)	4
Soil Type	
(Choice: default, hard, or sands)	default
n value	1.1

Sources

California Department of Transportation (Caltrans). 2020. Transportation and Construction Vibration Guidance Manual. April 2020. Available at: https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/tcvgm-apr2020-a11y.pdf

Federal Transit Administration (FTA). 2018. Transit Noise and Vibration Imapact Assessment Manual. September 2018. Available at: https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf

Groundborne Noise and Vibration Modeling

Notes
The reference distance is measured from the nearest anticipated point of construction equipment to the nearest structure. Last Updated: 09/29/2021

Variables	
V_{ref}	1E-06
Crest Factor (PPV/RMS)	4
Soil Type	
(Choice: default, hard, or sands)	default
n value	1.1

	Reference Level Inputs			
Equipment	**PPV_{ref} (in/sec)**	**Lv_{ref} (VdB)**	**RMS_{ref} (in/sec)**	**Reference Distance**
Impact Pile Driver	0.644	112	0.398	25
Sonic Pile Driver	0.17	105	0.178	25
Vibratory Roller	0.21	94	0.050	25
Hoe Ram	0.089	87	0.022	25
Large bulldozer	0.089	87	0.022	25
Caisson drilling	0.089	87	0.022	25
Loaded trucks	0.076	83	0.014	25
Jack hammer	0.035	79	0.009	25
Small bulldozer	0.003	58	0.001	25

	Vibration Level at Receiver			
Equipment	**Distance (feet)**	**PPV_x (in/sec)**	**Lv_x (VdB)**	**RMS_x (in/sec)**
Impact Pile Driver	100	0.1402	99	0.087
Sonic Pile Driver	100	0.0370	92	0.039
Vibratory Roller	100	0.0457	81	0.011
Hoe Ram	100	0.0194	74	0.005
Large bulldozer	100	0.0194	74	0.005
Caisson drilling	100	0.0194	74	0.005
Loaded trucks	100	0.0165	70	0.003
Jack hammer	100	0.0076	66	0.002
Small bulldozer	100	0.0007	45	0.000

	Vibration Contours		
	Distance to (feet)		
Equipment	**0.100 PPV**	**72.0 VdB**	**0.0080 RMS**
Impact Pile Driver	136	1645	872
Sonic Pile Driver	40	791	419
Vibratory Roller	49	250	133
Hoe Ram	22	120	64
Large bulldozer	22	120	64
Caisson drilling	22	120	64
Loaded trucks	19	79	42
Jack hammer	10	52	28
Small bulldozer	1	6	3

Sources

California Department of Transportation (Caltrans). 2020. Transportation and Construction Vibration Guidance Manual. April 2020. Available at: https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/tcvgm-apr2020-a11y.pdf

Federal Transit Administration (FTA). 2018. Transit Noise and Vibration Imapact Assessment Manual. September 2018. Available at: https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf

Groundborne Noise and Vibration Modeling

Variables	
V_{ref}	1E-06
Crest Factor (PPV/RMS)	4
Soil Type	
(Choice: default, hard, or sands)	default
n value	1.1

Notes

The reference distance is measured from the nearest anticipated point of construction equipment to the nearest structure. Last Updated: 09/29/2021

	Reference Level Inputs			
Equipment	PPV_{ref} (in/sec)	Lv_{ref} (VdB)	RMS_{ref} (in/sec)	Reference Distance
Impact Pile Driver	0.644	112	0.398	25
Sonic Pile Driver	0.17	105	0.178	25
Vibratory Roller	0.21	94	0.050	25
Hoe Ram	0.089	87	0.022	25
Large bulldozer	0.089	87	0.022	25
Caisson drilling	0.089	87	0.022	25
Loaded trucks	0.076	83	0.014	25
Jack hammer	0.035	79	0.009	25
Small bulldozer	0.003	58	0.001	25

	Vibration Level at Receiver			
Equipment	Distance (feet)	PPV_x (in/sec)	Lv_x (VdB)	RMS_x (in/sec)
Impact Pile Driver	125	0.1097	97	0.068
Sonic Pile Driver	125	0.0289	90	0.030
Vibratory Roller	125	0.0358	79	0.009
Hoe Ram	125	0.0152	72	0.004
Large bulldozer	125	0.0152	72	0.004
Caisson drilling	125	0.0152	72	0.004
Loaded trucks	125	0.0129	68	0.002
Jack hammer	125	0.0060	64	0.002
Small bulldozer	125	0.0005	43	0.000

	Vibration Contours		
	Distance to (feet)		
Equipment	0.100 PPV	72.0 VdB	0.0080 RMS
Impact Pile Driver	136	1645	872
Sonic Pile Driver	40	791	419
Vibratory Roller	49	250	133
Hoe Ram	22	120	64
Large bulldozer	22	120	64
Caisson drilling	22	120	64
Loaded trucks	19	79	42
Jack hammer	10	52	28
Small bulldozer	1	6	3

Sources

California Department of Transportation (Caltrans). 2020. Transportation and Construction Vibration Guidance Manual. April 2020. Available at: https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/tcvgm-apr2020-a11y.pdf

Federal Transit Administration (FTA). 2018. Transit Noise and Vibration Imapact Assessment Manual. September 2018. Available at: https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf

Noise Attenuation and Contours

Input Variables

Point or Line Source	Point	
Hard or Soft Site	Hard	
Attenuation Rate	6	dBA/Doubling of Distance
(Choice: 3, 4.5, 6, or 7.5)		
Reference Noise Level	70	dBA
Reference Distance	50	feet

Note: Within 0-10 feet from the source, there is virtually no attenuation.

Noise Level at Receiver

Distance to Receiver		Noise Level	
50	ft	70.0	dBA
100	ft	64.0	dBA
150	ft	60.5	dBA
200	ft	58.0	dBA
400	ft	51.9	dBA
300	ft	54.4	dBA

Noise Contours

Noise Level Contour		Distance from Source	
80	dBA	16	ft
75	dBA	28	ft
70	dBA	50	ft
65	dBA	89	ft
60	dBA	158	ft
55	dBA	281	ft
50	dBA	500	ft
45	dBA	889	ft

Groundborne Noise and Vibration Modeling

Notes
The reference distance is measured from the nearest anticipated point of construction equipment to the nearest structure. Last Updated: 04/14/2022

	Reference Level Inputs			
Equipment	**PPV_{ref} (in/sec)**	**Lv_{ref} (VdB)**	**RMS_{ref} (in/sec)**	**Reference Distance**
Impact Pile Driver	0.644	112	0.398	25
Sonic Pile Driver	0.17	105	0.178	25
Vibratory Roller	0.21	94	0.050	25
Hoe Ram	0.089	87	0.022	25
Large bulldozer	0.089	87	0.022	25
Caisson drilling	0.089	87	0.022	25
Loaded trucks	0.076	83	0.014	25
Jack hammer	0.035	79	0.009	25
Small bulldozer	0.003	58	0.001	25

	Vibration Level at Receiver			
Equipment	**Distance (feet)**	**PPV_x (in/sec)**	**Lv_x (VdB)**	**RMS_x (in/sec)**
Impact Pile Driver	100	0.1402	99	0.087
Sonic Pile Driver	100	0.0370	92	0.039
Vibratory Roller	100	0.0457	81	0.011
Hoe Ram	100	0.0194	74	0.005
Large bulldozer	100	0.0194	74	0.005
Caisson drilling	100	0.0194	74	0.005
Loaded trucks	100	0.0165	70	0.003
Jack hammer	100	0.0076	66	0.002
Small bulldozer	100	0.0007	45	0.000

	Vibration Contours		
	Distance to (feet)		
Equipment	**0.100 PPV**	**72.0 VdB**	**0.0080 RMS**
Impact Pile Driver	136	1645	872
Sonic Pile Driver	40	791	419
Vibratory Roller	49	250	133
Hoe Ram	22	120	64
Large bulldozer	22	120	64
Caisson drilling	22	120	64
Loaded trucks	19	79	42
Jack hammer	10	52	28
Small bulldozer	1	6	3

Sources
California Department of Transportation (Caltrans). 2020. Transportation and Construction

Relative Increase in Noise Levels (Traffic)

Traffic Volume Increase Calculations				
Roadway Segment	Initial Traffic Volume	Future Traffic Volume	Percentage Increase in Traffic Volume	Increase in Noise Level (dBA)
	3213590	3536996	10.1%	0.4

KITTELSON & ASSOCIATES
155 Grand Avenue, Suite 505
Oakland, CA 94612
P 510.839.1742

Technical Memorandum

June 23, 2022

Project# 26756

To: Grace Wu
City of Berkeley
1947 Center Street, 2nd Floor
Berkeley, CA 94704

From: Anusha Musunuru, Damian Stefanakis, Kittelson & Associates, Inc.

CC: Justin Horner, City of Berkeley; Karly Kaufman, Rincon Consultants, Inc.

RE: City of Berkeley Housing Element – Vehicle Miles Traveled (VMT) Impact Assessment Memorandum

INTRODUCTION

Kittelson and Associates (Kittelson) has prepared this vehicle miles traveled (VMT) impact assessment for the City of Berkeley Housing Element Update. This VMT assessment is based on Regional Housing Needs Allocation (RHNA) housing units developed by the City of Berkeley. Kittelson conducted the travel demand modeling with the Alameda County Transportation Commission (CTC) Countywide Model. The VMT assessment is based on the SB 743 requirements and City of Berkeley VMT Guidelines.

The 2023-2031 Draft RHNA estimates include a total of 19,098 units located in the sites inventory within 106 selected traffic analysis zones (TAZs) around the City. Travel forecasts were prepared for both existing 2020 model year and future 2040 cumulative model year conditions. Since the year 2031 represents the Housing Element buildout, VMT for year 2031 was interpolated between 2020 and 2040. VMT results were extracted at the citywide level based on the efficiency metric, VMT per Capita and total VMT. The results were compared to the Bay Area regionwide average to determine if the additional housing units as per the Housing Element Update contribute to a VMT impact under SB 743 and City guidelines.

The overall effect of adding 19,098 housing units in Berkeley in the locations identified by the TAZs in the city and region level VMT is to shorten trip lengths, promote mode choice to transit-related modes and reduce VMT per capita for the City under both 2020 plus project and 2040 plus cumulative project conditions. Kittelson evaluated the Housing Element Update at the programmatic level using an overall systemwide VMT assessment, i.e., considering all the TAZs within the city for evaluating the VMT impacts.

VMT THRESHOLDS

VMT thresholds are defined using recommendations from the California Office of Planning and Research (OPR) based on their final report, dated December 2018. Cities and counties could opt to develop their own methods, but CEQA impact criteria are generally consistent with OPR recommendations. The City of Berkeley's VMT Criteria and Thresholds were developed and published on June 29, 2020[1]. This CEQA analysis is based on the City policy and supplemented with OPR recommendations (where applicable and necessary).

[1] City of Berkeley VMT Criteria and Thresholds, June 2020. Link: https://berkeleyca.gov/sites/default/files/2022-02/VMT-Criteria-and-Thresholds.pdf

The City of Berkeley has opted to compare VMT to the Bay Area regionwide average. Based on OPR and City guidelines, any development that does not immediately screen out for a VMT per capita assessment should produce a VMT per capita of 15% less than the baseline Bay Area regionwide average.

In the City of Berkeley, the screening criteria for CEQA Exemptions include the following for housing projects:

1. Within ½ mile of BART stations and Amtrak station,
2. Within ¼ mile of high-quality transit corridor, which has 15-minute frequency fixed-route bus service,
3. Contains 100% affordable housing,
4. All projects (housing related) expected to generate less than 836 daily VMT (usually around 20 residential units) are also exempt, and
5. All projects located in the low VMT areas, in a TAZ that has the household VMT per capita that is 15% lower than the baseline regional average.

VMT RESULTS

For Berkeley, VMT metrics are compared to the Bay Area regionwide average, and an impact is assessed if the project VMT per capita is higher than the established 15% below the regionwide average threshold. At the aggregate level, Table 1 through Table 3 indicates that the Housing Element Update project's overall VMT per capita produces lower VMT than 15% below the regionwide average (10.64 vs 19.31 in 2020, 10.86 vs 19.08 in 2031, and 11.03 vs 18.93 in 2040), and in aggregate is ***less than significant*** and does screen out from further VMT analysis and evaluation under CEQA.

Tables and figures of the VMT analysis are summarized below.

- Table 1 provides a summary of 2020 VMT per capita at the City, County, and Regionwide level.
- Table 2 provides a summary of 2040 VMT per capita at the City, County, and Regionwide level.
- Table 3 provides a summary of 2031 VMT per capita at the City, County, and Regionwide level.
- Figure 1 displays the sites inventory (except for the projected ADUs) by TAZ in the City of Berkeley.
- Figure 2 displays the 2020 households by TAZ and color coded based on households per acre by TAZ in the City of Berkeley.
- Figure 3 displays the 2040 households by TAZ and color coded based on households per acre by TAZ in the City of Berkeley.
- Figure 4 displays the 2020 population by TAZ and color coded based on population per acre by TAZ in the City of Berkeley.
- Figure 5 displays the 2040 population by TAZ and color coded based on population per acre by TAZ in the City of Berkeley.
- Figure 6 displays the households added as per housing element by TAZ and color coded based on households per acre by TAZ in the City of Berkeley.
- Figure 6A displays the households added as per housing element by TAZ and color coded based on households added by TAZ in the City of Berkeley.
- Figure 7 displays the population added as per housing element by TAZ and color coded based on population per acre by TAZ in the City of Berkeley.
- Figure 7A displays the population added as per housing element by TAZ and color coded based on population added by TAZ in the City of Berkeley.
- Figure 8 displays the 2020 plus project households by TAZ and color coded based on households per acre by TAZ in the City of Berkeley.
- Figure 9 displays the 2040 plus project households by TAZ and color coded based on households per acre by TAZ in the City of Berkeley.

- Figure 10 displays the 2020 plus project population by TAZ and color coded based on population per acre by TAZ in the City of Berkeley.
- Figure 11 displays the 2040 plus project population by TAZ and color coded based on population per acre by TAZ in the City of Berkeley.

Table 1. 2020 City, County, and Regionwide VMT per capita

Scenario	Households	Population	VMT	VMT/capita	15% Below
2020 No-Project					
City	52,293	128,004	1,436,244	11.22	
County	620,008	1,720,139	33,432,049	19.44	
Regionwide	2,887,140	7,915,267	180,468,151	22.80	19.38
2020 Plus Project					
City	71,391	175,466	1,867,472	10.64	
County	639,106	1,767,601	33,888,385	19.17	
Regionwide	2,906,238	7,962,729	180,855,141	22.71	19.31

SOURCE: KITTELSON & ASSOCIATES, INC., 2022
NOTE: NET CHANGE IN METRICS IS ASSOCIATED WITH HOUSING ELEMENT UPDATE
2020 PLUS PROJECT VMT IS LOWER THAN 15% BELOW REGIONWIDE AVERAGE

Table 2. 2040 City, County, and Regionwide VMT per capita

Scenario	Households	Population	VMT	VMT/capita	15% Below
2040 No-Project					
City	55,366	141,068	1,607,349	11.39	
County	738,755	2,082,721	37,007,548	17.77	
Regionwide	3,431,389	9,626,790	215,286,847	22.36	19.01
2040 Plus Project					
City	74,464	188,530	2,078,822	11.03	
County	757,853	2,130,183	37,536,311	17.62	
Regionwide	3,450,487	9,674,252	215,459,688	22.27	18.93

SOURCE: KITTELSON & ASSOCIATES, INC., 2022
NOTE: NET CHANGE IN METRICS IS ASSOCIATED WITH HOUSING ELEMENT UPDATE
2040 PLUS PROJECT VMT IS LOWER THAN 15% BELOW REGIONWIDE AVERAGE

*Table 3. 2031 City, County, and Regionwide VMT per capita***

Scenario	Households	Population	VMT	VMT/capita	15% Below
2031 No-Project					
City	53,983	135,189	1,530,352	11.32	
County	685,319	1,919,559	35,398,573	18.44	
Regionwide	3,186,477	8,856,605	199,618,434	22.54	19.16
2031 Plus Project					
City	73,081	182,651	1,983,715	10.86	
County	704,417	1,967,021	35,894,744	18.25	
Regionwide	3,205,575	8,904,067	199,887,642	22.45	19.08

SOURCE: KITTELSON & ASSOCIATES, INC., 2022; **- INTERPOLATED RESULTS FROM 2020 & 2040.
NOTE: NET CHANGE IN METRICS IS ASSOCIATED WITH HOUSING ELEMENT UPDATE
2031 PLUS PROJECT VMT IS LOWER THAN 15% BELOW REGIONWIDE AVERAGE

CONCLUSION

The VMT assessment for the Housing Element Update was conducted using the Alameda CTC Countywide model. RHNA housing units were added to the model in each TAZ that represent the sites inventory and projected ADUs. VMT per capita was extracted at the systemwide (City, County, and Regionwide) level for 2020 and 2040. Year 2031 was interpolated from the 2020 and 2040. The results indicate that at the programmatic level, the VMT associated with the additional residential units is more than 15% below the existing regionwide average.

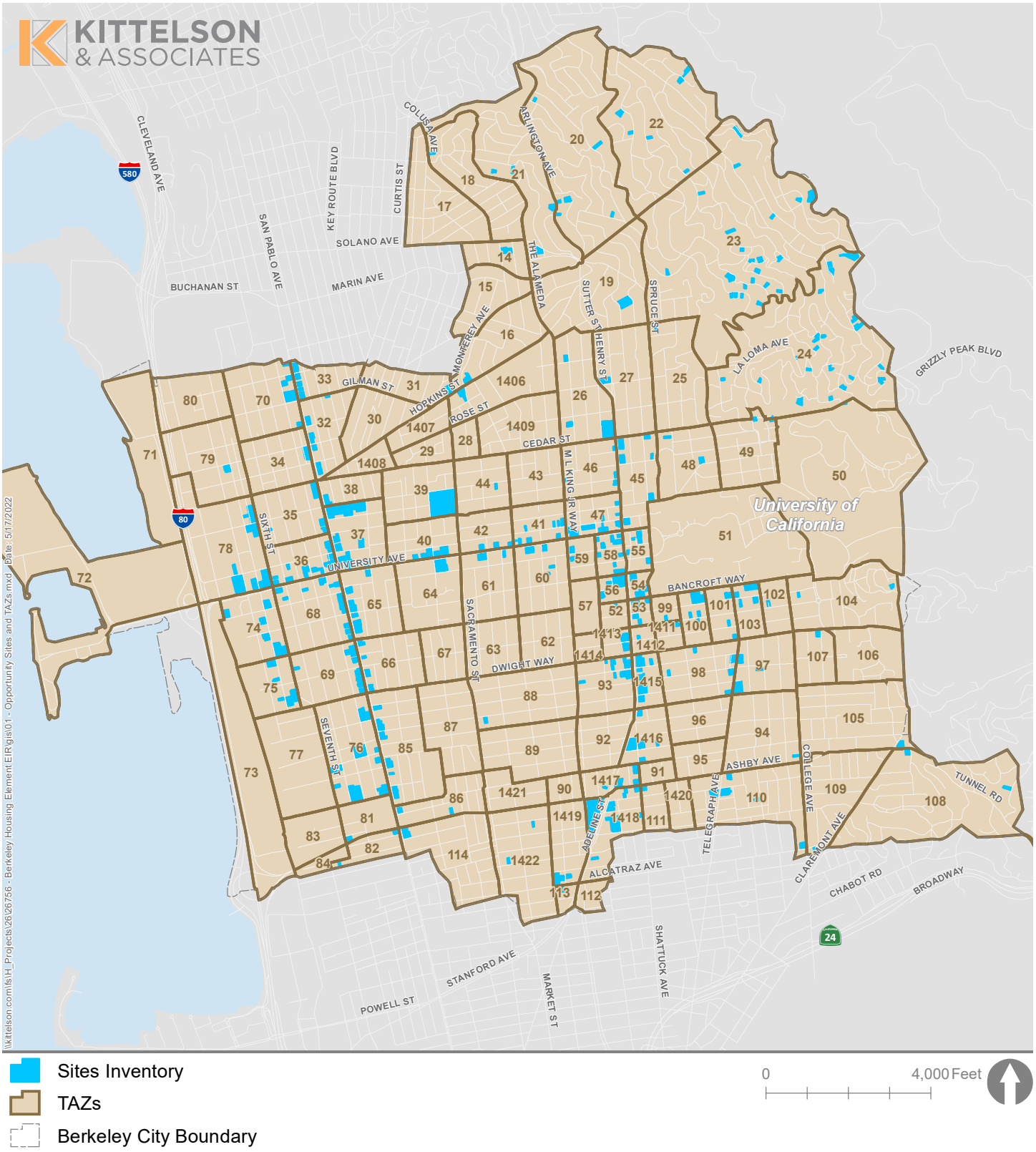


Figure 1

Sites Inventory and TAZs
Berkeley, California

Figure 2

Total 2020 Households: 52,293

2020 Households
Berkeley, California

2040 Households by TAZ

- 0
- 1 - 500
- 501 - 1000
- 1001 - 1500
- 1501 - 1566

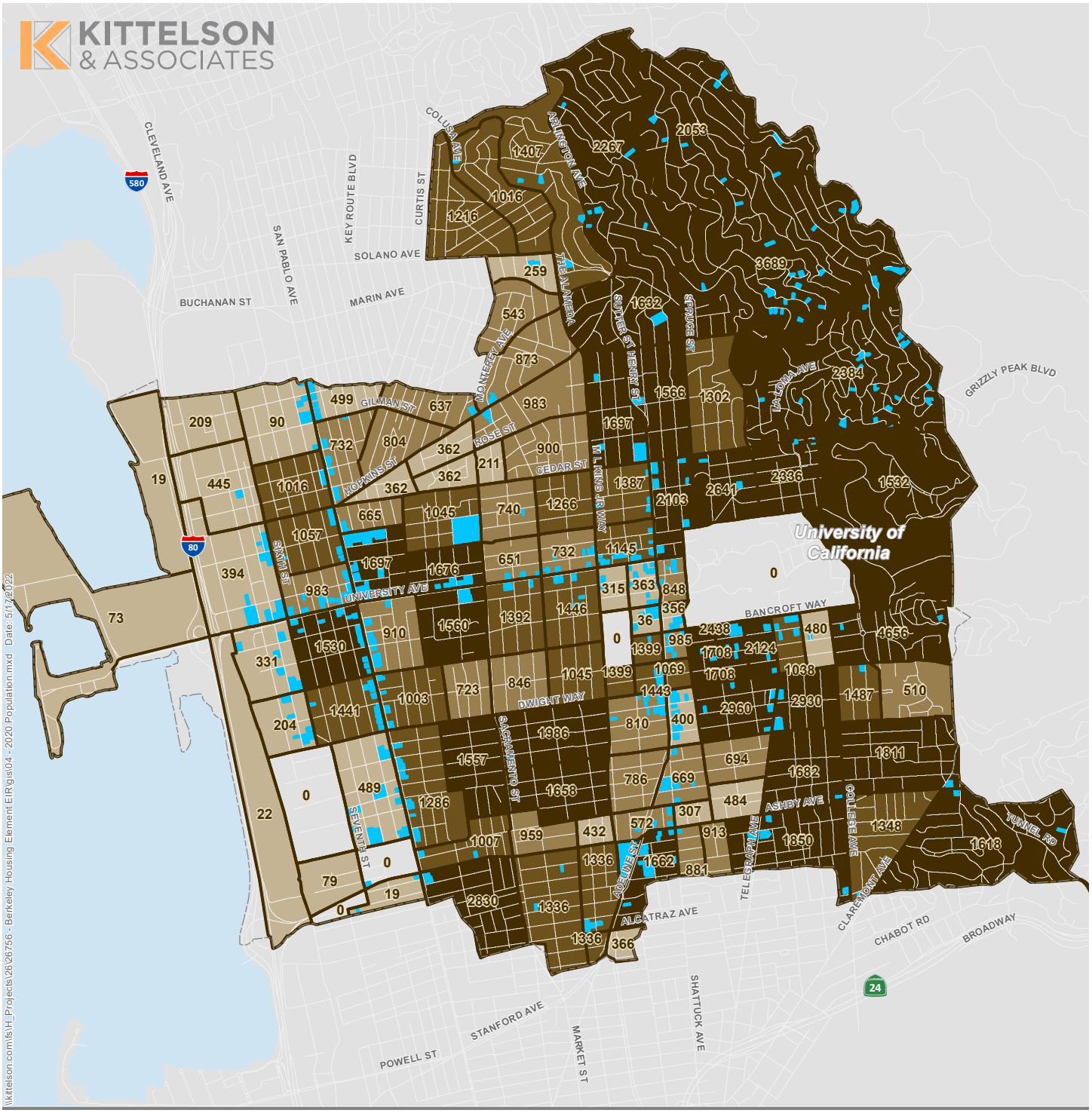
- Sites Inventory
- Berkeley City Boundary

0 — 4,000 Feet

Figure 3

2040 Households
Berkeley, California

Total 2040 Households: 55,366



2020 Population by TAZ

- 0
- 1 - 500
- 501 - 1000
- 1001 - 1500
- 1501 - 4656

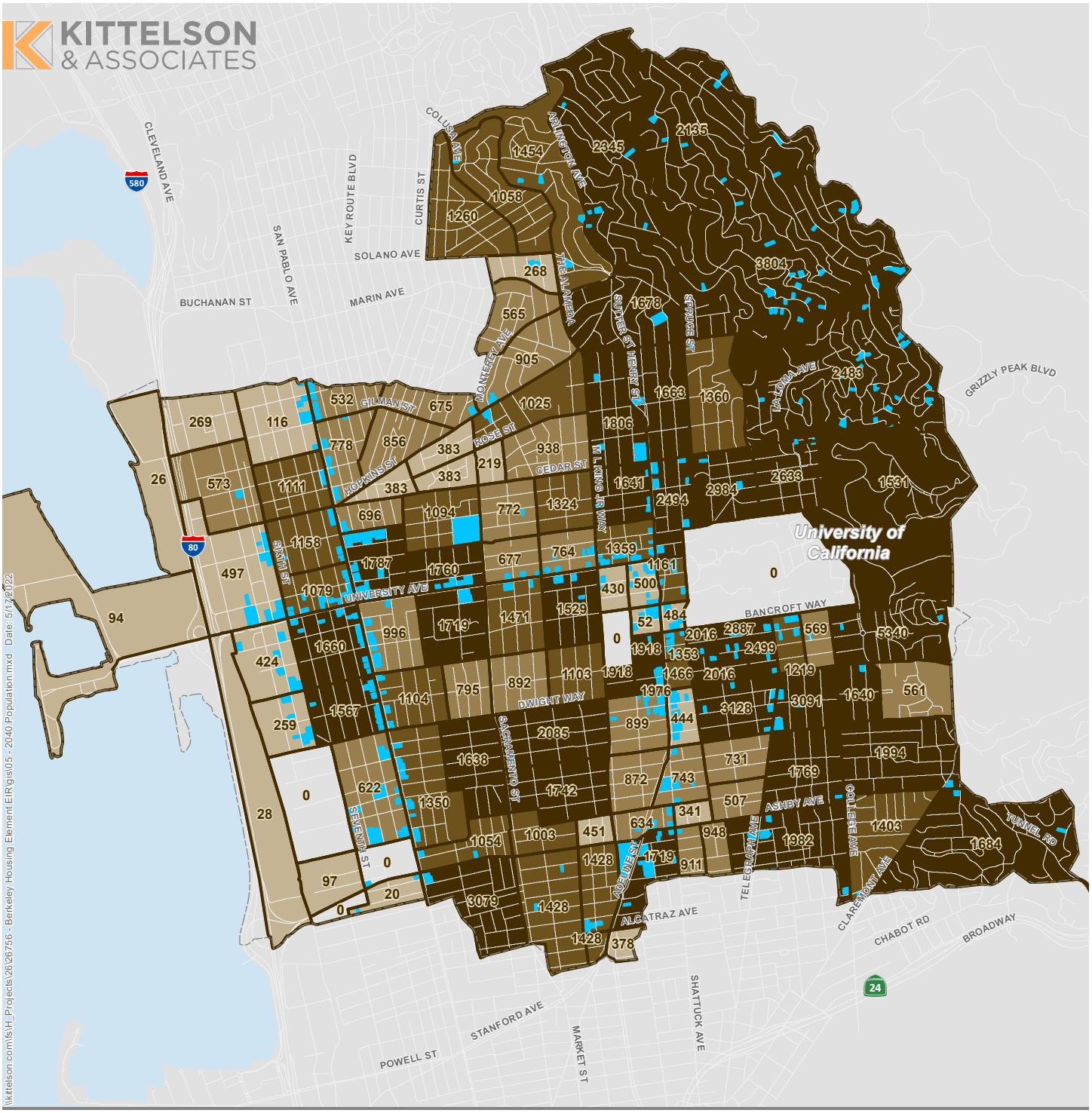
- Sites Inventory
- Berkeley City Boundary

0 4,000 Feet

Figure 4

Total 2020 Population: 128,004

2020 Population
Berkeley, California



2040 Population by TAZ

- 0
- 1 - 500
- 501 - 1000
- 1001 - 1500
- 1501 - 5340

- Sites Inventory
- Berkeley City Boundary

0 — 4,000 Feet

Figure 5

Total 2040 Population: 141,068

2040 Population
Berkeley, California

Households Added as per Housing Element by TAZ

- 0
- 1 - 500
- 501 - 1000
- 1001 - 1500
- 1501 - 1535

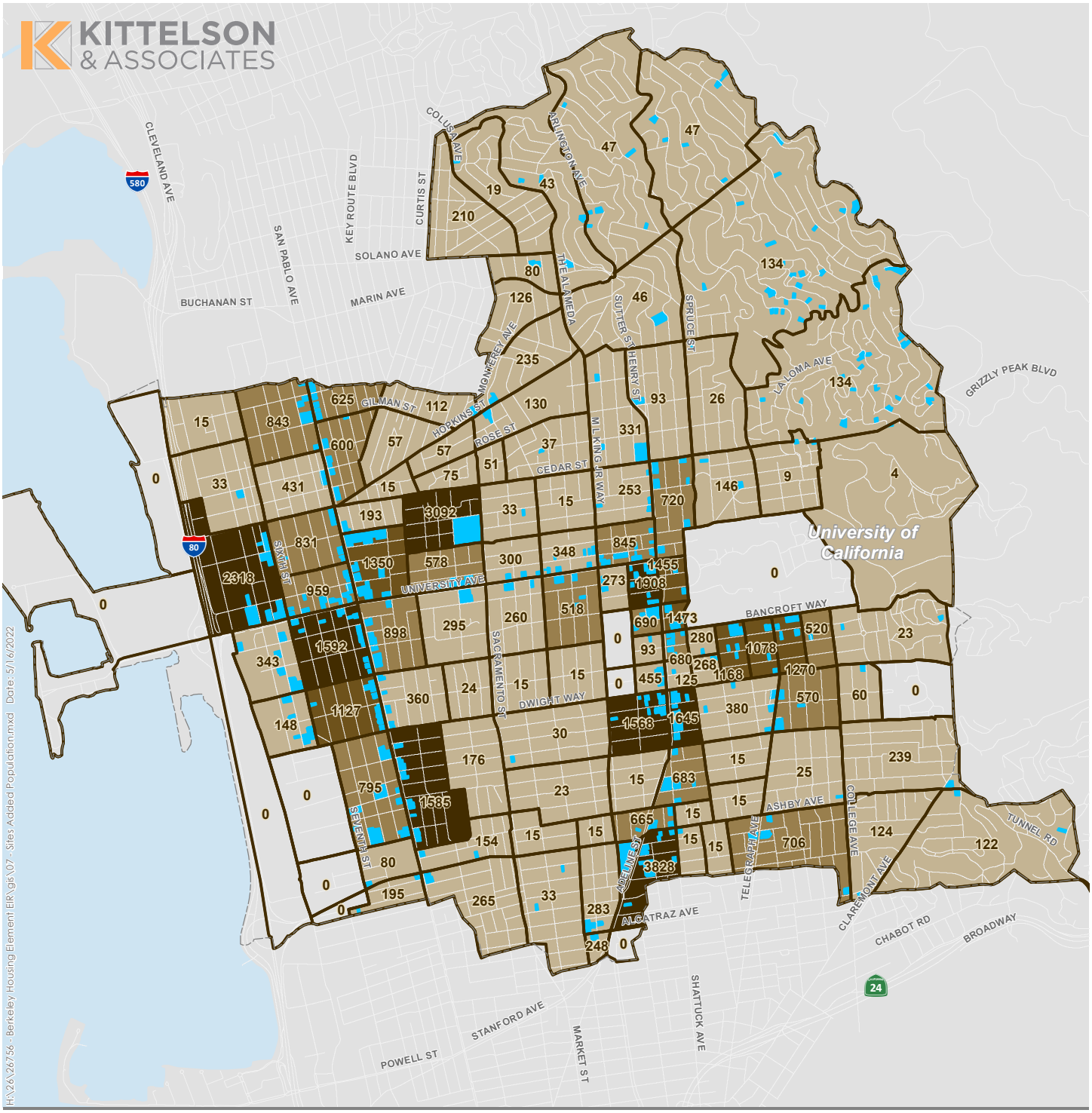
- Sites Inventory
- Berkeley City Boundary

0 4,000 Feet

Figure 6

Total Added Households per Housing Element by TAZ: 19,098

Sites Added Households Berkeley, California



Population Added as per Housing Element by TAZ

- 0
- 1 - 500
- 501 - 1000
- 1001 - 1500
- 1501 - 3828

- Sites Inventory
- Berkeley City Boundary

0 4,000 Feet

Figure 7

Total Added Population per Housing Element by TAZ: 47,443

Sites Added Population
Berkeley, California

Plus HE Households by TAZ

- 0
- 1 - 500
- 501 - 1000
- 1001 - 1500
- 1501 - 2274

- Sites Inventory
- Berkeley City Boundary

0 — 4,000 Feet

Figure 8

Total 2020+HE Households: 71,391

2020 Plus HE Households
Berkeley, California

Plus HE Households by TAZ

- 0
- 1 - 500
- 501 - 1000
- 1001 - 1500
- 1501 - 2273

- Sites Inventory
- Berkeley City Boundary

0 4,000 Feet

Figure 9

Total 2040+HE Households: 74,464

2040 Plus HE Households
Berkeley, California

Plus HE Population by TAZ

- 0
- 1 - 500
- 501 - 1000
- 1001 - 1500
- 1501 - 5490

- Sites Inventory
- Berkeley City Boundary

0 — 4,000 Feet

Figure 10

Total 2020+HE Population: 175,466

2020 Plus HE Population
Berkeley, California

Plus HE Population by TAZ

- 0
- 1 - 500
- 501 - 1000
- 1001 - 1500
- 1501 - 5546

- Sites Inventory
- Berkeley City Boundary

0 — 4,000 Feet

Figure 11

Total 2040+HE Population: 188,530

2040 Plus HE Population
Berkeley, California