

Whole Foods at 2675 Geary Boulevard Project

San Francisco Planning
Case No. **2019-004110ENV-02**

State Clearinghouse No. 2022060505

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San Francisco Planning

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Notice of Preparation and Initial Study

INITIAL STUDY
WHOLE FOODS AT 2675 GEARY BOULEVARD PROJECT
PLANNING DEPARTMENT CASE NO. 2019-004110ENV-02

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A. Project Description

A.1 Project Location

The project site is a 49,285-square-foot vacant retail space located on level 3 of the existing approximately 250,840-square-foot City Center shopping center. The project site includes parking lot C on level 3, which contains 117 parking spaces.

City Center is located at the southeast corner of Masonic Avenue and Geary Boulevard in the Western Addition neighborhood of San Francisco (see **Figure 1** and **Figure 2**, p. 3) and occupies the block bounded by Geary Boulevard to the north, Masonic Avenue to the west, O'Farrell Street to the south, and Lyon Street to the east. The southern portion of the City Center parcel (along O'Farrell Street) slopes upward from west to east between Masonic Avenue and Anzavista Avenue, and downward from west to east between Anzavista Avenue and Lyon Street. Both elevation changes are approximately 40 feet. The northern portion of the City Center parcel (along Geary Boulevard) is level between Masonic and Presidio avenues, then slopes downward from west to east between Presidio Avenue and Lyon Street, with an elevation change of approximately 30 feet. As a result, the approximately 250,840 square feet of retail space in City Center is located on five levels. Level 1 contains Target, Ulta, PetSmart, and parking lots A and F. Level 2 contains Target, smaller retail spaces, restaurants, PetSmart, and parking lots B and E. Level 3 contains the project site, including parking lot C, and levels 4 and 5 contain the Bright Horizons daycare facility and parking lot D. The six separate parking lots (parking lots A through F) are located throughout the City Center shopping center, each with independent access from O'Farrell Street, Geary Boulevard, or Masonic Avenue. The project site is located within the NC-3 (Moderate-Scale Neighborhood Commercial) zoning district and is within the 40-X and 80-X height and bulk districts.

A.2 Project Characteristics

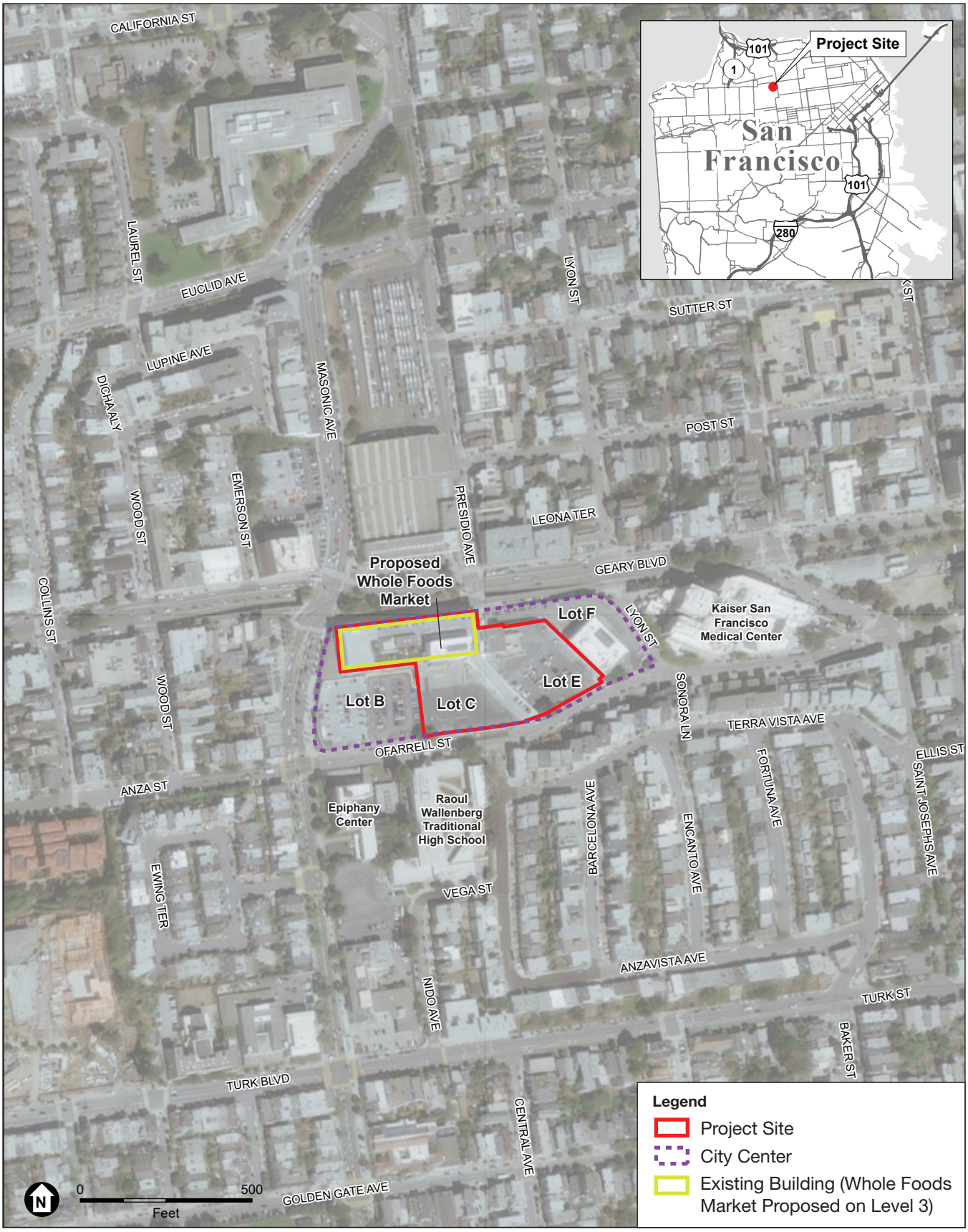
GROCERY STORE

The project sponsor proposes to renovate an existing vacant retail space on level 3 of the City Center shopping center for a new Whole Foods Market grocery store. The proposed project would include a 49,825-square-foot grocery store with a 25,030-square-foot sales floor (see **Figure 3**, p. 4, and **Figure 4**, p. 5). The remaining 24,795 square feet would be dedicated to other uses: seating areas, checkout, self-checkout, and back-of-house uses such as offices, restrooms, freezers, kitchens, and storage areas for online orders.[1] The grocery store would sell grocery items, prepared foods, medicine, household products, beverages, and other retail items. The store would have a lounge and seating area with a capacity of 50 people.

The proposed project is expected to employ approximately 200 people, with 35 to 40 employees per shift.

Table 1, p. 6, summarizes the characteristics of the proposed project.

[1] These areas store products ordered online and collected in store by Whole Foods Market employees for pickup or delivery. Customers can order groceries and other in-store products online through Whole Foods Market or Amazon Prime.



SOURCE: Google, 2021; ESA, 2021

Whole Foods at 2675 Geary Boulevard Project

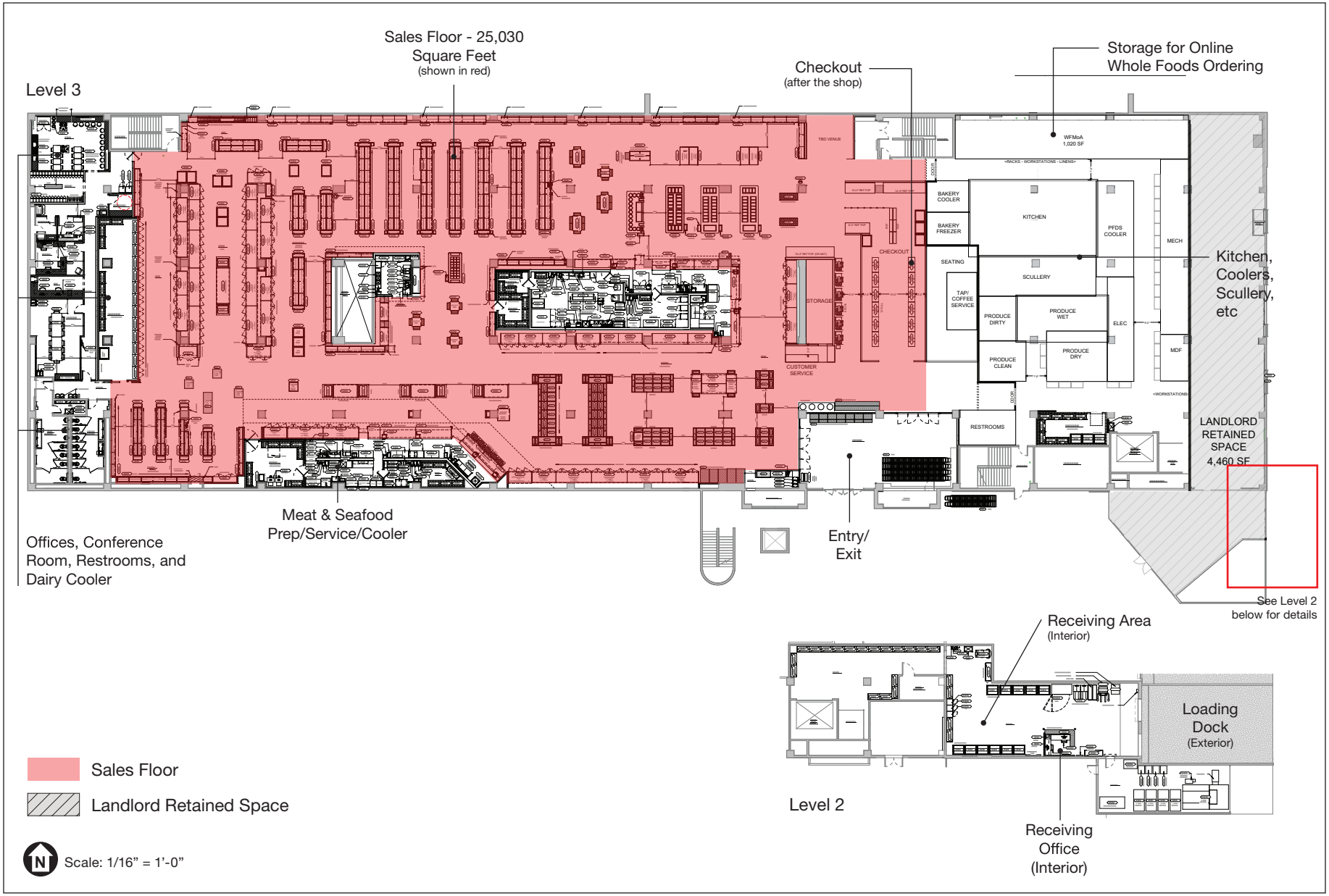
FIGURE 1
PROJECT LOCATION



SOURCE: Eagleview 2020

Whole Foods at 2675 Geary Boulevard Project

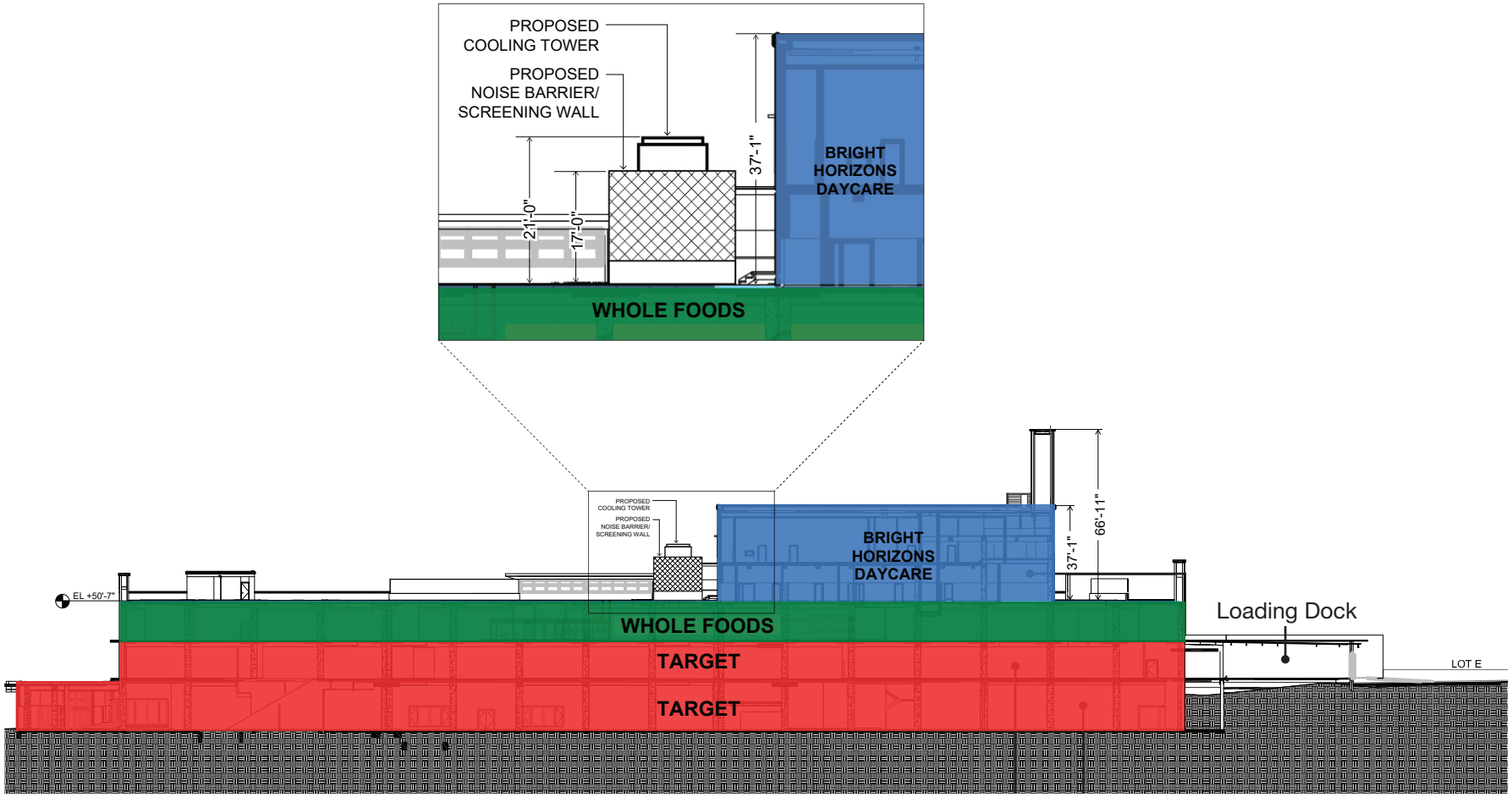
FIGURE 2
EXISTING AND PROPOSED SITE



SOURCE: BRR Architecture, Inc., 2020

Whole Foods at 2675 Geary Boulevard Project

FIGURE 3
PROPOSED SITE PLAN



South Elevation

SOURCE: Studioneleven, 2019

2675 Geary Boulevard Project

FIGURE 4
SOUTH ELEVATION

Table 1 2675 Geary Boulevard Project Characteristics

Project Characteristics	Existing	Proposed
Interior area (square feet)	49,825	49,825
Land use	Vacant Retail	Grocery Store
Rooftop mechanical penthouse (square feet)	930	1,630
Hours of loading	—	5 a.m.–3 p.m.
PROPOSED PARKING	**NUMBER**	
Vehicle parking spaces	117 (Lot C)	117 (Lot C)
Bicycle parking spaces	8 (Lot E)	8 (Lot E)
Americans with Disabilities Act (ADA) parking spaces	1 van ADA; 4 standard ADA	1 van ADA; 4 standard ADA

SOURCE: Whole Foods Market (2021)

The proposed project would also install new Whole Foods Market signage on the exterior of the City Center building along Geary Boulevard, along Masonic Avenue, at the intersection of Lyon Street and Geary Boulevard, and at the intersection of O'Farrell Street and Masonic Avenue. In addition, a pylon with Whole Foods Market signage would be placed in parking lot E near the intersection of O'Farrell Street and Anzavista Avenue.

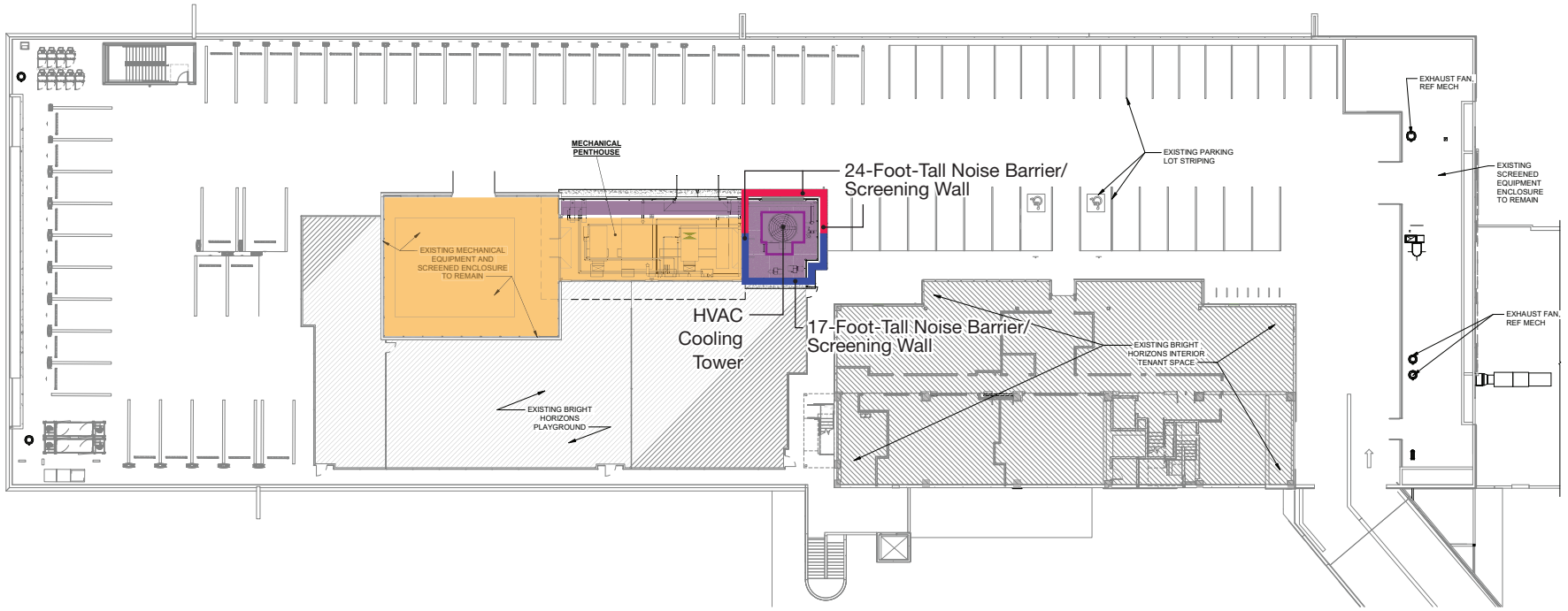
The proposed project includes replacement of the existing heating, ventilation, and air conditioning (HVAC) equipment and installation of new refrigeration equipment, including a new 21-foot-tall cooling tower, to support the proposed grocery store use. All of this equipment would continue to be located on level 4 of the City Center shopping center, which is on the roof of level 3 of the project site. The new cooling tower would be installed to the east of the existing HVAC equipment and penthouse enclosure (see **Figure 5**).

The proposed project would also expand the existing 930-square-foot rooftop mechanical penthouse on level 4 to approximately 1,630 square feet to accommodate new HVAC and refrigeration equipment. The existing 10-foot-tall enclosure wall on the north side would be removed and reconstructed approximately 7 feet farther north; another wall would be constructed approximately 20 feet east of and parallel to the existing east wall. The existing southern enclosure wall would be extended further east to meet the new east wall. All existing and proposed enclosure walls are/would be 10 feet tall.

The area around the new cooling tower would be open-air, or without a roof. The cooling tower would extend above the roofline of the penthouse. All other areas of the rooftop mechanical penthouse would be enclosed with a new roof.

CIRCULATION, PARKING, AND LOADING

The existing parking lot C on level 3, which contains 117 parking spaces, and the existing eight bicycle parking spaces in lot E (level 2) would be available for Whole Foods Market customers. No changes to vehicle parking, bicycle parking, loading, driveway access, or onsite circulation are proposed. In addition, no changes are proposed to the public right-of-way.



SOURCE: BRR Architecture, Inc., 2020

2675 Geary Boulevard Project

FIGURE 5
ROOFTOP MECHANICAL PENTHOUSE CHANGES

Freight and commercial loading activities would occur from an existing 3,528-square-foot, onsite receiving area on level 2, accessed from O'Farrell Street via parking lot E (see Figure 2, p. 3). The receiving area currently includes a four-stall loading dock shared with Target, who occupies the first level, a backstop room, a receiving cooler, a receiving office, a mechanical room, an elevator machine room, two freight elevators, and a dedicated pallet lift to the back-of-house space on level 3. The project sponsor would have exclusive use of two loading stalls that could each accommodate a 65-foot trailer. Deliveries would be received daily between 5 a.m. and 3 p.m.

The proposed project would replace the two existing *dock levelers*[2] and existing overhead doors in the receiving area. The two overhead doors, which are currently operated by chain, would be motorized. The proposed project would also include new lighting, switches, sinks, an eye wash station, walk-in coolers/freezers, and other storage amenities.

A.3 Project Construction

Construction of the proposed project is anticipated to occur over a 10-month period, beginning in October 2024 and ending in summer 2025. Construction activities would include demolishing interior walls, flooring, and some areas of the ceiling; expanding the rooftop mechanical penthouse and installing rooftop HVAC equipment including rooftop penetrations for venting and to connect the HVAC equipment to ducts; and constructing new interior walls and partitions for restrooms and back-of-house space (employee office, lounge, and locker rooms). Other activities would include reconfiguring the space and installing furniture and equipment to support the grocery store as well as replacing the two dock levelers. Construction staging is anticipated to occur within the existing vacant retail space and/or within parking lot C. Construction would generally occur between 8 a.m. and 4 p.m., in compliance with San Francisco Police Code section 2908. No excavation would be required.

A.4 Required Project Approvals

The proposed project is subject to review and approval by local agencies. Certification of the final EIR by the San Francisco Planning Commission, which would be appealable to the San Francisco Board of Supervisors, is required before issuance of any other discretionary approval or permits. The proposed project may require approvals from the following agencies.

SAN FRANCISCO PLANNING COMMISSION

- Adoption of findings of consistency with the San Francisco General Plan and priority policies of planning code section 101.1.
- Conditional use authorization to permit formula retail use.

SAN FRANCISCO DEPARTMENT OF BUILDING INSPECTION

- Review and approval of building permits.

[2] Dock levelers bridge the gap and height difference between the dock and the trailer.

B. Project Setting

B.1 Existing Setting

SITE HISTORY

The project site is located within the City Center shopping center, which was built in 1961 and was used as a Sears department store until the 1990s. After Sears vacated, City Center's retail space was subdivided and portions of the mall were leased by several retail chains: Mervyn's, Toys-R"-Us, The Good Guys, and Office Depot. City Center level 3 was leased by Toys-R-Us until it was replaced by Best Buy in 2007. Best Buy vacated City Center level 3 in 2017.

SURROUNDING LAND USES

The surrounding neighborhood is primarily a mix of two- to three-story residential buildings, with commercial and institutional uses along Geary Boulevard and Masonic Avenue; the Kaiser San Francisco Medical Center is located directly east of City Center. The Raoul Wallenberg Traditional High School and the Epiphany Center, a recovery institution, are located across O'Farrell Street, south of the project site. A seven-story storage building is located on a diagonal from the project site to the northwest. The University of San Francisco campus is approximately 0.2 mile to the southwest, the University of California Laurel Heights Campus is approximately 0.25 mile to the north, and Golden Gate Park is approximately 0.7 mile southwest of the project site.

SITE ACCESS

Geary Boulevard and Masonic Avenue are the major arterial streets that provide primary access to the project site. Geary Boulevard is an east–west arterial, with four westbound travel lanes and three eastbound travel lanes and one bus-only lane, adjacent to the project site. Class III[3] bicycle routes are located along Geary Street in both directions on Geary Boulevard between Masonic and Presidio avenues. Masonic Avenue is a north–south arterial adjacent to the project site and has three travel lanes. Class IV[4] bicycle routes are located on Masonic Avenue in both directions between Geary Boulevard and Grove Street. Lastly, O'Farrell Street is a west–east neighborhood residential one-way street with two travel lanes and one parking lane.

The project site is in an area served by the San Francisco Municipal Railway (Muni) transit network and is located adjacent to the 38 Geary, 38R Geary Rapid, and 43 Masonic[5] bus lines. Other bus lines that operate within 0.5 mile of the project site include the 1 California, 5 Fulton, 5R Fulton Rapid, 24 Divisadero, and 31 Balboa.

B.2 Cumulative Setting

CEQA Guidelines section 15130(b)(1) provides two methods for cumulative impact analysis: the "list-based approach" and the "projections-based approach". The list-based approach uses a list of projects producing

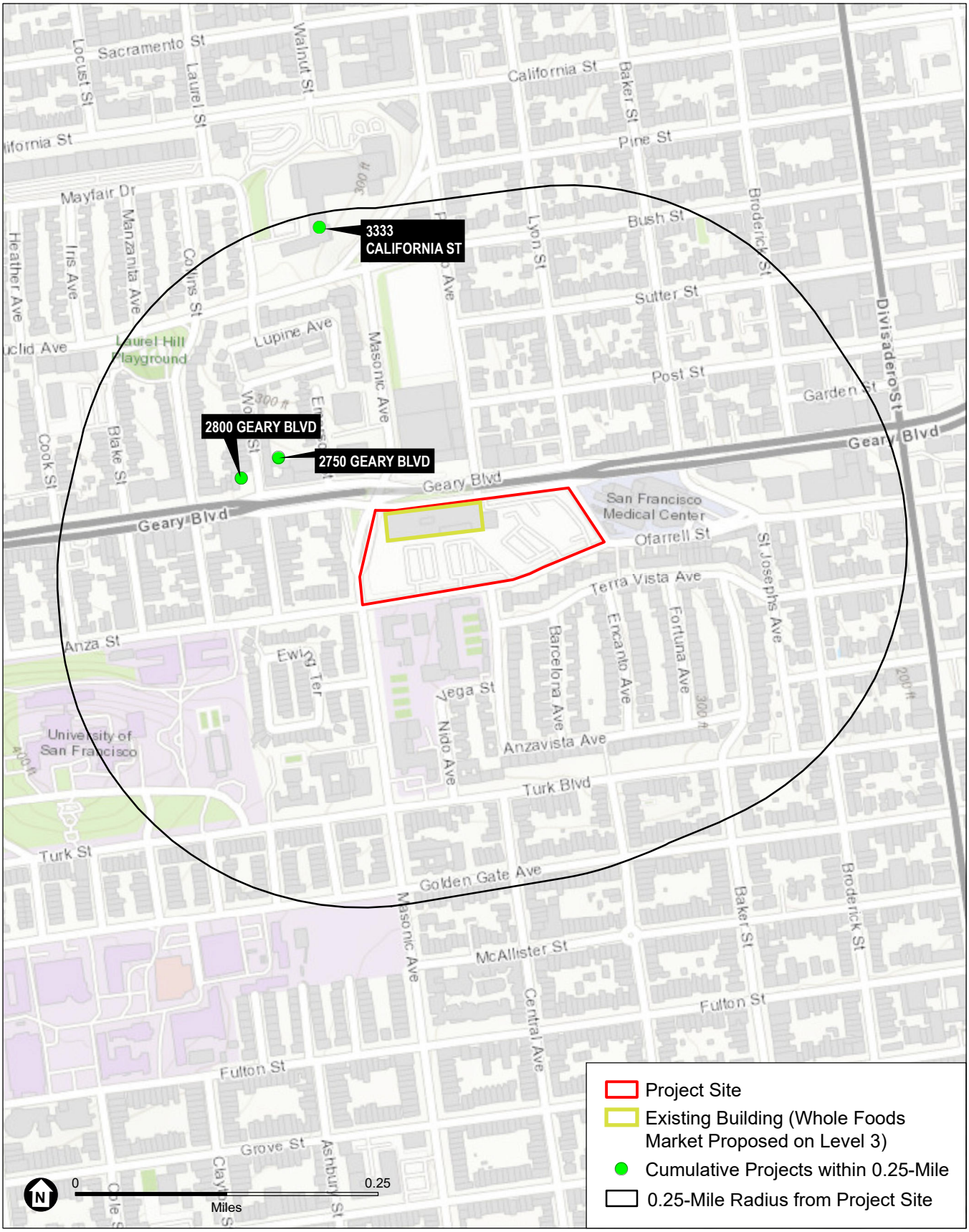
[3] Class III bicycle routes are signed bike routes that allow bicycles to share travel lanes with vehicles, and often marked with shared lane markings called sharrows.
[4] Class IV bicycle routes, referred to as cycle tracks or protected bikeways, are bicycle facilities that are separated from traffic by parked cars, safe-hit posts, transit islands, or other physical barriers.
[5] Muni is currently operating a shortened 43 Masonic bus route as part of the COVID-19 Muni Core Service Plan. However, the shortened route still includes two stops adjacent to the project site.

closely related impacts that could combine with those of a proposed project to evaluate whether the project would contribute to significant cumulative impacts. The projections-based approach uses projections contained in a general plan or related planning document to evaluate the potential for cumulative impacts. This project-specific analysis employs both the list-based and projections-based approaches, depending on which approach best suits the resource topic being analyzed. Projects with the potential to contribute to cumulative effects within a 0.25-mile radius of the project site are identified below in **Table 2** and **Figure 6**. These projects are currently under review by the planning department or are entitled but not yet under construction. The potential cumulative effects of these projects are addressed, as appropriate, under each environmental topic herein.

Table 2 Cumulative Projects within a 0.25-Mile Radius of the Proposed Project

Cumulative Project Number	Case No.	Address	Description
1	2019-023105PRJ	2800 Geary Boulevard	Demolish the existing one-story Firestone Tire Retail and Service Center and construct a 42-unit mixed-use, residential building with 850 square feet of ground floor retail.
2	2018-015786PRJ	2750 Geary Boulevard	Removal of the existing surface parking to construct a three-story, approximately 33-foot-tall horizontal and vertical addition with 20 one-bedroom dwelling units, and 2 tandem parking spaces on the existing driveway.
3	2015-014028PRJ	3333 California Street	Demolition of the existing 14,000-square-foot annex building, surface parking lots and ramp structures. Construction of 744 residential units, retail, childcare, open space, and parking uses.

SOURCE: San Francisco Planning Department Pipeline Report (2020)



SOURCE: Esri, 2021; San Francisco Planning Department Pipeline Report, 2020

Whole Foods at 2675 Geary Boulevard Project

FIGURE 6
CUMULATIVE PROJECTS WITHIN 0.25-MILE

C. Compatibility with Existing Zoning and Plans

	Applicable	Not Applicable
Discuss any variances, special authorizations, or changes proposed to the planning code or zoning map, if applicable.	☒	☐
Discuss any conflicts with any adopted plans and goals of the City or region, if applicable.	☒	☐
Discuss any approvals and/or permits from city departments other than the planning department or the Department of Building Inspection, or from regional, state, or federal agencies.	☐	☒

C.1 San Francisco Planning Code and Zoning Maps

The San Francisco Planning Code, which incorporates by reference the City's zoning maps, governs permitted uses, densities, and the configuration of buildings within San Francisco. Permits to construct new buildings or to alter or demolish existing buildings may not be issued unless the proposed project complies with the planning code, an exception or variance is granted pursuant to the planning code's provisions, or legislative amendments to the planning code are included and adopted as part of the proposed project.

LAND USE

The project site is a 49,825-square-foot vacant retail space within the existing 250,843-square-foot City Center shopping center. The project site is located within the NC-3 (Moderate-Scale Neighborhood Commercial) zoning district.

As stated in planning code section 712, the NC-3 zoning districts "are intended in most cases to offer a wide variety of comparison and specialty goods and services to a population greater than the immediate neighborhood, additionally providing convenience goods and services to the surrounding neighborhoods. NC-3 Districts are linear districts located along heavily trafficked thoroughfares which also serve as major transit routes." The NC-3 zoning districts permit moderately large commercial uses and buildings, including eating and drinking, entertainment, financial service and certain auto uses.

The proposed project would require a conditional use authorization (planning code section 303) from the planning commission to allow for formula retail use (planning code section 303.1) in a NC-3 zoning district. Planning code section 303.1 permits a conditional use authorization for a formula retail use that satisfies all of the applicable criteria in planning code sections 303 and 303.1.

HEIGHT AND BULK

The project site is within the 40-X and 80-X height and bulk districts. Portions of the parking areas are located within the 40-X height and bulk district and while the City Center building is located within the 80-X height and bulk district. The 40-X height and bulk district permits a maximum building height of 40 feet, while the 80-X height and bulk district permits a maximum building height of 80 feet. Pursuant to planning code section 270(a), there are no bulk controls in an "X" district. The proposed project would make no exterior alterations that would increase the building height; therefore, the proposed project complies with the height and bulk limits specified in the planning code for the project site. The proposed project's rooftop mechanical penthouse, including the sounds walls required pursuant to Mitigation Measure M-NO-3, Mechanical

Equipment Noise Control (see Section E.3, Noise, for additional details), are entirely within the buildable area of the 80-foot height limit.

PARKING AND LOADING

The project site includes parking lot C on level 3 of the City Center shopping center, which contains 117 existing parking spaces.

Freight and loading activities would occur via an existing onsite, 3,528-square-foot receiving area on level 2, accessed from O'Farrell Street just east of Anzavista Avenue, via parking lot E (see Figure 2, p. 3). The receiving area includes a four-stall loading dock, a backstop room, a receiving cooler, a staffed receiving office, and dedicated elevator lifts to the back-of-house space on level 3. The project sponsor would have exclusive use of two loading stalls that could each accommodate a 65-foot trailer. Deliveries would be received daily between 5 a.m. and 3 p.m. No changes to vehicle parking, bicycle parking, loading, driveway access, or onsite circulation are proposed.

C.2 Plans and Policies

SAN FRANCISCO GENERAL PLAN

The San Francisco General Plan (general plan) establishes objectives and policies guiding land use decisions related to the physical development of San Francisco. The general plan consists of 10 elements, each addressing a particular topic that applies citywide: air quality; arts; commerce and industry; community facilities; community safety; environmental protection; housing; recreation and open space; transportation; and urban design. Any conflict between the proposed project and policies that relate to physical environmental issues are discussed in Section D, Evaluation of Environmental Effects. The compatibility of the proposed project with general plan policies not related to physical environmental issues will be considered by decision makers when they determine whether to approve or disapprove the proposed project.

The proposed project consists of a renovation of an existing vacant retail space and expansion of the existing rooftop mechanical penthouse. The proposed project would not introduce incompatible land uses to the neighborhood or otherwise conflict with any general plan policies or objectives. Thus, the proposed project would not be inconsistent with the San Francisco General Plan.

THE ACCOUNTABLE PLANNING INITIATIVE

In November 1986, San Francisco voters approved Proposition M, the Accountable Planning Initiative, which added section 101.1 to the planning code and established eight priority policies. The topics in Sections E and D, Evaluation of Environmental Effects, that address the environmental issues associated with these policies, are as follows:

- Preservation and enhancement of neighborhood-serving retail uses
- Protection of neighborhood character
- Preservation and enhancement of affordable housing (Section D's Population and Housing, p. 17, regarding housing supply and displacement issues)
- Discouragement of commuter automobiles (Section E.2, Transportation and Circulation)

- Protection of industrial and service land uses from commercial office development and enhancement of resident employment and business ownership
- Maximization of earthquake preparedness (Section D, Geology and Soils)
- Preservation of landmark and historic buildings (not applicable to the proposed project)
- Protection of open space (not applicable to the proposed project)

Before issuing a permit for any project that requires an initial study under CEQA, and before issuing a permit for any demolition, conversion, or change of use, and before taking any action that requires a finding of consistency with the general plan, the City must find that the proposed project or legislation would be consistent with the priority policies. As noted above, the compatibility of the proposed project with general plan objectives and policies not related to physical environmental issues will be considered by decision makers when they determine whether to approve or disapprove the proposed project. Any potential conflicts identified as part of that process would not alter the physical environmental effects of the proposed project.

REGIONAL PLANS AND POLICIES

The four principal regional planning agencies and their overarching policies and plans that guide planning in the nine-county Bay Area (noted in parentheses) include the Bay Area Air Quality Management District (2017 Bay Area Clean Air Plan), the Metropolitan Transportation Commission (Plan Bay Area 2050), the San Francisco Bay Regional Water Quality Control Board (San Francisco Basin Plan), and the San Francisco Bay Conservation and Development Commission (San Francisco Bay Plan). Because the proposed project consists of renovation of an existing vacant retail space and expansion of the existing rooftop mechanical penthouse, the proposed project's new Whole Foods Market grocery store would occur within an urban environment and, thus, would not be inconsistent with regional plans and policies.

D. Summary of Environmental Effects

The proposed project could potentially result in adverse physical effects on the environmental resources checked below. Where those impacts would be significant or potentially significant, CEQA requires that mitigation measures be identified to reduce the severity of the impacts to a less-than-significant level to the extent feasible. This initial study presents a more detailed checklist and discussion of each environmental resource, unless otherwise noted below.

☐ Land Use and Planning	☐ Wind	☐ Hydrology and Water Quality
☐ Population and Housing	☐ Shadow	☐ Hazards and Hazardous Materials
☐ Cultural Resources	☐ Recreation	☐ Mineral Resources
☐ Tribal Cultural Resources	☐ Utilities and Service Systems	☐ Energy
☐ Transportation and Circulation	☐ Public Services	☐ Agriculture and Forestry Resources
☒ Noise	☐ Biological Resources	☐ Wildfire
☒ Air Quality	☐ Geology and Soils	☒ Mandatory Findings of Significance
☐ Greenhouse Gas Emissions		

Approach to Analysis

This initial study examines the proposed project to identify potential effects on the environment. For each item on the initial study checklist, the evaluation has considered the impacts of the proposed project both individually and cumulatively. All items on the Initial Study checklist that have been checked "Less-than-Significant Impact with Mitigation Incorporated," "Less-than-Significant Impact," "No Impact," or "Not Applicable" indicate that, upon evaluation, the planning department has determined that the proposed project could not have a significant adverse environmental effect relating to that issue. A discussion is included for those issues checked "Less than Significant with Mitigation Incorporated" and "Less-than-Significant Impact," and for most items checked with "No Impact" or "Not Applicable." For all of the items checked "No Impact" or "Not Applicable" without discussion, the conclusions regarding potential significant adverse environmental effects are based upon field observation, staff experience and expertise on similar projects, and/or standard reference material available within the planning department, such as the *Transportation Impact Analysis Guidelines for Environmental Review* or the California Natural Diversity Database and maps, published by the California Department of Fish and Wildlife. The items checked above have been determined to be "Less than Significant with Mitigation Incorporated."

E. Evaluation of Environmental Effects

E.1 No Impact or Not Applicable Topics

The proposed project would have no impact on the following environmental topics: aesthetics, land use and planning, population and housing, cultural resources, tribal cultural resources, wind, shadow, recreation, biological resources, geology and soils, hydrology and water quality, mineral resources, agriculture and forestry resources, and wildfire. As a result, this initial study does not discuss these topics further, except that this section briefly describes why the proposed project would have no impact on these topics or they are not applicable to the proposed project.

AESTHETICS AND PARKING

In accordance with CEQA section 21099, Modernization of Transportation Analysis for Transit-Oriented Projects, aesthetics and parking shall not be considered in determining whether a project has the potential to result in significant environmental effects, provided the project meets all of the following three criteria:

- The project is in a transit priority area.
- The project is on an infill site.
- The project is residential, mixed-use residential, or an employment center.

The proposed project meets each of the above criteria; therefore, this initial study does not consider aesthetics or parking in determining the significance of project impacts under CEQA.[6] These topics are not applicable to the proposed project.

[6] San Francisco Planning Department, *Eligibility Checklist for CEQA Section 21099: Modernization of Transportation Analysis, Whole Foods at 2675 Geary Street* (hereinafter "*CEQA section 21099 Checklist*" (December 28, 2021).

AUTOMOBILE DELAY AND VEHICLE MILES TRAVELED

In addition, CEQA section 21099(b)(1) requires that the Governor's Office of Planning and Research (OPR) develop revisions to the CEQA Guidelines establishing criteria for determining the significance of transportation impacts of projects that "promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses." CEQA section 21099(b)(2) states that upon certification of the revised guidelines for determining transportation impacts under section 21099(b)(1), automobile delay, as described solely by level of service or similar measures of vehicular capacity or traffic congestion, shall not be considered a significant environmental impact under CEQA.

In January 2016, OPR published for public review and comment the Revised Proposal on Updates to the CEQA Guidelines on Evaluating Transportation Impacts in CEQA, which recommended measuring the transportation impacts of projects using a vehicle miles traveled (VMT) metric. [7,8] On March 3, 2016, in anticipation of the future certification of the revised CEQA Guidelines, the San Francisco Planning Commission adopted OPR's recommendation to use the VMT metric instead of automobile delay to evaluate the transportation impacts of projects (Resolution No. 19579). In January 2019, changes to the CEQA statutes and guidelines went into effect, including a new section 15064.3 that states that VMT is the most appropriate measure of transportation impacts and includes updated criteria for analyzing transportation impacts. The VMT metric does not apply to the analysis of project impacts on non-automobile modes of travel such as riding transit, walking, and bicycling. Therefore, the topic of automobile delay is not applicable to the proposed project.

LAND USE AND PLANNING (NO IMPACT)

This initial study checklist topic addresses whether a project would physically divide an established community or conflict with land use plans, policies, or regulations adopted for the purpose of mitigating an environmental effect.

The division of an established community typically involves the construction of a physical barrier to neighborhood access, such as a new freeway, or the removal of a means of access, such as a bridge or a roadway. The proposed project would renovate an existing 49,825-square-foot vacant retail space with a new Whole Foods Market grocery store. The proposed project would not permanently alter the established street grid or permanently close any streets or sidewalks; therefore, the proposed project would not physically divide an established community.

In addition, the proposed project would not conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect; therefore, the proposed project would have no impact with respect to land use and planning.

The proposed project would have no impact with respect to physically dividing a community or causing a significant physical environmental impact due to a conflict with an applicable land use plan, policy, or regulation adopted for the purpose of mitigating an environmental effect and, therefore, would not have the potential to contribute to a significant cumulative impact related to land use and land use planning.

[7] Governor's Office of Planning and Research, *Revised Proposal on Updates to the CEQA Guidelines on Evaluating Transportation Impacts in CEQA* (January 20, 2016), http://opr.ca.gov/docs/Revised_VMT_CEQA_Guidelines_Proposal_January_20_2016.pdf, accessed December 15, 2021.
[8] California Office of Planning and Research, *Technical Advisory on Evaluating Transportation Impacts in CEQA* (December 2018), https://opr.ca.gov/docs/20190122-743_Technical_Advisory.pdf.

POPULATION AND HOUSING (NO IMPACT)

This initial study checklist topic addresses whether a proposed project would induce substantial unplanned population growth or displace a substantial number of people or housing necessitating the construction of replacement housing elsewhere.

In general, a project would be considered growth-inducing if its implementation would result in substantial unplanned population increases, either through the development of new homes and businesses or through the construction of infrastructure, such as the extension of roads, that could lead to substantial new development.

The proposed project would renovate an existing vacant retail space with a new Whole Foods Market grocery store, and would employ approximately 200 people, or 35 to 40 employees per shift. Employment opportunities presented by the project are anticipated to be fulfilled by people who currently reside within San Francisco or the bay area and the project is not anticipated to attract new workers to San Francisco or the bay area. The project does not propose any housing and would not displace any existing housing units. Therefore, it would not necessitate the construction of replacement housing elsewhere.

For these reasons, the proposed project would not induce substantial unplanned population growth either directly or indirectly and would not displace any existing housing units. The proposed project would have no impact with respect to population and housing. Therefore, the proposed project would not have the potential to contribute to a significant cumulative impact related population and housing.

CULTURAL RESOURCES (NO IMPACT)

This initial study checklist topic addresses whether a proposed project would result in a significant impact to historic resources pursuant to CEQA Guidelines section 15064.5, including those resources listed in San Francisco Planning Code article 10 or 11, or archeological resources pursuant to CEQA Guidelines section 15064.5.

Historic Architectural Resources: The planning department prepared a Historic Resource Evaluation Response (HRER) on August 4, 2011, for the entire City Center shopping center and the six parking lots at 2675 Geary Boulevard. The HRER concluded that no historic resources are present.[9] Since the issuance of the HRER, the planning department published the *Neighborhood Commercial Buildings Historic Context Statement*, which did not identify this property as significant.[10] Additionally, the *San Francisco Modern Architecture and Landscape Design 1935–1970 Historic Context Statement* identified this property,[11] but it did not present new information that would change the previous determination in the HRER. Therefore, the subject property is not considered an historic resource. According to the San Francisco Property Information Map, there are no historic resources adjacent to the project site, and the nearest historic resource (2690-2696 Geary Boulevard) is located approximately 200 feet northwest of the project site. As stated in Section E.3, Noise, the proposed project would not require any excavation and would not require the use of vibration-generating equipment that would have the potential to cause building damage to adjacent structures, including the historic resource at 2690-2696 Geary Boulevard. For these reasons, the proposed project would have no impact on historic architectural resources.

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[9] San Francisco Planning Department, *Historic Resource Evaluation Response, 2675 Geary Boulevard* (August 4, 2011).
[10] San Francisco Planning Department, *Neighborhood Commercial Buildings Historic Context Statement 1865–1965* (February 17, 2016).
[11] San Francisco Planning Department, *San Francisco Modern Architecture and Landscape Design 1935–1970, Historic Context Statement* (January 12, 2011). The planning department developed the *San Francisco Modern Architecture and Landscape Design 1935–1970 Historic Context Statement* to identify the character-defining features of modern architectural and landscape design and documents significance, criteria considerations, and integrity thresholds.

Archeological Resources: The proposed project would not include any ground disturbance and therefore would not adversely affect any subsurface archeological resources. The project would have no impact on archeological resources. The proposed project would have no impact on cultural resources and, therefore, would not have the potential to contribute to a significant cumulative cultural resources impact.

TRIBAL CULTURAL RESOURCES (NO IMPACT)

This initial study checklist topic addresses whether a proposed project would result in a significant impact to tribal cultural resources. Pursuant to CEQA section 21074, tribal cultural resources are defined as sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are also either (a) included or determined to be eligible for inclusion in the California Register of Historical Resources or (b) included in a local register of historical resources as defined in CEQA section 5020.1(k). Pursuant to CEQA section 21080.3.1(d), on May 9, 2022, the San Francisco Planning Department contacted Native American individuals and organizations for the San Francisco area, providing a description of the proposed project and requesting comments on the identification, presence, and significance of tribal cultural resources in the project vicinity. During the 30-day comment period one Native American tribal representative requested consultation; however, despite a number of subsequent outreach attempts, the department has been unable to engage further with the representative at this time. [12]

The proposed project is a change of use within a vacant retail space in the City Center shopping center, and as such, would not include new construction, ground disturbance, or removal of native plants associated with natural water sources. In addition, the project is not within an area of known resource sensitivity; thus, no impact on tribal cultural resources would occur. The proposed project would have no impact on tribal cultural resources and, therefore, would not have the potential to contribute to a significant cumulative tribal cultural resources impact.

WIND (NO IMPACT)

This initial study checklist topic addresses whether a proposed project would create wind hazards in publicly accessible areas of substantial pedestrian use. The proposed project would consist of interior renovation of an existing vacant retail space and expansion of the existing rooftop mechanical penthouse. The mechanical penthouse on level 4 would accommodate new heating, ventilation, and air conditioning equipment, including a new 21-foot-tall cooling tower.

As discussed in Section E.3, Noise, the proposed project would require implementation of Mitigation Measure M-NO-3, which calls for sound walls around the cooling tower to attenuate noise. Pursuant to M-NO-3, the 10-foot-tall penthouse enclosure would be extended to the east and topped by a 7-foot-tall sound wall, creating a 17-foot-tall noise barrier at the section south of the new cooling tower (see Figure 5, p. 7) between the cooling tower and the existing rooftop playground for the Bright Horizons daycare facility, which occupies levels 4 and 5. The 10-foot-tall penthouse enclosure walls north of the new cooling tower would be topped with a 14-foot-tall noise barrier, creating a 24-foot-tall barrier on those sides. The rooftop equipment placed on level 4 would not exceed the height of the Bright Horizons daycare facility, which extends 16 feet above the proposed cooling tower.

[12] San Francisco Planning Department, *Tribal Notification Regarding Tribal Cultural Resources and CEQA* (May 9, 2022). The tribal representative who responded to the tribal notification letter has been added to the distribution list for further notifications related to the proposed project.

The existing mechanical penthouse would shield the enclosure expansion from the prevailing westerly and northwesterly winds. The proposed enclosure expansion and noise barriers required pursuant to Mitigation Measure M-NO-3 would be set back from the building edge and surrounded by the level 4 parking lot and would be shielded to the west by the existing mechanical penthouse. Therefore, the proposed expansions would have little potential to cause any changes to ground-level wind conditions and would not create wind hazards in publicly accessible areas of substantial pedestrian use; no wind hazard impact would occur. In addition, there are no cumulative projects close enough to the project site and of sufficient height to combine with the proposed project to create wind hazards in publicly accessible areas of substantial pedestrian use.[13] No significant cumulative wind impact would occur.

SHADOW (NO IMPACT)

This initial study checklist topic addresses whether a proposed project would create new shadow that substantially and adversely affects the use and enjoyment of publicly accessible open spaces. The proposed project would expand the existing rooftop mechanical penthouse horizontally to accommodate new heating, ventilation, and air conditioning equipment. As discussed above, pursuant to Mitigation Measure M-NO-3, a 17-foot-tall noise barrier would be installed at the section south of the new cooling tower between the expanded rooftop mechanical penthouse and the existing rooftop playground for the Bright Horizons daycare facility, which occupies levels 4 and 5. A 24-foot-tall noise barrier would be installed at the section north of the new cooling tower. Any shadow cast by the cooling tower, penthouse enclosure and noise barriers would fall within areas of shadow cast by the taller portions (level 5) of the City Center building, which extends 16 feet above the proposed cooling tower. Lastly, there are no public parks or open spaces in the project vicinity. Therefore, no shadow impact would occur. Since the proposed project would have no shadow impact on publicly accessible open spaces it would not contribute to a significant cumulative shadow impact.

RECREATION (NO IMPACT)

This initial study checklist topic addresses whether a proposed project would increase the use of recreational facilities such that substantial deterioration would occur or be accelerated and whether a project would include recreational facilities that would have an adverse physical effect on the environment.

The nearest parks to the project site are Laurel Hill Playground (0.2 mile northwest of the project site), Bush and Broderick Mini Park (0.3 mile northeast of the project site), and Raymond Kimbell Playground (0.5 mile east of the project site). The proposed project would renovate an existing retail space, employing approximately 200 people, or 35 to 40 people per shift. It is anticipated that employees would only visit these parks during brief periods limited to the lunch hour or other midday breaks, if at all. Intermittent use of these parks throughout the day by Whole Foods employees would not result in substantial physical deterioration of recreational facilities. In addition, the proposed project would not include construction or operation of any recreational facilities and would not have the potential to result in an adverse physical environmental effect from construction or operation of recreational facilities. The proposed project would have no impact on recreational facilities and, therefore, would not have the potential to contribute to a significant cumulative recreation impact.

[13] 2750 Geary would be 33 feet tall and 2800 Geary would be 65 feet tall. In general, projects over 85 feet have potential to result in wind impacts. Because neither cumulative project is over 85 feet, they wouldn't combine with the project to result in cumulative wind hazard impacts.

PUBLIC SERVICES (NO IMPACT)

This initial study checklist topic addresses whether a proposed project would result in the need for new or physically altered governmental facilities in order to maintain acceptable service ratios, response times, or other performance objectives for any public services. An impact would occur if the construction or physical alteration of governmental facilities for these public services would result in substantial adverse physical impacts.

The project site is within the service area of the fire department's Battalion 5, Stations 10 and 21.[14] Station 10 is located at 655 Presidio Avenue, approximately 0.2 mile north of the project site, and Station 21 is located at 1443 Grove Street, approximately 0.5 mile southeast of the project site. The project site is within the police department's Richmond Police District, and the closest police station is the Richmond Police Station at 461 Sixth Avenue, approximately 1 mile west of the project site.[15]

The proposed project is a change of use within a vacant retail space in the City Center shopping center and would employ approximately 200 people, or 35–40 employees per shift. The increased population at the project site resulting from the proposed project would incrementally increase demand for fire protection, emergency medical services, and police services. The proposed project would increase activity at the project site and would increase the daytime service population which could incrementally increase the number of fire, emergency, or police calls. However, the project site is within existing police and fire service areas and the City Center shopping center is currently being served by fire, emergency, and police services. The fire department and the building department would review building plans to ensure that the proposed project complies with the latest California Building Code requirements for life safety measures as specified in the San Francisco Fire Code. The proposed project would be required to comply with all applicable building and fire codes, which establish requirements for fire protection systems, such as to provide state-mandated smoke alarms, fire alarms, and sprinkler systems, fire extinguishers; the required number and locations of egress points with appropriate distance separation; and emergency response notification systems. Therefore, the proposed project would not result in the need for new or physically altered police or fire facilities in order to maintain acceptable service ratios or response times.

The proposed project does not include any residential development and would not increase demands on public schools. As such, there would be no impact related to the need for new or physically altered government facilities.

The proposed project would have no impact related to the need for new or physically altered government facilities and, therefore, would not have the potential to contribute to a significant cumulative public services impact.

BIOLOGICAL RESOURCES (NO IMPACT)

This initial study checklist topic addresses whether a project would result in a significant impact to biological resources.

The project site is in a developed shopping center and in an urban area with high levels of human activity. Due to the existing development on the project site, the site does not include trees, nor does it provide

[14] San Francisco Fire Department, Fire Station Locations, http://sf-fire.org/fire-station-locations, accessed December 7, 2021.
[15] San Francisco Police Department, Richmond Station, https://www.sanfranciscopolice.org/stations/richmond-station, accessed November 11, 2021.

habitat for any rare or endangered plant or wildlife species. Therefore, the proposed project would have no impact on special-status species; riparian habitat; state or federally protected wetlands; native resident or migratory fish, or wildlife species; established native resident or migratory wildlife corridors; and would not conflict with local policies or ordinances protecting biological resources. The proposed project would have no impact on biological resources and, therefore, would not have the potential to contribute to a significant cumulative biological resources impact.

GEOLOGY AND SOILS (NO IMPACT)

This initial study checklist topic addresses whether a project would result in a significant impact related to various geology and soils concerns and to paleontological or unique geologic features.

The project site is in a developed shopping center and would consist of an interior renovation of an existing vacant retail space and expansion of the existing rooftop mechanical penthouse. Construction activities would not involve ground disturbance or subsurface work; therefore, the proposed project would not exacerbate risks of landslide or liquefaction, nor would it increase the potential for surface rupture. Additionally, the proposed project would not result in the loss of topsoil, cause erosion, or affect unique geologic features or paleontological resources. Therefore, the proposed project would have no impact on geology and soils. The proposed project would have no impact on geology and soils and, therefore, would not have the potential to contribute to a significant cumulative impact on geology and soils.

HYDROLOGY AND WATER QUALITY (NO IMPACT)

This initial study checklist topic addresses whether a project would result in a significant impact related to water quality, groundwater supplies and other environmental concerns related to altering drainage patterns.

The project site is not in a special flood hazard area as identified on the city's interim floodplain maps.[16] The project site is not in a tsunami hazard area, dam failure area, seiche hazard area, or located in a landslide-prone area.[17] The project site is in a developed shopping center and would consist of an interior renovation of an existing vacant retail space and expansion of the existing rooftop mechanical penthouse. The project site is already served by a combined stormwater and sewer system. Stormwater and wastewater from the project site would continue to be discharged to the underground piping network, which conveys the waters to the Southeast Water Pollution Control Plant for treatment and discharge in accordance with the City's National Pollutant Discharge Elimination System (NPDES) Permit (regional board Order No. R2-2013-0029/NPDES Number CA0037664). The proposed project would not involve ground disturbance; thus, groundwater would not be encountered during construction and groundwater supplies would not be depleted. The proposed rooftop mechanical penthouse horizontal expansion would not change the amount of impervious surface on the project site or alter drainage patterns. The proposed project would not degrade surface water or groundwater quality or violate water quality standards and waste discharge requirements. Therefore, the proposed project would have no impact on hydrology and water quality and would not have the potential to contribute to a significant cumulative hydrology or water quality impact.

[16] City and County of San Francisco, *San Francisco Interim Floodplain Map*, Southwest, Preliminary (November 12, 2015).
[17] City and County of San Francisco, *Community Safety Element of the San Francisco General Plan* (2012), Map 4 (Seismic Hazard Zones San Francisco) and Map 5 (Tsunami Hazard Zones San Francisco), https://generalplan.sfplanning.org/Community_Safety_Element_2012.pdf, accessed December 15, 2021.

MINERAL RESOURCES (NOT APPLICABLE)

The project site is not located in an area with known mineral resources and would not extract mineral resources. Therefore, this topic is not applicable to the proposed project and the project would not have the potential to contribute to any cumulative mineral resource impact.

AGRICULTURE AND FORESTRY RESOURCES (NOT APPLICABLE)

The project site is within an urbanized area in the city that does not contain any prime farmland, unique farmland, or farmland of statewide importance; forest land; or land under Williamson Act contract. The area is not zoned for any agricultural uses. Therefore, this topic is not applicable to the proposed project and the project would not have the potential to contribute to any cumulative impact on agriculture or forestry resources.

WILDFIRE (NOT APPLICABLE)

The project site is not located in or near state responsibility lands for fire management or lands classified as very high fire hazard severity zones. Therefore, this topic is not applicable to the proposed project and the project would not have the potential to contribute to any cumulative impact on wildfire.

E.2 Transportation and Circulation

Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact	Not Applicable
2. TRANSPORTATION AND CIRCULATION. Would the project:					
a) Involve construction that would require a substantially extended duration or intensive activity, and the effects would create potentially hazardous conditions for people walking, bicycling, or driving, or public transit operations; or interfere with emergency access or accessibility for people walking or bicycling; or substantially delay public transit?	☐	☐	☒	☐	☐
b) Create potentially hazardous conditions for people walking, bicycling, or driving or public transit operations?	☐	☐	☒	☐	☐
c) Interfere with accessibility of people walking or bicycling to and from the project site, and adjoining areas, or result in inadequate emergency access?	☐	☐	☒	☐	☐
d) Substantially delay public transit?	☐	☐	☒	☐	☐
e) Cause substantial additional vehicle miles traveled or substantially induce additional automobile travel by increasing physical roadway capacity in congested areas (i.e., by adding new mixed-flow travel lanes) or by adding new roadways to the network?	☐	☐	☒	☐	☐

Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact	Not Applicable
f) Result in a loading deficit, and the secondary effects would create potentially hazardous conditions for people walking, bicycling, or driving; or substantially delay public transit?	☐	☐	☒	☐	☐
g) Result in a substantial vehicular parking deficit, and the secondary effects would create potentially hazardous conditions for people walking, bicycling, or driving; or interfere with accessibility for people walking or bicycling or inadequate access for emergency vehicles; or substantially delay public transit?	☐	☐	☐	☐	☒

This evaluation of potential transportation and circulation impacts was prepared in accordance with the department's San Francisco Transportation Impact Analysis Guidelines for Environmental Review (SF Guidelines).[18] Additional technical information related to project trip generation, freight loading, and passenger loading is provided in **Appendix A**. The department evaluated the proposed project's eligibility under CEQA section 21099(d)(1) and determined that further analysis of secondary impacts due to a vehicular parking deficit are not required.[19] As such, topic E.1(g) related to vehicle parking is not applicable to the proposed project and this topic is not discussed further in this initial study.

TRANSPORTATION SETTING

The project site encompasses most of level 3 within the City Center shopping center which has frontages along Geary Boulevard, Masonic Avenue, Lyon Street, and O'Farrell Street. Geary Boulevard is on the High Injury Network.[20] The segments of Geary Boulevard, Masonic Avenue and Lyon Street that are adjacent to the project site are identified as Key Walking Streets in the department's WalkFirst program.[21]

There are four bicycle routes on the San Francisco Bikeway Network within 250 feet of the project site: Geary Boulevard (Class III), Masonic Avenue (Class II and IV), Presidio Boulevard (Class III), and Lyon Street.[22]

[18] San Francisco Planning Department, *Transportation Impact Analysis Guidelines for Environmental Review* (February 2019, updated October 2019), https://sfplanning.org/project/transportation-impact-analysis-guidelines-environmental-review-update#impact-analysis-guidelines.
[19] San Francisco Planning Department, *Eligibility Checklist: CEQA Section 21099 Modernization of Transportation Analysis – Whole Foods at 2675 Geary Boulevard Project* (December 28, 2021).
[20] San Francisco Department of Public Health, *Vision Zero High Injury Network: 2017* (2017), https://sfgov.maps.arcgis.com/apps/webappviewer/index.html?id=fa37f1274b4446f1bdddd7bdf9e708ff, accessed March 15, 2022.
[21] San Francisco Planning Department, WalkFirst Map of Key Walking Streets, https://default.sfplanning.org/Citywide/WalkFirst/phase3/WalkFirst_Key_Walking_Streets.pdf, accessed March 15, 2022. "Key Walking Streets" are defined as streets where people are walking, in the General Plan.
[22] San Francisco Municipal Transportation Authority, San Francisco Bike Network Map, https://www.sfmta.com/maps/san-francisco-bike-network-map, accessed March 15, 2022.

The General Plan classifies Geary Boulevard as a Transit Important Street.[23,24] The following Muni lines have stops within one-quarter mile of the project site: 31 Balboa, 38 Geary, 38R Geary Rapid, 43 Masonic. The nearest Muni stops are near the intersection of Geary Boulevard and Masonic Avenue (serving the 38 Geary, 38R Geary Rapid, and 43 Masonic routes).[25]

The City Center shopping center is surrounded by a large, paved apron, which includes 634 vehicle parking spaces (in lots A through F), six off-street freight loading spaces, and approximately 98 bicycle parking spaces. The existing parking lot E on level 3, which contains 117 parking spaces, would be available for Whole Foods customers. A continuous sidewalk within the public right-of-way runs around the perimeter of the shopping center property.

PROJECT TRAVEL DEMAND

The following travel demand analysis estimates the number of new trips that would result from implementation of the proposed project. Estimated weekday project person trip generation was prepared pursuant to methodologies outlined in the SF Guidelines and included the use of data collected at other Whole Foods Market stores in San Francisco. The proposed project is expected to generate approximately 16,124 daily weekday person trips, of which 1,177 would occur during the p.m. peak hour.[26] **Table 3** show the mode splits for the proposed project's estimated weekday trip generation, which includes people traveling to the project site by automobile, transit, walking, bicycling, taxi or transportation network company (TNC), and private shuttle.

Table 3 Weekday Travel Demand

Mode Choice	Daily Trips	P.M. Peak Hour Trips
Automobile	4,176	305
TNC/Taxi	226	16
Muni Bus/Rail	1,903	139
Bicycle	451	33
Walking	9,287	678
Private Shuttle	81	6
Total Person Trips	16,124	1,177
Vehicle Trips[a]	2,620	216
Total Vehicle Trips (Private Vehicles + TNC/Taxi)	2,846	232

SOURCE: Kittelson Associates (2022), Appendix A

[a] Vehicle Trips = Automobile Person Trips/Average Vehicle Occupancy

[23] According to the General Plan, transit important streets are streets where dedicated bus lanes and Bus Rapid Transit lanes should be installed to expedite transit travel times and improve transit reliability.

[24] San Francisco Planning Department, *San Francisco General Plan*, Transportation Element (2018), Map 9: Transit Preferential Streets, https://generalplan.sfplanning.org/images/I4.transportation/tra_map9.pdf, accessed March 15, 2022.

[25] Under MTA's COVID-19 Muni Core Service Plan: the 31 Balboa and the 43 Masonic are currently operating on shortened routes.

[26] A person trip is a one-way trip to or from the site; e.g., 500 visitors per day equates to 1,000 daily person trips, assuming each visitor makes a trip to and from a site. The p.m. peak hour is defined as the one-hour period with the highest volume of vehicular traffic between the hours of 3 p.m. and 7 p.m.

FREIGHT LOADING DEMAND

The following loading demand calculations are based on data collected from various existing Whole Foods Market stores in San Francisco, detailed information and calculations are included in Appendix A. The number of deliveries on an average weekday is based on a rate of one delivery per 1,000 gross square feet. For the proposed project, 54 deliveries per day would be expected.[27] Based on observed data at the 2001 Market Street Whole Foods location, the maximum dwell time per vehicle was approximately 30 minutes.

Impact TR-1: Construction of the proposed project would not require a substantially extended duration or an intense activity. ***(Less than Significant)***

The SF Guidelines set forth screening criteria for types of construction activities that would typically not result in significant construction-related transportation effects based on project site context[28] and construction duration and magnitude. Construction of the proposed project is anticipated to occur over a 10-month period. Construction activities would include demolishing interior walls, flooring, and some areas of the ceiling; expanding the rooftop mechanical penthouse and installing rooftop HVAC equipment; and constructing new interior walls and partitions for restrooms and back-of-house space (employee office, lounge, and locker rooms). Other activities would include reconfiguring the interior space and installing furniture and equipment to support the grocery store and installation of exterior signage.

The proposed project would result in limited interior demolition and exterior construction activities and no excavation. Therefore, construction activities would require low volumes of materials to be exported from or imported to the project site. Furthermore, project construction and staging are anticipated to occur within the existing vacant retail space and/or within parking lots C and E and would not encroach into the public right-of-way on O'Farrell Street. Given the project site context and construction duration and magnitude, the project meets the SF Guidelines screening criteria. For these reasons, construction of the proposed project would result in a ***less-than-significant*** transportation impact.

Impact TR-2: The proposed project would not create potentially hazardous conditions for people walking, bicycling, or driving or public transit operations. ***(Less than Significant)***

The project would add 232 p.m. peak hour vehicle trips. These vehicle trips would likely start from or end at loading areas close to the store entrance or elsewhere within parking lot Cand be dispersed along nearby streets. This number of vehicle trips that would be accessing the driveway and crossing over the sidewalk is not substantial. In addition, the proposed project would not result in changes to pedestrian or bicycle facilities, transit stops or lanes, or roadways. Further, the proposed project would not result in changes to curb cuts, site access, or onsite circulation. Therefore, the proposed project would result in a ***less-than-significant*** impact with respect to potentially hazardous conditions for people walking, bicycling, or driving or public transit operations.

[27] The freight loading calculation is based on a 54,290-square-foot floor area. The proposed project's floor area would be 49,285 square feet; therefore, the number of freight deliveries are likely lower than estimated here.

[28] "Site context" in relation to construction transportation analysis refers to how people travel to and around the project area and how that may be affected by construction activities. Site context is further defined in the Appendix N of the 2019 guidelines (see Attachment A of Appendix N), available at https://sfplanning.org/project/transportation-impact-analysis-guidelines-environmental-review-update#impact-analysis-guidelines, accessed June 1, 2022.

Impact TR-3: The proposed project would not interfere with accessibility for people walking or bicycling to and from the project site and adjoining areas and would not result in inadequate emergency access. ***(Less than Significant)***

The project would add 232 p.m. peak hour vehicle trips. These vehicle trips would likely start from or end at loading areas close to the store entrance or elsewhere within parking lot C and be dispersed along nearby streets. The project's driveways would be able to accommodate the anticipated number of vehicle trips without blocking access to a substantial number of people walking within the sidewalk. Given that project-generated vehicle trips would not be substantial, the proposed project is also not expected to result in inadequate emergency access. Additionally, adequate access to the City Center shopping center is already provided via existing bikeways, sidewalks, streets and curb cuts and no changes to the public-right-of way, site access, or onsite circulation are proposed. Therefore, the proposed project would result in a ***less-than-significant*** impact with respect to accessibility for people walking or bicycling to and from the project site and adjoining areas, and emergency access.

Impact TR-4: The proposed project would not substantially delay public transit. ***(Less than Significant)***

The SF Guidelines set forth a screening criterion for projects that would typically not result in significant public transit delay effects. As shown above in Table 3, p. 24, the proposed project would generate an estimated 216 trips by private vehicle and 16 trips by taxi or transportation network company, for a total of 232 vehicle trips during the p.m. peak hour. Given that the number of new vehicle trips is below the department's screening criterion of 300 trips during the p.m. peak hour, the proposed project would not substantially delay public transit. Further, the proposed project's driveway is located on a section of O'Farrell Street (just east of Anzavista Avenue and approximately 500 feet from the Masonic Avenue intersection), which is not along a Muni route, or adjacent to a Muni stop location. Therefore, the proposed project would result in a ***less-than-significant*** impact with respect to public transit delay.

Impact TR-5: The proposed project would not cause substantial additional vehicle miles traveled or substantially induce additional automobile travel by increasing physical roadway capacity in congested areas (i.e., by adding new mixed-flow travel lanes) or by adding new roadways to the network. ***(Less than Significant)***

A project would have a significant transportation impact if it would cause substantial additional VMT or substantially induce automobile travel. VMT per person (or per capita) is a measurement of the amount and distance that a resident, employee, or visitor drives, accounting for the number of passengers within a vehicle. The city displays different amounts of VMT per capita geographically through TAZs. The San Francisco County Transportation Authority uses the San Francisco Chained Activity Model Process (SF-CHAMP) to estimate VMT by private automobiles and taxis for different TAZs.

The proposed project is infill development within an existing shopping center and does not include any changes to the public right-of-way. Therefore, the proposed project would not substantially induce additional automobile travel by increasing physical roadway capacity in congested areas (i.e., by adding new mixed-flow travel lanes) or by adding new roadways to the network.

The SF Guidelines set forth screening criteria for types of projects that would typically not result in significant VMT impacts. The project site is an area where existing VMT per capita is more than 15 percent below the existing regional per employee average. The project meets this locational screening criterion. The

project also meets the proximity to transit screening criterion.[29] The project site is within one-half mile of an existing major transit stop or an existing stop along a high-quality transit corridor and the project meets other characteristic requirements. Therefore, the project would have a ***less-than-significant*** VMT impact and mitigation measures are necessary.

Impact TR-6: The proposed project would not result in a loading deficit. ***(Less than Significant)***

FREIGHT LOADING

During the average day, the project's freight and delivery loading demand is 54 trips. The proposed project would receive freight deliveries in a staffed receiving area from an existing 3,528-square-foot loading dock at the north end of lot E (see Figure 2, p. 3). Alternatively, the proposed project would have staff or delivery drivers hand cart freight deliveries to the receiving area from vehicles parked in parking spaces in lot E. Lot E is accessed from O'Farrell Street at the second driveway east of Anzavista Avenue. All delivery vehicles would use this driveway for both ingress and egress. There are four stalls within the existing loading dock, each of which can accommodate a 65-foot tractor trailer. Two stalls are currently used by Target, and the other two would be dedicated to Whole Foods Market.

Whole Foods Markets receive deliveries from vehicles of several different sizes grouped as 65-foot (tractor trailer), 30- to 48-foot vehicles, and vehicles under 30 feet long. Each vehicle type has a different height and loading door configuration; some vehicles load from the tailgate and others from a side door. Larger trucks, such as tractor trailers have bed heights that closely align with 48-inch-high platforms; loading dock platforms most commonly are 44 to 48 inches high.[30] Loading docks designed to accommodate these larger rear-loading vehicles are not designed to accommodate smaller and/or side-loading delivery vehicles; these vehicles would deliver from the parking lot and hand cart goods to the receiving area, via a freight elevator.

Of the 54 daily freight trips, 50 percent (27 trips) would be received via the loading dock, and the other 50 percent (27 trips) via lot E. This equates to a total loading dock demand of approximately 13.5 hours per day (27 deliveries x 0.5 hours each = 13.5 hours). Given that two loading docks would be available, the demand per dock would be 6 hours and 45 minutes per dock per day (13.5 hours/2 docks = 6.75 hours/dock). As proposed, deliveries would be received between the hours of 5 a.m. and 3 p.m., a 10-hour period, which is greater than the demand.

If both docks were occupied and additional delivery vehicles arrived, there would be adequate space within lot E for additional trucks to queue, without spillover into the public right-of- way (see Figure 2). Lot E provides access to the loading docks for 65-foot tractor trailers and has wide drive aisles and large concrete aprons surrounding the loading dock and the freight elevator which allow adequate queuing space for multiple vehicles.

Given that the loading demand would be accommodated on-site, no loading deficit would occur. Therefore, the proposed project would have a ***less-than-significant*** impact related to freight loading. No mitigation measures are necessary.

[29] San Francisco Planning Department, Senate Bill 743 CEQA section 21099, Vehicle Parking Checklist (December 28, 2021).
[30] safetyandhealthmagazine.com, OSHA loading dock requirements, *Safety+Health* Magazine, (https://www.safetyandhealthmagazine.com/articles/16472-osha-loading-dock-requirements, accessed May 25, 2022.

PASSENGER LOADING

The proposed project would not result in a passenger loading deficit since there is adequate space within the existing parking lot (lot E), including a generous curb space along the building entrance, for passenger loading operations to occur. Given that passenger loading for the proposed grocery store use is most likely to occur close to the store entrance or elsewhere within the parking lot rather than within the public right-of-way, no passenger loading deficit would occur. As such, the proposed project would have a ***less-than-significant*** impact related to passenger loading. No mitigation measures are necessary.

Impact C-TR-1: The proposed project, in combination with cumulative projects, would not result in significant cumulative impacts related to transportation and circulation. ***(Less than Significant)***

There are no cumulative projects that would occur within the same block as the proposed project; therefore, no cumulative construction impacts would occur, and no additional analysis is required.

As discussed above, adequate access to the City Center shopping center is already provided via existing bikeways, sidewalks, streets and curb cuts. There are no proposed changes to the public-right-of way, site access, or onsite circulation proposed as part of project and there are no cumulative projects within or adjacent to the shopping center that would: affect the public right-of-way, create new hazards, or affect access to the project site. Therefore, the project, in combination with cumulative projects, would not result in significant cumulative potentially hazardous conditions and accessibility impacts.

Public transit delay typically occurs from traffic congestion, including transit reentry, and passenger boarding delay. The project would add 232 p.m. peak hour vehicle trips and 139 p.m. peak hour transit trips. These trips would be dispersed along surrounding streets including Masonic Avenue, Geary Boulevard and O'Farrell Street, and among several transit lines, including the 38 Geary, the 38R Geary Rapid, and the 43 Masonic. As such, this minor number of trips would not contribute considerably to a significant cumulative transit delay impact.

VMT by its nature is largely a cumulative impact. As described above, the project would meet the project-level screening criteria and therefore would not result in a significant VMT impact. Furthermore, the project site is an area where projected year 2040 VMT per capita is more than 15 percent below the future regional average both per capita and per employee; therefore, no significant cumulative VMT impact would occur.

As discussed above, the proposed project's passenger and freight loading demand would be accommodated within the City Center shopping center in lot C and lot E, respectively, and the proposed project would not result in a significant passenger or freight loading deficit. Given that the proposed project would have dedicated loading areas within the shopping center and would not rely on on-street loading zones, the project, in combination with cumulative projects, would not result in a significant cumulative loading impact.

In summary, the proposed project, in combination with cumulative projects, would not result in cumulative impacts to construction, hazardous conditions and accessibility, public transit delay, VMT, or loading. Therefore, the proposed project would result in a ***less-than-significant*** cumulative impact related to transportation and circulation. No mitigation measures are necessary.

E.3 Noise

Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact	Not Applicable
3. NOISE. Would the project result in:					
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☒	☐	☐	☐
b) Generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☐	☒	☐
c) For a project located within the vicinity of a private airstrip or an airport land use plan area or, where such a plan has not been adopted, in an area within two miles of a public airport or public use airport, would the project expose people residing or working in the area to excessive noise levels?	☐	☐	☐	☐	☒

NOTE: The project site is not within the vicinity of a private airstrip or within 2 miles of a public airport or public use airport; therefore, topic 3(c) is not applicable.

ENVIRONMENTAL SETTING

The ambient noise environment in the City and County of San Francisco is affected by a variety of noise sources, including auto traffic on arterial streets. The following section defines common acoustical terms, identifies noise sensitive receptors in the project vicinity, and describes the existing noise environment in the vicinity of the project site. The existing noise environment relies on information provided in a noise study[31] prepared for the proposed project.

Table 4 defines common acoustical terms used in this section.

[31] Salter, *2675 Geary Boulevard – Whole Foods Market Noise Measurement Results and Initial Recommendations* (May 27, 2022).

Table 4 Definitions of Acoustical Terms

Term	Definitions
Decibel, dB	A measure of sound on a logarithmic scale that indicates the squared ratio of sound pressure amplitude to a reference sound pressure amplitude. The reference pressure is 20 micropascals.
A-Weighted Sound Level, dBA	The A-weighted sound pressure level, expressed in decibels (dB). Sometimes the unit of sound level is written as dBA. A weighting is a standard weighting that accounts for the sensitivity of human hearing to the range of audible frequencies.
Ambient Noise Level	The lowest sound level repeating itself during a minimum ten-minute period. The minimum sound level shall be determined with the noise source at issue silent, and in the same location as the measurement of the noise level of the source or sources at issue. The department of public health considers the ambient noise level, for purposes of enforcement of article 29 of the police code, under most conditions, the L_{90} (the level of noise exceeded 90% of the time) to be a conservative representation of the ambient noise level.
L_n	The sound level exceeded for a stated percentage (n) of a specified measurement period. L_{10}, L_{50}, and L_{90} are the levels exceeded 10, 50, and 90 percent of the time, respectively.
Equivalent Continuous Noise Level, L_{eq}	The level of a steady sound that, in a stated time period and at a stated location, has the same A-weighted sound energy as the time varying sound.
Day/Night Noise Level, L_{dn}	(Day-Night Average Sound Level) – A descriptor for a 24-hour A-weighted average noise level. DNL accounts for the increased acoustical sensitivity of people to noise during the nighttime hours. DNL penalizes sound levels by 10 dB during the hours from 10 p.m. to 7 a.m. DNL is sometimes written as L_{dn}.

SOURCE: San Francisco Department of Public Health, *San Francisco Police Code Article 29: Regulation of Noise Guidelines for Noise Control Ordinance Monitoring and Enforcement* (December 2014), https://www.sfdph.org/dph/files/EHSdocs/ehsNoise/GuidelinesNoiseEnforcement.pdf, accessed May 4, 2022.

NOISE-SENSITIVE RECEPTORS

Certain land uses are considered more sensitive to noise than others. Examples of these include residential areas, educational facilities, religious institutions, hospitals, childcare facilities, senior housing, hotels, and motels. The project site is located within the City Center shopping center, which contains primarily retail uses. However, levels 4 and 5 contain the Bright Horizons daycare facility, which is considered a noise sensitive receptor. The daycare facility includes an outdoor playground on level 4, which is the same level where the proposed project's mechanical equipment would be located.

The surrounding neighborhood also contains noise sensitive land uses. Nearby noise sensitive land uses include residential buildings, the Kaiser San Francisco Medical Center, the Raoul Wallenberg Traditional High School, and the Epiphany Center, a recovery institution. Sagebrook Senior Assisted Living is also located approximately 0.1 mile northwest of the project site at 2750 Geary Boulevard and the University of San Francisco campus is located approximately 0.2 mile to the southwest of the project site. Therefore, the project site and surrounding area contains land uses that are sensitive to noise.

AMBIENT NOISE LEVELS

To assess existing noise levels, noise monitoring was conducted as part of the noise study to establish the existing ambient noise environment around the project site. Three long-term (24-hour) and three short term noise measurements were conducted on and near the project site on January 25 and 26, 2022.[32] As shown in **Figure 7**, long-term measurement 1 (LT-1) is located near the north property plane at Geary Boulevard and Presidio Avenue, LT-2 is located near the west property plane along Masonic Avenue, and LT-3 is located along the south property plane along O'Farrell Street and Anzavista Avenue. Long term noise measurement data are summarized in **Table 5**. As shown in Table 5, the long-term noise measurements indicate that ambient noise levels in the project site vicinity range from approximately 61 to 69 dBA L_{eq} and 42 to 47 dBA L_{90}. However, pursuant to San Francisco Police Code Article 29 (discussed below), ambient noise levels are considered to be no less than 45 dBA; thus, L_{90} ambient noise levels around the project site range from 45 to 47 dBA.[33] The long-term measurements show daily noise levels of 63 dBA to 71 dBA L_{dn}. Vehicle traffic on surrounding roadways is the primary noise source at these locations.

Table 5 Ambient Noise Monitoring Results, dBA

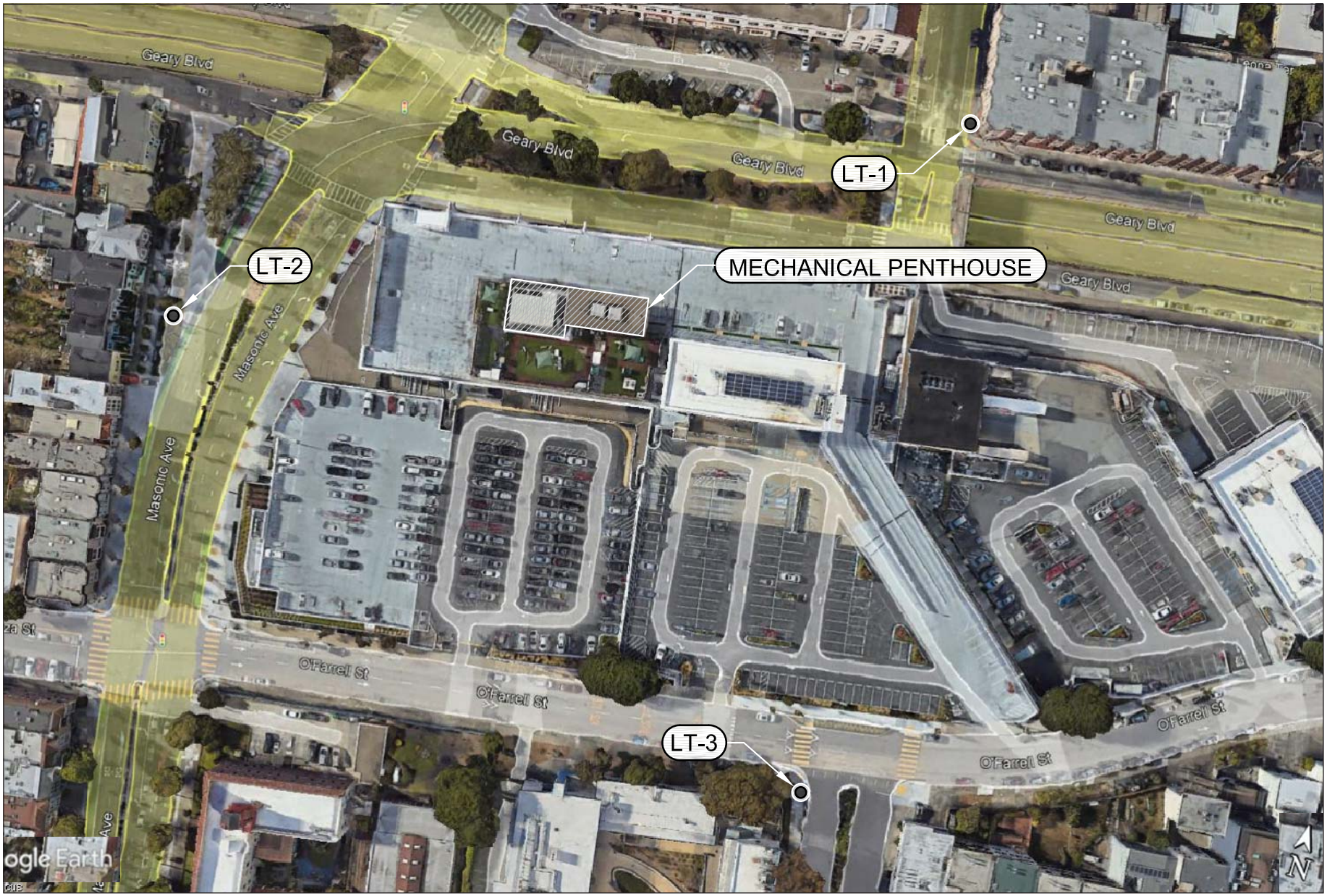
Location No.	Location Description	Minimum L_{90} (1 hr)[a]	DNL[b]	Average Daytime L_{eq} (1 hr)[c]	Average nighttime L_{eq} (1 hr)[c]
LT-1	Geary Boulevard/ Presidio Avenue	47	71	69	61
LT-2	Masonic Avenue	42	70	69	60
LT-3	O'Farrell Street/ Anzavista Avenue	46	63	61	52

SOURCE: Salter, *2675 Geary Boulevard – Whole Foods Market Noise Measurement Results and Recommendations, Salter Project 21-0548* (May 27, 2022)

[a] L_{90} is the fast A-weighted noise level equaled or exceeded by a fluctuating sound level for 90 percent of a stated time period.
[b] DNL is a descriptor for a 24-hour A-weighted average noise level. DNL accounts for the increased acoustical sensitivity of people to noise during the nighttime hours. DNL penalizes sound levels by 10 dB during the hours from 10 p.m. to 7 a.m.
[c] L_{eq} is the equivalent steady-state sound level containing the same total acoustical energy as a time-varying signal over a given sample period.

Noise from the existing mechanical equipment serving the project space does not contribute to the noise environment at these locations. Therefore, three short term noise measurements were conducted at the childcare facility's rooftop outdoor playground to quantify the noise environment near the existing mechanical equipment. **Figure 8**, p. 33, shows the locations of the three short-term noise measurements. Existing mechanical equipment noise ranges between 51 and 57 dBA at the childcare facility's outdoor playground. The overall existing equipment noise is clearly audible. The equipment specific to the former tenant at the project space (Best Buy) contributes somewhat to the overall noise levels.

[32] Noise monitoring occurred during the COVID-19 pandemic, which may result in lower than pre-pandemic ambient noise levels from reduced traffic or construction noise but reflects the best information available under current conditions. A lower ambient noise level would result in a conservative (worst-case) evaluation of the proposed project's potential noise impact as there would be a greater potential for increased ambient noise levels.
[33] City and County of San Francisco, San Francisco Police Code section 2901(a) (2012), https://codelibrary.amlegal.com/codes/san_francisco/latest/sf_police/0-0-0-6469, accessed May 27, 2022.



SOURCE: Salter 2022

Whole Foods at 2675 Geary Boulevard Project

FIGURE 7
LONG-TERM NOISE MEASUREMENT LOCATIONS



SOURCE: Salter 2022

Whole Foods at 2675 Geary Boulevard Project

FIGURE 8
SHORT-TERM NOISE MEASUREMENT LOCATIONS

REGULATORY SETTING

Noise is regulated by the City of San Francisco Police Code Article 29 (noise ordinance). Section 2907 of the noise ordinance requires that noise levels from individual pieces of construction equipment, other than impact tools, not exceed 80 dBA at a distance of 100 feet from the source. Impact tools are not subject to the equipment noise limit provided that impact tools and equipment shall have intake and exhaust mufflers recommended by the manufacturers and are approved by the Director of Public Works or the Director of Building Inspection as best accomplishing maximum noise attenuation. Pavement breakers and jackhammers shall also be equipped with acoustically attenuating shields or shrouds recommended by the manufacturers and approved by the Director of Public Works or the Director of Building Inspection as best accomplishing maximum noise attenuation.

Section 2908 of the noise ordinance prohibits construction work between 8 p.m. and 7 a.m., if noise would exceed the ambient noise level by 5 dBA at the project property line, unless a special permit is authorized by the director of public works or the director of building inspection. The proposed project is required to comply with section 2907 and 2908 of the city's noise ordinance.

Section 2909 of the noise ordinance regulates noise from mechanical equipment and other similar sources. This includes all equipment that is installed on commercial/industrial and residential properties. Section 2909 states in subsection (b) that mechanical equipment operating on commercial or industrial property must not produce a noise level more than 8 dBA above the ambient noise level at the property plane. Section 2909 also states in subsection (d) that no fixed (permanent) noise source (as defined by the noise ordinance) may cause the noise level inside any sleeping or living room in a dwelling unit on residential property to exceed 45 dBA between 10 p.m. and 7 a.m. or 55 dBA between 7 a.m. and 10 p.m. when windows are open, except where building ventilation is achieved through mechanical systems that allow windows to remain closed.

IMPACTS AND MITIGATION MEASURES

Impact NO-1: The proposed project would not generate excessive groundborne vibration or groundborne noise levels. ***(No Impact)***

The proposed project would renovate an existing vacant retail space with a new Whole Foods Market grocery store. Proposed construction would not require the use of any vibratory equipment. Additionally, operational vibration is generally caused by new rail or transit projects, including projects involving above ground rail or transit lines and underground tunnels. The proposed project does not involve these uses. As such, the proposed project would have ***no impact*** with respect to generating excessive groundborne vibration or groundborne noise.

Impact NO-2: Construction of the proposed project would not result in a substantial temporary increase in ambient noise levels in the project vicinity in excess of applicable standards. ***(Less than Significant)***

Construction of the proposed project is anticipated to occur over a 10-month period and would include demolishing interior walls, flooring, and some areas of the ceiling; expanding the rooftop mechanical penthouse and installing rooftop HVAC equipment; and constructing new interior walls and partitions for restrooms and back-of-house space (employee office, lounge, and locker rooms). Other activities would

include reconfiguring the interior space and installing furniture and equipment to support the grocery store and installation of exterior signage.

The proposed project's construction activities would cause a temporary increase in noise levels in the immediate vicinity of the project site. Construction noise levels would fluctuate depending on the equipment being used, duration of use, distance to sensitive receptors, and the presence (or absence) of physical barriers. Impacts would generally be limited to the expansion of the rooftop mechanical penthouse because interior construction noise associated with renovation activities would be substantially reduced by the exterior walls. The amount of construction noise generated at any one time would vary depending on the types of construction activities underway, numbers and types of pieces of equipment and duration of use, distance between noise source and listener, and presence or absence of barriers between the noise source and the receptors.

As discussed above, construction noise is regulated by the noise ordinance (article 29 of the Police Code). Section 2907 of the ordinance requires that noise levels from individual pieces of construction equipment, other than impact tools, not exceed 80 dBA at a distance of 100 feet from the source. Impact tools (e.g., jackhammers, hoe rams, impact wrenches) must have manufacturer-recommended and city-approved mufflers for both intake and exhaust. Section 2908 of the noise ordinance prohibits construction work between 8 p.m. and 7 a.m., if noise would exceed the ambient noise level by 5 dBA at the project property line, unless a special permit is authorized by the director of the department of public works or the director of building inspection. The project would be required to comply with regulations set forth in the noise ordinance.

Nearby sensitive receptors would likely experience temporary and intermittent increases in noise levels associated with construction activities at the project site. Although construction activities are a common occurrence in an urban environment, such as the project site, construction equipment would generate noise that could be considered an annoyance by occupants of adjacent and nearby uses. However, as described above, construction activities would be temporary, lasting only 10 months and consisting of mostly interior renovation. Further, compliance with the noise ordinance would ensure that the proposed project would not result in a substantial temporary increase in ambient noise levels. Therefore, impacts related to noise from construction activities would be ***less than significant***. No mitigation measures are necessary.

Impact NO-3: The proposed project would result in a substantial permanent increase in ambient noise levels in the project vicinity in excess of applicable standards. ***(Less than Significant with Mitigation)***

Operation of the proposed project would generate traffic, which could increase noise levels in the project vicinity. Additionally, the proposed project's mechanical equipment would generate noise. Project-generated noise from these sources is evaluated below.

TRAFFIC NOISE

With respect to traffic noise, a 3 dBA increase is barely perceptible to people, while a 5 dBA increase is readily noticeable; an increase of less than 3 dBA from continuous noise sources of similar character is generally not perceptible outside of controlled laboratory conditions.[34] A proposed project that results in a doubling of the

[34] California Department of Transportation, *Technical Noise Supplement to the Traffic Noise Analysis Protocol* (September 2013), pp. 2-44 to 2-45, https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/tens-sep2013-a11y.pdf, accessed May 27, 2022.

baseline number of vehicular trips per day would potentially result in a perceptible traffic noise increase of 3 dBA.

As discussed in Section E.2, Transportation and Circulation, the proposed project would generate approximately 2,836vehicle trips per day with approximately 224 of those trips occurring during the p.m. peak hour (defined as the one-hour period with the highest volume of vehicular traffic). The existing parking lot C on level 3, which contains 117 parking spaces, would be available for Whole Foods customers. Vehicles would access parking lot C from the curb cut off O'Farrell Street, via Masonic Avenue.

The City Center's primary frontages are along Geary Boulevard and Masonic Avenue; both carry high volumes of traffic. Traffic counts collected in 2017 show that the intersection of Geary Boulevard and Masonic Avenue carries over 3,000 vehicles during the p.m. peak hour.[35] Thus, the proposed project's 224 p.m. peak hour vehicle trips would not double traffic volumes and therefore would not result in a perceptible increase in noise (approximately 3 dBA). Noise from traffic generated by the proposed project would be ***less than significant***. No mitigation measures are necessary.

MECHANICAL EQUIPMENT NOISE

The proposed project includes replacement of the existing heating, ventilation, and air conditioning (HVAC) equipment and installation of new refrigeration equipment, including a new 21-foot-tall cooling tower, to support the proposed grocery store use. All of this equipment would continue to be located on level 4 of the City Center shopping center, which is on the roof of level 3 of the project site. The new cooling tower would be installed to the east of the existing HVAC equipment and penthouse enclosure (see Figure 5, p. 7). The proposed project would also expand the existing 930-square-foot rooftop mechanical penthouse on level 4 to approximately 1,630 square feet to accommodate new HVAC and refrigeration equipment. All existing and proposed enclosure walls are/would be 10 feet tall.

The area around the new cooling tower would be open-air, or without a roof. The cooling tower would extend above the roofline of the existing penthouse (see Figure 4, p. 5). All other areas of the rooftop mechanical penthouse would be enclosed with a new roof.

A noise study was conducted to evaluate noise from the existing mechanical equipment and the proposed project's mechanical equipment, described above, and to determine whether the proposed mechanical equipment noise would meet the noise limits in section 2909 (b) and (d) of the noise ordinance (described above).[36]

Noise ordinance limits are based on noise levels at the property plane (section 2909 (b)), the boundary of the property line including the vertical dimension; which is the entire City Center property, and at residential interiors (section 2909(d)). Additional analysis was necessary to determine the impact of mechanical equipment noise at the Bright Horizons daycare facility outdoor playground on level 4 of the City Center. The City and County of San Francisco General Plan includes land use compatibility standards for community noise for playgrounds and school classrooms. For parks and playgrounds, noise levels of Ldn 67.5 dBA or lower are considered "satisfactory, with no special noise insulation requirements." For the land use category of "school classrooms, libraries, churches, hospitals, nursing homes, etc.," noise levels of Ldn 62.5 dBA or

[35] San Francisco Planning Department, *3333 California Street Mixed-Use Project Draft Environmental Impact Report*, Volume 2c: Appendices D–G (November 7, 2018), Appendix D, Transportation and Circulation Calculation Details and Supporting Information, 2015-014028ENV_3333CaliforniaSt_DEIR_Volume02_AppendixD-G.pdf (sfplanning.s3.amazonaws.com), accessed May 27, 2022.
[36] Salter, *2675 Geary Boulevard – Whole Foods Market Noise Measurement Results and Recommendations, Salter Project 21-0548* (May 27, 2022).

lower are considered "satisfactory, with no special noise insulation requirements." [37] Here, the lower standard of 62.5 dBA was applied at the Bright Horizons daycare facility because the children would likely be using the outdoor playground multiple hours a day and the playground could also be used as an outdoor learning space. Therefore, the noise study evaluated mechanical equipment noise at the Bright Horizons daycare facility and compared it with a noise level of 62.5 dBA.

In summary, the noise study evaluated the proposed project's mechanical equipment and compared the resulting noise levels against the following three criteria:

- Noise ordinance section 2909(b)- mechanical equipment operating on commercial or industrial property must not produce a noise level more than 8 dBA above the ambient noise level at the property plane.
- Noise ordinance section 2909(d)- no fixed (permanent) noise source may cause the noise level inside any sleeping or living room in a dwelling unit on residential property to exceed 45 dBA between 10 p.m. and 7 a.m. or 55 dBA between 7 a.m. and 10 p.m. when windows are open, except where building ventilation is achieved through mechanical systems that allow windows to remain closed.
- San Francisco General Plan Land Use Compatibility- noise levels of Ldn 62.5 dBA or lower are considered satisfactory, with no special noise insulation requirements.

The following presents the results of the noise analysis and compares the proposed project's mechanical equipment noise levels against each of the criteria above.

EXISTING AND PROPOSED PROJECT MECHANICAL EQUIPMENT NOISE

As discussed above, the noise analysis determined that the existing mechanical equipment noise ranges between 51 and 57 dBA at the Bright Horizons outdoor playground. The loudest new equipment at that location would be the cooling tower. Noise from the cooling tower is calculated to be 70 dBA, on its own, at the outdoor playground, which does not factor in any noise attenuation, such as from noise barrier walls. Noise from other proposed mechanical equipment is calculated to be 57 dBA.

NOISE ORDINANCE SECTION 2909(B)

The San Francisco Department of Public Health's *Guidelines for Noise Control Ordinance Monitoring and Enforcement* state that under most conditions, the L_{90}, the level of noise exceeded 90 percent of the time, is a conservative representation of the ambient noise environment.[38] The analysis of consistency with the noise ordinance uses the L_{90} noise levels as representative of ambient noise. As shown in Table 5, p. 31, the measured minimum L_{90} noise levels are 47 dBA near the north property line, 42 dBA at near the west property line, and 46 dBA near the south property line. Mechanical equipment operating on a commercial or industrial property may not increase noise levels more than 8 dBA above the ambient noise levels. Therefore, the section 2909(b) noise limits for the cooling tower and other mechanical equipment are defined as 55 dBA Nalong the north property plane, 53 dBA along the west property plane,[39] and 54 dBA along the south property plane. The noise analysis determined that noise from the project's mechanical equipment would be

[37] San Francisco Planning Department, *San Francisco General Plan Environmental Protection Element* (2004), Land Use Compatibility Chart for Community Noise, https://generalplan.sfplanning.org/I6_Environmental_Protection.htm, accessed May 27, 2022.
[38] City and County of San Francisco, *San Francisco Police Code Article 29: Regulation of Noise Guidelines for Noise Control Ordinance Monitoring and Enforcement, December 2014 Guidance (Supersedes all previous Guidance)* (December 2014), p. 20, https://www.sfdph.org/dph/files/EHSdocs/ehsNoise/GuidelinesNoiseEnforcement.pdf, accessed May 27, 2022.
[39] As mentioned above, San Francisco Police Code article 29 ambient noise levels are considered to be no less than 45 dBA. 45 dBA plus 8 dBA results in a 53 dBA noise limit at the west property plane.

no higher than 48 dBA along the west property plane, and 51 dBA along the south property plane. These calculated levels meet the noise ordinance section 2909(b) commercial and industrial property noise limits. However, noise levels would be 66 dBA along the north property plane without sound attenuation, which would exceed the 55 dBA noise limit, resulting in a ***significant*** impact.[40]

Mitigation Measure M-NO-3, Mechanical Equipment Noise Control, discussed further below, has been identified to reduce noise from the proposed project's cooling tower and other mechanical equipment.

NOISE ORDINANCE SECTION 2909(D)

The nearest residence to the proposed project is located at 2580-2590 Geary Boulevard, approximately 280 feet northeast of the proposed project's mechanical equipment. At this distance, noise from the proposed project's mechanical equipment is calculated to be 41 dBA inside the nearest residence, assuming open windows. This calculated noise level meets the noise ordinance section 2909(d) residential interior daytime and nighttime noise limits of 55 dBA and 45 dBA, respectively.

GENERAL PLAN LAND USE COMPATIBILITY

As discussed above, noise from the proposed project's enclosed mechanical equipment is calculated to be 57 dBA and would meet the general plan land use compatibility standard for school classrooms of 62.5 dBA. However, noise from the cooling tower is calculated to be 70 dBA at the outdoor playground. This level exceeds the general plan land use compatibility standard for school classrooms of 62.5 dBA. Noise levels are calculated to be highest at the portion of the outdoor area nearest the new equipment (i.e., the northeast corner of the childcare facility's outdoor area). Compared to the existing mechanical equipment noise, the new equipment noise could be perceived as more than twice as loud. Therefore, without sound attenuation, the proposed project's mechanical equipment noise would be ***significant***. Mitigation Measure M-NO-3: Mechanical Equipment Noise Control, has been identified to reduce noise from the proposed project's cooling tower and other mechanical equipment.

> **Mitigation Measure M-NO-3: Mechanical Equipment Noise Control.** In order to reduce mechanical equipment noise, the project sponsor shall install noise barriers along the south, west, north, and east sides of the proposed cooling tower to block the line of sight between the cooling tower and daycare facility's outdoor playground and to attenuate noise at the north property plane.
>
> The noise barriers shall include, at a minimum, all of the following specifications:
>
> - Noise Barrier South of Cooling Tower:
>   - A total height of approximately 17 feet (an additional 7 feet on top of the 10-foot-tall mechanical penthouse enclosure walls);
>   - A solid barrier with a weight of at least 3 pounds per square foot (psf) and solid without any gaps; and
>   - Sound absorptive material on the side facing the mechanical equipment.

[40] Note that this assumes all project equipment to be operating simultaneously.

- Noise Barrier North of Cooling Tower (extending at least 10 feet from the northwest and northeast corners to the south:
  - A total height of approximately 24 feet (an additional 14 feet on top of the 10-foot-tall mechanical penthouse enclosure walls);
  - A solid barrier with a weight of at least 3 pounds per square foot (psf) and solid without any gaps; and
  - Sound absorptive material on the side facing the mechanical equipment.
- Acoustical louvers shall be located at the section of the enclosure east of the cooling tower meeting the minimum insertion loss (noise reduction), as shown below.

	63 Hertz (Hz)	125 Hz	250 Hz	500 Hz	1 kilohertz (kHz)	2 kHz	4 kHz
Acoustical Louver Minimum Insertion Loss (dB)	—	8	7	11	13	10	8

- The outside air (OSA) units shall include:
  - 5 feet of internally lined duct with 1-inch-thick glass fiber duct lining between each of the OSA units and the outside air openings on the penthouse roof; or
  - As an alternative to an internally lined duct, duct silencers may be provided at the same duct segments described above. Each of the silencers shall meet the minimum insertion loss as shown below.

	63 Hertz (Hz)	125 Hz	250 Hz	500 Hz	1 kilohertz (kHz)	2 kHz	4 kHz
Silencer Minimum Insertion Loss (dB)	—	—	6	6	12	10	6

In lieu of the above, the project sponsor may install alternative noise control measures provided the sponsor submits documentation demonstrating that noise from the alternative measures would not exceed 62.5 dBA at the daycare facility's outdoor playground and 55 dBA at the north property plane, on level 4 of City Center.

Upon installation of the proposed project's mechanical equipment and required noise control measures, the project sponsor, with approval from the daycare facility, shall take noise measurements of the equipment at various locations within the outdoor playground to confirm that the project's mechanical equipment noise does not exceed 62.5 dBA. Noise measurements shall also be taken at the north property plane to confirm that noise levels do not exceed 55 dBA. Noise measurements shall be provided to the planning department prior to receipt of a certificate of occupancy. Should noise measurements indicate that the project's mechanical equipment noise exceeds 62.5 dBA at the daycare facility's outdoor playground or 55 dBA at the north property plane, the project sponsor, with an acoustical consultant, shall install additional noise attenuation measures necessary to ensure that noise levels do not exceed 62.5 dBA or 55 dBA, at the respective locations. Any additional noise attenuation measures shall be approved by the planning department, installed, and verified as not exceeding 62.5 dBA at the outdoor playground or 55 dBA at the north property plane, prior to receiving a certificate of occupancy.

SIGNIFICANCE AFTER MITIGATION

The noise study determined that with implementation of Mitigation Measure M-NO-3, noise from the proposed project's cooling tower would not exceed 62.5 dBA at the Bright Horizons outdoor playground. The noise study found that at areas within the Bright Horizons outdoor playground near the cooling tower, the 17-foot-tall barrier completely blocks the line-of-sight to the equipment. The barrier reduces cooling tower noise alone by 10 dB at this location. The noise level is calculated to be 62.5 dBA at this location. At areas of the outdoor playground farther away from the cooling tower, the barrier partially blocks the line-of-sight, reducing cooling tower noise by 5 dB. With the noise reduction provided by the barrier and the increased distance from the equipment, the noise level at these areas is 62 dBA. **Figure 9** shows the noise barrier, line-of-sight to locations within the outdoor playground and resulting noise levels.

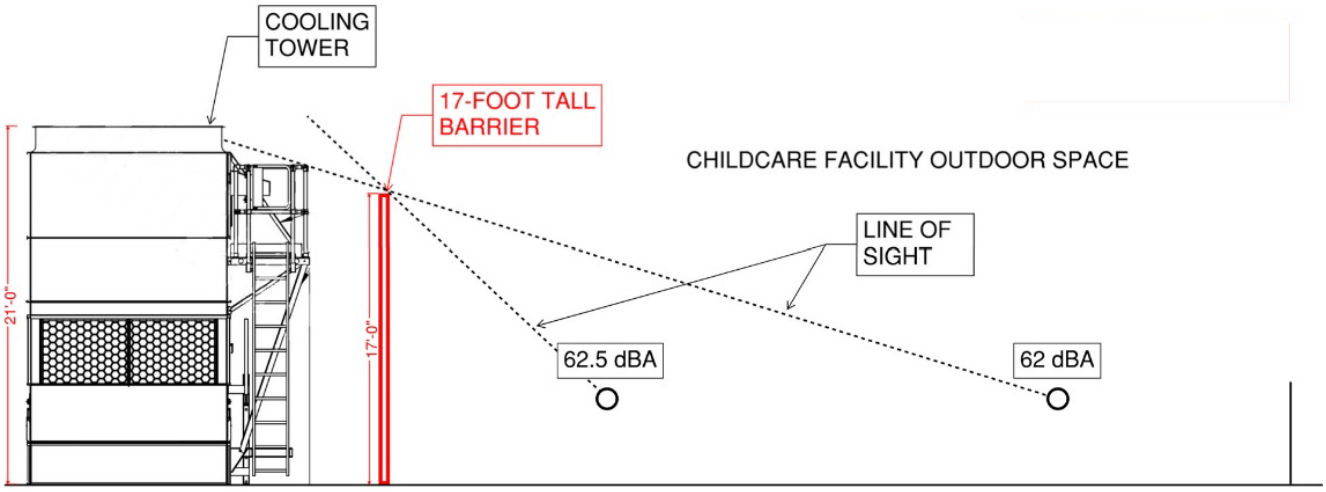


FIGURE 9 **17-FOOT-TALL NOISE BARRIER AND CALCULATED NOISE LEVELS AT OUTDOOR SPACE**

The noise study determined that with implementation of Mitigation Measure M-NO-3, the noise barrier north of the cooling tower (extending 10 feet from the northwest and northeast corners to the south), the acoustical louvers, and the noise attenuation equipment installed on the OSA units would reduce the proposed project's cooling tower and other mechanical equipment mechanical noise to 55 dBA at the north property plane.

The project sponsor has agreed to Mitigation Measure M-NO-3. As demonstrated above, with implementation of Mitigation Measure M-NO-3, the proposed project's mechanical equipment noise would not exceed 62.5 dBA, the level determined to be satisfactory for school classrooms pursuant to the San Francisco General Plan Land Use Compatibility Guidelines. In addition, noise levels would not exceed 55 dBA (8 dBA above ambient noise levels) at the north property plane consistent with the commercial and industrial property noise limits included in noise ordinance section 2909(b). Therefore, the proposed project's mechanical equipment noise would be ***less than significant with mitigation***.

Impact C-NO-1: The proposed project, in combination with cumulative projects, would not result in significant cumulative noise or vibration impacts. ***(Less than Significant)***

Since the proposed project would result in no impact with respect to groundborne noise or vibration, the proposed project would have no potential to combine with other nearby projects to result in a cumulative groundborne noise or vibration impact.

The geographic context for cumulative noise impacts is considered localized because noise attenuates (reduces) with distance from the noise source. As shown in Table 2, p. 10, and depicted in Figure 6, p. 11, there are currently three cumulative development projects within an approximately 0.25-mile radius of the project site. These projects may be under construction at the same time as the proposed project, and each would also add new sources of noise to the area once completed (e.g., traffic noise and/or mechanical equipment noise). However, the closest cumulative project is at 2750 Geary Boulevard, at least 670 feet northwest of the project site, which is too far away to combine with construction noise from the proposed project. The project at 2800 Geary Boulevard is located even further away from the project site.

The proposed project's construction activities would occur for 10 months and would largely consist of interior renovation and minor exterior work; noise from interior construction is attenuated by the building itself. Given the limited scope of the project's exterior construction activity, that no cumulative projects are immediately adjacent to the proposed project, and that all construction activity within San Francisco is required to comply with section 2907 and 2908 of the police code (noise ordinance), which limits noise from construction equipment and generally prohibits nighttime construction without a special permit, the proposed project in combination with cumulative projects would not result in a significant cumulative construction noise impact.

Similarly, the proposed project's mechanical equipment and mechanical equipment from cumulative projects would be fairly localized, would attenuate with distance, and would be required to comply with the noise limits in section 2909 of the police that limit noise levels at the property plane and at residential interiors. Therefore, mechanical equipment noise from the proposed project combined with that from cumulative projects would not cause a significant cumulative noise impact.

Lastly, the cumulative projects would incrementally increase vehicle trips on nearby roadways throughout the day. Vehicle trips from the proposed project and cumulative projects would be distributed along the local roadway network. Given the high existing vehicle volumes along Geary Boulevard and Masonic Avenue, for example, the proposed project combined with the cumulative projects, would not result in a doubling of traffic volumes and therefore would not result in a noticeable increase (3 dBA) in ambient noise levels.

For the reasons described above, the proposed project in combination with cumulative projects would result in a ***less than significant*** cumulative noise impact. No mitigation measures are necessary.

E.4 Air Quality

Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact	Not Applicable
4. AIR QUALITY. Would the project:					
a) Conflict with or obstruct implementation of the applicable air quality plan?	☒	☐	☐	☐	☐
b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal, state, or regional ambient air quality standard?	☒	☐	☐	☐	☐
c) Expose sensitive receptors to substantial pollutant concentrations?	☒	☐	☐	☐	☐
d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	☒	☐	☐	☐	☐

Pursuant to the Board of Supervisors' Motion M21-047, the proposed project ***may*** have a significant air quality impact; therefore, this topic is analyzed in the EIR.

E.5 Greenhouse Gas Emissions

Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact	Not Applicable
5. GREENHOUSE GAS EMISSIONS. Would the project:					
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐	☐
b) Conflict with any applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☒	☐	☐

Greenhouse gas (GHG) emissions and global climate change represent cumulative impacts. GHG emissions cumulatively contribute to the significant adverse environmental impacts of global climate change. No single project could generate enough GHG emissions to noticeably change the global average temperature; instead, the combination of GHG emissions from cumulative projects has contributed and will continue to contribute to global climate change and its associated environmental impacts. As such, this analysis is in a cumulative context only, and the analysis of this resource topic does not include a separate project-level impact discussion.

On April 20, 2022, the Bay Area Air Quality Management District (air district) adopted updated GHG thresholds.[41] Consistent with CEQA Guidelines sections 15064.4 and 15183.5 which address the analysis and determination of significant impacts from a proposed project's GHG emissions, the updated thresholds for land use projects, such as the proposed project, maintains the air district's previous GHG threshold that allow projects that are consistent with a GHG reduction strategy to conclude that the project's GHG impact is less than significant. San Francisco's 2017 GHG Reduction Strategy Update presents a comprehensive assessment of policies, programs, and ordinances that collectively represent San Francisco's GHG reduction strategy in compliance with the air district's guidelines and CEQA Guidelines. These GHG reduction actions have resulted in a 41 percent reduction in GHG emissions in 2019 compared to 1990 levels,[42] which far exceeds the goal of 2020 GHG emissions equaling those in 1990 set in Executive Order S-3-05[43] and the California Global Warming Solutions Act.[44] The city has also met and exceeded the 2030 target of 40 percent reduction below 1990 levels set in the California Global Warming Solutions Act of 2016[45] and the air district's 2017 Clean Air Plan[46] more than 10 years before the target date.

San Francisco's GHG reduction goals, updated in July 2021 by ordinance 117-02,[47] are consistent with, or more aggressive than, the long-term goals established under executive orders S-3-05,[48] B-30-15,[49] B-55-18,[50] and the California Global Warming Solutions Act of 2016.[51] The updated GHG ordinance demonstrates the city's commitment to continued GHG reductions by establishing targets for 2030, 2040, and 2050 and setting other critical sustainability goals. In particular, the updated ordinance sets a goal to reach net-zero sector-based GHG emissions by 2040 and sequester any residual emissions using nature-based solutions.[52] Thus, the city's GHG reduction goal is consistent with the state's long-term goal of reaching carbon neutrality by 2045. The updated GHG ordinance requires the San Francisco Department of the Environment to prepare

[41] Bay Area Air Quality Management District, CEQA Thresholds and Guidelines Update, https://www.baaqmd.gov/plans-and-climate/california-environmental-quality-act-ceqa/updated-ceqa-guidelines, accessed May 10, 2022.
[42] San Francisco Department of the Environment, San Francisco's 2019 Carbon Footprint, https://sfenvironment.org/carbonfootprint, accessed December 16, 2021.
[43] Office of the Governor, Executive Order S-3-05 (June 1, 2005), https://www.library.ca.gov/wp-content/uploads/GovernmentPublications/executive-order-proclamation/5129-5130.pdf, accessed: May 10, 2022.
[44] California Legislative Information, Assembly Bill 32 (September 27, 2006), http://www.leginfo.ca.gov/pub/05-06/bill/asm/ab_0001-0050/ab_32_bill_20060927_chaptered.pdf, accessed May 10, 2022.
[45] California Legislative Information, Senate Bill 32 (September 8, 2016), https://leginfo.legislature.ca.gov/faces/billPdf.xhtml?bill_id=201520160SB32&version=20150SB3288CHP, accessed May 10, 2022.
[46] Bay Area Air Quality Management District, *Clean Air Plan* (September 2017), http://www.baaqmd.gov/plans-and-climate/air-quality-plans/current-plans, accessed May 10, 2022.
[47] San Francisco Board of Supervisors, Ordinance No. 117-21, File No. 210563 (July 27, 2021), https://sfbos.org/sites/default/files/o0117-21.pdf, accessed May 10, 2022. San Francisco's GHG reduction goals are codified in Environment Code section 902(a) and include the following goals: (1) by 2030, a reduction in sector-based GHG emissions of at least 61 percent below 1990 levels; (2) by 2030, a reduction in consumption-based GHG emissions equivalent to a 40 percent reduction compared to 1990 levels; (3) by 2040, achievement of net-zero sector-based GHG emissions by reducing such emissions by at least 90 percent compared to 1990 levels and sequestering any residual emissions; and (4) by 2050, a reduction in consumption-based GHG emissions equivalent to an 80 percent reduction compared to 1990 levels.
[48] Executive Order S-3-05 sets forth a goal of an 80 percent reduction in GHG emissions by 2050. San Francisco's goal of net-zero sector-based emissions by 2040 requires a greater reduction of GHG emissions.
[49] Office of the Governor, Executive Order B-30-15 (April 29, 2015), https://www.ca.gov/archive/gov39/2015/04/29/news18938/, accessed May 22, 2022. Executive Order B-30-15 sets a state GHG emissions reduction goal of 40 percent below 1990 levels by 2030. San Francisco's 2030 sector-based GHG reduction goal of 61 percent below 1990 levels requires a greater reduction of GHG emissions.
[50] Office of the Governor, Executive Order B-55-18 (September 18, 2018), https://www.ca.gov/archive/gov39/wp-content/uploads/2018/09/9.10.18-Executive-Order.pdf, accessed May 10, 2022. Executive Order B-55-18 establishes a statewide goal of achieving carbon neutrality as soon as possible, but no later than 2045, and achieving and maintaining net negative emissions thereafter. San Francisco's goal of net-zero sector-based emissions by 2040 is a similar goal but requires achievement of the target five years earlier.
[51] Senate Bill 32 amends California Health and Safety Code division 25.5 (also known as the California Global Warming Solutions Act of 2006) by adding section 38566, which directs that statewide GHG emissions be reduced by 40 percent below 1990 levels by 2030. San Francisco's 2030 sector-based GHG reduction goal of 61 percent below 1990 levels requires a greater reduction of GHG emissions.
[52] Nature-based solutions are those that remove remaining emissions from the atmosphere by storing them in natural systems that support soil fertility or employing other carbon farming practices.

and submit to the mayor a climate action plan (CAP) by December 31, 2021. The CAP, which was released on December 8, 2021, and will be updated every five years, carries forward the efforts of the city's previous CAPs and charts a path toward meeting the GHG commitments of the Paris Agreement (e.g., limit global warming to 1.5 degrees Celsius) as well as the reduction targets adopted in the GHG ordinance.

In summary, the CEQA Guidelines and air district-adopted GHG thresholds allow projects consistent with an adopted GHG reduction strategy to determine a less than significant GHG impact. San Francisco has a GHG reduction strategy that is consistent with near and long-term state and regional GHG reduction goals and is effective because the city has demonstrated its ability to meet state and regional GHG goals in advance of target dates. Therefore, projects that are consistent with San Francisco's GHG reduction strategy would not result in GHG emissions that would have a significant effect on the environment, and would not conflict with state, regional, or local GHG reduction plans and regulations.

Impact C-GG-1: The proposed project would generate greenhouse gas emissions, but not at levels that would result in a significant impact on the environment or conflict with any policy, plan, or regulation adopted for the purpose of reducing greenhouse gas emissions. ***(Less than Significant)***

Individual projects contribute to the cumulative effects of climate change by emitting GHGs directly or indirectly during the projects' construction and operational phases. Direct operational emissions include GHG emissions from new vehicle trips and area sources (natural gas combustion). Indirect emissions include emissions from electricity providers; energy required to pump, treat, and convey water; and emissions associated with waste removal, disposal, and landfill operations.

The proposed project would result in temporary increases in GHG emissions because it involves a minor amount of construction activities for a new grocery store to occupy an existing vacant retail space. These construction activities include worker trips, vendor trips, haul trips, and use of a crane, all of which would emit GHGs. Other construction equipment, such as electric-powered tools, would also require electricity, which would result in indirect GHG emissions. However, any GHG emissions that occur during the approximate 10-month construction phase would be temporary and would not result in ongoing GHG emissions.

The proposed project also would contribute to annual long-term increases in GHG emissions as a result of increased vehicle trips (mobile sources) and retail operations that would result in an increase in energy use (e.g., indirect electricity or energy associated with water use, wastewater treatment, and solid waste disposal).

While the proposed project would be subject to applicable regulations adopted to reduce GHG emissions as identified in the GHG reduction strategy and demonstrated in the GHG checklist completed for the proposed project,[53] because the minor scope of the project and because it does not involve new construction, several of the regulations do not apply to the project. Therefore, the following addresses each source of GHG emissions and describes features of the project or applicable federal, state, or local regulations that would reduce the project's GHG emissions.

[53] San Francisco Planning Department, *Greenhouse Gas Analysis: Compliance Checklist for the Whole Foods at 2675 Geary Boulevard Project* (May 12, 2022).

VEHICLE TRIPS

The proposed project would provide a neighborhood-serving grocery store in an existing vacant retail space in a densely developed urban area, close to transit. As such, the auto mode share (percentage of trips made by private vehicle) is 25.9 percent, which is low for both San Francisco and the bay area region. In addition, the project site is located within transportation analysis zone (TAZ) 663 where the existing average daily VMT per retail employee is 7.41 miles, 51 percent below the regional average. The proposed project would comply with the Commuter Benefits Ordinance (San Francisco Environment Code, section 427) which offers incentives to employees to take transit, rather than drive to work. Therefore, the number of vehicle trips to the site and the average number of VMT by employees would be substantially less than for a store located elsewhere in the region.

In addition, as with all new grocery stores in infill locations, the proposed project would provide opportunities for customers to drive shorter distances and/or reduce vehicle trips to buy groceries both of which could result in fewer VMT.

Lastly, the United States Environmental Protection Agency (EPA) finalized new standards for passenger cars and light trucks (applying to Model Years 2023 through 2026) in December 2021, which is expected to result in a projected industry-wide fuel economy of 40 miles per gallon by 2026, an approximately 25 percent increase over the previous standard.[54] The new standards will speed the transition toward a zero-emissions future and reduce national GHG emissions, including those from the proposed project.

As a result, the proposed project, due to its low VMT, would not generate substantial GHG emissions related to vehicle trips.[55]

BUILDING ENERGY/CONSERVATION

Electricity in San Francisco is provided primarily by the San Francisco Public Utilities Commission (SFPUC) and Pacific Gas & Electric. The proposed project would use grid-supplied electricity from PG&E. PG&E's 2020 electric power mix was as follows: 16 percent natural gas, 43 percent nuclear, 31 percent renewables (including wind, geothermal, biomass, solar and small hydro), and 10 percent large hydroelectric; this represents 90 percent carbon-free electricity.[56]

Regulations pertaining to building energy and conservation use that would apply to the proposed project include the California Green Building Standards (CALGreen) and the San Francisco Green Building Code. These regulations establish volatile organic compound limits[57] reducing or regulating the use of adhesives, primers, sealants, caulks, paints, coatings, and carpet, and composite wood. Compliance with existing regulations related to building energy use would reduce GHG emissions from the proposed project's building energy use.

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[54] U.S. Environmental Protection Agency, *Final Rule to Revise Existing National GHG Emissions Standards for Passenger Cars and Light Trucks Through Model Year 2026* (2022), https://www.epa.gov/regulations-emissions-vehicles-and-engines/final-rule-revise-existing-national-ghg-emissions#additional-resources, accessed March 25, 2022.

[55] U.S. EPA, *EPA Finalizes Greenhouse Gas Standards for Passenger Vehicles, Paving Way for a Zero-Emissions Future* (December 20, 2021), https://www.epa.gov/newsreleases/epa-finalizes-greenhouse-gas-standards-passenger-vehicles-paving-way-zero-emissions, accessed February 28, 2022.

[56] Pacific Gas & Electric, *Exploring Clean Energy Solutions* (2022), https://www.pge.com/en_US/about-pge/environment/what-we-are-doing/clean-energy-solutions/clean-energy-solutions.page?WT.mc_id=Vanity_cleanenergy, accessed February 28, 2022.

[57] While not GHGs, VOCs are precursor pollutants that form ground-level ozone. Increased ground-level ozone is an anticipated effect of future global warming that would result in added health effects locally. Reducing VOC emissions would reduce the anticipated local effects of global warming.

In addition, the proposed project would make use of an existing vacant retail space, rather than relying on new construction which further conserves the embodied energy contained in the existing building and increases energy efficiency by limiting the use of new materials. Moreover, the proposed project would replace the existing HVAC equipment and lighting appliances with more energy efficient fixtures. Therefore, GHG emissions from building energy would not be substantial.

ENERGY USE ASSOCIATED WITH WATER SUPPLY AND WASTEWATER TREATMENT

The proposed project would result in an increase in water and wastewater demand for the kitchen, food preparation areas, restrooms, and other uses at the project site given that the retail space is currently vacant. The use of water and wastewater services require energy which would emit GHGs. The proposed project would not involve landscaping or any exterior water use for irrigation. Moreover, the proposed project would comply with the San Francisco Green Building requirements for water use reduction, which include upgrading fixtures to meet maximum flush/flow limits. As stated in the City's GHG inventory, water-related emissions comprised less than 0.12 percent of San Francisco's overall greenhouse gas inventory in 2019.[58] Therefore, GHG emissions from water and wastewater would not be substantial.

REFRIGERANTS

The proposed project would include refrigerators and freezers, which would result in GHG emissions from the use of high-global warming potential refrigerants. However, the project would comply with applicable sections in the CALGreen regulations related to enhanced refrigerant management, which prevent use of chlorofluorocarbons or halons. Compliance with this requirement would reduce project-related GHG emissions from the use of refrigerants.

SOLID WASTE

The proposed project's waste-related emissions would be reduced through compliance with the City's Recycling and Composting Ordinance and Construction and Demolition Debris Recovery Ordinance. The proposed project will provide for the storage, collection, and loading of recyclables, compost and solid waste as required. These regulations reduce the amount of material sent to landfills, thus reducing the GHGs emitted by landfill operations. These regulations also promote the reuse of materials, conserving their embodied energy,[59] and reducing the energy required to produce new materials. Compliance with solid waste regulations would reduce the GHG emissions associated with solid waste generation at the project site.

CONCLUSION

As discussed above, the regulations identified in the 2017 GHG Reduction Strategy Update have proved effective as San Francisco has reduced its GHG emissions by 41 percent below 1990 levels, which far exceed statewide and regional 2020 GHG reduction targets. Furthermore, the city's GHG emission reductions in 2019 also met statewide and regional 2030 targets more than 10 years in advance of the target year. Therefore, because the proposed project would be subject to regulations adopted to reduce GHG emissions, the proposed project would be consistent with San Francisco's GHG reduction strategy and would not generate significant GHG emissions nor conflict with state, regional, and local GHG reduction plans and regulations. Additionally, the proposed project site is located in a VMT-efficient area and the project includes re-use of an

[58] San Francisco Department of the Environment, *San Francisco's Climate Storyboard* (2019), https://sfenvironment.org/sf-climate-dashboard, accessed March 24, 2022.
[59] *Embodied energy* is the total energy required for the extraction, processing, manufacture, and delivery of building materials to the building site.

existing building, which would reduce GHG emissions compared to development in less VMT-efficient areas and conserve the embodied energy of the existing building.

For these reasons, the proposed project's contribution to cumulative GHG impacts would not be cumulatively considerable. Therefore, the proposed project would result in a ***less-than-significant*** impact with respect to GHG emissions. No mitigation measures are necessary.

E.6 Utilities and Service Systems

Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact	Not Applicable
6. UTILITIES AND SERVICE SYSTEMS. Would the project:					
a) Require or result in the relocation or construction of new or expanded, water, wastewater treatment, or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	☐	☐	☐	☒	☐
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years?	☐	☐	☒	☐	☐
c) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒	☐
d) Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	☐	☐	☒	☐	☐
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	☐	☐	☒	☐	☐

The proposed project is a change of use within a vacant retail space in the City Center shopping center. The City Center was constructed in 1961 and has been served by utility service systems, including water, wastewater, and stormwater collection and treatment, solid waste collection and disposal, electric power, natural gas, and telecommunications facilities since that time. Given that the proposed project would not require the extension of utilities to a new location or an increase in demand for utilities at the project site such that construction of new utilities would be required, there would be ***no impact*** under topic E.5(a), and no further discussion is required.

Implementing the proposed project would incrementally increase wastewater flows from the project site with the introduction of a grocery store and approximately 200 employees (35-40 employees per shift). The project site is served by San Francisco's combined sewer system, which handles both sewage and stormwater runoff. Project related wastewater and stormwater would flow into the city's combined sewer system and would be treated to standards contained in the city's National Pollutant Discharge Elimination System Permit for the Southeast Water Pollution Control Plant prior to discharge into the San Francisco Bay. The Southeast Treatment Plant provides wastewater and stormwater treatment and management for the eastern portion of the city, including the project site. Wastewater is transported to the Southeast Treatment Plant through a grid of transport/storage boxes, sewers, and five major pump stations. The Southeast Treatment Plant treats an average of 60 million gallons per day (mgd) of dry-weather flow, has a current dry-weather design capacity of 85.4 mgd, and has a peak wet-weather capacity of 250 mgd.[60] The proposed project would upgrade all existing water fixtures that do not comply with the San Francisco Green Building Requirements for Water Use. In addition, all new water fixtures would comply with the maximum flush/flow limits of the CALGreen and San Francisco Green Building Code. Therefore, the proposed project's incremental increase in wastewater flows would not exceed the capacity of the Southeast Treatment Plant.

The proposed project would consist of interior renovation of an existing vacant retail space and expansion of the existing rooftop mechanical penthouse. The proposed project would not require ground disturbance and would not increase the amount of stormwater entering the combined sewer system because the project site is already developed and covered with impervious surfaces. For these reasons, the proposed project would have ***no impact*** with respect to exceeding wastewater treatment capacity (topic E.5(c)), and no further discussion is required.

Impact UT-1: The SFPUC has sufficient water supplies available to serve the proposed project and reasonably foreseeable future development during normal, dry, and multiple dry years. *(Less than Significant)*

SFPUC adopted the 2020 Urban Water Management Plan (2020 plan) in June 2021.[61] The 2020 plan estimates that current and projected water supplies will be sufficient to meet future demand for retail water[62] customers through 2045 under wet- and normal-year conditions; however, in dry years, SFPUC would implement water use and supply reductions through its Water Shortage Contingency Plan and a corresponding Retail Water Shortage Allocation Plan. [63]

In December 2018, the State Water Resources Control Board adopted amendments to the Water Quality Control Plan for the San Francisco Bay/Sacramento–San Joaquin Delta Estuary, which establishes water quality objectives to maintain the health of rivers and the Bay-Delta ecosystem (the Bay-Delta Plan Amendment).[64] The state water board has indicated that it intends to implement the Bay-Delta Plan

[60] San Francisco Bay Regional Water Quality Control Board, Order No. R2-2013-0029 and NPDES No. CA0037664 (2013), https://www.gsweventcenter.com/Draft_SEIR_References/2013_0819_RWQCB_SF_Bayside_NPDES_Permit.pdf, accessed May 10, 2022.
[61] San Francisco Public Utilities Commission, *2020 Urban Water Management Plan for the City and County of San Francisco* (adopted June 11, 2021), https://www.sfpuc.org/sites/default/files/programs/local-water/SFPUC_2020_UWMP2020_%20FINAL.pdf, accessed December 23, 2021.
[62] "Retail" demand represents water that SFPUC provides to individual customers in San Francisco. "Wholesale" demand represents water that SFPUC provides to other water agencies supplying other jurisdictions.
[63] San Francisco Public Utilities Commission, *2020 Urban Water Management Plan for the City and County of San Francisco* (adopted June 11, 2021), Appendix K, Water Shortage Contingency Plan, https://www.sfpuc.org/sites/default/files/programs/local-water/SFPUC_2020_UWMP2020_%20FINAL.pdf, accessed December 23, 2021.
[64] State Water Resources Control Board Resolution No. 2018-0059, *Adoption of Amendments to the Water Quality Control Plan for the San Francisco Bay/Sacramento–San Joaquin Delta Estuary and Final Substitute Environmental Document* (December 12, 2018), https://www.waterboards.ca.gov/plans_policies/docs/2018wqcp.pdf, accessed December 23, 2021.

Amendment by 2022, assuming that all required approvals are obtained by that time. Implementing the Bay-Delta Plan Amendment would result in a substantial reduction in SFPUC's water supplies from the Tuolumne River watershed during dry years, requiring rationing in San Francisco to a greater degree than previously anticipated to address supply shortages.

Implementation of the Bay-Delta Plan Amendment is uncertain for several reasons. Whether, when, and in what form the Bay-Delta Plan Amendment will be implemented, and how those amendments could affect SFPUC's water supply, is currently unknown. In acknowledgment of these uncertainties, the 2020 plan presents future supply scenarios both with and without the Bay-Delta Plan Amendment, as follows:

1. Without implementation of the Bay-Delta Plan Amendment, wherein the water supply and demand assumptions contained in Section 8.4 of the 2020 plan would be applicable
2. With implementation of a voluntary agreement between the SFPUC and the State Water Resources Control Board that would include a combination of flow and non-flow measures designed to benefit fisheries at a lower water cost, particularly during multiple dry years, than would occur under the Bay-Delta Plan Amendment
3. With implementation of the Bay-Delta Plan Amendment as adopted, wherein the water supply and demand assumptions contained in Section 8.3 of the 2020 plan would be applicable

Water supply shortfalls during dry years would be lowest without implementation and highest with implementation of the Bay-Delta Plan Amendment. Shortfalls under the proposed voluntary agreement would be between those with and without implementation of the Bay-Delta Plan Amendment.[65]

Under these three scenarios, SFPUC would have adequate water to meet demand in San Francisco through 2045 in wet and normal years.[66] Without implementation of the Bay-Delta Plan Amendment, water supplies would be available to meet demand in all years except for a shortfall of 4.0 million gallons per day (5.3 percent) in years four and five of a multiple-year drought based on 2045 demand.

With implementation of the Bay-Delta Plan Amendment, shortfalls would range from 11.2 million gallons per day (15.9 percent) in a single dry year to 19.2 million gallons per day (27.2 percent) in years two through five of a multiple-year drought based on 2025 demand levels, and from 20.5 million gallons per day (25.4 percent) in a single dry year to 28.5 million gallons per day (35.4 percent) in years four and five of a multiple-year drought based on 2045 demand.

The proposed project does not require a water supply assessment under the California Water Code. Under California Water Code sections 10910–10915, urban water suppliers like SFPUC must prepare water supply

[65] On March 26, 2019, SFPUC adopted Resolution No. 19-0057 to support its participation in the voluntary agreement negotiation process. To date, those negotiations are ongoing with the California Natural Resources Agency. On March 1, 2019, SFPUC submitted to the state water board a proposed project description that could be the basis for a voluntary agreement. Because the proposed voluntary agreement has yet to be accepted by the state water board as an alternative to the Bay-Delta Plan Amendment, the shortages that would occur with its implementation are not known with certainty; however, if accepted, the voluntary agreement would result in dry-year shortfalls of a lesser magnitude than under the Bay-Delta Plan Amendment.

[66] Based on historic records of hydrology and reservoir inflow from 1920 to 2017, current delivery and flow obligations, and fully implemented infrastructure under the 2018 Phased Water System Improvement Program Variant, normal or wet years occurred in 85 out of 97 years. This translates into roughly nine normal or wet years out of every 10 years. Conversely, systemwide rationing is required in roughly one out of every 10 years. This frequency is expected to increase as climate change intensifies.

assessments for certain large "water demand" projects, as defined in CEQA Guidelines section 15155.[67] The proposed project would renovate an existing 49,825-square-foot vacant retail space for a new grocery store. The proposed project would not employ more than 1,000 persons or have more than 500,000 square feet of shopping center space; as such, it does not qualify as a "water-demand" project as defined by CEQA Guidelines section 15155(a)(1), and a water supply assessment is not required and has not been prepared for the proposed project. The following discussion considers the potential water supply impacts for projects such as the proposed project that do not qualify as "water-demand" projects.

No single development project alone in San Francisco would require the development of new or expanded water supply facilities or require SFPUC to take other actions, such as imposing a higher level of rationing across the city in the event of a supply shortage in dry years. Therefore, a separate project-only analysis is not provided for this topic. The following analysis instead considers whether the proposed project, in combination with both existing development and projected growth through 2045, would require new or expanded water supply facilities, the construction or relocation of which could have significant impacts on the environment. It also considers whether a high level of rationing would be required that could have significant cumulative impacts. It is only under this cumulative context that development in San Francisco could have the potential to require new or expanded water supply facilities or require SFPUC to take other actions, which in turn could result in significant physical environmental impacts related to water supply. If significant cumulative impacts could result, then the analysis considers whether the proposed project would make a considerable contribution to the cumulative impact.

Based on guidance from the California Department of Water Resources and a citywide demand analysis, SFPUC has established 50,000 gallons per day as the maximum water demand for projects that do not meet the definitions provided in CEQA Guidelines section 15155(a)(1).[68] The proposed project would represent 10 percent of the 500,000 square feet of commercial space provided in section 15155(1)(B). In addition, the proposed project would upgrade non-compliant water fixtures as required by California Code of Regulations title 24, the City's Green Building Ordinance, and the California Green Building Standards Code. It is therefore reasonable to assume that the proposed project would result in an average daily water demand of substantially less than 50,000 gallons per day.

Assuming that the proposed project would demand no more than 50,000 gallons of water per day, its water demand would represent a small fraction of the total projected demand, ranging at most from 0.07 to 0.06 percent between 2025 and 2045. As such, the project's water demand would not require or result in the relocation or construction of new or expanded water facilities, the construction or relocation of which could cause significant environmental effects.

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[67] Pursuant to CEQA Guidelines section 15155(1), a *water-demand project* means:
(A) A residential development of more than 500 dwelling units.
(B) A shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet of floor space.
(C) A commercial office building employing more than 1,000 persons or having more than 250,000 square feet of floor area.
(D) A hotel or motel, or both, having more than 500 rooms.
(E) An industrial, manufacturing, or processing plant, or industrial park planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 square feet of floor area.
(F) A mixed-use project that includes one or more of the projects specified in subdivisions (a)(1)(A), (a)(1)(B), (a)(1)(C), (a)(1)(D), (a)(1)(E), and (a)(1)(G) of this section.
(G) A project that would demand an amount of water equivalent to, or greater than, the amount of water required by a 500-dwelling-unit project.

[68] Steven R. Ritchie, Assistant General Manager, Water Enterprise, San Francisco Public Utilities Commission, memorandum to Lisa Gibson, Environmental Review Officer, San Francisco Planning Department–Environmental Planning (May 31, 2019).

Sufficient water supplies are available to serve the proposed project and reasonably foreseeable future development in normal, dry, and multiple dry years unless the Bay-Delta Plan Amendment is implemented. As indicated above, the proposed project's maximum demand would represent less than 0.06 percent of the total demand in 2045, when the retail supply shortfall projected to occur with implementation of the Bay-Delta Plan Amendment would be up to 35.4 percent in a multi-year drought. SFPUC has indicated that it is accelerating its efforts to develop additional water supplies and explore other projects that would improve overall water supply resilience through an alternative water supply program. SFPUC has taken action to fund the study of additional water supply projects, but it has not determined the feasibility of the possible projects and has determined that the identified potential projects would take anywhere from 10 to 30 years or more to implement. The potential impacts from construction and/or operation of any such water supply facility projects cannot be identified at this time. In any event, under such a worst-case scenario, the demand for SFPUC to develop new or expanded dry-year water supplies would exist regardless of whether the proposed project is approved.

Given the long lead times associated with development of additional water supplies, if the Bay-Delta Plan Amendment were to take effect sometime after 2022 and result in a dry-year shortfall, SFPUC's expected action for the next 10–30 years (or more) would be limited to requiring increased rationing. As discussed in the SFPUC memorandum, SFPUC has established a process through its Retail Water Shortage Allocation Plan for actions it would take under circumstances that require rationing. The level of rationing that would be required of the proposed project is unknown at this time. Both direct and indirect environmental impacts could result from high levels of rationing. However, the small increase in potable water demand attributable to the proposed project compared to citywide demand would not substantially affect the levels of dry-year rationing that otherwise would be required throughout the city. Therefore, the proposed project would not make a considerable contribution to a cumulative environmental impact caused by implementation of the Bay-Delta Plan Amendment. Proposed project impacts related to water supply would be ***less than significant*** and no mitigation measures are necessary.

Impact UT-2: The proposed project would not generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals; the proposed project would comply with federal, state, and local solid waste management and reduction statutes and regulations. ***(Less than Significant)***

In September 2015, the City entered into a landfill disposal agreement with Recology, Inc., for disposal of all solid waste collected in San Francisco, at the Recology Hay Road Landfill in Solano County, through September 2024 or until 3.4 million tons have been disposed, whichever occurs first. The City would have an option to renew the agreement for six years or until an additional 1.6 million tons have been disposed, whichever occurs first.[69] The Recology Hay Road Landfill is permitted to accept up to 2,400 tons per day of solid waste. At that maximum permitted rate, the landfill has the capacity to accommodate solid waste until approximately 2034. Under existing conditions, the landfill receives an average of approximately 1,850 tons per day from all sources, with approximately 1,200 tons per day coming from San Francisco, and consisting of residential and commercial waste and demolition and construction debris that cannot be reused or recycled.[70] At the current disposal rate, the landfill has operating capacity until 2041. The City's contract with

[69] San Francisco Planning Department, *Agreement for Disposal of San Francisco Municipal Solid Waste at Recology Hay Road Landfill in Solano County, Final Negative Declaration, Planning Department Case No. 2014.0653* (May 21, 2015), http://sfmea.sfplanning.org/2014.0653E_Revised_FND.pdf.
[70] Ibid.

the Recology Hay Road Landfill will extend until 2031 or until the city has disposed 5 million tons of solid waste, whichever occurs first. At that point, the City will either further extend the landfill contract or find and entitle an alternative landfill site.

The proposed project would be required to comply with the City's Mandatory Recycling and Composting Ordinance (Ordinance No. 100-09), the objective of which is to minimize the city's landfill trash generation. To comply with this ordinance, the proposed project would be required to provide convenient facilities for the separation of recyclables, compostables, and landfill trash for its users.

Construction of the proposed project also would generate demolition and construction waste. The City's Construction and Demolition Debris Recovery Ordinance (Ordinance No. 27-06) prohibits taking construction and demolition material to a landfill or placing such material in the garbage. All mixed debris must be transported by a registered hauler to a registered facility to be processed for recycling, and source-separated material must be taken to a facility that recycles or reuses those materials.

The proposed project would be required to follow state and federal regulations related to the disposal of hazardous wastes, and hazardous wastes would be transported to a permitted disposal or recycling facility. The proposed project would comply with all applicable local, state, and federal laws and regulations pertaining to solid waste.

As discussed above, the city has access to adequate landfill capacity at least through 2031 and potentially through 2041 and anticipates that an adequate alternative site will be identified at that point. Thus, the city has adequate solid waste capacity to serve the proposed project. Further, the proposed project is required to comply with all applicable local, state and federal laws and regulations concerning solid waste. Therefore, the proposed project's impact on landfill capacity and compliance with solid waste regulations would be ***less than significant***, and no mitigation measures are necessary.

Impact C-UT-1: The proposed project, in combination with cumulative projects, would not result in significant cumulative impacts on utilities and service systems. ***(Less than Significant)***

The geographic scope for potential cumulative utilities and service systems impacts consists of the project area, its immediate vicinity, and the service areas of utilities and service system providers.

Implementation of the proposed project, in combination with cumulative projects, would result in an incremental increase in population, water consumption, and wastewater and solid waste generation. SFPUC has accounted for such growth in its water demand and wastewater service projections, and the City has implemented various regulations to divert solid waste from landfills. For these reasons, the proposed project would not combine with cumulative projects to result in a significant cumulative impact on utilities and service systems, and impacts would be ***less than significant***. No mitigation measures are necessary.

E.7 Hazards and Hazardous Materials

Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact	Not Applicable
7. HAZARDS AND HAZARDOUS MATERIALS. Would the project:					
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☒	☐	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☒	☐	☐
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?	☐	☐	☐	☐	☒
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐	☐
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires?	☐	☐	☐	☐	☒

The nearest public use airport to the project site is San Francisco International Airport, located approximately 10 miles to the south. The project site is not located within an airport land use plan area; therefore, topic E.6(e) is not applicable to the proposed project.

Finally, the project site is not located within or adjacent to a wildland area; as a result, topic E.7(g) is not applicable to the proposed project.

Impact HZ-1: The proposed project would not create a significant hazard through the routine transport, use, or disposal of hazardous materials. ***(Less than Significant)***

Construction of the proposed project would involve demolition and construction of interior walls, partial demolition of the ceiling and floor, expansion of the rooftop mechanical penthouse, and installation of a new HVAC system and cooling tower. Construction materials, vehicles, and equipment would require the routine use of hazardous materials such as fuels and oils; lubricants, paints, and thinners; and solvents and cleaning solutions. Once constructed, the proposed project would require use of common types of hazardous materials that are typically associated with grocery store uses, such as cleaning products, disinfectants, and solvents. These materials could be released during their transport, use, or disposal and could cause a hazard for the public. However, these products are labeled to inform users of their potential risks and provide instruction regarding appropriate handling procedures. The majority of these hazardous materials would be consumed upon use and would produce very little waste. Any hazardous wastes that are produced would be managed in accordance with San Francisco Health Code article 22. In addition, the transportation of hazardous materials, are regulated by the California Highway Patrol and the California Department of Transportation. The use of any hazardous materials is not expected to cause any substantial health or safety hazards. Therefore, potential impacts related to the routine use, transport, and disposal of hazardous materials would be ***less than significant***. No mitigation measures are necessary.

Impact HZ-2: The proposed project would not create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. ***(Less than Significant)***

The City Center shopping center was constructed in 1961. The proposed project would involve partial demolition of the ceiling and floor and construction of a new grocery store in an existing vacant retail space. Some building materials commonly used in older buildings could present a public health risk if disturbed during an accident or during demolition or renovation of an existing building. These hazardous building materials include asbestos and other hazardous building materials as further discussed below.

ASBESTOS-CONTAINING MATERIALS

Based on the date the building was constructed, some of the building materials may pre-date the 1970s ban on the use of asbestos-containing material and asbestos-containing materials may be present in building materials that could become airborne when disturbed during demolition. Interior renovation activities would be required to follow all applicable standards and regulations for hazardous building materials, including the California Health and Safety Code. California Health and Safety Code section 19827.5 requires that local agencies not issue demolition or alteration permits until an applicant has demonstrated compliance with the notification requirements under applicable federal regulations regarding hazardous air pollutants, including asbestos. The air district is vested by the California legislature with authority to regulate airborne pollutants, including asbestos, through both inspection and law enforcement, and is to be notified ten days in advance of any proposed demolition or abatement work.

Notification includes the following:

- Names and address of operations and persons responsible
- A description and location of the structure to be demolished/altered including size, age and prior use, and the approximate amount of friable asbestos
- Scheduled starting and completion dates of demolition or abatement
- Nature of the planned work and methods to be employed
- Procedures to be employed to meet air district requirements
- The name and location of the waste disposal site to be used

The air district randomly inspects asbestos removal operations. In addition, the air district will inspect any removal operation when a complaint has been received. The local California Occupational Safety and Health Administration (OSHA) office must be notified of asbestos abatement to be performed. Asbestos abatement contractors must follow state regulations contained in 8 CCR sections 1529 and 341.6 through 341.14 where there is asbestos-related work involving 100 square feet or more of asbestos containing materials. Asbestos removal contractors must be certified by the State of California Contractors Licensing Board. The owner of the property where abatement is to occur must have a Hazardous Waste Generator Number assigned by and registered with the California Department of Health Services in Sacramento. In addition, the contractor and hauler of the material are required to file a hazardous waste manifest, which details the hauling of the material from the site and appropriate disposal. Pursuant to California law, the Department of Building Inspection will not issue a required permit until an applicant has complied with the notice and abatement requirements described above. These regulations and procedures, already established as part of the permit review process, would ensure that asbestos impacts from building materials would be less than significant.

OTHER POTENTIAL HAZARDOUS BUILDING MATERIALS

Other potential hazardous building materials such as polychlorinated biphenyls (PCB), PCB-containing electrical equipment, or fluorescent lights, could pose health threats for construction workers if not properly disposed of and create a significant impact in case of worker exposure or a release to the environment. These materials are regulated and would be managed, handled, transported, and disposed of according to federal, state, and local laws and regulations. Consequently, potential impacts of the proposed project related to exposure to hazardous building materials would be less than significant. In addition, project construction would be required to comply with federal and state OSHA regulations and Code of Federal Regulations title 29, section 1910. Compliance with these regulations would ensure the proposed project would not result in significant impacts from the potential release of hazardous building materials during renovation activities. Based on mandatory compliance with existing regulatory requirements, the proposed project would not result in a significant hazard to the public or environment from asbestos or other hazardous building materials, and would result in a ***less-than-significant*** impact with respect to the release of hazardous materials into the environment. No mitigation measures are necessary.

Impact HZ-3: The proposed project would not emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school. ***(Less than Significant)***

The project site is located one story below the Bright Horizons early education and preschool facility and within 0.25 mile of Raoul Wallenberg Traditional High School at 40 Vega Street; the University of California, San Francisco Laurel Heights Campus at 3333 California Street; the University of San Francisco at 2820 Turk Boulevard; the Little School preschool at 1520 Lyon Street; and the San Francisco Day School at 350 Masonic Avenue.

Construction may require the handling and transport of hazardous wastes during the approximately 10-month construction period, as described in Impacts HZ-1 and HZ-2. However, the materials would be handled in compliance with applicable federal, state, and local laws and regulations, as described above. With adherence to these regulations, there would be no potential for such materials to affect the nearest schools. During operations, the project sponsor would be required to store, handle, and dispose of hazardous materials in accordance with the regulations described under Impact HZ-1, which would ensure that hazardous materials are handled safely and there would be no potential for such materials to affect the nearest schools. Therefore, the proposed project would have a ***less-than-significant*** impact related to hazardous emissions or materials within 0.25 mile of a school. No mitigation measures are necessary.

Impact HZ-4: The proposed project would be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code section 65962.5, but would not create a significant hazard to the public or the environment. ***(No impact)***

The project site is located on a list of hazardous materials sites compiled pursuant to California Government Code section 65962.5, also known as the "Cortese List," because it formerly contained five leaking underground storage tanks at the prior Sears Automobile Service Center.[71] The five 10-gallon underground storage tanks were used to store hydraulic lift fluid. The tanks were removed on August 28, 1992. Following the excavation, six soil and two water samples were collected. Oil and grease were detected in those samples which resulted in two rounds of additional excavation and sampling. The second round of sampling confirmed that levels of hydrocarbon constituents were still present; albeit at acceptably low levels. Moreover, the underlying geologic condition is a bedrock-sandstone formation with scant groundwater present, and it was determined that the remaining hydrocarbons did not pose a threat to groundwater. As such, no further site investigation or cleanup was required, and the Department of Public Health issued a Notice of Completion [of] Underground Storage Removal on April 5, 1995.[72]

In February 1999[73], additional soil samples were collected from the excavation area surrounding the former leaking underground storage tanks, which required drilling. During the drilling activities, bedrock was encountered at eight to 11 feet below ground surface. Although some oil and grease were detected, no constituents of concern (BTEX, MTBE or PCBs) were present. The soil sampling process confirmed that there

[71] San Francisco Department of Public Health, *Case Closure Summary, Leaking Underground Fuel Storage Tank Program* (March 24, 1999), https://documents.geotracker.waterboards.ca.gov/regulators/deliverable_documents/8679410636/GEARY%20BLVD_2675_CASE%20CLOSURE%20SUMMARY_1999-03-24.PDF, accessed May 26, 2022.
[72] San Francisco Department of Public Health, *Notice of Completion [of] Underground Storage Removal* (April 5, 1995).
[73] Secor International Incorporated, *Phase I Environmental Site Assessment Report, The City Center, 2675 Geary Boulevard, San Francisco, California* (September 1998).

was no threat to groundwater, and the Department of Public Health recommended that the case be closed, with no further action.[74]

Given that the tank removal (in 1992) and subsequent soil samples (in 1995 and 1999) resulted in issuance of a case closure letter (in 1999) and given that tank removal area is two levels down from the project site and enclosed in concrete, and given that the proposed project would not result in excavation, the proposed project would have ***no impact*** with respect to being located on a list of hazardous materials sites and, as a result, create a significant hazard to the public or environment. No mitigation measures are necessary.

Impact HZ-5: The proposed project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. ***(Less than Significant)***

The City has a published (though not legislatively adopted) emergency response plan, prepared by the Department of Emergency Management as part of the City's Emergency Management Program.[75] The plan includes guidelines for hazard mitigation and disaster preparedness and recovery, and includes 16 annexes (similar to appendices) that cover a number of emergency topics. The Transportation Annex includes operational concepts for evacuating people in an emergency, including the process for designating evacuation routes.

The proposed project is a change of use within a vacant retail space in the City Center shopping center and would not add new physical features that would interfere with an emergency response plan or emergency evacuation plan. The proposed project is not anticipated to interfere with the San Francisco Emergency Response Plan because the proposed project would not permanently alter or impede access to existing roads in the area. Construction staging would occur on the project site and would not obstruct the sidewalks, street parking, and vehicular travel lanes bordering the project site. Therefore, construction of the proposed project would not interfere with travel by emergency response vehicles, restrict access to critical facilities such as hospitals or fire stations, or affect implementation of emergency response plans or emergency evacuation plans. The proposed project would have a ***less-than-significant*** impact with respect to interfering with an emergency response plan, and no mitigation measures are necessary.

Impact C-HZ-1: The proposed project, in combination with cumulative projects, would not result in a significant cumulative impact related to hazards and hazardous materials. ***(Less than Significant)***

Impacts related to hazards and hazardous materials are generally site-specific but can include other sites in the vicinity of the project site. Therefore, the geographic scope for potential cumulative hazardous materials impacts includes the projects listed in Table 2, p. 10, and shown in Figure 6, p. 11. Nearby cumulative projects would be subject to the same federal, state, regional, and city regulations designed to protect the public and the environment from risks of hazards and hazardous materials, and to maintain emergency access routes. Any future development in the project vicinity would be subject to these same laws and regulations. For

[74] San Francisco Department of Public Health, *Case Closure Summary, Leaking Underground Fuel Storage Tank Program* (March 24, 1999), https://documents.geotracker.waterboards.ca.gov/regulators/deliverable_documents/8679410636/GEARY%20BLVD_2675_CASE%20CLOSURE%20SUMMARY_1999-03-24.PDF, accessed May 26, 2022.

[75] City and County of San Francisco, *Emergency Response Plan: An Element of the CCSF Emergency Management Program* (May 2017), https://sfdem.org/sites/default/files/CCSF%20Emergency%20Response%20Plan_April%202008%20-%20updated%20May%202017_Posted.pdf, accessed March 8, 2022.

these reasons, the proposed project would not combine with cumulative projects to create a significant cumulative impact related to hazards and hazardous materials. This impact would be ***less than significant***, and no mitigation measures are necessary.

E.8 Energy

Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact	Not Applicable
8. ENERGY. Would the project:					
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	☐	☐	☒	☐	☐
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☐	☒	☐	☐

Impact EN-1: The proposed project would not result in wasteful, inefficient, or unnecessary consumption of energy resources during construction or operation or conflict with or obstruct a state or local plan for renewable energy or energy efficiency. ***(Less than Significant)***

The proposed project would increase the daytime population on the project site. The proposed project is a change of use within a vacant retail space in the City Center shopping center. While occupation of the vacant retail space would increase energy use onsite, the proposed project would not result in the wasteful, inefficient or unnecessary consumption of energy resources because it would comply with all applicable regulations related to consumption of energy resources.

In addition, the proposed project would make use of a vacant retail store rather than constructing a new facility. This would conserve the embodied energy present in the existing building and reduce the energy required to produce and transport new materials.

Further, the project site's urban location is accessible by transit and is bicycle and pedestrian friendly resulting in fewer vehicle trips and VMT. These features ensure that the project would not result in the wasteful, inefficient, or unnecessary consumption of fuel. For the reasons described above, the proposed project would not result in the wasteful use of energy. Furthermore, the proposed project would not conflict with or obstruct implementation of state or local plan for renewable energy and energy efficiency. Therefore, the impact would be ***less than significant***, and no mitigation measures are necessary.

Impact C-EN-1: The proposed project, in combination with cumulative projects, would increase the use of energy resources, but not in a wasteful manner. ***(Less than Significant)***

The geographic context for the analysis of cumulative impacts associated with energy is the service territory of the energy utility that serves the project site, PG&E, while the geographic context for the analysis of cumulative impacts associated with fuel use is the city. The proposed project would consist of interior renovation of an existing vacant retail space and expansion of the existing rooftop mechanical penthouse, including new HVAC equipment and a cooling tower, resulting in an increase of energy use at the site. All new development in the city would be required to comply with the standards of Title 24 and the San Francisco Green Building Code, thereby minimizing the amount of water and energy used. The majority of San Francisco, including the project site is located within a transportation analysis zone that experiences low levels of VMT per capita compared to regional VMT levels. Therefore, the proposed project, in combination with other reasonably foreseeable cumulative projects in San Francisco would not encourage activities that result in the use of large amounts of fuel or energy or use these in a wasteful manner and this impact would be ***less than significant***. No mitigation measures are required.

E.9 Mandatory Findings of Significance

Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact	Not Applicable
8. MANDATORY FINDINGS OF SIGNIFICANCE. Does the project:					
a) Have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?	☐	☐	☒	☐	☐
b) Have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)	☒	☐	☐	☐	☐
c) Have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☒	☐	☐	☐	☐

NOTE: Authority cited: Public Resources Code sections 21083 and 21083.05, 21083.09. Reference: Section 65088.4, Gov. Code; Public Resources Code sections 21073, 21074, 21080(c), 21080.1, 21080.3, 21083, 21083.05, 21083.3, 21080.3.1, 21080.3.2,21082.3, 21084.2, 21084.3, 21093, 21094, 21095, and 21151; *Sundstrom v. County of Mendocino* (1988) 202 Cal.App.3d 296; *Leonoff v. Monterey Board of Supervisors* (1990) 222 Cal.App.3d 1337; *Eureka Citizens for Responsible Govt. v. City of Eureka* (2007) 147 Cal.App.4th 357; *Protect the Historic Amador Waterways v. Amador Water Agency* (2004) 116 Cal.App.4th at 1109; *San Franciscans Upholding the Downtown Plan v. City and County of San Francisco* (2002) 102 Cal.App.4th 656.

As described in Section D of this initial study, the following topics are either not applicable to the proposed project or the project would have no impact on the topic: land use and planning, population and housing, wind, shadow, recreation, public services, geology and soils, hydrology and water quality, wildfire hazards, biological, historic, archeological, tribal cultural, paleontological, mineral, agricultural, or forestry resources. Given that these topics are either not applicable or the proposed project would have no impact on these environmental topics individually, the proposed project would also not contribute to any cumulative impacts for these environmental topics. Further, because the proposed project would have no impact on biological, historic, archeological, tribal cultural, and paleontological resources, the proposed project does not have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory.

The proposed project would have a less-than-significant impact on transportation and circulation, GHG emissions, utilities and service systems, hazards and hazardous materials, and energy resources. As discussed in Section E, cumulative impacts to these environmental topics would be less than significant.

The proposed project would have a potentially significant impact on sensitive receptors related to operational noise, which would be reduced to a less-than-significant level with the implementation of Mitigation Measure M-NO-3. As discussed in Section E, cumulative noise impacts would be less than significant.

This initial study finds that the proposed project ***may*** have a significant individual and cumulative air quality impact on sensitive receptors which could adversely affect human beings. The EIR will assesses this topic and identify mitigation measures, if applicable.

F. Mitigation Measures

The following mitigation measure has been identified to reduce a potentially significant noise impact to a less-than-significant level. The project sponsor has agreed to implement this mitigation measure.

> **Mitigation Measure M-NO-3: Mechanical Equipment Noise Control.** In order to reduce mechanical equipment noise, the project sponsor shall install noise barriers along the south, west, north, and east sides of the proposed cooling tower to block the line of sight between the cooling tower and daycare facility's outdoor playground and to attenuate noise at the north property plane.
>
> The noise barriers shall include, at a minimum, all of the following specifications:
>
> - Noise Barrier South of Cooling Tower:
>   - A total height of approximately 17 feet (an additional 7 feet on top of the 10-foot-tall rooftop mechanical penthouse enclosure walls);
>   - A solid barrier with a weight of at least 3 pounds per square foot (psf) and solid without any gaps; and
>   - Sound absorptive material on the side facing the mechanical equipment.

- Noise Barrier North of Cooling Tower (extending at least 10 feet from the northwest and northeast corners to the south:
  - A total height of approximately 24 feet (an additional 14 feet on top of the 10-foot-tall rooftop mechanical penthouse enclosure walls);
  - A solid barrier with a weight of at least 3 pounds per square foot (psf) and solid without any gaps; and
  - Sound absorptive material on the side facing the mechanical equipment.
- Acoustical louvers shall be located at the section of the enclosure east of the cooling tower meeting the minimum insertion loss as shown below.

	63 Hertz (Hz)	125 Hz	250 Hz	500 Hz	1 kilohertz (kHz)	2 kHz	4 kHz
Acoustical Louver Minimum Insertion Loss (dB)	—	8	7	11	13	10	8

- The outside air (OSA) units shall include:
  - 5 feet of internally lined duct with 1-inch-thick glass fiber duct lining between each of the OSA units and the outside air openings on the penthouse roof; or
  - As an alternative to an internally lined duct, duct silencers may be provided at the same duct segments described above. Each of the silencers shall meet the minimum insertion loss as shown below.

	63 Hertz (Hz)	125 Hz	250 Hz	500 Hz	1 kilohertz (kHz)	2 kHz	4 kHz
Silencer Minimum Insertion Loss (dB)	—	—	6	6	12	10	6

In lieu of the above, the project sponsor may install alternative noise control measures provided the sponsor submits documentation demonstrating that noise from the alternative measures would not exceed 62.5 dBA at the daycare facility's outdoor playground and 55 dBA at the north property plane, on level 4 of City Center.

Upon installation of the proposed project's mechanical equipment and required noise control measures, the project sponsor, with approval from the daycare facility, shall take noise measurements of the equipment at various locations within the outdoor playground to confirm that the project's mechanical equipment noise does not exceed 62.5 dBA. Noise measurements shall also be taken at the north property plane to confirm that noise levels do not exceed 55 dBA. Noise measurements shall be provided to the planning department prior to receipt of a certificate of occupancy. Should noise measurements indicate that the project's mechanical equipment noise exceeds 62.5 dBA at the daycare facility's outdoor playground or 55 dBA at the north property plane, the project sponsor, with an acoustical consultant, shall install additional noise attenuation measures necessary to ensure that noise levels do not exceed 62.5 dBA or 55 dBA, at the respective locations. Any additional noise attenuation measures shall be approved by the planning department, installed, and verified as not exceeding 62.5 dBA at the outdoor playground or 55 dBA at the north property plane, prior to receiving a certificate of occupancy.

G. Determination

On the basis of this initial study:

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☐ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☒ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect (1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and (2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, no further environmental documentation is required.

_____
Lisa Gibson
Environmental Review Officer
for
Rich Hillis
Director of Planning

DATE_____

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APPENDIX A

Transportation Technical Information

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From: Mike Alston, RSP; Sophia Semensky

RE: Transportation Memorandum
2675 Geary Boulevard

PURPOSE OF THIS MEMORANDUM

Kittelson & Associates, Inc. (Kittelson) has prepared this memorandum to present the travel demand and freight loading demand methodology and calculations for the proposed 2675 Geary Boulevard project ("project," Case No. 2019-004110ENV-02) in San Francisco, California. This memorandum also provides substantiation for air quality-related transportation data inputs subsequently used to model transportation-related emissions from the proposed project, in support of the environmental analysis.

Memorandum Organization

This memorandum is organized into the following sections which include data tables and substantiation as listed below:

- Project Description
  - Table 1. Proposed Project Characteristics
- Methodology
- Data Collection
- Project Travel Demand
  - Table 2. Weekday Travel Demand
  - Table 3. Vehicle Trips
  - Table 4. Customer Trips
  - Table 5. Employee Trips
- Project Freight Loading Demand
  - Table 6. Freight Trips
  - Table 7. Fleet Mix
  - Table 8. Loading Locations
  - Table 9. Loading Event Average Duration by Location
  - Table 10. Loading Event Average Duration by Vehicle Type
  - Table 11. Vehicle Miles Traveled by Freight Vehicle Type

Discussion preceding each table lists the data sources available and estimates based on each data source. The discussion then documents the source selected and explains how and why that data source was used. References to data sources are included as numbered endnotes; see Attachment A: Data Sources, for the complete reference. In addition, each section notes whether the analysis was completed for transportation environmental review or as an input to air quality analysis.

Each table listed above includes the following information:

- The item to be estimated
- The data and details on the calculation (where applicable)
- The data selected for analysis (including a source citation)

Attachment A and Attachment B include the data sources and support documents used to derive project analysis estimates. They are referenced throughout this memorandum when the corresponding analysis and estimates are discussed.

- Attachment A: Data Sources
  - **Attachment A-1: Weekday versus Weekend Transaction Data.** These data were used to estimate weekend project travel alongside weekday project travel in order to estimate overall average daily estimates.
  - **Attachment A-2: FHWA to EMFAC Vehicle Crosswalk.** This attachment is a support tool developed to convert fleet mix data collected in a particular format to a vehicle classification system appropriate for air quality analysis.
  - **Attachment A-3: Excerpt from San Francisco Travel Demand Update: Data Collection and Analysis.** This attachment includes the standard travel demand estimates consistent with the San Francisco TIA Guidelines (TIA Guidelines).
- Attachment B: Data Tables
  - **Table B-1. Data Sources + Store Amenities.** This table compares the project characteristics of the Whole Foods stores available for data analysis.
  - **Table B-2. Available Data by Source.** This table compares the available data from each source and shows which sources provided which data for estimation.
  - **Table B-3. Trip Generation Data.** This table shows the comparative results of potential travel demand analysis methodologies (including choice of source data).
  - **Table B-4. Freight Loading Data:** This table shows the available data sources for estimating project freight travel demand.

PROJECT DESCRIPTION

The project site is a vacant 49,825 -square-foot retail space within an existing 250,843-square-foot shopping center, the "City Center," located at the southeast corner of Masonic Avenue and Geary Boulevard, in the Western Addition Neighborhood of San Francisco (Assessor's Block 1094, Lot 001). The project site also includes an existing parking lot with 117 vehicle parking spaces (Parking Lot C) and a loading dock in Parking Lot E.

The project sponsor proposes to renovate an existing vacant retail space on level 3 of the City Center shopping center for a new Whole Foods Market grocery store. The proposed project would include a 49,825-square-foot grocery store with a 25,030-square-foot sales floor**.** The remaining 24,795 square feet would be dedicated to other uses: seating areas, checkout, self-checkout, and back-of-house uses such as offices, restrooms, freezers, kitchens, and storage areas for online orders.[i,ii] The grocery store would sell

[i] These areas store products ordered online and collected in store by Whole Foods Market employees for pickup or delivery. Customers can order groceries and other in-store products online through Whole Foods Market or Amazon Prime.

[ii] Note: Although trips for retail land uses (including freight trips) are typically generated based on the size of the sales floor, all trip calculations are based on the entire store volume (gross square footage). This provides a conservative approach to analysis.

grocery items, prepared foods, medicine, household products, beverages, and other retail items. The store would have a lounge and seating area with a capacity of 50 people.

The analysis presented in this memorandum (and used for subsequent air quality analysis) was based on a prior project description that included a larger store (54,290 gross square feet). As a result, the estimates presented in this memorandum are conservative estimates (i.e., higher and more impactful from an environmental impact perspective compared to the revised project description).

Table 1. Proposed Project Characteristics

Project Characteristics	Existing	Proposed
Interior area (square feet)	49,825	49,825
Land use	Vacant Retail	Grocery Store
Rooftop mechanical penthouse (square feet)	930	1,630
Hours of loading	–	5 AM – 3 PM
Store hours	–	8 AM – 10 PM
Vehicle parking spaces	117 (Lot C)	117 (Lot C)
Bicycle parking spaces	8 (Lot E)	8 (Lot E)
Americans with Disabilities Act (ADA) parking spaces	1 van ADA; 4 standard ADA	1 van ADA; 4 standard ADA

Source: Whole Foods Market, 2021

METHODOLOGY

This section describes the methodology used to develop project travel demand and freight loading estimates.

Transportation analysis for environmental review typically proceeds with a proposed designated land use and unknown future tenants. For example, a project may specify a "retail – supermarket" use but not have a proposed retailer. As a result, analysis will typically include general assumptions associated with the land use type.

However, for the proposed project the project sponsor is the prospective tenant, Whole Foods Market. Therefore, Kittelson and the San Francisco Planning Department ("planning department") collected data from Whole Foods Market sites within San Francisco, including observation-based counts at the Whole Foods Market at 2001 Market Street (in 2017 and 2021). Additional Whole Foods specific data was collected by the planning department for other studies, such as the Balboa Reservoir EIR, or via data requests to Whole Foods Market. See Appendix A for further detail. Where possible, specific data for Whole Foods operations was used to improve the accuracy of estimates for the proposed project compared to more general input assumptions for the "retail – supermarket" land use type.

Whole Foods Operations

At the time this analysis was completed (early 2022), Whole foods operated seven stores in San Francisco and a local distribution center in Richmond, California.

DATA COLLECTION

Kittelson compared data at the 2001 Market Street Whole Foods Market site. This included data collected in 2017 for the TIA Guidelines update [8] and Kittelson data collected in 2021. A comparison of data in 2017 and 2021 helped identify travel demand and freight loading demand methodology and calculations for the proposed project, including to account for whether changes related to the Whole Foods business model (addition of Amazon lockers and Amazon Fresh grocery delivery) and travel pattern changes related to COVID-19 (started in March 2020 in San Francisco) meaningfully altered Whole Foods travel characteristics over time.

According to the San Francisco Travel Demand Update: Data Collection and Analysis report[9], the Whole Foods store at 2001 Market Street is 23,751 square feet. The store operating hours are 8:00 AM to 10:00 PM, seven days a week.

2021 DATA COLLECTION

Travel activity data was collected on July 20 and 21, 2021 at the 2001 Market Street Whole Foods store [5]. The data collection effort included:

- Person Trip Generation:
  - Total person trip generation by time of day
  - Person trip generation per thousand square feet
  - Trip generation (daily and peak hour person-trips per 1,000 square feet)
- Passenger Loading
  - Total of passenger loading vehicles by time of day
  - Length of each activity and average duration
  - Location of loading activity, including use of formal loading space or other curb or street location
  - Peak hour loading rate within the peak period for passenger loading (5 to 8 PM)
- Commercial Loading
  - Total of commercial loading vehicles by time of day and type of vehicle
  - Length of stay for vehicles and average duration
  - Location of loading activity, including use of formal loading space or other curb or street location
  - Peak hour loading rate within the peak period for commercial loading (11 AM to 2 PM)

In 2021, the 2001 Market Street store included Amazon Fresh service and Amazon lockers onsite for parcel delivery. The 2001 Market Street store included an onsite coffee bar and two interior eateries, similar to the proposed project. Activity associated with the onsite coffee bar and eateries was not separately observed or counted.

2017 REFERENCE DATA

The June 29, 2018, San Francisco Travel Demand Update: Data Collection and Analysis report included data collection at representative retail sites and documented those data in technical appendices [9]. Those data include 2017 travel demand data collected at the site.

At the time of the 2017 data collection, the 2001 Market Street Whole Foods site did not include Amazon Fresh service and Amazon lockers onsite for parcel delivery. (The Amazon purchase of Whole Foods was reported in June 2017.) The site did include the onsite coffee bar and two interior eateries at the time, similar to the proposed project.

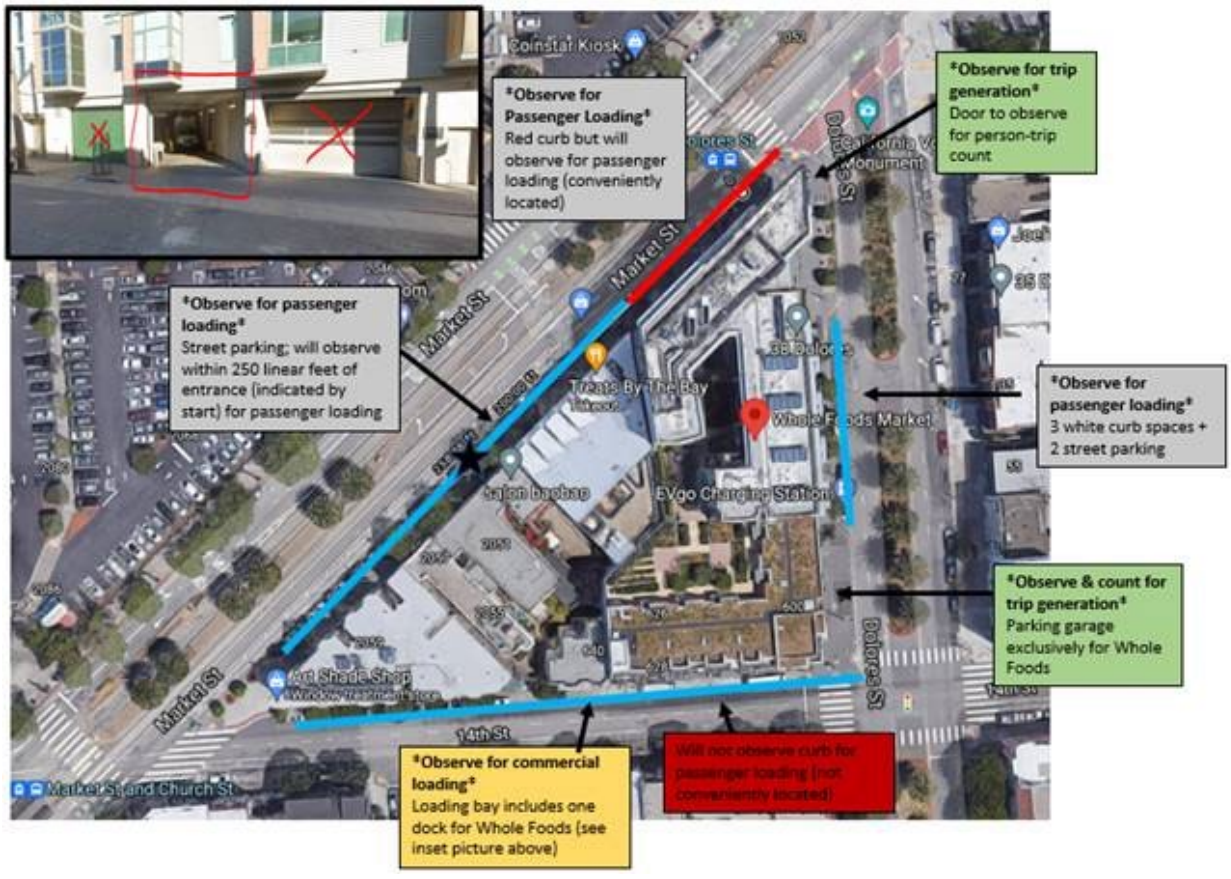
The following data was collected at the 2001 Market Street site as part of the TIA Guidelines update project (source: San Francisco Travel Demand Update: Data Collection and Analysis report Appendix D, page 2):

- **Person-trip** video counts on May 24, 2017
- **Mode share** intercept surveys on April 27, 2017
- **Loading activity** time lapse data on May 24, 2017

Site and Data Collection Logistics

Figure 1 shows an aerial image of the 2001 Market Street site block face; data observation locations are described below.

Figure 1: Data Collection Site Plan



PERSON TRIPS

Person trips were counted between 8 AM and 10 PM (the store's operating hours) on Tuesday, July 20, 2021, and Wednesday, July 21, 2021. Person trips were counted by observing and tallying at the following locations (refer to Figure 1):

- In/out activity at the doorway onto Dolores and Market (direct person trip count)
- Vehicle entries and exits to parking garage, with an assumed 1.4 average vehicle occupancy (indirect person trip count; this is the average vehicle occupancy reported by the Travel Demand Tool for this site) [8]

PASSENGER LOADING ACTIVITY

Passenger loading was counted between 8 AM and 10 PM (the store's operating hours) on the same two weekdays. Passenger loading activity was counted by observing and tallying at the following locations (refer to figure 1):

- Three white curb loading spaces and four street parking spaces along Dolores Street
- Red curb along Market Street which is within 250 linear feet of the Whole Foods entrance
- Street parking within 250 linear feet of Whole Foods entrance

The type of event (pickup/drop-off), time of day, location, and duration was recorded for all events, as well as qualitative observations (e.g., double parking). The cameras were set up and observed between 5 AM and 12 AM so that all commercial loading activity in these locations was recorded.

COMMERCIAL LOADING ACTIVITY

Per a July 8, 2021, conversation with onsite staff, Whole Foods suppliers use the loading dock along 14th Street (see Figure 1) to deliver groceries [13]. Drivers making deliveries for Amazon Lockers typically use available white curb space or short-term parking. Third-party vendors park and use the main entrance. There are no yellow curb commercial loading zones along the project side of the street within 250 linear feet of the Whole Foods entrance. Commercial activity was observed and tallied between 5 AM and 12 AM on the same two weekdays at the following locations:

- The loading dock on 14th Street
- Any commercial loading activity observed at the passenger loading sites
- Any incidental commercial loading activity observed at the garage entrance/exit
- Any obvious commercial deliveries being made through the front door (e.g., pushing a handcart)

The vehicle type, time of day, location, and duration was reported for all commercial loading activity. For third-party vendors making commercial deliveries through the front door, the duration was estimated based on the arrival and departure through the front doors.

OTHER AVAILABLE DATA SOURCES

Kittelson compiled and summarized the original data collection, allowing for comparison to the following other sources of data:

- The TIA Guidelines published travel demand rates for grocery store use [8]
- The June 29, 2018, San Francisco Travel Demand Update: Data Collection and Analysis report, including the technical appendices (for 2017 travel information at the 2001 Market site [9]

- Commercial loading data collected at the 1150 Ocean Avenue Whole Foods site on March 10, 2019 [3]
- Published documents associated with the proposed project:
  - Transportation Coordination Memo, May 4, 2020, which provided data from the 1765 California Site collected in 2019 [7]
  - Appeal of Exemption Determination, November 9, 2020
  - Hypothetical Loading Demand Analysis Memo, November 6, 2020

As part of the transportation analysis, Kittelson discussed the range of travel demand estimates indicated by available data and analyzed the project with a reasonable and appropriately conservative estimate.

PROJECT TRAVEL DEMAND

This section presents the project's travel demand, including:

- Table 2. Weekday Travel Demand
- Table 3. Vehicle Trips
- Table 4. Customer Trips
- Table 5. Employee Trips

Weekday Travel Demand

Kittelson and the department reviewed the data discussed in the Data Collection section of this memorandum to identify the appropriate data to use for the project's travel demand (see Attachment B: Data Tables).

As shown in Table B-2: Available Data by Source (Attachment B), daily and weekday PM peak hour person trip rates were available from the following sources:

- 2001 Market Street (2017) [6]
- 2001 Market Street (2021) [5]
- The 2675 Geary Blvd Planning Department Transportation Coordination Memo [7]
- The TIA Guidelines (2019) [8]

Daily and weekday PM peak hour person trip rates are shown in Table B-3: Trip Generation Data.

For weekday daily person trips: Kittelson used the TIA Guidelines rate of 297 weekday daily person trips per 1,000 gross square feet, which includes trips by all ways of travel. Kittelson conservatively selected this daily person trip rate because of the variation of observed rates (173.27 to 322) and because it is higher than the person rate observed in the 2001 Market Street (2021) data collection (173.27).

Kittelson then applied the mode split and average vehicle occupancy rates for the project location from the TIA Guidelines and incorporated those rates into the SF Travel Demand Tool [1] to determine the number of daily and PM peak hour Automobile, TNC/Taxi, Transit, Bicycle, Walking, and Private Shuttle person trips. The results from the travel demand analysis are summarized in Table 2. Weekday Travel Demand.

Table 2. Weekday Travel Demand

Mode Choice	Daily Trips	PM Peak Hour Trips
Automobile Person Trips	4,176	305
TNC/Taxi Person Trips	226	16
Muni Bus/Rail Person Trips	1,903	139
Bicycle Person Trips	451	33
Walking Person Trips	9,287	678
Private Shuttle Person Trips	81	6
Total Person Trips	16,124	1,177
Total Vehicle Trips[1]	2,620	216
Total Vehicle Trips (Private Vehicles + TNC/Taxi)[iii]	2,846	232

Source: Refer to Table B-3

1 Total Vehicle Trips = Automobile Person Trips/Average Vehicle Occupancy

Weekend Vehicle Trips

Kittelson estimated the average daily vehicle trips and PM Peak Hour vehicle trips (including weekends) for air quality model inputs. To develop average daily values (in contrast with the average weekday values already presented), Kittelson estimated weekend project-related travel compared to the weekday estimates provided in the preceding section and adjusted the overall estimates.

To develop weekend travel demand estimates in relation to weekday demand, Kittelson obtained and analyzed transaction and gross sales data from Whole Food's seven San Francisco stores [10]. The average number of weekend (Saturday and Sunday) transactions across all stores citywide was 5 percent higher than average weekday transactions which means 5 percent more trips across all modes. Therefore, a 5 percent growth was applied to estimate weekend project-related trips, and then a weighted average of weekend and weekday trips was taken to arrive at average daily vehicle trips.

Table 3. Vehicle Trips presents the average daily project vehicle trips.

The PM Peak Hour weekday vehicle trips are a direct output from the SF Travel Demand Tool [1]. The weekend trips can be estimated as 1.05 multiplied by the weekday trips. A weighted average of weekend and weekday trips was taken to yield the average daily and PM Peak Hour Vehicle Trips: 2,658 and 219, respectively.

[iii] Vehicle trips that were included in the air quality model only included trips by private vehicle and did not include taxi/TNC trips. However, the vehicle trips were based on a 54,290-square-foot floor area. The proposed project's floor area would be 49,285 square feet which would generate approximately 2,378 daily private vehicle trips and 205 taxi/TNC trips or 2,583 total vehicle trips which is less than the 2,620 vehicle trips that were included in the air quality model. Therefore, the number of vehicle trips was overestimated even with the omission of taxi/TNC trips.

Table 3. Vehicle Trips

Item to be Estimated	Data	Source
Total daily vehicle trips (weekday)	2,620 (rounded)	
Total daily vehicle trips (weekend)	2,620*1.05 = **2,751**(rounded)	Whole Foods data on weekend vs weekday gross sales and transactions [10]
Average daily vehicle trips	**2,658 trips** 297 daily trips per 1,000 square feet * 54.290 = 16,124 weekday daily person-trips 16,124.13 * 1.05 = 16,930 weekend daily person-trips Weighted average daily trips = 16,124*5/7 + 16,930*2/7 = 16,354.3 = 16,354 daily person trips (rounded) 16,354 daily trips * 26% (0.26) auto mode share / 1.6 average vehicle occupancy = 2,657.5 = 2,658 (rounded) daily vehicle trips (weekday))	Daily trip generation rate: TIA Guidelines (2019) [8] Mode Split: SF Travel Demand Tool (sftraveldemand.sfcta.org) [1] Whole Foods provided data on weekend vs weekday gross sales [10]
PM Peak Hour vehicle trips (weekday)	**216**	Mode Split and PM to daily trip relationship: SF Travel Demand Tool (sftraveldemand.sfcta.org) [1]
PM Peak Hour vehicle trips (weekend)	216*1.05 = 226.8 = **227** (rounded)	
PM Peak Hour vehicle trips (daily)	216 * 5/7 + 216*1.05*2/7 = 219.1 = **219** (rounded)	

Customer and Employee Trips

The number of weekday and weekend customer and employee daily and PM Peak Hour trips, as well as average trip length and Vehicles Mile Traveled (VMT) were estimated for the air quality analysis.

The average number of daily and PM Peak Hour trips (weekday, weekend, and average daily) was used from Table 3. Vehicle Trips, and the SF Travel Demand Tool was used to estimate the share of non-work vehicle trips as a percent of total trips [1]. Customer trips (non-work trips) are about 78 percent of daily vehicle trips, so that factor was applied to total vehicle trips to estimate the customer share. As before, weekday trips were converted to weekend trips with a multiplication factor of 1.05 [10].

Average customer trip lengths were estimated using the TIA Guidelines trip distribution guidelines to route vehicle trips to the centroid of each distributed geography, with a weighted average of trip lengths taken

[8]. The VMT for weekday, weekend, and combined was then generated by multiplying the average trip length by the corresponding number of daily trips.

As shown in Table 4. Customer Trips, the average customer trip length as estimated would be 4.99 miles. However, this estimate may overstate the actual average customer trip length for a few reasons. Grocery stores and other local-serving retail uses often reduce trip lengths by providing a closer destination for existing shopping demand near the project site. In this case, some portion of project-related trips would be redirected from existing longer shopping trips, allowing shoppers to travel a shorter distance.

Also, the trip length estimates are based on the guidelines and represent a sample trip distribution for the use type. Given that the project site is near the center of San Francisco (which is seven miles by seven miles), an average vehicle trip length of 4.99 miles would indicate that customers would be driving to this store instead of other, closer Whole Foods stores or other grocery stores (e.g., Marin County or the farthest western portions of the Richmond and Sunset neighborhoods).

Table 4. Customer Trips

Item to be Estimated	Data	Source
Daily customer vehicle trips (weekday)	2,620 * 0.78 = **2,056 vehicle trips** (rounded)	Daily trip generation rate: TIA Guidelines (2019) [8] Mode Split: SF Travel Demand Tool (sftraveldemand.sfcta.org)[1]
PM peak hour customer vehicle trips (weekday)	216 * 0.78 = **152 vehicle trips** (rounded)	2001 Market Street (2021) Original Data Collection [5] TIA Guidelines [8] Mode Split
Daily customer vehicle trips (weekend)	2,056 * 1.05 = **2,159 vehicle trips** (rounded)	2001 Market Street (2021) Original Data Collection [5] Whole Foods market estimates of # of employees on weekdays vs. weekends
PM peak hour customer vehicle trips (weekend)	152 * 1.05 = **160 vehicle trips** (rounded)	2001 Market Street (2021) Original Data Collection [5]
Average daily customer vehicle trips	2,056*5/7+2,159*2/7 = **2,085 vehicle trips** (rounded)	Daily trip generation rate: TIA Guidelines (2019) [8] Mode Split: SF Travel Demand Tool (sftraveldemand.sfcta.org) [1]
Average day PM peak hour customer trips	152*5/7 + 160*2/7 = **154 vehicle trips**	Daily trip generation rate: TIA Guidelines (2019) [8] Mode Split: SF Travel Demand Tool (sftraveldemand.sfcta.org) [1]
Average vehicle trip length for customers	**4.99 miles**	TIA Guidelines [8] Trip Distribution estimates
Total VMT for customers (weekday)	2,056 * 4.99 = **10,259 VMT**	

Item to be Estimated	Data	Source
Total VMT for customers (weekend)	2,159 * 4.99 = **10,772 VMT**	
Total daily VMT for customers	2,085 * 4.99 = **10,406 VMT**	

The employee trips were calculated using the same method as above: employee trips account for about 22 percent of daily vehicle trips, total vehicle trips were multiplied by 0.22 to arrive at an estimate. See Table 5. Employee Trips for detailed calculations. The average trip length was calculated by obtaining vehicle miles traveled (VMT) estimates by traffic analysis zone (TAZ) per retail employee and multiplying by the number of employees to result in VMT. The VMT estimates are provided by the San Francisco Chained Activity Modeling Process (SF-CHAMP) travel demand model [11]. Then, the VMT divided by the number of employee vehicle trips yields the average vehicle trip length. The number of employees was estimated by total number of daily person trips classified as work trips (22 percent): 3,332 (this is approximately 22 percent of the total person trips obtained and presented in Table 2. Weekday Travel Demand). Assuming these are one-way trips, and assuming three or four one-way trips per day per employee (a typical assumption for retail employee travel within San Francisco), the number of employees may be 25 to 33 percent of that, or 833 to 1,111 employees.

This estimate is likely conservative. Whole Foods anticipates a total of 200 employees with 35 to40 employees working each shift. Based on typical Whole Foods Market hours of 8:00 AM to 10:00 PM, the store would be open 14 hours per day, likely resulting in three shifts. Three shifts with 40 employees each would result in 120 employees per day. Again, assuming employees typically make three or four one-way trips per day (which accounts for trips taken off-site during a shift break), then if 120 employees take four trips per day, this would result in 480 daily employee trips, compared to 3,332, calculated above. In addition, the average trip length for employees is 21.6 miles. While that may be accurate for commute trips (two per day per employee), trips taken during an employee's shift are not likely to be that far; therefore, these calculations likely overestimate the VMT for employees.

Table 5. Employee Trips

Item to be Estimated	Data	Source
# of vehicle trips (weekday)	2,620 * 0.22 = **564 vehicle trips (rounded)**	2001 Market Street (2021) Original Data Collection [5] TIA Guidelines [8] Trip Distribution
# of PM peak hour vehicle trips (weekday)	216 * 0.22 = **64 vehicle trips** (rounded)	2001 Market Street (2021) Original Data Collection [5] TIA Guidelines [8] Trip Distribution
# of vehicle trips (weekend)	**564 * 1.05 =** 592.2 = **592 vehicle trips** (rounded)	2001 Market Street (2021) Original Data Collection [5]
# of PM peak hour vehicle trips (weekend)	64 * 1.05 = 67.2 = **67 vehicle trips** (rounded)	2001 Market Street (2021) Original Data Collection [5]
Average # of daily vehicle trips	564 * 5/7 + 564*1.05*2/7 = 572.1 **= 572 vehicle trips** (rounded)	2001 Market Street (2021) Original Data Collection [5] TIA Guidelines [8] Trip Distribution
Average # of PM peak hour vehicle trips	65*5/7 + 64*1.05*2/7 = 64.9 = **69 vehicle trips** (rounded)	
Average trip length for employees	21.6 (see below) Step 1: TIM VMT/retail employee = 7.41 Step 2: VMT/retail employee * # of employees = Total VMT: 7.41 * 1,666 = 12,345.1 Total VMT Step 3: total VMT/# of vehicle trips = 12,345.1 / 572 = **21.6 miles per employee vehicle trip**	TIM estimates (by TAZ) [11]
Total VMT for employees (weekday)	564 * 21.6 = **12,182 VMT**	
Total VMT for employees (weekend)	592 * 21.6 = **12,787 VMT**	
Total daily VMT for employees	572 * 21.6 = **12,355 VMT**	

FREIGHT LOADING DEMAND

Freight loading data were available from three Whole Foods locations as part of four studies (including the 2021 original data collection): 2001 Market Street (2021) [5], 1765 California Street (2019) [2], and 1150 Ocean Avenue (2019 & 2021) [3]. These locations include Amazon services, such as an Amazon Hub Locker and Amazon Returns, but these Amazon services are not proposed for 2675 Geary Boulevard.[iv] Therefore, the data collected likely overestimates freight loading demand for the proposed project: these activities are associated with additional trips: private trips to drop off Amazon returns, private trips to pick up deliveries from lockers, and commercial trips to collect returns and drop packages off to lockers.

For each item to be estimated, the data sources available were compared and the most conservative choice was generally chosen. The following section presents each item that was estimated, the sources, and an explanation of why the source was chosen. The following items were estimated:

- Freight Trips
  - Daily Freight Trips (Weekday)
  - Daily Freight Trips (Weekend)
  - Total Daily Freight Trips
- Fleet Mix (Total Daily Freight Trips by Vehicle Classification)
- Loading Locations
- Loading Event Average Duration by Location
- Loading Event Average Duration by Vehicle Type
- Vehicle Miles Traveled by Freight Delivery Vehicle Type (weekday/weekend daily vehicle miles traveled)

Freight Trips

The weekday, weekend, and average daily freight trips were estimated for the transportation analysis and as inputs to the air quality model. Freight loading trip data were available from four studies: 2001 Market Street (2021) [5], 1765 California Street (2019) [2] and 1150 Ocean Avenue (2019 & 2021) [3], so a freight trip rate (e.g., freight trips per square foot) was calculated for each data source using the average number of weekday freight trips and corresponding store square footage. Kittelson selected the 1765 California Street (2019) [2] rate of 1 trip per 1,000 square feet, because it provided the highest truck trip rate from among the four studies and represents an appropriately conservative estimate. Applying that rate to project's proposed square footage of 54,290[v], a total of 54 daily weekday freight trips was estimated. Table 6. Freight Trips shows the estimated demand.

Freight loading demand calculations look at the maximum freight trips on any given day and at peak times and do not distinguish between weekend and weekday trips. Whole Foods provided a log of freight delivery activity for the 1150 Ocean Avenue location at the Planning Department's request. Based on the data provided, weekend freight trip totals are about 45 percent of the total of weekday freight trips, leading to about 24 daily weekend freight trips for the proposed 2675 Geary location.

[iv] **Note:** although customers can order groceries and other in-store products online through Whole Foods Market or Amazon Prime for pick-up or delivery, the Amazon services, such as lockers or an Amazon return center would not be provided at this location.

[v] While the current project description has a square footage of 49,825, at the time of analysis, the square footage was proposed to be 54,290. As such, this analysis is conservative as it overestimates the number of freight trips.

Based on the above estimates, Kittelson estimated a weighted average daily (weekday and weekend) freight trips estimate of 0.84 trips per 1,000 square feet, as shown in Table 6. Freight Trips. The weighted average of weekday and weekend freight trips was used for the air quality analysis which accounts of emissions occurring every day of the year.

Table 6. Freight Trips

Item to be Estimated	Data	Source
Daily freight trips (weekday)	**54 daily freight trips** 1.0 trips per 1,000 square feet = 1.0 * 54.290 = 54.29 = 54 daily trips (rounded)	1765 California Street (2019) [2]
Daily freight trips (weekend)	**24 daily freight trips** 1.0 trips per 1,000 square feet * 45% (0.45) = 0.45 trips per 1,000 square feet * 54.290 = 24.43 = 24 daily trips (rounded)	1150 Ocean Avenue (2021) [3]
Total daily freight trips	**0.84 trips per 1,000 square feet =** **46 daily freight trips** [(5/7) * 1.0)] + [(2/7) *0.45] = 0.84 trips per 1,000 square feet = 46 trips (5/7 * 54 daily weekday freight loading trips) + (2/7 * 24 daily weekend freight loading trips) = 38.57 + 6.85 = 45.427 = 46 average daily freight trips (rounded)	1765 California Street (2019) [2] 1150 Ocean Avenue (2021 [3]

Fleet Mix

The total daily freight trips by vehicle classification were estimated for the air quality model in order to estimate the emissions associated with different vehicle types. There were two data sources available: 2001 Market Street (2021) [5] and 1150 Ocean Avenue (2021) [4]. Kittelson selected the 2001 Market Street data as the source for the fleet mix because the data were more heavily weighted toward larger trucks which have a higher rate of emissions; using this data provided a more conservative approach (i.e., worst-case). The 2001 Market Street (2021) data recorded the fleet mix using Federal Highway Administration (FHWA) vehicle classifications, and the air quality model requires fleet mix by Emission FACtor (EMFAC) Vehicle Weight Classification. Kittelson developed a translation from the FHWA vehicle classification types, which classify vehicles based on weight and number of axles, to EMFAC classifications, which classify vehicles based on engine type and resulting emissions (see Attachment A-2).

The EMFAC truck information was used for the following air quality model inputs:

- An estimate of overall vehicle fleet mix
- An estimate of average loading time per vehicle type (see the Loading Event Average Duration by Vehicle Type section, below).
- In conjunction with data collected about the presence of transportation refrigerated units (TRUs) on observed freight vehicles in the 2001 Market Street (2021) data, it enabled an estimate of TRUs per truck type for the proposed project (see the Loading Event Average Duration by Vehicle Type section, below).

The EMFAC vehicle fleet mix was calculated for both sources which confirmed that the vehicle types from 2001 Market Street (2021) would have a higher rate of emissions.

Table 7. Fleet Mix

Item to be Estimated	Data	Source
Medium-Duty Trucks (MDV)	46 trips x 13% = 5.98 trucks, rounds to **6 trucks**	2001 Market Street (2021) [5]
Light-Heavy-Duty Trucks, Gross Vehicle Weight Rating (GVWR) 8,501-10,000 lbs (LHDT1)	46 trips x 0 % = **0 trucks**	MDV – 13% LHDT1 – 0% LDT2 – 18% MHDT – 49% HHDT – 20%
Light-Duty Trucks, GVWR < 6,000 lbs (LDT2)	46 trips x 18 % = 8.28 trucks, rounds to **8 trucks**	
Medium-Heavy Duty Trucks (MHDT)	46 trips x 49 % = 22.54 trucks, rounds to **23 trucks**	
Heavy-Heavy Duty Trucks (HHDT)	46 trips x 20 % = 9.2 trucks, rounds to **9 trucks**	

Loading Locations

The air quality modeling analysis includes emissions estimates in relation to their location; therefore, the estimated freight loading trips were assigned to one of two locations for air quality analysis: loading dock or parking lot.

Whole Foods Markets receive deliveries from vehicles of several different sizes grouped as 65-foot (tractor trailer), 30-48-foot vehicles, and vehicles under 30 feet long. Each vehicle type has a different height and loading door configuration; some vehicles load from the tailgate and others from a side door. Larger trucks, such as tractor trailers have bed heights that closely align with 48-inch-high platforms; loading dock platforms most commonly are 44 to 48 inches high.[vi] Loading docks designed to accommodate these larger rear-loading vehicles are not designed to accommodate smaller and/or side-loading delivery vehicles; these vehicles typically unload from the street or parking lot and hand cart goods into the store.

The location of freight trips (loading docks vs hand cart) was estimated for both the transportation analysis and as an input to the air quality model. The observed data at 2001 Market Street (2021) [5] showed 41% of freight loading trips occurring at the loading dock and 59% delivered through the front door via hand truck.

[vi] https://www.safetyandhealthmagazine.com/articles/16472-osha-loading-dock-requirements. Accessed May 25, 2022.

This data was not collected for other Whole Foods locations, or as part of the 2017 data collection at 2001 Market Street.

At 2675 Geary, all deliveries would be received in a staffed receiving area from an existing 3,528-square-foot loading dock at the north end of Lot E, or would be hand carted to the receiving area from Lot E. There are four stalls within the loading dock, each of which can accommodate a 65-foot tractor trailer. Two stalls would be dedicated to Whole Foods Market.

There is a large concrete apron surrounding the freight elevator with adequate space for multiple trucks of various sizes to dwell while hand-carting deliveries to the freight elevator. Delivery vehicles could also park elsewhere within Lot E during loading activities. As such, loading spaces for smaller vehicles are not constrained (See Figure 2).

Figure 2: Existing and Proposed Site, Including Loading Dock



Source: Eagleview 2020

Given that the loading dock space is limited to two spaces, the analysis assumed a more conservative (i.e., higher demand) 50% of the freight loading trips would occur at the loading dock and 50% would occur from Lot E to the receiving area via hand truck.

Table 8. Loading Locations

Item to be Estimated	Data	Source
Loading dock	**23 trips** (50% of freight trips)	2001 Market Street (2021) [5]
Hand cart	**23 trips** (50% of freight trips)	2001 Market Street (2021) [5]

Loading Event Average Duration by Location

The loading event average duration by location was estimated for both the transportation analysis and as an input to the air quality model. Loading event durations were observed at 2001 Market Street (2021) [5] at both the loading dock and for deliveries via hand cart. As shown in Table 9, average loading durations were 20:49 minutes for events at the loading dock and 23:40 minutes for events by hand cart.

Table 9. Loading Event Average Duration by Location

Item to be Estimated	Data	Source
Loading dock	**20:49 minutes**	2001 Market Street (2021) [5]
Hand cart	**23:40 minutes**	2001 Market Street (2021) [5]

Loading Event Average Duration by Vehicle Type

The loading event average duration by vehicle type was estimated as an input to the air quality model. This information was necessary to determine the idling time for deliveries. Whole Foods does not allow trucks to idle while queuing for freight loading, state law allows 5 minutes of idling upon arrival and 5 minutes prior to departure. Additionally, for TRUs (refrigerated units), it was assumed that the motor that keeps the freight chilled (which is separate from the engine motor that powers the vehicle) would be operational (i.e., engine running) for the entire loading duration.

The fleet mix from 2001 Market Street (2021) [5] was used (as per the Fleet Mix section above), with average event duration pulled for each vehicle type.

Table 10. Loading Event Average Duration by Vehicle Type

Item to be Estimated	Data	Source
MDV	**21:18 (minutes: seconds)**	2001 Market Street (2021) [5]
LHDT1	**No data**	
LDT2	**29:24 (minutes: seconds)**	
MHDT	**20:23 (minutes: seconds)**	
HHDT	**23:39 (minutes: seconds)**	
Share of Truck Type with Refrigeration (TRUs)		
MDV	0% -- 6 x 0% = **0 TRUs**	2001 Market Street (2021) [5]
LHDT1	27% -- 0 x 27% = **0 TRUs**	MDV TRUs – 0%
LDT2	0% -- 8 x 0% = **0 TRUs**	LHDT1 TRUs – 27%
MHDT	27% -- 23 x 27% = 6.21, rounds up to **7 TRUs**	LDT2 TRUs – 0% MHDT TRUs – 27%
HHDT	58% -- 9 x 58% = 5.22, rounds up to **6 TRUs**	HHDT TRUs – 58%

Vehicle Miles Traveled by Freight Vehicle Type

Total VMT for the proposed project was estimated as an input to the air quality model which includes vehicle trips by employees, customers, and freight delivery vehicles. For the purposes of calculating emissions, all vehicle miles traveled are assigned to a vehicle type.

VMT calculations include number of trips and average trip length. VMT calculations are provided for each freight vehicle type.

The 2001 Market Street [5] data provided the number of deliveries per FHWA classification type, which was then translated to EMFAC vehicle classification type per the vehicle 'crosswalk' (Attachment A-2).

Estimated average trip length per EMFAC vehicle classification type was based on Whole Foods provided origin/destination data to 2675 Geary. It is conservatively estimated that each freight loading trip would consist of a truck making a round trip the distribution center to the store (2675 Geary) and back without stopping at another Whole Foods location. In all likelihood, each truck would be stopping at one or more Whole Foods stores within San Francisco.

MDVs, which are small passenger type vehicles, are likely to represent delivery trips made by specialty vendors from various locations, rather than from Whole Foods distribution centers. Therefore, the analysis assumed that this average trip length would be the same as for retail employees which is shown below and calculated in Table 5. Employee Trips.

Table 11. Vehicle Miles Traveled by Freight Vehicle Type

Item to be Estimated	Data	Source
	MDV	
# of Deliveries	5.7 trips (rounds to 6)	2001 Market Street (2021) [5]
Average trip length	21.6 miles (roundtrip)	Whole Foods provided origin/destination information; no MDVs in WF-provided data. [12] Average retail employee trip length based on TIM estimates (by TAZ), as shown below.
	LHDT1	
# of Deliveries	0 trips	2001 Market Street (2021) [5]
Average trip length	36.6 miles (roundtrip)	Whole Foods provided origin/destination information [12]; each trip assumed to be a round trip from origin to 2675 Geary and back
	LDT2	
# of Deliveries	7.8 trips (rounds to 8)	2001 Market Street (2021) [5]
Average trip length	101.6 miles (roundtrip)	Whole Foods provided origin/destination information[12]; each trip assumed to be a round trip from origin to 2675 Geary and back
	MHDT	
# of Deliveries	21.3 trips (rounds to 21)	2001 Market Street (2021) [5]
Average trip length	59.6 miles (roundtrip)	Whole Foods provided origin/destination information [12]; each trip assumed to be a round trip from origin to 2675 Geary and back
	HHDT	
# of Deliveries	8.7 trips (rounds to 9)	2001 Market Street (2021) [5]
Average trip length	117.6 miles (roundtrip)	Whole Foods provided origin/destination information [12]; each trip assumed to be a round trip from origin to 2675 Geary and back

ATTACHMENT A: DATA SOURCES

1. SF Travel Demand Tool

Data Source: *SF Travel Demand Tool*, San Francisco Planning Department and San Francisco County Transportation Authority. http://sftraveldemand.sfcta.org. Accessed May 24, 2022.

2. 1765 California Street (2019)

Data Source: *Transportation Coordination Memo, Record No. 2019-004110ENV.* Rachel Schuett, Transportation Planner, San Francisco Planning Department. May 4, 2020.

3. 1150 Ocean Avenue (2019)

Data Source: *Balboa Reservoir Draft Supplemental Environmental Impact Report*, San Francisco Planning Department, 2019. https://sfplanning.org/project/balboa-reservoir-and-community-advisory-committee-cac. Obtained May 24, 2022.

4. 1150 Ocean Avenue (2021)

Data Source: Whole Foods. Data request for 2675 Geary Boulevard. (2021)

5. 2001 Market Street (2021)

Data Source: Kittelson. 2675 Geary Boulevard. (2021) See description of data collection methodology in the Data Collection section in the main report.

6. 2001 Market Street (2017)

Data Source: Fehr & Peers. TIA Guidelines Update. (2017)

7. 2675 Geary Boulevard

Data Source: Planning Department. Transportation Coordination Memo for 2675 Geary Boulevard (Case No. 2019-004110ENV). (2020)

8. TIA Guidelines

Data Source: SF Transportation Impact Analysis Guidelines, San Francisco Planning Department https://default.sfplanning.org/publications_reports/TIA_Guidelines_NoApp.pdf. Accessed May 24, 2022.

9. San Francisco Travel Demand Update: Data Collection and Analysis

Data Source: San Francisco Planning Department. *San Francisco Travel Demand Update: Data Collection and Analysis*. June 29, 2018. Obtained from the planning department. Excerpt included as Attachment A-3.

10. Project sponsor-provided data on weekend vs weekday gross sales and transactions

Data Source: 2020-21 data on weekday and weekend average sales at Whole Foods locations in San Francisco. Obtained via email from Marija Reilly, September 9, 2021. Data included in Attachment A-1.

11. TIM Estimates by TAZ

Data Source: San Francisco Transportation Information Map, Version 9.1. San Francisco Planning Department, 2022. http://sfplanninggis.org/tim/. Accessed May 24, 2022.

12. Project sponsor-provided data on origins and destinations.

    Data Source: Whole Foods provided origin data of freight vehicles to 2675 Geary Blvd. Vehicle miles traveled was estimated based on the distance between addresses provided and 2675 Geary Blvd.

13. July 8, 2021, conversation with onsite staff

    Data Source: Per a July 8, 2021, phone conversation with onsite staff, Whole Foods suppliers use the loading dock along 14th Street to deliver groceries

Attachment A-1: Weekday versus Weekend Transaction Data

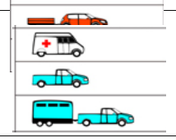
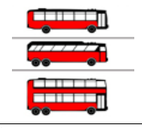
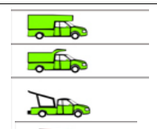
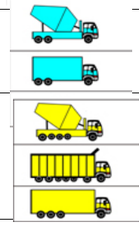
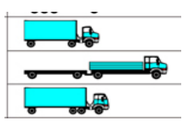
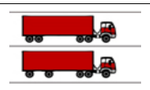
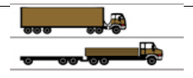
Table A1. Weekday and weekend average sales at Whole Foods locations in San Francisco

Location	Weekday avg sales	Weekend avg sales	PCF Diff weekend compared to weekday	WD Trxn Ct Avg	WE Trxn Ct Avg	PCT Diff weekend compared to weekday
Castro	$ 120,614	$ 146,270	+21%	2,308	2,493	+8%
Franklin	$ 128,855	$ 147,816	+15%	2,141	2,175	+2%
Haight	$ 65,722	$ 77,561	+18%	1,398	1,530	+9%
Noe Valley	$ 88,039	$ 107,350	+22%	1,802	1,899	+5%
Ocean Ave	$ 100,068	$ 120,526	+20%	1,843	1,982	+8%
Potrero Hill	$ 149,958	$ 184,819	+23%	2,500	2,635	+5%
Soma	$ 113,929	$ 127,742	+12%	2,023	2,050	+1%
San Francisco Metro	***$ 767,185***	***$ 912,084***	***+19%***	***14,015***	***14,764***	***+5%***

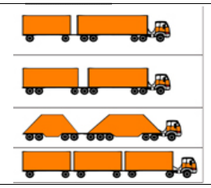
Attachment A-2: FHWA to EMFAC Vehicle Crosswalk

Table A2. FHWA to EMFAC Vehicle Crosswalk

Proposed FHWA to EMFAC crosswalk.
Cells in light green provide the mapping. Other cells provide supportive information.

FHWA Classification	FHWA Description	Representative Vehicle	Class Includes	Number of axles	Illustration	GVWR (approximate)	EPA Emissions Classification (approximate)	Associated EMFAC Vehicle / Code	EMFAC Description	EMFAC Truck / Non-Truck classification
1	Motorcycle	M	Motorcycles	2		-	-	MCY / MC	Motorcycles	Non-Trucks
2	Passenger Car	P	All cars cars with one-axle trailers cars with two-axle trailers	2, 3, or 4		< 6000 lb	Light Light Duty Trucks (<6000 lbs)	LDA / PC MDV / T3	Passenger cars Medium-Duty Trucks (GVWR 6000-8500 lbs)	Non-Trucks
3	Two-Axle, 4 Tire Single Unit	SU	pick-ups and vans pick-ups and vans with one- and two-axle trailers	2. 3. or 4		<10000 lb	Heavy Light Duty Trucks (6001 - 8500 lbs) Light Heavy Duty Engines (8501 - 19500 lbs)	LDT1 / T1 LDT2 / T2	Light-Duty Trucks (GVWR <6000 lbs. and ETW <= 3750 lbs) Light-Duty-Trucks (GVWR < 6000 lbs. and ETW 3751-5750 lbs)	Non-Trucks
4	Bus	BUS-12; BUS-14; CITY-BUS; S-BUS 11; S-BUS 12; A-BUS	two- and three-axle buses	2 or 3		19500 - 33000 lbs	Light Heavy Duty Engines (8501 - 19500 lbs)	SBUS / SB UBUS / UB OBUS / OB MH / MH	School Buses Urban buses Other buses Motor Homes	Non-Trucks
5	Two-Axle, 6 Tire Single Unit	SU-30	Two-axle trucks	2		10000 - 19,500 lbs		LHDT1 / T4 LHDT2 / T5 MHDT / T6	Light-Heavy-Duty Trucks (GVWR 8501-10000 lbs) Light-Heavy-Duty Trucks (GVWR 10001-14000 lbs) Medium Heavy-Duty Diesel …	Trucks
6	Three Axle Single Unit	SU-8 [SU-25]	Three-axle trucks Three-axle tractors without trailers	3		19500-26000 lb				
7	Four or More Axle Single Unit	WB-12 [WB-40]	Four-, five-, six- and seven-axle single-unit trucks	4 or more		>33000 lb	Medium Heavy Duty Engines (19501 - 33000 lbs)			
8	Four or Less Axle Single Unit	WB-12 [WB-40]	Two-axle trucks pulling one- and two-axle trailers Two-axle tractors pulling one- and two-axle trailers Three-axle tractors pulling one-axle trailers	3 or 4		>33000 lb				
9	Five Axle Single Trailer	*WB-15 [WB-50]*	Two-axle tractors pulling three-axle trailers Three-axle tractors pulling two-axle trailers	5		>33000 lb	Heavy Heavy Duty Engines Urban Bus (>33,001 lbs)	HHDT / T7	Heavy-Heavy Duty Diesel… Power Take Off	Trucks
10	Six or More Axle Single Trailer	WB-20 [WB-57 or WB-67]	Multiple configurations	6 or more		>33000 lb				
11	Five or Less Axle Multi Trailer	WB-20D [WB-67D]	Multiple configurations	4 or 5		>33000 lb				
12	Six Axle Multi Trailer	WB-30T	Multiple configurations	6		>33000 lb				

Proposed FHWA to EMFAC crosswalk.
Cells in light green provide the mapping. Other cells provide supportive information.

FHWA Classification	FHWA Description	Representative Vehicle	Class Includes	Number of axles	Illustration	GVWR (approximate)	EPA Emissions Classification (approximate)	Associated EMFAC Vehicle / Code	EMFAC Description	EMFAC Truck / Non-Truck classification
13	Seven or More Axle Multi Trailer	WB-33D [WB-109D]	Multiple configurations	7 or more		>33000 lb				

Resources:

Karner, Alex, et al. "Mitigating diesel truck impacts in environmental justice communities: Transportation planning and air quality in Barrio
Hallenbeck, Mark E., Olga I. Selezneva, and Rich Quinley. *Verification, refinement, and applicability of long-term pavement performance*
US Department of Energy Alternative Fuels Data Center website.

Attachment A-3: Excerpt from *San Francisco Travel Demand Update: Data Collection and Analysis*

Site Address	Land Use	Geography		Site Characteristics			Data Collection Dates		
		Super-district	Place Type	Building Size (ksf)	# of Dwelling Units	# of Hotel Rooms	Person Trip Video Counts	Intercept Surveys	Loading Time Lapse Data
345 Taylor Street	Hotel	1	Place Type 1	-	-	131	3/30/2017	5/26/2017	3/30/2017
1075 Sutter Street	Hotel	1	Place Type 1	-	-	177	3/30/2017	5/16/2017	3/30/2017
466 Bush Street	Hotel	1	Place Type 1	-	-	86	2/14/2017	11/8/2016	2/14/2017
524 Sutter Street	Hotel	1	Place Type 1	-	-	114	3/30/2017	11/8/2016	3/30/2017
535 Mission Street	Office	1	Place Type 1	354.000	-	-	-	11/10/2016	-
654 Mission Street	Office	1	Place Type 1	11.564	-	-	-	11/10/2016	-
300 Montgomery Street	Office	1	Place Type 1	211.947	-	-	3/30/2017	5/9/2017	-
417 Montgomery Street	Office	1	Place Type 1	94.537	-	-	3/30/2017	10/13/2016	-
221 Pine Street	Office	1	Place Type 1	26.808	-	-	3/30/2017	11/10/2016	3/30/2017
1000 Brannan Street	Office	1	Place Type 1	108.840	-	-	3/16/2017	5/9/2017	3/16/2017
50 Green Street	Office	1	Place Type 1	101.160	-	-	3/30/2017	10/13/2016	-
733 Front Street	Office	1	Place Type 1	9.268	-	-	3/30/2017	11/16/2016	3/30/2017
1190 Mission Street	Residential	1	Place Type 1	-	419	-	-	11/1/2016	-
255 Broadway	Residential	1	Place Type 1	-	61	-	2/14/2017	9/29/2016	2/14/2017
170 King Street	Residential	3	Place Type 1	-	202	-	-	4/19/2017	-
45 Lansing Street	Residential	1	Place Type 1	-	320	-	3/30/2017	5/10/2017	3/30/2017
2140 Polk Street	Retail	1	Place Type 1	4.996	-	-	3/30/2017	11/15/2016	3/30/2017
17 3rd Street	Retail	1	Place Type 1	13.333	-	-	4/6/2017	-	4/6/2017
26 4th Street	Retail	1	Place Type 1	15.689	-	-	4/6/2017	-	4/6/2017
225 Bush Street	Retail	1	Place Type 1	20.667	-	-	4/6/2017	-	4/6/2017
425 Market Street	Retail	1	Place Type 1	2.920	-	-	-	11/15/2016	-
100 California Street	Retail	1	Place Type 1	3.100	-	-	-	11/16/2016	-
768 Market Street	Retail	1	Place Type 1	3.457	-	-	-	11/15/2016	3/30/2017
928 Van Ness Avenue	Retail	1	Place Type 1	3.000	-	-	3/30/2017	-	-
2160 Market Street	Hotel	2	Place Type 2	-	-	64	3/23/2017	10/27/2016	3/23/2017
610 Fillmore Street	Hotel	2	Place Type 2	-	-	54	3/23/2017	10/18/2016	3/23/2017
1500 Sutter Street	Hotel	2	Place Type 2	-	-	83	4/4/2017	10/18/2016	4/4/2017
1901 Lombard Street	Hotel	2	Place Type 2	-	-	69	3/23/2017	5/16/2017	3/23/2017
2775 Van Ness Avenue	Hotel	2	Place Type 2	-	-	143	-	4/26/2017	-

Site Address	Land Use	Geography		Site Characteristics			Data Collection Dates		
		Super-district	Place Type	Building Size (ksf)	# of Dwelling Units	# of Hotel Rooms	Person Trip Video Counts	Intercept Surveys	Loading Time Lapse Data
1700 Owens Street	Office	3	Place Type 2	167.053	-	-	-	5/2/2017	-
455 Mission Bay Boulevard South	Office	3	Place Type 2	222.000	-	-	5/24/2017	10/25/2016	5/24/2017
500 Terry Francois Boulevard	Office	3	Place Type 2	319.279	-	-	-	5/3/2017	-
550 Terry Francois Boulevard	Office	3	Place Type 2	319.279	-	-	-	5/3/2017	-
1501 Mariposa Street	Office	3	Place Type 2	50.196	-	-	3/16/2017	-	3/16/2017
2333 Buchanan Street	Office	2	Place Type 2	73.151	-	-	-	4/27/2017	-
1808 Wedemeyer Street	Office	2	Place Type 2	154.756	-	-	3/23/2017	5/24/2017	-
1 Letterman Drive (Bldg C & D)	Office	2	Place Type 2	154.756	-	-	-	4/25/2017	-
1600 Market Street	Residential	2	Place Type 2	-	24	-	2/14/2017	5/17/2017	-
55 Page Street	Residential	2	Place Type 2	-	128	-	2/14/2017	5/10/2017	-
1998 Market Street	Residential	2	Place Type 2	-	115	-	2/14/2017	4/26/2017	-
2125 Bryant Street	Residential	3	Place Type 2	-	76	-	2/14/2017	5/23/2017	-
235 Berry Street	Residential	3	Place Type 2	-	111	-	2/14/2017	5/2/2017	2/14/2017
325 Berry Street	Residential	3	Place Type 2	-	110	-	-	5/4/2017	-
38 Dolores Street	Residential	3	Place Type 2	-	81	-	5/24/2017	5/23/2017	5/24/2017
2175 Market Street	Residential	3	Place Type 2	-	90	-	5/24/2017	5/16/2017	-
400 Duboce Avenue	Residential	2	Place Type 2	-	78	-	5/24/2017	4/12/2017	5/24/2017
2200 Sacramento Street	Residential	2	Place Type 2	-	127	-	3/30/2017	-	3/30/2017
2000 Broadway	Residential	2	Place Type 2	-	221	-	3/30/2017	-	3/30/2017
2200 Pacific Avenue	Residential	2	Place Type 2	-	65	-	3/30/2017	-	3/30/2017
2141 Chestnut Street	Retail	2	Place Type 2	14.421	-	-	2/14/2017	-	2/14/2017
2390 Market Street	Retail	2	Place Type 2	13.000	-	-	3/16/2017	-	-
3400 Cesar Chavez Street	Retail	3	Place Type 2	12.000	-	-	3/14/2017	4/13/2017	-
2001 Market Street	Retail	3	Place Type 2	23.751	-	-	5/24/2017	4/27/2017	5/24/2017
545 Valencia Street	Retail	3	Place Type 2	3.600	-	-	3/23/2017	10/12/2016	3/23/2017
2801 22nd Street	Retail	3	Place Type 2	4.410	-	-	3/23/2017	11/17/2016	-
2299 15th Street	Retail	2	Place Type 2	2.247	-	-	3/23/2017	11/2/2016	-
2076 Chestnut Street	Retail	2	Place Type 2	2.250	-	-	3/30/2017	5/24/2017	-
489 Castro Street	Retail	3	Place Type 2	2.395	-	-	3/16/2017	4/27/2017	-

Site Address	Land Use	Geography		Site Characteristics			Data Collection Dates		
		Super-district	Place Type	Building Size (ksf)	# of Dwelling Units	# of Hotel Rooms	Person Trip Video Counts	Intercept Surveys	Loading Time Lapse Data
735 7th Avenue	Retail	2	Place Type 2	27.725	-	-	3/14/2017	11/3/2016	3/14/2017
5843 Geary Boulevard	Retail	2	Place Type 2	6.500	-	-	3/14/2017	10/27/2016	3/14/2017
2159 Chestnut Street	Retail	2	Place Type 2	9.452	-	-	3/23/2017	-	3/23/2017
2654 Mission Street	Retail	3	Place Type 2	3.746	-	-	3/14/2017	10/25/2016	-
3100 Geary Boulevard	Retail	2	Place Type 2	7.690	-	-	3/23/2017	-	-
1234 Great Highway	Hotel	4	Place Type 3	-	-	20	-	5/18/2017	-
2600 Sloat Boulevard	Hotel	4	Place Type 3	-	-	33	5/24/2017	5/18/2017	-
5 Thomas Mellon Circle	Office	3	Place Type 3	100.393	-	-	-	5/24/2017	-
150 Executive Park Blvd	Office	3	Place Type 3	105.000	-	-	3/14/2017	5/4/2017	3/14/2017
250 Executive Park Blvd	Office	3	Place Type 3	114.089	-	-	3/14/2017	5/3/2017	3/14/2017
1290 20th Avenue	Residential	4	Place Type 3	-	42	-	3/23/2017	-	-
1150 Ocean Avenue	Residential	3	Place Type 3	-	173	-	5/17/2017	-	5/17/2017
55 Chumasero Drive	Residential	4	Place Type 3	-	152	-	5/24/2017	5/11/2017	5/24/2017
1501 Lincoln Way	Residential	4	Place Type 3	-	35	-	5/24/2017	-	-
2770, 2780, 2790 19th Avenue	Residential	4	Place Type 3	-	84	-	3/14/2017	-	-
100 Font Boulevard	Residential	4	Place Type 3	-	458	-	3/14/2017	5/11/2017	3/14/2017
1630 Ocean Avenue	Retail	3	Place Type 3	11.142	-	-	3/14/2017	4/18/2017	3/14/2017
3001 Taraval Street	Retail	4	Place Type 3	10.750	-	-	3/14/2017	10/21/2016	-
2550 Ocean Avenue	Retail	4	Place Type 3	7.072	-	-	3/23/2017	11/9/2016	-
1200 Irving Street	Retail	4	Place Type 3	36.999	-	-	5/24/2017	4/25/2017	5/24/2017
2350 Noriega Street	Retail	4	Place Type 3	36.120	-	-	3/14/2017	-	3/14/2017
265 Winston Drive	Retail	4	Place Type 3	15.000	-	-	3/14/2017	11/9/2016	3/14/2017
2025 Irving Street	Retail	4	Place Type 3	2.495	-	-	-	4/11/2017	-
4621 Mission Street	Retail	3	Place Type 3	3.757	-	-	3/14/2017	5/17/2017	-

ATTACHMENT B: DATA TABLES

Table B-1. Data Sources + Store Amenities

Source/ Project (Year)	Location	Store Size (gross SF)	Place Type	Store Amenities						
				Grocery Delivery and Pickup	Café Seating	Sandwich counter or taco bar	Coffee Bar	Wine Bar	Amazon Returns [1]	Amazon Hub – Locker [2]
Fehr & Peers TIA Guidelines Update (2017)[6]	2001 Market Street	33,030	2	Y	Y	Y	Y			
Kittelson 2675 Geary Boulevard (2021)[5]	2001 Market Street	33,030	2	Y	Y	Y	Y		Y	Y
Whole Foods Data request for 1600 Jackson Street (2019)[2]	1765 California Street	28,000	2	Y	Y	Y			Y	
Kittelson Balboa Reservoir EIR (2019)[3]	1150 Ocean Avenue	26,623	3	Y	Y	Y		Y	Y	
Whole Foods Data request for 2675 Geary Boulevard (2021)[4]	1150 Ocean Avenue	26,623	3	Y	Y	Y		Y	Y	
-n/a-	2675 Geary Blvd (proposed project)	54,290	2	Y	Y	Y	Y			

Notes:
[1] Amazon Returns. Amazon Returns allow customers to return Amazon.com order in-store to be mailed rather than mailing the packages themselves.
[2] Amazon Hub – Lockers+. Amazon Hub Lockers are secure lockers located within Whole Foods stores that allow for personal package pickup of Amazon.com order in-store (rather than home delivery).

Data was collected from the following Whole Foods locations at a time when these locations included Amazon services (Amazon Returns and/or Amazon Hub):

- 2001 Market Street (in 2021, but not in 2017)
- 1765 California Street
- 1150 Ocean Avenue

Given that these locations included Amazon services and these Amazon services are not proposed for 2675 Geary Boulevard, the data collected at these locations conservatively overestimates trip generation for the proposed project.

Table B-2. Available Data by Source

Source/Project (Year)	Location	Place Type	Store Size (gross square feet)	Trip Generation Information			Freight Loading Information				Passenger Loading Information		
				Daily Trips	Daily Vehicle Trips	PM Peak Hour Vehicle Trips	Daily Trips	Peak Hour Trips	Fleet Mix for Whole Foods	Average event durations	Daily	Temporal Distribution	Average event durations
Fehr & Peers TIA Guidelines Update (2017)	2001 Market Street	2	33,030	Y	Y								
Kittelson 2675 Geary Boulevard (2021)	2001 Market Street	2	33,030	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Whole Foods Data request for 1600 Jackson Street (2019)	1765 California Street	2	28,000				Y		Y				
Kittelson Balboa Reservoir EIR (2019)	1150 Ocean Avenue	3	26,623				Y		Y	Y			
Whole Foods Data request for 2675 Geary Boulevard (2021)	1150 Ocean Avenue	3	26,623				Y	Y	Y	Y			
Whole Foods Data request for 2675 Geary Boulevard (2021)	Various	Various	Various	Y	Y								
TIA Guidelines	2675 Geary Blvd (proposed project)	2	54,290	Y	Y	Y	Y	Y		Y			

Table B-3. Trip Generation Data

Source/Project (Year)	Location	Place Type	Store Size (SF)	Daily Person Trips		PM peak hour trips		Passenger Loading PM peak hour	
				# of Trips	Rate (per 1,000 SF)	# of Trips	Rate (per 1,000 SF)	Daily	PM Peak Hour
Fehr & Peers TIA Guidelines Update (2017)	2001 Market Street	2	33,030	9,464	286.53	n/a	n/a	n/a	n/a
Kittelson 2675 Geary Boulevard (2021)	2001 Market Street	2	33,030	5,723	173.27	638	19.3	77 (included in daily trip counts)	8.5 (included in daily trip counts)
Whole Foods Data request for 1600 Jackson Street (2019)	1765 California Street	2	28,000	n/a	n/a	n/a	n/a	n/a	n/a
Kittelson Balboa Reservoir EIR (2019)	1150 Ocean Avenue	3	26,623	n/a	n/a	n/a	n/a	n/a	n/a
Whole Foods Data request for 2675 Geary Boulevard (2021)	1150 Ocean Avenue	3	26,623	n/a	n/a	n/a	n/a	n/a	n/a
Planning Department Transportation Coordination Memo (2020)	2675 Geary Blvd (proposed project)	2	54,290 [1]	17,491	322	1,329	24.5		
TIA Guidelines (2019)	2675 Geary Blvd (proposed project)	2	54,290	16,124	297	1,178	21.7		

Notes:

[1] In the Transportation Coordination Memo (2020) the trip generation was calculated based on three different land uses: grocery store (49,780 square feet), restaurant (3,320 square feet) and coffee shop (1,190 square feet).

Table B-4. Freight Loading Data

Source/Project (Year)	Location	Place Type	Store Size (Square Feet)	Daily Trips	Daily Trips per 1,000 square feet	Peak Hour Trips	Delivery Type		Average event durations (minutes:seconds)		Fleet Mix	
							Loading Dock	Hand Truck	Loading Dock	Hand Truck	Vehicle Type	Refrigerated vs. Non-Refrigerated
Fehr & Peers TIA Guidelines Update (2017)	2001 Market Street	2	33,030									
Kittelson 2675 Geary Boulevard (2021)	2001 Market Street	2	33,030	31.5	0.95	5.5 events in peak hour	41%	59%	20:49	23:40	**MDV**[2] – 13% **LHDT1** – 0% **LDT2** – 18% **MHDT** – 49% **HHDT** – 20%	Refrigerated Vehicles - 25% Non-Refrigerated vehicles – 75%
Whole Foods Data request for 1600 Jackson Street (2019)	1765 California Street	2	28,000	28 [1]	1.00				35:21			
Kittelson Balboa Reservoir EIR (2019)	1150 Ocean Avenue	3	26,623	23	0.86				32:15		<30 foot – 33% 30-48 foot – 4% 65 foot – 7% Other – 56%	
Whole Foods Data request for 2675 Geary Boulevard (2021)	1150 Ocean Avenue	3	26,623	20.2	0.76		23 (50%)	23 (50%)			**MDV** – 0% **LHDT1** – 13% **LDT1** – 30% **MHDT** – 48% **HHDT** – 9%	Refrigerated Vehicles - 26% Non-Refrigerated vehicles – 74%
Whole Foods Data request for 2675 Geary Boulevard (2021)	Various	Various	Various									
Planning Department Transportation Coordination Memo (2020)	2675 Geary Blvd (proposed project)	2	54,290	28 [2]	0.52				34:12		30-48 foot –14% 65 foot – 14% Other – 72%	

Notes:

[1] Kittelson used the number from 1765 California Street, so 23 deliveries on an average day and 28 on a maximum delivery day.

[2] This number was based on the deliveries to the 1765 California Street store which include 23 deliveries on an average day and 28 on a maximum delivery day.

APPENDIX B

EIR Scoping Comments

Elliott Schwimmer

From: Michael Ducker <miradu@miradu.com>
Sent: Tuesday, June 28, 2022 12:12 PM
To: cpc.wholefoods2675Geary@sfgov.org
Subject: In support of Whole Foods at 2675 Geary Blvd

This message is from outside the City email system. Do not open links or attachments from untrusted sources.

I am a neighbor of the proposed project site living in District 2, and I find it ridiculous that CEQA is being abused to stop a grocery store from filling a vacant retail space. As I understand the board of supes has overruled the expert staff opinions in planning to require an EIR, I support the smallest/most simple/ fastest EIR that enables us to have great quality affordable food tomorrow, not in years.

-Michael Ducker
1949 McAllister St, San Francisco, CA 94115

Elliott Schwimmer

From: corey johnson <probablycorey@gmail.com>
Sent: Tuesday, June 28, 2022 11:45 AM
To: CPC.WholeFoods2675Geary@sfgov.org
Subject: Whole foods environmental effects

This message is from outside the City email system. Do not open links or attachments from untrusted sources.

I live a few blocks from this location and support letting Whole Foods take over the space. I'm also confused about why San Francisco wastes so much time and money on hearings and delays like this. Keeping this lot building empty for 5 years has not helped the neighborhood. It used to be a Best Buy, there is no reason it can't be a Whole Foods. There is no law against Whole Foods going in or zoning issues that I know of. It is in a dense and walkable area of the City.

There is also an abandoned diner across the street. There are supposed 101 new housing units, all within walking distance of this store. But that development has also been delayed for years.

All our neighbors and friends would rather have something go into these spaces than have them be empty and abandoned for years. Please figure out how to fast track this so we can start using our neighborhood instead of looking at abandoned buildings.

Corey Johnson

Elliott Schwimmer

From: Rachel Moore <missbrookline@gmail.com>
Sent: Thursday, July 7, 2022 12:39 PM
To: CPC.WholeFoods2675Geary
Subject: Re: Notice of Preparation of an Environmental Impact Report (EIR) and an initial study for the Whole Foods at 2675 Geary Boulevard Project

This message is from outside the City email system. Do not open links or attachments from untrusted sources.

Dear Planning Team,

I am wholeheartedly endorsing the proposed Whole Foods in the shopping center at Masonic and Geary. This center can support another large store, namely, Whole Foods.
Having more options for grocery shopping is always a good thing, I can't see any downside to this.
This complex has long housed national chain stores and has been a useful place to shop.

If there will be adequate parking and the store will use the same facilities as previous tenants, I can't fathom there will be any negative impacts to the community. The availability of another grocery store should outweigh any opposition.

Neighbors voiced concerns about Target opening up in this complex, but Target continues to thrive and be a positive part of our community. As long as this shopping center exists, we should encourage full tenancy of the center and again, groceries are always needed and wanted and necessary.

Sincerely,

Rachel Moore

www.rachelbmoore.com

www.fogcitynotes.blogspot.com

On Wed, Jun 22, 2022 at 4:50 PM CPC.WholeFoods2675Geary <CPC.WholeFoods2675Geary@sfgov.org> wrote:

San Francisco Planning

This email is to inform you that the San Francisco Planning Department has prepared a Notice of Preparation of an Environmental Impact Report (EIR) and an initial study for the Whole Foods at 2675 Geary Boulevard Project. An EIR must be prepared for the proposed project prior to any final decision regarding whether to approve the project. The purpose of the EIR is to provide information about potential significant physical environmental effects of the proposed project, identify possible ways to minimize the significant effects, and describe and analyze possible alternatives to the proposed project.

A notice of preparation of an EIR does not indicate a decision by the City to approve or to disapprove the project. The City must review and consider the information contained in the EIR prior to making a decision.

You may participate in the first public process concerning the project's environmental effects by contacting Rachel Schuett via email (CPC.WholeFoods2675Geary@sfgov.org), phone (628) 652-7546, or by mail at 49 South Van Ness Avenue, Suite 1400, San Francisco, CA 94103. See attached notice for additional information.
The notice of preparation and initial study are available here: https://sfplanning.org/sfceqadocs.

中文詢問請電 | Para información en Español llamar al |
Para sa impormasyon sa Tagalog tumawag sa
628.652.7550

Elliott Schwimmer

From: JackieandAustin Peterson <japet2019@gmail.com>
Sent: Saturday, July 23, 2022 8:27 PM
To: CPC.WholeFoods2675Geary@sfgov.org
Subject: Comment on the scope of EIR

This message is from outside the City email system. Do not open links or attachments from untrusted sources.

Hi,

I have been a resident of the area for about a year and a half now, and I lived in the Sunset district prior to that. I remember when the Best Buy went out of business, and it has been several years that the lot has been vacant. A Whole Foods would bring jobs to the area, a quality grocery store to the community, and business to a lot that is doing nothing but taking up useless space today.

There's no reason this environmental review needs to take up more time than it's already taken. Please think about the community and end the unnecessary need to stop a move that would make complete economic sense.

Not only should priority go to that space being filled, but also to the other vacant spots that are currently neighboring that store front. City Center could be thriving with business, but instead it is in a state of mediocrity. Half filled is not good enough for this community.

Stonestown is a perfect example of a center that was dying out before the movie theatre and Whole Foods were put in. Now, there are visibly more crowds flocking to the mall to spend their money, and an energy/vibe that didn't exist before the renovations.

This community deserves better.

Best,
Jackie and Austin Peterson

Elliott Schwimmer

From: Joe Wee <joeryanwee3@gmail.com>
Sent: Saturday, July 9, 2022 2:45 PM
To: CPC.WholeFoods2675Geary@sfgov.org
Subject: Support for Whole Foods at City Center

This message is from outside the City email system. Do not open links or attachments from untrusted sources.

Hello,

I'm a resident in the North Panhandle neighborhood and wanted to voice my support for building a new Whole Foods in the City Center shopping center.

It's deeply important to me that our neighborhood has more grocery options, particularly more options for healthy, fresh produce.

Please finish the review as soon as possible. The sooner the review is completed, the sooner local residents can benefit from increased access to healthy food.

Thank you,
Joe

m | r | wolfe
& associates, p.c.
attorneys-at-law

July 22, 2022

By E-Mail

Rachel Schuett, Senior Environmental Planner
San Francisco Planning Department
49 South Van Ness Ave, Suite 1400
San Francisco, CA 94103
CPC.WholeFoods2675Geary@sfgov.org

Re: Notice of Preparation of an EIR for Whole Foods at 2675 Geary Boulevard Project, Case No. 2019-004110ENV-02

Dear Ms. Schuett:

Please accept the following comments on the above-referenced Notice of Preparation, submitted on behalf of: United Food & Commercial Workers Union Local 5; United Food & Commercial Workers Union Local 648; International Brotherhood of Teamsters Joint Council 7; San Francisco Labor Council, and their respective members who live and work in San Francisco.

The significant environmental impacts associated with construction and operation of a Whole Foods at this location are numerous and diverse. Of particular concern are the air quality and human health effects to people living, working, and attending school near the site. According to the San Francisco Health Department, the site is within a designated Air Pollutant Exposure Zone pursuant to Section 3806 of the San Francisco Health Code. This means the neighborhood already experiences elevated pollutant concentrations that have resulted in a cancer risk to residents. The pollutants of concern include PM 2.5 and toxic air contaminants (TACs) including diesel particulate matter (DPM) from diesel truck traffic, a known carcinogen. Depending on the number and frequency of truck deliveries to the Project, including trucks with top-mounted refrigeration units (TRUs), emissions of air pollutants and/or releases of hazardous materials and TACs into the ambient air at concentrations adversely affecting human health are reasonably foreseeable. Emissions from customer vehicles will likely aggravate these impacts.

Furthermore, given the increasing number of retail business closures, boarded-up storefronts, long-term underutilization of street-level commercial space, and

increase in physical deterioration that may fairly be characterized as blight in this neighborhood and the City as a whole, the Draft EIR should include a thorough and probing analysis of this Project's potential to result in further store closures, urban decay, and blight.

To this end, the EIR should disclose detailed information about the Project's operations, so that the public has a meaningful opportunity to critically evaluate the document. At a minimum, the EIR should disclose:

- The number and type of diesel trucks expected to travel to and from the site (EMFAC vehicle class with fleet percent diesel), and the frequency of travel on an average daily and peak-hour basis.

- The number of top-mounted refrigeration units (TRUs) anticipated to be included among this number, with estimates of diesel engine idle-times.

- Daily and peak-hour trip generation rates for each expected occupant/user of the site.

- The number, type, and engine classification of all construction equipment and construction vehicles expected, including expected duration of operation for each.

- Expected truck travel/delivery routes that clearly identify the streets that will be used by parcel delivery/last-mile vehicles.

- A study of existing ambient noise levels at the closest residential receptor location, with an analysis of noise impacts from both construction of the Project and its operational phase.

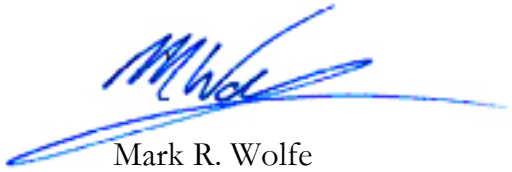
- A study, based on an accurate inventory of potentially affected retailers, of the Project's potential to trigger retail store closures in the area, leading to urban decay and blight.

Please note that the above is not intended to be an exhaustive list of items that the EIR must disclose.

Thank you for your consideration of these scoping comments. We look forward to reviewing the Draft EIR for this Project when it is released for public review.

Most sincerely,

M. R. WOLFE & ASSOCIATES, P.C



Mark R. Wolfe
On behalf of UFCW Local 5, UFCW Local 648, IBT Joint Council 7, and Sand Francisco Labor Council

MRW:sa

APPENDIX C

Air Quality Analysis Supporting Information

- Appendix C.1, Response to Appeal of Proposed Project at 2675 Geary Boulevard
- Appendix C.2, 2675 Geary Boulevard Update Air Quality Scope of Work
- Appendix C.3, 2675 Geary Boulevard Update Air Quality and Health Risk Assessment Methodology
- Appendix C.4, 2675 Geary Boulevard Project Update Air Quality and Health Risk Assessment Results
- Appendix C.5, 2675 Geary Boulevard Project Update Air Quality and Health Risk Assessment Results for Worker Receptors

APPENDIX C.1

Response to Appeal of Proposed Project at 2675 Geary Boulevard

RAMBOLL

ENVIRONMENT & HEALTH

MEMO

Date: **September 16, 2022**

To: **Rachel Schuett**
San Francisco Environmental Planning

From: **Michael Keinath**
Megan Sutter

Subject: **RESPONSE TO APPEAL OF PROPOSED PROJECT AT 2675 GEARY BLVD, SAN FRANCISCO, CALIFORNIA**

Ramboll
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Emeryville, CA 94608
USA

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F +1 510 655 9517
www.ramboll.com

At the request of the City of San Francisco Environmental Planning Department (SF Planning), Ramboll US Consulting, Inc. (Ramboll) reviewed a supplemental technical letter submitted to SF Planning by Environmental Permitting Specialists (EPS), for the appellant to the proposed Whole Foods Market to be located at 2675 Geary Boulevard in San Francisco, California (the "Project").

BACKGROUND

The Project would consist of renovation of a portion of an existing retail space to convert to an approximately 50,000 square foot supermarket. The Project does not include substantial exterior construction or changes to the existing structures, parking area, or roadways.[1] The Project is located in an Air Pollution Exposure Zone (APEZ), as defined by the San Francisco Department of Public Health. This memo was prepared in response to the technical memorandum prepared by Environmental Permitting Specialists (EPS) dated November 16, 2020.

A brief timeline of appeal activities and additional analysis related to the project is shown below:

- On July 23, 2019, the project sponsor filed an application with SF Planning for a California Environmental Quality Act (CEQA) determination.[2]

[1] Construction activities would include: demolishing interior walls, flooring, and some areas of the ceiling; expanding the rooftop mechanical penthouse and installing rooftop HVAC equipment including rooftop penetrations for venting and to connect the HVAC equipment to ducts; and constructing new interior walls and partitions for restrooms and back-of-house space (employee office, lounge, and locker rooms). Other activities would include reconfiguring the space and installing furniture and equipment to support the grocery store as well as replacing the two dock levelers.

[2] Whole Foods Market California, Inc., Project Application (PRJ), Project Address: 2675 Geary Boulevard, July 23, 2019, https://citypln-m-extnl.sfgov.org/External/link.ashx?Action=Download&ObjectVersion=-1&vault={A4A7DACD-B0DC-4322-BD29-F6F07103C6E0}&objectGUID={B14E02AE-432F-4391-9E0C-D5E5AA5DC935}&fileGUID={AB0312E7-A70E-46A7-8945-07E9ED70B2C5}, accessed October 15, 2021. This document (and all documents cited in this report (unless otherwise noted) are available for review on the following website: https://sfplanning.org/resource/permits-my-neighborhood. Individual files related to environmental review can be accessed by entering the project address (2675 Geary Boulevard) into the search box, clicking on the blue dot on the project site, and then clicking on the "Documents" button under the ENV application

- On September 11, 2020, the SF Planning determined that the proposed project was eligible for a common sense exemption (CEQA determination) under CEQA Guidelines section 15061(b)(3).[3] This decision was made on the basis that there is no possibility that the proposed project could have a significant adverse effect on the environment.[4]

- On September 18, 2020, M.R. Wolfe & Associates, P.C. on behalf of others (Appellant) filed an appeal of the CEQA determination.[5]

- On September 29, 2020, the Environmental Review Officer determined that the appeal was timely filed.[6]

- On October 30, 2020, Environmental Science Associates (ESA) prepared an Air Quality Technical Memorandum that detailed the methodology and results of an air quality analysis and screening-level health risk assessment.

- The Appellant submitted two supplemental letters to their September 18, 2020 appeal, dated November 6 and November 16, 2020. EPS made substantial changes to the technical memorandum between November 6 and November 16, 2020; However, the supplemental letter dated November 16, 2020, did not include any new arguments in additional to those already mentioned in the supplemental letter dated November 6. The November 6th supplemental letter was addressed by Ramboll in a memo to SF Planning dated November 13th, 2020, included in Attachment 1.

- On November 17, 2020, the San Francisco Board of Supervisors (Board) held a duly noticed public hearing to consider the appeal of the CEQA determination filed by the appellants. Following the conclusion of the public hearing, the Board adopted Motion No. M20-175 conditionally reversing the exemption determination subject to written findings.[7]

- On March 16, 2021, the Board of Supervisors adopted Motion No. M21-047 reversing the determination by SF Planning that the proposed project is exempt from CEQA under the common sense exemption.[8] The Board directed SF Planning to further analyze the potential air quality impacts of the proposed project to sensitive receptors in the vicinity of the project site. Regarding all other environmental issues, the board found the common sense exemption in conformance with the requirements of CEQA; that the exemption was adequate, accurate, and objective; and that there is no substantial evidence in the record to support a fair argument that the project may have a significant effect on the environment. The Board found that for topics other than air quality, no further analysis is required.

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number on the right side of the screen. Project application materials can be viewed by clicking on the "Documents" button under the PRJ case number. The "Filters" function can be used to search by case number.

[3] San Francisco Planning Department, *CEQA Common Sense Exemption Determination, 2675 Geary Boulevard, Case No. 2019-004110ENV*, September 11, 2020.

[4] The planning department issued a Class 32 categorical Exemption on May 14, 2020, and the proposed project was approved by the Planning Commission on June 25, 2020. Subsequent to the project approvals, the Class 32 categorical exemption was rescinded and a common sense exemption was issued on September 11, 2020.

[5] M.R. Wolfe & Associates, P.C., *Appeal to the Board of Supervisors of CEQA "Common Sense" Exemption Determination 2019-004110ENV – 2675 Geary Boulevard [Whole Foods Market], Conditional Use Authorization*, September 17, 2020.

[6] San Francisco Planning Department, *Appeal Timeliness Determination –2675 Geary Boulevard Common Sense Exemption; Planning Department Case No. 2019-004110ENV*, September 11, 2020.

[7] San Francisco Board of Supervisors, *File No. 201129, Motion No. M20-175, Conditionally Reversing the Exemption Determination - 2675 Geary Boulevard*, November 17, 2020.

[8] San Francisco Board of Supervisors, *File No. 210266, Motion No. M21-047, Findings to Reverse the Common Sense Exemption - 2675 Geary Boulevard*, March 16, 2021.

- In February 2022, Ramboll submitted an updated air quality and health risk assessment Methodology Report and in September 2022, Ramboll submitted an updated air quality and health risk assessment Results Report for the Project, henceforth referred to together as the "refined analysis" and included in Attachment 2.

The following section notes the additional issues raised in the November 16th EPS technical memorandum in support of the arguments in the Appellant's November 6 letter.

RESPONSES TO THE LETTER

The Appellant's November 6 letter and the EPS technical memorandum submitted by the Appellant on November 16, 2020 concludes that previous health risk analysis performed by ESA on October 30, 2020 was limited by using screening-level tools and considering only one toxic air contaminant (TAC), and by underestimating certain parameters such as the auto and truck trips generated by the Project. Deficiencies according to the EPS technical memorandum are summarized below. The refined analysis done by Ramboll on August 17, 2022 used AERMOD, included TAC emissions from various sources of Project construction and operation, and considered off-site residential receptors and receptors at the Bright Horizons daycare located above the proposed Project ("daycare receptors"). The responses, below, to these deficiency comments are based on this refined analysis on September 12, 2022.

EPS comment: *ESA's analysis excluded TACs from light-duty vehicles, which should not be negligible.*

Ramboll response: In the refined analysis, Ramboll included the following TACs for health risk analysis from both construction worker vehicles and operational passenger vehicles: Ethylbenzene, Toluene, Hexane, Xylenes, Benzene, Ethylbenzene, Styrene, Xylenes, 1,3 Butadiene, Acrolein, Toluene, Hexane, Propylene, Formaldehyde, Methanol, Benzene, Acetaldehyde, Methyl Ethyl Ketone, Naphthalene, and diesel particulate matter (DPM). The tailpipe unit factor for each toxic compound was obtained from the BAAQMD Recommended Methods for Screening and Modeling Local Risks and Hazards Tables. Underlying assumptions on trip rates, travel routes, emission rates and other parameters are detailed in Attachment 2.

For dispersion modeling of TACs, on-road mobile sources were modeled as adjacent volume sources along a line on nearby roadways based on routes provided by the Transportation Engineer, Kittelson Associates (see Figure 5 from the 2675 Geary Boulevard Project Update Air Quality and Health Risk Assessment Results Memo in Attachment 2). US EPA Haul Road Guidance[9] and the Citywide Health Risk Assessment Technical support document[10] recommends that emissions from haul roads be modeled as volume sources. The San Joaquin Valley Air Pollution Control District (APCD) also released Guidance for Air Dispersion Modeling which recommends that trucks traveling along their travel route be modeled as a line of volume sources[11]. A release height of 3.96 meters was chosen according to the 2010 CAPCOA HRA & Land Use Workshop guidance. Based on USEPAs AERMOD guidance, initial lateral and vertical dimensions were determined by dividing the side length by 4.3. Other dispersion modelling parameters are consistent with the methodologies used in San Francisco Citywide Health Risk Assessment for on-road mobile sources.[12]

[9] US EPA Haul Road Guidance. Accessed at: https://www.epa.gov/sites/default/files/2020-10/documents/haul_road_workgroup-final_report_package-20120302.pdf.

[10] City of San Francisco. Citywide Health Risk Assessment: Technical Support Documentation. Accessed at: https://www.sfdph.org/dph/files/EHSdocs/AirQuality/Air_Pollutant_Exposure_Zone_Technical_Documentation_2020.pdf

[11] San Joaquin Valley APCD. Guidance for Air Dispersion Modeling. Accessed at: http://www.valleyair.org/busind/pto/tox_resources/Modeling%20Guidance.pdf

[12] City of San Francisco. Citywide Health Risk Assessment: Technical Support Documentation. Accessed at: https://www.sfdph.org/dph/files/EHSdocs/AirQuality/Air_Pollutant_Exposure_Zone_Technical_Documentation_2020.pdf

As shown in Table 14 from the 2675 Geary Boulevard Project Update Air Quality and Health Risk Assessment Results Memo in Attachment 2, light-duty gasoline vehicles have limited contribution to overall health risks impacts on off-site resident and daycare receptors. For example, light-duty gasoline vehicles from Project construction and operation combined would contribute about 64% of cancer risk at the maximally exposed individual resident (MEIR) and 15% of cancer risk at the daycare receptor. The combined health risks with the addition of light-duty vehicles as an emission source are all less than the project-level health risk thresholds for receptors located within the Air Pollution Exposure Zone (APEZ).

EPS comment: *For the Hazard Identification step in the Health Risk Assessment, the ESA analysis omitted truck emissions on roadways adjacent to the site and emissions from on-site truck manoeuvring. Inclusion of these sources would have increased the cancer risk, especially at residences South of O'Farrell Street.*

Ramboll response: In the refined analysis, Ramboll included the following operational sources of DPM: truck exhaust on the segments of travel routes provided by Transportation Engineer within 1,000 meters of the Project boundary (including on-site from the project boundary to the loading docks, as shown in Figure 4 from the 2675 Geary Boulevard Project Update Air Quality and Health Risk Assessment Results Memo in Attachment 2), transportation refrigeration units (TRU) operating simultaneously during truck travel and loading/unloading activities, and on-site truck idling. In addition to these operational sources of DPM, Ramboll also included two construction sources of DPM emissions: an on-site diesel crane and heavy on-road construction truck travel.

As detailed in Attachment 2, the number of truck trips, travel speed, TRU horsepower and load factor, average loading time and idling time, and other parameters were used to derive the emission rates of DPM from these sources. Note that emission rates of particulate matter less than 2.5 micrometers in width ($PM_{2.5}$) related to mobile sources include both exhaust and fugitive emissions.

To estimate TAC concentrations from construction sources, an area source on the Project site was used to represent the on-site construction activity (off-road equipment). TRU and idling at the loading dock locations were modeled as volume sources.

As shown in Table 14 from the 2675 Geary Boulevard Project Update Air Quality and Health Risk Assessment Results Memo in Attachment 2, diesel vehicles and equipment have limited contribution to overall health risks impacts on off-site resident and daycare receptors. For example, diesel vehicles, construction equipment, and the TRUs contribute about 36% of cancer risk at the MEIR and 85% of cancer risk at the daycare receptor from the combination of Project construction and operations. The combined health risks with these additional DPM emissions in the refined analysis are all less than the project-level health risk thresholds for receptors located within the Air Pollution Exposure Zone (APEZ).

EPS comment: *For the Exposure Assessment step in the Health Risk Assessment, EPS performed a refined health risk assessment using AERMOD. AERMOD parameters were given in the November 16 letter. EPS claims that the results from the November 16 analysis are more refined.*

Ramboll response: Ramboll also performed an air dispersion modelling based on AERMOD in the refined analysis dated August 17, 2022. As discussed above, the refined analysis has demonstrated that all health risk impacts are below the applicable thresholds of the City. In addition, Ramboll notes that the EPS model setup has several flaws:

- EPS technical memorandum uses AERMOD to model two area sources to model the loading dock and the parking lot with a 2-meter release height, 0-meter initial vertical dimension, and the use of a ground-level release with a 5-meter initial vertical dimension for roadway emissions. However, the EPS technical memorandum does not cite or justify the use of these modeling parameters. The US EPA AERMOD Guidance document and the San Francisco Citywide Health Risk Assessment includes recommended initial vertical dimensions for volume, line, and area sources. However, EPS did not follow those recommendations. Ramboll's updated analysis modelled the emissions at the loading dock and project site vehicle circulation as volume sources with source parameters consistent with the USEPA AERMOD guidance, except that the TRU operation volume sources were assumed to have the same release height as trucks (5 meters), as recommended by the BAAQMD. [13]
- There is no justification for why EPS modeled the Project with no flagpole height and a vertical dimension of 5 meters. The City of San Francisco released the Citywide Health Risk Assessment: Technical Support Documentation,[14] which includes recommendations for modeling parameters for projects developed throughout the city. The EPS Technical Memorandum assumes that there is no flagpole receptor height. This is inconsistent with the Bay Area Air Quality Management District's (BAAQMD's) recommendation of a flagpole receptor height of 1.5 meters, which was used in Ramboll's updated analysis. Additionally, Ramboll also used varying flagpole receptor heights to account for daycare receptors on different floor levels.
- The EPS Technical Memorandum used six years of hourly met data, and four years from the nearest upper air station to develop hourly inversion heights. The specific inversion height changes were missing justification. In the refined analysis, Ramboll used BAAQMD's Mission Bay meteorological data for the year 2008, which is consistent with the San Francisco Citywide HRA Methodology.[15]

For the reasons above, the EPS Technical Memorandum does not use recommended modelling parameters and does not justify the use of their modelling parameters. In contrast, Ramboll's AERMOD setup and justifications for the parameter selection, documented in Attachment 2, are consistent with available guidance.

EPS comment: *For the Risk Characterization step in the Health Risk Assessment, EPS claims that, based on the modelling done in the technical memorandum dated November 16, 2022, the Project would result in increased cancer risks that exceed the applicable threshold. EPS also claims that health risk impacts at the existing child-care center and at the on-site worker receptors are likely to exceed the applicable threshold.*

Ramboll response: As discussed previously, Ramboll's refined analysis demonstrates that the Project's health risk impacts on residential receptors would be below the applicable thresholds. In the refined analysis, Ramboll also evaluated risks to the existing Bright Horizons daycare center ("the daycare") using exposure parameters for children ages less than two years of age. The cancer risk at the daycare from construction and operational activities was estimated to be 1.07 in a million, well below the threshold of 7 in a million. Maximum $PM_{2.5}$ concentrations at the daycare receptor would occur during operation of the Project and would be less than 0.01 µg/m^3, with is less than the

[13] US EPA AERMOD User Guide. Accessed at: https://gaftp.epa.gov/Air/aqmg/SCRAM/models/preferred/aermod/aermod_userguide.pdf

[14] City of San Francisco. Citywide Health Risk Assessment: Technical Support Documentation, 2020.

[15] *Ibid.*

threshold of 0.2 ug/m^3. Ramboll also conducted an analysis of impacts to worker receptors, included as Attachment 3. The results of the worker receptor analysis indicate that the off-site maximally exposed individual worker (MEIW), who is assumed to be a worker in the shopping center near the loading dock, would be exposed to construction and operational emissions associated with the proposed project. The health risk impacts at the MEIW would be a cancer risk of 3.7 in a million and $PM_{2.5}$ concentrations of 0.10 µg/m^3 , which are below the project-level significance thresholds of a cancer risk of 7 per one million or $PM_{2.5}$ concentrations at or above 0.2 ug/m^3 for projects within the air pollutant exposure zone (APEZ).

EPS comment: *EPS claims that, because the Project is located in the APEZ, its cumulative health risk impacts would also exceed the 100-in-a-million cancer risk threshold recommended by the BAAQMD. Therefore, the Project would have a significant cumulative impact.*

Ramboll response: The proposed project's location within the APEZ indicates a significant health risk impact already exists. Pursuant to CEQA, the next step is to determine whether the proposed project's contribution is cumulatively considerable. Based on the Air District's CEQA guidelines, projects that result in a cancer risk of less than 10 per one million or $PM_{2.5}$ concentrations less than 0.3 ug/m^3, would not result in a significant impact in combination with cumulative sources.[16] However, for projects located in the APEZ, the San Francisco Planning Department defines a considerable contribution based on a threshold that is approximately 30 percent lower than the Air District's cancer risk threshold- a cancer risk of 7 per one million or $PM_{2.5}$ concentrations of 0.2 ug/m^3 or greater. As described in Attachment 2, the health risk impacts of the project are well below these levels. If the rationale of this comment were valid, any additional health risk impacts within the APEZ would be considered a potentially significant cumulative impact, even if the action could be as simple as purchasing a piece of gasoline-powered landscaping equipment or building an in-law unit using minimal amount of diesel construction equipment for foundation work.

SF Planning, in coordination with the San Francisco Department of Public Health, undertook an extensive process to delineate the APEZ within the city to address the BAAQMD's cumulative threshold. Because the Project is located within the APEZ, its cumulative health risk impact would be considered significant only if the Project's *contribution* to cumulative health risks are cumulatively considerable. Because the Project's contribution to excess cancer risk would less than 7.0 in a million and its contribution to annual average $PM_{2.5}$ concentration would be less than 0.2 µg/m^3 (the Project-level thresholds in an APEZ), the Project's contribution to cumulative health risks impacts is considered less than cumulatively considerable, which is a Less-Than-Significant impact.

CLOSING

Based on the technical points raised in the two letters prepared by the Appellant, the Appellant's findings of significant health impacts appear to be based on an incomplete analysis and to rely on outdated and/or incorrect methods that overestimate impacts. In order to fully address any air quality-related concerns surrounding Project operation and construction, Ramboll has performed a complete HRA to understand the potential health impacts of the proposed Project (see Attachment 2). This analysis was performed in accordance with BAAQMD CEQA guidelines, OEHHA health risk assessment guidelines, and the Citywide Modeling done in the city of San Francisco. Details of the methods and results of this analysis are presented in the Methodology Report and Results Report (Attachment 2), respectively.

[16] BAAQMD, 2017. CEQA Air Quality Guidelines. May

ATTACHMENTS

RAMBOLL

ENVIRONMENT
& HEALTH

MEMO

Date: November 13, 2020

To: Jessica Range
San Francisco Environmental Planning

From: Michael Keinath
Michael Howley

Subject: HEALTH RISK ASSESSMENT AND PEER REVIEW OF PROPOSED PROJECT AT 2675 GEARY BLVD, SAN FRANCISCO, CALIFORNIA

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At the request of the City of San Francisco Planning Department, Ramboll US Consulting, Inc. (Ramboll) conducted a health risk assessment (HRA) for the proposed Whole Foods Market at 2675 Geary Blvd ("the Project"), as well as a peer review of two prior studies for the same Project. These studies were conducted on behalf of the Project Sponsor by ESA+Associates (ESA) and for an appellant to the Project by Environmental Permitting Specialists (EPS).

The Project would consist of a 50,000 square foot supermarket in an existing retail complex. The Project would require no construction or changes to the existing structures, parking area, or roadways. The Project is located in an Air Pollution Exposure Zone (APEZ), as defined by the San Francisco Department of Public Health.

The primary sources of emissions associated with Project operation are mobile sources, including delivery trucks equipped with diesel-powered transport refrigeration units (TRUs). These trucks emit toxic air contaminants (TACs) while running, idling, and when "dwelling" in the loading dock during delivery unloading. The primary TAC of concern is diesel particulate matter (DPM), a known carcinogen emitted from diesel combustion. To be conservative, all DPM will be assumed to be less than 2.5 microns in diameter ($PM_{2.5}$), to evaluate against applicable $PM_{2.5}$ concentration thresholds as well.[1]

HEALTH RISK ASSESSMENT

Toxic Air Contaminant Emissions

The TAC emissions associated with the Project were calculated using databases from the California Air Resources Board (ARB). ARB maintains emissions databases for both on-road vehicles and off-road equipment which calculate projected

[1] State regulatory emission models, discussed in detail below, do not explicitly report "DPM" emissions, but rather exhaust emissions of particulate matter less than 10 microns in diameter (PM_{10}) and $PM_{2.5}$. By definition, $PM_{2.5}$ is a subset of PM_{10}. In this analysis, DPM is defined as all exhaust PM_{10} emissions from diesel vehicles and equipment.

emissions based on user-specified locations (e.g., the County of San Francisco), year, fuel type, and vehicle class. Ramboll queried the most recent version of the on-road database (EMFAC2017) to generate running and idling emission factors for the two heaviest classes of diesel trucks, and the off-road database (OFFROAD2017-Orion) for emission factors associated with TRUs on trucks.

On-road idling emission factors from EMFAC were reported in units of tons/vehicle/day. Ramboll converted these emission factors into units of grams/trip using the EMFAC-reported vehicle population and trips/day rate. This method is slightly conservative as the idling emissions reported by EMFAC include all idling activity during vehicle operation and not just at trip endpoints. Similarly, TRU emissions for each equipment class from OFFROAD were reported in total tons, alongside total operating hours. Ramboll used these data to calculate emission factors in grams/hour.

The Project Sponsor provided estimated daily truck activity by truck type associated with the Project based on the maximum truck activity for an existing Whole Foods Market in San Francisco. This data, along with the derived emission factors and calculated emission rates, are presented in Table 1. For all emissions, Ramboll used PM_{10} exhaust emission factors and conservatively assumed that all PM_{10} exhaust emissions were DPM and $PM_{2.5}$.

Although passenger vehicles associated with customer trips also emit TACs, these vehicles are overwhelmingly gasoline-powered (or electric) and have far less impact on nearby receptors than diesel vehicles. Ramboll has reviewed the traffic study associated with the Project and notes that the average daily number of customer trips is expected to be 3,366 trips per day, well below the adjusted BAAQMD screening threshold of 5,000 vehicles per day. Thus passenger vehicles are not expected to contribute to any significant impacts and were not included in this assessment.

Screening Health Risk Assessment

Ramboll analyzed Project risks by estimating ambient air concentrations of DPM and $PM_{2.5}$. To estimate air concentrations of DPM and $PM_{2.5}$, Ramboll used AERSCREEN, a single source Gaussian plume model developed by USEPA which provides worst-case maximum ground-level concentrations. The model automatically generates concentrations at regular distances from the input source, but Ramboll also specified distances based on the nearest receptors to the Project. These were a daycare facility on the roof level of the building, 36 meters West of the truck loading dock, and residences to the south of the Project, with the nearest being 80 meters away.

The AERSCREEN methodology incorporates conservative assumptions and worst-case meteorological conditions, which result in overly conservative health risk estimates. Ramboll modeled the loading dock as a single volume source, consistent with USEPA methodology for haul trucks. Ramboll used the following source parameters:

- Release Height: 2.55 meters, based on USEPA Haul Road Guidance[2] of 1.7 x vehicle height/2 and an assumed vehicle height of 3 meters
- Initial Vertical Dimension: 2.37 meters, based on USEPA Haul Road Guidance of Release Height x 2/2.15 (also consistent with AERMOD and AERSCREEN guidance[3] for a single volume source adjacent to a building)

[2] USEPA. 2012. Haul Road Workgroup Final Report Submission. Available at: https://www3.epa.gov/scram001/reports/Haul_Road_Workgroup-Final_Report_Package-20120302.pdf

[3] USEPA. 2019. AERMOD User's Guide. Available at: https://www3.epa.gov/ttn/scram/models/aermod/aermod_userguide.pdf

- Initial Lateral Dimension: 1.96 meters, based on the AERMOD guidance for a single volume source of source width / 4.3, with the width of the loading dock measured to be 8.4 meters

The complete AERSCREEN inputs and outputs are included in Appendix A.

In February 2015, OEHHA released the updated Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments (OEHHA 2015), which combines information from previously-released and adopted technical support documents to delineate OEHHA's revised risk assessment methodologies based on current science. The BAAQMD has issued HRA Guidelines formally adopting the OEHHA 2015 Guidance Manual.[4] This analysis followed the recommended methodology from the 2015 OEHHA Hot Spots Guidance. Ramboll conservatively evaluated Project impacts using default exposure assumptions for a resident child and daycare child from OEHHA (2015) unless otherwise noted.[5] The resident child scenario assumes a much higher daily breathing rate and age-sensitivity factor (ASF)[6] than other sensitive receptor populations and therefore is the most conservative scenario to evaluate for this analysis. The exposure parameters used to estimate excess lifetime cancer risks for a resident child are presented in Table 2.

The dose estimated for each exposure pathway is a function of the concentration of a chemical and the intake of that chemical. The intake factor for inhalation, IF_{inh}, can be calculated as follows:

$$IF_{inh} = \frac{DBR * FAH * EF * ED * ASF * CF}{AT}$$

Where:

IF_{inh}	=	Intake Factor for Inhalation (m^3/kg-day)
DBR	=	Daily Breathing Rate (L/kg-day)
FAH	=	Fraction of Time at Home (unitless)
EF	=	Exposure Frequency (days/year)
ED	=	Exposure Duration (years)
AT	=	Averaging Time (days)
ASF	=	Age Sensitivity Factor (unitless)
CF	=	Conversion Factor, 0.001 (m^3/L)

The chemical intake or dose is estimated by multiplying the inhalation intake factor, IF_{inh}, by the chemical concentration in air, C_i. When coupled with the chemical concentration, this calculation is mathematically equivalent to the dose algorithm given in the OEHHA Hot Spots guidance (Cal/EPA 2003).

The toxicity assessment characterizes the relationship between the magnitude of exposure and the nature and magnitude of adverse health effects that may result from such exposure. This HRA evaluated theoretical exposures to TACs for two categories of potential adverse health effects, cancer and non-cancer endpoints. Toxicity values used to estimate the likelihood of adverse effects occurring in humans at different exposure levels are identified as part of the toxicity assessment component of a

[4] BAAQMD. 2016. Proposed Health Risk Assessment Guidelines. Air Toxics NSR program. January. Available at: http://www.baaqmd.gov/~/media/files/planning-and-research/rules-and-regs/workshops/2016/reg-2-5/hra-guidelines_clean_jan_2016-pdf.pdf?la=en

[5] BAAQMD. 2010. BAAQMD Air Toxics NSR Program Health Risk Screening Analysis (HRSA) Guidelines. January.

[6] Ibid.

risk assessment. Since the only chemical of concern in this HRA is DPM, and the chronic non-cancer Reference Exposure Level for DPM (5.0 ug/m^3) is less than the significance threshold for $PM_{2.5}$ concentration (0.2 ug/m^3) in an air pollution exposure zone (APEZ), non-cancer effects were not explicitly evaluated.

Cancer risk was calculated from ambient annual concentrations using intake factors, cancer potency factors, and chronic reference exposure levels calculated consistent with the 2015 OEHHA Hot Spots Guidance[7] and 2010 BAAQMD guidance.[8]

As shown in Table 3, the maximum cancer risk from Project operations is calculated to be 2.6 in 1 million, compared to a threshold of 7 in 1 million, based on a maximum $PM_{2.5}$ concentration of 0.008 µg/m^3 (threshold of 0.2 µg/m^3). These results are all well below the APEZ thresholds of significance; thus, health risk impacts associated with construction of the Project are less than significant.

PEER REVIEW OF PRIOR ASSESSMENTS

ESA Air Quality Technical Memo

ESA conducted an air quality analysis and health risk assessment for the Project using much of the same data and methods described above, and in fact produced similar overall results. ESA relied on the same truck activity data, emission factor sources, and HRA methodology as Ramboll.

ESA did not include truck running emissions, but these are negligible compared to idling and TRU emissions. There appear to be some minor differences, such as the use of an area source for truck idling and a volume source for TRU operation, but the model parameters used by ESA are reasonable for this analysis. The area source for truck idling may be overly conservative when using a worst-case screening dispersion model such as AERSCREEN, according to USEPA Haul Road Guidance.

The primary difference between ESA's report and Ramboll's analysis is that ESA established a Baseline condition for the Project based on the previous tenant of the space, a Best Buy store. ESA used vehicle count data from another Best Buy in San Francisco to estimate Baseline activity and presented Project impacts as the net change from that Baseline. This serves to reduce the overall impacts of the Project compared to analyzing the Project by itself.

However, even without subtracting the Baseline condition none of ESA's conclusions would change. All mass emissions of Criteria Air Pollutants evaluated by ESA would still be below the applicable significance thresholds. In the HRA, the vast majority of impacts calculated by ESA are from TRU emissions, which only exist in the Project case, and thus if Baseline activity were removed from ESA's HRA the results would be similar to those reported and still less than significant. This is also consistent with Ramboll's HRA analysis.

EPS Technical Memorandum

EPS conducted their own evaluation of the Project and determined that the Project would result in significant health impacts. To make this determination, EPS calculated Project-related emissions from truck idling, TRU operations, truck travel across the parking lot, and gasoline vehicle travel, then input all of the calculated emissions to a Prioritization Score Calculator published by the San Juaquin Valley Air Pollution Control District (SJVAPCD).

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[7] Cal/EPA. 2003. The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments. Office of Environmental Health Hazard Assessment. August.

[8] BAAQMD. 2010. Air Toxics NSR Program Health Risk Screening Analysis (HRSA) Guidelines. January

EPS interprets the output of this Prioritization Score Calculator to reflect Project cancer risks in excess of BAAQMD thresholds. However, there is no indication in the Calculator or associated documentation from SJVAPCD to support this assertion. The California Air Pollution Control Officers Association (CAPCOA) Facility Prioritization Guidelines state, "Because the threshold for high priority is based on a conservative modeling scenario, it is possible that facilities with higher scores than the threshold may not significantly impact receptors."[9] The Prioritization Score calculated by EPS does not necessarily equate to the actual maximum Project cancer risk, but would signal the need for a more detailed analysis like the ones conducted by ESA and Ramboll. EPS did not include any such analysis in their report.

EPS calculated emissions associated with the same truck operations as Ramboll. EPS uses a conservatively low number of truck trips, and uses similar data and methods to calculate truck running and idling emissions as Ramboll. EPS also uses a similar methodology to calculate TRU emissions, relying on reported average TRU size in horsepower and an emission factor in units of grams per horsepower-hour (g/hp-hr). However, EPS appears to calculate substantially higher TRU emissions, based on an emission factor from a regulatory limit rather than actual unit operations presented in ARB models. Ramboll was unable to verify the exact emission factor used by EPS as it does not appear in the cited document. The nearest emission factor in that document, 0.22 g/hp-hr (compared to EPS value of 0.25), is 2.5 to 9 times greater than equivalent emission factors from the ARB OFFROAD database used by Ramboll and ESA. BAAQMD guidance specifically recommends the ARB OFFROAD and EMFAC models for projects that do not require an air permit such as large retail centers.[10] The EPS analysis artificially inflates potential impacts in contraction to appropriate regulatory guidance.

EPS also includes TAC emissions from gasoline passenger vehicles in their Prioritization Score calculations. This is a conservative approach, as discussed above, but EPS appears to use overly conservative emission factors without justification. Rather than calculate passenger vehicle emissions in a manner consistent with truck emissions using ARB developed models and then apply a TAC speciation profile to the results, EPS calculated individual TAC emissions directly. The emission factors used by EPS appear to be selected as the maximum emission factors for each TAC from a subset of emission factors reported in the source document cited by EPS. This subset is a series of studies conducted in the Caldecott Tunnel from 1994-1999. The emission factors themselves were derived from factors in units of TAC emission per fuel consumption based on assumed fuel consumption rates, also specific to the 1994-1999. Vehicle standards and performance change significantly over time; these emission factors likely do not represent operating conditions relevant to the Project. Again, EPS artificially inflates potential impacts by citing a document which reports emissions reflective of an automobile fleet from 25-years ago, rather than using the most up-to-date models published by ARB to estimate the emissions from the current automobile fleet.

CLOSING

Based on the assumptions and methodology described above, Ramboll has determined that the proposed Project would not result in any health impacts in excess of the relevant thresholds of

[9] CAPCOA. Facility Prioritization Guidelines. 2016. Available at: http://www.valleyair.org/busind/pto/tox_resources/CAPCOA-Prioritization-Guidelines-August-2016-FINAL.pdf

[10] BAAQMD. 2017. California Environmental Quality Act (CEQA) Air Quality Guidelines. Available at: https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en

significance for a project located in an APEZ. This is consistent with the analysis conducted by ESA. The findings of significant health impacts reported by EPS appear to be based on an incomplete analysis and rely on outdated methods to overly inflate potential impacts.

Attachments:

Tables

Appendix A: AERSCREEN Output Files

TABLES

Table 1
Emissions Calculations
2675 Geary Whole Foods Market
San Francisco, California

Truck type[1]	EMFAC Vehicle Category	TRU Category	Average Daily Trips[1]	Dwelling Time[1] (hours/trip)	Onsite Travel Distance (mi)	TRU PM_{10} EF[2] (g/hour)	Idling PM_{10} EF[3] (g/trip)	Running PM_{10} EF (g/mi)	Annual Emission Rate[4,5] (g/s)
65 Foot Trailer	HHDT	TRU - Instate Trailer TRU	4	1	0.05	0.96	0.011	0.115	4.6E-05
30-48 Foot Trailer	HHDT	TRU - Instate Truck TRU	4	0.5	0.05	1.35	0.011	0.159	3.3E-05
Other	MHDT	TRU - Instate Van TRU	15	0.5	0.05	0.86	0.003	0.115	7.7E-05
							Total:		1.6E-04

Notes:

1. Truck descriptions, trip counts, and dwelling times provided by Project Sponsor.
2. TRU emission factors derived from ARB OFFROAD2017-Orion model for San Francisco in 2021, assuming all diesel fuel.
3. Idling emission factors derived from ARB EMFAC2017 for San Francisco in 2021, assuming all diesel fuel.
4. Annual emission rate calculated assuming idling activity takes place both at arrival and departure of each truck.
5. Emissions annualized over a continuous year.

Abbreviations:

EF - Emission Factor
g - grams
HHDT - Heavy Heavy Duty Truck
MHDT - Medium Heavy Duty Truck
mi - mile
PM10 - Particulate Matter less than 10 microns in diameter
s - second
TRU - Transport Refrigeration Unit

References:

California Air Resource Board. 2017. OFFROAD2017-Orion Web Database (v1.0.1). Available at: https://www.arb.ca.gov/orion/?_ga=2.128781003.634143458.1605135827-1292042476.1557263948

California Air Resource Board. 2017. EMFAC017 Web Database (v1.0.2). Available at: https://arb.ca.gov/emfac/2017/?_ga=2.135013046.634143458.1605135827-1292042476.1557263948

Table 2
Exposure Paramaters
2675 Geary Whole Foods Market
San Francisco, California

Population	Receptor Age Group	Exposure Parameters						
		Daily Breathing Rate (DBR)[1]	Exposure Duration (ED)	Fraction of Time at Home (FAH)[2]	Exposure Frequency (EF)[3]	Averaging Time (AT)	Age Sensitivity Factor	Intake Factor, Inhalation (IF_{inh})
		[L/kg-day]	[years]	[unitless]	[days/year]	[days]	[unitless]	$[m^3/kg\text{-}day]^{-1}$
Resident Child	3rd Trimester	361	0.25	1.0	350	25,550	10	0.0124
	Age 0-<2 Years	1,090	2.0	1.0	350	25,550	10	0.299
	Age 2-<16 Years	572	14	1.0	350	25,550	3	0.33
	Age 16-30 Years	261	14	0.73	350	25,550	1	0.037
Daycare Child	Age Six Weeks-<2 Years	1,200	1.9	1.0	250	25,550	10	0.221
	Age 2-<9 Years	520	4.0	1.0	250	25,550	3	0.061

Notes:

1. Daily breathing rates reflect default breathing rates from OEHHA 2015 and BAAQMD 2016 as follows: 95th percentile 24-hour daily breathing rate for 3rd trimester and age 0-<2 years; 80th percentile for ages 2 years and older (per BAAQMD 2016 guidance).

2. Fraction of time spent at home is conservatively assumed to be 1 (i.e., 24 hours/day) for age groups from the third trimester to less than 16 years old based on the recommendation from BAAQMD (BAAQMD 2016) and OEHHA (OEHHA 2015). The fraction of time at home for adults age 16-30 reflects default OEHHA guidance (OEHHA 2015) as recommended by BAAQMD (2016). The fraction of time at home for the daycare children was conservatively set to be 1, consistent with OEHHA 2015 guidance for resident children.

3. Exposure frequency reflects default residential exposure frequency from OEHHA 2015.

4. Daycare children are modeled using parameters consistent with OEHHA 2015 guidance, but conservatively assumed to be exposed to all emissions 5 days/week by maintaing FAH of 1.

Calculation:

IF_{inh} = DBR * FAH * EF * ED * ASF * CF / AT

CF = 0.001 (m^3/L)

Abbreviations:

AT - averaging time
BAAQMD - Bay Area Air Quality Management District
DBR - daily breathing rate
ED - exposure duration
EF - exposure frequency
FAH - fraction of time at home
IF_{inh} - intake factor
kg - kilogram
L - liter
m^3 - cubic meter
OEHHA - Office of Environmental Health Hazard Assessment

References:

BAAQMD. 2016. Air Toxics NSR ProgramHealth Risk Assessment (HRA) Guidelines. January.
OEHHA. 2015. Air Toxics Hot Spots Program Risk Assessment Guidelines. Guidance Manual for Preparation of Health Risk Assessments. February.

Table 3
Health Risk Assessment
2675 Geary Whole Foods Market
San Francisco, California

Receptor Type	Hourly Dispersion Factor[1]	Annual Dispersion Factor[2]	PM_{10} Emission Rate	Annual PM_{10} Concentration (C)	Inhalation Factor (IF_{inh})	Cancer Potency Factor (CPF)	Lifetime Cancer Risk
	[$ug/m^3/g/s$]	[$ug/m^3/g/s$]	[g/s]	[ug/m^3]	[$m^3/kg\text{-}day]^{-1}$	[mg/kg-day]	[in a million]
Daycare Child	544	54.4	1.55E-04	8.46E-03	0.28	1.1	2.6
Resident Child	194.9	19.49	1.55E-04	3.03E-03	0.68	1.1	2.3

Notes:

1. Maximum hourly dispersion factor as reported by AERSCREEN at the nearest distance of each receptor type from the edge of the loading dock area. See Appendix A for model parameters.

2. Annual dispersion factors calcualted as 0.1* Maximum Hourly Dispersion Factor, consistent with the AERSCREEN User Guide.

Calculation:

Cancer Risk = IF_{Inh} * C * CPF / CF

CF = 1000 ug/mg

Abbreviations:

g - gram
kg - kilogram
m3 - meters cubed
mg - miligram
PM10 - Particulate Matter less than 10 microns in diameter
s - second
ug - microgram

References:

United States Environmental Protection Agency. AERSCREEN User Guide (v16216). Available at: https://www.epa.gov/scram/air-quality-dispersion-modeling-screening-models

APPENDIX A
AERSCREEN OUTPUT FILES

AERSCREEN 16216 / AERMOD 19191 11/12/20
16:48:00

TITLE: Geary_WF_daycare_vol

********** VOLUME PARAMETERS **********

SOURCE EMISSION RATE: 1.0000 g/s 7.937 lb/hr
VOLUME HEIGHT: 2.55 meters 8.37 feet
INITIAL LATERAL DIMENSION: 1.96 meters 6.43 feet
INITIAL VERTICAL DIMENSION: 2.37 meters 7.78 feet
RURAL OR URBAN: URBAN
POPULATION: 4335391

FLAGPOLE RECEPTOR HEIGHT: 10.90 meters 35.76 feet

INITIAL PROBE DISTANCE = 300. meters 984. feet

********** BUILDING DOWNWASH PARAMETERS **********

BUILDING DOWNWASH NOT USED FOR NON-POINT SOURCES

********** PROBE ANALYSIS **********
25 meter receptor spacing: 5. meters - 300. meters

	Zo SECTOR	ROUGHNESS LENGTH	1-HR CONC (ug/m3)	DIST (m)	TEMPORAL PERIOD
1*	1.000	2074.	5.2	SUM

* = worst case flow sector

********** MAKEMET METEOROLOGY PARAMETERS **********

MIN/MAX TEMPERATURE: 250.0 / 310.0 (K)

MINIMUM WIND SPEED: 0.5 m/s

ANEMOMETER HEIGHT: 10.000 meters

SURFACE CHARACTERISTICS INPUT: AERMET SEASONAL TABLES

DOMINANT SURFACE PROFILE: Urban
DOMINANT CLIMATE TYPE: Average Moisture
DOMINANT SEASON: Summer

ALBEDO: 0.16
BOWEN RATIO: 2.00
ROUGHNESS LENGTH: 1.000 (meters)

SURFACE FRICTION VELOCITY (U*) ADJUSTED

METEOROLOGY CONDITIONS USED TO PREDICT OVERALL MAXIMUM IMPACT

YR MO DY JDY HR
-- -- -- --- --
10 01 18 18 12

H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS
155.88	0.179	1.200	0.020	340.	174.	-2.8	1.000	2.00	0.16	0.50

HT	REF TA	HT
10.0	250.0	2.0

METEOROLOGY CONDITIONS USED TO PREDICT AMBIENT BOUNDARY IMPACT

YR MO DY JDY HR
-- -- -- --- --
10 01 18 18 12

H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS
155.88	0.179	1.200	0.020	340.	174.	-2.8	1.000	2.00	0.16	0.50

HT	REF TA	HT
10.0	250.0	2.0

********** AERSCREEN AUTOMATED DISTANCES **********
OVERALL MAXIMUM CONCENTRATIONS BY DISTANCE

DIST (m)	MAXIMUM 1-HR CONC (ug/m3)	DIST (m)	MAXIMUM 1-HR CONC (ug/m3)
5.21	2074.	150.00	100.1
25.00	806.8	175.00	78.57
36.00	544.9	200.00	63.55
50.00	416.2	225.00	52.53
75.00	268.8	250.00	44.20
80.00	247.0	275.00	37.77
100.00	181.6	300.00	32.70
125.00	131.7		

********** AERSCREEN MAXIMUM IMPACT SUMMARY **********

CALCULATION PROCEDURE	MAXIMUM 1-HOUR CONC (ug/m3)	SCALED 3-HOUR CONC (ug/m3)	SCALED 8-HOUR CONC (ug/m3)	SCALED 24-HOUR CONC (ug/m3)	SCALED ANNUAL CONC (ug/m3)
FLAT TERRAIN	2074.	2074.	1866.	1244.	207.4

DISTANCE FROM SOURCE 5.21 meters

IMPACT AT THE AMBIENT BOUNDARY	2074.	2074.	1866.	1244.	207.4

DISTANCE FROM SOURCE 5.21 meters

AERSCREEN 16216 / AERMOD 19191 11/12/20
17:10:59

TITLE: Geary_WF_resident_vol

********** VOLUME PARAMETERS **********

SOURCE EMISSION RATE: 1.0000 g/s 7.937 lb/hr
VOLUME HEIGHT: 2.55 meters 8.37 feet
INITIAL LATERAL DIMENSION: 1.96 meters 6.43 feet
INITIAL VERTICAL DIMENSION: 2.37 meters 7.78 feet
RURAL OR URBAN: URBAN
POPULATION: 4335391

FLAGPOLE RECEPTOR HEIGHT: 1.80 meters 5.91 feet

INITIAL PROBE DISTANCE = 300. meters 984. feet

********** BUILDING DOWNWASH PARAMETERS **********

BUILDING DOWNWASH NOT USED FOR NON-POINT SOURCES

********** PROBE ANALYSIS **********
25 meter receptor spacing: 5. meters - 300. meters

	Zo SECTOR	ROUGHNESS LENGTH	1-HR CONC (ug/m3)	DIST (m)	TEMPORAL PERIOD
1*	1.000	0.1858E+05	5.2	AUT

* = worst case flow sector

********** MAKEMET METEOROLOGY PARAMETERS **********

MIN/MAX TEMPERATURE: 250.0 / 310.0 (K)

MINIMUM WIND SPEED: 0.5 m/s

ANEMOMETER HEIGHT: 10.000 meters

SURFACE CHARACTERISTICS INPUT: AERMET SEASONAL TABLES

DOMINANT SURFACE PROFILE: Urban
DOMINANT CLIMATE TYPE: Average Moisture
DOMINANT SEASON: Autumn

ALBEDO: 0.18
BOWEN RATIO: 2.00
ROUGHNESS LENGTH: 1.000 (meters)

SURFACE FRICTION VELOCITY (U*) ADJUSTED

METEOROLOGY CONDITIONS USED TO PREDICT OVERALL MAXIMUM IMPACT

YR MO DY JDY HR
-- -- -- --- --
10 01 13 13 12

H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS
3.41	0.110	0.600	0.020	2182.	84.	-33.8	1.000	2.00	0.18	0.50

HT	REF TA	HT
10.0	280.0	2.0

METEOROLOGY CONDITIONS USED TO PREDICT AMBIENT BOUNDARY IMPACT

YR MO DY JDY HR
-- -- -- --- --
10 01 13 13 12

H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS
3.41	0.110	0.600	0.020	2182.	84.	-33.8	1.000	2.00	0.18	0.50

HT	REF TA	HT
10.0	280.0	2.0

********** AERSCREEN AUTOMATED DISTANCES **********
OVERALL MAXIMUM CONCENTRATIONS BY DISTANCE

DIST (m)	MAXIMUM 1-HR CONC (ug/m3)	DIST (m)	MAXIMUM 1-HR CONC (ug/m3)
5.21	0.1858E+05	150.00	66.23
25.00	1554.	175.00	50.93
36.00	782.5	200.00	43.53
50.00	440.8	225.00	37.84
75.00	217.9	250.00	33.12
80.00	194.9	275.00	29.21
100.00	132.6	300.00	25.95
125.00	90.44		

********** AERSCREEN MAXIMUM IMPACT SUMMARY **********

CALCULATION PROCEDURE	MAXIMUM 1-HOUR CONC (ug/m3)	SCALED 3-HOUR CONC (ug/m3)	SCALED 8-HOUR CONC (ug/m3)	SCALED 24-HOUR CONC (ug/m3)	SCALED ANNUAL CONC (ug/m3)
FLAT TERRAIN	0.1858E+05	0.1858E+05	0.1672E+05	0.1115E+05	1858.

DISTANCE FROM SOURCE 5.21 meters

IMPACT AT THE
AMBIENT BOUNDARY 0.1858E+05 0.1858E+05 0.1672E+05 0.1115E+05 1858.

DISTANCE FROM SOURCE 5.21 meters

Prepared for
San Francisco Planning Department
San Francisco, California

Prepared by
Ramboll US Consulting, Inc.
San Francisco, California

Project Number
1690022356

Date
February 2022

2675 GEARY BOULEVARD PROJECT UPDATE AIR QUALITY AND HEALTH RISK ASSESSMENT METHODOLOGY

2675 GEARY BOULEVARD

SAN FRANCISCO, CALIFORNIA

RAMBOLL

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ACRONYMS AND ABBREVIATIONS

AERMOD	USEPA's atmospheric dispersion modeling system
APEZ	Air Pollution Exposure Zone
ARB	(California) Air Resources Board
ASF	age sensitivity factor
BAAQMD	Bay Area Air Quality Management District
Cal/EPA	California Environmental Protection Agency
CalEEMod®	California Emissions Estimator Model
CAP	criteria air pollutant
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CPF	cancer potency factor
Citywide HRA	San Francisco Citywide Health Risk Analysis database
DPM	diesel particulate matter
EIR	Environmental Impact Report
ESA	Environmental Science Associates
g/s	gram per second
HHDT	Heavy-Heavy Duty Trucks
HI	Hazard Index
HQ	Hazard Quotient
HRA	health risk assessment
LDA	Light-Duty Auto
LDT1	Light-Duty Truck 1
MEIR	Maximally Exposed Individual Receptor
mg/kg-day	milligram per kilogram per day
MHDT	Medium-Heavy Duty Trucks
MUNI	Municipal Railway
OEHHA	Office of Environmental Health Hazard Assessment
$PM_{2.5}$	fine particulate matter less than 2.5 micrometers in aerodynamic diameter
Ramboll	Ramboll US Consulting, Inc.
ROG	Reactive Organic Gases
SF DPH	San Francisco Department of Public Health
SFEP	San Francisco Planning Department Environmental Planning Division
SF Planning	San Francisco Planning Department
TAC	toxic air contaminant
TOG	total organic gases
TRUs	Transportation Refrigeration Units
$\mu g/m^3$	microgram per cubic meter
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
VOC	volatile organic compounds
χ/Q	"chi over q"

1. INTRODUCTION

At the request of Environmental Science Associates (ESA), Ramboll US Consulting, Inc. (Ramboll) will conduct a California Environmental Quality Act (CEQA) analysis of criteria air pollutants and precursors and local air quality and health impacts associated with the construction and operation of a proposed Whole Foods grocery store to be located at 2675 Geary Boulevard in San Francisco (referred to hereafter as "Proposed Project" or "Project") on sensitive receptors. This emissions and Health Risk Assessment (HRA) methodology describes the scope and methodology for evaluation of air quality and health impacts from construction and operational sources and cumulative off-site sources at existing on-site and nearby off-site sensitive receptors. This analysis will be performed to support the Project's CEQA documentation at the request of the San Francisco Planning Department's (SF Planning) Environmental Planning (SFEP) Division.

1.1 Project Understanding

The project site is located within the existing 250,843-square-foot "City Center' shopping center, located at the southeast corner of Masonic Avenue and Geary Boulevard, in the Western Addition Neighborhood of San Francisco. Whole Foods Market (the Project Sponsor) proposes to renovate a vacant retail space formerly occupied by Best Buy, above an existing Target store. The Project would consist of a 54,285-square-foot grocery store with a 29,485-square-foot sales floor, as well as 24,805 square feet for other uses, including seating areas, self-checkout and back-of-house uses such as offices, restrooms, freezers and kitchens. The store would have a lounge and seating area with capacity to seat up to 50 people. Construction of the proposed Project consists of interior renovations within the existing vacant retail space, replacement of existing heating, ventilation, and air conditioning (HVAC) equipment in the mechanical penthouse, an approximately 700-square-foot expansion of the rooftop penthouse to accommodate the new HVAC equipment, and new exterior signage. The Project would not require changes to the existing parking area or roadways. The existing 117 vehicle parking spaces accessed from O'Farrell Street would be available for Whole Foods customers. Loading and deliveries would occur from an existing loading dock accessible via O'Farrell Street, between Anza Vista Avenue and Lyon Street.

The Project is located in an Air Pollution Exposure Zone (APEZ), as defined by the San Francisco Department of Public Health.

The Project is being analyzed in response to the San Francisco Board of Supervisors directing SF Planning to further analyze the potential air quality impacts of the proposed project to sensitive receptors in the vicinity of the project site in March 2021 (Motion No. M21-047).

1.2 Objective and Methodology

The purpose of the air quality analysis is to assess potential criteria air pollutant and health risks and hazards that would result from the construction and operation of the proposed Project consistent with guidelines and methodologies from air quality agencies, specifically, the Bay Area Air Quality Management District (BAAQMD), the California Air Resources Board (ARB), the California Office of Environmental Health Hazard Assessment (OEHHA), and the US Environmental Protection Agency (USEPA). Consistent with guidelines and recommended methods from these agencies, the HRA will evaluate the estimated incremental increase in cancer risk from toxic air contaminants (TACs), including diesel particulate matter (DPM) and gasoline speciated total organic gases (TOG), as well as fine PM concentrations (specifically particulate matter less than 2.5 microns in aerodynamic diameter [$PM_{2.5}$]). The regional criteria air pollutant analysis will quantitatively describe potential short-term construction impacts and long-term operational impacts that could be generated by the proposed

Project. The construction and operational emission sources included in the HRA for the Project include diesel-powered construction equipment, construction vendor and worker vehicles, and Project-related traffic, including diesel trucks, transportation refrigeration units (TRUs), and passenger vehicles.

In addition to estimating the air quality and health risk impacts from the Project, Ramboll will conduct an existing plus project HRA of cancer risk and $PM_{2.5}$ concentrations at on- and off-site receptors resulting from other sources of stationary, area, and mobile emissions as calculated in the San Francisco Citywide Health Risk Analysis database (Citywide HRA) in addition to health impacts from Project construction and operations. Ramboll will also conduct semi-quantitative (if health risk information from cumulative projects is available) or qualitative analyses to evaluate the cumulative health risk impact resulting from reasonably foreseeable projects within 1,000 feet of the Maximally Exposed Individual Receptor (MEIR) that emits TACs from construction or operations (e.g., new stationary sources proposed as part of a cumulative project). A list of cumulative projects to be considered in this analysis are discussed further in **Section 6** below.

The results of the analysis will be documented in a summary results memo to be presented to ESA and SFEP before being incorporated into the Draft Environmental Impact Report (EIR) as applicable chapter text and technical appendices.

1.3 Document Organization

This scope of work is divided into seven sections as follows:

Section 1.0 – Introduction: describes the purpose and scope of the air quality analysis, the objectives and methodology to be used, and outlines the document organization;

Section 2.0 – Emission Estimation Methods: describes the methods that will be used to estimate CAP and TAC emissions from various sources for the Project;

Section 3.0 – Estimated Air Concentrations Methods: discusses the air dispersion modeling, the selection of the dispersion models, the data to be used in the dispersion models (*e.g.*, terrain, meteorology, source characterization), and the identification of receptor locations evaluated in the HRA;

Section 4.0 – Risk Characterization Methods: provides an overview of the methodology for conducting the HRA;

Section 5.0 – Existing Plus Project Analysis Methods: summarizes the approach to be used in the existing plus Project analyses;

Section 6.0 – Cumulative Analysis Methods: summarizes the approach to be used in the HRA cumulative analysis.

Section 7.0 – References: includes a listing of all references cited in this report.

2. PROJECT EMISSIONS ESTIMATION

Ramboll will estimate the incremental criteria air pollutant (CAP) and TAC emissions associated with Project construction and operations. Methodologies used to calculate CAP and TAC emissions are summarized below.

2.1 Construction Sources

Construction emission calculation methodologies cover diesel-fueled off-road equipment and on-road vehicles.

Ramboll will rely on project-specific data provided by the Project Sponsor, including a construction equipment list, a construction schedule, and site map. According to the Project Sponsor, construction activities will be limited to interior renovations within the existing vacant retail space, replacement of existing heating, ventilation, and air conditioning (HVAC) equipment in the mechanical penthouse, an approximately 700-square-foot expansion of the rooftop penthouse to accommodate the new HVAC equipment, and new exterior signage. Therefore, use of a lot of off-road equipment is not anticipated.

Where project-specific construction data is not available, California Emissions Estimator Model (CalEEMod®) defaults can be used. For purposes of this analysis, Ramboll will assume that all construction off-road equipment is diesel powered, and that all off-road equipment emissions of PM with an aerodynamic diameter less than 10 microns (PM_{10}) are DPM, which is a TAC. Emissions will be estimated using CalEEMod® or equivalent methods, as summarized in **Table 2**.

2.1.1 Off-road Equipment

According to the Project Sponsor, the only diesel-powered off-road construction equipment that will be used on-site is a crane for lifting HVAC equipment onto the roof. For diesel-powered off-road construction equipment, Ramboll will use CalEEMod® and methodologies consistent with CalEEMod® to estimate emissions. The CalEEMod® emissions methodology for off-road construction equipment relies on the ARB In-Use Off-Road Equipment model (OFFROAD2011), which incorporates statewide survey data to develop emission factors based on the fleet average for each year of construction.[1] The OFFROAD2011 model also identifies average horsepower and load factor for each type of equipment; Ramboll will request the equipment horsepower and load factors from the Project Sponsor, however, if this information is not available, default data in OFFROAD2011, which are included in CalEEMod®, can be used. The methodology to be used to calculate emissions from off-road equipment is presented in **Table 2**.

Emissions without control measures will be calculated assuming fleet average equipment, meaning the emission factors used reflect the fleet predicted to be in use in the OFFROAD2011 model.

2.1.2 Construction On-road Mobile Sources

On-road mobile sources include vehicle trips associated with workers, vendors, and demolition and excavation hauling trips. Because there will only be interior renovations for Project construction, there will be no demolition or excavation hauling trips associated with the Project.

The emission factors for running emissions of criteria pollutants in CalEEMod® are from EMFAC2017, the ARB Emission Factors model for on-road emissions. Since the last release of CalEEMod®, ARB

[1] Although ARB has released an updated model as OFFROAD2017, the newer version does not generate "default" fleet data the way OFFROAD2011 does. As such, OFFROAD2011 is still used in CalEEMod® version 2020.4.0. Until ARB updates default fleet mix data, OFFROAD2011 will continue to be used.

released a new version of its model for on-road emissions, EMFAC2021, which will be used in this assessment because it is the most recent version of ARB emissions factors available at the time the analysis is conducted. Emission factors vary by vehicle type, fuel type, and calendar year. Consistent with CalEEMod® methodology, Ramboll will assume that worker trips are 50% Light-Duty Auto (LDA), 25% Light-Duty Truck 1 (LDT1) and 25% LDT2 vehicle classes. The Transportation Engineer will provide vehicle type assumptions for vendor trips, likely mapped to heavy-heavy duty trucks (HHDT) and medium-heavy duty trucks (MHDT). EMFAC2021 incorporates the Pavley Clean Car Standards and the Advanced Clean Cars program. The emission factors used for construction of the Project will be provided from EMFAC2021 for 2024.

For HRA purposes, Ramboll will consider DPM and $PM_{2.5}$ emissions from vendor trucks and construction worker vehicle trips from construction. Construction worker vehicle trips from the project are not expected to exceed an average of 5,000 worker trips per day, and the BAAQMD recommends a traffic screening criteria of 10,000 vehicles per day for lifetime cancer risk exposure analyses (BAAQMD 2011). This screening criteria was derived from 2003 OEHHA Guidance, which has since been updated. The current OEHHA Guidance roughly increases lifetime cancer risk exposure by a factor of 40%. To be conservative, Ramboll has established a revised screening criteria of 5,000 vehicles per day, consistent with a 100% increase in lifetime exposure. This is especially conservative for construction analyses as the actual exposure period would be much shorter. However, to conservatively estimate impacts from Project construction, Ramboll is proposing to calculate health risks from worker trips in this analysis.

The methodology used to calculate emissions from on-road sources is presented in Table 2.

2.1.3 Architectural Coating

Emissions from architectural coating were estimated using methodologies consistent with CalEEMod®.

Architectural coating emissions are based on the square footage of the grocery store, as indicated by the Project sponsor, as well as the CalEEMod® default values of architectural coatings per square footage. Since construction work to be done for the Project is all interior, Ramboll assumes there is no coating required for the exterior area.

Emissions from architectural coating during Project construction assume compliance with BAAQMD paint Volatile Organic Compounds (VOC) regulations.

2.2 Operational Sources

Because the existing building has been vacant for several years, the analysis will assume that there is currently no activity at the Project site and no emissions are currently being generated. Thus, all operational CAP and TAC emissions from the Project would be considered net new emissions. Sources of operational emissions from the Project include on-road delivery, worker, and customer vehicles, energy use, and area sources. Based on information from the Project Sponsor, it is assumed that the Project will be operational by 2025; therefore, the operational emissions analysis will assume emissions begin in year 2025. Operational emissions occurring beyond years 2025 would likely be lower due to reductions in vehicle emissions due to vehicle turn over and increasingly stringent regulatory requirements. Energy and area source CAP emissions from the Project will be calculated based on the size of the building and California Emissions Estimator Model (CalEEMod®) defaults.

2.2.1 Operational On-road Mobile Sources

On-road mobile sources include vehicle trips associated with customers, employees, and vendor deliveries. Vehicles on the roadway emit TACs in their exhaust and CAPs through exhaust, tire wear, and brake wear. In addition, gasoline vehicles emit CAPs and TACs through fuel evaporation. To estimate operational vehicle emissions from the Project, Ramboll will rely on Project-generated trip rates (weekday and weekend) and truck trip estimates from the Transportation Engineer and Project Sponsor, respectively. For customer and employee distances, Ramboll will rely on information provided by the Transportation Engineer. For vendor trip distances, Ramboll will use average travel distances provided by the Transportation Engineer based on vendor origin and destination provided by the Project Sponsor.

As mentioned above, ARB released a new version of its on-road emissions model (EMFAC2021) after the development of the latest version of CalEEMod®, so the latest on-road emissions model (EMFAC2021) will be used in this assessment. The emission factors used for operation of the Project will be provided from EMFAC2021 for operational year 2025.

Consistent with CalEEMod® methodology, Ramboll will assume that customer and employee trips are 50% Light-Duty Auto (LDA), 25% Light-Duty Truck 1 (LDT1) and 25% LDT2 vehicle classes. The Transportation Engineer will provide vehicle types for vendor trips, including refrigerated and non-refrigerated trucks, likely mapped to heavy-heavy duty trucks (HHDT) and medium-heavy duty trucks (MHDT).

Additionally, Ramboll will also calculate emissions from truck engines idling at loading docks during loading and unloading. Ramboll will assume that all trucks comply with the California state law[2] limiting truck idling to 5 minutes at any location. It will be conservatively assumed that each truck idles for 5 minutes at the start of loading and 5 minutes at the end of loading for a total of 10 minutes of idling per truck trip.

For HRA purposes, Ramboll will consider DPM, gasoline TOGs, and $PM_{2.5}$ emissions from vehicles during Project operation.

The methodology used to calculate emissions from on-road sources is presented in **Table 2**.

2.2.2 Transportation Refrigeration Units

TRUs are cooling units installed on trucks carrying perishable goods, such as food. TRU emissions will be calculated for this analysis to account for perishable goods delivery for the proposed Project. It is assumed that the TRU is a separate emissions source that will run to keep perishable goods cold regardless of whether the truck engine is running. It was assumed that all TRUs coming to the Project will be diesel-powered. Emissions during travel time and during unloading will be calculated using TRU trips per year, engine size and load factors from CARB's 2017 off-road inventory, average speed and miles traveled for trucks, and unloading time. The average speed traveled by trucks carrying TRUs was assumed to be 30 mph, based on the prima facie speed limits contained within Article 700 of the San Francisco Transportation Code, which states that the standard speed limit for business or residential districts in California is 30 miles per hour (mph). The trip length was assumed to be consistent with the truck deliveries estimated as part of the mobile emissions inventory. Unloading

[2] Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling, Title 13, California Code of Regulations (CCR), Section 2485. Additional information available at: https://ww2.arb.ca.gov/our-work/programs/atcm-to-limit-vehicle-idling

times will be provided by the Transportation Engineer by truck type, which will be used to calculate emissions occurring from TRUs while at loading docks. Additional details regarding these calculations are shown in **Table 2**.

2.2.3 Operational On-Site Generators

According to the Project Sponsor, no new generators will be installed or operated as part of the Project. Therefore, Ramboll will not analyze the effect of generators on air quality or health risks for this Project.

2.2.4 Architectural Coating

Operational architectural coatings account for the reapplication of paint and coatings on interior and exterior surfaces, which would result in emissions of volatile organic compounds (VOCs). Ramboll will use CalEEMod®, or equivalent methodology, as well as the CalEEMod® default values of architectural coatings per square footage to estimate emissions from architectural coatings. Total building square footage will be obtained by the Project Sponsor.

2.2.5 Consumer Products

Consumer product emissions come from various non-industrial solvents, including cleaning supplies, kitchen aerosols, cosmetics and toiletries, which emit VOCs during their use. Using the estimated building square footage for the Project, Ramboll will use CalEEMod® or equivalent methodology to estimate emissions from consumer products as well as the default CalEEMod® emission factor for San Francisco.

2.2.6 Energy Use

CAP emissions are generated from buildings as a result of activities for which electricity and natural gas are typically used as energy sources. Combustion of any type of fuel, including natural gas, emits CAPs directly into the atmosphere; these emissions are considered direct emissions associated with a building. CAPs are also emitted during the generation of electricity from fossil fuels; these emissions are considered to be indirect emissions and are not included in the CAP emissions analysis.

Natural gas emissions for the Project will be calculated using 2021 natural gas usage from a similar Bay Area Whole Foods grocery store, along with emission factors from CalEEMod®. CAP emissions will be calculated from natural gas use only and not from electricity use.

2.2.7 Landscaping Equipment

Based on the location of the Project within an existing shopping center and according to the Project Sponsor, there will be no landscaping activities as part of the Project. Thus, these are not included in the analysis.

3. ESTIMATED AIR CONCENTRATIONS

Consistent with the Citywide HRA, the air toxics analysis will evaluate health risks and $PM_{2.5}$ concentrations resulting from the Project upon the surrounding community. For the Project, this would include construction off-road equipment, construction vendor and worker truck trips, and operational traffic emissions, including emissions from trucks traveling to and from the site. The methodologies used to evaluate emissions from the Project are based on the most recent BAAQMD CEQA Guidelines (BAAQMD 2017), BAAQMD Health Risk Assessment Modeling Protocol (BAAQMD 2020) and the most recent Air Toxics Hot Spots Program Risk Assessment Guidelines (OEHHA 2015).

3.1 Chemical Selection

The cancer risk analysis in the HRA for the Project is based on DPM and gasoline TOG concentrations from operational traffic, including trucks. Diesel exhaust, a complex mixture that includes hundreds of individual constituents (California Environmental Protection Agency [Cal/EPA] 1998), is identified by the State of California as a known carcinogen (Cal/EPA 2016). Under California regulatory guidelines, DPM is used as a surrogate measure of exposure for the mixture of chemicals that make up diesel exhaust as a whole. Cal/EPA and other proponents of using the surrogate approach to quantifying cancer risks associated with the diesel mixture indicate that this method is preferable to use of a component-based approach. A component-based approach involves estimating risks for each of the individual components of a mixture. Critics of the component-based approach believe it will underestimate the risks associated with diesel as a whole mixture because the identity of all chemicals in the mixture may not be known and/or exposure and health effects information for all chemicals identified within the mixture may not be available. Furthermore, Cal/EPA has concluded that "potential cancer risk from inhalation exposure to whole diesel exhaust will outweigh the multi-pathway cancer risk from the speciated components" (OEHHA 2003).

The cancer risk analysis for the Project will also include speciated TACs from gasoline-fueled mobile sources. For gasoline vehicles, exhaust and evaporative TOGs from gasoline-fueled vehicles would be evaluated based on the organic chemical profiles from ARB (CARB 2021).

3.2 Sources

As discussed in the sections above, the HRA will include Project construction and operational sources, including construction off-road equipment and construction traffic, as well as operational traffic and truck trips, including emissions from TRUs.

3.3 AERMOD Modeling

Ramboll will use the most recent version of the American Meteorological Society/Environmental Protection Agency regulatory air dispersion model (AERMOD Version 21112) to evaluate ambient air concentrations of TACs and $PM_{2.5}$ at receptors (USEPA 2021). For each receptor location, the model generates air concentrations (or air dispersion factors as unit emissions will be modeled) that result from emissions from multiple sources.

Air dispersion models such as AERMOD require a variety of inputs such as source parameters, meteorological data, topographical data, and receptor parameters. When site-specific information is unknown, Ramboll will use default parameter sets that are designed to produce conservative (i.e., overestimates of) air concentrations (USEPA 2021).

3.3.1 Meteorological Data

Air dispersion modeling applications require the use of meteorological data that ideally are spatially and temporally representative of conditions in the immediate vicinity of the site under consideration. For this HRA, BAAQMD's Mission Bay meteorological data for the year 2008 will be used, which aligns with the San Francisco Citywide HRA Methodology (San Francisco Department of Public Health [SF DPH], SF Planning, and Ramboll 2020).

3.3.2 Terrain and Land Use Considerations

Elevation for all emissions sources will be imported from the National Elevation Dataset maintained by the United States Geological Survey ([USGS] 2013). Elevations for all receptors will be consistent with the Citywide HRA modeling.

An important consideration in an air dispersion modeling analysis is whether or not to model an area as urban. Due to the urban nature of San Francisco, the Project will be modeled with the urban population of 873,965, corresponding to the July 1, 2019 US Census population estimate (US Census Bureau 2020). The urban option in AERMOD accounts for increased turbulence associated with the urban heat island effect.

3.3.3 Emission Rates

Emissions will be modeled using the χ/Q ("chi over q") method, such that each source has a unit emission rate (i.e., 1 gram per second [g/s]), and the model estimates dispersion factors (with units of [µg/m^3]/[g/s]). Actual emission rates will be multiplied by the dispersion factors to obtain concentrations.

For annual average ambient air concentrations, the estimated annual average dispersion factors are multiplied by the annual average emission rates. The emission rates will vary day to day (e.g., weekday vs. weekend traffic), with some days having no emissions. The model will assume a constant emission rate during the entire year.

3.3.4 Source Parameters

Source location and parameters are necessary to model the dispersion of air emissions. Source parameters for the Project are summarized in **Table 3**.

For construction off-road equipment emissions, an area source will be used to represent the on-site activity in AERMOD. The on-site construction area source will be modeled with a release height of 5 meters (SCAQMD 2008) and an initial vertical dimension of 1.4 meters (BAAQMD, SF DPH, and SF EP 2012). Construction on-road activity will be modeled (consistent with the Citywide HRA methodology for operational on-road activity) in AERMOD as adjacent volume sources, with the number of sources dependent on the length and width of the roadway segment. For AERMOD modeling, the release height of volume sources for on-road light duty vehicles will be set to 1.7 meters, and the initial vertical dimension will be set to 1.6 meters (SF DPH, SF Planning, and Ramboll 2020). For on-road trucks, the release height of volume sources will be set to 2.6 meters and the initial vertical dimension will be set to 2.4 meters, consistent with USEPA haul road guidance (USEPA 2012). Initial lateral dimensions will be calculated for each segment based on the width of the modeled roadway plus a six-meter mixing zone, all divided by a factor of 2.15 consistent with the USEPA AERMOD User's Guide.

For operational emissions, Ramboll will model mobile sources on roadways and at loading docks. Similar to on-road construction emissions, on-road operational emissions will be modeled (consistent with the Citywide HRA methodology) in AERMOD as adjacent volume sources, with the number of sources dependent on the length and width of the roadway segment. For AERMOD modeling, the release height of volume sources for on-road light duty vehicles will be set to 1.7 meters, and the initial vertical dimension will be set to 1.6 meters, consistent with Citywide HRA methodology (SF DPH, SF Planning, and Ramboll 2020). For on-road trucks, the release height of volume sources will be set to 2.6 meters and the initial vertical dimension will be set to 2.4 meters, consistent with USEPA haul road guidance (USEPA 2012). Initial lateral dimensions will be calculated for each segment based on the width of the modeled roadway plus a six-meter mixing zone, all divided by a factor of 2.15 consistent with the USEPA AERMOD User's Guide.

At loading docks, TRU operations will be modeled as a single volume source. The TRU operation volume source will be modeled using a release height consistent with BAAQMD truck release height (5 meters). The other modeling parameters will be estimated using methodology consistent with USEPA AERMOD guidance for volume sources, as shown in Table 3.

3.3.5 Receptors

In order to evaluate health impacts to receptors, receptors will be placed at locations collocated with the receptors used in the Citywide HRA and within 1,000 meters of the Project and modeled traffic sources. Receptors will be modeled at a height of 1.5 meters above terrain height, a default breathing height for ground-floor receptors (BAAQMD 2020).[3] As discussed previously, annual dispersion factors will be estimated for each receptor location.

For the existing daycare located on the floor above the Project, Ramboll will use a receptors height equivalent to the height of the fourth and fifth floors of the building where the Project is located.

[3] Updated BAAQMD Health Risk Assessment Modeling Protocol Guidance (2020) recommends a default breathing height for ground-floor receptors of 1.5 meters. The previous recommendation of 1.8 meters was used in the Citywide HRA.

4. RISK CHARACTERIZATION METHODS

In February 2015, OEHHA released the updated Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments (OEHHA 2015), which combines information from previously-released and adopted technical support documents to delineate OEHHA's revised risk assessment methodologies based on current science. This updated Guidance Manual supersedes the 2003 Hot Spots Guidance Manual (OEHHA 2003) that previously provided methodologies for conducting HRAs under the Air Toxics Hot Spots Program (AB2588). The BAAQMD has issued Guidelines on adopting the OEHHA 2015 Guidance Manual as well as additional guidance published in December 2020 (BAAQMD 2020). This evaluation will utilize the 2015 OEHHA methodology following BAAQMD guidance; details of this methodology are discussed below.

Ramboll will estimate Project health risk impacts from the Project assuming operations begin in 2025.

4.1 Project Sources Evaluated

Ramboll will evaluate excess lifetime cancer risk and $PM_{2.5}$ concentration for nearby sensitive receptor exposure to emissions from construction and operation of the Project. Ramboll will estimate Project health risk impacts from Project construction assuming construction begins in 2024 and at least partial operations beginning in 2025.

The health risks will account for project construction and operational traffic and truck activity. The HRA will be calculated using the methodology explained in the following sections.

4.1.1 Exposure Assessment

Ramboll will conservatively model all existing Citywide HRA grid (20-meter spacing) receptors within 1 kilometer of the Project (including any roadways with Project-generated traffic volumes in excess of 1,000 vehicles per day). Consistent with the Citywide HRA, all sensitive receptors will be analyzed as residents, with the exception of the daycare co-located with the Project, which will be modeled as a daycare.

Potentially Exposed Populations: This analysis will evaluate health risks to residents based on OEHHA 2015 Hot Spots Guidelines.

For assessing impacts to exposed populations from emissions resulting from the Project on-road vehicle emissions, sensitive receptors will be evaluated as a fetus *in utero* at the beginning of the third trimester until age 30 for operational exposures.

Exposure Assumptions: The exposure parameters used to estimate excess lifetime cancer risks for all potentially exposed populations from operational emissions will be obtained using risk assessment guidelines from OEHHA (2015) and BAAQMD (2016, 2020). **Tables 4 and 5** show the proposed exposure duration, age sensitivity factor, and resulting exposure parameters that will be used for the HRA.

Calculation of Intake: The dose estimated for each exposure pathway is a function of the concentration of a chemical and the intake of that chemical. The intake factor for inhalation, IF_{inh}, can be calculated as follows:

$$IF_{inh} = \frac{DBR * FAH * EF * ED * CF}{AT}$$

Where:

IF_{inh}	=	Intake Factor for Inhalation (m^3/kg-day)
DBR	=	Daily Breathing Rate (L/kg-day)
FAH	=	Frequency of Time at Home (unitless)
EF	=	Exposure Frequency (days/year)
ED	=	Exposure Duration (years)
AT	=	Averaging Time (days)
CF	=	Conversion Factor, 0.001 (m^3/L)

The chemical intake or dose is estimated by multiplying the inhalation intake factor, IF_{inh}, by the chemical concentration in air, C_i. When coupled with the chemical concentration, this calculation is mathematically equivalent to the dose algorithm given in the current OEHHA Hot Spots guidance (OEHHA 2015).

4.1.2 Toxicity Assessment

The toxicity assessment characterizes the relationship between the magnitude of exposure and the nature and magnitude of adverse health effects that may result from such exposure. For purposes of calculating exposure criteria to be used in risk assessments, adverse health effects are classified into two broad categories – cancer and non-cancer endpoints. Toxicity values that are used to estimate the likelihood of adverse effects occurring in humans at different exposure levels are identified as part of the toxicity assessment component of a risk assessment.

Following the Citywide HRA methodology for cancer risk calculations, Ramboll will include the carcinogenic toxicity for DPM from on-road vehicles and additional organic gases from on-road gasoline-powered vehicles. Chronic hazard quotient (HQs) calculations for Project operation will utilize toxicity values for chemicals emitted from these same sources.

This analysis utilizes available toxicity values including inhalation cancer potency factors (CPFs) and chronic inhalation reference exposure levels (RELs). Ramboll will utilize the Cal/EPA-approved (Cal/EPA 2017) inhalation cancer potency factor for DPM and chronic inhalation RELs. The CPF for DPM that will be used for the HRA is 1.1 $(mg/kg\text{-}day)^{-1}$. Toxicity values are summarized in **Table 5**.

4.1.3 Age Sensitivity Factors

The estimated excess lifetime cancer risks for a resident will be adjusted using age sensitivity factors (ASFs) that account for an "anticipated special sensitivity to carcinogens" of infants and children as recommended in the OEHHA Technical Support Document (OEHHA 2009) and OEHHA 2015 Guidance (2015). Cancer risk estimates will be weighted by a factor of 10 for exposures that occur from the third trimester of pregnancy to two years of age and by a factor of three for exposures that occur from two years through 15 years of age. No weighting factor (i.e., an ASF of one, which is equivalent to no adjustment) is applied to ages 16 and older. **Table 6** presents the ASF values that will be used for the HRA.

4.2 Risk Characterization

4.2.1 Estimation of Cancer Risks

Excess lifetime cancer risks are estimated as the upper-bound incremental probability that an individual will develop cancer over a lifetime as a direct result of exposure to potential carcinogens. The estimated risk is expressed as a unitless probability. The cancer risk attributed to a chemical is calculated by multiplying the chemical intake or dose at the human exchange boundaries (e.g., lungs) by the chemical specific CPF.

The equation used to calculate the potential excess lifetime cancer risk for the inhalation pathway is as follows:

$$Risk_{inh} = C_i \times CF \times IF_{inh} \times CPF \times ASF$$

Where:

$Risk_{inh}$	=	Cancer risk; the incremental probability of an individual developing cancer as a result of inhalation exposure to a particular potential carcinogen (unitless)
C_i	=	Annual average air concentration for $chemical_i$ ($\mu g/m^3$)
CF	=	Conversion factor (mg/µg)
IF_{inh}	=	Intake factor for inhalation (m^3/kg-day)
CPF_i	=	Cancer potency factor for $chemical_i$ $(mg\ chemical/kg\ body\ weight\text{-}day)^{-1}$
ASF	=	Age sensitivity factor (unitless)

4.2.2 Estimation of Project Health Risks

Results for cancer risk, chronic Hazard Index (HI), and $PM_{2.5}$ concentrations will be presented for the MEIR, which are the locations where the maximum health impacts are estimated to occur. For cancer risk, which is calculated as a 30-year lifetime risk, Ramboll will add together the risks calculated for construction and the risks calculated for 30 years of operations prior to determining the MEIR. This is a conservative assumption that will result in a slight overestimate of results as it is a marginally longer duration than 30 years (10 months of construction + 30 years of operations).

4.2.3 Estimation of Existing Plus Project Health Risks

Ramboll will conduct an existing plus project HRA of cancer risk and $PM_{2.5}$ concentrations at on- and off-site receptors resulting from other sources of stationary, area, and mobile emissions as calculated in the Citywide HRA in addition to health impacts from Project operations. We will use the Citywide HRA database to determine the existing cancer risk and $PM_{2.5}$ concentrations at on- and off-site sensitive receptors within 1-kilometer of the Project and will add Project operational impacts to determine the existing plus project impact. The Citywide HRA does not report Chronic HI, therefore, Existing Plus Project results will not be calculated for Chronic HI.

5. CUMULATIVE ANALYSIS

Ramboll will evaluate the cumulative health risk impact resulting from reasonably foreseeable projects within a half mile of the MEIR that emit TACs from construction or operations (e.g., new stationary sources proposed as part of a cumulative project). Ramboll reviewed nearby reasonably foreseeable projects to determine if any would potentially impact the MEIR for the Project. Based on Ramboll's discussion with SFEP, the following nearby projects will be considered in this analysis:

1. 1846 Grove Street;
2. 1735-1751 Fulton Street;
3. 2800 Geary Boulevard;
4. 3641 Geary Boulevard;
5. 3333 California Street;
6. 2750 Geary Boulevard;
7. 3657 Sacramento Street;
8. 2670 Geary Boulevard;
9. 709 Lyon Street;
10. 1355 Fulton Street; and
11. 3330 Geary Boulevard
12. Geary Bus Rapid Transit (BRT) Project.

Ramboll previously conducted a health risk assessment for 3333 California Street and will determine risks at the Project MEIR from this previous modeling effort. If health risk information is available for any of the remaining projects, Ramboll will include risks from those at the Project site in this analysis. For those without health risk information, Ramboll proposes to qualitatively discuss potential health impacts from construction and operation of these projects.

6. SUMMARY RESULTS MEMORANDUM AND OTHER DELIVERABLES

Ramboll will complete preliminary analysis of the CAP and health risks from Project construction and operations and present that information to SFEP. Ramboll will meet with SFEP and ESA to determine if revisions to the modeling or control scenarios need to be applied. Ramboll will then prepare a Results Report, which will consist of the following:

- Documentation of any deviations or revisions from the approved CEQA Air Quality and Health Risk Assessment Methodology and reasons for those deviations;
- CAP and HRA results for the Project (and any controlled scenarios, if applicable). This section will include listing the controlled strategies modeled and the methodology for modeling the effectiveness of the strategies;
- Additional figures showing citywide changes in health risks due to the Project; and
- Uncertainties associated with the analysis.

In addition to the Results Report for the Project, Ramboll will submit health risk databases to SFEP. The databases will mirror the 2020 Citywide HRA and provide updated project and total cancer risk and $PM_{2.5}$ concentration at each receptor location. Figures may show incremental differences in health risks as compared to the existing 2020 health risk conditions, or other figures to be later determined by SFEP. Some figures may be included in the results memorandum only and others may be presented in the EIR. Ramboll will meet with SFEP and ESA to determine the figures to be presented in the Final Results Memorandum and in the EIR.

7. REFERENCES

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TABLES

Table 1
Land Use Description
Whole Foods Market - 2675 Geary Boulevard
San Francisco, California

Land Use Type[1]	Amount[2]	Units
Retail - Supermarket (Total)	49.825	1000 sqft
Landlord Retained Area (not part of Project)	4.46	1000 sqft
Total Area	54.285	1000 sqft

Notes

[1] For calculating architectural coating and consumer products emissions (which rely on land use area), total area of 54,285 square feet was used as a conservative estimate. Retail - Supermarket was used for land use type.

[2] Square footages were provided by the Project Sponsor.

Abbreviations

sqft - square feet

Table 2
Emissions Calculation Methodology
Whole Foods Market - 2675 Geary Boulevard
San Francisco, California

Type	Source	Methodology and Formula	Reference
Construction Equipment	Off-Road Equipment[1]	$Ec = \Sigma(EFc * HP * LF * Hr * C)$	OFFROAD2011 and ARB/USEPA Engine Standards
Construction On-Road Mobile Sources[2]	Exhaust – Running	$E_R = \Sigma(EF_R * VMT * C)$, where VMT = Trip Length * Trip Number	EMFAC2021
	Exhaust - Idling	$E_I = \Sigma(EF_I * Trip\ Number * T_I * C)$	EMFAC2021
Operational On-Road Mobile Sources[2]	Exhaust - Running	$E_R = \Sigma(EF_R * VMT * C)$, where VMT = Trip Length * Trip Number	EMFAC2021
	Brake Wear and Tire Wear	$E_{BW,TW} = \Sigma(EF_{BW,TW} * VMT * C)$, where VMT = Roadway Link Length * Vehicle Counts	EMFAC2021
	Exhaust - Idling	$E_I = \Sigma(EF_I * Trip\ Number * T_I * C)$	EMFAC2021
	Exhaust - Running Losses	$E_R = \Sigma(EF_{RL} * VMT * C)$, where VMT = Trip Length * Trip Number	EMFAC2021
Other Operational Sources	Transportation Refrigeration Units	$Ec = \Sigma(Trip\ Number\ Per\ Event * Number\ of\ Events * HP * LF * T_I * VMT * Truck\ Average\ Speed * C)$	CARB 2021
	Area, Energy	CalEEMod®	CalEEMod®

Notes:

1. E_c: off-road equipment exhaust emissions (lb)
   EF_c: emission factor (g/hp-hr). CalEEMod 2020.4.0 default emission factors used
   HP: equipment horsepower from CalEEMod default or Project Sponsor
   LF: equipment load factor. OFFROAD2011
   Hr: equipment hours
   C: unit conversion factor

2. On-road mobile sources include truck and passenger vehicle trips. Emissions associated with mobile sources were calculated using the following formulas.
   E_R: running exhaust and running losses emissions (lb)
   EF_R: running emission factor (g/mile). From EMFAC2021
   VMT: vehicle miles traveled
   C: unit conversion factor
   The calculation involves the following assumptions:
   a. Truck types will be provided by Transportation Engineer, including a breakdown of refrigerated and non-refrigerated trucks.
   b. Trip Length: The one-way trip length as calculated based on estimated truck route from the Project Sponsor based on vendor
   c. Trip Number will be provided by the Transportation Engineer.
   E_I: vehicle idling emissions (lb).
   EF_I: vehicle idling emission factor (g/hr-trip). From EMFAC2021
   T_I: idling time
   C: unit conversion factor

Abbreviations:

ARB: California Air Resources Board
BW: Brake Wear
EF: Emission Factor
EMFAC: EMission FACtor Model
g: gram
HP: horsepower
lb: pound
LF: Load Factor
mi: mile
USEPA: United States Environmental Protection Agency
RL: Running Losses
VMT: vehicle miles traveled
TW: Tire Wear

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Table 3
Modeling Parameters
Whole Foods Market - 2675 Geary Boulevard
San Francisco, California

Construction Sources

Source	Source Type	Number of Sources	Source Dimension [m]	Release Height[3] [m]	Initial Vertical Dimension [m]	Initial Lateral Dimension [m]
Construction Equipment[1]	Area	1	Approximate Equipment Area	5.0	1.4	--
On-Road Light Duty Vehicles (Worker Trips)[2,3]	Volume	Variable	Variable	1.70	1.58	Variable
On-Road Trucks[2,3]	Volume	Variable	Variable	2.55	2.37	Variable

Operational Sources

Source	Source Type	Number of Sources	Source Dimension [m]	Release Height [m]	Initial Vertical Dimension [m]	Initial Lateral Dimension [m]
On-Road Light Duty Vehicles[2,3]	Volume	Variable	Variable	1.70	1.58	Variable
On-Road Trucks[2,3]	Volume	Variable	Variable	2.55	2.37	Variable
Transportation Refrigeration Units[4]	Volume	2	--	3.96	0.92	1.18

Notes:

1. Construction off-road equipment will be modeled as an area source covering the small area occupied by the crane, since the crane is the only piece of off-road equipment to be used for the Project. This information was provided by the Project Sponsor. According to the 2012 San Francisco Community HRA methodology, initial vertical dimension of the modeled construction equipment area sources will be set to 1.4 meters and the release height will be set to 5 meters consistent with SCAQMD LST methods.
2. The number of on-road sources is based on the geometry of the truck or traffic routes.
3. On-road truck and car initial vertical dimension were based on previous Citywide HRA modeling and USEPA haul road guidance.
4. Operational TRUs are modeled as a single volume source at each of the two loading docks. A release height of 3.96 meters was chosen according to the 2010 CAPCOA HRA & Land Use Workshop guidance. Based on USEPA's AERMOD guidance, initial lateral and vertical dimensions were determined by dividing the side length by 4.3.

Abbreviations:

AERMOD - Atmospheric Dispersion MODeling
ARB - California Air Resources Board
BAAQMD - Bay Area Air Quality Management District
CEQA - California Environmental Quality Act
CRRP - Community Risk Reduction Plan
HRA - Health risk assessment
m - meter
m - meter
USEPA - United States Environmental Protection Agency

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Table 4
Exposure Parameters
Whole Foods Market - 2675 Geary Boulevard
San Francisco, California

Construction

Population	Receptor Age Group	Exposure Parameters					
		Daily Breathing Rate (DBR)[1] [L/kg-day]	Exposure Duration (ED) [years]	Fraction of Time at Home (FAH)[2] [unitless]	Exposure Frequency (EF)[3] [days/year]	Averaging Time (AT) [days]	Intake Factor, Inhalation (IF_{inh}) [m^3/kg-day]
Residents[4]	Age 0-<2 Years	1,090	0.8	1.0	350	25,550	0.012
Daycare Children[5]	Age Six Weeks-<2 Years	1,090	0.8	--	350	25,550	0.012

Operations

Population	Receptor Age Group	Exposure Parameters					
		Daily Breathing Rate (DBR)[1] [L/kg-day]	Exposure Duration (ED) [years]	Fraction of Time at Home (FAH)[2] [unitless]	Exposure Frequency (EF)[3] [days/year]	Averaging Time (AT) [days]	Intake Factor, Inhalation (IF_{inh}) [m^3/kg-day]
Residents[4]	3rd Trimester	361	0.25	1.0	350	25,550	0.0012
	Age 0-<2 Years	1,090	2.0	1.0	350	25,550	0.030
	Age 2-<16 Years	572	14	1.0	350	25,550	0.11
	Age 16-30 Years	261	14	0.73	350	25,550	0.037
Daycare Children[5]	Age Six Weeks-<2 Years	1,090	1.9	--	350	25,550	0.028
	Age 2-<9 Years	631	4.0	--	350	25,550	0.035

Notes:

1. Daily breathing rates reflect default breathing rates from OEHHA 2015 and BAAQMD 2016 as follows: 95th percentile 24-hour daily breathing rate for 3rd trimester and age 0-<2 years; 80th percentile for ages 2 years and older (per BAAQMD 2016 and 2020 Health Risk Assessment (HRA) Modeling Guidelines).
2. Fraction of time spent at home is conservatively assumed to be 1 (i.e., 24 hours/day) for age groups from the third trimester to less than 16 years old based on the recommendation from BAAQMD (BAAQMD 2016 and 2020) and OEHHA (OEHHA 2015). The fraction of time at home for adults age 16-30 reflects default OEHHA guidance (OEHHA 2015) as recommended by BAAQMD (2016 and 2020).
3. Exposure frequency reflects default residential exposure frequency from OEHHA 2015.
4. All receptorss are assumed to be exposed to construction risks for the duration of construction, which is 10 months. All receptors are assumed to be exposed to operational risks for 30 years beginning in 2025 at the start of operation.
5. Daycare children are modeled using parameters consistent with OEHHA 2015 guidance for resident children, which conservatively assumes 24 hours/day exposure.

Calculation:

IF_{inh} = DBR * FAH * EF * ED * CF / AT

CF = 0.001 (m^3/L)

Abbreviations:

AT - averaging time
BAAQMD - Bay Area Air Quality Management District
DBR - daily breathing rate
ED - exposure duration
EF - exposure frequency
FAH - fraction of time at home
IF_{inh} - intake factor
kg - kilogram
L - liter
m^3 - cubic meter
OEHHA - Office of Environmental Health Hazard Assessment

References:

BAAQMD. 2016. Air Toxics NSR Program Health Risk Assessment (HRA) Guidelines. January.
BAAQMD. 2020. Health Risk Assessment (HRA) Modeling Protocol. December.
OEHHA. 2015. Air Toxics Hot Spots Program Risk Assessment Guidelines. Guidance Manual for Preparation of Health Risk Assessments. February.

Table 5
Toxicity Values
Whole Foods Market - 2675 Geary Boulevard
San Francisco, California

Fuel[1]	Source	Chemical	CAS Number	Cancer Potency Factor [mg/kg-day]$^{-1}$	Chronic REL (µg/m^3)	Weight Fraction[2]
Diesel	PM_{10}	Diesel PM	9-90-1	1.1	5	1
Gasoline	TOG	1,3-Butadiene	106-99-0	0.6	2	0.0055
		Acetaldehyde	75-07-0	0.01	140	0.0028
		Acrolein	107-02-8	-	0.35	0.0013
		Benzene[3]	71-43-2	0.1	3	0.0036
						0.025
		Ethylbenzene[3]	100-41-4	0.0087	2000	0.0012
						0.011
		Formaldehyde	50-00-0	0.021	9	0.016
		Hexane[3]	110543	-	7000	0.015
						0.016
		Methanol	67-56-1	-	4000	0.0012
		Naphthalene	91-20-3	0.12	9	0.0005
		Propylene	115-07-1	-	3000	0.031
		Styrene	100-42-5	-	900	0.0012
		Toluene[3]	108-88-3	-	420	0.017
						0.058
		Xylenes[3]	1330-20-7	-	700	0.0058
						0.048

Notes:

1. For the health risk analysis, health effects will be evaluated for emissions from off-road equipment, vehicles, and transportation refrigeration units (TRUs), which are assumed to be diesel and gasoline-fueled.
2. Speciation fractions shown are for gasoline-fueled vehicles.
3. Benzene, ethylbenzene, hexane, toluene, and xylenes are produced from catalytic exhaust and evaporative losses from gasoline engines. For each of these chemicals, the evaporative loss weight fraction is shown before the exhaust weight fraction in this table.

Abbreviations:

ARB - Air Resources Board
Cal/EPA - California Environmental Protection Agency
CAS - chemical abstract services
mg/kg-day - milligrams per kilogram per day
OEHHA - Office of Environmental Health Hazard Assessment
PM - particulate matter
REL - reference exposure level
TOG - Total Organic Gas

Reference:

Cal/EPA. 2020. OEHHA/ARB Consolidated Table of Approved Risk Assessment Health Values. October. Available at: https://ww2.arb.ca.gov/sites/default/files/classic//toxics/healthval/contable.pdf.

Table 6
Age Sensitivity Factors
Whole Foods Market - 2675 Geary Boulevard
San Francisco, California

Receptor Age Group	Value[1]
3rd Trimester	10
Age 0-<2 Years	10
Age 2-<9 Years	3
Age 2-<16 Years	3
Age >16 Years	1

Note:

1. Based on OEHHA 2015. Age sensitivity factors are unitless.

Abbreviation:

OEHHA - Office of Environmental Health Hazard Assessment

Source:

OEHHA. 2015. Air Toxics Hot Spots Program Risk Assessment Guidelines. Guidance Manual for Preparation of Health Risk Assessments. Februarv.

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ENVIRONMENT
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MEMO

Date	**September 12, 2022**
To	**San Francisco Planning Department** **San Francisco, California**
From	**Michael Keinath** **Megan Sutter**
Subject	**2675 Geary Boulevard Project Update Air Quality and Health Risk Assessment Results**

1 Introduction

Ramboll US Consulting, Inc. (Ramboll) at the request of Environmental Science Associates (ESA) conducted a California Environmental Quality Act (CEQA) air quality analysis and health risk assessment for the proposed Whole Foods Market to be located at 2675 Geary Blvd in San Francisco, California (the "Project"). The Project would consist of an approximately 50,000 square foot supermarket in an existing retail complex.

Details on the methodology and assumptions are described in the "CEQA Air Quality and Health Risk Assessment Methodology" (Ramboll, February 2022, referred to hereafter as "Methodology Report"). This technical memorandum presents a brief summary of the methodology, noting any details not included in or deviating from the Methodology Report, and provides the results for air quality and health impact analysis from construction and operation of the proposed Project. This analysis has been performed to support the CEQA documentation at the request of the San Francisco Planning Department. The Project boundary and modeling extent are shown in **Figure 1**. The locations of residential and mix-use parcels surrounding the Project site are presented in **Figure 2**.

2 Methodology

The purpose of this air quality analysis is to assess potential health risks and hazards that would result from the construction and operation of the proposed Project. Potential health risks and hazards are analyzed consistent with the guidelines and methodologies from air quality agencies, specifically: Bay Area Air Quality Management District (BAAQMD), California Air Resources Board (CARB), California Office of Environmental Health Hazard Assessment (OEHHA), and USEPA.

The steps conducted in performing this air quality analysis are as follows:

1. Quantify criteria air pollutant (CAP) and toxic air contaminant (TAC) emissions from Project construction and operation.
2. Perform air dispersion modeling for pollutant concentrations for area and roadway sources of TAC emissions.

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3. Calculate resulting cancer risk and fine particulate matter ($PM_{2.5}$) concentrations resulting from construction and operational sources of TACs.

2.1 Methodology for Construction Impacts

The Methodology Report describes the methods used to estimate CAP emissions, TAC emissions, and the associated health risks from Project construction. According to the Methodology Report, CAP emissions were calculated for the one required piece of off-road diesel construction equipment and construction on-road mobile sources, *i.e.*, vendor trips and worker trips. To estimate TAC concentrations from construction sources, an area source on the Project site was used to represent the on-site construction activity (off-road equipment), and volume sources on roadways were used to represent the on-road vehicle activity. Cancer risks, chronic hazards index (HI), and $PM_{2.5}$ concentrations were then evaluated for off-site sensitive receptors in accordance with the updated Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments (OEHHA 2015) and additional guidance from the BAAQMD.[1]

The results presented in this memorandum used the same methods described in the Methodology Report, except for the following assumptions:

- Construction worker trips were included in the emissions and health risks estimates. The Project-generated construction worker trips were provided by the Project Sponsor.[2] Identical to the employee trip assumption for Project operation, Ramboll assumed the worker trips all use gasoline vehicles and used the same methodology and assumptions to estimate health risks contributions from the operational customer and employee trips.

2.2 Methodology for Operational Impacts

The Methodology Report describes the methods used to estimate CAP emissions, TAC emissions, and the associated health risks from Project operation. According to the Methodology Report, CAP emissions were calculated for on-road mobile sources, transportation refrigeration units (TRUs), truck idling activity, architectural coating, consumer products, and energy use. For dispersion modeling of TACs, on-road mobile sources were modeled as adjacent volume sources on nearby roadways based on routes provided by the transportation engineer[3], and TRU and idling emissions were modeled as on-site volume sources at loading dock locations. Other modeling and health risks calculation parameters are described in detail in the Methodology Report.

The results presented in this memorandum used the same methods described in the Methodology Report, except for the following assumptions:

- The methodology for estimating on-road fugitive dust emissions was not described in the Methodology Report. CalEEMod® default methods and parameters were used to calculate the annual average emission factors for fugitive PM_{10} and $PM_{2.5}$ emissions from on-road trucks and passenger vehicles. The weighted average San Francisco-specific silt loading factor was calculated based on travel fraction by roadway category and silt loading parameters, obtained from the CARB's

[1] BAAQMD. 2016. Proposed Health Risk Assessment Guidelines. Air Toxics NSR Program. January. Available online at: https://www.baaqmd.gov/~/media/files/planning-and-research/permit-modeling/hra_guidelines_12_7_2016_clean-pdf.pdf?la=en.
BAAQMD. 2020. Health Risk Assessment Modeling Protocol. December. Available online at: https://www.baaqmd.gov/~/media/files/ab617-community-health/facility-risk-reduction/documents/baaqmd_hra_modeling_protocol-pdf.pdf?la=en.

[2] Sheppard Mullin, 2022. Email communication titled "FW: Whole Foods at 2675 Blvd: EIR Check-in Meeting" from Jennifer Renk at Sheppard Mullin to Elliott Schwimmer at ESA Associates. January 10.

[3] Kittelson, 2022. Email communication titled "RE: 2675 Geary – AQ model inputs" between Mike Alston at Kittleson and Megan Klevze Sutter at Ramboll. January 3 and January 4.

Entrained Road Travel Emission Inventory Source Methodology document. The average silt loading factor was then used to calculate fugitive PM_{10} and $PM_{2.5}$ emission factors. Details of the calculation are summarized in **Table 8**.

- The land use parameter in the American Meteorological Society/Environmental Protection Agency regulatory air dispersion model (AERMOD) for dispersion modelling was 881,549 for urban population of San Francisco, where the project is located, in contrast to 873,965 described in the Methodology Report.

  The methodology for estimating emissions from TRUs has been updated since the Methodology Report as a result of the CARB adopting new regulatory requirements for TRUs in February 2022.[4] These regulations will require truck-based TRUs to turn over their fleet to meet a 100% zero-emission limit by end of 2029 and trailer-based TRUs to meet the Tier 4 final off-road emissions limit starting with model year 2023. These regulatory requirements are incorporated into CARB's web-based EMFAC tool, which was used to estimate $PM_{2.5}$ emissions per hour of both truck- and trailer-based TRUs for each operational year. For the refrigerated truck analysis, medium heavy-duty trucks (MHDT) were assumed to have truck-based TRUs and heavy heavy-duty trucks (HHDT) were assumed to have trailer-based TRUs.

- To evaluate impacts of TRUs while at the loading dock, operational TRUs are modeled as a single volume source at each of the two loading docks. A release height of 3.96 meters was chosen according to the 2010 CAPCOA HRA & Land Use Workshop guidance. Based on USEPA's AERMOD guidance, initial lateral and vertical dimensions were determined by dividing the side length by 4.3. These source parameters are different from what was described in the Methodology Report.

- Residential receptors are assumed to be exposed to the Project's construction and operational emissions for 30 years starting from the third trimester of pregnancy. Daycare receptors are assumed to be exposed to Project's construction and operational emissions for 5 years starting from infancy (age group 0-2 years).

3 Results from Project Analysis

3.1 Construction CAP Emissions

A summary of annual average daily construction CAP emissions is shown in **Table 1**. Additional details on construction sources that contribute to CAP emissions are summarized in **Tables 2-4**. Because construction is expected to occur for less than a year,[5] the total construction emissions were averaged over the number of days construction would occur to obtain average daily construction emissions.

3.1.1 CAP Emissions from On-Site Construction Equipment

According to the Project Sponsor, the only diesel-powered off-road construction equipment that will be used on-site is a crane for lifting HVAC equipment onto the roof. Equipment activity is shown in **Table 2** and was used to calculate CAP emissions. All other parameters are based on CalEEMod® default values confirmed by the Project Sponsor.

[4] CARB. 2022. 2022 Amendments to the Airborne Toxic Control Measure for In-Use Diesel-Fueled Transport Refrigeration Units (TRU) and TRU Generator Sets, and Facilities Where TRUs Operate. Available at: https://ww2.arb.ca.gov/resources/fact-sheets/2022-amendments-tru-atcm. March 17.

[5] According to the Project Sponsor, project construction would start as early as October 2024 and last for ten months.

3.1.2 CAP Emissions from On-Road Construction Vehicles

The total one-way trips from vendor trucks and construction workers generated during Project construction are provided by Whole Foods and are summarized in **Table 3**.[6] Construction activities would include: demolishing interior walls, flooring, and some areas of the ceiling; expanding the rooftop mechanical penthouse and installing rooftop HVAC equipment including rooftop penetrations for venting and to connect the HVAC equipment to ducts; and constructing new interior walls and partitions for restrooms and back-of-house space (employee office, lounge, and locker rooms). Other activities would include reconfiguring the space and installing furniture and equipment to support the grocery store as well as replacing the two dock levelers. As described in the Methodology Report, Ramboll used CalEEMod® default trip lengths for San Francisco County to calculate the total vehicle miles travelled (VMT). Fleet mix and fuel assumptions are also summarized in **Table 3**.

3.1.3 CAP Emissions from Architectural Coating

Emissions from architectural coating during Project construction were estimated using methodologies described in the Methodology Report and are summarized in **Table 4**. No paving would occur during Project construction since a parking lot exists at the site. Architectural coating emissions were based on the square footage of the total Project area (including the landlord retained area, which is not part of the proposed project) and CalEEMod® default emission factor. Because the architectural coating estimates are based on a larger floor area than Whole Foods would occupy, these results are considered conservative, or worst-case (i.e., the analysis is based on 54,290 square feet, while Whole Foods would occupy a smaller space at about 49,285 square feet).

3.2 Operational CAP Emissions

A summary of annual and daily average operational CAP emissions is shown in **Table 5**. Additional details on operational sources that would contribute to CAP emissions are summarized in **Tables 6-10**.

3.2.1 CAP Emissions from On-Road Vehicles

Mobile emissions were calculated using Project-specific trip generation and VMT by vehicle type and emission factors from EMFAC2021 for San Francisco County for year 2025. The Transportation Engineer for the Project provided daily average project-generated trip rates, trip lengths, and vehicle types,[7] summarized in **Table 6**. In addition to estimating CAP emissions from on-road vehicles, trip and VMT information in **Table 6** from refrigerated and nonrefrigerated delivery trucks are also used to calculate fugitive dust, loading dock idling emissions, and TRU emissions.

CAP Emissions from refrigerated delivery trucks, non-refrigerated delivery trucks, and passenger vehicles (employees and customers) are summarized in **Table 7**.

3.2.2 Fugitive Dust Emissions from On-Road Vehicles

Fugitive dust emissions and the associated calculation are summarized in **Table 8**. Annual VMT from **Table 6** was multiplied by the fugitive PM_{10} and $PM_{2.5}$ emission factor to obtain the annual fugitive dust emissions.

3.2.3 CAP Emissions from Truck Idling

Additional CAP and TAC emissions are generated from delivery truck idling on the Project site. The average number of trucks accessing the Project site is assumed to be the same as the number of daily

[6] Sheppard Mullin, 2022. Email communication titled "FW: Whole Foods at 2675 Blvd: EIR Check-in Meeting" from Jennifer Renk at Sheppard Mullin to Elliott Schwimmer at ESA Associates. January 10.
[7] Kittelson, 2022. Transportation Memorandum, 2675 Geary Boulevard. June 13.

one-way truck trips in **Table 6**. Whole Foods does not allow trucks to idle while queuing for freight loading. However, state law allows 5 minutes of idling upon arrival and 5 minutes prior to departure. Therefore, for the purposes of the air quality model, we assumed 10 minutes of idling time for each delivery trip, as shown in **Table 9**. Weighted average idling emission factors from EMFAC2021 were derived from emission factors by truck types and fleet mixes for refrigerated and unrefrigerated trucks, respectively. The breakdown of CAP emissions by truck type are shown in **Table 9**.

3.2.4 CAP Emissions from Transportation Refrigeration Units (TRUs)

The number of refrigerated delivery trucks accessing the Project site during operation was provided in the Kittelson Memo and shown in **Table 6**.[8] TRU emissions in grams per hour of operation were developed using CARB's web-based EMFAC tool,[9] which incorporates the February 2022 regulatory changes described above, and are shown in **Table 10**. The average unloading time per refrigerated truck was provided in the Kittelson Memo. Ramboll assumed that the engine that keeps the freight chilled (which is separate from the engine that powers the vehicle) would be operational for the entire loading duration. Emission factors from the EMFAC web tool and the resulting emissions for the highest TRU emission year (2025) are shown in **Table 10**. Variable TRU emission factors from 2025 to 2054 are also shown in **Table 11** and were used to evaluate the health risk impacts of TRU emissions.

3.2.5 CAP Emissions from Consumer Products and Energy Use

CalEEMod® 2020.4.0 was used to obtain CAP emissions from area sources and natural gas consumption of Project operation. A copy of the CalEEMod output is in **Appendix A**. Because the proposed project would include cooking and heating activities, CalEEMod default natural gas consumption was not used to avoid underestimation. Instead, annual natural gas consumption of the Project was assumed to be the same as a similar store of 52,889 square feet in Sunnyvale in 2021, provided by the Project Sponsor. For comparison, the actual square footage proposed to be occupied by Whole Foods at the Project is 49,285 square feet. Therefore, assuming the Project would use the same amount of natural gas as the larger Sunnyvale store is a conservative assumption. CAP emissions from consumer products, also shown in **Table 5**, were conservatively based on the Project's approximate footprint of 55,000 square feet.[10]

3.3 Project Health Risks

The purpose of the health risk assessment (HRA) is to analyze potential health impacts that would result from construction and operation of the Project. This HRA evaluated the estimated cancer risk, chronic hazard index, and fine particulate matter ($PM_{2.5}$) concentration associated with construction and operation of the Project. The methodology for this HRA is detailed in the Methodology Report.

As described in the Methodology Report, Ramboll performed air dispersion modeling using the American Meteorological Society/USEPA Regulatory Model (AERMOD) (version 21112), with representative meteorological data to determine diesel particulate matter (DPM), total organic gases (TOG), and $PM_{2.5}$ concentrations for potentially exposed individuals. These concentrations were used to assess the potential human health risk.

[8] Kittelson, 2022. Transportation Memorandum, 2675 Geary Boulevard. June 13.

[9] https://arb.ca.gov/emfac/emissions-inventory

[10] When the air quality modeling was conducted the project description included the entire 54,285-square-foot vacant retail space on level 3 of the City Center shopping center, which was rounded up to 55,000 square feet in the air quality model. Subsequently, the project description was refined as level 3 will be split into two retail spaces, of which 49,825 square feet will be available to Whole Foods. The other 4,460 square feet will be retained by City Center and is not part of the proposed project. As a result, the air quality modeling results are conservative (worst-case), as the results are based on a larger retail space.

3.3.1 Construction Health Risk Assessment

A summary of the results of the construction HRA are presented below.

Emission rates were calculated using the emissions inventory described for construction in **Section 3.1.1** and **3.1.2**. The diesel-powered off-road equipment crane was the only onsite emission source evaluated for the construction HRA. Emissions within 1,000 meters of the Project boundary from construction vendor trucks and worker vehicles were evaluated as on-road construction emissions. The modeled construction sources are shown in **Figures 3** and **5**. Construction emissions for HRA modeling are summarized in **Appendix B**.

Exposure parameters for the construction HRA are presented in **Table 12.** These are consistent with the Methodology Report.

The Project health risks from construction sources are summarized in **Table 14.**

3.3.2 Operational Health Risk Assessment

Consistent with the BAAQMD and Cal/EPA OEHHA guidance described in the Methodology Report, Ramboll performed an HRA for operational sources of TACs from the Project, namely Project-generated traffic. According to the Transportation Engineer, the Project would result in 2,658 one-way daily passenger vehicle trips from customers and employees, as well as 46 daily truck round trips from delivery vehicles (92 one-way trips).[11] Modeled operational sources are shown in **Figures 4** and **5**. The operational emissions from TRUs for the HRA modeling would vary throughout the exposure period. The operational emissions for HRA modeling are summarized in **Appendix B**.

Exposure parameters for the operational HRA are discussed in the Methodology Report, and the detailed setups are shown in **Table 12**. Operational emissions would vary year to year due to decreasing TRU emission factors over time, as shown in **Table 11**. Further details on how the exposure parameters were applied to operational emissions from each calendar year are shown in **Table 13**.

The Project health risks from operational sources are also summarized in **Table 14.** The locations of the Maximally Exposed Individuals (MEIs) for cancer risk and $PM_{2.5}$ concentration are shown in **Figure 6.**

3.4 Results from Cumulative Analysis

The cumulative analysis includes Project impacts added to background risk and reasonably foreseeable future projects. Background risks are available through San Francisco's Citywide HRA 2020.

Citywide modelling for the year 2020 does not include construction or operational emissions from cumulative projects because these are variable and difficult to predict; however, this cumulative analysis evaluates known construction activities and their future operations within the zone of influence (1,000 feet) that could impact local air quality and affect health risk. These sources are not already included in the Citywide HRA. Based on Ramboll's discussion with SFEP, the following nearby projects were considered in this analysis:

1. 1846 Grove Street: the project includes the construction of five single-family dwelling units in the rear yard of an existing property. The 1846 Grove Street project is located approximately 2,500 feet from the 2675 Geary Boulevard Project's Maximally Exposed Individual Receptor at Bright Horizons daycare;

[11] Kittelson, 2022. Transportation Memorandum, 2675 Geary Boulevard. June 13.

2. 1735-1751 Fulton Street: the project proposes to demolish two existing one-story buildings on two lots and construct a four-story 40-foot-tall mixed-use building, containing approximately 25,000 square feet, including nine dwelling units and 4,340 gross square feet of retail space. The two lots would be merged. The 1735-1751 Fulton Street project is located approximately 2,000 feet from the 2675 Geary Boulevard Project's Maximally Exposed Individual Receptor in the residential neighborhood at O'Farrell and Anzavista;
3. 2800 Geary Boulevard: the project includes demolition of an existing commercial building on the project site, and new construction of a six-story, 65-foot-tall mixed-use building with 42 dwelling units and 850 square feet of ground floor commercial space. The 2800 Geary Boulevard project is located approximately 1,010 feet from the 2675 Geary Boulevard Project's Maximally Exposed Individual Receptor at Bright Horizons daycare;
4. 3641 California Street: the project proposes to demolish the existing two-story building at 3641 California Street and construct a new, mixed-use development with residential over commercial. The 3641 California Street project is located approximately 3,600 feet from the 2675 Geary Boulevard Project's Maximally Exposed Individual Receptor at Bright Horizons daycare. For the 3641 California Street project, a screening-level HRA was conducted to evaluate the excess lifetime cancer risk for a child below 2 years of age due to the higher breathing rate of a child. The project would contribute cancer risks of up to 1.7 per million at the Maximally Exposed Individual for that project (see below for additional details);
5. 3333 California Street: a large development project nearby the site. Ramboll previously conducted a health risk assessment for 3333 California Street (see below for additional details). The 3333 California Street project is located approximately 1,580 feet from the 2675 Geary Boulevard Project's Maximally Exposed Individual Receptor at Bright Horizons daycare;
6. 2750 Geary Boulevard: the project includes construction of a three-story addition with 20 dwelling units, increasing the total number to 99 units. The 2750 Geary Boulevard project is located approximately 800 feet from the 2675 Geary Boulevard Project's Maximally Exposed Individual Receptor at Bright Horizons daycare;
7. 3657 Sacramento Street: the project proposes to demolish existing buildings and construct a 40-foot tall, four-story building with a 9-foot-tall elevator penthouse and 4-foot-tall parapet. The building would contain 6,500 square feet of retail, 10,000 square feet of medical office use on the second floor, and 18 dwelling units on the third and fourth floors. The 3657 Sacramento Street project is located approximately 2,640 feet from the 2675 Geary Boulevard Project's Maximally Exposed Individual Receptor at Bright Horizons daycare;
8. 709 Lyon Street: the project proposes to construct a new five-unit residential building. The 709 Lyon Street project is located approximately 1,460 feet from the 2675 Geary Boulevard Project's Maximally Exposed Individual Receptor in the residential neighborhood at O'Farrell and Anzavista;
9. 1355 Fulton Street: the project proposes to construct an 8-story vertical addition above the existing building for a 9-story building for residential use and ground floor retail space. The 1355 Fulton Street project is located approximately 2,520 feet from the 2675 Geary Boulevard Project's Maximally Exposed Individual Receptor in the residential neighborhood at O'Farrell and Anzavista;
10. 3330 Geary Boulevard: the project would demolish three existing office buildings and construct a six-story-over-basement, 65-foot-tall mixed use building including 41 dwelling units. The 3330 Geary Boulevard project is located approximately 2,050 feet from the 2675 Geary Boulevard Project's Maximally Exposed Individual Receptor at Bright Horizons daycare; and

11. Geary Corridor Rapid Transit Project: The project would improve Geary Boulevard with safety improvements and faster, more reliable bus service for the 38 Geary and 38R Geary Rapid bus routes every day. Project improvements include red bus-only lanes, signal priority for buses, expanded rapid and local bus service, and a suite of safety improvements such as sidewalk extensions, accessible curb ramps, and protected left turn signals.12 This is discussed further below. The closest segment of the Geary Corridor Rapid Transit project is located approximately 210 feet from the 2675 Geary Boulevard Project's Maximally Exposed Individual Receptor at Bright Horizons daycare;

Apart from the Geary Corridor Rapid Transit Project and the 2750 Geary Boulevard project, none of the above cumulative projects are located within 1,000 feet of the proposed project daycare or resident MEI. Many of the projects listed above would consist of demolition and/or new construction. Such activities would require the use of off-road diesel construction equipment. Apart from the few exceptions listed below, none of the projects above required a quantitative health risk assessment and are therefore, not expected to have a significant impact on nearby receptors' health due to air pollution. Nevertheless, construction and/or operational activities from the projects above could incrementally increase health risks to the Project's Maximally Exposed Individuals. The cumulative projects listed above range from 210 feet to 3,600 feet from the Project's Maximally Exposed Individual Receptors. In general, air pollutant concentrations decrease with distance (sometimes quite quickly) and would therefore be expected to be lower (and in some cases substantially lower) at the Project's Maximally Exposed Individual Receptors.

Quantitative health risk assessment results were available for the project at 3641 California Street, the Geary Corridor Rapid Transit Project, and the 3333 California Street project, described below:

3641 California Street

A screening-level HRA was conducted to evaluate the excess lifetime cancer risk for a child below 2 years of age due to the higher breathing rate of a child. The 3641 California Street project would contribute cancer risks of up to 1.7 per million. The maximum health risk impacts identified for the 3641 California Street project were added to impacts at the proposed project's maximally exposed individual sensitive receptor, which is very conservative. In reality, health risks are expected to be much lower at the proposed project's (2675 Geary Blvd) maximally exposed individual sensitive receptor based on the fact that the proposed project's maximally exposed individual sensitive daycare receptor is located approximately 3,600 feet from 3641 California Street project.

Geary Corridor Rapid Transit Project

Health risk impacts from the construction and operation of the Geary Bus Rapid Transit Project were calculated as part of that project's environmental review. Excess lifetime cancer risk was shown to be 2.8 in a million at the Maximum Exposed Individual. The maximum health risk impacts identified were added to impacts at the proposed project's maximally exposed individual sensitive receptor, which is conservative. In reality, health risks from the Geary Bus Rapid Transit project are expected to be lower at the proposed project's (2675 Geary Blvd) maximally exposed individual sensitive receptor at Bright Horizons daycare based on the fact that the proposed project's maximally exposed individual sensitive receptor is located approximately 210 feet from the Geary Bus Rapid Transit construction emissions sources.

[12] San Francisco County Transportation Authority. Geary Bus Rapid Transit. Available at: https://www.sfcta.org/projects/geary-bus-rapid-transit

3333 California Street

Health risk impacts from the construction and operation of the 3333 California Street project were calculated as part of that project's environmental review. Excess lifetime cancer risk was shown to be 24 in a million at the Maximally Exposed Individual for the 3333 California Street project. The maximum health risk impacts identified were added to impacts at the proposed project's maximally exposed individual sensitive receptor, which is very conservative. In reality, health risks from the 3333 California Street project are expected to be lower at the proposed project's maximally exposed individual sensitive receptor at Bright Horizons daycare based on the fact that the proposed project's maximally exposed individual sensitive receptor is located approximately 1,580 feet from the 3333 California Street construction emissions sources.

Using the above information, the quantitative cumulative cancer risks and $PM_{2.5}$ concentrations from the Project are presented in **Table 15**. The impacts presented in **Table 15** could be greater when considering other cumulative projects where quantitative health risk information is not available. Toxic air contaminant emissions, including DPM, from the proposed project in combination with the cumulative projects described above would increase health risks to these receptors. However, most of the cumulative projects listed above are relatively small, with short construction periods. As such, these projects did not require a quantitative health risk assessment as part of their evaluation because they would have limited construction-related emissions.

TABLES

Table 1: Construction Criteria Air Pollutants Emissions Summary

Table 2: Off-Road Equipment and Criteria Air Pollutants Emissions from Project Construction

Table 3: On-Road Vehicles and Criteria Air Pollutants Emissions from Project Construction

Table 4: Architectural Coating Emissions from Project Construction

Table 5: Operational Criteria Air Pollutants Emissions Summary

Table 6: Trip Information for Project Operations

Table 7: Mobile Criteria Air Pollutants Emissions from Project Operations

Table 8: On-Road Fugitive Dust Emissions from Project Operations

Table 9: Idling Criteria Air Pollutants Emissions from Onsite Truck Activity

Table 10: Transportation Refrigeration Unit (TRU) Criteria Air Pollutants Emissions from Project Operations

Table 11: Transportation Refrigeration Unit (TRU) Emissions Factors for Health Risk Assessment

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Figure 5: Modeled Construction and Operational Sources – Passenger Vehicles

Figure 6: Cancer Risk, Chronic HI, and $PM_{2.5}$ Concentration Maximally Exposed Individuals

Table 1
Construction Criteria Air Pollutants Emissions Summary
Whole Foods - 2675 Geary Blvd
San Francisco, California

Construction Sources[1]	Annual Emissions[2] (lb/day)			
	ROG	NOx	PM_{10} (exhaust)	PM_{25} (exhaust)
Off-Road Equipment	0.0030	0.032	0.0013	0.0012
On-Road Vehicles	0.53	0.23	0.05	0.02
Architectural Coating	2.6	--	--	--
Total	**3.1**	**0.3**	**0.05**	**0.02**

Notes:

1. Uncontrolled emissions assume fleet-average equipment tiers for each calendar year. The emissions above include emissions from diesel off-road equipment, gasoline and diesel on-road vehicles, and off-gassing emissions from architectural coating. Emission factors of off-road equipment are based on CalEEMod® Appendix D.
2. Emissions are averaged over 218 working days during a 10-month construction period starting in October 2024.

Abbreviations:

CalEEMod® - California Emissions Estimator Model

PM_{10} - particulate matter < 10 µm

$PM_{2.5}$ - particulate matter < 2.5 µm

ROG - reactive organic gases

lb - pound

NOx - nitrogen oxides

References

The California Emissions Estimator Model (CalEEMod®). Available at: http://www.caleemod.com/

Table 2
Off-Road Construction Equipment Assumptions
Whole Foods - 2675 Geary Blvd
San Francisco, California

Year	Equipment Quantity	Equipment Type	Fuel Type	Utilization Factor[1]	Power Rating (HP)[1]	Operating Hours/Day[1]	Operating Days[1]
2024	1	Cranes	Diesel	0.29	231	8	2

Notes

[1.] Equipment details and activities provided by Project Sponsor.

Abbreviations:

HP - horsepower

Table 3
On-Road Construction Vehicle Assumptions
Whole Foods - 2675 Geary Blvd
San Francisco, California

Year	Trip Type	Total One-Way Trip during Construction Period[1]	Fleet Mix	Trip Length (Miles/One-Way Trip)[2]	Total Vehicle Miles Travelled	Fuel
2024	Vendor	80	50% MHDT, 50% HHDT	7.3	584	Diesel
2024	Worker	22,100	50% LDA, 25% LDT1, 25% LDT2	10.8	238,680	Gasoline

Notes

[1] Construction trips were provided by Project Sponsor.

[2] Consistent with CalEEMod, worker trip length is home-work (H-W) trip length and vendor trip length is commercial-nonwork (C-NW) trip length for San Francisco county.

Abbreviations:

MHDT - medium-heavy duty Trucks

LDA - light-duty automobiles

HHDT - Heavy-heavy duty trucks

LDT1 - Light-duty trucks (gross vehicle weight rating <6000 pounds. And equivalent test weight <= 3750 pounds)

LDT2 - Light-duty trucks (gross vehicle weight rating <6000 pounds. And equivalent test weight <= 3751-5750 pounds)

Reference

The California Emissions Estimator Model (CalEEMod). Available at: http://www.caleemod.com/

ARB. 2021. EMission FACtors Model, 2021 (EMFAC2021). Available online at: https://arb.ca.gov/emfac/emissions-inventory

Sheppard Mullin, 2022. Email communication titled "FW: Whole Foods at 2675 Blvd: EIR Check-in Meeting" from Jennifer Renk at Sheppard Mullin to Elliott Schwimmer at ESA Associates. January 10.

Table 4
Architectural Coating Emissions from Project Construction
Whole Foods - 2675 Geary Blvd
San Francisco, California

Land Use	Floor Area[1] (square feet)	Building Surface Area[1] (square feet)	Application Rate	Percent of Parking Lot Area Painted[4]	Indoor Paint VOC EF[2] (g/L)	Outdoor Paint VOC EF[2] (g/L)	Architectural Coating VOC emissions[3] (lb)
Supermarket	54,290	108,580	100%	--	100	150	566

Notes:

1. Consistent with CalEEMod®, non-residential area is 2 times the floor area. Building area is assumed to be 75% indoors and 25% outdoors, consistent with CalEEMod®.
2. Paint VOC content is consistent with the BAAQMD Regulation 8 Rule 3 (Architectural Coatings) and CalEEMod's default emission factor values for nonresidential interior/exterior, respectively.
3. Uses CalEEMod® assumption that 1 gallon of paint covers 180 square feet.

Abbreviations:

CalEEMod® - California Emissions Estimator Model
EF - Emission Factor
g - grams
L - liter
lb - pound
VOC - Volatile Organic Compound

References:

California Air Pollution Control Officers Association (CAPCOA). California Emissions Estimator Model (CalEEMod), Version 2016.3.2. Available online at http://www.caleemod.com/

Table 5
Operational Criteria Air Pollutants Emissions Summary
Whole Foods - 2675 Geary Blvd
San Francisco, California

Type of Sources	Emissions Sources	Annual Emissions[3] (tons/year)				Average Daily Emissions[4] (lb/day)			
		ROG	NOx	PM_{10} [3]	$PM_{2.5}$ [3]	ROG	NOx	PM_{10} [3]	$PM_{2.5}$ [3]
Area[1]	--	0.25	1.0E-05	--	--	1.4	5.5E-05	--	--
Energy[2]	--	0.013	0.12	0.0090	0.0090	0.071	0.65	0.049	0.049
On-Road Mobile Emissions	Refrigerated Delivery Trucks	0.015	1.3	0.14	0.085	0.084	7.0	0.78	0.46
	Non-Refrigerated Delivery Trucks	0.025	1.1	0.23	0.17	0.14	6.0	1.3	0.93
	Passenger Vehicles	2.4	0.70	1.9	1.7	13	3.9	11	9.4
	Truck Refrigeration Units	0.43	0.45	0.014	0.013	2.4	2.5	0.08	0.07
Loading Dock Emissions	Truck Idling	0.0024	0.08	1.3E-04	1.3E-04	0.013	0.5	0.0007	0.0007
	Truck Refrigeration Units	0.09	0.09	0.0033	0.0030	0.47	0.51	0.018	0.017
Total		**3.2**	**3.8**	**2.3**	**2.0**	**18**	**21**	**13**	**11**

Notes:

1. Emissions from all area sources (consumer products, architectural coating, and landscaping) are calculated in CalEEMod by conservatively assuming 65,000 square feet of parking and 55,000 square feet of supermarket.
2. Natural gas consumption was provided by the Project Sponsor and is based on a project of similar size.
3. Assume the earliest year of operation to be 2025.
4. Particulate matter emissions include both exhaust and fugitive emissions from on-road mobile sources.

Abbreviations:

PM_{10} - particulate matter less than 10 microns
$PM_{2.5}$ - particulate matter less than 2.5 microns
ROG - reactive organic gases
NOx - nitrogen oxides

Table 6
Trip Information for Project Operations
Whole Foods - 2675 Geary Blvd
San Francisco, California

Fleet Type	Fleet Category	Average Trip Rate[1]	Average Trip Length[2]	Annual Activity	Annual Trips[3]	Annual VMT[3]
		one-way trips/day	mi/one-way trip	days/year	one-way trips/yr	mi/yr
Refrigerated Delivery Trucks	MHDT	14	29.80	365	5,110	152,278
	HHDT	12	58.80	365	4,380	257,544
Non-Refrigerated Delivery Trucks	MDV	12	10.80	365	4,380	47,304
	LDT2	16	50.80	365	5,840	296,672
	MHDT	32	29.80	365	11,680	348,064
	HHDT	6	58.80	365	2,190	128,772
Passenger Vehicles	LDA	1,328	8.57	365	484,720	4,153,883
	LDT1	665	8.56	365	242,725	2,076,941
	LDT2	665	8.56	365	242,725	2,076,941

Notes:

[1] The daily trip rate was provided in the Kittelson Memo.

[2] The average trip length (mi/trip) was provided in the Kittelson Memo.

[3] Annual trips and annual VMT were calculated assuming 365 days per year for trucking operations (provided in the Kittelson Memo).

Abbreviations:

mi - mile(s)

VMT - vehicle miles travelled

yr - year

MHDT - medium-heavy duty Trucks

HHDT - heavy-heavy duty trucks

MDV - medium-duty trucks

LDT1 - Light-duty trucks (gross vehicle weight rating <6000 pounds. And equivalent test weight <= 3750 pounds)

LDT2 - Light-duty trucks (gross vehicle weight rating <6000 pounds. And equivalent test weight <= 3751-5750 pounds)

References:

Kittelson, 2022. Transportation Memorandum, 2675 Geary Boulevard. June 13.

Table 7
Mobile Criteria Air Pollutants Emissions from Project Operations
Whole Foods - 2675 Geary Blvd
San Francisco, California

Fleet Type	Fleet Category	Emissions from Mobile Sources			
		ROG	NOx	PM_{10}	$PM_{2.5}$
		[tons/yr]			
Refrigerated Delivery Trucks	MHDT	0.0052	0.24	0.012	0.0053
	HHDT	0.010	1.0	0.045	0.020
	Refrigerated Delivery Trucks Total	0.015	1.3	0.057	0.025
Non-Refrigerated Delivery Trucks	MDV	9.3E-04	0.0027	0.0013	6.1E-04
	LDT2	0.0075	0.015	0.0084	0.0039
	MHDT	0.012	0.55	0.027	0.012
	HHDT	0.0051	0.52	0.023	0.010
	Non-Refrigerated Delivery Trucks Total	0.025	1.1	0.060	0.026
Passenger Vehicles	LDA	1.1	0.31	0.088	0.032
	LDT1	0.83	0.29	0.051	0.019
	LDT2	0.48	0.11	0.059	0.027
	Passenger Vehicles Total	2.4	0.70	0.20	0.078
Mobile Sources Total		**2.5**	**3.1**	**0.31**	**0.13**

Abbreviations:

yr - year

ROG - reactive organic gases

NOx - nitrogen oxides

HHDT - Heavy-heavy duty trucks

PM_{10} - particulate matter < 10 µm

$PM_{2.5}$ - particulate matter < 2.5 µm

MHDT - medium-heavy duty Trucks

LDA - light-duty automobiles

LDT1 - Light-duty trucks (gross vehicle weight rating <6000 pounds. And equivalent test weight <= 3750 pounds)

LDT2 - Light-duty trucks (gross vehicle weight rating <6000 pounds. And equivalent test weight <= 3751-5750 pounds)

Table 8
On-Road Fugitive Dust Emissions from Project Operations
Whole Foods - 2675 Geary Blvd
San Francisco, California

Road Dust Equation[1]

E = k*(sL)^0.91 * (W)^1.02 * (1-P/4N)

Parameter[2]	**Value**
E = annual average emission factor in the same units as k	[calculated]
k = particle size multiplier for particle size range and units of interest	
PM_{10} (lb/VMT)	0.0022
$PM_{2.5}$ (lb/VMT)	3.3E-04
sL = road surface silt loading (grams per square meter) (g/m^2)	0.063
W = average weight (tons) of all the vehicles traveling the road	2.4
P = number of "wet" days with at least 0.01 in of precipitation during averaging period[3]	64
N number of days in the averaging period	365

Vehicle Miles Traveled (miles per year)[4]

Refrigerated Delivery Trucks	409,822
Non-Refrigerated Delivery Trucks	820,812
Passenger Vehicles	8,307,765

Scenario[4]	**Fugitive PM_{10}**	**Fugitive $PM_{2.5}$**	**Units**
Emission Factor	4.14E-04	6.21E-05	lb/VMT
Emissions - Refrigerated Delivery Trucks	0.08	0.01	tons/year
Emissions - Non-Refrigerated Delivery Trucks	0.17	0.03	tons/year
Emissions - Passenger Vehicles	1.72	0.26	tons/year
Full Emissions - Total	**1.97**	**0.30**	**tons/year**

Notes:

1. The road dust equation for paved roads is from the California Air Resources Board's (ARB) 2018 Miscellaneous Process Methodology 7.9 for Entrained Road Travel, Paved Road Dust.
2. Silt loading emission factor calculated in Table 6 using roadway travel fractions. Other parameters are from ARB 2016. $PM_{2.5}$ is assumed to be 15% of PM_{10} based on paved road dust sampling in California (ARB Speciation Profile #471), which is a more representative fraction than provided in the older AP-42 fugitive dust methodology as discussed in ARB 2018 (page 10).
3. The number of "wet" days for San Francisco County is from CalEEMod® Appendix D Table 1.1 (64 days).
4. Emission factors calculated using Road Dust Equation and parameters presented in upper sub-table. Fugitive emission rates calculated as product of the emission factor and annual VMT.

Abbreviations:

ARB - Air Resources Board
CalEEMod® - California Emissions Estimator Model
lb - pounds
PM - particulate matter
VMT - vehicle miles traveled

References:

California Air Pollution Control Officers Association (CAPCOA). California Emissions Estimator Model (CalEEMod®), Version 2020.4.0. Available online at http://www.caleemod.com/

California ARB. 2018. Miscellaneous Processes Methodologies - Paved Entrained Road Dust. Available online at: https://www.arb.ca.gov/ei/areasrc/fullpdf/full7-9_2018.pdf

USEPA. 1996. AP 42. Compilation of Air Pollutant Emission Factors, Volume 1. Fifth Edition. Chapter 13.2.1, Paved Roads. Available online at: http://www3.epa.gov/ttn/chief/ap42/ch13/final/c13s0201.pdf. . Accessed January 2016.

Table 9
Idling Criteria Air Pollutants Emissions from Onsite Truck Activity
Whole Foods - 2675 Geary Blvd
San Francisco, California

Truck Idling Inputs[1]

Scenario	Parameter	Value	Units
Project Operation	Year	2025	--
	Average Number of Refrigerated Delivery Trucks per Day	26	one-way trips/day
	Average Number of Non-Refrigerated Delivery Trucks per Day	66	one-way trips/day
	Idle Time	5	min/one-way trip
	Operational Days per Year	365	days/yr
	Total Annual Refrigerated Delivery Trucks Idling	791	idle-hr/yr
	Total Annual Non-Refrigerated Delivery Trucks Idling	2,008	idle-hr/yr

Truck Idling Emission Factors and Emissions

Truck Type	Pollutant	Idling Emission Factors[2] (g/idle-hr)	Emissions	
Refrigerated Delivery Trucks	ROG	1.4	0.0012	tpy
	NO_X	38	0.033	tpy
	PM_{10}	0.057	5.0E-05	tpy
	$PM_{2.5}$	0.054	4.7E-05	tpy
Non-Refrigerated Delivery Trucks	ROG	0.52	0.0012	tpy
	NO_X	23	0.051	tpy
	PM_{10}	0.037	8.3E-05	tpy
	$PM_{2.5}$	0.036	7.9E-05	tpy

Notes:

1. Truck idling activity inputs were provided in the Kittelson Memo.
2. Emission factors were estimated using EMFAC2021 to generate emission rates for San Francisco County from diesel trucks.

Abbreviations

CO - carbon monoxide
CO_2e - carbon dioxide equivalents
EMFAC - EMission FACtors model
g - grams
idle-hr - hour spent idling
min - minute
NO_X - oxides of nitrogen
PM - particulate matter
ROG - reactive organic gases
tpy - tons per year
yr - year
MT - metric ton

References

ARB. 2021. EMission FACtors Model, 2021 (EMFAC2021). Available online at: https://arb.ca.gov/emfac/emissions-inventory

Table 10
Transportation Refrigeration Unit (TRU) Criteria Air Pollutants Emissions from Project Operations
Whole Foods - 2675 Geary Blvd
San Francisco, California

TRU Usage Inputs [Unit]		Truck TRU	Trailer TRU
TRU Usage[1] [One-way trips/day]		14	12
Percent of time when engine is on during TRU operation [--][2]		62.5%	62.5%
Operational Days [days/yr]		365	
TRU Engine Operation During Travel	Average Speed Traveled by Truck[3] [mi/hr]	25	
	Average Miles Traveled by Truck[4] [mi/one-way trip]	29.8	58.8
	Annual Hours of Operation During Travel [hr]	3807	6439
TRU Engine Operation During Unloading	Unloading Time per TRU[5] [hour/one-way trip]	0.34	0.39
	Annual Hours of Operation During Unloadingl [hr]	1085	1079

TRU Emission Factors

Source	Year[6]	Emission Factor (g/hour)[7]			
		ROG	NO_X	PM_{10}	$PM_{2.5}$
Truck TRU	2025	28	35	1.8	1.7
Trailer TRU		44	42	0.94	0.86

TRU Emissions

TRU Type	Operation	Annual Average Emissions (tons/yr)			
		ROG	NO_X	PM_{10}	$PM_{2.5}$
Truck TRU	Operation During Travel	0.12	0.15	0.0076	0.0070
	Operation During Unloading	0.033	0.042	0.0022	0.0020
Trailer TRU	Operation During Travel	0.31	0.30	0.0067	0.0061
	Operation During Unloading	0.053	0.050	0.0011	0.0010

Notes:

1. Approximate TRU usage provided in the Kittelson Memo.
2. According to Appendix H: 2021 Update to Emissions Inventory for Transport Refrigeration Units, TRU engines are generally running about 62.5% of time that a TRU unit is turned on.
2. Per San Francisco CVC "Prima facie speed limits", the standard speed limit for business or residential districts in CA is 25 MPH. Some streets near the Project have limits of 30 MPH and a portion of each delivery trip will be on highways, but 25 MPH was conservatively assumed for the entire trip.
3. Truck trip length is consistent with the trip length assumed for truck deliveries. All other emissions from the trucks' engines during travel are included in the mobile emissions and are therefore not estimated separately here.
4. Loading and unloading time provided in the Kittelson Memo.
5. Emissions from TRUs decrease over time, but the earliest possible year was chosen to calculate criteria air pollutant emissions from TRUs.
6. Based on OFFROAD2021 for Transportation Refrigeration Unit vehicle class.

Abbreviations:

ARB - [California] Air Resources Board
g - gram
PM - particulate matter
hr - hour
mi - mile
NO_X - oxides of nitrogen
ROG - reactive organic gases
TRU - transportation refrigeration unit
yr - year

References:

California Air Resources Board. 2021 OFFROAD database. Available at: https://arb.ca.gov/emfac/emissions-inventory/.

California Air Resources Board. Appendix H: 2021 Update to Emissions Inventory for Transport Refrigeration Units. July.

Kittelson, 2022. Transportation Memorandum, 2675 Geary Boulevard. June 13.

Table 11
Transportation Refrigeration Unit (TRU) Emissions Factors for Health Risk Assessment
Whole Foods - 2675 Geary Blvd
San Francisco, California

TRU Emission Factors

Year	Operation	Operation Hour-Weighted Emission Factor (g/hour)[1,2]			
		ROG	NO_X	PM_{10}	$PM_{2.5}$
2025	Operation During Travel	35.4	38.5	1.41	1.30
2025	Operation During Unloading	36.0	38.7	1.38	1.27
2026	Operation During Travel	35.3	38.1	1.35	1.24
2026	Operation During Unloading	35.9	38.4	1.31	1.20
2027	Operation During Travel	35.5	37.9	1.29	1.19
2027	Operation During Unloading	36.1	38.1	1.25	1.15
2028	Operation During Travel	35.6	37.7	1.24	1.14
2028	Operation During Unloading	36.3	37.9	1.20	1.10
2029	Operation During Travel	35.6	37.6	1.20	1.11
2029	Operation During Unloading	36.3	37.7	1.15	1.06
2030	Operation During Travel	20.4	18.5	0.19	0.18
2030	Operation During Unloading	22.1	20.0	0.21	0.19
2031	Operation During Travel	20.2	18.4	0.17	0.16
2031	Operation During Unloading	21.8	19.9	0.19	0.17
2032	Operation During Travel	19.9	18.4	0.16	0.15
2032	Operation During Unloading	21.6	19.8	0.17	0.16
2033	Operation During Travel	19.9	18.3	0.15	0.14
2033	Operation During Unloading	21.5	19.8	0.16	0.15
2034	Operation During Travel	20.0	18.3	0.14	0.13
2034	Operation During Unloading	21.6	19.8	0.16	0.14
2035	Operation During Travel	20.1	18.3	0.14	0.13
2035	Operation During Unloading	21.7	19.8	0.15	0.14
2036	Operation During Travel	20.3	18.4	0.13	0.12
2036	Operation During Unloading	21.9	19.8	0.15	0.13
2037	Operation During Travel	20.4	18.4	0.13	0.12
2037	Operation During Unloading	22.0	19.9	0.14	0.13
2038	Operation During Travel	20.4	18.4	0.13	0.12
2038	Operation During Unloading	22.0	19.8	0.14	0.12
2039	Operation During Travel	20.3	18.4	0.12	0.11
2039	Operation During Unloading	21.9	19.8	0.13	0.12
2040	Operation During Travel	20.1	18.4	0.12	0.11
2040	Operation During Unloading	21.7	19.8	0.13	0.12
2041	Operation During Travel	20.0	18.3	0.12	0.11
2041	Operation During Unloading	21.6	19.8	0.13	0.12
2042	Operation During Travel	20.0	18.3	0.12	0.11
2042	Operation During Unloading	21.6	19.8	0.13	0.12
2043	Operation During Travel	20.1	18.3	0.12	0.11
2043	Operation During Unloading	21.7	19.8	0.13	0.12
2044	Operation During Travel	20.2	18.4	0.12	0.11
2044	Operation During Unloading	21.8	19.8	0.13	0.12
2045	Operation During Travel	20.2	18.4	0.12	0.11
2045	Operation During Unloading	21.9	19.8	0.13	0.12
2046	Operation During Travel	20.3	18.4	0.12	0.11
2046	Operation During Unloading	21.9	19.8	0.13	0.12
2047	Operation During Travel	20.2	18.4	0.12	0.11
2047	Operation During Unloading	21.9	19.8	0.13	0.12
2048	Operation During Travel	20.2	18.4	0.12	0.11
2048	Operation During Unloading	21.8	19.9	0.13	0.12
2049	Operation During Travel	20.1	18.3	0.12	0.11
2049	Operation During Unloading	21.7	19.8	0.13	0.12
2050	Operation During Travel	20.1	18.3	0.12	0.11
2050	Operation During Unloading	21.7	19.8	0.13	0.12
2051	Operation During Travel	20.1	18.3	0.12	0.11
2051	Operation During Unloading	21.7	19.8	0.13	0.12
2052	Operation During Travel	20.1	18.3	0.12	0.11
2052	Operation During Unloading	21.7	19.8	0.13	0.12
2053	Operation During Travel	20.1	18.3	0.12	0.11
2053	Operation During Unloading	21.7	19.8	0.13	0.12
2054	Operation During Travel	20.1	18.3	0.12	0.11
2054	Operation During Unloading	21.7	19.8	0.13	0.12

Notes:

1. Loading and unloading time provided in the Kittelson Memo.
2. Based on OFFROAD2021 for Transportation Refrigeration Unit vehicle class

Abbreviations:

ARB - [California] Air Resources Board
hp - horsepower
g - gram
gal - gallon
PM - particulate matter
hr - hour
mi - mile
MT - metric tonnes
NO_X - oxides of nitrogen
ROG - reactive organic gases
TRU - transportation refrigeration unit
VMT - vehicles miles traveled
yr - year

References:

California Air Resources Board. 2021 OFFROAD database. Available at: https://arb.ca.gov/emfac/emissions-inventory/.

Table 12
Exposure Parameters for Project Construction and Operations
Whole Foods - 2675 Geary Blvd
San Francisco, California

Construction

Population	Receptor Age Group	Exposure Parameters					
		Daily Breathing Rate (DBR)[1] [L/kg-day]	Exposure Duration (ED) [years]	Fraction of Time at Home (FAH)[2] [unitless]	Exposure Frequency (EF)[3] [days/year]	Averaging Time (AT) [days]	Intake Factor, Inhalation (IF_{inh}) [m^3/kg-day]
Residents[4]	Age 0-<2 Years	1,090	0.83	1.0	350	25,550	0.012
Daycare Children[5]	Age Six Weeks-<2 Years	1,090	0.83	--	350	25,550	0.012

Operations

Population	Receptor Age Group	Exposure Parameters					
		Daily Breathing Rate (DBR)[1] [L/kg-day]	Exposure Duration (ED)[6] [years]	Fraction of Time at Home (FAH)[2] [unitless]	Exposure Frequency (EF)[3] [days/year]	Averaging Time (AT) [days]	Intake Factor, Inhalation (IF_{inh}) [m^3/kg-day]
Residents[4]	3rd Trimester	361	1.0	1.0	350	25,550	0.0049
	Age 0-<2 Years	1,090	1.0	1.0	350	25,550	0.015
	Age 2-<16 Years	572	1.0	1.0	350	25,550	0.0078
	Age 16-30 Years	261	1.0	0.73	350	25,550	0.0026
Daycare Children[5]	Age Six Weeks-<2 Years	1,090	1.0	--	350	25,550	0.015
	Age 2-<9 Years	631	1.0	--	350	25,550	0.0086

Notes:

1. Daily breathing rates reflect default breathing rates from OEHHA 2015 and BAAQMD 2016 as follows: 95th percentile 24-hour daily breathing rate for 3rd trimester and age 0-<2 years; 80th percentile for ages 2 years and older (per BAAQMD 2016 and 2020 Health Risk Assessment (HRA) Modeling Guidelines).
2. Fraction of time spent at home is conservatively assumed to be 1 (i.e., 24 hours/day) for age groups from the third trimester to less than 16 years old based on the recommendation from BAAQMD (BAAQMD 2016 and 2020) and OEHHA (OEHHA 2015). The fraction of time at home for adults age 16-30 reflects default OEHHA guidance (OEHHA 2015) as recommended by BAAQMD (2016 and 2020).
3. Exposure frequency reflects default residential exposure frequency from OEHHA 2015.
4. All receptors are assumed to be exposed to construction risks for the duration of construction, which is 10 months. All receptors are assumed to be exposed to operational risks for 30 years beginning in 2025 at the start of operation.
5. Daycare children are modeled using parameters consistent with OEHHA 2015 guidance for resident children, which conservatively assumes 24 hours/day exposure.
6. Exposure Duration during operational years is shown in Table 13.

Calculation:

IF_{inh} = DBR * FAH * EF * ED * CF / AT

CF = 0.001 (m^3/L)

Abbreviations:

AT - averaging time
BAAQMD - Bay Area Air Quality Management District
DBR - daily breathing rate
ED - exposure duration
EF - exposure frequency
FAH - fraction of time at home
IF_{inh} - intake factor
kg - kilogram
L - liter
m^3 - cubic meter
OEHHA - Office of Environmental Health Hazard Assessment

References:

BAAQMD. 2016. Air Toxics NSR Program Health Risk Assessment (HRA) Guidelines. January.

BAAQMD. 2020. Health Risk Assessment (HRA) Modeling Protocol. December.

OEHHA. 2015. Air Toxics Hot Spots Program Risk Assessment Guidelines. Guidance Manual for Preparation of Health Risk Assessments. February.

Table 13
Age Sensitivity Weighted Intake Factors by Year and Age Bin
Whole Foods - 2675 Geary Blvd
San Francisco, California

Year[1]	Resident				Daycare Child		
	Fraction of Year in Age Bin[2]			Age Sensitivity Weighted Intake Factor by Year, Inhalation[3]	Fraction of Year in Age Bin[2]		Age Sensitivity Weighted Intake Factor by Year, Inhalation[3]
	0-2	2-16	16-30	(m^3/kg-day)	0-2	2-9	(m^3/kg-day)
2025	1			0.149	1		0.15
2026	1			0.149	0.75	0.25	0.12
2027		1		0.024		1	0.026
2028		1		0.024		1	0.026
2029		1		0.024			
2030		1		0.024			
2031		1		0.024			
2032		1		0.024			
2033		1		0.024			
2034		1		0.024			
2035		1		0.024			
2036		1		0.024			
2037		1		0.024			
2038		1		0.024			
2039		1		0.024			
2040		1		0.024			
2041			1	0.0026			
2042			1	0.0026			
2043			1	0.0026			
2044			1	0.0026			
2045			1	0.0026			
2046			1	0.0026			
2047			1	0.0026			
2048			1	0.0026			
2049			1	0.0026			
2050			1	0.0026			
2051			1	0.0026			
2052			1	0.0026			
2053			1	0.0026			
2054			1	0.0026			

Notes:

1. Operational exposure begins in 2025.
2. The operational exposure duration for all years is 1, as the health risk assessment is based on annual emissions. While the 3rd Trimester is only 3 months, the exposure duration for the first year is set to 1 since annual average concentrations are used to calculate risks.
3. The Intake Factors have been multiplied by the Age Sensitivity Factors and weighted by the exposure duration for each age bin.

Abbreviations:

IF - intake factor
m^3 - cubic meter
kg - kilogram

References:

OEHHA. 2015. Air Toxics Hot Spots Program Risk Assessment Guidelines. Guidance Manual for Preparation of Health Risk Assessments. February.

Table 14
Summary of Project Resident and Daycare Health Risks
Whole Foods - 2675 Geary
San Francisco, California

Receptor Type	Resident[1]			Daycare[1]		
Sources	**Excess Lifetime Cancer Risk (in a million)[2]**	**Non-Cancer Hazard Index[3]**	**$PM_{2.5}$ Concentration ($\mu g/m^3$, Annual Average)[4]**	**Lifetime Excess Cancer Risk (in a million)[2]**	**Non-Cancer Hazard Index[3]**	**$PM_{2.5}$ Concentration ($\mu g/m^3$, Annual Average)[4]**
Construction Sources						
Passenger Vehicles[5]	0.0027	6.0E-04	0.0020	3.9E-04	9.7E-05	3.2E-04
Truck[5]	2.8E-05	4.1E-07	6.7E-06	6.1E-06	9.3E-08	1.5E-06
Crane	4.0E-04	5.8E-06	2.7E-05	0.0028	2.7E-05	1.3E-04
Construction Total	0.0031	6.1E-04	0.0020	0.0032	1.2E-04	4.5E-04
Operational Sources						
Passenger Vehicles[5]	2.3	0.010	0.034	0.16	0.0016	0.0054
Truck[5]	0.24	6.6E-05	0.0010	0.029	1.8E-05	2.7E-04
TRU Exhaust	1.0	4.5E-04	0.0021	0.83	4.6E-04	0.0021
Truck Idling	0.084	2.3E-05	1.1E-04	0.053	2.8E-05	1.3E-04
Operations Total	3.58	0.010	0.037	1.07	0.0021	0.0080
Construction + Operations Total[6]	3.58	--	--	1.07	--	--
MEI Location[7]						
UTMx	548,840	548,840	548,840	548,780	548,800	548,800
UTMy	4,181,680	4,181,680	4,181,680	4,181,780	4,181,780	4,181,780
Located in APEZ?	No	--	No	Yes	--	Yes

Notes:

1. All receptors are assumed to be exposed to construction risks for the duration of construction, which is 10 months in 2024. All receptors are assumed to be exposed to operational risks for 30 years beginning in 2025 at the start of operation.
2. Excess lifetime cancer risks are estimated as the upper-bound incremental probability that an individual will develop cancer over a lifetime as a direct result of exposure to potential carcinogens. The estimated risk is expressed as a unitless probability. The cancer risk attributed to the emissions associated with the Project was calculated based on the modeled annual average concentration of toxic air contaminants (TACs), the intake factor for a resident child, the Cancer Potency Factors (CPF) for TACs, and the Age Sensitivity Factors (ASF). TACs in this project include DPM and speciated total organic gas (TOG).
3. The potential for exposure to result in adverse chronic noncancer effects is evaluated by comparing the estimated annual average air concentration to the noncancer chronic Reference Exposure Level (REL) for each chemical. When calculated for a single chemical, the comparison yields a ratio termed a chronic hazard quotient (HQ). To evaluate the potential for adverse chronic noncancer health effects from simultaneous exposure to multiple chemicals, the chronic hazard quotients for all chemicals are summed, yielding a hazard index (HI).
4. $PM_{2.5}$ concentration and Non-Cancer Hazard Index represent annual values.
5. Passenger and truck emissions considered in the health risk assessment include both exhaust and fugitive dust emissions.
6. Construction + operations totals were reported for excess lifetime cancer risk only since excess lifetime cancer risk is based on a 30-year exposure scenario. Chronic non-cancer HI and PM2.5 concentration are based on annual averages; therefore, chronic non-cancer HI and PM2.5 from construction and operations would not be additive since construction and operations would not occur at the same time. As shown in the table, the highest values of non-cancer HI and PM2.5 concentrations occur during operations.
7. Maximum Exposed Individual location identified for this project (construction and operations) is the same as the Maximum Exposed Individual location for operational health risks impacts.

Abbreviations:

µg - microgram
ASF - age sensitivity factor
DPM - diesel particulate matter
HQ - hazard quotient
m^3 - cubic meter
OEHHA - Office of Environmental Health Hazard Assessment
PM - particulate matter
REL- reference exposure level
TAC - toxic air contaminants
TOG - total organic gas
TRU - transport refrigeration unit
HI - hazard index

Reference:

OEHHA. 2015. Air Toxics Hot Spots Program Risk Assessment Guidelines. Guidance Manual for Preparation of Health Risk Assessments. February.

Table 15
Cumulative Cancer Risk and $PM_{2.5}$ Concentration
Whole Foods - 2675 Geary Blvd
San Francisco, California

Source Category	Distance to Nearest MEIR (feet)	$PM_{2.5}$ Concentration ($\mu g/m^3$, Annual Average)		Excess Lifetime Cancer Risk (in a million)	
		Off-Site Resident[1]	On-Site Daycare[2]	Off-Site Resident	On-Site Daycare
Proposed Project[3]	-	0.037	0.0080	3.6	1.07
2020 Citywide Background[4]	-	8.5	9.2	50	105
Total Project + Background	**-**	**8.5**	**9.2**	**54**	**106**
Future Construction Projects not in Citywide HRA					
3333 California Street[5]	*1,583*	0.065	0.065	24	24
Geary Bus Rapid Transit Project[6]	*210*	0.0050	0.0050	2.8	2.8
3641 California Street.[7]	*3,616*	-	-	1.7	1.7
Total Non-Project	**-**	**0.070**	**0.070**	**29**	**29**
Cumulative Total[8,9]	**-**	**8.6**	**9.3**	**82**	**135**

MEISR Location:

MEISR Type	UTMx [m]	UTMy [m]
Off-Site Resident	548840	4181680
On-Site Daycare[10]	548780	4181780

Notes:

1. Off-site Project Maximum Exposed Individual Sensitive Receptor (MEISR) was identified as the off-site sensitive receptor location with the maximum total cancer risk and $PM_{2.5}$ concentration attributed to the emissions associated with the Project construction and operation.
2. On-site daycare Maximum Exposed Individual Sensitive Receptor (MEISR) is the receptor located at the daycare center above the Whole Foods Project with the maximum health impact. Residential exposure parameters were assumed for the daycare as discussed in the Methodology Report.
3. The Proposed Project values account for impacts from construction and operation of the Proposed Project. Construction impacts are from off-road construction equipment (crane only) and on-road construction delivery and worker trips. Operational impacts are from passenger vehicle trips and delivery truck trips. Values shown here are the maximum impacts, which for excess lifetime cancer risk include impacts from construction and operations over a 30 year lifetime and for PM2.5 concentration includes the maximum annual concentration which occurs during operations.
4. Background cancer risks and $PM_{2.5}$ concentrations for 2020 were obtained from the San Francisco Citywide model output database.
5. Health risk from 3333 California Street was analyzed in a previous EIR for the 3333 California Street Mixed Use Project (SCH: 2017092053).
6. The maximum health risks from both construction and operation for the Geary Bus Rapid Transit (BRT) Project were taken from the 2015 DEIR and conservatively added to the Whole Foods Project cancer risk, and assumed to occur at the Project MEISR as a conservative estimate. In reality, health risks from this future project are expected to be lower at the Project MEISR.
7. Accessed from the Air Quality Technical Memorandum - 3641 California Street, Case Number 2018-007764ENV
8. Cumulative total health impacts are the sum of the Proposed Project impacts, background impacts included in the Citywide model, and background impacts for future projects not included in the Citywide model.
9. Maximum Exposed Individual values from the cumulative projects were not specifically for a daycare receptor, but were added to the Project daycare receptor as a conservative approach to calculate the cumulative total.
10. The reported on-site daycare MEI location is for the cancer risk, which is 20 meters away from the $PM_{2.5}$ MEI location.

Abbreviations:

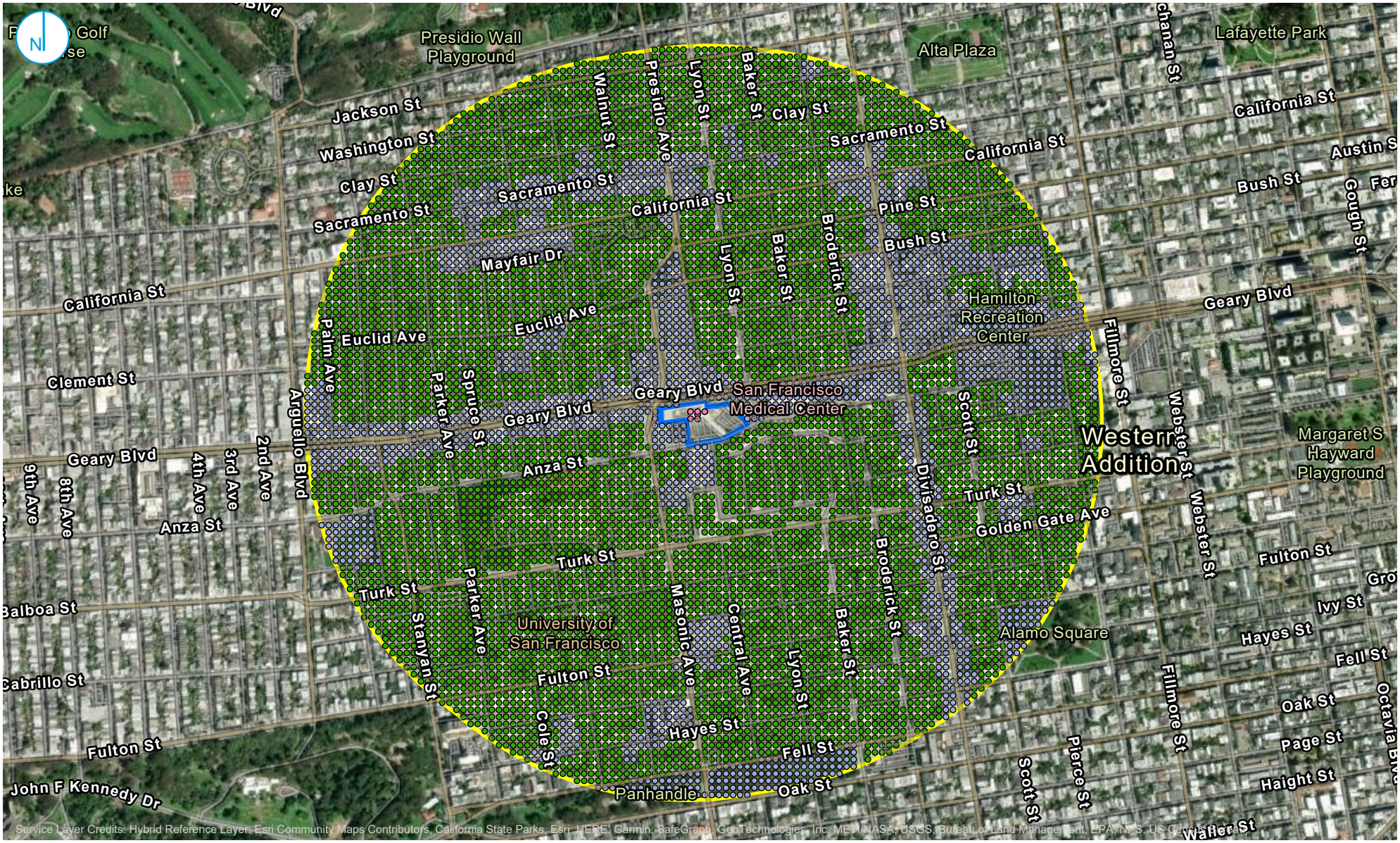
UTM - Universal Transverse Mercator
$PM_{2.5}$ - particulate matter 2.5 microns or less
DEIR - Draft Environmental Impact Report
m - meter
MEISR - Maximally Exposed Individual Sensitive Receptor
Citywide model - San Francisco Citywide Health Risk Assessment Model

References:

San Francisco County Transportation Authority, et al. 2015. Geary Corridor Bus Rapid Transit Project, Draft Environmental Impact Statement/Environmental Impact Report. September.

City and County of San Francisco, et al. 2018. 3333 California Street Mixed-Use Project, Draft Environmental Impact Report.

PROJECT: 1690022356 | DATED: 8/22/2022 | DESIGNER: LLI



Receptor Type
- Daycare
- Resident
- Other

- Project Boundary
- Modeling Extent (1000 m Buffer Area)

0 250 500 1,000 Meters

PROJECT BOUNDARY AND MODELING EXTENT

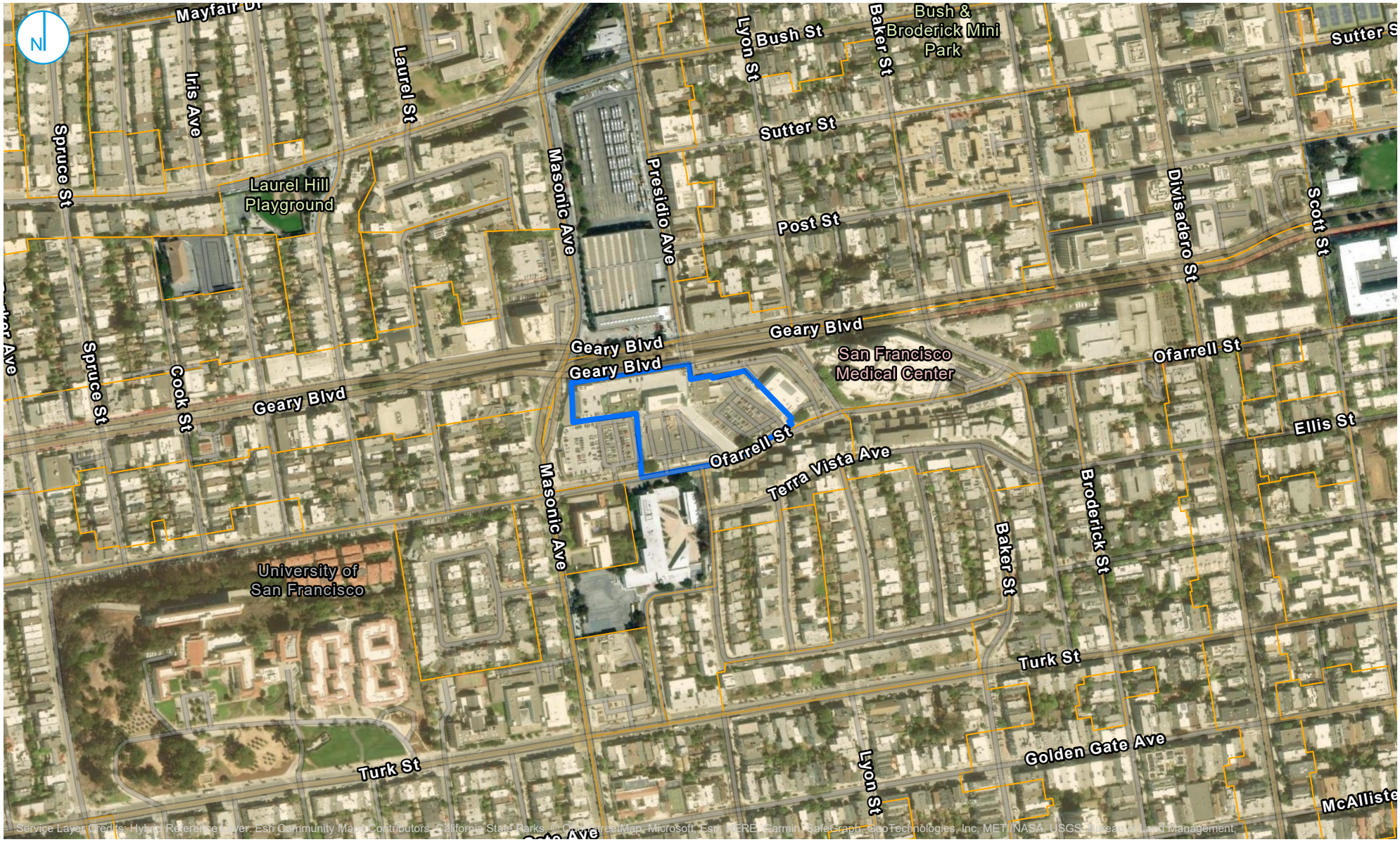
Whole Foods - 2675 Geary Blvd
San Francisco, California

FIGURE 01

RAMBOLL US CONSULTING, INC.
A RAMBOLL COMPANY

RAMBOLL

PROJECT: 1690022356 | DATED: 8/22/2022 | DESIGNER: LLI



Project Boundary

Land Use: Resident & Mixed Use

0 125 250 500 Meters

SENSITIVE RECEPTOR PARCELS

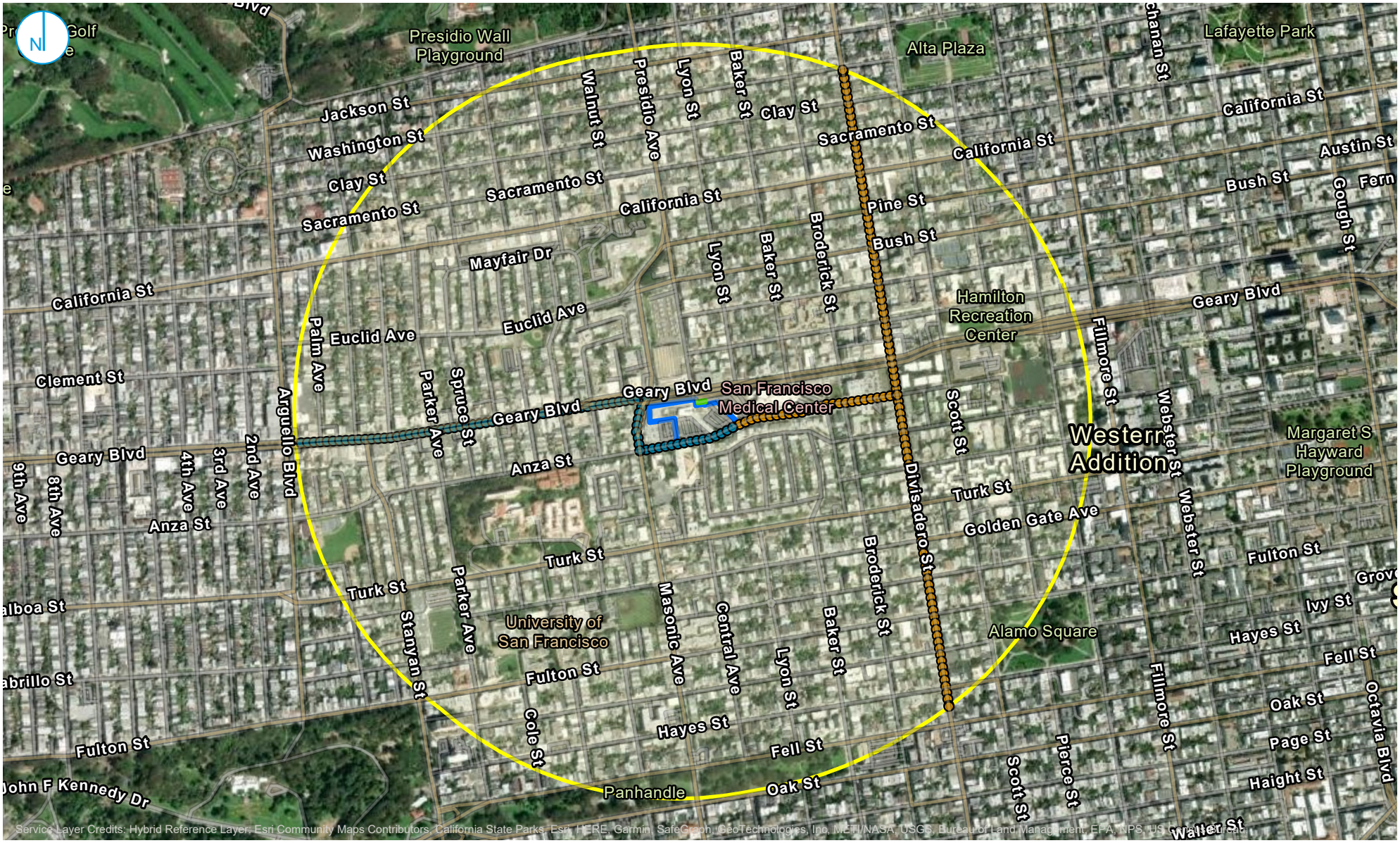
Whole Foods - 2675 Geary Blvd
San Francisco, California

FIGURE 02

RAMBOLL US CONSULTING, INC.
A RAMBOLL COMPANY

RAMBOLL

PROJECT: 1690022356 | DATED: 8/22/2022 | DESIGNER: LLI



Construction Crane
Truck Outbound
Truck Inbound
Project Boundary
Modeling Extent (1000 m Buffer Area)

0 250 500 1,000 Meters

MODELED CONSTRUCTION SOURCES - CRANE AND TRUCKS

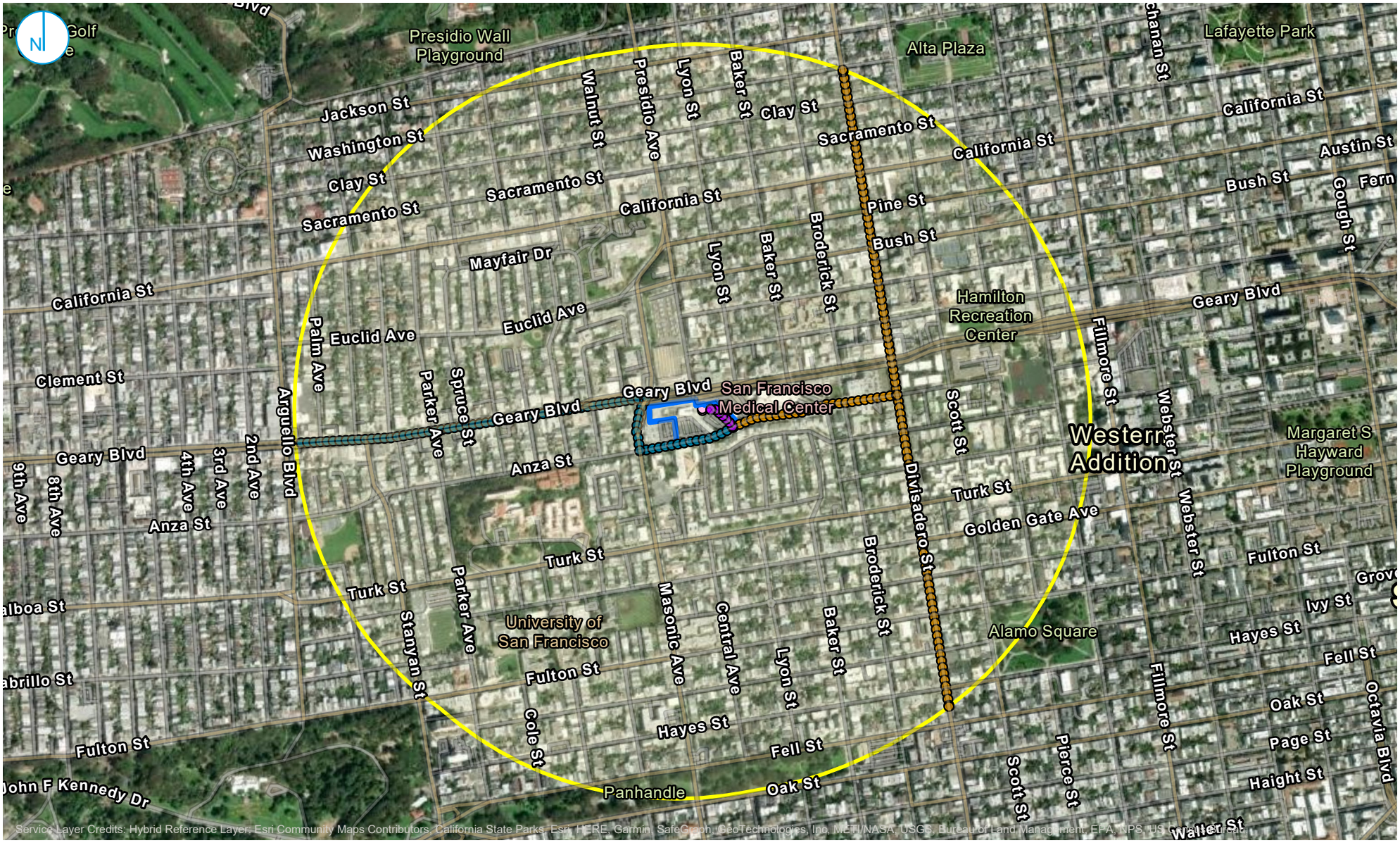
Whole Foods - 2675 Geary Blvd
San Francisco, California

FIGURE 03

RAMBOLL US CONSULTING, INC.
A RAMBOLL COMPANY

RAMBOLL

PROJECT: 1690022356 | DATED: 8/22/2022 | DESIGNER: LLI



- Truck/TRU Outbound
- Truck/TRU Inbound
- Truck/TRU Onsite
- Truck Idling/TRU Loading Dock
- Project Boundary
- Modeling Extent (1000 m Buffer Area)

0 250 500 1,000 Meters

MODELED OPERATIONAL SOURCES - DELIVERY TRUCKS

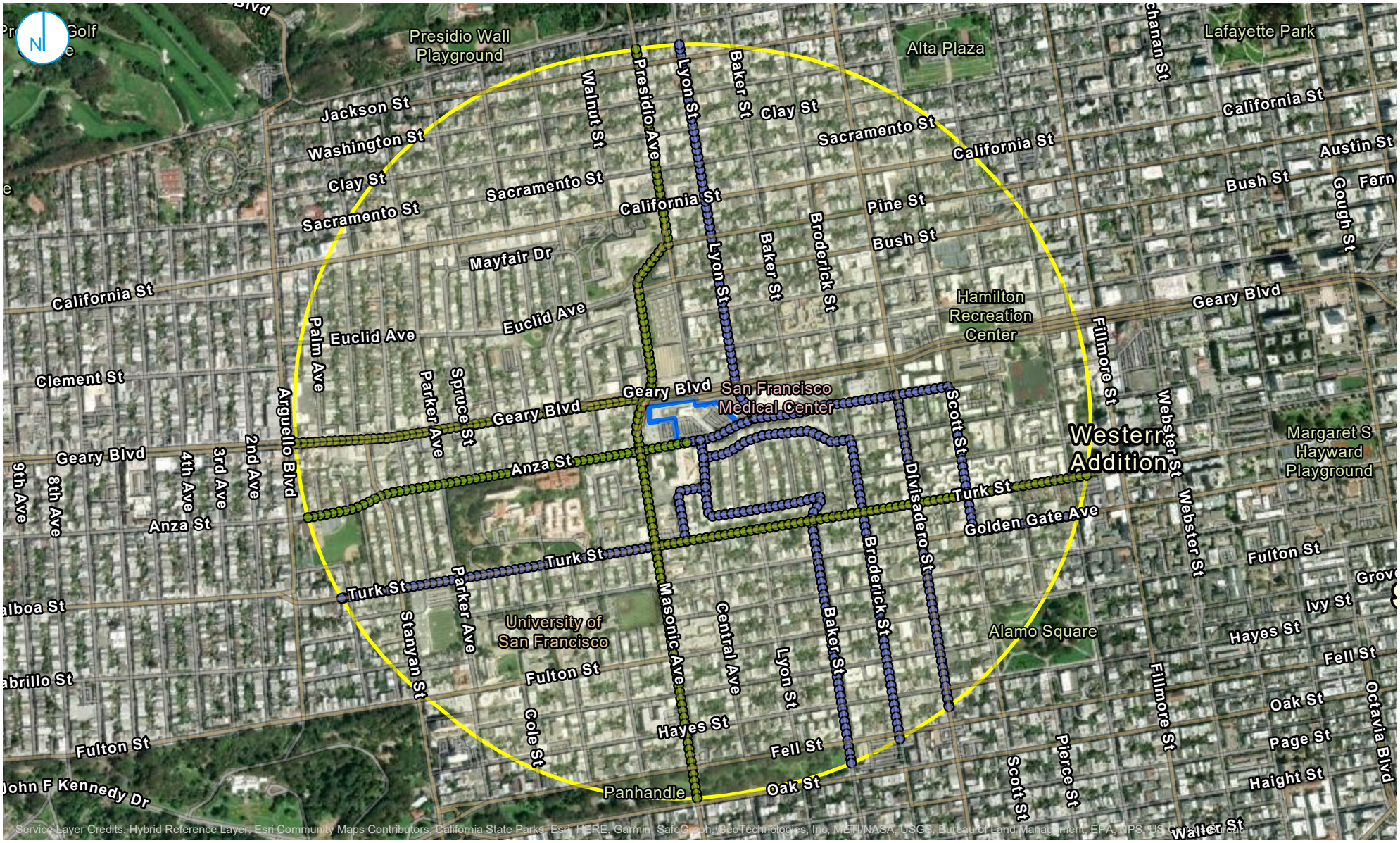
Whole Foods - 2675 Geary Blvd
San Francisco, California

FIGURE 04

RAMBOLL US CONSULTING, INC.
A RAMBOLL COMPANY

RAMBOLL

PROJECT: 1690022356 | DATED: 8/22/2022 | DESIGNER: LLI



Passenger Vehicle Outbound

Passenger Vehicle Inbound

Project Boundary

Modeling Extent (1000 m Buffer Area)

0 250 500 1,000 Meters

MODELED CONSTRUCTION AND OPERATIONAL SOURCES - PASSENGER VEHICLES

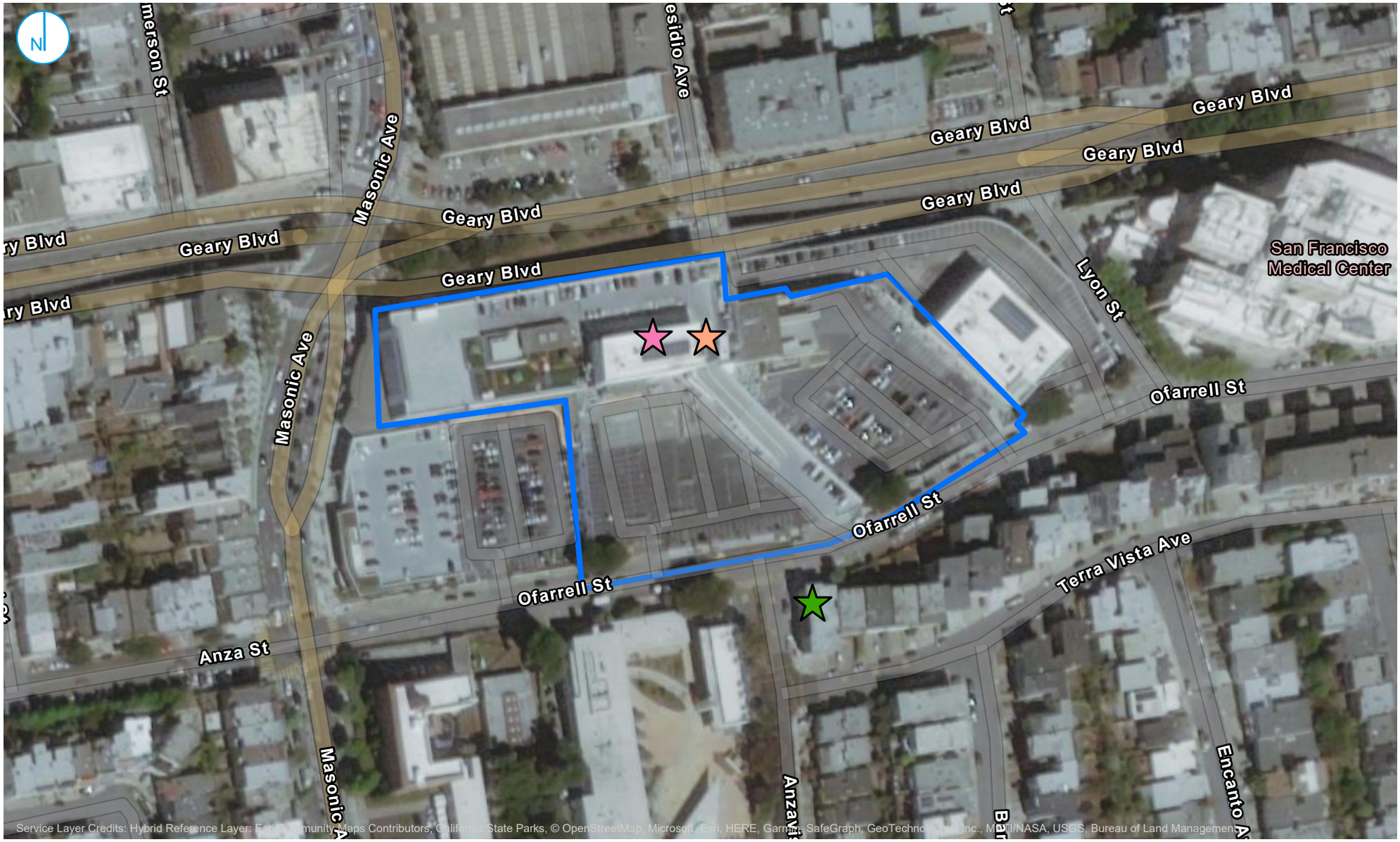
Whole Foods - 2675 Geary Blvd
San Francisco, California

FIGURE 05

RAMBOLL US CONSULTING, INC.
A RAMBOLL COMPANY

RAMBOLL

PROJECT: 1690022356 | DATED: 2/28/2022 | DESIGNER: LLI



Project Boundary

Cancer Risk, Chronic HI, and $PM_{2.5}$ Concentration MEI for Resident

Cancer Risk MEI for Daycare

Chronic HI and $PM_{2.5}$ Concentration MEI for Daycare

0 25 50 100 150 Meters

MAXIMALLY EXPOSED INDIVIDUAL RECEPTOR LOCATIONS

Whole Foods - 2675 Geary Blvd
San Francisco, California

FIGURE 06

RAMBOLL US CONSULTING, INC.
A RAMBOLL COMPANY

RAMBOLL

APPENDIX A

CALEEMOD® OUTPUT FOR ENERGY USE AND CONSUMER PRODUCTS DURING PROJECT OPERATION

Whole Foods - 2675 Geary Blvd San Francisco - San Francisco County, Annual

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

Whole Foods - 2675 Geary Blvd San Francisco

San Francisco County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	65.00	1000sqft	1.49	65,000.00	0
Supermarket	55.00	1000sqft	1.15	55,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	4.6	**Precipitation Freq (Days)**	64
Climate Zone	5			**Operational Year**	2025
Utility Company					
CO2 Intensity (lb/MWhr)	192	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Whole Foods store - no construction, only minor interior renovations. CO2 intensity factor calculated assuming a PG&E RPS of 47% for 2025.

Land Use - Land use based on data request dated 2021.09.08

Construction Phase - Operational emissions only

Off-road Equipment - Operational emissions only

Trips and VMT - Operational emissions only

On-road Fugitive Dust - Operational emissions only

Demolition - Operational emissions only

Grading - Operational emissions only

Architectural Coating - Operational emissions only

Vehicle Trips - Trip rate updated trip data provided by client. Mobile emissions calculated outside of CalEEMod.

Whole Foods - 2675 Geary Blvd San Francisco - San Francisco County, Annual

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

Vehicle Emission Factors - Mobile emissions calculated outside of CalEEMod. EFs here have been updated using the latest EMFAC tool and values.

Vehicle Emission Factors - Mobile emissions calculated outside of CalEEMod.

Vehicle Emission Factors - Mobile emissions calculated outside of CalEEMod.

Road Dust -

Energy Use - Electricity ccording to data request, updated 1/14/2022. NG consumption scaled to match total NG consumption of a similar project in Sunnyvale.

Water And Wastewater -

Fleet Mix - Mobile emissions calculated outside of CalEEMod.

Table Name	Column Name	Default Value	New Value
tblEnergyUse	LightingElect	0.35	0.23
tblEnergyUse	LightingElect	7.42	4.80
tblEnergyUse	NT24NG	12.69	15.09
tblEnergyUse	T24NG	24.29	28.88
tblLandUse	LotAcreage	1.26	1.15
tblProjectCharacteristics	CH4IntensityFactor	0	0.029
tblProjectCharacteristics	CO2IntensityFactor	0	192
tblProjectCharacteristics	N2OIntensityFactor	0	0.006
tblVehicleTrips	ST_TR	177.62	177.59
tblVehicleTrips	SU_TR	166.47	166.44
tblVehicleTrips	WD_TR	106.78	102.24

2.0 Emissions Summary

Whole Foods - 2675 Geary Blvd San Francisco - San Francisco County, 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					
2021	0.1375	1.1492	0.9880	1.9700e-003	0.0488	0.0553	0.1042	0.0174	0.0526	0.0700	0.0000	171.5754	171.5754	0.0313	4.1000e-003	173.5807
2022	0.4311	1.0289	1.0375	2.1100e-003	0.0306	0.0465	0.0771	8.3300e-003	0.0445	0.0528	0.0000	183.6718	183.6718	0.0308	4.9400e-003	185.9138
Maximum	**0.4311**	**1.1492**	**1.0375**	**2.1100e-003**	**0.0488**	**0.0553**	**0.1042**	**0.0174**	**0.0526**	**0.0700**	**0.0000**	**183.6718**	**183.6718**	**0.0313**	**4.9400e-003**	**185.9138**

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					
2021	0.1375	1.1492	0.9880	1.9700e-003	0.0488	0.0553	0.1042	0.0174	0.0526	0.0700	0.0000	171.5753	171.5753	0.0313	4.1000e-003	173.5805
2022	0.4311	1.0289	1.0375	2.1100e-003	0.0306	0.0465	0.0771	8.3300e-003	0.0445	0.0528	0.0000	183.6716	183.6716	0.0308	4.9400e-003	185.9136
Maximum	**0.4311**	**1.1492**	**1.0375**	**2.1100e-003**	**0.0488**	**0.0553**	**0.1042**	**0.0174**	**0.0526**	**0.0700**	**0.0000**	**183.6716**	**183.6716**	**0.0313**	**4.9400e-003**	**185.9136**

Whole Foods - 2675 Geary Blvd San Francisco - San Francisco County, 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	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)
1	**7-8-2021**	**10-7-2021**	0.6769	0.6769
2	**10-8-2021**	**1-7-2022**	0.6492	0.6492
3	**1-8-2022**	**4-7-2022**	0.5794	0.5794
4	**4-8-2022**	**7-7-2022**	0.5783	0.5783
5	**7-8-2022**	**9-30-2022**	0.2645	0.2645
		Highest	0.6769	0.6769

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	0.2491	1.0000e-005	1.1000e-003	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.1400e-003	2.1400e-003	1.0000e-005	0.0000	2.2800e-003
Energy	0.0130	0.1186	0.0996	7.1000e-004		9.0100e-003	9.0100e-003		9.0100e-003	9.0100e-003	0.0000	295.4634	295.4634	0.0276	7.5700e-003	298.4084
Mobile	2.3693	1.7843	17.4851	0.0271	2.8190	0.0221	2.8411	0.7535	0.0205	0.7740	0.0000	2,577.3936	2,577.3936	0.2839	0.1515	2,629.6356
Waste						0.0000	0.0000		0.0000	0.0000	62.9678	0.0000	62.9678	3.7213	0.0000	156.0001
Water						0.0000	0.0000		0.0000	0.0000	2.1509	3.2588	5.4097	0.2214	5.3200e-003	12.5298
Total	**2.6315**	**1.9029**	**17.5858**	**0.0278**	**2.8190**	**0.0311**	**2.8501**	**0.7535**	**0.0295**	**0.7830**	**65.1187**	**2,876.1179**	**2,941.2366**	**4.2542**	**0.1644**	**3,096.5761**

Whole Foods - 2675 Geary Blvd San Francisco - San Francisco County, 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	0.2491	1.0000e-005	1.1000e-003	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.1400e-003	2.1400e-003	1.0000e-005	0.0000	2.2800e-003
Energy	0.0130	0.1186	0.0996	7.1000e-004		9.0100e-003	9.0100e-003		9.0100e-003	9.0100e-003	0.0000	295.4634	295.4634	0.0276	7.5700e-003	298.4084
Mobile	2.3693	1.7843	17.4851	0.0271	2.8190	0.0221	2.8411	0.7535	0.0205	0.7740	0.0000	2,577.3936	2,577.3936	0.2839	0.1515	2,629.6356
Waste						0.0000	0.0000		0.0000	0.0000	62.9678	0.0000	62.9678	3.7213	0.0000	156.0001
Water						0.0000	0.0000		0.0000	0.0000	2.1509	3.2588	5.4097	0.2214	5.3200e-003	12.5298
Total	**2.6315**	**1.9029**	**17.5858**	**0.0278**	**2.8190**	**0.0311**	**2.8501**	**0.7535**	**0.0295**	**0.7830**	**65.1187**	**2,876.1179**	**2,941.2366**	**4.2542**	**0.1644**	**3,096.5761**

	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**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	7/8/2021	8/4/2021	5	20	
2	Site Preparation	Site Preparation	8/5/2021	8/9/2021	5	3	
3	Grading	Grading	8/10/2021	8/17/2021	5	6	

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4	Building Construction	Building Construction	8/18/2021	6/21/2022	5	220	
5	Paving	Paving	6/22/2022	7/5/2022	5	10	
6	Architectural Coating	Architectural Coating	7/6/2022	7/19/2022	5	10	

Acres of Grading (Site Preparation Phase): 4.5

Acres of Grading (Grading Phase): 6

Acres of Paving: 1.49

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 82,500; Non-Residential Outdoor: 27,500; Striped Parking Area: 3,900 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Rubber Tired Dozers	1	8.00	247	0.40
Demolition	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Site Preparation	Graders	1	8.00	187	0.41
Site Preparation	Scrapers	1	8.00	367	0.48
Site Preparation	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	2	7.00	97	0.37
Building Construction	Cranes	1	8.00	231	0.29
Building Construction	Forklifts	2	7.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Building Construction	Welders	3	8.00	46	0.45
Paving	Cement and Mortar Mixers	1	8.00	9	0.56
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	1	8.00	132	0.36

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Paving	Rollers	2	8.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Architectural Coating	Air Compressors	1	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
Demolition	5	13.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	3	8.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	10.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	8	45.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	9.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2021

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					
Off-Road	0.0199	0.1970	0.1449	2.4000e-004		0.0104	0.0104		9.7100e-003	9.7100e-003	0.0000	21.0713	21.0713	5.3900e-003	0.0000	21.2060
Total	**0.0199**	**0.1970**	**0.1449**	**2.4000e-004**		**0.0104**	**0.0104**		**9.7100e-003**	**9.7100e-003**	**0.0000**	**21.0713**	**21.0713**	**5.3900e-003**	**0.0000**	**21.2060**

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3.2 Demolition - 2021

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	0.0000	0.0000	0.0000	0.0000	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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.6000e-004	2.5000e-004	3.2900e-003	1.0000e-005	1.0300e-003	1.0000e-005	1.0300e-003	2.7000e-004	1.0000e-005	2.8000e-004	0.0000	0.8902	0.8902	3.0000e-005	2.0000e-005	0.8980
Total	**3.6000e-004**	**2.5000e-004**	**3.2900e-003**	**1.0000e-005**	**1.0300e-003**	**1.0000e-005**	**1.0300e-003**	**2.7000e-004**	**1.0000e-005**	**2.8000e-004**	**0.0000**	**0.8902**	**0.8902**	**3.0000e-005**	**2.0000e-005**	**0.8980**

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					
Off-Road	0.0199	0.1970	0.1449	2.4000e-004		0.0104	0.0104		9.7100e-003	9.7100e-003	0.0000	21.0713	21.0713	5.3900e-003	0.0000	21.2060
Total	**0.0199**	**0.1970**	**0.1449**	**2.4000e-004**		**0.0104**	**0.0104**		**9.7100e-003**	**9.7100e-003**	**0.0000**	**21.0713**	**21.0713**	**5.3900e-003**	**0.0000**	**21.2060**

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3.2 Demolition - 2021

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	0.0000	0.0000	0.0000	0.0000	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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.6000e-004	2.5000e-004	3.2900e-003	1.0000e-005	1.0300e-003	1.0000e-005	1.0300e-003	2.7000e-004	1.0000e-005	2.8000e-004	0.0000	0.8902	0.8902	3.0000e-005	2.0000e-005	0.8980
Total	**3.6000e-004**	**2.5000e-004**	**3.2900e-003**	**1.0000e-005**	**1.0300e-003**	**1.0000e-005**	**1.0300e-003**	**2.7000e-004**	**1.0000e-005**	**2.8000e-004**	**0.0000**	**0.8902**	**0.8902**	**3.0000e-005**	**2.0000e-005**	**0.8980**

3.3 Site Preparation - 2021

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					
Fugitive Dust					2.3900e-003	0.0000	2.3900e-003	2.6000e-004	0.0000	2.6000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.3200e-003	0.0274	0.0161	4.0000e-005		1.0500e-003	1.0500e-003		9.7000e-004	9.7000e-004	0.0000	3.2290	3.2290	1.0400e-003	0.0000	3.2551
Total	**2.3200e-003**	**0.0274**	**0.0161**	**4.0000e-005**	**2.3900e-003**	**1.0500e-003**	**3.4400e-003**	**2.6000e-004**	**9.7000e-004**	**1.2300e-003**	**0.0000**	**3.2290**	**3.2290**	**1.0400e-003**	**0.0000**	**3.2551**

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3.3 Site Preparation - 2021

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	0.0000	0.0000	0.0000	0.0000	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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.0000e-005	2.0000e-005	3.0000e-004	0.0000	9.0000e-005	0.0000	1.0000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0822	0.0822	0.0000	0.0000	0.0829
Total	**3.0000e-005**	**2.0000e-005**	**3.0000e-004**	**0.0000**	**9.0000e-005**	**0.0000**	**1.0000e-004**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**0.0822**	**0.0822**	**0.0000**	**0.0000**	**0.0829**

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					
Fugitive Dust					2.3900e-003	0.0000	2.3900e-003	2.6000e-004	0.0000	2.6000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.3200e-003	0.0274	0.0161	4.0000e-005		1.0500e-003	1.0500e-003		9.7000e-004	9.7000e-004	0.0000	3.2290	3.2290	1.0400e-003	0.0000	3.2551
Total	**2.3200e-003**	**0.0274**	**0.0161**	**4.0000e-005**	**2.3900e-003**	**1.0500e-003**	**3.4400e-003**	**2.6000e-004**	**9.7000e-004**	**1.2300e-003**	**0.0000**	**3.2290**	**3.2290**	**1.0400e-003**	**0.0000**	**3.2551**

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3.3 Site Preparation - 2021

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	0.0000	0.0000	0.0000	0.0000	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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.0000e-005	2.0000e-005	3.0000e-004	0.0000	9.0000e-005	0.0000	1.0000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0822	0.0822	0.0000	0.0000	0.0829
Total	**3.0000e-005**	**2.0000e-005**	**3.0000e-004**	**0.0000**	**9.0000e-005**	**0.0000**	**1.0000e-004**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**0.0822**	**0.0822**	**0.0000**	**0.0000**	**0.0829**

3.4 Grading - 2021

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					
Fugitive Dust					0.0213	0.0000	0.0213	0.0103	0.0000	0.0103	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.4800e-003	0.0606	0.0293	6.0000e-005		2.7500e-003	2.7500e-003		2.5300e-003	2.5300e-003	0.0000	5.4312	5.4312	1.7600e-003	0.0000	5.4751
Total	**5.4800e-003**	**0.0606**	**0.0293**	**6.0000e-005**	**0.0213**	**2.7500e-003**	**0.0240**	**0.0103**	**2.5300e-003**	**0.0128**	**0.0000**	**5.4312**	**5.4312**	**1.7600e-003**	**0.0000**	**5.4751**

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3.4 Grading - 2021

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	0.0000	0.0000	0.0000	0.0000	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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.0000e-005	6.0000e-005	7.6000e-004	0.0000	2.4000e-004	0.0000	2.4000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.2054	0.2054	1.0000e-005	1.0000e-005	0.2072
Total	**8.0000e-005**	**6.0000e-005**	**7.6000e-004**	**0.0000**	**2.4000e-004**	**0.0000**	**2.4000e-004**	**6.0000e-005**	**0.0000**	**6.0000e-005**	**0.0000**	**0.2054**	**0.2054**	**1.0000e-005**	**1.0000e-005**	**0.2072**

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					
Fugitive Dust					0.0213	0.0000	0.0213	0.0103	0.0000	0.0103	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.4800e-003	0.0606	0.0293	6.0000e-005		2.7500e-003	2.7500e-003		2.5300e-003	2.5300e-003	0.0000	5.4312	5.4312	1.7600e-003	0.0000	5.4751
Total	**5.4800e-003**	**0.0606**	**0.0293**	**6.0000e-005**	**0.0213**	**2.7500e-003**	**0.0240**	**0.0103**	**2.5300e-003**	**0.0128**	**0.0000**	**5.4312**	**5.4312**	**1.7600e-003**	**0.0000**	**5.4751**

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3.4 Grading - 2021

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	0.0000	0.0000	0.0000	0.0000	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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.0000e-005	6.0000e-005	7.6000e-004	0.0000	2.4000e-004	0.0000	2.4000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.2054	0.2054	1.0000e-005	1.0000e-005	0.2072
Total	**8.0000e-005**	**6.0000e-005**	**7.6000e-004**	**0.0000**	**2.4000e-004**	**0.0000**	**2.4000e-004**	**6.0000e-005**	**0.0000**	**6.0000e-005**	**0.0000**	**0.2054**	**0.2054**	**1.0000e-005**	**1.0000e-005**	**0.2072**

3.5 Building Construction - 2021

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					
Off-Road	0.1002	0.7854	0.7136	1.2300e-003		0.0401	0.0401		0.0384	0.0384	0.0000	101.7479	101.7479	0.0200	0.0000	102.2483
Total	**0.1002**	**0.7854**	**0.7136**	**1.2300e-003**		**0.0401**	**0.0401**		**0.0384**	**0.0384**	**0.0000**	**101.7479**	**101.7479**	**0.0200**	**0.0000**	**102.2483**

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3.5 Building Construction - 2021

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.0800e-003	0.0742	0.0240	2.2000e-004	6.4200e-003	9.5000e-004	7.3600e-003	1.8600e-003	9.0000e-004	2.7600e-003	0.0000	23.8199	23.8199	2.6300e-003	3.6600e-003	24.9764
Worker	6.0300e-003	4.2900e-003	0.0558	1.6000e-004	0.0174	1.2000e-004	0.0175	4.6400e-003	1.1000e-004	4.7500e-003	0.0000	15.0985	15.0985	4.6000e-004	4.1000e-004	15.2316
Total	**9.1100e-003**	**0.0785**	**0.0797**	**3.8000e-004**	**0.0238**	**1.0700e-003**	**0.0249**	**6.5000e-003**	**1.0100e-003**	**7.5100e-003**	**0.0000**	**38.9183**	**38.9183**	**3.0900e-003**	**4.0700e-003**	**40.2080**

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					
Off-Road	0.1002	0.7854	0.7136	1.2300e-003		0.0401	0.0401		0.0384	0.0384	0.0000	101.7478	101.7478	0.0200	0.0000	102.2482
Total	**0.1002**	**0.7854**	**0.7136**	**1.2300e-003**		**0.0401**	**0.0401**		**0.0384**	**0.0384**	**0.0000**	**101.7478**	**101.7478**	**0.0200**	**0.0000**	**102.2482**

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3.5 Building Construction - 2021

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.0800e-003	0.0742	0.0240	2.2000e-004	6.4200e-003	9.5000e-004	7.3600e-003	1.8600e-003	9.0000e-004	2.7600e-003	0.0000	23.8199	23.8199	2.6300e-003	3.6600e-003	24.9764
Worker	6.0300e-003	4.2900e-003	0.0558	1.6000e-004	0.0174	1.2000e-004	0.0175	4.6400e-003	1.1000e-004	4.7500e-003	0.0000	15.0985	15.0985	4.6000e-004	4.1000e-004	15.2316
Total	**9.1100e-003**	**0.0785**	**0.0797**	**3.8000e-004**	**0.0238**	**1.0700e-003**	**0.0249**	**6.5000e-003**	**1.0100e-003**	**7.5100e-003**	**0.0000**	**38.9183**	**38.9183**	**3.0900e-003**	**4.0700e-003**	**40.2080**

3.5 Building Construction - 2022

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					
Off-Road	0.1132	0.8909	0.8756	1.5300e-003		0.0428	0.0428		0.0411	0.0411	0.0000	126.6849	126.6849	0.0244	0.0000	127.2959
Total	**0.1132**	**0.8909**	**0.8756**	**1.5300e-003**		**0.0428**	**0.0428**		**0.0411**	**0.0411**	**0.0000**	**126.6849**	**126.6849**	**0.0244**	**0.0000**	**127.2959**

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3.5 Building Construction - 2022

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.5600e-003	0.0794	0.0269	2.7000e-004	7.9900e-003	6.6000e-004	8.6500e-003	2.3100e-003	6.3000e-004	2.9400e-003	0.0000	28.8531	28.8531	3.2500e-003	4.4500e-003	30.2600
Worker	7.0300e-003	4.7400e-003	0.0647	2.0000e-004	0.0217	1.4000e-004	0.0218	5.7700e-003	1.3000e-004	5.9000e-003	0.0000	18.3021	18.3021	5.2000e-004	4.7000e-004	18.4559
Total	**9.5900e-003**	**0.0842**	**0.0916**	**4.7000e-004**	**0.0297**	**8.0000e-004**	**0.0305**	**8.0800e-003**	**7.6000e-004**	**8.8400e-003**	**0.0000**	**47.1552**	**47.1552**	**3.7700e-003**	**4.9200e-003**	**48.7159**

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					
Off-Road	0.1132	0.8908	0.8756	1.5300e-003		0.0428	0.0428		0.0411	0.0411	0.0000	126.6847	126.6847	0.0244	0.0000	127.2957
Total	**0.1132**	**0.8908**	**0.8756**	**1.5300e-003**		**0.0428**	**0.0428**		**0.0411**	**0.0411**	**0.0000**	**126.6847**	**126.6847**	**0.0244**	**0.0000**	**127.2957**

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3.5 Building Construction - 2022

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.5600e-003	0.0794	0.0269	2.7000e-004	7.9900e-003	6.6000e-004	8.6500e-003	2.3100e-003	6.3000e-004	2.9400e-003	0.0000	28.8531	28.8531	3.2500e-003	4.4500e-003	30.2600
Worker	7.0300e-003	4.7400e-003	0.0647	2.0000e-004	0.0217	1.4000e-004	0.0218	5.7700e-003	1.3000e-004	5.9000e-003	0.0000	18.3021	18.3021	5.2000e-004	4.7000e-004	18.4559
Total	**9.5900e-003**	**0.0842**	**0.0916**	**4.7000e-004**	**0.0297**	**8.0000e-004**	**0.0305**	**8.0800e-003**	**7.6000e-004**	**8.8400e-003**	**0.0000**	**47.1552**	**47.1552**	**3.7700e-003**	**4.9200e-003**	**48.7159**

3.6 Paving - 2022

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					
Off-Road	4.7100e-003	0.0467	0.0585	9.0000e-005		2.4400e-003	2.4400e-003		2.2500e-003	2.2500e-003	0.0000	7.7550	7.7550	2.4600e-003	0.0000	7.8165
Paving	1.9500e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**6.6600e-003**	**0.0467**	**0.0585**	**9.0000e-005**		**2.4400e-003**	**2.4400e-003**		**2.2500e-003**	**2.2500e-003**	**0.0000**	**7.7550**	**7.7550**	**2.4600e-003**	**0.0000**	**7.8165**

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3.6 Paving - 2022

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	0.0000	0.0000	0.0000	0.0000	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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.9000e-004	1.3000e-004	1.7700e-003	1.0000e-005	5.9000e-004	0.0000	6.0000e-004	1.6000e-004	0.0000	1.6000e-004	0.0000	0.5001	0.5001	1.0000e-005	1.0000e-005	0.5043
Total	**1.9000e-004**	**1.3000e-004**	**1.7700e-003**	**1.0000e-005**	**5.9000e-004**	**0.0000**	**6.0000e-004**	**1.6000e-004**	**0.0000**	**1.6000e-004**	**0.0000**	**0.5001**	**0.5001**	**1.0000e-005**	**1.0000e-005**	**0.5043**

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					
Off-Road	4.7100e-003	0.0467	0.0585	9.0000e-005		2.4400e-003	2.4400e-003		2.2500e-003	2.2500e-003	0.0000	7.7550	7.7550	2.4600e-003	0.0000	7.8165
Paving	1.9500e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**6.6600e-003**	**0.0467**	**0.0585**	**9.0000e-005**		**2.4400e-003**	**2.4400e-003**		**2.2500e-003**	**2.2500e-003**	**0.0000**	**7.7550**	**7.7550**	**2.4600e-003**	**0.0000**	**7.8165**

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3.6 Paving - 2022

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	0.0000	0.0000	0.0000	0.0000	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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.9000e-004	1.3000e-004	1.7700e-003	1.0000e-005	5.9000e-004	0.0000	6.0000e-004	1.6000e-004	0.0000	1.6000e-004	0.0000	0.5001	0.5001	1.0000e-005	1.0000e-005	0.5043
Total	**1.9000e-004**	**1.3000e-004**	**1.7700e-003**	**1.0000e-005**	**5.9000e-004**	**0.0000**	**6.0000e-004**	**1.6000e-004**	**0.0000**	**1.6000e-004**	**0.0000**	**0.5001**	**0.5001**	**1.0000e-005**	**1.0000e-005**	**0.5043**

3.7 Architectural Coating - 2022

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	0.3004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.0200e-003	7.0400e-003	9.0700e-003	1.0000e-005		4.1000e-004	4.1000e-004		4.1000e-004	4.1000e-004	0.0000	1.2766	1.2766	8.0000e-005	0.0000	1.2787
Total	**0.3014**	**7.0400e-003**	**9.0700e-003**	**1.0000e-005**		**4.1000e-004**	**4.1000e-004**		**4.1000e-004**	**4.1000e-004**	**0.0000**	**1.2766**	**1.2766**	**8.0000e-005**	**0.0000**	**1.2787**

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3.7 Architectural Coating - 2022

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	0.0000	0.0000	0.0000	0.0000	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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.2000e-004	8.0000e-005	1.0600e-003	0.0000	3.6000e-004	0.0000	3.6000e-004	9.0000e-005	0.0000	1.0000e-004	0.0000	0.3000	0.3000	1.0000e-005	1.0000e-005	0.3026
Total	**1.2000e-004**	**8.0000e-005**	**1.0600e-003**	**0.0000**	**3.6000e-004**	**0.0000**	**3.6000e-004**	**9.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**	**0.3000**	**0.3000**	**1.0000e-005**	**1.0000e-005**	**0.3026**

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	0.3004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.0200e-003	7.0400e-003	9.0700e-003	1.0000e-005		4.1000e-004	4.1000e-004		4.1000e-004	4.1000e-004	0.0000	1.2766	1.2766	8.0000e-005	0.0000	1.2787
Total	**0.3014**	**7.0400e-003**	**9.0700e-003**	**1.0000e-005**		**4.1000e-004**	**4.1000e-004**		**4.1000e-004**	**4.1000e-004**	**0.0000**	**1.2766**	**1.2766**	**8.0000e-005**	**0.0000**	**1.2787**

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3.7 Architectural Coating - 2022

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	0.0000	0.0000	0.0000	0.0000	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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.2000e-004	8.0000e-005	1.0600e-003	0.0000	3.6000e-004	0.0000	3.6000e-004	9.0000e-005	0.0000	1.0000e-004	0.0000	0.3000	0.3000	1.0000e-005	1.0000e-005	0.3026
Total	**1.2000e-004**	**8.0000e-005**	**1.0600e-003**	**0.0000**	**3.6000e-004**	**0.0000**	**3.6000e-004**	**9.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**	**0.3000**	**0.3000**	**1.0000e-005**	**1.0000e-005**	**0.3026**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

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	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	2.3693	1.7843	17.4851	0.0271	2.8190	0.0221	2.8411	0.7535	0.0205	0.7740	0.0000	2,577.3936	2,577.3936	0.2839	0.1515	2,629.6356
Unmitigated	2.3693	1.7843	17.4851	0.0271	2.8190	0.0221	2.8411	0.7535	0.0205	0.7740	0.0000	2,577.3936	2,577.3936	0.2839	0.1515	2,629.6356

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Parking Lot	0.00	0.00	0.00		
Supermarket	5,623.20	9,767.45	9154.20	7,643,239	7,643,239
Total	5,623.20	9,767.45	9,154.20	7,643,239	7,643,239

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
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Supermarket	9.50	7.30	7.30	6.50	74.50	19.00	34	30	36

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Parking Lot	0.556828	0.060307	0.188813	0.104870	0.021351	0.005032	0.017142	0.004233	0.001901	0.002263	0.034674	0.000871	0.001715
Supermarket	0.556828	0.060307	0.188813	0.104870	0.021351	0.005032	0.017142	0.004233	0.001901	0.002263	0.034674	0.000871	0.001715

5.0 Energy Detail

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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	0.0000		0.0000	0.0000	0.0000	166.4111	166.4111	0.0251	5.2000e-003	168.5891
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	166.4111	166.4111	0.0251	5.2000e-003	168.5891
NaturalGas Mitigated	0.0130	0.1186	0.0996	7.1000e-004		9.0100e-003	9.0100e-003		9.0100e-003	9.0100e-003	0.0000	129.0524	129.0524	2.4700e-003	2.3700e-003	129.8193
NaturalGas Unmitigated	0.0130	0.1186	0.0996	7.1000e-004		9.0100e-003	9.0100e-003		9.0100e-003	9.0100e-003	0.0000	129.0524	129.0524	2.4700e-003	2.3700e-003	129.8193

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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					
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Supermarket	2.41835e+006	0.0130	0.1186	0.0996	7.1000e-004		9.0100e-003	9.0100e-003		9.0100e-003	9.0100e-003	0.0000	129.0524	129.0524	2.4700e-003	2.3700e-003	129.8193
Total		**0.0130**	**0.1186**	**0.0996**	**7.1000e-004**		**9.0100e-003**	**9.0100e-003**		**9.0100e-003**	**9.0100e-003**	**0.0000**	**129.0524**	**129.0524**	**2.4700e-003**	**2.3700e-003**	**129.8193**

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					
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Supermarket	2.41835e+006	0.0130	0.1186	0.0996	7.1000e-004		9.0100e-003	9.0100e-003		9.0100e-003	9.0100e-003	0.0000	129.0524	129.0524	2.4700e-003	2.3700e-003	129.8193
Total		**0.0130**	**0.1186**	**0.0996**	**7.1000e-004**		**9.0100e-003**	**9.0100e-003**		**9.0100e-003**	**9.0100e-003**	**0.0000**	**129.0524**	**129.0524**	**2.4700e-003**	**2.3700e-003**	**129.8193**

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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			
Parking Lot	14950	1.3020	2.0000e-004	4.0000e-005	1.3190
Supermarket	1.89585e+006	165.1091	0.0249	5.1600e-003	167.2701
Total		**166.4111**	**0.0251**	**5.2000e-003**	**168.5891**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Parking Lot	14950	1.3020	2.0000e-004	4.0000e-005	1.3190
Supermarket	1.89585e+006	165.1091	0.0249	5.1600e-003	167.2701
Total		**166.4111**	**0.0251**	**5.2000e-003**	**168.5891**

6.0 Area Detail

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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	0.2491	1.0000e-005	1.1000e-003	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.1400e-003	2.1400e-003	1.0000e-005	0.0000	2.2800e-003
Unmitigated	0.2491	1.0000e-005	1.1000e-003	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.1400e-003	2.1400e-003	1.0000e-005	0.0000	2.2800e-003

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	0.0300					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.2190					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.0000e-004	1.0000e-005	1.1000e-003	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.1400e-003	2.1400e-003	1.0000e-005	0.0000	2.2800e-003
Total	**0.2491**	**1.0000e-005**	**1.1000e-003**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.1400e-003**	**2.1400e-003**	**1.0000e-005**	**0.0000**	**2.2800e-003**

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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	0.0300					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.2190					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.0000e-004	1.0000e-005	1.1000e-003	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.1400e-003	2.1400e-003	1.0000e-005	0.0000	2.2800e-003
Total	**0.2491**	**1.0000e-005**	**1.1000e-003**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.1400e-003**	**2.1400e-003**	**1.0000e-005**	**0.0000**	**2.2800e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

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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	5.4097	0.2214	5.3200e-003	12.5298
Unmitigated	5.4097	0.2214	5.3200e-003	12.5298

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Supermarket	6.77975 / 0.209683	5.4097	0.2214	5.3200e-003	12.5298
Total		**5.4097**	**0.2214**	**5.3200e-003**	**12.5298**

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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			
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Supermarket	6.77975 / 0.209683	5.4097	0.2214	5.3200e-003	12.5298
Total		**5.4097**	**0.2214**	**5.3200e-003**	**12.5298**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	62.9678	3.7213	0.0000	156.0001
Unmitigated	62.9678	3.7213	0.0000	156.0001

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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			
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Supermarket	310.2	62.9678	3.7213	0.0000	156.0001
Total		**62.9678**	**3.7213**	**0.0000**	**156.0001**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Supermarket	310.2	62.9678	3.7213	0.0000	156.0001
Total		**62.9678**	**3.7213**	**0.0000**	**156.0001**

9.0 Operational Offroad

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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 B

CONSTRUCTION AND OPERATIONAL TOXIC AIR CONTAMINANT EMISSIONS FOR HRA MODELING

Appendix B
Construction and Operational Toxic Air Contaminant Emissions for HRA Modeling
Whole Foods - 2675 Geary Blvd
San Francisco, California

Phase	Modeled Source Group	Pollutant	CAS	Year	Emission Rate (g/s)	Source Description
Construction[1,2,3]	CRANE	DPM	9901	2024	1.51E-05	Construction_Crane
	CRANE	PM2.5	88101	2024	1.40E-05	Construction_Crane
	PVIN	1,3-Butadiene	106990	2024	2.85E-06	Construction_Cars
	PVIN	Acetaldehyde	75070	2024	1.45E-06	Construction_Cars
	PVIN	Acrolein	107028	2024	6.73E-07	Construction_Cars
	PVIN	Benzene	71432	2024	2.06E-05	Construction_Cars
	PVIN	Ethylbenzene	100414	2024	8.04E-06	Construction_Cars
	PVIN	Formaldehyde	50000	2024	8.17E-06	Construction_Cars
	PVIN	Hexane	110543	2024	4.18E-05	Construction_Cars
	PVIN	Methanol	67561	2024	6.21E-07	Construction_Cars
	PVIN	Methyl Ethyl Ketone	78933	2024	1.03E-07	Construction_Cars
	PVIN	Naphthalene	91203	2024	2.59E-07	Construction_Cars
	PVIN	Propylene	115071	2024	1.58E-05	Construction_Cars
	PVIN	Styrene	100425	2024	6.21E-07	Construction_Cars
	PVIN	Toluene	108883	2024	6.68E-05	Construction_Cars
	PVIN	Xylenes	1330207	2024	3.74E-05	Construction_Cars
	PVOUT	1,3-Butadiene	106990	2024	3.21E-06	Construction_Cars
	PVOUT	Acetaldehyde	75070	2024	1.63E-06	Construction_Cars
	PVOUT	Acrolein	107028	2024	7.58E-07	Construction_Cars
	PVOUT	Benzene	71432	2024	2.32E-05	Construction_Cars
	PVOUT	Ethylbenzene	100414	2024	9.06E-06	Construction_Cars
	PVOUT	Formaldehyde	50000	2024	9.21E-06	Construction_Cars
	PVOUT	Hexane	110543	2024	4.71E-05	Construction_Cars
	PVOUT	Methanol	67561	2024	7.00E-07	Construction_Cars
	PVOUT	Methyl Ethyl Ketone	78933	2024	1.17E-07	Construction_Cars
	PVOUT	Naphthalene	91203	2024	2.91E-07	Construction_Cars
	PVOUT	Propylene	115071	2024	1.78E-05	Construction_Cars
	PVOUT	Styrene	100425	2024	7.00E-07	Construction_Cars
	PVOUT	Toluene	108883	2024	7.52E-05	Construction_Cars
	PVOUT	Xylenes	1330207	2024	4.22E-05	Construction_Cars
	PVIN	PM2.5	88101	2024	3.75E-05	Construction_Cars
	PVOUT	PM2.5	88101	2024	4.22E-05	Construction_Cars
	TRIN	DPM	9901	2024	1.07E-07	Construction_Trucks
	TROUT	DPM	9901	2024	1.03E-07	Construction_Trucks
	TRIN	PM2.5	88101	2024	3.45E-07	Construction_Trucks
	TROUT	PM2.5	88101	2024	3.33E-07	Construction_Trucks
Operations[4,5,6,7]	PVIN	1,3-Butadiene	106990	2025 - 2054	4.57E-05	Operations_Cars
	PVIN	Acetaldehyde	75070	2025 - 2054	2.33E-05	Operations_Cars
	PVIN	Acrolein	107028	2025 - 2054	1.08E-05	Operations_Cars
	PVIN	Benzene	71432	2025 - 2054	3.36E-04	Operations_Cars
	PVIN	Ethylbenzene	100414	2025 - 2054	1.31E-04	Operations_Cars
	PVIN	Formaldehyde	50000	2025 - 2054	1.31E-04	Operations_Cars
	PVIN	Hexane	110543	2025 - 2054	6.94E-04	Operations_Cars
	PVIN	Methanol	67561	2025 - 2054	9.97E-06	Operations_Cars
	PVIN	Methyl Ethyl Ketone	78933	2025 - 2054	1.66E-06	Operations_Cars
	PVIN	Naphthalene	91203	2025 - 2054	4.15E-06	Operations_Cars
	PVIN	Propylene	115071	2025 - 2054	2.54E-04	Operations_Cars
	PVIN	Styrene	100425	2025 - 2054	9.97E-06	Operations_Cars
	PVIN	Toluene	108883	2025 - 2054	1.10E-03	Operations_Cars
	PVIN	Xylenes	1330207	2025 - 2054	6.10E-04	Operations_Cars
	PVOUT	1,3-Butadiene	106990	2025 - 2054	5.15E-05	Operations_Cars
	PVOUT	Acetaldehyde	75070	2025 - 2054	2.62E-05	Operations_Cars
	PVOUT	Acrolein	107028	2025 - 2054	1.22E-05	Operations_Cars
	PVOUT	Benzene	71432	2025 - 2054	3.79E-04	Operations_Cars
	PVOUT	Ethylbenzene	100414	2025 - 2054	1.48E-04	Operations_Cars
	PVOUT	Formaldehyde	50000	2025 - 2054	1.48E-04	Operations_Cars
	PVOUT	Hexane	110543	2025 - 2054	7.82E-04	Operations_Cars
	PVOUT	Methanol	67561	2025 - 2054	1.12E-05	Operations_Cars
	PVOUT	Methyl Ethyl Ketone	78933	2025 - 2054	1.87E-06	Operations_Cars
	PVOUT	Naphthalene	91203	2025 - 2054	4.68E-06	Operations_Cars
	PVOUT	Propylene	115071	2025 - 2054	2.86E-04	Operations_Cars
	PVOUT	Styrene	100425	2025 - 2054	1.12E-05	Operations_Cars
	PVOUT	Toluene	108883	2025 - 2054	1.24E-03	Operations_Cars
	PVOUT	Xylenes	1330207	2025 - 2054	6.87E-04	Operations_Cars
	PVIN	PM2.5	88101	2025 - 2054	6.41E-04	Operations_Cars
	PVOUT	PM2.5	88101	2025 - 2054	7.22E-04	Operations_Cars
	TRIN	DPM	9901	2025 - 2054	1.55E-05	Operations_Trucks
	TROUT	DPM	9901	2025 - 2054	1.50E-05	Operations_Trucks
	TRPK	DPM	9901	2025 - 2054	1.77E-06	Operations_Trucks
	TRIN	PM2.5	88101	2025 - 2054	4.64E-05	Operations_Trucks
	TROUT	PM2.5	88101	2025 - 2054	4.48E-05	Operations_Trucks
	TRPK	PM2.5	88101	2025 - 2054	5.30E-06	Operations_Trucks
	TRU_LD	PM2.5	88101	2025 - 2054	8.74E-06	Operations_Idling
	TRU_LD	DPM	9901	2025 - 2054	9.13E-06	Operations_Idling

Phase	Modeled Source Group	Pollutant	CAS	Year	Emission Rate (g/s)	Source Description
Operations[4,5,6,7]	TRIN	DPM	9901	2025	2.27E-05	Operations_TRU
	TRIN	DPM	9901	2026	2.16E-05	Operations_TRU
	TRIN	DPM	9901	2027	2.08E-05	Operations_TRU
	TRIN	DPM	9901	2028	2.00E-05	Operations_TRU
	TRIN	DPM	9901	2029	1.93E-05	Operations_TRU
	TRIN	DPM	9901	2030	3.08E-06	Operations_TRU
	TRIN	DPM	9901	2031	2.79E-06	Operations_TRU
	TRIN	DPM	9901	2032	2.56E-06	Operations_TRU
	TRIN	DPM	9901	2033	2.40E-06	Operations_TRU
	TRIN	DPM	9901	2034	2.31E-06	Operations_TRU
	TRIN	DPM	9901	2035	2.24E-06	Operations_TRU
	TRIN	DPM	9901	2036	2.16E-06	Operations_TRU
	TRIN	DPM	9901	2037	2.08E-06	Operations_TRU
	TRIN	DPM	9901	2038	2.02E-06	Operations_TRU
	TRIN	DPM	9901	2039	1.96E-06	Operations_TRU
	TRIN	DPM	9901	2040	1.92E-06	Operations_TRU
	TRIN	DPM	9901	2041	1.90E-06	Operations_TRU
	TRIN	DPM	9901	2042	1.89E-06	Operations_TRU
	TRIN	DPM	9901	2043	1.88E-06	Operations_TRU
	TRIN	DPM	9901	2044	1.88E-06	Operations_TRU
	TRIN	DPM	9901	2045	1.88E-06	Operations_TRU
	TRIN	DPM	9901	2046	1.89E-06	Operations_TRU
	TRIN	DPM	9901	2047	1.88E-06	Operations_TRU
	TRIN	DPM	9901	2048	1.88E-06	Operations_TRU
	TRIN	DPM	9901	2049	1.88E-06	Operations_TRU
	TRIN	DPM	9901	2050	1.88E-06	Operations_TRU
	TRIN	DPM	9901	2051	1.88E-06	Operations_TRU
	TRIN	DPM	9901	2052	1.88E-06	Operations_TRU
	TRIN	DPM	9901	2053	1.88E-06	Operations_TRU
	TRIN	DPM	9901	2054	1.88E-06	Operations_TRU
	TROUT	DPM	9901	2025	2.19E-05	Operations_TRU
	TROUT	DPM	9901	2026	2.09E-05	Operations_TRU
	TROUT	DPM	9901	2027	2.00E-05	Operations_TRU
	TROUT	DPM	9901	2028	1.93E-05	Operations_TRU
	TROUT	DPM	9901	2029	1.86E-05	Operations_TRU
	TROUT	DPM	9901	2030	2.98E-06	Operations_TRU
	TROUT	DPM	9901	2031	2.69E-06	Operations_TRU
	TROUT	DPM	9901	2032	2.47E-06	Operations_TRU
	TROUT	DPM	9901	2033	2.32E-06	Operations_TRU
	TROUT	DPM	9901	2034	2.23E-06	Operations_TRU
	TROUT	DPM	9901	2035	2.16E-06	Operations_TRU
	TROUT	DPM	9901	2036	2.09E-06	Operations_TRU
	TROUT	DPM	9901	2037	2.01E-06	Operations_TRU
	TROUT	DPM	9901	2038	1.95E-06	Operations_TRU
	TROUT	DPM	9901	2039	1.89E-06	Operations_TRU
	TROUT	DPM	9901	2040	1.86E-06	Operations_TRU
	TROUT	DPM	9901	2041	1.83E-06	Operations_TRU
	TROUT	DPM	9901	2042	1.82E-06	Operations_TRU
	TROUT	DPM	9901	2043	1.81E-06	Operations_TRU
	TROUT	DPM	9901	2044	1.82E-06	Operations_TRU
	TROUT	DPM	9901	2045	1.82E-06	Operations_TRU
	TROUT	DPM	9901	2046	1.82E-06	Operations_TRU
	TROUT	DPM	9901	2047	1.82E-06	Operations_TRU
	TROUT	DPM	9901	2048	1.82E-06	Operations_TRU
	TROUT	DPM	9901	2049	1.81E-06	Operations_TRU
	TROUT	DPM	9901	2050	1.81E-06	Operations_TRU
	TROUT	DPM	9901	2051	1.81E-06	Operations_TRU
	TROUT	DPM	9901	2052	1.81E-06	Operations_TRU
	TROUT	DPM	9901	2053	1.81E-06	Operations_TRU
	TROUT	DPM	9901	2054	1.81E-06	Operations_TRU
	TRPK	DPM	9901	2025	1.29E-06	Operations_TRU
	TRPK	DPM	9901	2026	1.24E-06	Operations_TRU
	TRPK	DPM	9901	2027	1.18E-06	Operations_TRU
	TRPK	DPM	9901	2028	1.14E-06	Operations_TRU
	TRPK	DPM	9901	2029	1.10E-06	Operations_TRU
	TRPK	DPM	9901	2030	1.76E-07	Operations_TRU
	TRPK	DPM	9901	2031	1.59E-07	Operations_TRU
	TRPK	DPM	9901	2032	1.46E-07	Operations_TRU
	TRPK	DPM	9901	2033	1.37E-07	Operations_TRU
	TRPK	DPM	9901	2034	1.32E-07	Operations_TRU
	TRPK	DPM	9901	2035	1.28E-07	Operations_TRU
	TRPK	DPM	9901	2036	1.23E-07	Operations_TRU
	TRPK	DPM	9901	2037	1.19E-07	Operations_TRU
	TRPK	DPM	9901	2038	1.15E-07	Operations_TRU
	TRPK	DPM	9901	2039	1.12E-07	Operations_TRU
	TRPK	DPM	9901	2040	1.10E-07	Operations_TRU
	TRPK	DPM	9901	2041	1.08E-07	Operations_TRU
	TRPK	DPM	9901	2042	1.08E-07	Operations_TRU
	TRPK	DPM	9901	2043	1.07E-07	Operations_TRU
	TRPK	DPM	9901	2044	1.07E-07	Operations_TRU
	TRPK	DPM	9901	2045	1.08E-07	Operations_TRU
	TRPK	DPM	9901	2046	1.08E-07	Operations_TRU
	TRPK	DPM	9901	2047	1.08E-07	Operations_TRU
	TRPK	DPM	9901	2048	1.07E-07	Operations_TRU
	TRPK	DPM	9901	2049	1.07E-07	Operations_TRU
	TRPK	DPM	9901	2050	1.07E-07	Operations_TRU
	TRPK	DPM	9901	2051	1.07E-07	Operations_TRU
	TRPK	DPM	9901	2052	1.07E-07	Operations_TRU
	TRPK	DPM	9901	2053	1.07E-07	Operations_TRU
	TRPK	DPM	9901	2054	1.07E-07	Operations_TRU

Phase	Modeled Source Group	Pollutant	CAS	Year	Emission Rate (g/s)	Source Description
Operations[4,5,6,7]	TRU_LD	DPM	9901	2025	1.42E-04	Operations_TRU
	TRU_LD	DPM	9901	2026	1.35E-04	Operations_TRU
	TRU_LD	DPM	9901	2027	1.29E-04	Operations_TRU
	TRU_LD	DPM	9901	2028	1.23E-04	Operations_TRU
	TRU_LD	DPM	9901	2029	1.19E-04	Operations_TRU
	TRU_LD	DPM	9901	2030	2.13E-05	Operations_TRU
	TRU_LD	DPM	9901	2031	1.93E-05	Operations_TRU
	TRU_LD	DPM	9901	2032	1.77E-05	Operations_TRU
	TRU_LD	DPM	9901	2033	1.66E-05	Operations_TRU
	TRU_LD	DPM	9901	2034	1.60E-05	Operations_TRU
	TRU_LD	DPM	9901	2035	1.55E-05	Operations_TRU
	TRU_LD	DPM	9901	2036	1.50E-05	Operations_TRU
	TRU_LD	DPM	9901	2037	1.44E-05	Operations_TRU
	TRU_LD	DPM	9901	2038	1.40E-05	Operations_TRU
	TRU_LD	DPM	9901	2039	1.36E-05	Operations_TRU
	TRU_LD	DPM	9901	2040	1.33E-05	Operations_TRU
	TRU_LD	DPM	9901	2041	1.31E-05	Operations_TRU
	TRU_LD	DPM	9901	2042	1.31E-05	Operations_TRU
	TRU_LD	DPM	9901	2043	1.30E-05	Operations_TRU
	TRU_LD	DPM	9901	2044	1.30E-05	Operations_TRU
	TRU_LD	DPM	9901	2045	1.30E-05	Operations_TRU
	TRU_LD	DPM	9901	2046	1.30E-05	Operations_TRU
	TRU_LD	DPM	9901	2047	1.30E-05	Operations_TRU
	TRU_LD	DPM	9901	2048	1.30E-05	Operations_TRU
	TRU_LD	DPM	9901	2049	1.30E-05	Operations_TRU
	TRU_LD	DPM	9901	2050	1.30E-05	Operations_TRU
	TRU_LD	DPM	9901	2051	1.30E-05	Operations_TRU
	TRU_LD	DPM	9901	2052	1.30E-05	Operations_TRU
	TRU_LD	DPM	9901	2053	1.30E-05	Operations_TRU
	TRU_LD	DPM	9901	2054	1.30E-05	Operations_TRU
	TRIN	PM2.5	88101	2025	2.09E-05	Operations_TRU
	TRIN	PM2.5	88101	2026	1.99E-05	Operations_TRU
	TRIN	PM2.5	88101	2027	1.91E-05	Operations_TRU
	TRIN	PM2.5	88101	2028	1.84E-05	Operations_TRU
	TRIN	PM2.5	88101	2029	1.78E-05	Operations_TRU
	TRIN	PM2.5	88101	2030	2.84E-06	Operations_TRU
	TRIN	PM2.5	88101	2031	2.56E-06	Operations_TRU
	TRIN	PM2.5	88101	2032	2.35E-06	Operations_TRU
	TRIN	PM2.5	88101	2033	2.21E-06	Operations_TRU
	TRIN	PM2.5	88101	2034	2.12E-06	Operations_TRU
	TRIN	PM2.5	88101	2035	2.06E-06	Operations_TRU
	TRIN	PM2.5	88101	2036	1.99E-06	Operations_TRU
	TRIN	PM2.5	88101	2037	1.91E-06	Operations_TRU
	TRIN	PM2.5	88101	2038	1.86E-06	Operations_TRU
	TRIN	PM2.5	88101	2039	1.80E-06	Operations_TRU
	TRIN	PM2.5	88101	2040	1.77E-06	Operations_TRU
	TRIN	PM2.5	88101	2041	1.75E-06	Operations_TRU
	TRIN	PM2.5	88101	2042	1.74E-06	Operations_TRU
	TRIN	PM2.5	88101	2043	1.73E-06	Operations_TRU
	TRIN	PM2.5	88101	2044	1.73E-06	Operations_TRU
	TRIN	PM2.5	88101	2045	1.73E-06	Operations_TRU
	TRIN	PM2.5	88101	2046	1.73E-06	Operations_TRU
	TRIN	PM2.5	88101	2047	1.73E-06	Operations_TRU
	TRIN	PM2.5	88101	2048	1.73E-06	Operations_TRU
	TRIN	PM2.5	88101	2049	1.73E-06	Operations_TRU
	TRIN	PM2.5	88101	2050	1.73E-06	Operations_TRU
	TRIN	PM2.5	88101	2051	1.73E-06	Operations_TRU
	TRIN	PM2.5	88101	2052	1.73E-06	Operations_TRU
	TRIN	PM2.5	88101	2053	1.73E-06	Operations_TRU
	TRIN	PM2.5	88101	2054	1.73E-06	Operations_TRU
	TROUT	PM2.5	88101	2025	2.01E-05	Operations_TRU
	TROUT	PM2.5	88101	2026	1.92E-05	Operations_TRU
	TROUT	PM2.5	88101	2027	1.84E-05	Operations_TRU
	TROUT	PM2.5	88101	2028	1.77E-05	Operations_TRU
	TROUT	PM2.5	88101	2029	1.72E-05	Operations_TRU
	TROUT	PM2.5	88101	2030	2.74E-06	Operations_TRU
	TROUT	PM2.5	88101	2031	2.48E-06	Operations_TRU
	TROUT	PM2.5	88101	2032	2.27E-06	Operations_TRU
	TROUT	PM2.5	88101	2033	2.13E-06	Operations_TRU
	TROUT	PM2.5	88101	2034	2.05E-06	Operations_TRU
	TROUT	PM2.5	88101	2035	1.99E-06	Operations_TRU
	TROUT	PM2.5	88101	2036	1.92E-06	Operations_TRU
	TROUT	PM2.5	88101	2037	1.85E-06	Operations_TRU
	TROUT	PM2.5	88101	2038	1.79E-06	Operations_TRU
	TROUT	PM2.5	88101	2039	1.74E-06	Operations_TRU
	TROUT	PM2.5	88101	2040	1.71E-06	Operations_TRU
	TROUT	PM2.5	88101	2041	1.69E-06	Operations_TRU
	TROUT	PM2.5	88101	2042	1.68E-06	Operations_TRU
	TROUT	PM2.5	88101	2043	1.67E-06	Operations_TRU
	TROUT	PM2.5	88101	2044	1.67E-06	Operations_TRU
	TROUT	PM2.5	88101	2045	1.67E-06	Operations_TRU
	TROUT	PM2.5	88101	2046	1.67E-06	Operations_TRU
	TROUT	PM2.5	88101	2047	1.67E-06	Operations_TRU
	TROUT	PM2.5	88101	2048	1.67E-06	Operations_TRU
	TROUT	PM2.5	88101	2049	1.67E-06	Operations_TRU
	TROUT	PM2.5	88101	2050	1.67E-06	Operations_TRU
	TROUT	PM2.5	88101	2051	1.67E-06	Operations_TRU
	TROUT	PM2.5	88101	2052	1.67E-06	Operations_TRU
	TROUT	PM2.5	88101	2053	1.67E-06	Operations_TRU
	TROUT	PM2.5	88101	2054	1.67E-06	Operations_TRU

Phase	Modeled Source Group	Pollutant	CAS	Year	Emission Rate (g/s)	Source Description
Operations[4,5,6,7]	TRPK	PM2.5	88101	2025	1.19E-06	Operations_TRU
	TRPK	PM2.5	88101	2026	1.14E-06	Operations_TRU
	TRPK	PM2.5	88101	2027	1.09E-06	Operations_TRU
	TRPK	PM2.5	88101	2028	1.05E-06	Operations_TRU
	TRPK	PM2.5	88101	2029	1.01E-06	Operations_TRU
	TRPK	PM2.5	88101	2030	1.62E-07	Operations_TRU
	TRPK	PM2.5	88101	2031	1.46E-07	Operations_TRU
	TRPK	PM2.5	88101	2032	1.34E-07	Operations_TRU
	TRPK	PM2.5	88101	2033	1.26E-07	Operations_TRU
	TRPK	PM2.5	88101	2034	1.21E-07	Operations_TRU
	TRPK	PM2.5	88101	2035	1.18E-07	Operations_TRU
	TRPK	PM2.5	88101	2036	1.14E-07	Operations_TRU
	TRPK	PM2.5	88101	2037	1.09E-07	Operations_TRU
	TRPK	PM2.5	88101	2038	1.06E-07	Operations_TRU
	TRPK	PM2.5	88101	2039	1.03E-07	Operations_TRU
	TRPK	PM2.5	88101	2040	1.01E-07	Operations_TRU
	TRPK	PM2.5	88101	2041	9.97E-08	Operations_TRU
	TRPK	PM2.5	88101	2042	9.93E-08	Operations_TRU
	TRPK	PM2.5	88101	2043	9.87E-08	Operations_TRU
	TRPK	PM2.5	88101	2044	9.88E-08	Operations_TRU
	TRPK	PM2.5	88101	2045	9.90E-08	Operations_TRU
	TRPK	PM2.5	88101	2046	9.90E-08	Operations_TRU
	TRPK	PM2.5	88101	2047	9.89E-08	Operations_TRU
	TRPK	PM2.5	88101	2048	9.88E-08	Operations_TRU
	TRPK	PM2.5	88101	2049	9.87E-08	Operations_TRU
	TRPK	PM2.5	88101	2050	9.87E-08	Operations_TRU
	TRPK	PM2.5	88101	2051	9.87E-08	Operations_TRU
	TRPK	PM2.5	88101	2052	9.87E-08	Operations_TRU
	TRPK	PM2.5	88101	2053	9.87E-08	Operations_TRU
	TRPK	PM2.5	88101	2054	9.87E-08	Operations_TRU
	TRU_LD	PM2.5	88101	2025	1.31E-04	Operations_TRU
	TRU_LD	PM2.5	88101	2026	1.24E-04	Operations_TRU
	TRU_LD	PM2.5	88101	2027	1.18E-04	Operations_TRU
	TRU_LD	PM2.5	88101	2028	1.13E-04	Operations_TRU
	TRU_LD	PM2.5	88101	2029	1.09E-04	Operations_TRU
	TRU_LD	PM2.5	88101	2030	1.96E-05	Operations_TRU
	TRU_LD	PM2.5	88101	2031	1.77E-05	Operations_TRU
	TRU_LD	PM2.5	88101	2032	1.63E-05	Operations_TRU
	TRU_LD	PM2.5	88101	2033	1.53E-05	Operations_TRU
	TRU_LD	PM2.5	88101	2034	1.47E-05	Operations_TRU
	TRU_LD	PM2.5	88101	2035	1.42E-05	Operations_TRU
	TRU_LD	PM2.5	88101	2036	1.38E-05	Operations_TRU
	TRU_LD	PM2.5	88101	2037	1.32E-05	Operations_TRU
	TRU_LD	PM2.5	88101	2038	1.28E-05	Operations_TRU
	TRU_LD	PM2.5	88101	2039	1.25E-05	Operations_TRU
	TRU_LD	PM2.5	88101	2040	1.22E-05	Operations_TRU
	TRU_LD	PM2.5	88101	2041	1.21E-05	Operations_TRU
	TRU_LD	PM2.5	88101	2042	1.20E-05	Operations_TRU
	TRU_LD	PM2.5	88101	2043	1.20E-05	Operations_TRU
	TRU_LD	PM2.5	88101	2044	1.20E-05	Operations_TRU
	TRU_LD	PM2.5	88101	2045	1.20E-05	Operations_TRU
	TRU_LD	PM2.5	88101	2046	1.20E-05	Operations_TRU
	TRU_LD	PM2.5	88101	2047	1.20E-05	Operations_TRU
	TRU_LD	PM2.5	88101	2048	1.20E-05	Operations_TRU
	TRU_LD	PM2.5	88101	2049	1.20E-05	Operations_TRU
	TRU_LD	PM2.5	88101	2050	1.20E-05	Operations_TRU
	TRU_LD	PM2.5	88101	2051	1.20E-05	Operations_TRU
	TRU_LD	PM2.5	88101	2052	1.20E-05	Operations_TRU
	TRU_LD	PM2.5	88101	2053	1.20E-05	Operations_TRU
	TRU_LD	PM2.5	88101	2054	1.20E-05	Operations_TRU

Notes:

1. Off-road equipment crane emissions are calculated in Table 2.
2. Passenger vehicles and trucks mobile emissions are calculated in Table 3.
3. Modeled emission rates in grams/second calculated assuming construction schedule between 8 am - 4 pm (8 hours) for a period of 10 months (i.e., 303 days/year).
4. Passenger vehicles and trucks mobile emissions are calculated in Table 7.
5. Delivery truck idling emissions are calculated in Table 9.
6. Emissions of TRUs equipped on the refrigerated delivery trucks are calculated in Table 10.
7. Operational schedules of truck loading were provided in the Kittelson Memo. Modeled emission rates in grams/second calculated assuming truck loading schedule between 5 am - 3 pm (10 hours) and passenger vehicles operating schedule between 6 am - 11 pm (17 hours) for 365 days/year.

Abbreviations:

DPM - diesel particulate matter
$PM_{2.5}$- particulate matter < 2.5 μm
TRU - transportation refrigeration unit
g - gram
s - second

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ENVIRONMENT
& HEALTH

MEMO

Date	**September 12, 2022**
To	**San Francisco Planning Department** **San Francisco, California**
From	**Michael Keinath, PE** **Megan Sutter**
Subject	**2675 Geary Boulevard Project Update Air Quality and Health Risk Assessment Results for Worker Receptors**

1 Introduction

Ramboll US Consulting, Inc. (Ramboll) at the request of Environmental Science Associates (ESA) conducted a California Environmental Quality Act (CEQA) air quality analysis and health risk assessment for off-site worker receptors for the proposed Whole Foods Market to be located at 2675 Geary Blvd in San Francisco, California (the "Project"). The Project would consist of renovation of a portion of an existing retail complex for use as an approximately 50,000 square foot supermarket.

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Details on the methodology and assumptions are described in the CEQA Air Quality and Health Risk Assessment Methodology (Ramboll, February 2022, referred to hereafter as "Methodology Report") and the Air Quality and Health Risks Assessment Results (Ramboll, September 2022, referred to hereafter as "Air Quality Memo"), which estimated health risk impacts at the maximally exposed individual (MEI) resident and daycare receptors. This technical memorandum is based on the methodologies developed in the Methodology Report and Air Quality Memo, with the additional methodologies used to estimate cancer risk, chronic hazard index (HI), and fine particulate matter ($PM_{2.5}$) concentration associated with construction and operation of the Project at off-site worker receptor locations. The estimated health risk impacts on off-site worker receptors from the construction and operation of the proposed Project are summarized in Section 3. The Project boundary and modeling extent are shown in **Figure 1**. This analysis has been performed at the request of the San Francisco Planning Department.

2 Methodology

The purpose of this air quality analysis is to assess potential health risks and hazards on off-site workers that would result from the construction and operation of the proposed Project. Potential health risks and hazards are analyzed consistent with the guidelines and methodologies from air quality agencies, specifically: Bay Area Air Quality Management District (BAAQMD), California Air Resources Board (CARB), California Office of Environmental Health Hazard Assessment (OEHHA), and USEPA.

As discussed in the Methodology Report and the Air Quality Memo, the steps conducted in performing this health risk assessment are as follows:

1. Quantify toxic air contaminants (TACs) emissions from Project construction and operation.
2. Perform air dispersion modeling for pollutant concentrations for area and roadway sources of TAC emissions.
3. Calculate resulting cancer risk, chronic HI, and fine particulate matter ($PM_{2.5}$) concentrations resulting from construction and operational sources of TACs.

All methodologies implemented in this memo are consistent with those described in the Methodology Report and the Air Quality Memo. This Memo provides further information for worker health risk parameters, exposure, and HRA, as described below.

2.1 Locations of Worker Receptors

In order to evaluate health impacts to any potential offsite worker receptors, receptors were placed at locations collocated with the receptors used in the Citywide HRA and within 1,000 feet of the Project and modeled traffic sources. Receptors were modeled on site and at varying heights: 1.5, 6.6, 15, and 18.9 meters above terrain height to account for workers that share the site with the Project, including Target and other existing commercial and retail uses within the Project site, such as the shared loading dock. As discussed in the Methodology Report and the Air Quality Memo, annual dispersion factors were estimated for each receptor location.

During the determination of the location of the maximally exposed individual worker (MEIW) for each risk category, receptor locations exposed to elevated TAC concentrations were examined using satellite images and other publicly available map data. When a receptor location did not appear to represent an actual, existing worker receptor, the receptor location was excluded from the analysis. For example, receptor locations on local roadways and parking lots were excluded.

2.2 Exposure Parameters for Worker Receptors

The exposure parameters used to estimate excess lifetime cancer risks for the worker receptors are presented in **Table 1**. In accordance with the OEHHA Guidelines, the recommended exposure duration of 25 years of operation following 10 months of construction was selected for the age group of 16-70 years of age. Selection of other exposure parameters, such as breathing rate and exposure frequency, are also consistent with the recommended Tier 1 approach in the OEHHA Guidelines.[1]

OEHHA recommends applying an adjustment factor to the annual average concentration modeled assuming continuous emissions (i.e., 24 hours per day, seven days per week), when the actual emissions are less than 24 hours per day and exposures are concurrent with activities occurring as part of the Project. For construction and operational activities, emissions only impact receptors during certain hours of the day when activities are occurring. However, the TAC concentrations modeled during those hours are annualized assuming 24 hour per day in the modeling outputs. Thus, a worker adjustment factor (WAF) was applied to the annual average concentration used in the evaluation to account for an emissions schedule that is not occurring 24 hours per day, seven days per week if the exposure takes place preferentially during working hours.

The WAF for the worker receptors assumes receptors are present only during the hours of the day and days of the week emissions are occurring. Project construction and operation are assumed to occur every day for 8 hours a day and 17 hours a day, respectively. A worker is assumed to have 8-hours shifts, five times a week. Therefore, a WAF of 4.2 was applied to the annual average concentration for

[1] OEHHA, 2015. Air Toxics Hot Spots Program, Risk Assessment Guidelines, Guidance Manual for Preparation of Health Risk Assessments. February.

construction ([24 hours/8 hours] and [7 days/5 days]) for the worker receptors. For project operations, a WAF of 2.0 was applied to the annual average concentration for operation ([24 hours/17 hours] and [7 days/5 days]) for the worker receptors.

3 Results from the Project Health Risks Assessment

The Project health risks from construction and operational sources are summarized in **Table 2.** The MEIW for cancer risk, chronic HI and $PM_{2.5}$ concentration is located on the loading area on the Project site (assuming the worker is employed at one of the entities sharing the site with the Project), at the northeastern corner of the existing building. Location of the MEIW is shown in **Figure 2**

As shown in **Table 2**, the cancer risk from the Project was calculated to be 3.7 in a million for the MEIW. At this receptor, the construction risk is 0.0036 in a million and the operational risk is 3.69 in a million; the $PM_{2.5}$ annual average concentration for construction is 0.00089 µg/m^3 and 0.010 µg/m^3 for operation. As shown in **Table 2**, the maximum non-cancer chronic HI at the MEIW would occur during Project operation and was calculated to be 0.022.

Attachments: A: Tables

B: Figure

TABLES

Table 1: Worker Exposure Parameters for Project Construction and Operations
Table 2: Summary of Project Worker Health Risks

Table 1
Worker Exposure Parameters for Project Construction and Operations
Whole Foods - 2675 Geary Blvd
San Francisco, California

Phase	Receptor Type[1]	Receptor Age Group	Exposure Parameters						
			Daily Breathing Rate (DBR)[2]	Exposure Duration (ED)	Exposure Frequency (EF)[3]	Averaging Time (AT)	Intake Factor, Inhalation (If_{inh})	Age Sensitivity Factor (ASF)	ASF- and WAF-Weighted Intake Factor, Inhalation (IF_{inh})[4]
			(L/kg-day)	(years)	(days/year)	(days)	(m^3/kg-day)	(unitless)	(m^3/kg-day)
Construction	Worker	16-70 years	230	0.83	250	25,550	0.002	1	0.0079
Operations	Worker	16-70 years	230	25	250	25,550	0.056	1	0.111

Receptor Type	Worker Adjustment Factor (WAF)	
	Construction[4]	Operations[5]
Worker	4.2	2.0

Notes:

1. All workers are assumed to be exposed to construction risks for the duration of construction, which is 10 months, and continute to be exposed to operational risks for 25 years beginning in 2025 at the start of operation.

2. Daily breathing rates for workers assume 230 L/kg-8 hours, which represents the 95th percentile 8-hour breathing rate based on moderate activity of 16-70 years-old age range, per BAAQMD 2016 and 2020 Health Risk Assessment (HRA) Modeling Guidelines.

3. Exposure frequency reflects default worker exposure frequency from OEHHA 2015.

4. Ifinh was scaled using age sensitivity factor and worker adjustment factor.

4. A Worker Adjustment Factor for construction was implemented to adjust the concentration calculated by emission rates and modeling dispersion factors. The WAF adjusts the model from 24 hours/day to 8 hours/day of construction and from 7 days/week of exposure to 5 days/week of exposure.

5. A Worker Adjustment Factor for operation was implemented to adjust the concentration calculated by emission rates and modeling dispersion factors. The WAF adjusts the model from 24 hours/day to 10 hours/day of operation and from 7 days/week of exposure to 5 days/week of exposure.

Abbreviations:

AT - averaging time
BAAQMD - Bay Area Air Quality Management District
DBR - daily breathing rate
ED - exposure duration
EF - exposure frequency
FAH - fraction of time at home
IF_{inh} - intake factor
kg - kilogram
L - liter
m^3 - cubic meter
OEHHA - Office of Environmental Health Hazard Assessment
WAF - Worker Adjustment Factor

Reference:

Air Toxics Control Programs Health Risk Assessment Guidelines. 2021. BAAQMD. December. Available online at: https://www.baaqmd.gov/~/media/dotgov/files/rules/reg-2-permits/2021-amendments/documents/20211215_hraguidelines-pdf.pdf?la=en
OEHHA. 2015. Air Toxics Hot Spots Program Risk Assessment Guidelines. Guidance Manual for Preparation of Health Risk Assessments. February.

Table 2
Summary of Project Worker Health Risks
Whole Foods - 2675 Geary
San Francisco, California

Receptor Type	Worker[1]		
Sources	**Excess Lifetime Cancer Risk (in a million)[2]**	**Non-Cancer Hazard Index[3]**	**$PM_{2.5}$ Concentration ($\mu g/m^3$, Annual Average)[4]**
Construction Sources			
Passenger Vehicles[5]	4.7E-04	1.7E-04	5.5E-04
Truck[5]	6.0E-06	1.4E-07	2.3E-06
Crane	0.0031	7.2E-05	3.3E-04
Construction Total	0.0036	2.4E-04	8.9E-04
Operational Sources			
Passenger Vehicles[5]	0.10	0.0027	0.0094
Truck[5]	0.026	4.4E-05	6.5E-04
TRU Exhaust	2.9	0.018	0.082
Truck Idling	0.68	0.0011	0.0055
Operations Total	3.68	0.022	0.10
Construction + Operations Total[6]	3.69	--	--
MEI Location			
UTMx	548,820	548,820	548,820
UTMy	4,181,780	4,181,780	4,181,780
Located in APEZ?	Yes	--	Yes

Notes:

1. All receptors are assumed to be exposed to construction risks for the duration of construction, which is 10 months in 2024. All receptors are assumed to be exposed to operational risks for 25 years beginning in 2025 at the start of operation.

2. Excess lifetime cancer risks are estimated as the upper-bound incremental probability that an individual will develop cancer over a lifetime as a direct result of exposure to potential carcinogens. The estimated risk is expressed as a unitless probability. The cancer risk attributed to the emissions associated with the Project was calculated based on the modeled annual average concentration of toxic air contaminants (TACs), the intake factor for worker receptors, the Cancer Potency Factors (CPF) for TACs, and the Age Sensitivity Factors (ASF). TACs in this project include DPM and speciated total organic gas (TOG).

3. The potential for exposure to result in adverse chronic noncancer effects is evaluated by comparing the estimated annual average air concentration to the noncancer chronic Reference Exposure Level (REL) for each chemical. When calculated for a single chemical, the comparison yields a ratio termed a chronic hazard quotient (HQ). To evaluate the potential for adverse chronic noncancer health effects from simultaneous exposure to multiple chemicals, the chronic hazard quotients for all chemicals are summed, yielding a hazard index (HI).
4. $PM_{2.5}$ concentration and Non-Cancer Hazard Index represent annual values.
5. Passenger and truck emissions considered in the health risk assessment include both exhaust and fugitive dust emissions.

6. Construction + operations totals were reported for excess lifetime cancer risk only since excess lifetime cancer risk is based on a 25-year exposure scenario. Chronic non-cancer HI and $PM_{2.5}$ concentration are based on annual averages; therefore, chronic non-cancer HI and $PM_{2.5}$ from construction and operations would not be additive since construction and operations would not occur at the same time. As shown in the table, the highest values of non-cancer HI and $PM_{2.5}$ concentrations occur during operations.

Abbreviations:

μg - microgram
ASF - age sensitivity factor
DPM - diesel particulate matter
HQ - hazard quotient
m^3 - cubic meter
OEHHA - Office of Environmental Health Hazard Assessment
PM - particulate matter
REL- reference exposure level
TAC - toxic air contaminants
TOG - total organic gas
TRU - transport refrigeration unit
HI - hazard index

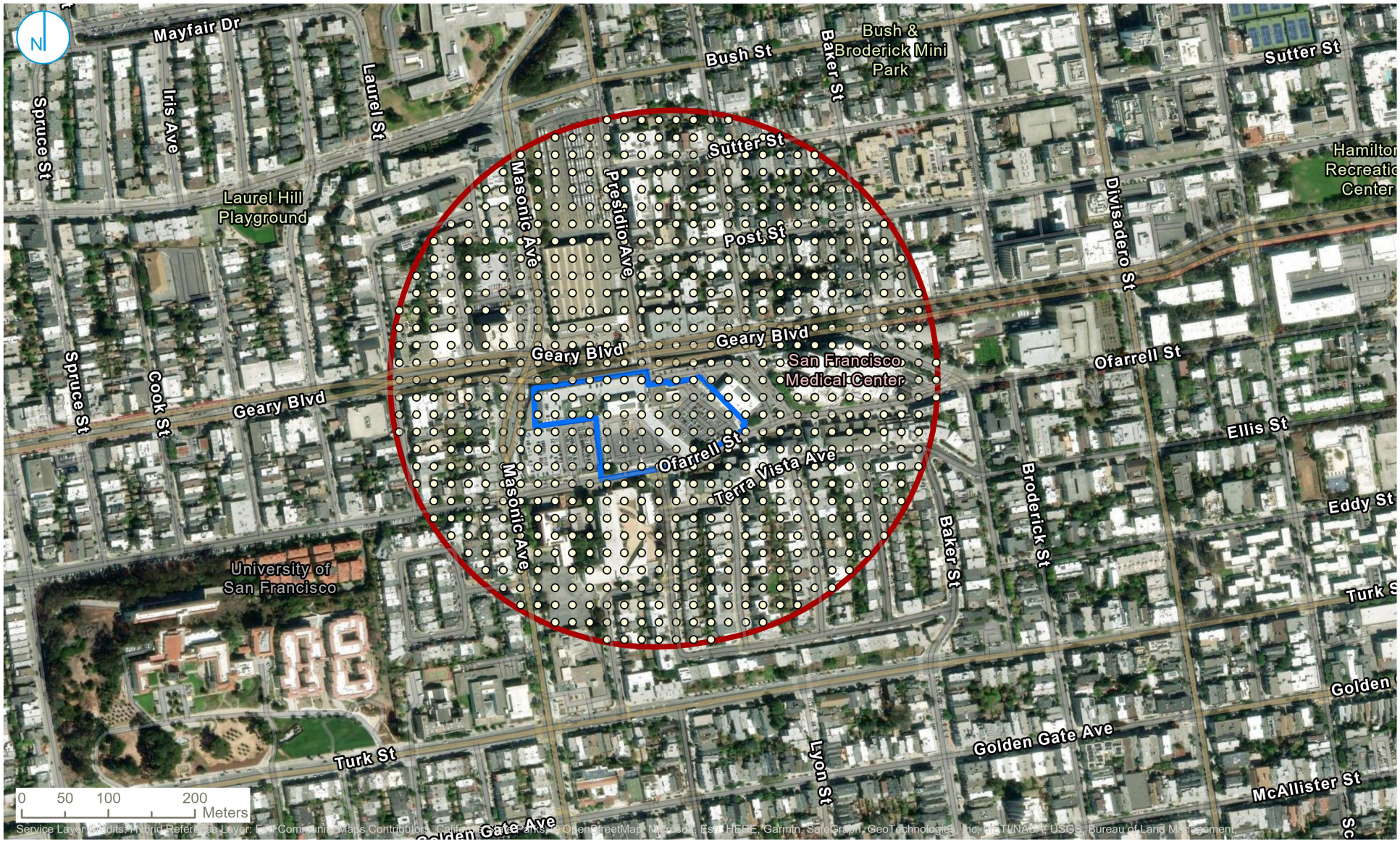
Reference:

OEHHA. 2015. Air Toxics Hot Spots Program Risk Assessment Guidelines. Guidance Manual for Preparation of Health Risk Assessments. February.

FIGURES

Figure 1: Project Boundary and Modeling Extent
Figure 2: Maximally Exposed Individual Worker

PROJECT: 1690022356 | DATED: 6/20/2022 | DESIGNER: MISIED



Project Boundary

Worker 1000ft Buffer

Worker Receptors 1000ft

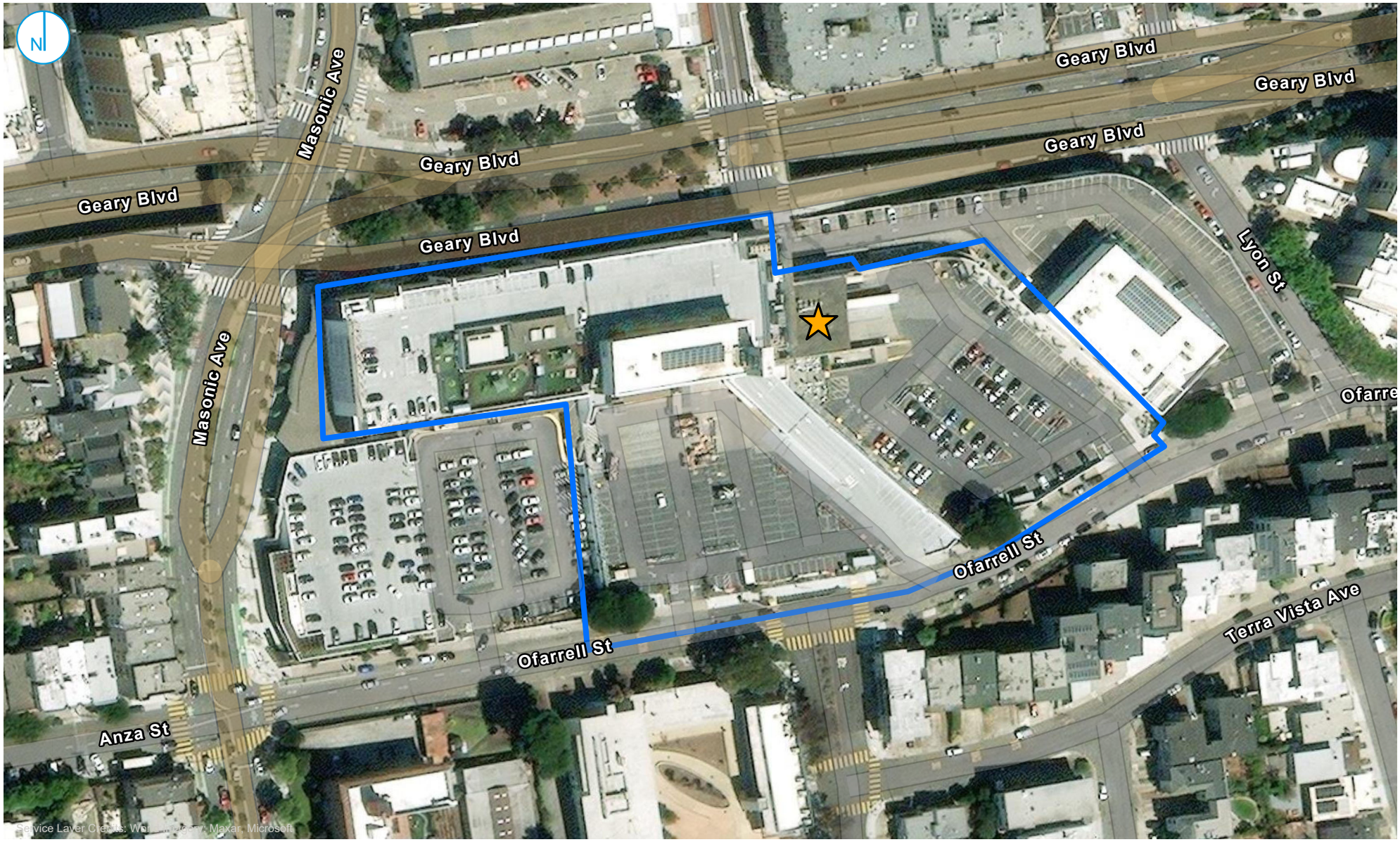
PROJECT BOUNDARY AND MODELING EXTENT

Whole Foods - 2675 Geary Blvd
San Francisco, California

FIGURE 01

RAMBOLL US CONSULTING, INC.
A RAMBOLL COMPANY

PROJECT: 1690022356 | DATED: 8/5/2022 | DESIGNER: LLI



Project Boundary

MEIW

0 50 100 200 Meters

MAXIMUM EXPOSED INDIVIDUAL WORKER LOCATIONS

Whole Foods - 2675 Geary Blvd
San Francisco, California

FIGURE 02

RAMBOLL US CONSULTING, INC.
A RAMBOLL COMPANY

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APPENDIX C.2

2675 Geary Boulevard Update Air Quality Scope of Work

2675 GEARY BOULEVARD UPDATE
AIR QUALITY SCOPE OF WORK
SAN FRANCISCO, CALIFORNIA

Ramboll US Consulting, Inc. ("Ramboll"), as a subcontractor to Environmental Science Associates (ESA), will conduct a California Environmental Quality Act (CEQA) air quality analysis and health risk assessment for the proposed Whole Foods Market located at 2675 Geary Blvd in San Francisco, California (the "Project"). This scope of work provides a description of the Project and air quality methodology proposed.

Project Understanding

The Project would consist of an approximately 50,000 square foot supermarket in an existing retail complex. The Project would require interior renovations within the existing vacant retail space and would not require excavation or exterior construction. The project would not require changes to the parking area or roadways. The Project is located in an Air Pollution Exposure Zone (APEZ), as defined by the San Francisco Department of Public Health.

Air Quality Scope of Work

The Bay Area Air Quality Management District (BAAQMD) CEQA Guidelines ("Guidelines")[1] provide recommended procedures for evaluating potential air quality (AQ) impacts during the environmental review process consistent with CEQA requirements. The analyses we propose herein and methods to perform the analysis is consistent with recommendations in the BAAQMD CEQA Guidelines and are typical analyses to fulfill the requirements requested by San Francisco Environmental Planning (SF EP). Given the minor amount of construction that may be required for interior renovations, construction related emissions would be negligible and therefore this air quality analysis will only need to evaluate operational emissions from the Project.

Operational Health Risk Assessment (HRA)

TAC Emissions Inventory

The primary sources of emissions associated with Project operation are mobile sources, including delivery trucks equipped with diesel-powered Transport Refrigeration Units (TRUs). Expected TACs from Project operation are diesel particulate matter (DPM), a known carcinogen emitted from diesel combustion, and speciated exhaust and evaporative emissions from both diesel- and gasoline-fired vehicles, including on-road vehicles. This cost estimate assumes that the Project does not include addition or modification of diesel generators.

To be conservative, all PM10 from diesel trucks will be assumed to be DPM. Particulate matter less than 2.5 microns in diameter (PM2.5) will be used to evaluate against applicable PM2.5 concentration thresholds.

Trip generation assumptions will be taken from the Project's Traffic Impact Study and will be used to calculate speciated total organic gas (TOG) emissions from gasoline vehicles. Additionally, the estimated number of diesel trucks and TRUs provided by the Project Sponsor will be used to estimate DPM. Ramboll proposes to use EMFAC 2021 for on-road vehicle exhaust emissions and California Air Resources Board (CARB) methods for roadway dust.

We will provide ESA with a data request for site specific data. If such data are not available, default assumptions can be used. Ramboll will incorporate one control measure into the emissions model -

[1] BAAQMD CEQA Guidelines, May 2017.

loading dock electrification. For this task, Ramboll will determine what fraction of refrigerated trucks will be able to use loading dock power and assume that all those trucks will be required to plug in within 2 minutes of docking or preparing to undock. If additional control measures will be required, Ramboll will prepare an additional scope of work for their analysis.

Air Dispersion Modeling

Ramboll will use AERMOD and BAAQMD's Mission Bay meteorological data for the year 2008 for modeling operational sources. Based on the results of the HRA modeling, Ramboll will evaluate PM2.5 concentrations and the excess lifetime cancer risk and noncancer hazard index against the applicable Air Pollution Exposure Zone (APEZ) thresholds. Ramboll will use the same receptor grid as the Citywide HRA in this modeling, clipping to an extent that covers the 1,000-meter zone of influence of this Project.

The model will be consistent with San Francisco Citywide HRA methodology for setting up roadway sources.

HRA

TACs emitted from Project operation and the dispersion modeling will be used to estimate health risks on surrounding sensitive populations, including the daycare center located immediately above the proposed Project. The Operational HRA will be based on the Project-generated traffic, including trucks, based on the anticipated number of trips associated with retail uses, as well as truck idling at loading docks.

We will follow the 2015 Office of Environmental Health Hazard Assessment (OEHHA) Risk Assessment Guidelines. Ramboll will use the BAAQMD HRA guidance for exposure assumptions for operation, which will conservatively assume surrounding receptors are residential receptors, consistent with the Citywide HRA. The resident scenario assumes the highest exposure time, exposure frequency, daily breathing rate, and age-sensitivity factor, and therefore is the most conservative scenario for residential exposure populations for the analysis. Additionally, daycare receptor exposure parameters will be applied for known daycares in the vicinity of the Project, including the Bright Horizons daycare immediately above the proposed Project.

Existing plus Project and Cumulative HRA

Ramboll will conduct an existing plus project HRA of cancer risk and PM2.5 concentrations at on- and off-site receptors resulting from other sources of stationary, area, and mobile emissions as calculated in the Citywide HRA in addition to health impacts from Project operations. We will use the Citywide HRA database to determine the existing cancer risk and PM2.5 concentrations at on- and off-site sensitive receptors within 1-kilometer of the Project and will add Project operational impacts to determine the existing plus project impact. Additionally, Ramboll will conduct semi-quantitative (if health risk information from cumulative projects are available) or qualitative analyses to evaluate the cumulative health risk impact resulting from reasonably foreseeable projects within 1,000 feet of the Maximally Exposed Individual Receptor (MEIR) that emit TACs from construction or operations (e.g., new stationary sources proposed as part of a cumulative project). Ramboll will work with SF EP to determine which nearby projects need to be considered in this analysis, which may include Geary Bus Rapid Transit project and projects located at 2750 Geary Boulevard and 2800 Geary Boulevard, among others. Ramboll will rely upon previously conducted health risk assessments for these projects, when available. If no health risk information is available for nearby projects, Ramboll will use a screening approach to estimate potential health impacts from construction of these projects, in consultation with SF EP.

Analysis of Project Alternative

In addition to the Project, Ramboll can evaluate the operational air quality impacts (CAP emissions and health impacts) of one proposed Project Alternative on a qualitative basis and quantitatively using scaling of Project results.

Operational CAP Emissions Inventory

In addition to the TAC emissions inventory, Ramboll will also prepare a CAP emissions inventory including the following CAP emission categories: mobile sources, energy use, and emissions associated with area sources.

We propose to use CalEEMod® and equivalent methods for the development of the operational emissions inventory for energy use and area sources, and we will use EMFAC 2021 for the mobile emissions inventory. CalEEMod® will estimate CAP emissions based on project-specific data provided by the Project Sponsor, incorporated as available. Where project-specific data are not available, Ramboll will use default data specific for retail buildings located in San Francisco, California.

Deliverables

Ramboll will prepare three separate deliverables detailing the work described above. First, this document, which is the preliminary Scope of Work. Second, a Methodology and Assumptions Memo will be prepared to outline the methodologies, data sources, assumptions, and uncertainties to be used for this Project. Following the completion of all analyses, Ramboll will present preliminary findings to SF EP in order to discuss model refinements and/or control measures prior to proceeding with documenting results. After discussing these with SF EP, the results of the health risk assessment will be reported in a Results Memo. The Results memo will also discuss the methodology and results of any control measures analyzed.

We anticipate two administrative drafts of the three Memos (1. Scope of Work, 2. Methodology and Assumptions, and 3. Results) for SF EP review prior to finalization and inclusion in the Draft EIR.

Prior Project Appeal Response Memo

In addition to the three deliverables described above, Ramboll will also prepare a memo evaluating the prior technical air quality reports submitted during the appeal of the previous CEQA analysis. Ramboll will include work previously conducted as well as an analysis of the last report submitted prior to the appeal that Ramboll has not yet analyzed. This review will be summarized in a separate memo for the EIR file.

Additional EIR Support

Ramboll will assist ESA and SF EP with a variety of tasks in support of the EIR Certification and Potential Appeal Process, including:

1. Responding to air quality-related comments on the EIR. This may include evaluating technical reports submitted during the Draft EIR public review period and providing an assessment of the work, as well as providing additional technical analyses or responses to public comments.
2. Attending the EIR Certification hearing to address any air quality questions from commissioners.
3. Assisting with addressing potential EIR appeals, including preparing appeal responses for air quality related issues, addressing late submittals that provide technical air quality information inconsistent with the EIR findings.
4. Attending a potential appeal hearing to address technical air quality related issues.

Closing

If you have any questions or need further information, please contact Michael Keinath at (510) 882-1734 or by email at mkeinath@ramboll.com, or contact Megan Sutter at (415) 426-5016 or by email at msutter@ramboll.com.

APPENDIX C.3

2675 Geary Boulevard Update Air Quality and Health Risk Assessment Methodology

Prepared for
San Francisco Planning Department
San Francisco, California

Prepared by
Ramboll US Consulting, Inc.
San Francisco, California

Project Number
1690022356

Date
February 2022

2675 GEARY BOULEVARD PROJECT UPDATE AIR QUALITY AND HEALTH RISK ASSESSMENT METHODOLOGY

2675 GEARY BOULEVARD

SAN FRANCISCO, CALIFORNIA

RAMBOLL

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ACRONYMS AND ABBREVIATIONS

AERMOD	USEPA's atmospheric dispersion modeling system
APEZ	Air Pollution Exposure Zone
ARB	(California) Air Resources Board
ASF	age sensitivity factor
BAAQMD	Bay Area Air Quality Management District
Cal/EPA	California Environmental Protection Agency
CalEEMod®	California Emissions Estimator Model
CAP	criteria air pollutant
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CPF	cancer potency factor
Citywide HRA	San Francisco Citywide Health Risk Analysis database
DPM	diesel particulate matter
EIR	Environmental Impact Report
ESA	Environmental Science Associates
g/s	gram per second
HHDT	Heavy-Heavy Duty Trucks
HI	Hazard Index
HQ	Hazard Quotient
HRA	health risk assessment
LDA	Light-Duty Auto
LDT1	Light-Duty Truck 1
MEIR	Maximally Exposed Individual Receptor
mg/kg-day	milligram per kilogram per day
MHDT	Medium-Heavy Duty Trucks
MUNI	Municipal Railway
OEHHA	Office of Environmental Health Hazard Assessment
$PM_{2.5}$	fine particulate matter less than 2.5 micrometers in aerodynamic diameter
Ramboll	Ramboll US Consulting, Inc.
ROG	Reactive Organic Gases
SF DPH	San Francisco Department of Public Health
SFEP	San Francisco Planning Department Environmental Planning Division
SF Planning	San Francisco Planning Department
TAC	toxic air contaminant
TOG	total organic gases
TRUs	Transportation Refrigeration Units
$\mu g/m^3$	microgram per cubic meter
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
VOC	volatile organic compounds
χ/Q	"chi over q"

1. INTRODUCTION

At the request of Environmental Science Associates (ESA), Ramboll US Consulting, Inc. (Ramboll) will conduct a California Environmental Quality Act (CEQA) analysis of criteria air pollutants and precursors and local air quality and health impacts associated with the construction and operation of a proposed Whole Foods grocery store to be located at 2675 Geary Boulevard in San Francisco (referred to hereafter as "Proposed Project" or "Project") on sensitive receptors. This emissions and Health Risk Assessment (HRA) methodology describes the scope and methodology for evaluation of air quality and health impacts from construction and operational sources and cumulative off-site sources at existing on-site and nearby off-site sensitive receptors. This analysis will be performed to support the Project's CEQA documentation at the request of the San Francisco Planning Department's (SF Planning) Environmental Planning (SFEP) Division.

1.1 Project Understanding

The project site is located within the existing 250,843-square-foot "City Center' shopping center, located at the southeast corner of Masonic Avenue and Geary Boulevard, in the Western Addition Neighborhood of San Francisco. Whole Foods Market (the Project Sponsor) proposes to renovate a vacant retail space formerly occupied by Best Buy, above an existing Target store. The Project would consist of a 54,285-square-foot grocery store with a 29,485-square-foot sales floor, as well as 24,805 square feet for other uses, including seating areas, self-checkout and back-of-house uses such as offices, restrooms, freezers and kitchens. The store would have a lounge and seating area with capacity to seat up to 50 people. Construction of the proposed Project consists of interior renovations within the existing vacant retail space, replacement of existing heating, ventilation, and air conditioning (HVAC) equipment in the mechanical penthouse, an approximately 700-square-foot expansion of the rooftop penthouse to accommodate the new HVAC equipment, and new exterior signage. The Project would not require changes to the existing parking area or roadways. The existing 117 vehicle parking spaces accessed from O'Farrell Street would be available for Whole Foods customers. Loading and deliveries would occur from an existing loading dock accessible via O'Farrell Street, between Anza Vista Avenue and Lyon Street.

The Project is located in an Air Pollution Exposure Zone (APEZ), as defined by the San Francisco Department of Public Health.

The Project is being analyzed in response to the San Francisco Board of Supervisors directing SF Planning to further analyze the potential air quality impacts of the proposed project to sensitive receptors in the vicinity of the project site in March 2021 (Motion No. M21-047).

1.2 Objective and Methodology

The purpose of the air quality analysis is to assess potential criteria air pollutant and health risks and hazards that would result from the construction and operation of the proposed Project consistent with guidelines and methodologies from air quality agencies, specifically, the Bay Area Air Quality Management District (BAAQMD), the California Air Resources Board (ARB), the California Office of Environmental Health Hazard Assessment (OEHHA), and the US Environmental Protection Agency (USEPA). Consistent with guidelines and recommended methods from these agencies, the HRA will evaluate the estimated incremental increase in cancer risk from toxic air contaminants (TACs), including diesel particulate matter (DPM) and gasoline speciated total organic gases (TOG), as well as fine PM concentrations (specifically particulate matter less than 2.5 microns in aerodynamic diameter [$PM_{2.5}$]). The regional criteria air pollutant analysis will quantitatively describe potential short-term construction impacts and long-term operational impacts that could be generated by the proposed

Project. The construction and operational emission sources included in the HRA for the Project include diesel-powered construction equipment, construction vendor and worker vehicles, and Project-related traffic, including diesel trucks, transportation refrigeration units (TRUs), and passenger vehicles.

In addition to estimating the air quality and health risk impacts from the Project, Ramboll will conduct an existing plus project HRA of cancer risk and $PM_{2.5}$ concentrations at on- and off-site receptors resulting from other sources of stationary, area, and mobile emissions as calculated in the San Francisco Citywide Health Risk Analysis database (Citywide HRA) in addition to health impacts from Project construction and operations. Ramboll will also conduct semi-quantitative (if health risk information from cumulative projects is available) or qualitative analyses to evaluate the cumulative health risk impact resulting from reasonably foreseeable projects within 1,000 feet of the Maximally Exposed Individual Receptor (MEIR) that emits TACs from construction or operations (e.g., new stationary sources proposed as part of a cumulative project). A list of cumulative projects to be considered in this analysis are discussed further in **Section 6** below.

The results of the analysis will be documented in a summary results memo to be presented to ESA and SFEP before being incorporated into the Draft Environmental Impact Report (EIR) as applicable chapter text and technical appendices.

1.3 Document Organization

This scope of work is divided into seven sections as follows:

Section 1.0 – Introduction: describes the purpose and scope of the air quality analysis, the objectives and methodology to be used, and outlines the document organization;

Section 2.0 – Emission Estimation Methods: describes the methods that will be used to estimate CAP and TAC emissions from various sources for the Project;

Section 3.0 – Estimated Air Concentrations Methods: discusses the air dispersion modeling, the selection of the dispersion models, the data to be used in the dispersion models (*e.g.*, terrain, meteorology, source characterization), and the identification of receptor locations evaluated in the HRA;

Section 4.0 – Risk Characterization Methods: provides an overview of the methodology for conducting the HRA;

Section 5.0 – Existing Plus Project Analysis Methods: summarizes the approach to be used in the existing plus Project analyses;

Section 6.0 – Cumulative Analysis Methods: summarizes the approach to be used in the HRA cumulative analysis.

Section 7.0 – References: includes a listing of all references cited in this report.

2. PROJECT EMISSIONS ESTIMATION

Ramboll will estimate the incremental criteria air pollutant (CAP) and TAC emissions associated with Project construction and operations. Methodologies used to calculate CAP and TAC emissions are summarized below.

2.1 Construction Sources

Construction emission calculation methodologies cover diesel-fueled off-road equipment and on-road vehicles.

Ramboll will rely on project-specific data provided by the Project Sponsor, including a construction equipment list, a construction schedule, and site map. According to the Project Sponsor, construction activities will be limited to interior renovations within the existing vacant retail space, replacement of existing heating, ventilation, and air conditioning (HVAC) equipment in the mechanical penthouse, an approximately 700-square-foot expansion of the rooftop penthouse to accommodate the new HVAC equipment, and new exterior signage. Therefore, use of a lot of off-road equipment is not anticipated.

Where project-specific construction data is not available, California Emissions Estimator Model (CalEEMod®) defaults can be used. For purposes of this analysis, Ramboll will assume that all construction off-road equipment is diesel powered, and that all off-road equipment emissions of PM with an aerodynamic diameter less than 10 microns (PM_{10}) are DPM, which is a TAC. Emissions will be estimated using CalEEMod® or equivalent methods, as summarized in **Table 2**.

2.1.1 Off-road Equipment

According to the Project Sponsor, the only diesel-powered off-road construction equipment that will be used on-site is a crane for lifting HVAC equipment onto the roof. For diesel-powered off-road construction equipment, Ramboll will use CalEEMod® and methodologies consistent with CalEEMod® to estimate emissions. The CalEEMod® emissions methodology for off-road construction equipment relies on the ARB In-Use Off-Road Equipment model (OFFROAD2011), which incorporates statewide survey data to develop emission factors based on the fleet average for each year of construction.[1] The OFFROAD2011 model also identifies average horsepower and load factor for each type of equipment; Ramboll will request the equipment horsepower and load factors from the Project Sponsor, however, if this information is not available, default data in OFFROAD2011, which are included in CalEEMod®, can be used. The methodology to be used to calculate emissions from off-road equipment is presented in **Table 2**.

Emissions without control measures will be calculated assuming fleet average equipment, meaning the emission factors used reflect the fleet predicted to be in use in the OFFROAD2011 model.

2.1.2 Construction On-road Mobile Sources

On-road mobile sources include vehicle trips associated with workers, vendors, and demolition and excavation hauling trips. Because there will only be interior renovations for Project construction, there will be no demolition or excavation hauling trips associated with the Project.

The emission factors for running emissions of criteria pollutants in CalEEMod® are from EMFAC2017, the ARB Emission Factors model for on-road emissions. Since the last release of CalEEMod®, ARB

[1] Although ARB has released an updated model as OFFROAD2017, the newer version does not generate "default" fleet data the way OFFROAD2011 does. As such, OFFROAD2011 is still used in CalEEMod® version 2020.4.0. Until ARB updates default fleet mix data, OFFROAD2011 will continue to be used.

released a new version of its model for on-road emissions, EMFAC2021, which will be used in this assessment because it is the most recent version of ARB emissions factors available at the time the analysis is conducted. Emission factors vary by vehicle type, fuel type, and calendar year. Consistent with CalEEMod® methodology, Ramboll will assume that worker trips are 50% Light-Duty Auto (LDA), 25% Light-Duty Truck 1 (LDT1) and 25% LDT2 vehicle classes. The Transportation Engineer will provide vehicle type assumptions for vendor trips, likely mapped to heavy-heavy duty trucks (HHDT) and medium-heavy duty trucks (MHDT). EMFAC2021 incorporates the Pavley Clean Car Standards and the Advanced Clean Cars program. The emission factors used for construction of the Project will be provided from EMFAC2021 for 2024.

For HRA purposes, Ramboll will consider DPM and $PM_{2.5}$ emissions from vendor trucks and construction worker vehicle trips from construction. Construction worker vehicle trips from the project are not expected to exceed an average of 5,000 worker trips per day, and the BAAQMD recommends a traffic screening criteria of 10,000 vehicles per day for lifetime cancer risk exposure analyses (BAAQMD 2011). This screening criteria was derived from 2003 OEHHA Guidance, which has since been updated. The current OEHHA Guidance roughly increases lifetime cancer risk exposure by a factor of 40%. To be conservative, Ramboll has established a revised screening criteria of 5,000 vehicles per day, consistent with a 100% increase in lifetime exposure. This is especially conservative for construction analyses as the actual exposure period would be much shorter. However, to conservatively estimate impacts from Project construction, Ramboll is proposing to calculate health risks from worker trips in this analysis.

The methodology used to calculate emissions from on-road sources is presented in Table 2.

2.1.3 Architectural Coating

Emissions from architectural coating were estimated using methodologies consistent with CalEEMod®.

Architectural coating emissions are based on the square footage of the grocery store, as indicated by the Project sponsor, as well as the CalEEMod® default values of architectural coatings per square footage. Since construction work to be done for the Project is all interior, Ramboll assumes there is no coating required for the exterior area.

Emissions from architectural coating during Project construction assume compliance with BAAQMD paint Volatile Organic Compounds (VOC) regulations.

2.2 Operational Sources

Because the existing building has been vacant for several years, the analysis will assume that there is currently no activity at the Project site and no emissions are currently being generated. Thus, all operational CAP and TAC emissions from the Project would be considered net new emissions. Sources of operational emissions from the Project include on-road delivery, worker, and customer vehicles, energy use, and area sources. Based on information from the Project Sponsor, it is assumed that the Project will be operational by 2025; therefore, the operational emissions analysis will assume emissions begin in year 2025. Operational emissions occurring beyond years 2025 would likely be lower due to reductions in vehicle emissions due to vehicle turn over and increasingly stringent regulatory requirements. Energy and area source CAP emissions from the Project will be calculated based on the size of the building and California Emissions Estimator Model (CalEEMod®) defaults.

2.2.1 Operational On-road Mobile Sources

On-road mobile sources include vehicle trips associated with customers, employees, and vendor deliveries. Vehicles on the roadway emit TACs in their exhaust and CAPs through exhaust, tire wear, and brake wear. In addition, gasoline vehicles emit CAPs and TACs through fuel evaporation. To estimate operational vehicle emissions from the Project, Ramboll will rely on Project-generated trip rates (weekday and weekend) and truck trip estimates from the Transportation Engineer and Project Sponsor, respectively. For customer and employee distances, Ramboll will rely on information provided by the Transportation Engineer. For vendor trip distances, Ramboll will use average travel distances provided by the Transportation Engineer based on vendor origin and destination provided by the Project Sponsor.

As mentioned above, ARB released a new version of its on-road emissions model (EMFAC2021) after the development of the latest version of CalEEMod®, so the latest on-road emissions model (EMFAC2021) will be used in this assessment. The emission factors used for operation of the Project will be provided from EMFAC2021 for operational year 2025.

Consistent with CalEEMod® methodology, Ramboll will assume that customer and employee trips are 50% Light-Duty Auto (LDA), 25% Light-Duty Truck 1 (LDT1) and 25% LDT2 vehicle classes. The Transportation Engineer will provide vehicle types for vendor trips, including refrigerated and non-refrigerated trucks, likely mapped to heavy-heavy duty trucks (HHDT) and medium-heavy duty trucks (MHDT).

Additionally, Ramboll will also calculate emissions from truck engines idling at loading docks during loading and unloading. Ramboll will assume that all trucks comply with the California state law[2] limiting truck idling to 5 minutes at any location. It will be conservatively assumed that each truck idles for 5 minutes at the start of loading and 5 minutes at the end of loading for a total of 10 minutes of idling per truck trip.

For HRA purposes, Ramboll will consider DPM, gasoline TOGs, and $PM_{2.5}$ emissions from vehicles during Project operation.

The methodology used to calculate emissions from on-road sources is presented in **Table 2**.

2.2.2 Transportation Refrigeration Units

TRUs are cooling units installed on trucks carrying perishable goods, such as food. TRU emissions will be calculated for this analysis to account for perishable goods delivery for the proposed Project. It is assumed that the TRU is a separate emissions source that will run to keep perishable goods cold regardless of whether the truck engine is running. It was assumed that all TRUs coming to the Project will be diesel-powered. Emissions during travel time and during unloading will be calculated using TRU trips per year, engine size and load factors from CARB's 2017 off-road inventory, average speed and miles traveled for trucks, and unloading time. The average speed traveled by trucks carrying TRUs was assumed to be 30 mph, based on the prima facie speed limits contained within Article 700 of the San Francisco Transportation Code, which states that the standard speed limit for business or residential districts in California is 30 miles per hour (mph). The trip length was assumed to be consistent with the truck deliveries estimated as part of the mobile emissions inventory. Unloading

[2] Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling, Title 13, California Code of Regulations (CCR), Section 2485. Additional information available at: https://ww2.arb.ca.gov/our-work/programs/atcm-to-limit-vehicle-idling

times will be provided by the Transportation Engineer by truck type, which will be used to calculate emissions occurring from TRUs while at loading docks. Additional details regarding these calculations are shown in **Table 2**.

2.2.3 Operational On-Site Generators

According to the Project Sponsor, no new generators will be installed or operated as part of the Project. Therefore, Ramboll will not analyze the effect of generators on air quality or health risks for this Project.

2.2.4 Architectural Coating

Operational architectural coatings account for the reapplication of paint and coatings on interior and exterior surfaces, which would result in emissions of volatile organic compounds (VOCs). Ramboll will use CalEEMod®, or equivalent methodology, as well as the CalEEMod® default values of architectural coatings per square footage to estimate emissions from architectural coatings. Total building square footage will be obtained by the Project Sponsor.

2.2.5 Consumer Products

Consumer product emissions come from various non-industrial solvents, including cleaning supplies, kitchen aerosols, cosmetics and toiletries, which emit VOCs during their use. Using the estimated building square footage for the Project, Ramboll will use CalEEMod® or equivalent methodology to estimate emissions from consumer products as well as the default CalEEMod® emission factor for San Francisco.

2.2.6 Energy Use

CAP emissions are generated from buildings as a result of activities for which electricity and natural gas are typically used as energy sources. Combustion of any type of fuel, including natural gas, emits CAPs directly into the atmosphere; these emissions are considered direct emissions associated with a building. CAPs are also emitted during the generation of electricity from fossil fuels; these emissions are considered to be indirect emissions and are not included in the CAP emissions analysis.

Natural gas emissions for the Project will be calculated using 2021 natural gas usage from a similar Bay Area Whole Foods grocery store, along with emission factors from CalEEMod®. CAP emissions will be calculated from natural gas use only and not from electricity use.

2.2.7 Landscaping Equipment

Based on the location of the Project within an existing shopping center and according to the Project Sponsor, there will be no landscaping activities as part of the Project. Thus, these are not included in the analysis.

3. ESTIMATED AIR CONCENTRATIONS

Consistent with the Citywide HRA, the air toxics analysis will evaluate health risks and $PM_{2.5}$ concentrations resulting from the Project upon the surrounding community. For the Project, this would include construction off-road equipment, construction vendor and worker truck trips, and operational traffic emissions, including emissions from trucks traveling to and from the site. The methodologies used to evaluate emissions from the Project are based on the most recent BAAQMD CEQA Guidelines (BAAQMD 2017), BAAQMD Health Risk Assessment Modeling Protocol (BAAQMD 2020) and the most recent Air Toxics Hot Spots Program Risk Assessment Guidelines (OEHHA 2015).

3.1 Chemical Selection

The cancer risk analysis in the HRA for the Project is based on DPM and gasoline TOG concentrations from operational traffic, including trucks. Diesel exhaust, a complex mixture that includes hundreds of individual constituents (California Environmental Protection Agency [Cal/EPA] 1998), is identified by the State of California as a known carcinogen (Cal/EPA 2016). Under California regulatory guidelines, DPM is used as a surrogate measure of exposure for the mixture of chemicals that make up diesel exhaust as a whole. Cal/EPA and other proponents of using the surrogate approach to quantifying cancer risks associated with the diesel mixture indicate that this method is preferable to use of a component-based approach. A component-based approach involves estimating risks for each of the individual components of a mixture. Critics of the component-based approach believe it will underestimate the risks associated with diesel as a whole mixture because the identity of all chemicals in the mixture may not be known and/or exposure and health effects information for all chemicals identified within the mixture may not be available. Furthermore, Cal/EPA has concluded that "potential cancer risk from inhalation exposure to whole diesel exhaust will outweigh the multi-pathway cancer risk from the speciated components" (OEHHA 2003).

The cancer risk analysis for the Project will also include speciated TACs from gasoline-fueled mobile sources. For gasoline vehicles, exhaust and evaporative TOGs from gasoline-fueled vehicles would be evaluated based on the organic chemical profiles from ARB (CARB 2021).

3.2 Sources

As discussed in the sections above, the HRA will include Project construction and operational sources, including construction off-road equipment and construction traffic, as well as operational traffic and truck trips, including emissions from TRUs.

3.3 AERMOD Modeling

Ramboll will use the most recent version of the American Meteorological Society/Environmental Protection Agency regulatory air dispersion model (AERMOD Version 21112) to evaluate ambient air concentrations of TACs and $PM_{2.5}$ at receptors (USEPA 2021). For each receptor location, the model generates air concentrations (or air dispersion factors as unit emissions will be modeled) that result from emissions from multiple sources.

Air dispersion models such as AERMOD require a variety of inputs such as source parameters, meteorological data, topographical data, and receptor parameters. When site-specific information is unknown, Ramboll will use default parameter sets that are designed to produce conservative (i.e., overestimates of) air concentrations (USEPA 2021).

3.3.1 Meteorological Data

Air dispersion modeling applications require the use of meteorological data that ideally are spatially and temporally representative of conditions in the immediate vicinity of the site under consideration. For this HRA, BAAQMD's Mission Bay meteorological data for the year 2008 will be used, which aligns with the San Francisco Citywide HRA Methodology (San Francisco Department of Public Health [SF DPH], SF Planning, and Ramboll 2020).

3.3.2 Terrain and Land Use Considerations

Elevation for all emissions sources will be imported from the National Elevation Dataset maintained by the United States Geological Survey ([USGS] 2013). Elevations for all receptors will be consistent with the Citywide HRA modeling.

An important consideration in an air dispersion modeling analysis is whether or not to model an area as urban. Due to the urban nature of San Francisco, the Project will be modeled with the urban population of 873,965, corresponding to the July 1, 2019 US Census population estimate (US Census Bureau 2020). The urban option in AERMOD accounts for increased turbulence associated with the urban heat island effect.

3.3.3 Emission Rates

Emissions will be modeled using the χ/Q ("chi over q") method, such that each source has a unit emission rate (i.e., 1 gram per second [g/s]), and the model estimates dispersion factors (with units of [µg/m^3]/[g/s]). Actual emission rates will be multiplied by the dispersion factors to obtain concentrations.

For annual average ambient air concentrations, the estimated annual average dispersion factors are multiplied by the annual average emission rates. The emission rates will vary day to day (e.g., weekday vs. weekend traffic), with some days having no emissions. The model will assume a constant emission rate during the entire year.

3.3.4 Source Parameters

Source location and parameters are necessary to model the dispersion of air emissions. Source parameters for the Project are summarized in **Table 3**.

For construction off-road equipment emissions, an area source will be used to represent the on-site activity in AERMOD. The on-site construction area source will be modeled with a release height of 5 meters (SCAQMD 2008) and an initial vertical dimension of 1.4 meters (BAAQMD, SF DPH, and SF EP 2012). Construction on-road activity will be modeled (consistent with the Citywide HRA methodology for operational on-road activity) in AERMOD as adjacent volume sources, with the number of sources dependent on the length and width of the roadway segment. For AERMOD modeling, the release height of volume sources for on-road light duty vehicles will be set to 1.7 meters, and the initial vertical dimension will be set to 1.6 meters (SF DPH, SF Planning, and Ramboll 2020). For on-road trucks, the release height of volume sources will be set to 2.6 meters and the initial vertical dimension will be set to 2.4 meters, consistent with USEPA haul road guidance (USEPA 2012). Initial lateral dimensions will be calculated for each segment based on the width of the modeled roadway plus a six-meter mixing zone, all divided by a factor of 2.15 consistent with the USEPA AERMOD User's Guide.

For operational emissions, Ramboll will model mobile sources on roadways and at loading docks. Similar to on-road construction emissions, on-road operational emissions will be modeled (consistent with the Citywide HRA methodology) in AERMOD as adjacent volume sources, with the number of sources dependent on the length and width of the roadway segment. For AERMOD modeling, the release height of volume sources for on-road light duty vehicles will be set to 1.7 meters, and the initial vertical dimension will be set to 1.6 meters, consistent with Citywide HRA methodology (SF DPH, SF Planning, and Ramboll 2020). For on-road trucks, the release height of volume sources will be set to 2.6 meters and the initial vertical dimension will be set to 2.4 meters, consistent with USEPA haul road guidance (USEPA 2012). Initial lateral dimensions will be calculated for each segment based on the width of the modeled roadway plus a six-meter mixing zone, all divided by a factor of 2.15 consistent with the USEPA AERMOD User's Guide.

At loading docks, TRU operations will be modeled as a single volume source. The TRU operation volume source will be modeled using a release height consistent with BAAQMD truck release height (5 meters). The other modeling parameters will be estimated using methodology consistent with USEPA AERMOD guidance for volume sources, as shown in Table 3.

3.3.5 Receptors

In order to evaluate health impacts to receptors, receptors will be placed at locations collocated with the receptors used in the Citywide HRA and within 1,000 meters of the Project and modeled traffic sources. Receptors will be modeled at a height of 1.5 meters above terrain height, a default breathing height for ground-floor receptors (BAAQMD 2020).[3] As discussed previously, annual dispersion factors will be estimated for each receptor location.

For the existing daycare located on the floor above the Project, Ramboll will use a receptors height equivalent to the height of the fourth and fifth floors of the building where the Project is located.

[3] Updated BAAQMD Health Risk Assessment Modeling Protocol Guidance (2020) recommends a default breathing height for ground-floor receptors of 1.5 meters. The previous recommendation of 1.8 meters was used in the Citywide HRA.

4. RISK CHARACTERIZATION METHODS

In February 2015, OEHHA released the updated Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments (OEHHA 2015), which combines information from previously-released and adopted technical support documents to delineate OEHHA's revised risk assessment methodologies based on current science. This updated Guidance Manual supersedes the 2003 Hot Spots Guidance Manual (OEHHA 2003) that previously provided methodologies for conducting HRAs under the Air Toxics Hot Spots Program (AB2588). The BAAQMD has issued Guidelines on adopting the OEHHA 2015 Guidance Manual as well as additional guidance published in December 2020 (BAAQMD 2020). This evaluation will utilize the 2015 OEHHA methodology following BAAQMD guidance; details of this methodology are discussed below.

Ramboll will estimate Project health risk impacts from the Project assuming operations begin in 2025.

4.1 Project Sources Evaluated

Ramboll will evaluate excess lifetime cancer risk and $PM_{2.5}$ concentration for nearby sensitive receptor exposure to emissions from construction and operation of the Project. Ramboll will estimate Project health risk impacts from Project construction assuming construction begins in 2024 and at least partial operations beginning in 2025.

The health risks will account for project construction and operational traffic and truck activity. The HRA will be calculated using the methodology explained in the following sections.

4.1.1 Exposure Assessment

Ramboll will conservatively model all existing Citywide HRA grid (20-meter spacing) receptors within 1 kilometer of the Project (including any roadways with Project-generated traffic volumes in excess of 1,000 vehicles per day). Consistent with the Citywide HRA, all sensitive receptors will be analyzed as residents, with the exception of the daycare co-located with the Project, which will be modeled as a daycare.

Potentially Exposed Populations: This analysis will evaluate health risks to residents based on OEHHA 2015 Hot Spots Guidelines.

For assessing impacts to exposed populations from emissions resulting from the Project on-road vehicle emissions, sensitive receptors will be evaluated as a fetus *in utero* at the beginning of the third trimester until age 30 for operational exposures.

Exposure Assumptions: The exposure parameters used to estimate excess lifetime cancer risks for all potentially exposed populations from operational emissions will be obtained using risk assessment guidelines from OEHHA (2015) and BAAQMD (2016, 2020). **Tables 4 and 5** show the proposed exposure duration, age sensitivity factor, and resulting exposure parameters that will be used for the HRA.

Calculation of Intake: The dose estimated for each exposure pathway is a function of the concentration of a chemical and the intake of that chemical. The intake factor for inhalation, IF_{inh}, can be calculated as follows:

$$IF_{inh} = \frac{DBR * FAH * EF * ED * CF}{AT}$$

Where:

IF_{inh}	=	Intake Factor for Inhalation (m^3/kg-day)
DBR	=	Daily Breathing Rate (L/kg-day)
FAH	=	Frequency of Time at Home (unitless)
EF	=	Exposure Frequency (days/year)
ED	=	Exposure Duration (years)
AT	=	Averaging Time (days)
CF	=	Conversion Factor, 0.001 (m^3/L)

The chemical intake or dose is estimated by multiplying the inhalation intake factor, IF_{inh}, by the chemical concentration in air, C_i. When coupled with the chemical concentration, this calculation is mathematically equivalent to the dose algorithm given in the current OEHHA Hot Spots guidance (OEHHA 2015).

4.1.2 Toxicity Assessment

The toxicity assessment characterizes the relationship between the magnitude of exposure and the nature and magnitude of adverse health effects that may result from such exposure. For purposes of calculating exposure criteria to be used in risk assessments, adverse health effects are classified into two broad categories – cancer and non-cancer endpoints. Toxicity values that are used to estimate the likelihood of adverse effects occurring in humans at different exposure levels are identified as part of the toxicity assessment component of a risk assessment.

Following the Citywide HRA methodology for cancer risk calculations, Ramboll will include the carcinogenic toxicity for DPM from on-road vehicles and additional organic gases from on-road gasoline-powered vehicles. Chronic hazard quotient (HQs) calculations for Project operation will utilize toxicity values for chemicals emitted from these same sources.

This analysis utilizes available toxicity values including inhalation cancer potency factors (CPFs) and chronic inhalation reference exposure levels (RELs). Ramboll will utilize the Cal/EPA-approved (Cal/EPA 2017) inhalation cancer potency factor for DPM and chronic inhalation RELs. The CPF for DPM that will be used for the HRA is 1.1 $(mg/kg\text{-}day)^{-1}$. Toxicity values are summarized in **Table 5**.

4.1.3 Age Sensitivity Factors

The estimated excess lifetime cancer risks for a resident will be adjusted using age sensitivity factors (ASFs) that account for an "anticipated special sensitivity to carcinogens" of infants and children as recommended in the OEHHA Technical Support Document (OEHHA 2009) and OEHHA 2015 Guidance (2015). Cancer risk estimates will be weighted by a factor of 10 for exposures that occur from the third trimester of pregnancy to two years of age and by a factor of three for exposures that occur from two years through 15 years of age. No weighting factor (i.e., an ASF of one, which is equivalent to no adjustment) is applied to ages 16 and older. **Table 6** presents the ASF values that will be used for the HRA.

4.2 Risk Characterization

4.2.1 Estimation of Cancer Risks

Excess lifetime cancer risks are estimated as the upper-bound incremental probability that an individual will develop cancer over a lifetime as a direct result of exposure to potential carcinogens. The estimated risk is expressed as a unitless probability. The cancer risk attributed to a chemical is calculated by multiplying the chemical intake or dose at the human exchange boundaries (e.g., lungs) by the chemical specific CPF.

The equation used to calculate the potential excess lifetime cancer risk for the inhalation pathway is as follows:

$$Risk_{inh} = C_i \times CF \times IF_{inh} \times CPF \times ASF$$

Where:

$Risk_{inh}$	=	Cancer risk; the incremental probability of an individual developing cancer as a result of inhalation exposure to a particular potential carcinogen (unitless)
C_i	=	Annual average air concentration for $chemical_i$ ($\mu g/m^3$)
CF	=	Conversion factor (mg/µg)
IF_{inh}	=	Intake factor for inhalation (m^3/kg-day)
CPF_i	=	Cancer potency factor for $chemical_i$ $(mg\ chemical/kg\ body\ weight\text{-}day)^{-1}$
ASF	=	Age sensitivity factor (unitless)

4.2.2 Estimation of Project Health Risks

Results for cancer risk, chronic Hazard Index (HI), and $PM_{2.5}$ concentrations will be presented for the MEIR, which are the locations where the maximum health impacts are estimated to occur. For cancer risk, which is calculated as a 30-year lifetime risk, Ramboll will add together the risks calculated for construction and the risks calculated for 30 years of operations prior to determining the MEIR. This is a conservative assumption that will result in a slight overestimate of results as it is a marginally longer duration than 30 years (10 months of construction + 30 years of operations).

4.2.3 Estimation of Existing Plus Project Health Risks

Ramboll will conduct an existing plus project HRA of cancer risk and $PM_{2.5}$ concentrations at on- and off-site receptors resulting from other sources of stationary, area, and mobile emissions as calculated in the Citywide HRA in addition to health impacts from Project operations. We will use the Citywide HRA database to determine the existing cancer risk and $PM_{2.5}$ concentrations at on- and off-site sensitive receptors within 1-kilometer of the Project and will add Project operational impacts to determine the existing plus project impact. The Citywide HRA does not report Chronic HI, therefore, Existing Plus Project results will not be calculated for Chronic HI.

5. CUMULATIVE ANALYSIS

Ramboll will evaluate the cumulative health risk impact resulting from reasonably foreseeable projects within a half mile of the MEIR that emit TACs from construction or operations (e.g., new stationary sources proposed as part of a cumulative project). Ramboll reviewed nearby reasonably foreseeable projects to determine if any would potentially impact the MEIR for the Project. Based on Ramboll's discussion with SFEP, the following nearby projects will be considered in this analysis:

1. 1846 Grove Street;
2. 1735-1751 Fulton Street;
3. 2800 Geary Boulevard;
4. 3641 Geary Boulevard;
5. 3333 California Street;
6. 2750 Geary Boulevard;
7. 3657 Sacramento Street;
8. 2670 Geary Boulevard;
9. 709 Lyon Street;
10. 1355 Fulton Street; and
11. 3330 Geary Boulevard
12. Geary Bus Rapid Transit (BRT) Project.

Ramboll previously conducted a health risk assessment for 3333 California Street and will determine risks at the Project MEIR from this previous modeling effort. If health risk information is available for any of the remaining projects, Ramboll will include risks from those at the Project site in this analysis. For those without health risk information, Ramboll proposes to qualitatively discuss potential health impacts from construction and operation of these projects.

6. SUMMARY RESULTS MEMORANDUM AND OTHER DELIVERABLES

Ramboll will complete preliminary analysis of the CAP and health risks from Project construction and operations and present that information to SFEP. Ramboll will meet with SFEP and ESA to determine if revisions to the modeling or control scenarios need to be applied. Ramboll will then prepare a Results Report, which will consist of the following:

- Documentation of any deviations or revisions from the approved CEQA Air Quality and Health Risk Assessment Methodology and reasons for those deviations;
- CAP and HRA results for the Project (and any controlled scenarios, if applicable). This section will include listing the controlled strategies modeled and the methodology for modeling the effectiveness of the strategies;
- Additional figures showing citywide changes in health risks due to the Project; and
- Uncertainties associated with the analysis.

In addition to the Results Report for the Project, Ramboll will submit health risk databases to SFEP. The databases will mirror the 2020 Citywide HRA and provide updated project and total cancer risk and $PM_{2.5}$ concentration at each receptor location. Figures may show incremental differences in health risks as compared to the existing 2020 health risk conditions, or other figures to be later determined by SFEP. Some figures may be included in the results memorandum only and others may be presented in the EIR. Ramboll will meet with SFEP and ESA to determine the figures to be presented in the Final Results Memorandum and in the EIR.

7. REFERENCES

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TABLES

Table 1
Land Use Description
Whole Foods Market - 2675 Geary Boulevard
San Francisco, California

Land Use Type[1]	Amount[2]	Units
Retail - Supermarket (Total)	49.825	1000 sqft
Landlord Retained Area (not part of Project)	4.46	1000 sqft
Total Area	54.285	1000 sqft

Notes

[1] For calculating architectural coating and consumer products emissions (which rely on land use area), total area of 54,285 square feet was used as a conservative estimate. Retail - Supermarket was used for land use type.

[2] Square footages were provided by the Project Sponsor.

Abbreviations

sqft - square feet

Table 2
Emissions Calculation Methodology
Whole Foods Market - 2675 Geary Boulevard
San Francisco, California

Type	Source	Methodology and Formula	Reference
Construction Equipment	Off-Road Equipment[1]	$Ec = \Sigma(EFc * HP * LF * Hr * C)$	OFFROAD2011 and ARB/USEPA Engine Standards
Construction On-Road Mobile Sources[2]	Exhaust – Running	$E_R = \Sigma(EF_R * VMT * C)$, where VMT = Trip Length * Trip Number	EMFAC2021
	Exhaust - Idling	$E_I = \Sigma(EF_I * Trip\ Number * T_I * C)$	EMFAC2021
Operational On-Road Mobile Sources[2]	Exhaust - Running	$E_R = \Sigma(EF_R * VMT * C)$, where VMT = Trip Length * Trip Number	EMFAC2021
	Brake Wear and Tire Wear	$E_{BW,TW} = \Sigma(EF_{BW,TW} * VMT * C)$, where VMT = Roadway Link Length * Vehicle Counts	EMFAC2021
	Exhaust - Idling	$E_I = \Sigma(EF_I * Trip\ Number * T_I * C)$	EMFAC2021
	Exhaust - Running Losses	$E_R = \Sigma(EF_{RL} * VMT * C)$, where VMT = Trip Length * Trip Number	EMFAC2021
Other Operational Sources	Transportation Refrigeration Units	$Ec = \Sigma(Trip\ Number\ Per\ Event * Number\ of\ Events * HP * LF * T_I * VMT * Truck\ Average\ Speed * C)$	CARB 2021
	Area, Energy	CalEEMod®	CalEEMod®

Notes:

1. E_c: off-road equipment exhaust emissions (lb)
   EF_c: emission factor (g/hp-hr). CalEEMod 2020.4.0 default emission factors used
   HP: equipment horsepower from CalEEMod default or Project Sponsor
   LF: equipment load factor. OFFROAD2011
   Hr: equipment hours
   C: unit conversion factor

2. On-road mobile sources include truck and passenger vehicle trips. Emissions associated with mobile sources were calculated using the following formulas.
   E_R: running exhaust and running losses emissions (lb)
   EF_R: running emission factor (g/mile). From EMFAC2021
   VMT: vehicle miles traveled
   C: unit conversion factor
   The calculation involves the following assumptions:
   a. Truck types will be provided by Transportation Engineer, including a breakdown of refrigerated and non-refrigerated trucks.
   b. Trip Length: The one-way trip length as calculated based on estimated truck route from the Project Sponsor based on vendor
   c. Trip Number will be provided by the Transportation Engineer.
   E_I: vehicle idling emissions (lb).
   EF_I: vehicle idling emission factor (g/hr-trip). From EMFAC2021
   T_I: idling time
   C: unit conversion factor

Abbreviations:

ARB: California Air Resources Board
BW: Brake Wear
EF: Emission Factor
EMFAC: EMission FACtor Model
g: gram
HP: horsepower
lb: pound
LF: Load Factor
mi: mile
USEPA: United States Environmental Protection Agency
RL: Running Losses
VMT: vehicle miles traveled
TW: Tire Wear

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Table 3
Modeling Parameters
Whole Foods Market - 2675 Geary Boulevard
San Francisco, California

Construction Sources

Source	Source Type	Number of Sources	Source Dimension [m]	Release Height[3] [m]	Initial Vertical Dimension [m]	Initial Lateral Dimension [m]
Construction Equipment[1]	Area	1	Approximate Equipment Area	5.0	1.4	--
On-Road Light Duty Vehicles (Worker Trips)[2,3]	Volume	Variable	Variable	1.70	1.58	Variable
On-Road Trucks[2,3]	Volume	Variable	Variable	2.55	2.37	Variable

Operational Sources

Source	Source Type	Number of Sources	Source Dimension [m]	Release Height [m]	Initial Vertical Dimension [m]	Initial Lateral Dimension [m]
On-Road Light Duty Vehicles[2,3]	Volume	Variable	Variable	1.70	1.58	Variable
On-Road Trucks[2,3]	Volume	Variable	Variable	2.55	2.37	Variable
Transportation Refrigeration Units[4]	Volume	2	--	3.96	0.92	1.18

Notes:

1. Construction off-road equipment will be modeled as an area source covering the small area occupied by the crane, since the crane is the only piece of off-road equipment to be used for the Project. This information was provided by the Project Sponsor. According to the 2012 San Francisco Community HRA methodology, initial vertical dimension of the modeled construction equipment area sources will be set to 1.4 meters and the release height will be set to 5 meters consistent with SCAQMD LST methods.
2. The number of on-road sources is based on the geometry of the truck or traffic routes.
3. On-road truck and car initial vertical dimension were based on previous Citywide HRA modeling and USEPA haul road guidance.
4. Operational TRUs are modeled as a single volume source at each of the two loading docks. A release height of 3.96 meters was chosen according to the 2010 CAPCOA HRA & Land Use Workshop guidance. Based on USEPA's AERMOD guidance, initial lateral and vertical dimensions were determined by dividing the side length by 4.3.

Abbreviations:

AERMOD - Atmospheric Dispersion MODeling
ARB - California Air Resources Board
BAAQMD - Bay Area Air Quality Management District
CEQA - California Environmental Quality Act
CRRP - Community Risk Reduction Plan
HRA - Health risk assessment
m - meter
m - meter
USEPA - United States Environmental Protection Agency

References:

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Table 4
Exposure Parameters
Whole Foods Market - 2675 Geary Boulevard
San Francisco, California

Construction

Population	Receptor Age Group	Exposure Parameters					
		Daily Breathing Rate (DBR)[1] [L/kg-day]	Exposure Duration (ED) [years]	Fraction of Time at Home (FAH)[2] [unitless]	Exposure Frequency (EF)[3] [days/year]	Averaging Time (AT) [days]	Intake Factor, Inhalation (IF_{inh}) [m^3/kg-day]
Residents[4]	Age 0-<2 Years	1,090	0.8	1.0	350	25,550	0.012
Daycare Children[5]	Age Six Weeks-<2 Years	1,090	0.8	--	350	25,550	0.012

Operations

Population	Receptor Age Group	Exposure Parameters					
		Daily Breathing Rate (DBR)[1] [L/kg-day]	Exposure Duration (ED) [years]	Fraction of Time at Home (FAH)[2] [unitless]	Exposure Frequency (EF)[3] [days/year]	Averaging Time (AT) [days]	Intake Factor, Inhalation (IF_{inh}) [m^3/kg-day]
Residents[4]	3rd Trimester	361	0.25	1.0	350	25,550	0.0012
	Age 0-<2 Years	1,090	2.0	1.0	350	25,550	0.030
	Age 2-<16 Years	572	14	1.0	350	25,550	0.11
	Age 16-30 Years	261	14	0.73	350	25,550	0.037
Daycare Children[5]	Age Six Weeks-<2 Years	1,090	1.9	--	350	25,550	0.028
	Age 2-<9 Years	631	4.0	--	350	25,550	0.035

Notes:

1. Daily breathing rates reflect default breathing rates from OEHHA 2015 and BAAQMD 2016 as follows: 95th percentile 24-hour daily breathing rate for 3rd trimester and age 0-<2 years; 80th percentile for ages 2 years and older (per BAAQMD 2016 and 2020 Health Risk Assessment (HRA) Modeling Guidelines).
2. Fraction of time spent at home is conservatively assumed to be 1 (i.e., 24 hours/day) for age groups from the third trimester to less than 16 years old based on the recommendation from BAAQMD (BAAQMD 2016 and 2020) and OEHHA (OEHHA 2015). The fraction of time at home for adults age 16-30 reflects default OEHHA guidance (OEHHA 2015) as recommended by BAAQMD (2016 and 2020).
3. Exposure frequency reflects default residential exposure frequency from OEHHA 2015.
4. All receptorss are assumed to be exposed to construction risks for the duration of construction, which is 10 months. All receptors are assumed to be exposed to operational risks for 30 years beginning in 2025 at the start of operation.
5. Daycare children are modeled using parameters consistent with OEHHA 2015 guidance for resident children, which conservatively assumes 24 hours/day exposure.

Calculation:

IF_{inh} = DBR * FAH * EF * ED * CF / AT

CF = 0.001 (m^3/L)

Abbreviations:

AT - averaging time
BAAQMD - Bay Area Air Quality Management District
DBR - daily breathing rate
ED - exposure duration
EF - exposure frequency
FAH - fraction of time at home
IF_{inh} - intake factor
kg - kilogram
L - liter
m^3 - cubic meter
OEHHA - Office of Environmental Health Hazard Assessment

References:

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OEHHA. 2015. Air Toxics Hot Spots Program Risk Assessment Guidelines. Guidance Manual for Preparation of Health Risk Assessments. February.

Table 5
Toxicity Values
Whole Foods Market - 2675 Geary Boulevard
San Francisco, California

Fuel[1]	Source	Chemical	CAS Number	Cancer Potency Factor [mg/kg-day]$^{-1}$	Chronic REL (µg/m^3)	Weight Fraction[2]
Diesel	PM_{10}	Diesel PM	9-90-1	1.1	5	1
Gasoline	TOG	1,3-Butadiene	106-99-0	0.6	2	0.0055
		Acetaldehyde	75-07-0	0.01	140	0.0028
		Acrolein	107-02-8	-	0.35	0.0013
		Benzene[3]	71-43-2	0.1	3	0.0036
						0.025
		Ethylbenzene[3]	100-41-4	0.0087	2000	0.0012
						0.011
		Formaldehyde	50-00-0	0.021	9	0.016
		Hexane[3]	110543	-	7000	0.015
						0.016
		Methanol	67-56-1	-	4000	0.0012
		Naphthalene	91-20-3	0.12	9	0.0005
		Propylene	115-07-1	-	3000	0.031
		Styrene	100-42-5	-	900	0.0012
		Toluene[3]	108-88-3	-	420	0.017
						0.058
		Xylenes[3]	1330-20-7	-	700	0.0058
						0.048

Notes:

1. For the health risk analysis, health effects will be evaluated for emissions from off-road equipment, vehicles, and transportation refrigeration units (TRUs), which are assumed to be diesel and gasoline-fueled.
2. Speciation fractions shown are for gasoline-fueled vehicles.
3. Benzene, ethylbenzene, hexane, toluene, and xylenes are produced from catalytic exhaust and evaporative losses from gasoline engines. For each of these chemicals, the evaporative loss weight fraction is shown before the exhaust weight fraction in this table.

Abbreviations:

ARB - Air Resources Board
Cal/EPA - California Environmental Protection Agency
CAS - chemical abstract services
mg/kg-day - milligrams per kilogram per day
OEHHA - Office of Environmental Health Hazard Assessment
PM - particulate matter
REL - reference exposure level
TOG - Total Organic Gas

Reference:

Cal/EPA. 2020. OEHHA/ARB Consolidated Table of Approved Risk Assessment Health Values. October. Available at: https://ww2.arb.ca.gov/sites/default/files/classic//toxics/healthval/contable.pdf.

Table 6
Age Sensitivity Factors
Whole Foods Market - 2675 Geary Boulevard
San Francisco, California

Receptor Age Group	Value[1]
3rd Trimester	10
Age 0-<2 Years	10
Age 2-<9 Years	3
Age 2-<16 Years	3
Age >16 Years	1

Note:

1. Based on OEHHA 2015. Age sensitivity factors are unitless.

Abbreviation:

OEHHA - Office of Environmental Health Hazard Assessment

Source:

OEHHA. 2015. Air Toxics Hot Spots Program Risk Assessment Guidelines. Guidance Manual for Preparation of Health Risk Assessments. Februarv.

APPENDIX C.4

2675 Geary Boulevard Project Update Air Quality and Health Risk Assessment Results

RAMBOLL

ENVIRONMENT
& HEALTH

MEMO

Project name	**2675 Geary Boulevard, San Francisco**
Project no.	**1690022356**
To	**San Francisco Planning Department** **San Francisco, California**
From	**Michael Keinath** **Megan Sutter**
Subject	**2675 Geary Boulevard Project Update Air Quality and Health Risk Assessment Results**

November 9, 2022

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1 Introduction

Ramboll US Consulting, Inc. (Ramboll) at the request of Environmental Science Associates (ESA) conducted a California Environmental Quality Act (CEQA) air quality analysis and health risk assessment for the proposed Whole Foods Market to be located at 2675 Geary Blvd in San Francisco, California (the "Project"). The Project would consist of an approximately 50,000 square foot supermarket in an existing retail complex.

Details on the methodology and assumptions are described in the "CEQA Air Quality and Health Risk Assessment Methodology" (Ramboll, February 2022, referred to hereafter as "Methodology Report"). This technical memorandum presents a brief summary of the methodology, noting any details not included in or deviating from the Methodology Report, and provides the results for air quality and health impact analysis from construction and operation of the proposed Project. This analysis has been performed to support the CEQA documentation at the request of the San Francisco Planning Department. The Project boundary and modeling extent are shown in **Figure 1**. The locations of residential and mix-use parcels surrounding the Project site are presented in **Figure 2**.

2 Methodology

The purpose of this air quality analysis is to assess potential health risks and hazards that would result from the construction and operation of the proposed Project. Potential health risks and hazards are analyzed consistent with the guidelines and methodologies from air quality agencies, specifically: Bay Area Air Quality Management District (BAAQMD), California Air Resources Board (CARB), California Office of Environmental Health Hazard Assessment (OEHHA), and USEPA.

The steps conducted in performing this air quality analysis are as follows:

1. Quantify criteria air pollutant (CAP) and toxic air contaminant (TAC) emissions from Project construction and operation.
2. Perform air dispersion modeling for pollutant concentrations for area and roadway sources of TAC emissions.

3. Calculate resulting cancer risk and fine particulate matter ($PM_{2.5}$) concentrations resulting from construction and operational sources of TACs.

2.1 Methodology for Construction Impacts

The Methodology Report describes the methods used to estimate CAP emissions, TAC emissions, and the associated health risks from Project construction. According to the Methodology Report, CAP emissions were calculated for the one required piece of off-road diesel construction equipment and construction on-road mobile sources, *i.e.*, vendor trips and worker trips. To estimate TAC concentrations from construction sources, an area source on the Project site was used to represent the on-site construction activity (off-road equipment), and volume sources on roadways were used to represent the on-road vehicle activity. Cancer risks, chronic hazards index (HI), and $PM_{2.5}$ concentrations were then evaluated for off-site sensitive receptors in accordance with the updated Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments (OEHHA 2015) and additional guidance from the BAAQMD.[1]

The results presented in this memorandum used the same methods described in the Methodology Report, except for the following assumptions:

- Construction worker trips were included in the emissions and health risks estimates. The Project-generated construction worker trips were provided by the Project Sponsor.[2] Identical to the employee trip assumption for Project operation, Ramboll assumed the worker trips all use gasoline vehicles and used the same methodology and assumptions to estimate health risks contributions from the operational customer and employee trips.

2.2 Methodology for Operational Impacts

The Methodology Report describes the methods used to estimate CAP emissions, TAC emissions, and the associated health risks from Project operation. According to the Methodology Report, CAP emissions were calculated for on-road mobile sources, transportation refrigeration units (TRUs), truck idling activity, architectural coating, consumer products, and energy use. For dispersion modeling of TACs, on-road mobile sources were modeled as adjacent volume sources on nearby roadways based on routes provided by the transportation engineer[3], and TRU and idling emissions were modeled as on-site volume sources at loading dock locations. Other modeling and health risks calculation parameters are described in detail in the Methodology Report.

The results presented in this memorandum used the same methods described in the Methodology Report, except for the following assumptions:

- The methodology for estimating on-road fugitive dust emissions was not described in the Methodology Report. CalEEMod® default methods and parameters were used to calculate the annual average emission factors for fugitive PM_{10} and $PM_{2.5}$ emissions from on-road trucks and passenger vehicles. The weighted average San Francisco-specific silt loading factor was calculated based on travel fraction by roadway category and silt loading parameters, obtained from the CARB's

[1] BAAQMD. 2016. Proposed Health Risk Assessment Guidelines. Air Toxics NSR Program. January. Available online at: https://www.baaqmd.gov/~/media/files/planning-and-research/permit-modeling/hra_guidelines_12_7_2016_clean-pdf.pdf?la=en.
BAAQMD. 2020. Health Risk Assessment Modeling Protocol. December. Available online at: https://www.baaqmd.gov/~/media/files/ab617-community-health/facility-risk-reduction/documents/baaqmd_hra_modeling_protocol-pdf.pdf?la=en.

[2] Sheppard Mullin, 2022. Email communication titled "FW: Whole Foods at 2675 Blvd: EIR Check-in Meeting" from Jennifer Renk at Sheppard Mullin to Elliott Schwimmer at ESA Associates. January 10.

[3] Kittelson, 2022. Email communication titled "RE: 2675 Geary – AQ model inputs" between Mike Alston at Kittleson and Megan Klevze Sutter at Ramboll. January 3 and January 4.

Entrained Road Travel Emission Inventory Source Methodology document. The average silt loading factor was then used to calculate fugitive PM_{10} and $PM_{2.5}$ emission factors. Details of the calculation are summarized in **Table 8**.

- The land use parameter in the American Meteorological Society/Environmental Protection Agency regulatory air dispersion model (AERMOD) for dispersion modelling was 881,549 for urban population of San Francisco, where the project is located, in contrast to 873,965 described in the Methodology Report.

  The methodology for estimating emissions from TRUs has been updated since the Methodology Report as a result of the CARB adopting new regulatory requirements for TRUs in February 2022.[4] These regulations will require truck-based TRUs to turn over their fleet to meet a 100% zero-emission limit by end of 2029 and trailer-based TRUs to meet the Tier 4 final off-road emissions limit starting with model year 2023. These regulatory requirements are incorporated into CARB's web-based EMFAC tool, which was used to estimate $PM_{2.5}$ emissions per hour of both truck- and trailer-based TRUs for each operational year. For the refrigerated truck analysis, medium heavy-duty trucks (MHDT) were assumed to have truck-based TRUs and heavy heavy-duty trucks (HHDT) were assumed to have trailer-based TRUs.

- To evaluate impacts of TRUs while at the loading dock, operational TRUs are modeled as a single volume source at each of the two loading docks. A release height of 3.96 meters was chosen according to the 2010 CAPCOA HRA & Land Use Workshop guidance. Based on USEPA's AERMOD guidance, initial lateral and vertical dimensions were determined by dividing the side length by 4.3. These source parameters are different from what was described in the Methodology Report.

- Residential receptors are assumed to be exposed to the Project's construction and operational emissions for 30 years starting from the third trimester of pregnancy. Daycare receptors are assumed to be exposed to Project's construction and operational emissions for 5 years starting from infancy (age group 0-2 years).

3 Results from Project Analysis

3.1 Construction CAP Emissions

A summary of annual average daily construction CAP emissions is shown in **Table 1**. Additional details on construction sources that contribute to CAP emissions are summarized in **Tables 2-4**. Because construction is expected to occur for less than a year,[5] the total construction emissions were averaged over the number of days construction would occur to obtain average daily construction emissions.

3.1.1 CAP Emissions from On-Site Construction Equipment

According to the Project Sponsor, the only diesel-powered off-road construction equipment that will be used on-site is a crane for lifting HVAC equipment onto the roof. Equipment activity is shown in **Table 2** and was used to calculate CAP emissions. All other parameters are based on CalEEMod® default values confirmed by the Project Sponsor.

[4] CARB. 2022. 2022 Amendments to the Airborne Toxic Control Measure for In-Use Diesel-Fueled Transport Refrigeration Units (TRU) and TRU Generator Sets, and Facilities Where TRUs Operate. Available at: https://ww2.arb.ca.gov/resources/fact-sheets/2022-amendments-tru-atcm. March 17.

[5] According to the Project Sponsor, project construction would start as early as October 2024 and last for ten months.

3.1.2 CAP Emissions from On-Road Construction Vehicles

The total one-way trips from vendor trucks and construction workers generated during Project construction are provided by Whole Foods and are summarized in **Table 3**.[6] Construction activities would include: demolishing interior walls, flooring, and some areas of the ceiling; expanding the rooftop mechanical penthouse and installing rooftop HVAC equipment including rooftop penetrations for venting and to connect the HVAC equipment to ducts; and constructing new interior walls and partitions for restrooms and back-of-house space (employee office, lounge, and locker rooms). Other activities would include reconfiguring the space and installing furniture and equipment to support the grocery store as well as replacing the two dock levelers. As described in the Methodology Report, Ramboll used CalEEMod® default trip lengths for San Francisco County to calculate the total vehicle miles travelled (VMT). Fleet mix and fuel assumptions are also summarized in **Table 3**.

3.1.3 CAP Emissions from Architectural Coating

Emissions from architectural coating during Project construction were estimated using methodologies described in the Methodology Report and are summarized in **Table 4**. No paving would occur during Project construction since a parking lot exists at the site. Architectural coating emissions were based on the square footage of the total Project area (including the landlord retained area, which is not part of the proposed project) and CalEEMod® default emission factor. Because the architectural coating estimates are based on a larger floor area than Whole Foods would occupy, these results are considered conservative, or worst-case (i.e., the analysis is based on 54,290 square feet, while Whole Foods would occupy a smaller space at about 49,285 square feet).

3.2 Operational CAP Emissions

A summary of annual and daily average operational CAP emissions is shown in **Table 5**. Additional details on operational sources that would contribute to CAP emissions are summarized in **Tables 6-10**.

3.2.1 CAP Emissions from On-Road Vehicles

Mobile emissions were calculated using Project-specific trip generation and VMT by vehicle type and emission factors from EMFAC2021 for San Francisco County for year 2025. The Transportation Engineer for the Project provided daily average project-generated trip rates, trip lengths, and vehicle types,[7] summarized in **Table 6**. In addition to estimating CAP emissions from on-road vehicles, trip and VMT information in **Table 6** from refrigerated and nonrefrigerated delivery trucks are also used to calculate fugitive dust, loading dock idling emissions, and TRU emissions.

CAP Emissions from refrigerated delivery trucks, non-refrigerated delivery trucks, and passenger vehicles (employees and customers) are summarized in **Table 7**.

3.2.2 Fugitive Dust Emissions from On-Road Vehicles

Fugitive dust emissions and the associated calculation are summarized in **Table 8**. Annual VMT from **Table 6** was multiplied by the fugitive PM_{10} and $PM_{2.5}$ emission factor to obtain the annual fugitive dust emissions.

3.2.3 CAP Emissions from Truck Idling

Additional CAP and TAC emissions are generated from delivery truck idling on the Project site. The average number of trucks accessing the Project site is assumed to be the same as the number of daily

[6] Sheppard Mullin, 2022. Email communication titled "FW: Whole Foods at 2675 Blvd: EIR Check-in Meeting" from Jennifer Renk at Sheppard Mullin to Elliott Schwimmer at ESA Associates. January 10.
[7] Kittelson, 2022. Transportation Memorandum, 2675 Geary Boulevard. June 13.

one-way truck trips in **Table 6**. Whole Foods does not allow trucks to idle while queuing for freight loading. However, state law allows 5 minutes of idling upon arrival and 5 minutes prior to departure. Therefore, for the purposes of the air quality model, we assumed 10 minutes of idling time for each delivery trip, as shown in **Table 9**. Weighted average idling emission factors from EMFAC2021 were derived from emission factors by truck types and fleet mixes for refrigerated and unrefrigerated trucks, respectively. The breakdown of CAP emissions by truck type are shown in **Table 9**.

3.2.4 CAP Emissions from Transportation Refrigeration Units (TRUs)

The number of refrigerated delivery trucks accessing the Project site during operation was provided in the Kittelson Memo and shown in **Table 6**. [8] TRU emissions in grams per hour of operation were developed using CARB's web-based EMFAC tool,[9] which incorporates the February 2022 regulatory changes described above, and are shown in **Table 10**. The average unloading time per refrigerated truck was provided in the Kittelson Memo. Ramboll assumed that the engine that keeps the freight chilled (which is separate from the engine that powers the vehicle) would be operational for the entire loading duration. Emission factors from the EMFAC web tool and the resulting emissions for the highest TRU emission year (2025) are shown in **Table 10**. Variable TRU emission factors from 2025 to 2054 are also shown in **Table 11** and were used to evaluate the health risk impacts of TRU emissions.

3.2.5 CAP Emissions from Consumer Products and Energy Use

CalEEMod® 2020.4.0 was used to obtain CAP emissions from area sources and natural gas consumption of Project operation. A copy of the CalEEMod output is in **Appendix A**. Because the proposed project would include cooking and heating activities, CalEEMod default natural gas consumption was not used to avoid underestimation. Instead, annual natural gas consumption of the Project was assumed to be the same as a similar store of 52,889 square feet in Sunnyvale in 2021, provided by the Project Sponsor. For comparison, the actual square footage proposed to be occupied by Whole Foods at the Project is 49,285 square feet. Therefore, assuming the Project would use the same amount of natural gas as the larger Sunnyvale store is a conservative assumption. CAP emissions from consumer products, also shown in **Table 5**, were conservatively based on the Project's approximate footprint of 55,000 square feet.[10]

3.3 Project Health Risks

The purpose of the health risk assessment (HRA) is to analyze potential health impacts that would result from construction and operation of the Project. This HRA evaluated the estimated cancer risk, chronic hazard index, and fine particulate matter ($PM_{2.5}$) concentration associated with construction and operation of the Project. The methodology for this HRA is detailed in the Methodology Report.

As described in the Methodology Report, Ramboll performed air dispersion modeling using the American Meteorological Society/USEPA Regulatory Model (AERMOD) (version 21112), with representative meteorological data to determine diesel particulate matter (DPM), total organic gases (TOG), and $PM_{2.5}$ concentrations for potentially exposed individuals. These concentrations were used to assess the potential human health risk.

[8] Kittelson, 2022. Transportation Memorandum, 2675 Geary Boulevard. June 13.

[9] https://arb.ca.gov/emfac/emissions-inventory

[10] When the air quality modeling was conducted the project description included the entire 54,285-square-foot vacant retail space on level 3 of the City Center shopping center, which was rounded up to 55,000 square feet in the air quality model. Subsequently, the project description was refined as level 3 will be split into two retail spaces, of which 49,825 square feet will be available to Whole Foods. The other 4,460 square feet will be retained by City Center and is not part of the proposed project. As a result, the air quality modeling results are conservative (worst-case), as the results are based on a larger retail space.

3.3.1 Construction Health Risk Assessment

A summary of the results of the construction HRA are presented below.

Emission rates were calculated using the emissions inventory described for construction in **Section 3.1.1** and **3.1.2**. The diesel-powered off-road equipment crane was the only onsite emission source evaluated for the construction HRA. Emissions within 1,000 meters of the Project boundary from construction vendor trucks and worker vehicles were evaluated as on-road construction emissions. The modeled construction sources are shown in **Figures 3** and **5**. Construction emissions for HRA modeling are summarized in **Appendix B**.

Exposure parameters for the construction HRA are presented in **Table 12.** These are consistent with the Methodology Report.

The Project health risks from construction sources are summarized in **Table 14.**

3.3.2 Operational Health Risk Assessment

Consistent with the BAAQMD and Cal/EPA OEHHA guidance described in the Methodology Report, Ramboll performed an HRA for operational sources of TACs from the Project, namely Project-generated traffic. According to the Transportation Engineer, the Project would result in 2,658 one-way daily passenger vehicle trips from customers and employees, as well as 46 daily truck round trips from delivery vehicles (92 one-way trips).[11] Modeled operational sources are shown in **Figures 4** and **5**. The operational emissions from TRUs for the HRA modeling would vary throughout the exposure period. The operational emissions for HRA modeling are summarized in **Appendix B**.

Exposure parameters for the operational HRA are discussed in the Methodology Report, and the detailed setups are shown in **Table 12**. Operational emissions would vary year to year due to decreasing TRU emission factors over time, as shown in **Table 11**. Further details on how the exposure parameters were applied to operational emissions from each calendar year are shown in **Table 13**.

The Project health risks from operational sources are also summarized in **Table 14.** The locations of the Maximally Exposed Individuals (MEIs) for cancer risk and $PM_{2.5}$ concentration are shown in **Figure 6.**

3.4 Results from Cumulative Analysis

The cumulative analysis includes Project impacts added to background risk and reasonably foreseeable future projects. Background risks are available through San Francisco's Citywide HRA 2020.

Citywide modelling for the year 2020 does not include construction or operational emissions from cumulative projects because these are variable and difficult to predict; however, this cumulative analysis evaluates known construction activities and their future operations within the zone of influence (1,000 feet) that could impact local air quality and affect health risk. These sources are not already included in the Citywide HRA. Based on Ramboll's discussion with SFEP, the following nearby projects were considered in this analysis:

1. 1846 Grove Street: the project includes the construction of five single-family dwelling units in the rear yard of an existing property. The 1846 Grove Street project is located approximately 2,500 feet from the 2675 Geary Boulevard Project's Maximally Exposed Individual Receptor at Bright Horizons daycare;

[11] Kittelson, 2022. Transportation Memorandum, 2675 Geary Boulevard. June 13.

2. 1735-1751 Fulton Street: the project proposes to demolish two existing one-story buildings on two lots and construct a four-story 40-foot-tall mixed-use building, containing approximately 25,000 square feet, including nine dwelling units and 4,340 gross square feet of retail space. The two lots would be merged. The 1735-1751 Fulton Street project is located approximately 2,000 feet from the 2675 Geary Boulevard Project's Maximally Exposed Individual Receptor in the residential neighborhood at O'Farrell and Anzavista;
3. 2800 Geary Boulevard: the project includes demolition of an existing commercial building on the project site, and new construction of a six-story, 65-foot-tall mixed-use building with 42 dwelling units and 850 square feet of ground floor commercial space. The 2800 Geary Boulevard project is located approximately 1,010 feet from the 2675 Geary Boulevard Project's Maximally Exposed Individual Receptor at Bright Horizons daycare;
4. 3641 California Street: the project proposes to demolish the existing two-story building at 3641 California Street and construct a new, mixed-use development with residential over commercial. The 3641 California Street project is located approximately 3,600 feet from the 2675 Geary Boulevard Project's Maximally Exposed Individual Receptor at Bright Horizons daycare. For the 3641 California Street project, a screening-level HRA was conducted to evaluate the excess lifetime cancer risk for a child below 2 years of age due to the higher breathing rate of a child. The project would contribute cancer risks of up to 1.7 per million at the Maximally Exposed Individual for that project (see below for additional details);
5. 3333 California Street: a large development project nearby the site. Ramboll previously conducted a health risk assessment for 3333 California Street (see below for additional details). The 3333 California Street project is located approximately 1,580 feet from the 2675 Geary Boulevard Project's Maximally Exposed Individual Receptor at Bright Horizons daycare;
6. 2750 Geary Boulevard: the project includes construction of a three-story addition with 20 dwelling units, increasing the total number to 99 units. The 2750 Geary Boulevard project is located approximately 800 feet from the 2675 Geary Boulevard Project's Maximally Exposed Individual Receptor at Bright Horizons daycare;
7. 3657 Sacramento Street: the project proposes to demolish existing buildings and construct a 40-foot tall, four-story building with a 9-foot-tall elevator penthouse and 4-foot-tall parapet. The building would contain 6,500 square feet of retail, 10,000 square feet of medical office use on the second floor, and 18 dwelling units on the third and fourth floors. The 3657 Sacramento Street project is located approximately 2,640 feet from the 2675 Geary Boulevard Project's Maximally Exposed Individual Receptor at Bright Horizons daycare;
8. 709 Lyon Street: the project proposes to construct a new five-unit residential building. The 709 Lyon Street project is located approximately 1,460 feet from the 2675 Geary Boulevard Project's Maximally Exposed Individual Receptor in the residential neighborhood at O'Farrell and Anzavista;
9. 1355 Fulton Street: the project proposes to construct an 8-story vertical addition above the existing building for a 9-story building for residential use and ground floor retail space. The 1355 Fulton Street project is located approximately 2,520 feet from the 2675 Geary Boulevard Project's Maximally Exposed Individual Receptor in the residential neighborhood at O'Farrell and Anzavista;

10. 3330 Geary Boulevard: the project would demolish three existing office buildings and construct a six-story-over-basement, 65-foot-tall mixed use building including 41 dwelling units. The 3330 Geary Boulevard project is located approximately 2,050 feet from the 2675 Geary Boulevard Project's Maximally Exposed Individual Receptor at Bright Horizons daycare;
11. Geary Corridor Rapid Transit Project: The project would improve Geary Boulevard with safety improvements and faster, more reliable bus service for the 38 Geary and 38R Geary Rapid bus routes every day. Project improvements include red bus-only lanes, signal priority for buses, expanded rapid and local bus service, and a suite of safety improvements such as sidewalk extensions, accessible curb ramps, and protected left turn signals.[12] This is discussed further below. The closest segment of the Geary Corridor Rapid Transit project is located approximately 210 feet from the 2675 Geary Boulevard Project's Maximally Exposed Individual Receptor at Bright Horizons daycare; and
12. 2670 Geary Boulevard: The project would consist of the demolition of the existing one-story restaurant (currently vacant, formerly Lucky Penny) and construction of a mixed-use project with 101 residential dwelling units and 1,756 square feet of ground floor commercial uses. The 2670 Geary Boulevard project is approximately 400 feet northwest of the 2675 Geary Boulevard Project's Maximally Exposed Individual Receptor at Bright Horizons Daycare.

Apart from the Geary Corridor Rapid Transit Project, the 2750 Geary Boulevard project, and the 2670 Geary Boulevard project, none of the above cumulative projects are located within 1,000 feet of the proposed project daycare or resident MEI. Many of the projects listed above would consist of demolition and/or new construction. Such activities would require the use of off-road diesel construction equipment. Apart from the few exceptions listed below, none of the projects above required a quantitative health risk assessment and are therefore, not expected to have a significant impact on nearby receptors' health due to air pollution. Nevertheless, construction and/or operational activities from the projects above could incrementally increase health risks to the Project's Maximally Exposed Individuals. The cumulative projects listed above range from 210 feet to 3,600 feet from the Project's Maximally Exposed Individual Receptors. In general, air pollutant concentrations decrease with distance (sometimes quite quickly) and would therefore be expected to be lower (and in some cases substantially lower) at the Project's Maximally Exposed Individual Receptors.

Quantitative health risk assessment results were available for the project at 3641 California Street, the Geary Corridor Rapid Transit Project, and the 3333 California Street project, described below:

<u>3641 California Street</u>

A screening-level HRA was conducted to evaluate the excess lifetime cancer risk for a child below 2 years of age due to the higher breathing rate of a child. The 3641 California Street project would contribute cancer risks of up to 1.7 per million. The maximum health risk impacts identified for the 3641 California Street project were added to impacts at the proposed project's maximally exposed individual sensitive receptor, which is very conservative. In reality, health risks are expected to be much lower at the proposed project's (2675 Geary Blvd) maximally exposed individual sensitive receptor based on the fact that the proposed project's maximally exposed individual sensitive daycare receptor is located approximately 3,600 feet from 3641 California Street project.

[12] San Francisco County Transportation Authority. Geary Bus Rapid Transit. Available at: https://www.sfcta.org/projects/geary-bus-rapid-transit

Geary Corridor Rapid Transit Project

Health risk impacts from the construction and operation of the Geary Bus Rapid Transit Project were calculated as part of that project's environmental review. Excess lifetime cancer risk was shown to be 2.8 in a million at the Maximum Exposed Individual. The maximum health risk impacts identified were added to impacts at the proposed project's maximally exposed individual sensitive receptor, which is conservative. In reality, health risks from the Geary Bus Rapid Transit project are expected to be lower at the proposed project's (2675 Geary Blvd) maximally exposed individual sensitive receptor at Bright Horizons daycare based on the fact that the proposed project's maximally exposed individual sensitive receptor is located approximately 210 feet from the Geary Bus Rapid Transit construction emissions sources.

3333 California Street

Health risk impacts from the construction and operation of the 3333 California Street project were calculated as part of that project's environmental review. Excess lifetime cancer risk was shown to be 24 in a million at the Maximally Exposed Individual for the 3333 California Street project. At the maximally exposed individual sensitive receptors for the 2675 Geary Boulevard project (both residential and daycare receptors), the cancer risk from the 3333 California Street project is much lower since the proposed project's maximally exposed individual sensitive receptor is located approximately 1,580 feet from the 3333 California Street construction emissions sources. Ramboll pulled the health risk impacts from the 3333 California Street project that were modelled to occur at the 2675 Geary Boulevard Project's maximally exposed individual receptors and added them to impacts at the proposed project's maximally exposed individual sensitive receptor.

Using the above information, the quantitative cumulative cancer risks and $PM_{2.5}$ concentrations from the Project are presented in **Table 15**. The impacts presented in **Table 15** could be greater when considering other cumulative projects where quantitative health risk information is not available. Toxic air contaminant emissions, including DPM, from the proposed project in combination with the cumulative projects described above would increase health risks to these receptors. However, most of the cumulative projects listed above are relatively small, with short construction periods. As such, these projects did not require a quantitative health risk assessment as part of their evaluation because they would have limited construction-related emissions.

TABLES

Table 1: Construction Criteria Air Pollutants Emissions Summary

Table 2: Off-Road Equipment and Criteria Air Pollutants Emissions from Project Construction

Table 3: On-Road Vehicles and Criteria Air Pollutants Emissions from Project Construction

Table 4: Architectural Coating Emissions from Project Construction

Table 5: Operational Criteria Air Pollutants Emissions Summary

Table 6: Trip Information for Project Operations

Table 7: Mobile Criteria Air Pollutants Emissions from Project Operations

Table 8: On-Road Fugitive Dust Emissions from Project Operations

Table 9: Idling Criteria Air Pollutants Emissions from Onsite Truck Activity

Table 10: Transportation Refrigeration Unit (TRU) Criteria Air Pollutants Emissions from Project Operations

Table 11: Transportation Refrigeration Unit (TRU) Emissions Factors for Health Risk Assessment

Table 12: Exposure Parameters for Project Construction and Operations

Table 13: Age Sensitivity Weighted Intake Factors by Year and Age Bin

Table 14: Summary of Project Health Risks

Table 15: Cumulative Cancer Risk and $PM_{2.5}$

FIGURES

Figure 1: Project Boundary and Modeling Extent

Figure 2: Sensitive Receptor Parcels

Figure 3: Modeled Construction Sources – Crane and Trucks

Figure 4: Modeled Operational Sources – Delivery Trucks

Figure 5: Modeled Construction and Operational Sources – Passenger Vehicles

Figure 6: Cancer Risk, Chronic HI, and $PM_{2.5}$ Concentration Maximally Exposed Individuals

Table 1
Construction Criteria Air Pollutants Emissions Summary
Whole Foods - 2675 Geary Blvd
San Francisco, California

Construction Sources[1]	Annual Emissions[2] (lb/day)			
	ROG	NOx	PM_{10} (exhaust)	PM_{25} (exhaust)
Off-Road Equipment	0.0030	0.032	0.0013	0.0012
On-Road Vehicles	0.53	0.23	0.05	0.02
Architectural Coating	2.6	--	--	--
Total	**3.1**	**0.3**	**0.05**	**0.02**

Notes:

1. Uncontrolled emissions assume fleet-average equipment tiers for each calendar year. The emissions above include emissions from diesel off-road equipment, gasoline and diesel on-road vehicles, and off-gassing emissions from architectural coating. Emission factors of off-road equipment are based on CalEEMod® Appendix D.
2. Emissions are averaged over 218 working days during a 10-month construction period starting in October 2024.

Abbreviations:

CalEEMod® - California Emissions Estimator Model

PM_{10} - particulate matter < 10 µm

$PM_{2.5}$ - particulate matter < 2.5 µm

ROG - reactive organic gases

lb - pound

NOx - nitrogen oxides

References

The California Emissions Estimator Model (CalEEMod®). Available at: http://www.caleemod.com/

Table 2
Off-Road Construction Equipment Assumptions
Whole Foods - 2675 Geary Blvd
San Francisco, California

Year	Equipment Quantity	Equipment Type	Fuel Type	Utilization Factor[1]	Power Rating (HP)[1]	Operating Hours/Day[1]	Operating Days[1]
2024	1	Cranes	Diesel	0.29	231	8	2

Notes

[1.] Equipment details and activities provided by Project Sponsor.

Abbreviations:

HP - horsepower

Table 3
On-Road Construction Vehicle Assumptions
Whole Foods - 2675 Geary Blvd
San Francisco, California

Year	Trip Type	Total One-Way Trip during Construction Period[1]	Fleet Mix	Trip Length (Miles/One-Way Trip)[2]	Total Vehicle Miles Travelled	Fuel
2024	Vendor	80	50% MHDT, 50% HHDT	7.3	584	Diesel
2024	Worker	22,100	50% LDA, 25% LDT1, 25% LDT2	10.8	238,680	Gasoline

Notes

[1] Construction trips were provided by Project Sponsor.

[2] Consistent with CalEEMod, worker trip length is home-work (H-W) trip length and vendor trip length is commercial-nonwork (C-NW) trip length for San Francisco county.

Abbreviations:

MHDT - medium-heavy duty Trucks

LDA - light-duty automobiles

HHDT - Heavy-heavy duty trucks

LDT1 - Light-duty trucks (gross vehicle weight rating <6000 pounds. And equivalent test weight <= 3750 pounds)

LDT2 - Light-duty trucks (gross vehicle weight rating <6000 pounds. And equivalent test weight <= 3751-5750 pounds)

Reference

The California Emissions Estimator Model (CalEEMod). Available at: http://www.caleemod.com/

ARB. 2021. EMission FACtors Model, 2021 (EMFAC2021). Available online at: https://arb.ca.gov/emfac/emissions-inventory

Sheppard Mullin, 2022. Email communication titled "FW: Whole Foods at 2675 Blvd: EIR Check-in Meeting" from Jennifer Renk at Sheppard Mullin to Elliott Schwimmer at ESA Associates. January 10.

Table 4
Architectural Coating Emissions from Project Construction
Whole Foods - 2675 Geary Blvd
San Francisco, California

Land Use	Floor Area[1] (square feet)	Building Surface Area[1] (square feet)	Application Rate	Percent of Parking Lot Area Painted[4]	Indoor Paint VOC EF[2] (g/L)	Outdoor Paint VOC EF[2] (g/L)	Architectural Coating VOC emissions[3] (lb)
Supermarket	54,290	108,580	100%	--	100	150	566

Notes:

1. Consistent with CalEEMod®, non-residential area is 2 times the floor area. Building area is assumed to be 75% indoors and 25% outdoors, consistent with CalEEMod®.
2. Paint VOC content is consistent with the BAAQMD Regulation 8 Rule 3 (Architectural Coatings) and CalEEMod's default emission factor values for nonresidential interior/exterior, respectively.
3. Uses CalEEMod® assumption that 1 gallon of paint covers 180 square feet.

Abbreviations:

CalEEMod® - California Emissions Estimator Model
EF - Emission Factor
g - grams
L - liter
lb - pound
VOC - Volatile Organic Compound

References:

California Air Pollution Control Officers Association (CAPCOA). California Emissions Estimator Model (CalEEMod), Version 2016.3.2. Available online at http://www.caleemod.com/

Table 5
Operational Criteria Air Pollutants Emissions Summary
Whole Foods - 2675 Geary Blvd
San Francisco, California

Type of Sources	Emissions Sources	Annual Emissions[3] (tons/year)				Average Daily Emissions[4] (lb/day)			
		ROG	NOx	PM_{10} [3]	$PM_{2.5}$ [3]	ROG	NOx	PM_{10} [3]	$PM_{2.5}$ [3]
Area[1]	--	0.25	1.0E-05	--	--	1.4	5.5E-05	--	--
Energy[2]	--	0.013	0.12	0.0090	0.0090	0.071	0.65	0.049	0.049
On-Road Mobile Emissions	Refrigerated Delivery Trucks	0.015	1.3	0.14	0.085	0.084	7.0	0.78	0.46
	Non-Refrigerated Delivery Trucks	0.025	1.1	0.23	0.17	0.14	6.0	1.3	0.93
	Passenger Vehicles	2.4	0.70	1.9	1.7	13	3.9	11	9.4
	Truck Refrigeration Units	0.43	0.45	0.014	0.013	2.4	2.5	0.08	0.07
Loading Dock Emissions	Truck Idling	0.0024	0.08	1.3E-04	1.3E-04	0.013	0.5	0.0007	0.0007
	Truck Refrigeration Units	0.09	0.09	0.0033	0.0030	0.47	0.51	0.018	0.017
Total		**3.2**	**3.8**	**2.3**	**2.0**	**18**	**21**	**13**	**11**

Notes:

1. Emissions from all area sources (consumer products, architectural coating, and landscaping) are calculated in CalEEMod by conservatively assuming 65,000 square feet of parking and 55,000 square feet of supermarket.
2. Natural gas consumption was provided by the Project Sponsor and is based on a project of similar size.
3. Assume the earliest year of operation to be 2025.
4. Particulate matter emissions include both exhaust and fugitive emissions from on-road mobile sources.

Abbreviations:

PM_{10} - particulate matter less than 10 microns
$PM_{2.5}$ - particulate matter less than 2.5 microns
ROG - reactive organic gases
NOx - nitrogen oxides

Table 6
Trip Information for Project Operations
Whole Foods - 2675 Geary Blvd
San Francisco, California

Fleet Type	Fleet Category	Average Trip Rate[1]	Average Trip Length[2]	Annual Activity	Annual Trips[3]	Annual VMT[3]
		one-way trips/day	mi/one-way trip	days/year	one-way trips/yr	mi/yr
Refrigerated Delivery Trucks	MHDT	14	29.80	365	5,110	152,278
	HHDT	12	58.80	365	4,380	257,544
Non-Refrigerated Delivery Trucks	MDV	12	10.80	365	4,380	47,304
	LDT2	16	50.80	365	5,840	296,672
	MHDT	32	29.80	365	11,680	348,064
	HHDT	6	58.80	365	2,190	128,772
Passenger Vehicles	LDA	1,328	8.57	365	484,720	4,153,883
	LDT1	665	8.56	365	242,725	2,076,941
	LDT2	665	8.56	365	242,725	2,076,941

Notes:

[1] The daily trip rate was provided in the Kittelson Memo.

[2] The average trip length (mi/trip) was provided in the Kittelson Memo.

[3] Annual trips and annual VMT were calculated assuming 365 days per year for trucking operations (provided in the Kittelson Memo).

Abbreviations:

mi - mile(s)

VMT - vehicle miles travelled

yr - year

MHDT - medium-heavy duty Trucks

HHDT - heavy-heavy duty trucks

MDV - medium-duty trucks

LDT1 - Light-duty trucks (gross vehicle weight rating <6000 pounds. And equivalent test weight <= 3750 pounds)

LDT2 - Light-duty trucks (gross vehicle weight rating <6000 pounds. And equivalent test weight <= 3751-5750 pounds)

References:

Kittelson, 2022. Transportation Memorandum, 2675 Geary Boulevard. June 13.

Table 7
Mobile Criteria Air Pollutants Emissions from Project Operations
Whole Foods - 2675 Geary Blvd
San Francisco, California

Fleet Type	Fleet Category	Emissions from Mobile Sources			
		ROG	NOx	PM_{10}	$PM_{2.5}$
		[tons/yr]			
Refrigerated Delivery Trucks	MHDT	0.0052	0.24	0.012	0.0053
	HHDT	0.010	1.0	0.045	0.020
	Refrigerated Delivery Trucks Total	0.015	1.3	0.057	0.025
Non-Refrigerated Delivery Trucks	MDV	9.3E-04	0.0027	0.0013	6.1E-04
	LDT2	0.0075	0.015	0.0084	0.0039
	MHDT	0.012	0.55	0.027	0.012
	HHDT	0.0051	0.52	0.023	0.010
	Non-Refrigerated Delivery Trucks Total	0.025	1.1	0.060	0.026
Passenger Vehicles	LDA	1.1	0.31	0.088	0.032
	LDT1	0.83	0.29	0.051	0.019
	LDT2	0.48	0.11	0.059	0.027
	Passenger Vehicles Total	2.4	0.70	0.20	0.078
Mobile Sources Total		**2.5**	**3.1**	**0.31**	**0.13**

Abbreviations:

yr - year

ROG - reactive organic gases

NOx - nitrogen oxides

HHDT - Heavy-heavy duty trucks

PM_{10} - particulate matter < 10 µm

$PM_{2.5}$ - particulate matter < 2.5 µm

MHDT - medium-heavy duty Trucks

LDA - light-duty automobiles

LDT1 - Light-duty trucks (gross vehicle weight rating <6000 pounds. And equivalent test weight <= 3750 pounds)

LDT2 - Light-duty trucks (gross vehicle weight rating <6000 pounds. And equivalent test weight <= 3751-5750 pounds)

Table 8
On-Road Fugitive Dust Emissions from Project Operations
Whole Foods - 2675 Geary Blvd
San Francisco, California

Road Dust Equation[1]

E = k*(sL)^0.91 * (W)^1.02 * (1-P/4N)

Parameter[2]	**Value**
E = annual average emission factor in the same units as k	[calculated]
k = particle size multiplier for particle size range and units of interest	
PM_{10} (lb/VMT)	0.0022
$PM_{2.5}$ (lb/VMT)	3.3E-04
sL = road surface silt loading (grams per square meter) (g/m^2)	0.063
W = average weight (tons) of all the vehicles traveling the road	2.4
P = number of "wet" days with at least 0.01 in of precipitation during averaging period[3]	64
N number of days in the averaging period	365

Vehicle Miles Traveled (miles per year)[4]

Refrigerated Delivery Trucks	409,822
Non-Refrigerated Delivery Trucks	820,812
Passenger Vehicles	8,307,765

Scenario[4]	**Fugitive PM_{10}**	**Fugitive $PM_{2.5}$**	**Units**
Emission Factor	4.14E-04	6.21E-05	lb/VMT
Emissions - Refrigerated Delivery Trucks	0.08	0.01	tons/year
Emissions - Non-Refrigerated Delivery Trucks	0.17	0.03	tons/year
Emissions - Passenger Vehicles	1.72	0.26	tons/year
Full Emissions - Total	**1.97**	**0.30**	**tons/year**

Notes:

1. The road dust equation for paved roads is from the California Air Resources Board's (ARB) 2018 Miscellaneous Process Methodology 7.9 for Entrained Road Travel, Paved Road Dust.
2. Silt loading emission factor calculated in Table 6 using roadway travel fractions. Other parameters are from ARB 2016. $PM_{2.5}$ is assumed to be 15% of PM_{10} based on paved road dust sampling in California (ARB Speciation Profile #471), which is a more representative fraction than provided in the older AP-42 fugitive dust methodology as discussed in ARB 2018 (page 10).
3. The number of "wet" days for San Francisco County is from CalEEMod® Appendix D Table 1.1 (64 days).
4. Emission factors calculated using Road Dust Equation and parameters presented in upper sub-table. Fugitive emission rates calculated as product of the emission factor and annual VMT.

Abbreviations:

ARB - Air Resources Board
CalEEMod® - California Emissions Estimator Model
lb - pounds
PM - particulate matter
VMT - vehicle miles traveled

References:

California Air Pollution Control Officers Association (CAPCOA). California Emissions Estimator Model (CalEEMod®), Version 2020.4.0. Available online at http://www.caleemod.com/

California ARB. 2018. Miscellaneous Processes Methodologies - Paved Entrained Road Dust. Available online at: https://www.arb.ca.gov/ei/areasrc/fullpdf/full7-9_2018.pdf

USEPA. 1996. AP 42. Compilation of Air Pollutant Emission Factors, Volume 1. Fifth Edition. Chapter 13.2.1, Paved Roads. Available online at: http://www3.epa.gov/ttn/chief/ap42/ch13/final/c13s0201.pdf. . Accessed January 2016.

Table 9
Idling Criteria Air Pollutants Emissions from Onsite Truck Activity
Whole Foods - 2675 Geary Blvd
San Francisco, California

Truck Idling Inputs[1]

Scenario	Parameter	Value	Units
Project Operation	Year	2025	--
	Average Number of Refrigerated Delivery Trucks per Day	26	one-way trips/day
	Average Number of Non-Refrigerated Delivery Trucks per Day	66	one-way trips/day
	Idle Time	5	min/one-way trip
	Operational Days per Year	365	days/yr
	Total Annual Refrigerated Delivery Trucks Idling	791	idle-hr/yr
	Total Annual Non-Refrigerated Delivery Trucks Idling	2,008	idle-hr/yr

Truck Idling Emission Factors and Emissions

Truck Type	Pollutant	Idling Emission Factors[2] (g/idle-hr)	Emissions	
Refrigerated Delivery Trucks	ROG	1.4	0.0012	tpy
	NO_X	38	0.033	tpy
	PM_{10}	0.057	5.0E-05	tpy
	$PM_{2.5}$	0.054	4.7E-05	tpy
Non-Refrigerated Delivery Trucks	ROG	0.52	0.0012	tpy
	NO_X	23	0.051	tpy
	PM_{10}	0.037	8.3E-05	tpy
	$PM_{2.5}$	0.036	7.9E-05	tpy

Notes:

1. Truck idling activity inputs were provided in the Kittelson Memo.
2. Emission factors were estimated using EMFAC2021 to generate emission rates for San Francisco County from diesel trucks.

Abbreviations

CO - carbon monoxide
CO_2e - carbon dioxide equivalents
EMFAC - EMission FACtors model
g - grams
idle-hr - hour spent idling
min - minute
NO_X - oxides of nitrogen
PM - particulate matter
ROG - reactive organic gases
tpy - tons per year
yr - year
MT - metric ton

References

ARB. 2021. EMission FACtors Model, 2021 (EMFAC2021). Available online at: https://arb.ca.gov/emfac/emissions-inventory

Table 10
Transportation Refrigeration Unit (TRU) Criteria Air Pollutants Emissions from Project Operations
Whole Foods - 2675 Geary Blvd
San Francisco, California

TRU Usage Inputs [Unit]		Truck TRU	Trailer TRU
TRU Usage[1] [One-way trips/day]		14	12
Percent of time when engine is on during TRU operation [--][2]		62.5%	62.5%
Operational Days [days/yr]		365	
TRU Engine Operation During Travel	Average Speed Traveled by Truck[3] [mi/hr]	25	
	Average Miles Traveled by Truck[4] [mi/one-way trip]	29.8	58.8
	Annual Hours of Operation During Travel [hr]	3807	6439
TRU Engine Operation During Unloading	Unloading Time per TRU[5] [hour/one-way trip]	0.34	0.39
	Annual Hours of Operation During Unloadingl [hr]	1085	1079

TRU Emission Factors

Source	Year[6]	Emission Factor (g/hour)[7]			
		ROG	NO_X	PM_{10}	$PM_{2.5}$
Truck TRU	2025	28	35	1.8	1.7
Trailer TRU		44	42	0.94	0.86

TRU Emissions

TRU Type	Operation	Annual Average Emissions (tons/yr)			
		ROG	NO_X	PM_{10}	$PM_{2.5}$
Truck TRU	Operation During Travel	0.12	0.15	0.0076	0.0070
	Operation During Unloading	0.033	0.042	0.0022	0.0020
Trailer TRU	Operation During Travel	0.31	0.30	0.0067	0.0061
	Operation During Unloading	0.053	0.050	0.0011	0.0010

Notes:

1. Approximate TRU usage provided in the Kittelson Memo.
2. According to Appendix H: 2021 Update to Emissions Inventory for Transport Refrigeration Units, TRU engines are generally running about 62.5% of time that a TRU unit is turned on.
2. Per San Francisco CVC "Prima facie speed limits", the standard speed limit for business or residential districts in CA is 25 MPH. Some streets near the Project have limits of 30 MPH and a portion of each delivery trip will be on highways, but 25 MPH was conservatively assumed for the entire trip.
3. Truck trip length is consistent with the trip length assumed for truck deliveries. All other emissions from the trucks' engines during travel are included in the mobile emissions and are therefore not estimated separately here.
4. Loading and unloading time provided in the Kittelson Memo.
5. Emissions from TRUs decrease over time, but the earliest possible year was chosen to calculate criteria air pollutant emissions from TRUs.
6. Based on OFFROAD2021 for Transportation Refrigeration Unit vehicle class.

Abbreviations:

ARB - [California] Air Resources Board
g - gram
PM - particulate matter
hr - hour
mi - mile
NO_X - oxides of nitrogen
ROG - reactive organic gases
TRU - transportation refrigeration unit
yr - year

References:

California Air Resources Board. 2021 OFFROAD database. Available at: https://arb.ca.gov/emfac/emissions-inventory/.

California Air Resources Board. Appendix H: 2021 Update to Emissions Inventory for Transport Refrigeration Units. July.

Kittelson, 2022. Transportation Memorandum, 2675 Geary Boulevard. June 13.

Table 11
Transportation Refrigeration Unit (TRU) Emissions Factors for Health Risk Assessment
Whole Foods - 2675 Geary Blvd
San Francisco, California

TRU Emission Factors

Year	Operation	Operation Hour-Weighted Emission Factor (g/hour)[1,2]			
		ROG	NO_X	PM_{10}	$PM_{2.5}$
2025	Operation During Travel	35.4	38.5	1.41	1.30
2025	Operation During Unloading	36.0	38.7	1.38	1.27
2026	Operation During Travel	35.3	38.1	1.35	1.24
2026	Operation During Unloading	35.9	38.4	1.31	1.20
2027	Operation During Travel	35.5	37.9	1.29	1.19
2027	Operation During Unloading	36.1	38.1	1.25	1.15
2028	Operation During Travel	35.6	37.7	1.24	1.14
2028	Operation During Unloading	36.3	37.9	1.20	1.10
2029	Operation During Travel	35.6	37.6	1.20	1.11
2029	Operation During Unloading	36.3	37.7	1.15	1.06
2030	Operation During Travel	20.4	18.5	0.19	0.18
2030	Operation During Unloading	22.1	20.0	0.21	0.19
2031	Operation During Travel	20.2	18.4	0.17	0.16
2031	Operation During Unloading	21.8	19.9	0.19	0.17
2032	Operation During Travel	19.9	18.4	0.16	0.15
2032	Operation During Unloading	21.6	19.8	0.17	0.16
2033	Operation During Travel	19.9	18.3	0.15	0.14
2033	Operation During Unloading	21.5	19.8	0.16	0.15
2034	Operation During Travel	20.0	18.3	0.14	0.13
2034	Operation During Unloading	21.6	19.8	0.16	0.14
2035	Operation During Travel	20.1	18.3	0.14	0.13
2035	Operation During Unloading	21.7	19.8	0.15	0.14
2036	Operation During Travel	20.3	18.4	0.13	0.12
2036	Operation During Unloading	21.9	19.8	0.15	0.13
2037	Operation During Travel	20.4	18.4	0.13	0.12
2037	Operation During Unloading	22.0	19.9	0.14	0.13
2038	Operation During Travel	20.4	18.4	0.13	0.12
2038	Operation During Unloading	22.0	19.8	0.14	0.12
2039	Operation During Travel	20.3	18.4	0.12	0.11
2039	Operation During Unloading	21.9	19.8	0.13	0.12
2040	Operation During Travel	20.1	18.4	0.12	0.11
2040	Operation During Unloading	21.7	19.8	0.13	0.12
2041	Operation During Travel	20.0	18.3	0.12	0.11
2041	Operation During Unloading	21.6	19.8	0.13	0.12
2042	Operation During Travel	20.0	18.3	0.12	0.11
2042	Operation During Unloading	21.6	19.8	0.13	0.12
2043	Operation During Travel	20.1	18.3	0.12	0.11
2043	Operation During Unloading	21.7	19.8	0.13	0.12
2044	Operation During Travel	20.2	18.4	0.12	0.11
2044	Operation During Unloading	21.8	19.8	0.13	0.12
2045	Operation During Travel	20.2	18.4	0.12	0.11
2045	Operation During Unloading	21.9	19.8	0.13	0.12
2046	Operation During Travel	20.3	18.4	0.12	0.11
2046	Operation During Unloading	21.9	19.8	0.13	0.12
2047	Operation During Travel	20.2	18.4	0.12	0.11
2047	Operation During Unloading	21.9	19.8	0.13	0.12
2048	Operation During Travel	20.2	18.4	0.12	0.11
2048	Operation During Unloading	21.8	19.9	0.13	0.12
2049	Operation During Travel	20.1	18.3	0.12	0.11
2049	Operation During Unloading	21.7	19.8	0.13	0.12
2050	Operation During Travel	20.1	18.3	0.12	0.11
2050	Operation During Unloading	21.7	19.8	0.13	0.12
2051	Operation During Travel	20.1	18.3	0.12	0.11
2051	Operation During Unloading	21.7	19.8	0.13	0.12
2052	Operation During Travel	20.1	18.3	0.12	0.11
2052	Operation During Unloading	21.7	19.8	0.13	0.12
2053	Operation During Travel	20.1	18.3	0.12	0.11
2053	Operation During Unloading	21.7	19.8	0.13	0.12
2054	Operation During Travel	20.1	18.3	0.12	0.11
2054	Operation During Unloading	21.7	19.8	0.13	0.12

Notes:

1. Loading and unloading time provided in the Kittelson Memo.
2. Based on OFFROAD2021 for Transportation Refrigeration Unit vehicle class

Abbreviations:

ARB - [California] Air Resources Board
hp - horsepower
g - gram
gal - gallon
PM - particulate matter
hr - hour
mi - mile
MT - metric tonnes
NO_X - oxides of nitrogen
ROG - reactive organic gases
TRU - transportation refrigeration unit
VMT - vehicles miles traveled
yr - year

References:

California Air Resources Board. 2021 OFFROAD database. Available at: https://arb.ca.gov/emfac/emissions-inventory/.

Table 12
Exposure Parameters for Project Construction and Operations
Whole Foods - 2675 Geary Blvd
San Francisco, California

Construction

Population	Receptor Age Group	Exposure Parameters					
		Daily Breathing Rate (DBR)[1] [L/kg-day]	Exposure Duration (ED) [years]	Fraction of Time at Home (FAH)[2] [unitless]	Exposure Frequency (EF)[3] [days/year]	Averaging Time (AT) [days]	Intake Factor, Inhalation (IF_{inh}) [m^3/kg-day]
Residents[4]	Age 0-<2 Years	1,090	0.83	1.0	350	25,550	0.012
Daycare Children[5]	Age Six Weeks-<2 Years	1,090	0.83	--	350	25,550	0.012

Operations

Population	Receptor Age Group	Exposure Parameters					
		Daily Breathing Rate (DBR)[1] [L/kg-day]	Exposure Duration (ED)[6] [years]	Fraction of Time at Home (FAH)[2] [unitless]	Exposure Frequency (EF)[3] [days/year]	Averaging Time (AT) [days]	Intake Factor, Inhalation (IF_{inh}) [m^3/kg-day]
Residents[4]	3rd Trimester	361	1.0	1.0	350	25,550	0.0049
	Age 0-<2 Years	1,090	1.0	1.0	350	25,550	0.015
	Age 2-<16 Years	572	1.0	1.0	350	25,550	0.0078
	Age 16-30 Years	261	1.0	0.73	350	25,550	0.0026
Daycare Children[5]	Age Six Weeks-<2 Years	1,090	1.0	--	350	25,550	0.015
	Age 2-<9 Years	631	1.0	--	350	25,550	0.0086

Notes:

1. Daily breathing rates reflect default breathing rates from OEHHA 2015 and BAAQMD 2016 as follows: 95th percentile 24-hour daily breathing rate for 3rd trimester and age 0-<2 years; 80th percentile for ages 2 years and older (per BAAQMD 2016 and 2020 Health Risk Assessment (HRA) Modeling Guidelines).
2. Fraction of time spent at home is conservatively assumed to be 1 (i.e., 24 hours/day) for age groups from the third trimester to less than 16 years old based on the recommendation from BAAQMD (BAAQMD 2016 and 2020) and OEHHA (OEHHA 2015). The fraction of time at home for adults age 16-30 reflects default OEHHA guidance (OEHHA 2015) as recommended by BAAQMD (2016 and 2020).
3. Exposure frequency reflects default residential exposure frequency from OEHHA 2015.
4. All receptors are assumed to be exposed to construction risks for the duration of construction, which is 10 months. All receptors are assumed to be exposed to operational risks for 30 years beginning in 2025 at the start of operation.
5. Daycare children are modeled using parameters consistent with OEHHA 2015 guidance for resident children, which conservatively assumes 24 hours/day exposure.
6. Exposure Duration during operational years is shown in Table 13.

Calculation:

IF_{inh} = DBR * FAH * EF * ED * CF / AT

CF = 0.001 (m^3/L)

Abbreviations:

AT - averaging time
BAAQMD - Bay Area Air Quality Management District
DBR - daily breathing rate
ED - exposure duration
EF - exposure frequency
FAH - fraction of time at home
IF_{inh} - intake factor
kg - kilogram
L - liter
m^3 - cubic meter
OEHHA - Office of Environmental Health Hazard Assessment

References:

BAAQMD. 2016. Air Toxics NSR Program Health Risk Assessment (HRA) Guidelines. January.

BAAQMD. 2020. Health Risk Assessment (HRA) Modeling Protocol. December.

OEHHA. 2015. Air Toxics Hot Spots Program Risk Assessment Guidelines. Guidance Manual for Preparation of Health Risk Assessments. February.

Table 13
Age Sensitivity Weighted Intake Factors by Year and Age Bin
Whole Foods - 2675 Geary Blvd
San Francisco, California

Year[1]	Resident				Daycare Child		
	Fraction of Year in Age Bin[2]			Age Sensitivity Weighted Intake Factor by Year, Inhalation[3]	Fraction of Year in Age Bin[2]		Age Sensitivity Weighted Intake Factor by Year, Inhalation[3]
	0-2	2-16	16-30	(m^3/kg-day)	0-2	2-9	(m^3/kg-day)
2025	1			0.149	1		0.15
2026	1			0.149	0.75	0.25	0.12
2027		1		0.024		1	0.026
2028		1		0.024		1	0.026
2029		1		0.024			
2030		1		0.024			
2031		1		0.024			
2032		1		0.024			
2033		1		0.024			
2034		1		0.024			
2035		1		0.024			
2036		1		0.024			
2037		1		0.024			
2038		1		0.024			
2039		1		0.024			
2040		1		0.024			
2041			1	0.0026			
2042			1	0.0026			
2043			1	0.0026			
2044			1	0.0026			
2045			1	0.0026			
2046			1	0.0026			
2047			1	0.0026			
2048			1	0.0026			
2049			1	0.0026			
2050			1	0.0026			
2051			1	0.0026			
2052			1	0.0026			
2053			1	0.0026			
2054			1	0.0026			

Notes:

1. Operational exposure begins in 2025.
2. The operational exposure duration for all years is 1, as the health risk assessment is based on annual emissions. While the 3rd Trimester is only 3 months, the exposure duration for the first year is set to 1 since annual average concentrations are used to calculate risks.
3. The Intake Factors have been multiplied by the Age Sensitivity Factors and weighted by the exposure duration for each age bin.

Abbreviations:

IF - intake factor
m^3 - cubic meter
kg - kilogram

References:

OEHHA. 2015. Air Toxics Hot Spots Program Risk Assessment Guidelines. Guidance Manual for Preparation of Health Risk Assessments. February.

Table 14
Summary of Project Resident and Daycare Health Risks
Whole Foods - 2675 Geary
San Francisco, California

Receptor Type	Resident[1]			Daycare[1]		
Sources	**Excess Lifetime Cancer Risk (in a million)[2]**	**Non-Cancer Hazard Index[3]**	**$PM_{2.5}$ Concentration ($\mu g/m^3$, Annual Average)[4]**	**Lifetime Excess Cancer Risk (in a million)[2]**	**Non-Cancer Hazard Index[3]**	**$PM_{2.5}$ Concentration ($\mu g/m^3$, Annual Average)[4]**
Construction Sources						
Passenger Vehicles[5]	0.0027	6.0E-04	0.0020	3.9E-04	9.7E-05	3.2E-04
Truck[5]	2.8E-05	4.1E-07	6.7E-06	6.1E-06	9.3E-08	1.5E-06
Crane	4.0E-04	5.8E-06	2.7E-05	0.0028	2.7E-05	1.3E-04
Construction Total	0.0031	6.1E-04	0.0020	0.0032	1.2E-04	4.5E-04
Operational Sources						
Passenger Vehicles[5]	2.3	0.010	0.034	0.16	0.0016	0.0054
Truck[5]	0.24	6.6E-05	0.0010	0.029	1.8E-05	2.7E-04
TRU Exhaust	1.0	4.5E-04	0.0021	0.83	4.6E-04	0.0021
Truck Idling	0.084	2.3E-05	1.1E-04	0.053	2.8E-05	1.3E-04
Operations Total	3.58	0.010	0.037	1.07	0.0021	0.0080
Construction + Operations Total[6]	3.58	--	--	1.07	--	--
MEI Location[7]						
UTMx	548,840	548,840	548,840	548,780	548,800	548,800
UTMy	4,181,680	4,181,680	4,181,680	4,181,780	4,181,780	4,181,780
Located in APEZ?	No	--	No	Yes	--	Yes

Notes:

1. All receptors are assumed to be exposed to construction risks for the duration of construction, which is 10 months in 2024. All receptors are assumed to be exposed to operational risks for 30 years beginning in 2025 at the start of operation.
2. Excess lifetime cancer risks are estimated as the upper-bound incremental probability that an individual will develop cancer over a lifetime as a direct result of exposure to potential carcinogens. The estimated risk is expressed as a unitless probability. The cancer risk attributed to the emissions associated with the Project was calculated based on the modeled annual average concentration of toxic air contaminants (TACs), the intake factor for a resident child, the Cancer Potency Factors (CPF) for TACs, and the Age Sensitivity Factors (ASF). TACs in this project include DPM and speciated total organic gas (TOG).
3. The potential for exposure to result in adverse chronic noncancer effects is evaluated by comparing the estimated annual average air concentration to the noncancer chronic Reference Exposure Level (REL) for each chemical. When calculated for a single chemical, the comparison yields a ratio termed a chronic hazard quotient (HQ). To evaluate the potential for adverse chronic noncancer health effects from simultaneous exposure to multiple chemicals, the chronic hazard quotients for all chemicals are summed, yielding a hazard index (HI).
4. $PM_{2.5}$ concentration and Non-Cancer Hazard Index represent annual values.
5. Passenger and truck emissions considered in the health risk assessment include both exhaust and fugitive dust emissions.
6. Construction + operations totals were reported for excess lifetime cancer risk only since excess lifetime cancer risk is based on a 30-year exposure scenario. Chronic non-cancer HI and PM2.5 concentration are based on annual averages; therefore, chronic non-cancer HI and PM2.5 from construction and operations would not be additive since construction and operations would not occur at the same time. As shown in the table, the highest values of non-cancer HI and PM2.5 concentrations occur during operations.
7. Maximum Exposed Individual location identified for this project (construction and operations) is the same as the Maximum Exposed Individual location for operational health risks impacts.

Abbreviations:

µg - microgram
ASF - age sensitivity factor
DPM - diesel particulate matter
HQ - hazard quotient
m^3 - cubic meter
OEHHA - Office of Environmental Health Hazard Assessment
PM - particulate matter
REL- reference exposure level
TAC - toxic air contaminants
TOG - total organic gas
TRU - transport refrigeration unit
HI - hazard index

Reference:

OEHHA. 2015. Air Toxics Hot Spots Program Risk Assessment Guidelines. Guidance Manual for Preparation of Health Risk Assessments. February.

Table 15
Cumulative Cancer Risk and $PM_{2.5}$ Concentration
Whole Foods - 2675 Geary Blvd
San Francisco, California

Source Category	Distance to Nearest MEIR (feet)	$PM_{2.5}$ Concentration (µg/m^3, Annual Average)		Excess Lifetime Cancer Risk (in a million)	
		Off-Site Resident[1]	On-Site Daycare[2]	Off-Site Resident	On-Site Daycare
Proposed Project[3]	-	0.037	0.0080	3.6	0.73
2020 Citywide Background[4]	-	8.5	9.2	50	105
Total Project + Background	**-**	**8.5**	**9.2**	**54**	**106**
Future Construction Projects not in Citywide HRA					
3333 California Street[5]	*1,583*	0.0008	0.0014	0.15	0.32
Geary Bus Rapid Transit Project[6]	*210*	0.0050	0.0050	2.8	2.8
3461 Geary Blvd.[7]	*3,616*	-	-	1.7	1.7
Total Non-Project	**-**	**0.006**	**0.006**	**5**	**5**
Cumulative Total[8,9]	**-**	**8.5**	**9.2**	**58**	**111**

MEISR Location:

MEISR Type	UTMx [m]	UTMy [m]
Off-Site Resident	548840	4181680
On-Site Daycare[10]	548780	4181780

Notes:

1. Off-site Project Maximum Exposed Individual Sensitive Receptor (MEISR) was identified as the off-site sensitive receptor location with the maximum total cancer risk and $PM_{2.5}$ concentration attributed to the emissions associated with the Project construction and operation.
2. On-site daycare Maximum Exposed Individual Sensitive Receptor (MEISR) is the receptor located at the daycare center above the Whole Foods Project with the maximum health impact. Residential exposure parameters were assumed for the daycare as discussed in the Methodology Report.
3. The Proposed Project values account for impacts from construction and operation of the Proposed Project. Construction impacts are from off-road construction equipment (crane only) and on-road construction delivery and worker trips. Operational impacts are from passenger vehicle trips and delivery truck trips. Values shown here are the maximum impacts, which for excess lifetime cancer risk include impacts from construction and operations over a 30 year lifetime and for PM2.5 concentration includes the maximum annual concentration which occurs during operations.
4. Background cancer risks and $PM_{2.5}$ concentrations for 2020 were obtained from the San Francisco Citywide model output database.
5. Health risk from 3333 California Street was analyzed in a previous EIR for the 3333 California Street Mixed Use Project (SCH: 2017092053). The cancer risk and PM2.5 concentration values presented here are the modeled impacts from the 3333 California Street Project occuring at the Whole Foods Project's MEISR locations shown above.
6. The maximum health risks from both construction and operation for the Geary Bus Rapid Transit (BRT) Project were taken from the 2015 DEIR and conservatively summed, added to the Whole Foods Project cancer risk, and assumed to occur at the Project MEISR as a conservative estimate. In reality, health risks from this future project are expected to be lower at the Project MEISR.

Table 15
Cumulative Cancer Risk and $PM_{2.5}$ Concentration
Whole Foods - 2675 Geary Blvd
San Francisco, California

7. Accessed from the Air Quality Technical Memorandum - 3461 California Street, Case Number 2018-007764ENV
8. Cumulative total health impacts are the sum of the Proposed Project impacts, background impacts included in the Citywide model, and background impacts for future projects not included in the Citywide model.
9. Maximum Exposed Individual values from the cumulative projects were not specifically for a daycare receptor, but were added to the Project daycare receptor as a conservative approach to calculate the cumulative total.
10. The reported on-site daycare MEI location is for the cancer risk, which is 20 meters away from the $PM_{2.5}$ MEI location.

Abbreviations:

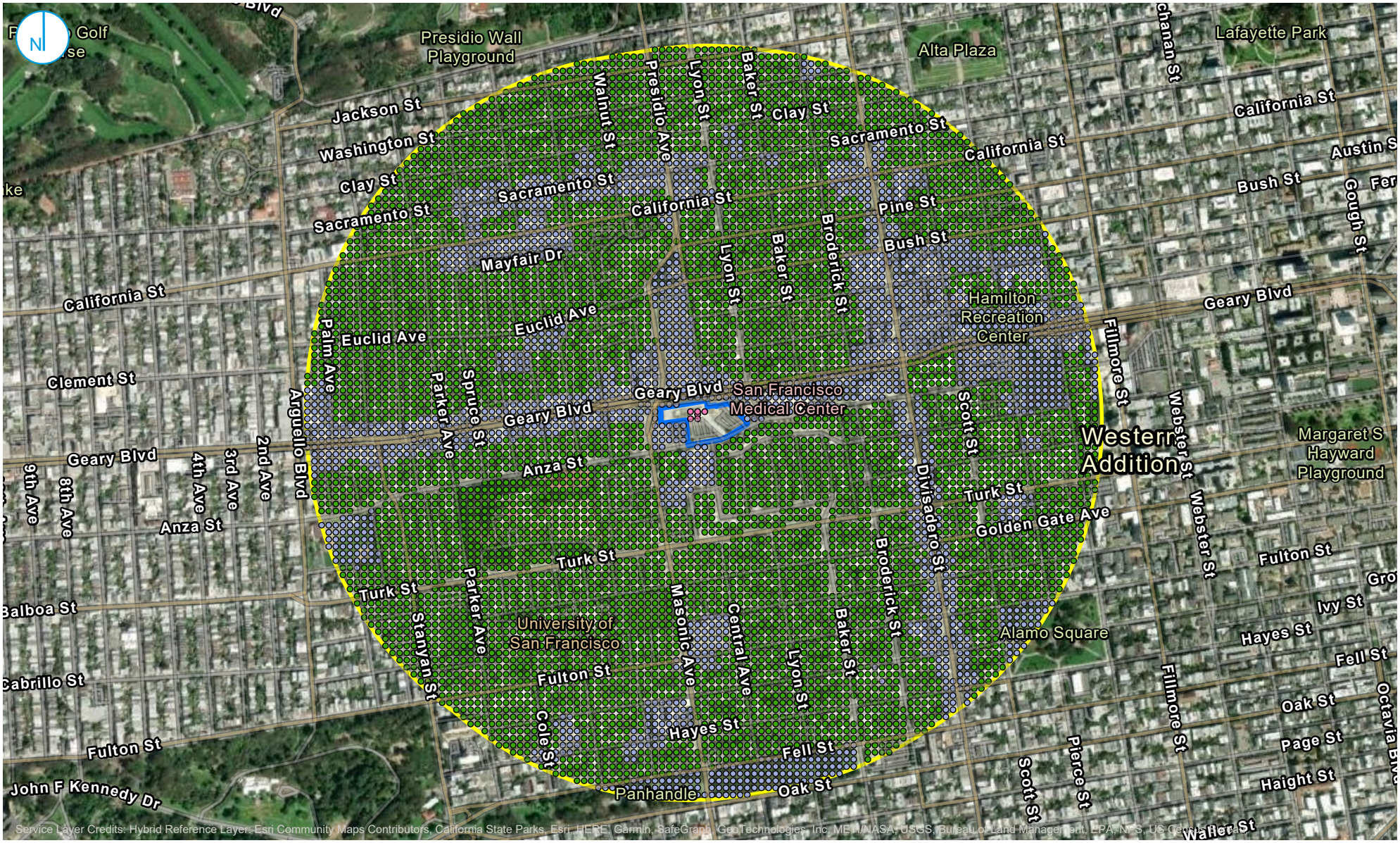
UTM - Universal Transverse Mercator
$PM_{2.5}$ - particulate matter 2.5 microns or less
DEIR - Draft Environmental Impact Report
m - meter
MEISR - Maximally Exposed Individual Sensitive Receptor
Citywide model - San Francisco Citywide Health Risk Assessment Model

References:

San Francisco County Transportation Authority, et al. 2015. Geary Corridor Bus Rapid Transit Project, Draft Environmental Impact Statement/Environmental Impact Report. September.

City and County of San Francisco, et al. 2018. 3333 California Street Mixed-Use Project, Draft Environmental Impact Report.

PROJECT: 1690022356 | DATED: 8/22/2022 | DESIGNER: LLI



Receptor Type
- Daycare
- Resident
- Other

- Project Boundary
- Modeling Extent (1000 m Buffer Area)

0 250 500 1,000 Meters

PROJECT BOUNDARY AND MODELING EXTENT

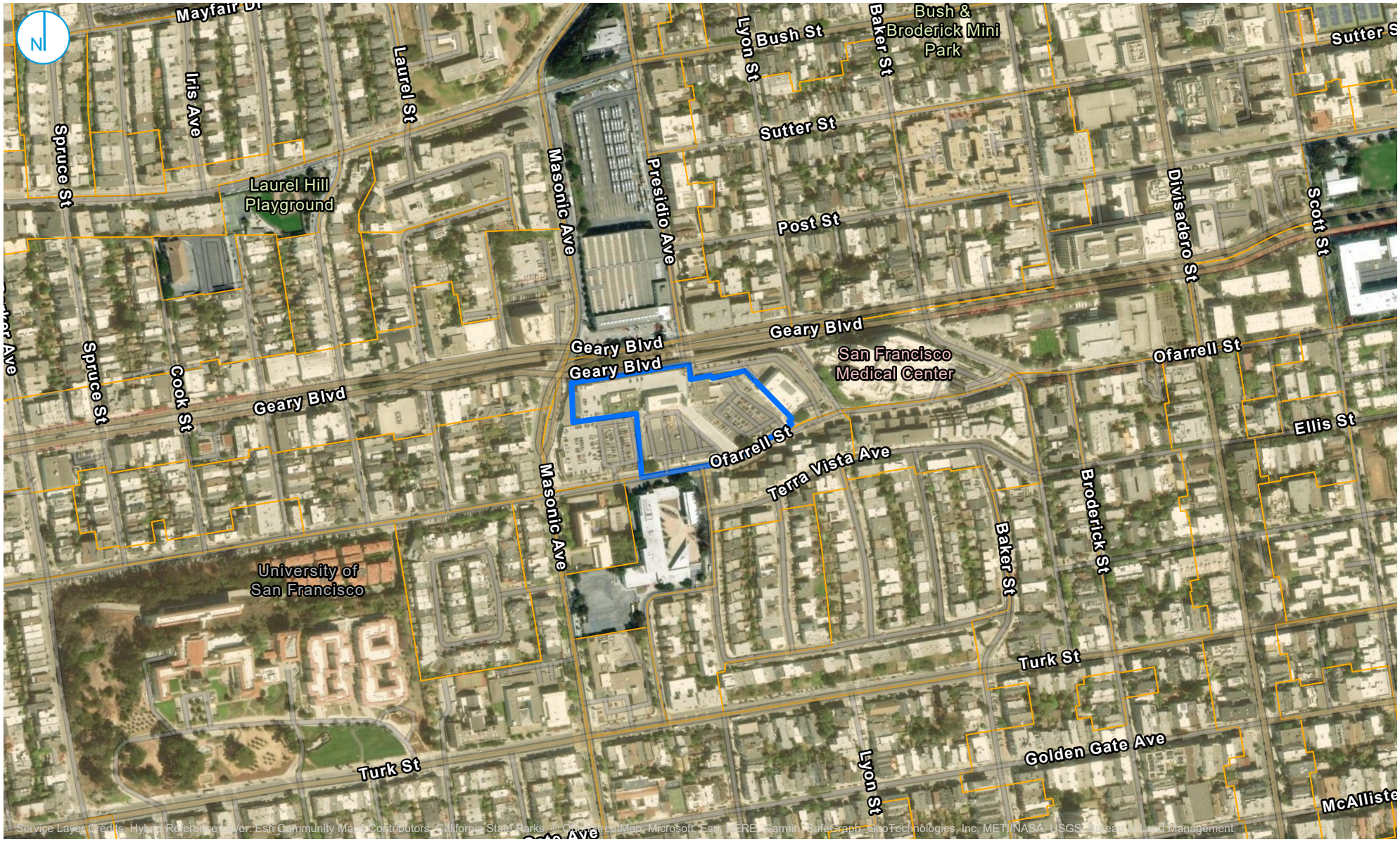
Whole Foods - 2675 Geary Blvd
San Francisco, California

FIGURE 01

RAMBOLL US CONSULTING, INC.
A RAMBOLL COMPANY

RAMBOLL

PROJECT: 1690022356 | DATED: 8/22/2022 | DESIGNER: LLI



Project Boundary

Land Use: Resident & Mixed Use

0 125 250 500 Meters

SENSITIVE RECEPTOR PARCELS

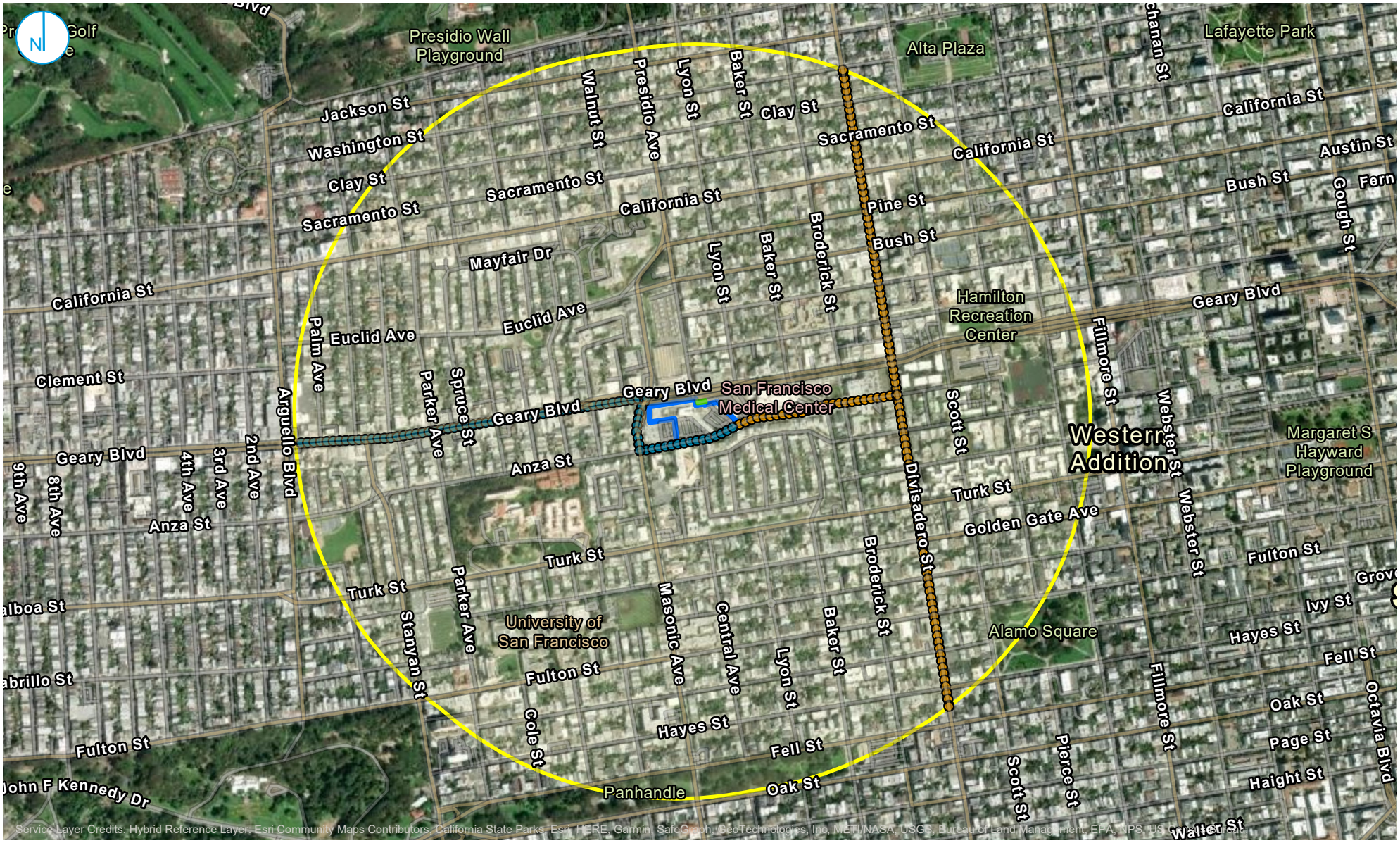
Whole Foods - 2675 Geary Blvd
San Francisco, California

FIGURE 02

RAMBOLL US CONSULTING, INC.
A RAMBOLL COMPANY

RAMBOLL

PROJECT: 1690022356 | DATED: 8/22/2022 | DESIGNER: LLI



Construction Crane
Truck Outbound
Truck Inbound
Project Boundary
Modeling Extent (1000 m Buffer Area)

0 250 500 1,000 Meters

MODELED CONSTRUCTION SOURCES - CRANE AND TRUCKS

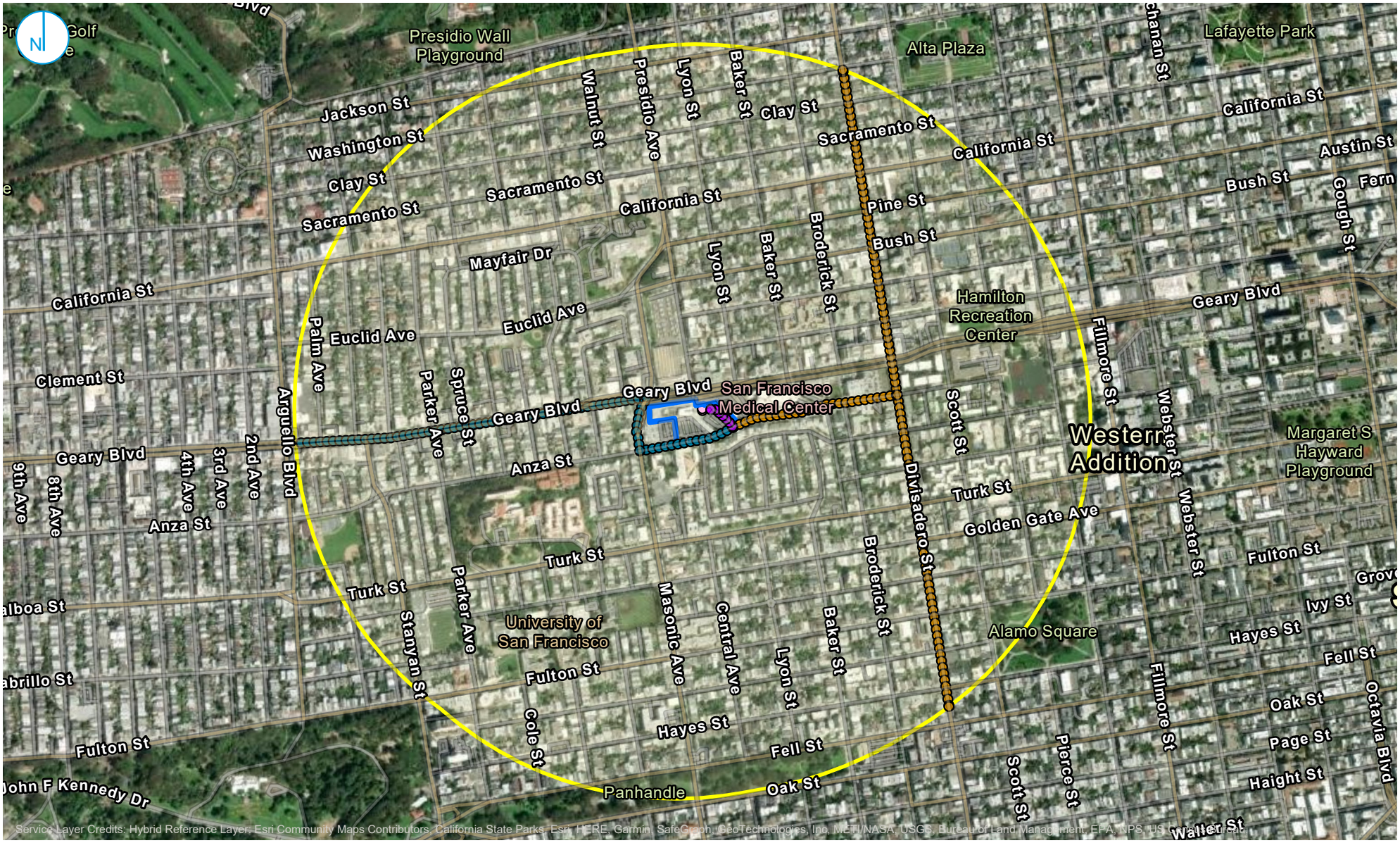
Whole Foods - 2675 Geary Blvd
San Francisco, California

FIGURE 03

RAMBOLL US CONSULTING, INC.
A RAMBOLL COMPANY

RAMBOLL

PROJECT: 1690022356 | DATED: 8/22/2022 | DESIGNER: LLI



- Truck/TRU Outbound
- Truck/TRU Inbound
- Truck/TRU Onsite
- Truck Idling/TRU Loading Dock
- Project Boundary
- Modeling Extent (1000 m Buffer Area)

0 250 500 1,000 Meters

MODELED OPERATIONAL SOURCES - DELIVERY TRUCKS

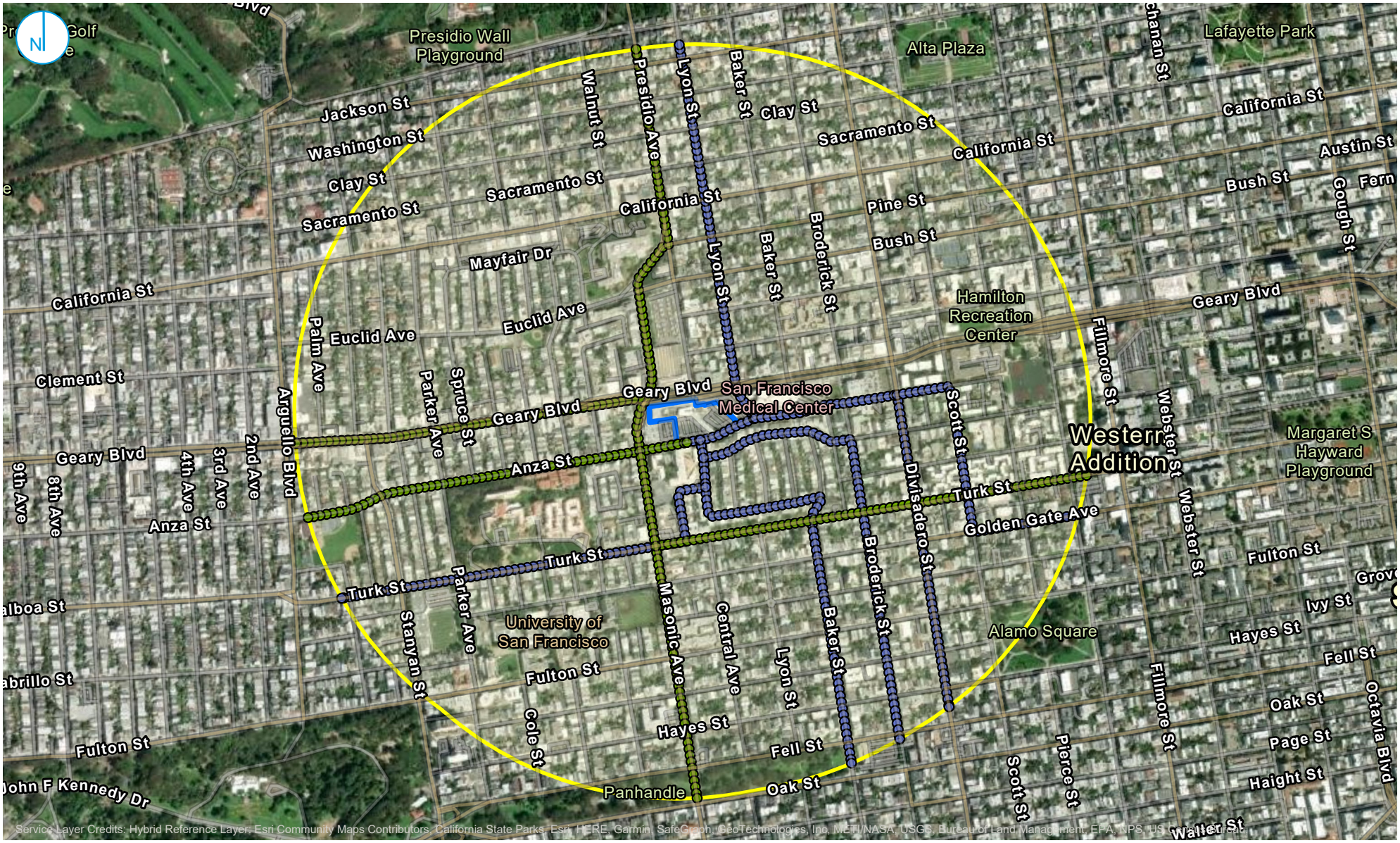
Whole Foods - 2675 Geary Blvd
San Francisco, California

FIGURE 04

RAMBOLL US CONSULTING, INC.
A RAMBOLL COMPANY

RAMBOLL

PROJECT: 1690022356 | DATED: 8/22/2022 | DESIGNER: LLI



Passenger Vehicle Outbound

Passenger Vehicle Inbound

Project Boundary

Modeling Extent (1000 m Buffer Area)

0 250 500 1,000 Meters

MODELED CONSTRUCTION AND OPERATIONAL SOURCES - PASSENGER VEHICLES

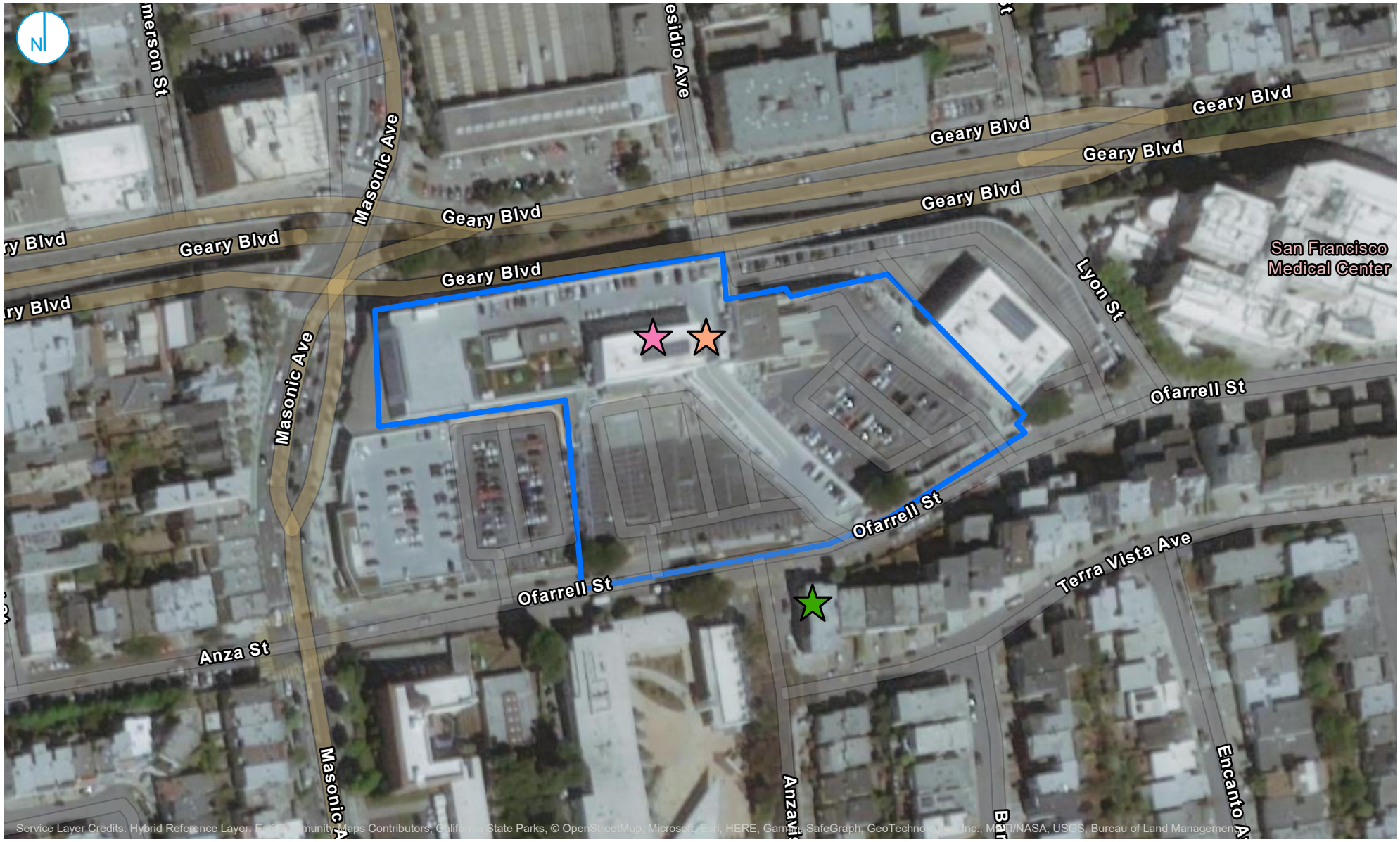
Whole Foods - 2675 Geary Blvd
San Francisco, California

FIGURE 05

RAMBOLL US CONSULTING, INC.
A RAMBOLL COMPANY

RAMBOLL

PROJECT: 1690022356 | DATED: 2/28/2022 | DESIGNER: LLI



Project Boundary

Cancer Risk, Chronic HI, and $PM_{2.5}$ Concentration MEI for Resident

Cancer Risk MEI for Daycare

Chronic HI and $PM_{2.5}$ Concentration MEI for Daycare

0 25 50 100 150 Meters

MAXIMALLY EXPOSED INDIVIDUAL RECEPTOR LOCATIONS

Whole Foods - 2675 Geary Blvd
San Francisco, California

FIGURE 06

RAMBOLL US CONSULTING, INC.
A RAMBOLL COMPANY

RAMBOLL

APPENDIX A

CALEEMOD® OUTPUT FOR ENERGY USE AND CONSUMER PRODUCTS DURING PROJECT OPERATION

Whole Foods - 2675 Geary Blvd San Francisco - San Francisco County, Annual

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

Whole Foods - 2675 Geary Blvd San Francisco

San Francisco County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Parking Lot	65.00	1000sqft	1.49	65,000.00	0
Supermarket	55.00	1000sqft	1.15	55,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	4.6	**Precipitation Freq (Days)**	64
Climate Zone	5			**Operational Year**	2025
Utility Company					
CO2 Intensity (lb/MWhr)	192	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Whole Foods store - no construction, only minor interior renovations. CO2 intensity factor calculated assuming a PG&E RPS of 47% for 2025.

Land Use - Land use based on data request dated 2021.09.08

Construction Phase - Operational emissions only

Off-road Equipment - Operational emissions only

Trips and VMT - Operational emissions only

On-road Fugitive Dust - Operational emissions only

Demolition - Operational emissions only

Grading - Operational emissions only

Architectural Coating - Operational emissions only

Vehicle Trips - Trip rate updated trip data provided by client. Mobile emissions calculated outside of CalEEMod.

Whole Foods - 2675 Geary Blvd San Francisco - San Francisco County, Annual

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

Vehicle Emission Factors - Mobile emissions calculated outside of CalEEMod. EFs here have been updated using the latest EMFAC tool and values.

Vehicle Emission Factors - Mobile emissions calculated outside of CalEEMod.

Vehicle Emission Factors - Mobile emissions calculated outside of CalEEMod.

Road Dust -

Energy Use - Electricity ccording to data request, updated 1/14/2022. NG consumption scaled to match total NG consumption of a similar project in Sunnyvale.

Water And Wastewater -

Fleet Mix - Mobile emissions calculated outside of CalEEMod.

Table Name	Column Name	Default Value	New Value
tblEnergyUse	LightingElect	0.35	0.23
tblEnergyUse	LightingElect	7.42	4.80
tblEnergyUse	NT24NG	12.69	15.09
tblEnergyUse	T24NG	24.29	28.88
tblLandUse	LotAcreage	1.26	1.15
tblProjectCharacteristics	CH4IntensityFactor	0	0.029
tblProjectCharacteristics	CO2IntensityFactor	0	192
tblProjectCharacteristics	N2OIntensityFactor	0	0.006
tblVehicleTrips	ST_TR	177.62	177.59
tblVehicleTrips	SU_TR	166.47	166.44
tblVehicleTrips	WD_TR	106.78	102.24

2.0 Emissions Summary

Whole Foods - 2675 Geary Blvd San Francisco - San Francisco County, 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					
2021	0.1375	1.1492	0.9880	1.9700e-003	0.0488	0.0553	0.1042	0.0174	0.0526	0.0700	0.0000	171.5754	171.5754	0.0313	4.1000e-003	173.5807
2022	0.4311	1.0289	1.0375	2.1100e-003	0.0306	0.0465	0.0771	8.3300e-003	0.0445	0.0528	0.0000	183.6718	183.6718	0.0308	4.9400e-003	185.9138
Maximum	**0.4311**	**1.1492**	**1.0375**	**2.1100e-003**	**0.0488**	**0.0553**	**0.1042**	**0.0174**	**0.0526**	**0.0700**	**0.0000**	**183.6718**	**183.6718**	**0.0313**	**4.9400e-003**	**185.9138**

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					
2021	0.1375	1.1492	0.9880	1.9700e-003	0.0488	0.0553	0.1042	0.0174	0.0526	0.0700	0.0000	171.5753	171.5753	0.0313	4.1000e-003	173.5805
2022	0.4311	1.0289	1.0375	2.1100e-003	0.0306	0.0465	0.0771	8.3300e-003	0.0445	0.0528	0.0000	183.6716	183.6716	0.0308	4.9400e-003	185.9136
Maximum	**0.4311**	**1.1492**	**1.0375**	**2.1100e-003**	**0.0488**	**0.0553**	**0.1042**	**0.0174**	**0.0526**	**0.0700**	**0.0000**	**183.6716**	**183.6716**	**0.0313**	**4.9400e-003**	**185.9136**

Whole Foods - 2675 Geary Blvd San Francisco - San Francisco County, 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	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)
1	**7-8-2021**	**10-7-2021**	0.6769	0.6769
2	**10-8-2021**	**1-7-2022**	0.6492	0.6492
3	**1-8-2022**	**4-7-2022**	0.5794	0.5794
4	**4-8-2022**	**7-7-2022**	0.5783	0.5783
5	**7-8-2022**	**9-30-2022**	0.2645	0.2645
		Highest	0.6769	0.6769

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	0.2491	1.0000e-005	1.1000e-003	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.1400e-003	2.1400e-003	1.0000e-005	0.0000	2.2800e-003
Energy	0.0130	0.1186	0.0996	7.1000e-004		9.0100e-003	9.0100e-003		9.0100e-003	9.0100e-003	0.0000	295.4634	295.4634	0.0276	7.5700e-003	298.4084
Mobile	2.3693	1.7843	17.4851	0.0271	2.8190	0.0221	2.8411	0.7535	0.0205	0.7740	0.0000	2,577.3936	2,577.3936	0.2839	0.1515	2,629.6356
Waste						0.0000	0.0000		0.0000	0.0000	62.9678	0.0000	62.9678	3.7213	0.0000	156.0001
Water						0.0000	0.0000		0.0000	0.0000	2.1509	3.2588	5.4097	0.2214	5.3200e-003	12.5298
Total	**2.6315**	**1.9029**	**17.5858**	**0.0278**	**2.8190**	**0.0311**	**2.8501**	**0.7535**	**0.0295**	**0.7830**	**65.1187**	**2,876.1179**	**2,941.2366**	**4.2542**	**0.1644**	**3,096.5761**

Whole Foods - 2675 Geary Blvd San Francisco - San Francisco County, 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	0.2491	1.0000e-005	1.1000e-003	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.1400e-003	2.1400e-003	1.0000e-005	0.0000	2.2800e-003
Energy	0.0130	0.1186	0.0996	7.1000e-004		9.0100e-003	9.0100e-003		9.0100e-003	9.0100e-003	0.0000	295.4634	295.4634	0.0276	7.5700e-003	298.4084
Mobile	2.3693	1.7843	17.4851	0.0271	2.8190	0.0221	2.8411	0.7535	0.0205	0.7740	0.0000	2,577.3936	2,577.3936	0.2839	0.1515	2,629.6356
Waste						0.0000	0.0000		0.0000	0.0000	62.9678	0.0000	62.9678	3.7213	0.0000	156.0001
Water						0.0000	0.0000		0.0000	0.0000	2.1509	3.2588	5.4097	0.2214	5.3200e-003	12.5298
Total	**2.6315**	**1.9029**	**17.5858**	**0.0278**	**2.8190**	**0.0311**	**2.8501**	**0.7535**	**0.0295**	**0.7830**	**65.1187**	**2,876.1179**	**2,941.2366**	**4.2542**	**0.1644**	**3,096.5761**

	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**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	7/8/2021	8/4/2021	5	20	
2	Site Preparation	Site Preparation	8/5/2021	8/9/2021	5	3	
3	Grading	Grading	8/10/2021	8/17/2021	5	6	

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4	Building Construction	Building Construction	8/18/2021	6/21/2022	5	220	
5	Paving	Paving	6/22/2022	7/5/2022	5	10	
6	Architectural Coating	Architectural Coating	7/6/2022	7/19/2022	5	10	

Acres of Grading (Site Preparation Phase): 4.5

Acres of Grading (Grading Phase): 6

Acres of Paving: 1.49

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 82,500; Non-Residential Outdoor: 27,500; Striped Parking Area: 3,900 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Rubber Tired Dozers	1	8.00	247	0.40
Demolition	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Site Preparation	Graders	1	8.00	187	0.41
Site Preparation	Scrapers	1	8.00	367	0.48
Site Preparation	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	2	7.00	97	0.37
Building Construction	Cranes	1	8.00	231	0.29
Building Construction	Forklifts	2	7.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Building Construction	Welders	3	8.00	46	0.45
Paving	Cement and Mortar Mixers	1	8.00	9	0.56
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	1	8.00	132	0.36

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Paving	Rollers	2	8.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Architectural Coating	Air Compressors	1	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
Demolition	5	13.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	3	8.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	10.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	8	45.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	9.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2021

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					
Off-Road	0.0199	0.1970	0.1449	2.4000e-004		0.0104	0.0104		9.7100e-003	9.7100e-003	0.0000	21.0713	21.0713	5.3900e-003	0.0000	21.2060
Total	**0.0199**	**0.1970**	**0.1449**	**2.4000e-004**		**0.0104**	**0.0104**		**9.7100e-003**	**9.7100e-003**	**0.0000**	**21.0713**	**21.0713**	**5.3900e-003**	**0.0000**	**21.2060**

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3.2 Demolition - 2021

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	0.0000	0.0000	0.0000	0.0000	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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.6000e-004	2.5000e-004	3.2900e-003	1.0000e-005	1.0300e-003	1.0000e-005	1.0300e-003	2.7000e-004	1.0000e-005	2.8000e-004	0.0000	0.8902	0.8902	3.0000e-005	2.0000e-005	0.8980
Total	**3.6000e-004**	**2.5000e-004**	**3.2900e-003**	**1.0000e-005**	**1.0300e-003**	**1.0000e-005**	**1.0300e-003**	**2.7000e-004**	**1.0000e-005**	**2.8000e-004**	**0.0000**	**0.8902**	**0.8902**	**3.0000e-005**	**2.0000e-005**	**0.8980**

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					
Off-Road	0.0199	0.1970	0.1449	2.4000e-004		0.0104	0.0104		9.7100e-003	9.7100e-003	0.0000	21.0713	21.0713	5.3900e-003	0.0000	21.2060
Total	**0.0199**	**0.1970**	**0.1449**	**2.4000e-004**		**0.0104**	**0.0104**		**9.7100e-003**	**9.7100e-003**	**0.0000**	**21.0713**	**21.0713**	**5.3900e-003**	**0.0000**	**21.2060**

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3.2 Demolition - 2021

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	0.0000	0.0000	0.0000	0.0000	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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.6000e-004	2.5000e-004	3.2900e-003	1.0000e-005	1.0300e-003	1.0000e-005	1.0300e-003	2.7000e-004	1.0000e-005	2.8000e-004	0.0000	0.8902	0.8902	3.0000e-005	2.0000e-005	0.8980
Total	**3.6000e-004**	**2.5000e-004**	**3.2900e-003**	**1.0000e-005**	**1.0300e-003**	**1.0000e-005**	**1.0300e-003**	**2.7000e-004**	**1.0000e-005**	**2.8000e-004**	**0.0000**	**0.8902**	**0.8902**	**3.0000e-005**	**2.0000e-005**	**0.8980**

3.3 Site Preparation - 2021

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					
Fugitive Dust					2.3900e-003	0.0000	2.3900e-003	2.6000e-004	0.0000	2.6000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.3200e-003	0.0274	0.0161	4.0000e-005		1.0500e-003	1.0500e-003		9.7000e-004	9.7000e-004	0.0000	3.2290	3.2290	1.0400e-003	0.0000	3.2551
Total	**2.3200e-003**	**0.0274**	**0.0161**	**4.0000e-005**	**2.3900e-003**	**1.0500e-003**	**3.4400e-003**	**2.6000e-004**	**9.7000e-004**	**1.2300e-003**	**0.0000**	**3.2290**	**3.2290**	**1.0400e-003**	**0.0000**	**3.2551**

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3.3 Site Preparation - 2021

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	0.0000	0.0000	0.0000	0.0000	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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.0000e-005	2.0000e-005	3.0000e-004	0.0000	9.0000e-005	0.0000	1.0000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0822	0.0822	0.0000	0.0000	0.0829
Total	**3.0000e-005**	**2.0000e-005**	**3.0000e-004**	**0.0000**	**9.0000e-005**	**0.0000**	**1.0000e-004**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**0.0822**	**0.0822**	**0.0000**	**0.0000**	**0.0829**

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					
Fugitive Dust					2.3900e-003	0.0000	2.3900e-003	2.6000e-004	0.0000	2.6000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.3200e-003	0.0274	0.0161	4.0000e-005		1.0500e-003	1.0500e-003		9.7000e-004	9.7000e-004	0.0000	3.2290	3.2290	1.0400e-003	0.0000	3.2551
Total	**2.3200e-003**	**0.0274**	**0.0161**	**4.0000e-005**	**2.3900e-003**	**1.0500e-003**	**3.4400e-003**	**2.6000e-004**	**9.7000e-004**	**1.2300e-003**	**0.0000**	**3.2290**	**3.2290**	**1.0400e-003**	**0.0000**	**3.2551**

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3.3 Site Preparation - 2021

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	0.0000	0.0000	0.0000	0.0000	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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.0000e-005	2.0000e-005	3.0000e-004	0.0000	9.0000e-005	0.0000	1.0000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0822	0.0822	0.0000	0.0000	0.0829
Total	**3.0000e-005**	**2.0000e-005**	**3.0000e-004**	**0.0000**	**9.0000e-005**	**0.0000**	**1.0000e-004**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**0.0822**	**0.0822**	**0.0000**	**0.0000**	**0.0829**

3.4 Grading - 2021

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					
Fugitive Dust					0.0213	0.0000	0.0213	0.0103	0.0000	0.0103	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.4800e-003	0.0606	0.0293	6.0000e-005		2.7500e-003	2.7500e-003		2.5300e-003	2.5300e-003	0.0000	5.4312	5.4312	1.7600e-003	0.0000	5.4751
Total	**5.4800e-003**	**0.0606**	**0.0293**	**6.0000e-005**	**0.0213**	**2.7500e-003**	**0.0240**	**0.0103**	**2.5300e-003**	**0.0128**	**0.0000**	**5.4312**	**5.4312**	**1.7600e-003**	**0.0000**	**5.4751**

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3.4 Grading - 2021

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	0.0000	0.0000	0.0000	0.0000	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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.0000e-005	6.0000e-005	7.6000e-004	0.0000	2.4000e-004	0.0000	2.4000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.2054	0.2054	1.0000e-005	1.0000e-005	0.2072
Total	**8.0000e-005**	**6.0000e-005**	**7.6000e-004**	**0.0000**	**2.4000e-004**	**0.0000**	**2.4000e-004**	**6.0000e-005**	**0.0000**	**6.0000e-005**	**0.0000**	**0.2054**	**0.2054**	**1.0000e-005**	**1.0000e-005**	**0.2072**

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					
Fugitive Dust					0.0213	0.0000	0.0213	0.0103	0.0000	0.0103	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.4800e-003	0.0606	0.0293	6.0000e-005		2.7500e-003	2.7500e-003		2.5300e-003	2.5300e-003	0.0000	5.4312	5.4312	1.7600e-003	0.0000	5.4751
Total	**5.4800e-003**	**0.0606**	**0.0293**	**6.0000e-005**	**0.0213**	**2.7500e-003**	**0.0240**	**0.0103**	**2.5300e-003**	**0.0128**	**0.0000**	**5.4312**	**5.4312**	**1.7600e-003**	**0.0000**	**5.4751**

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3.4 Grading - 2021

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	0.0000	0.0000	0.0000	0.0000	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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.0000e-005	6.0000e-005	7.6000e-004	0.0000	2.4000e-004	0.0000	2.4000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.2054	0.2054	1.0000e-005	1.0000e-005	0.2072
Total	**8.0000e-005**	**6.0000e-005**	**7.6000e-004**	**0.0000**	**2.4000e-004**	**0.0000**	**2.4000e-004**	**6.0000e-005**	**0.0000**	**6.0000e-005**	**0.0000**	**0.2054**	**0.2054**	**1.0000e-005**	**1.0000e-005**	**0.2072**

3.5 Building Construction - 2021

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					
Off-Road	0.1002	0.7854	0.7136	1.2300e-003		0.0401	0.0401		0.0384	0.0384	0.0000	101.7479	101.7479	0.0200	0.0000	102.2483
Total	**0.1002**	**0.7854**	**0.7136**	**1.2300e-003**		**0.0401**	**0.0401**		**0.0384**	**0.0384**	**0.0000**	**101.7479**	**101.7479**	**0.0200**	**0.0000**	**102.2483**

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3.5 Building Construction - 2021

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.0800e-003	0.0742	0.0240	2.2000e-004	6.4200e-003	9.5000e-004	7.3600e-003	1.8600e-003	9.0000e-004	2.7600e-003	0.0000	23.8199	23.8199	2.6300e-003	3.6600e-003	24.9764
Worker	6.0300e-003	4.2900e-003	0.0558	1.6000e-004	0.0174	1.2000e-004	0.0175	4.6400e-003	1.1000e-004	4.7500e-003	0.0000	15.0985	15.0985	4.6000e-004	4.1000e-004	15.2316
Total	**9.1100e-003**	**0.0785**	**0.0797**	**3.8000e-004**	**0.0238**	**1.0700e-003**	**0.0249**	**6.5000e-003**	**1.0100e-003**	**7.5100e-003**	**0.0000**	**38.9183**	**38.9183**	**3.0900e-003**	**4.0700e-003**	**40.2080**

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					
Off-Road	0.1002	0.7854	0.7136	1.2300e-003		0.0401	0.0401		0.0384	0.0384	0.0000	101.7478	101.7478	0.0200	0.0000	102.2482
Total	**0.1002**	**0.7854**	**0.7136**	**1.2300e-003**		**0.0401**	**0.0401**		**0.0384**	**0.0384**	**0.0000**	**101.7478**	**101.7478**	**0.0200**	**0.0000**	**102.2482**

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3.5 Building Construction - 2021

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.0800e-003	0.0742	0.0240	2.2000e-004	6.4200e-003	9.5000e-004	7.3600e-003	1.8600e-003	9.0000e-004	2.7600e-003	0.0000	23.8199	23.8199	2.6300e-003	3.6600e-003	24.9764
Worker	6.0300e-003	4.2900e-003	0.0558	1.6000e-004	0.0174	1.2000e-004	0.0175	4.6400e-003	1.1000e-004	4.7500e-003	0.0000	15.0985	15.0985	4.6000e-004	4.1000e-004	15.2316
Total	**9.1100e-003**	**0.0785**	**0.0797**	**3.8000e-004**	**0.0238**	**1.0700e-003**	**0.0249**	**6.5000e-003**	**1.0100e-003**	**7.5100e-003**	**0.0000**	**38.9183**	**38.9183**	**3.0900e-003**	**4.0700e-003**	**40.2080**

3.5 Building Construction - 2022

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					
Off-Road	0.1132	0.8909	0.8756	1.5300e-003		0.0428	0.0428		0.0411	0.0411	0.0000	126.6849	126.6849	0.0244	0.0000	127.2959
Total	**0.1132**	**0.8909**	**0.8756**	**1.5300e-003**		**0.0428**	**0.0428**		**0.0411**	**0.0411**	**0.0000**	**126.6849**	**126.6849**	**0.0244**	**0.0000**	**127.2959**

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3.5 Building Construction - 2022

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.5600e-003	0.0794	0.0269	2.7000e-004	7.9900e-003	6.6000e-004	8.6500e-003	2.3100e-003	6.3000e-004	2.9400e-003	0.0000	28.8531	28.8531	3.2500e-003	4.4500e-003	30.2600
Worker	7.0300e-003	4.7400e-003	0.0647	2.0000e-004	0.0217	1.4000e-004	0.0218	5.7700e-003	1.3000e-004	5.9000e-003	0.0000	18.3021	18.3021	5.2000e-004	4.7000e-004	18.4559
Total	**9.5900e-003**	**0.0842**	**0.0916**	**4.7000e-004**	**0.0297**	**8.0000e-004**	**0.0305**	**8.0800e-003**	**7.6000e-004**	**8.8400e-003**	**0.0000**	**47.1552**	**47.1552**	**3.7700e-003**	**4.9200e-003**	**48.7159**

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					
Off-Road	0.1132	0.8908	0.8756	1.5300e-003		0.0428	0.0428		0.0411	0.0411	0.0000	126.6847	126.6847	0.0244	0.0000	127.2957
Total	**0.1132**	**0.8908**	**0.8756**	**1.5300e-003**		**0.0428**	**0.0428**		**0.0411**	**0.0411**	**0.0000**	**126.6847**	**126.6847**	**0.0244**	**0.0000**	**127.2957**

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3.5 Building Construction - 2022

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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.5600e-003	0.0794	0.0269	2.7000e-004	7.9900e-003	6.6000e-004	8.6500e-003	2.3100e-003	6.3000e-004	2.9400e-003	0.0000	28.8531	28.8531	3.2500e-003	4.4500e-003	30.2600
Worker	7.0300e-003	4.7400e-003	0.0647	2.0000e-004	0.0217	1.4000e-004	0.0218	5.7700e-003	1.3000e-004	5.9000e-003	0.0000	18.3021	18.3021	5.2000e-004	4.7000e-004	18.4559
Total	**9.5900e-003**	**0.0842**	**0.0916**	**4.7000e-004**	**0.0297**	**8.0000e-004**	**0.0305**	**8.0800e-003**	**7.6000e-004**	**8.8400e-003**	**0.0000**	**47.1552**	**47.1552**	**3.7700e-003**	**4.9200e-003**	**48.7159**

3.6 Paving - 2022

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					
Off-Road	4.7100e-003	0.0467	0.0585	9.0000e-005		2.4400e-003	2.4400e-003		2.2500e-003	2.2500e-003	0.0000	7.7550	7.7550	2.4600e-003	0.0000	7.8165
Paving	1.9500e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**6.6600e-003**	**0.0467**	**0.0585**	**9.0000e-005**		**2.4400e-003**	**2.4400e-003**		**2.2500e-003**	**2.2500e-003**	**0.0000**	**7.7550**	**7.7550**	**2.4600e-003**	**0.0000**	**7.8165**

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3.6 Paving - 2022

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	0.0000	0.0000	0.0000	0.0000	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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.9000e-004	1.3000e-004	1.7700e-003	1.0000e-005	5.9000e-004	0.0000	6.0000e-004	1.6000e-004	0.0000	1.6000e-004	0.0000	0.5001	0.5001	1.0000e-005	1.0000e-005	0.5043
Total	**1.9000e-004**	**1.3000e-004**	**1.7700e-003**	**1.0000e-005**	**5.9000e-004**	**0.0000**	**6.0000e-004**	**1.6000e-004**	**0.0000**	**1.6000e-004**	**0.0000**	**0.5001**	**0.5001**	**1.0000e-005**	**1.0000e-005**	**0.5043**

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					
Off-Road	4.7100e-003	0.0467	0.0585	9.0000e-005		2.4400e-003	2.4400e-003		2.2500e-003	2.2500e-003	0.0000	7.7550	7.7550	2.4600e-003	0.0000	7.8165
Paving	1.9500e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**6.6600e-003**	**0.0467**	**0.0585**	**9.0000e-005**		**2.4400e-003**	**2.4400e-003**		**2.2500e-003**	**2.2500e-003**	**0.0000**	**7.7550**	**7.7550**	**2.4600e-003**	**0.0000**	**7.8165**

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3.6 Paving - 2022

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	0.0000	0.0000	0.0000	0.0000	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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.9000e-004	1.3000e-004	1.7700e-003	1.0000e-005	5.9000e-004	0.0000	6.0000e-004	1.6000e-004	0.0000	1.6000e-004	0.0000	0.5001	0.5001	1.0000e-005	1.0000e-005	0.5043
Total	**1.9000e-004**	**1.3000e-004**	**1.7700e-003**	**1.0000e-005**	**5.9000e-004**	**0.0000**	**6.0000e-004**	**1.6000e-004**	**0.0000**	**1.6000e-004**	**0.0000**	**0.5001**	**0.5001**	**1.0000e-005**	**1.0000e-005**	**0.5043**

3.7 Architectural Coating - 2022

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	0.3004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.0200e-003	7.0400e-003	9.0700e-003	1.0000e-005		4.1000e-004	4.1000e-004		4.1000e-004	4.1000e-004	0.0000	1.2766	1.2766	8.0000e-005	0.0000	1.2787
Total	**0.3014**	**7.0400e-003**	**9.0700e-003**	**1.0000e-005**		**4.1000e-004**	**4.1000e-004**		**4.1000e-004**	**4.1000e-004**	**0.0000**	**1.2766**	**1.2766**	**8.0000e-005**	**0.0000**	**1.2787**

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3.7 Architectural Coating - 2022

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	0.0000	0.0000	0.0000	0.0000	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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.2000e-004	8.0000e-005	1.0600e-003	0.0000	3.6000e-004	0.0000	3.6000e-004	9.0000e-005	0.0000	1.0000e-004	0.0000	0.3000	0.3000	1.0000e-005	1.0000e-005	0.3026
Total	**1.2000e-004**	**8.0000e-005**	**1.0600e-003**	**0.0000**	**3.6000e-004**	**0.0000**	**3.6000e-004**	**9.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**	**0.3000**	**0.3000**	**1.0000e-005**	**1.0000e-005**	**0.3026**

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	0.3004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.0200e-003	7.0400e-003	9.0700e-003	1.0000e-005		4.1000e-004	4.1000e-004		4.1000e-004	4.1000e-004	0.0000	1.2766	1.2766	8.0000e-005	0.0000	1.2787
Total	**0.3014**	**7.0400e-003**	**9.0700e-003**	**1.0000e-005**		**4.1000e-004**	**4.1000e-004**		**4.1000e-004**	**4.1000e-004**	**0.0000**	**1.2766**	**1.2766**	**8.0000e-005**	**0.0000**	**1.2787**

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3.7 Architectural Coating - 2022

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	0.0000	0.0000	0.0000	0.0000	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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.2000e-004	8.0000e-005	1.0600e-003	0.0000	3.6000e-004	0.0000	3.6000e-004	9.0000e-005	0.0000	1.0000e-004	0.0000	0.3000	0.3000	1.0000e-005	1.0000e-005	0.3026
Total	**1.2000e-004**	**8.0000e-005**	**1.0600e-003**	**0.0000**	**3.6000e-004**	**0.0000**	**3.6000e-004**	**9.0000e-005**	**0.0000**	**1.0000e-004**	**0.0000**	**0.3000**	**0.3000**	**1.0000e-005**	**1.0000e-005**	**0.3026**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

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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	2.3693	1.7843	17.4851	0.0271	2.8190	0.0221	2.8411	0.7535	0.0205	0.7740	0.0000	2,577.3936	2,577.3936	0.2839	0.1515	2,629.6356
Unmitigated	2.3693	1.7843	17.4851	0.0271	2.8190	0.0221	2.8411	0.7535	0.0205	0.7740	0.0000	2,577.3936	2,577.3936	0.2839	0.1515	2,629.6356

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Parking Lot	0.00	0.00	0.00		
Supermarket	5,623.20	9,767.45	9154.20	7,643,239	7,643,239
Total	5,623.20	9,767.45	9,154.20	7,643,239	7,643,239

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
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Supermarket	9.50	7.30	7.30	6.50	74.50	19.00	34	30	36

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Parking Lot	0.556828	0.060307	0.188813	0.104870	0.021351	0.005032	0.017142	0.004233	0.001901	0.002263	0.034674	0.000871	0.001715
Supermarket	0.556828	0.060307	0.188813	0.104870	0.021351	0.005032	0.017142	0.004233	0.001901	0.002263	0.034674	0.000871	0.001715

5.0 Energy Detail

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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	0.0000		0.0000	0.0000	0.0000	166.4111	166.4111	0.0251	5.2000e-003	168.5891
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	166.4111	166.4111	0.0251	5.2000e-003	168.5891
NaturalGas Mitigated	0.0130	0.1186	0.0996	7.1000e-004		9.0100e-003	9.0100e-003		9.0100e-003	9.0100e-003	0.0000	129.0524	129.0524	2.4700e-003	2.3700e-003	129.8193
NaturalGas Unmitigated	0.0130	0.1186	0.0996	7.1000e-004		9.0100e-003	9.0100e-003		9.0100e-003	9.0100e-003	0.0000	129.0524	129.0524	2.4700e-003	2.3700e-003	129.8193

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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					
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Supermarket	2.41835e+006	0.0130	0.1186	0.0996	7.1000e-004		9.0100e-003	9.0100e-003		9.0100e-003	9.0100e-003	0.0000	129.0524	129.0524	2.4700e-003	2.3700e-003	129.8193
Total		**0.0130**	**0.1186**	**0.0996**	**7.1000e-004**		**9.0100e-003**	**9.0100e-003**		**9.0100e-003**	**9.0100e-003**	**0.0000**	**129.0524**	**129.0524**	**2.4700e-003**	**2.3700e-003**	**129.8193**

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					
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Supermarket	2.41835e+006	0.0130	0.1186	0.0996	7.1000e-004		9.0100e-003	9.0100e-003		9.0100e-003	9.0100e-003	0.0000	129.0524	129.0524	2.4700e-003	2.3700e-003	129.8193
Total		**0.0130**	**0.1186**	**0.0996**	**7.1000e-004**		**9.0100e-003**	**9.0100e-003**		**9.0100e-003**	**9.0100e-003**	**0.0000**	**129.0524**	**129.0524**	**2.4700e-003**	**2.3700e-003**	**129.8193**

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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			
Parking Lot	14950	1.3020	2.0000e-004	4.0000e-005	1.3190
Supermarket	1.89585e+006	165.1091	0.0249	5.1600e-003	167.2701
Total		**166.4111**	**0.0251**	**5.2000e-003**	**168.5891**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Parking Lot	14950	1.3020	2.0000e-004	4.0000e-005	1.3190
Supermarket	1.89585e+006	165.1091	0.0249	5.1600e-003	167.2701
Total		**166.4111**	**0.0251**	**5.2000e-003**	**168.5891**

6.0 Area Detail

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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	0.2491	1.0000e-005	1.1000e-003	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.1400e-003	2.1400e-003	1.0000e-005	0.0000	2.2800e-003
Unmitigated	0.2491	1.0000e-005	1.1000e-003	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.1400e-003	2.1400e-003	1.0000e-005	0.0000	2.2800e-003

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	0.0300					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.2190					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.0000e-004	1.0000e-005	1.1000e-003	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.1400e-003	2.1400e-003	1.0000e-005	0.0000	2.2800e-003
Total	**0.2491**	**1.0000e-005**	**1.1000e-003**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.1400e-003**	**2.1400e-003**	**1.0000e-005**	**0.0000**	**2.2800e-003**

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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	0.0300					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.2190					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.0000e-004	1.0000e-005	1.1000e-003	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.1400e-003	2.1400e-003	1.0000e-005	0.0000	2.2800e-003
Total	**0.2491**	**1.0000e-005**	**1.1000e-003**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.1400e-003**	**2.1400e-003**	**1.0000e-005**	**0.0000**	**2.2800e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

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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	5.4097	0.2214	5.3200e-003	12.5298
Unmitigated	5.4097	0.2214	5.3200e-003	12.5298

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Supermarket	6.77975 / 0.209683	5.4097	0.2214	5.3200e-003	12.5298
Total		**5.4097**	**0.2214**	**5.3200e-003**	**12.5298**

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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			
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Supermarket	6.77975 / 0.209683	5.4097	0.2214	5.3200e-003	12.5298
Total		**5.4097**	**0.2214**	**5.3200e-003**	**12.5298**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	62.9678	3.7213	0.0000	156.0001
Unmitigated	62.9678	3.7213	0.0000	156.0001

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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			
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Supermarket	310.2	62.9678	3.7213	0.0000	156.0001
Total		**62.9678**	**3.7213**	**0.0000**	**156.0001**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Supermarket	310.2	62.9678	3.7213	0.0000	156.0001
Total		**62.9678**	**3.7213**	**0.0000**	**156.0001**

9.0 Operational Offroad

Whole Foods - 2675 Geary Blvd San Francisco - San Francisco County, 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 B

CONSTRUCTION AND OPERATIONAL TOXIC AIR CONTAMINANT EMISSIONS FOR HRA MODELING

Appendix B
Construction and Operational Toxic Air Contaminant Emissions for HRA Modeling
Whole Foods - 2675 Geary Blvd
San Francisco, California

Phase	Modeled Source Group	Pollutant	CAS	Year	Emission Rate (g/s)	Source Description
Construction[1,2,3]	CRANE	DPM	9901	2024	1.51E-05	Construction_Crane
	CRANE	PM2.5	88101	2024	1.40E-05	Construction_Crane
	PVIN	1,3-Butadiene	106990	2024	2.85E-06	Construction_Cars
	PVIN	Acetaldehyde	75070	2024	1.45E-06	Construction_Cars
	PVIN	Acrolein	107028	2024	6.73E-07	Construction_Cars
	PVIN	Benzene	71432	2024	2.06E-05	Construction_Cars
	PVIN	Ethylbenzene	100414	2024	8.04E-06	Construction_Cars
	PVIN	Formaldehyde	50000	2024	8.17E-06	Construction_Cars
	PVIN	Hexane	110543	2024	4.18E-05	Construction_Cars
	PVIN	Methanol	67561	2024	6.21E-07	Construction_Cars
	PVIN	Methyl Ethyl Ketone	78933	2024	1.03E-07	Construction_Cars
	PVIN	Naphthalene	91203	2024	2.59E-07	Construction_Cars
	PVIN	Propylene	115071	2024	1.58E-05	Construction_Cars
	PVIN	Styrene	100425	2024	6.21E-07	Construction_Cars
	PVIN	Toluene	108883	2024	6.68E-05	Construction_Cars
	PVIN	Xylenes	1330207	2024	3.74E-05	Construction_Cars
	PVOUT	1,3-Butadiene	106990	2024	3.21E-06	Construction_Cars
	PVOUT	Acetaldehyde	75070	2024	1.63E-06	Construction_Cars
	PVOUT	Acrolein	107028	2024	7.58E-07	Construction_Cars
	PVOUT	Benzene	71432	2024	2.32E-05	Construction_Cars
	PVOUT	Ethylbenzene	100414	2024	9.06E-06	Construction_Cars
	PVOUT	Formaldehyde	50000	2024	9.21E-06	Construction_Cars
	PVOUT	Hexane	110543	2024	4.71E-05	Construction_Cars
	PVOUT	Methanol	67561	2024	7.00E-07	Construction_Cars
	PVOUT	Methyl Ethyl Ketone	78933	2024	1.17E-07	Construction_Cars
	PVOUT	Naphthalene	91203	2024	2.91E-07	Construction_Cars
	PVOUT	Propylene	115071	2024	1.78E-05	Construction_Cars
	PVOUT	Styrene	100425	2024	7.00E-07	Construction_Cars
	PVOUT	Toluene	108883	2024	7.52E-05	Construction_Cars
	PVOUT	Xylenes	1330207	2024	4.22E-05	Construction_Cars
	PVIN	PM2.5	88101	2024	3.75E-05	Construction_Cars
	PVOUT	PM2.5	88101	2024	4.22E-05	Construction_Cars
	TRIN	DPM	9901	2024	1.07E-07	Construction_Trucks
	TROUT	DPM	9901	2024	1.03E-07	Construction_Trucks
	TRIN	PM2.5	88101	2024	3.45E-07	Construction_Trucks
	TROUT	PM2.5	88101	2024	3.33E-07	Construction_Trucks
Operations[4,5,6,7]	PVIN	1,3-Butadiene	106990	2025 - 2054	4.57E-05	Operations_Cars
	PVIN	Acetaldehyde	75070	2025 - 2054	2.33E-05	Operations_Cars
	PVIN	Acrolein	107028	2025 - 2054	1.08E-05	Operations_Cars
	PVIN	Benzene	71432	2025 - 2054	3.36E-04	Operations_Cars
	PVIN	Ethylbenzene	100414	2025 - 2054	1.31E-04	Operations_Cars
	PVIN	Formaldehyde	50000	2025 - 2054	1.31E-04	Operations_Cars
	PVIN	Hexane	110543	2025 - 2054	6.94E-04	Operations_Cars
	PVIN	Methanol	67561	2025 - 2054	9.97E-06	Operations_Cars
	PVIN	Methyl Ethyl Ketone	78933	2025 - 2054	1.66E-06	Operations_Cars
	PVIN	Naphthalene	91203	2025 - 2054	4.15E-06	Operations_Cars
	PVIN	Propylene	115071	2025 - 2054	2.54E-04	Operations_Cars
	PVIN	Styrene	100425	2025 - 2054	9.97E-06	Operations_Cars
	PVIN	Toluene	108883	2025 - 2054	1.10E-03	Operations_Cars
	PVIN	Xylenes	1330207	2025 - 2054	6.10E-04	Operations_Cars
	PVOUT	1,3-Butadiene	106990	2025 - 2054	5.15E-05	Operations_Cars
	PVOUT	Acetaldehyde	75070	2025 - 2054	2.62E-05	Operations_Cars
	PVOUT	Acrolein	107028	2025 - 2054	1.22E-05	Operations_Cars
	PVOUT	Benzene	71432	2025 - 2054	3.79E-04	Operations_Cars
	PVOUT	Ethylbenzene	100414	2025 - 2054	1.48E-04	Operations_Cars
	PVOUT	Formaldehyde	50000	2025 - 2054	1.48E-04	Operations_Cars
	PVOUT	Hexane	110543	2025 - 2054	7.82E-04	Operations_Cars
	PVOUT	Methanol	67561	2025 - 2054	1.12E-05	Operations_Cars
	PVOUT	Methyl Ethyl Ketone	78933	2025 - 2054	1.87E-06	Operations_Cars
	PVOUT	Naphthalene	91203	2025 - 2054	4.68E-06	Operations_Cars
	PVOUT	Propylene	115071	2025 - 2054	2.86E-04	Operations_Cars
	PVOUT	Styrene	100425	2025 - 2054	1.12E-05	Operations_Cars
	PVOUT	Toluene	108883	2025 - 2054	1.24E-03	Operations_Cars
	PVOUT	Xylenes	1330207	2025 - 2054	6.87E-04	Operations_Cars
	PVIN	PM2.5	88101	2025 - 2054	6.41E-04	Operations_Cars
	PVOUT	PM2.5	88101	2025 - 2054	7.22E-04	Operations_Cars
	TRIN	DPM	9901	2025 - 2054	1.55E-05	Operations_Trucks
	TROUT	DPM	9901	2025 - 2054	1.50E-05	Operations_Trucks
	TRPK	DPM	9901	2025 - 2054	1.77E-06	Operations_Trucks
	TRIN	PM2.5	88101	2025 - 2054	4.64E-05	Operations_Trucks
	TROUT	PM2.5	88101	2025 - 2054	4.48E-05	Operations_Trucks
	TRPK	PM2.5	88101	2025 - 2054	5.30E-06	Operations_Trucks
	TRU_LD	PM2.5	88101	2025 - 2054	8.74E-06	Operations_Idling
	TRU_LD	DPM	9901	2025 - 2054	9.13E-06	Operations_Idling

Phase	Modeled Source Group	Pollutant	CAS	Year	Emission Rate (g/s)	Source Description
Operations[4,5,6,7]	TRIN	DPM	9901	2025	2.27E-05	Operations_TRU
	TRIN	DPM	9901	2026	2.16E-05	Operations_TRU
	TRIN	DPM	9901	2027	2.08E-05	Operations_TRU
	TRIN	DPM	9901	2028	2.00E-05	Operations_TRU
	TRIN	DPM	9901	2029	1.93E-05	Operations_TRU
	TRIN	DPM	9901	2030	3.08E-06	Operations_TRU
	TRIN	DPM	9901	2031	2.79E-06	Operations_TRU
	TRIN	DPM	9901	2032	2.56E-06	Operations_TRU
	TRIN	DPM	9901	2033	2.40E-06	Operations_TRU
	TRIN	DPM	9901	2034	2.31E-06	Operations_TRU
	TRIN	DPM	9901	2035	2.24E-06	Operations_TRU
	TRIN	DPM	9901	2036	2.16E-06	Operations_TRU
	TRIN	DPM	9901	2037	2.08E-06	Operations_TRU
	TRIN	DPM	9901	2038	2.02E-06	Operations_TRU
	TRIN	DPM	9901	2039	1.96E-06	Operations_TRU
	TRIN	DPM	9901	2040	1.92E-06	Operations_TRU
	TRIN	DPM	9901	2041	1.90E-06	Operations_TRU
	TRIN	DPM	9901	2042	1.89E-06	Operations_TRU
	TRIN	DPM	9901	2043	1.88E-06	Operations_TRU
	TRIN	DPM	9901	2044	1.88E-06	Operations_TRU
	TRIN	DPM	9901	2045	1.88E-06	Operations_TRU
	TRIN	DPM	9901	2046	1.89E-06	Operations_TRU
	TRIN	DPM	9901	2047	1.88E-06	Operations_TRU
	TRIN	DPM	9901	2048	1.88E-06	Operations_TRU
	TRIN	DPM	9901	2049	1.88E-06	Operations_TRU
	TRIN	DPM	9901	2050	1.88E-06	Operations_TRU
	TRIN	DPM	9901	2051	1.88E-06	Operations_TRU
	TRIN	DPM	9901	2052	1.88E-06	Operations_TRU
	TRIN	DPM	9901	2053	1.88E-06	Operations_TRU
	TRIN	DPM	9901	2054	1.88E-06	Operations_TRU
	TROUT	DPM	9901	2025	2.19E-05	Operations_TRU
	TROUT	DPM	9901	2026	2.09E-05	Operations_TRU
	TROUT	DPM	9901	2027	2.00E-05	Operations_TRU
	TROUT	DPM	9901	2028	1.93E-05	Operations_TRU
	TROUT	DPM	9901	2029	1.86E-05	Operations_TRU
	TROUT	DPM	9901	2030	2.98E-06	Operations_TRU
	TROUT	DPM	9901	2031	2.69E-06	Operations_TRU
	TROUT	DPM	9901	2032	2.47E-06	Operations_TRU
	TROUT	DPM	9901	2033	2.32E-06	Operations_TRU
	TROUT	DPM	9901	2034	2.23E-06	Operations_TRU
	TROUT	DPM	9901	2035	2.16E-06	Operations_TRU
	TROUT	DPM	9901	2036	2.09E-06	Operations_TRU
	TROUT	DPM	9901	2037	2.01E-06	Operations_TRU
	TROUT	DPM	9901	2038	1.95E-06	Operations_TRU
	TROUT	DPM	9901	2039	1.89E-06	Operations_TRU
	TROUT	DPM	9901	2040	1.86E-06	Operations_TRU
	TROUT	DPM	9901	2041	1.83E-06	Operations_TRU
	TROUT	DPM	9901	2042	1.82E-06	Operations_TRU
	TROUT	DPM	9901	2043	1.81E-06	Operations_TRU
	TROUT	DPM	9901	2044	1.82E-06	Operations_TRU
	TROUT	DPM	9901	2045	1.82E-06	Operations_TRU
	TROUT	DPM	9901	2046	1.82E-06	Operations_TRU
	TROUT	DPM	9901	2047	1.82E-06	Operations_TRU
	TROUT	DPM	9901	2048	1.82E-06	Operations_TRU
	TROUT	DPM	9901	2049	1.81E-06	Operations_TRU
	TROUT	DPM	9901	2050	1.81E-06	Operations_TRU
	TROUT	DPM	9901	2051	1.81E-06	Operations_TRU
	TROUT	DPM	9901	2052	1.81E-06	Operations_TRU
	TROUT	DPM	9901	2053	1.81E-06	Operations_TRU
	TROUT	DPM	9901	2054	1.81E-06	Operations_TRU
	TRPK	DPM	9901	2025	1.29E-06	Operations_TRU
	TRPK	DPM	9901	2026	1.24E-06	Operations_TRU
	TRPK	DPM	9901	2027	1.18E-06	Operations_TRU
	TRPK	DPM	9901	2028	1.14E-06	Operations_TRU
	TRPK	DPM	9901	2029	1.10E-06	Operations_TRU
	TRPK	DPM	9901	2030	1.76E-07	Operations_TRU
	TRPK	DPM	9901	2031	1.59E-07	Operations_TRU
	TRPK	DPM	9901	2032	1.46E-07	Operations_TRU
	TRPK	DPM	9901	2033	1.37E-07	Operations_TRU
	TRPK	DPM	9901	2034	1.32E-07	Operations_TRU
	TRPK	DPM	9901	2035	1.28E-07	Operations_TRU
	TRPK	DPM	9901	2036	1.23E-07	Operations_TRU
	TRPK	DPM	9901	2037	1.19E-07	Operations_TRU
	TRPK	DPM	9901	2038	1.15E-07	Operations_TRU
	TRPK	DPM	9901	2039	1.12E-07	Operations_TRU
	TRPK	DPM	9901	2040	1.10E-07	Operations_TRU
	TRPK	DPM	9901	2041	1.08E-07	Operations_TRU
	TRPK	DPM	9901	2042	1.08E-07	Operations_TRU
	TRPK	DPM	9901	2043	1.07E-07	Operations_TRU
	TRPK	DPM	9901	2044	1.07E-07	Operations_TRU
	TRPK	DPM	9901	2045	1.08E-07	Operations_TRU
	TRPK	DPM	9901	2046	1.08E-07	Operations_TRU
	TRPK	DPM	9901	2047	1.08E-07	Operations_TRU
	TRPK	DPM	9901	2048	1.07E-07	Operations_TRU
	TRPK	DPM	9901	2049	1.07E-07	Operations_TRU
	TRPK	DPM	9901	2050	1.07E-07	Operations_TRU
	TRPK	DPM	9901	2051	1.07E-07	Operations_TRU
	TRPK	DPM	9901	2052	1.07E-07	Operations_TRU
	TRPK	DPM	9901	2053	1.07E-07	Operations_TRU
	TRPK	DPM	9901	2054	1.07E-07	Operations_TRU

Phase	Modeled Source Group	Pollutant	CAS	Year	Emission Rate (g/s)	Source Description
Operations[4,5,6,7]	TRU_LD	DPM	9901	2025	1.42E-04	Operations_TRU
	TRU_LD	DPM	9901	2026	1.35E-04	Operations_TRU
	TRU_LD	DPM	9901	2027	1.29E-04	Operations_TRU
	TRU_LD	DPM	9901	2028	1.23E-04	Operations_TRU
	TRU_LD	DPM	9901	2029	1.19E-04	Operations_TRU
	TRU_LD	DPM	9901	2030	2.13E-05	Operations_TRU
	TRU_LD	DPM	9901	2031	1.93E-05	Operations_TRU
	TRU_LD	DPM	9901	2032	1.77E-05	Operations_TRU
	TRU_LD	DPM	9901	2033	1.66E-05	Operations_TRU
	TRU_LD	DPM	9901	2034	1.60E-05	Operations_TRU
	TRU_LD	DPM	9901	2035	1.55E-05	Operations_TRU
	TRU_LD	DPM	9901	2036	1.50E-05	Operations_TRU
	TRU_LD	DPM	9901	2037	1.44E-05	Operations_TRU
	TRU_LD	DPM	9901	2038	1.40E-05	Operations_TRU
	TRU_LD	DPM	9901	2039	1.36E-05	Operations_TRU
	TRU_LD	DPM	9901	2040	1.33E-05	Operations_TRU
	TRU_LD	DPM	9901	2041	1.31E-05	Operations_TRU
	TRU_LD	DPM	9901	2042	1.31E-05	Operations_TRU
	TRU_LD	DPM	9901	2043	1.30E-05	Operations_TRU
	TRU_LD	DPM	9901	2044	1.30E-05	Operations_TRU
	TRU_LD	DPM	9901	2045	1.30E-05	Operations_TRU
	TRU_LD	DPM	9901	2046	1.30E-05	Operations_TRU
	TRU_LD	DPM	9901	2047	1.30E-05	Operations_TRU
	TRU_LD	DPM	9901	2048	1.30E-05	Operations_TRU
	TRU_LD	DPM	9901	2049	1.30E-05	Operations_TRU
	TRU_LD	DPM	9901	2050	1.30E-05	Operations_TRU
	TRU_LD	DPM	9901	2051	1.30E-05	Operations_TRU
	TRU_LD	DPM	9901	2052	1.30E-05	Operations_TRU
	TRU_LD	DPM	9901	2053	1.30E-05	Operations_TRU
	TRU_LD	DPM	9901	2054	1.30E-05	Operations_TRU
	TRIN	PM2.5	88101	2025	2.09E-05	Operations_TRU
	TRIN	PM2.5	88101	2026	1.99E-05	Operations_TRU
	TRIN	PM2.5	88101	2027	1.91E-05	Operations_TRU
	TRIN	PM2.5	88101	2028	1.84E-05	Operations_TRU
	TRIN	PM2.5	88101	2029	1.78E-05	Operations_TRU
	TRIN	PM2.5	88101	2030	2.84E-06	Operations_TRU
	TRIN	PM2.5	88101	2031	2.56E-06	Operations_TRU
	TRIN	PM2.5	88101	2032	2.35E-06	Operations_TRU
	TRIN	PM2.5	88101	2033	2.21E-06	Operations_TRU
	TRIN	PM2.5	88101	2034	2.12E-06	Operations_TRU
	TRIN	PM2.5	88101	2035	2.06E-06	Operations_TRU
	TRIN	PM2.5	88101	2036	1.99E-06	Operations_TRU
	TRIN	PM2.5	88101	2037	1.91E-06	Operations_TRU
	TRIN	PM2.5	88101	2038	1.86E-06	Operations_TRU
	TRIN	PM2.5	88101	2039	1.80E-06	Operations_TRU
	TRIN	PM2.5	88101	2040	1.77E-06	Operations_TRU
	TRIN	PM2.5	88101	2041	1.75E-06	Operations_TRU
	TRIN	PM2.5	88101	2042	1.74E-06	Operations_TRU
	TRIN	PM2.5	88101	2043	1.73E-06	Operations_TRU
	TRIN	PM2.5	88101	2044	1.73E-06	Operations_TRU
	TRIN	PM2.5	88101	2045	1.73E-06	Operations_TRU
	TRIN	PM2.5	88101	2046	1.73E-06	Operations_TRU
	TRIN	PM2.5	88101	2047	1.73E-06	Operations_TRU
	TRIN	PM2.5	88101	2048	1.73E-06	Operations_TRU
	TRIN	PM2.5	88101	2049	1.73E-06	Operations_TRU
	TRIN	PM2.5	88101	2050	1.73E-06	Operations_TRU
	TRIN	PM2.5	88101	2051	1.73E-06	Operations_TRU
	TRIN	PM2.5	88101	2052	1.73E-06	Operations_TRU
	TRIN	PM2.5	88101	2053	1.73E-06	Operations_TRU
	TRIN	PM2.5	88101	2054	1.73E-06	Operations_TRU
	TROUT	PM2.5	88101	2025	2.01E-05	Operations_TRU
	TROUT	PM2.5	88101	2026	1.92E-05	Operations_TRU
	TROUT	PM2.5	88101	2027	1.84E-05	Operations_TRU
	TROUT	PM2.5	88101	2028	1.77E-05	Operations_TRU
	TROUT	PM2.5	88101	2029	1.72E-05	Operations_TRU
	TROUT	PM2.5	88101	2030	2.74E-06	Operations_TRU
	TROUT	PM2.5	88101	2031	2.48E-06	Operations_TRU
	TROUT	PM2.5	88101	2032	2.27E-06	Operations_TRU
	TROUT	PM2.5	88101	2033	2.13E-06	Operations_TRU
	TROUT	PM2.5	88101	2034	2.05E-06	Operations_TRU
	TROUT	PM2.5	88101	2035	1.99E-06	Operations_TRU
	TROUT	PM2.5	88101	2036	1.92E-06	Operations_TRU
	TROUT	PM2.5	88101	2037	1.85E-06	Operations_TRU
	TROUT	PM2.5	88101	2038	1.79E-06	Operations_TRU
	TROUT	PM2.5	88101	2039	1.74E-06	Operations_TRU
	TROUT	PM2.5	88101	2040	1.71E-06	Operations_TRU
	TROUT	PM2.5	88101	2041	1.69E-06	Operations_TRU
	TROUT	PM2.5	88101	2042	1.68E-06	Operations_TRU
	TROUT	PM2.5	88101	2043	1.67E-06	Operations_TRU
	TROUT	PM2.5	88101	2044	1.67E-06	Operations_TRU
	TROUT	PM2.5	88101	2045	1.67E-06	Operations_TRU
	TROUT	PM2.5	88101	2046	1.67E-06	Operations_TRU
	TROUT	PM2.5	88101	2047	1.67E-06	Operations_TRU
	TROUT	PM2.5	88101	2048	1.67E-06	Operations_TRU
	TROUT	PM2.5	88101	2049	1.67E-06	Operations_TRU
	TROUT	PM2.5	88101	2050	1.67E-06	Operations_TRU
	TROUT	PM2.5	88101	2051	1.67E-06	Operations_TRU
	TROUT	PM2.5	88101	2052	1.67E-06	Operations_TRU
	TROUT	PM2.5	88101	2053	1.67E-06	Operations_TRU
	TROUT	PM2.5	88101	2054	1.67E-06	Operations_TRU

Phase	Modeled Source Group	Pollutant	CAS	Year	Emission Rate (g/s)	Source Description
Operations[4,5,6,7]	TRPK	PM2.5	88101	2025	1.19E-06	Operations_TRU
	TRPK	PM2.5	88101	2026	1.14E-06	Operations_TRU
	TRPK	PM2.5	88101	2027	1.09E-06	Operations_TRU
	TRPK	PM2.5	88101	2028	1.05E-06	Operations_TRU
	TRPK	PM2.5	88101	2029	1.01E-06	Operations_TRU
	TRPK	PM2.5	88101	2030	1.62E-07	Operations_TRU
	TRPK	PM2.5	88101	2031	1.46E-07	Operations_TRU
	TRPK	PM2.5	88101	2032	1.34E-07	Operations_TRU
	TRPK	PM2.5	88101	2033	1.26E-07	Operations_TRU
	TRPK	PM2.5	88101	2034	1.21E-07	Operations_TRU
	TRPK	PM2.5	88101	2035	1.18E-07	Operations_TRU
	TRPK	PM2.5	88101	2036	1.14E-07	Operations_TRU
	TRPK	PM2.5	88101	2037	1.09E-07	Operations_TRU
	TRPK	PM2.5	88101	2038	1.06E-07	Operations_TRU
	TRPK	PM2.5	88101	2039	1.03E-07	Operations_TRU
	TRPK	PM2.5	88101	2040	1.01E-07	Operations_TRU
	TRPK	PM2.5	88101	2041	9.97E-08	Operations_TRU
	TRPK	PM2.5	88101	2042	9.93E-08	Operations_TRU
	TRPK	PM2.5	88101	2043	9.87E-08	Operations_TRU
	TRPK	PM2.5	88101	2044	9.88E-08	Operations_TRU
	TRPK	PM2.5	88101	2045	9.90E-08	Operations_TRU
	TRPK	PM2.5	88101	2046	9.90E-08	Operations_TRU
	TRPK	PM2.5	88101	2047	9.89E-08	Operations_TRU
	TRPK	PM2.5	88101	2048	9.88E-08	Operations_TRU
	TRPK	PM2.5	88101	2049	9.87E-08	Operations_TRU
	TRPK	PM2.5	88101	2050	9.87E-08	Operations_TRU
	TRPK	PM2.5	88101	2051	9.87E-08	Operations_TRU
	TRPK	PM2.5	88101	2052	9.87E-08	Operations_TRU
	TRPK	PM2.5	88101	2053	9.87E-08	Operations_TRU
	TRPK	PM2.5	88101	2054	9.87E-08	Operations_TRU
	TRU_LD	PM2.5	88101	2025	1.31E-04	Operations_TRU
	TRU_LD	PM2.5	88101	2026	1.24E-04	Operations_TRU
	TRU_LD	PM2.5	88101	2027	1.18E-04	Operations_TRU
	TRU_LD	PM2.5	88101	2028	1.13E-04	Operations_TRU
	TRU_LD	PM2.5	88101	2029	1.09E-04	Operations_TRU
	TRU_LD	PM2.5	88101	2030	1.96E-05	Operations_TRU
	TRU_LD	PM2.5	88101	2031	1.77E-05	Operations_TRU
	TRU_LD	PM2.5	88101	2032	1.63E-05	Operations_TRU
	TRU_LD	PM2.5	88101	2033	1.53E-05	Operations_TRU
	TRU_LD	PM2.5	88101	2034	1.47E-05	Operations_TRU
	TRU_LD	PM2.5	88101	2035	1.42E-05	Operations_TRU
	TRU_LD	PM2.5	88101	2036	1.38E-05	Operations_TRU
	TRU_LD	PM2.5	88101	2037	1.32E-05	Operations_TRU
	TRU_LD	PM2.5	88101	2038	1.28E-05	Operations_TRU
	TRU_LD	PM2.5	88101	2039	1.25E-05	Operations_TRU
	TRU_LD	PM2.5	88101	2040	1.22E-05	Operations_TRU
	TRU_LD	PM2.5	88101	2041	1.21E-05	Operations_TRU
	TRU_LD	PM2.5	88101	2042	1.20E-05	Operations_TRU
	TRU_LD	PM2.5	88101	2043	1.20E-05	Operations_TRU
	TRU_LD	PM2.5	88101	2044	1.20E-05	Operations_TRU
	TRU_LD	PM2.5	88101	2045	1.20E-05	Operations_TRU
	TRU_LD	PM2.5	88101	2046	1.20E-05	Operations_TRU
	TRU_LD	PM2.5	88101	2047	1.20E-05	Operations_TRU
	TRU_LD	PM2.5	88101	2048	1.20E-05	Operations_TRU
	TRU_LD	PM2.5	88101	2049	1.20E-05	Operations_TRU
	TRU_LD	PM2.5	88101	2050	1.20E-05	Operations_TRU
	TRU_LD	PM2.5	88101	2051	1.20E-05	Operations_TRU
	TRU_LD	PM2.5	88101	2052	1.20E-05	Operations_TRU
	TRU_LD	PM2.5	88101	2053	1.20E-05	Operations_TRU
	TRU_LD	PM2.5	88101	2054	1.20E-05	Operations_TRU

Notes:

1. Off-road equipment crane emissions are calculated in Table 2.
2. Passenger vehicles and trucks mobile emissions are calculated in Table 3.
3. Modeled emission rates in grams/second calculated assuming construction schedule between 8 am - 4 pm (8 hours) for a period of 10 months (i.e., 303 days/year).
4. Passenger vehicles and trucks mobile emissions are calculated in Table 7.
5. Delivery truck idling emissions are calculated in Table 9.
6. Emissions of TRUs equipped on the refrigerated delivery trucks are calculated in Table 10.
7. Operational schedules of truck loading were provided in the Kittelson Memo. Modeled emission rates in grams/second calculated assuming truck loading schedule between 5 am - 3 pm (10 hours) and passenger vehicles operating schedule between 6 am - 11 pm (17 hours) for 365 days/year.

Abbreviations:

DPM - diesel particulate matter
$PM_{2.5}$- particulate matter < 2.5 μm
TRU - transportation refrigeration unit
g - gram
s - second

APPENDIX C.5

2675 Geary Boulevard Project Update Air Quality and Health Risk Assessment Results for Worker Receptors

RAMBOLL

ENVIRONMENT
& HEALTH

MEMO

Date	**December 9, 2022**
To	**San Francisco Planning Department** **San Francisco, California**
From	**Michael Keinath, PE** **Megan Sutter**
Subject	**2675 Geary Boulevard Project Update Air Quality and Health Risk Assessment Results for Worker Receptors**

1 Introduction

Ramboll US Consulting, Inc. (Ramboll) at the request of Environmental Science Associates (ESA) conducted a California Environmental Quality Act (CEQA) air quality analysis and health risk assessment for off-site worker receptors for the proposed Whole Foods Market to be located at 2675 Geary Blvd in San Francisco, California (the "Project"). The Project would consist of renovation of a portion of an existing retail complex for use as an approximately 50,000 square foot supermarket.

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Details on the methodology and assumptions are described in the CEQA Air Quality and Health Risk Assessment Methodology (Ramboll, February 2022, referred to hereafter as "Methodology Report") and the Air Quality and Health Risks Assessment Results (Ramboll, September 2022, referred to hereafter as "Air Quality Memo"), which estimated health risk impacts at the maximally exposed individual (MEI) resident and daycare receptors. This technical memorandum is based on the methodologies developed in the Methodology Report and Air Quality Memo, with the additional methodologies used to estimate cancer risk, chronic hazard index (HI), and fine particulate matter ($PM_{2.5}$) concentration associated with construction and operation of the Project at off-site worker receptor locations. The estimated health risk impacts on off-site worker receptors from the construction and operation of the proposed Project are summarized in Section 3. The Project boundary and modeling extent are shown in **Figure 1**. This analysis has been performed at the request of the San Francisco Planning Department.

2 Methodology

The purpose of this air quality analysis is to assess potential health risks and hazards on off-site workers that would result from the construction and operation of the proposed Project. Potential health risks and hazards are analyzed consistent with the guidelines and methodologies from air quality agencies, specifically: Bay Area Air Quality Management District (BAAQMD), California Air Resources Board (CARB), California Office of Environmental Health Hazard Assessment (OEHHA), and USEPA.

As discussed in the Methodology Report and the Air Quality Memo, the steps conducted in performing this health risk assessment are as follows:

1. Quantify toxic air contaminants (TACs) emissions from Project construction and operation.
2. Perform air dispersion modeling for pollutant concentrations for area and roadway sources of TAC emissions.
3. Calculate resulting cancer risk, chronic HI, and fine particulate matter ($PM_{2.5}$) concentrations resulting from construction and operational sources of TACs.

All methodologies implemented in this memo are consistent with those described in the Methodology Report and the Air Quality Memo. This Memo provides further information for worker health risk parameters, exposure, and health risk assessment (HRA), as described below.

2.1 Locations of Worker Receptors

In order to evaluate health impacts to any potential offsite worker receptors, receptors were placed at locations collocated with the receptors used in the Citywide HRA and within 1,000 feet of the Project and modeled traffic sources. Receptors were modeled on site and at varying heights: 1.5, 6.6, 15, and 18.9 meters above terrain height to account for workers that share the site with the Project, including Target and other existing commercial and retail uses within the Project site, such as the shared loading dock. As discussed in the Methodology Report and the Air Quality Memo, annual dispersion factors were estimated for each receptor location.

During the determination of the location of the maximally exposed individual worker (MEIW) for each risk category, receptor locations exposed to elevated TAC concentrations were examined using satellite images and other publicly available map data. When a receptor location did not appear to represent an actual, existing worker receptor, the receptor location was excluded from the analysis. For example, receptor locations on local roadways and parking lots were excluded.

2.2 Exposure Parameters for Worker Receptors

The exposure parameters used to estimate excess lifetime cancer risks for the worker receptors are presented in **Table 1**. In accordance with the OEHHA Guidelines, the recommended exposure duration of 25 years of operation following 10 months of construction was selected for the age group of 16-70 years of age. Selection of other exposure parameters, such as breathing rate and exposure frequency, are also consistent with the recommended Tier 1 approach in the OEHHA Guidelines.[1]

OEHHA recommends applying an adjustment factor to the annual average concentration modeled assuming continuous emissions (i.e., 24 hours per day, seven days per week), when the actual emissions are less than 24 hours per day and exposures are concurrent with activities occurring as part of the Project. For construction and operational activities, emissions only impact receptors during certain hours of the day when activities are occurring. However, the TAC concentrations modeled during those hours are annualized assuming 24 hour per day in the modeling outputs. Thus, a worker adjustment factor (WAF) was applied to the annual average concentration used in the evaluation to account for an emissions schedule that is not occurring 24 hours per day, seven days per week if the exposure takes place preferentially during working hours.

The WAF for the worker receptors assumes receptors are present only during the hours of the day and days of the week emissions are occurring. Project construction and operation are assumed to occur every day for 8 hours a day and 17 hours a day, respectively. A worker is assumed to have 8-hours shifts, five times a week. Therefore, a WAF of 4.2 was applied to the annual average concentration for

[1] OEHHA, 2015. Air Toxics Hot Spots Program, Risk Assessment Guidelines, Guidance Manual for Preparation of Health Risk Assessments. February.

construction ([24 hours/8 hours] and [7 days/5 days]) for the worker receptors. For project operations, a WAF of 2.0 was applied to the annual average concentration for operation ([24 hours/17 hours] and [7 days/5 days]) for the worker receptors.

3 Results from the Project Health Risks Assessment

The Project health risks from construction and operational sources are summarized in **Table 2.** The MEIW for cancer risk, chronic HI and $PM_{2.5}$ concentration is located on the loading area on the Project site (assuming the worker is employed at one of the entities sharing the site with the Project), at the northeastern corner of the existing building. Location of the MEIW is shown in **Figure 2**

As shown in **Table 2**, the cancer risk from the Project was calculated to be 3.7 in a million for the MEIW. At this receptor, the construction risk is 0.0036 in a million and the operational risk is 3.69 in a million; the $PM_{2.5}$ annual average concentration for construction is 0.00089 µg/m^3 and 0.010 µg/m^3 for operation. As shown in **Table 2**, the maximum non-cancer chronic HI at the MEIW would occur during Project operation and was calculated to be 0.022.

4 Cumulative Health Risks

The cumulative analysis includes Project impacts added to background risk and reasonably foreseeable future projects. Background risks are available through San Francisco's Citywide HRA 2020.

Citywide modelling for the year 2020 does not include construction or operational emissions from cumulative projects because these are variable and difficult to predict; however, this cumulative analysis evaluates known construction activities and their future operations within the zone of influence (1,000 feet) that could impact local air quality and affect health risk. These sources are not already included in the Citywide HRA. A description for each of the nearby cumulative projects is included in the Air Quality Memo. Consistent with the approaches for the residential and daycare MEIs in the Air Quality Memo, the health risk impacts from three nearby projects were quantified for the MEIW location, summarized below. The cumulative health risk impacts are summarized in **Table 3**. As shown in **Table 3**, cumulative cancer risk and annual average $PM_{2.5}$ concentration would be 105 in a million and 9.2 µg/m^3 at the MEIW location, respectively.

Attachments:

A: Tables

B: Figure

TABLES

Table 1: Worker Exposure Parameters for Project Construction and Operations
Table 2: Summary of Project Worker Health Risks
Table 3: Cumulative Cancer Risk and PM2.5 Concentration

Table 1
Worker Exposure Parameters for Project Construction and Operations
Whole Foods - 2675 Geary Blvd
San Francisco, California

Phase	Receptor Type[1]	Receptor Age Group	Exposure Parameters						
			Daily Breathing Rate (DBR)[2]	Exposure Duration (ED)	Exposure Frequency (EF)[3]	Averaging Time (AT)	Intake Factor, Inhalation (If_{inh})	Age Sensitivity Factor (ASF)	ASF- and WAF-Weighted Intake Factor, Inhalation (IF_{inh})[4]
			(L/kg-day)	(years)	(days/year)	(days)	(m^3/kg-day)	(unitless)	(m^3/kg-day)
Construction	Worker	16-70 years	230	0.83	250	25,550	0.002	1	0.0079
Operations	Worker	16-70 years	230	25	250	25,550	0.056	1	0.111

Receptor Type	Worker Adjustment Factor (WAF)	
	Construction[4]	Operations[5]
Worker	4.2	2.0

Notes:

1. All workers are assumed to be exposed to construction risks for the duration of construction, which is 10 months, and continute to be exposed to operational risks for 25 years beginning in 2025 at the start of operation.

2. Daily breathing rates for workers assume 230 L/kg-8 hours, which represents the 95th percentile 8-hour breathing rate based on moderate activity of 16-70 years-old age range, per BAAQMD 2016 and 2020 Health Risk Assessment (HRA) Modeling Guidelines.

3. Exposure frequency reflects default worker exposure frequency from OEHHA 2015.

4. Ifinh was scaled using age sensitivity factor and worker adjustment factor.

4. A Worker Adjustment Factor for construction was implemented to adjust the concentration calculated by emission rates and modeling dispersion factors. The WAF adjusts the model from 24 hours/day to 8 hours/day of construction and from 7 days/week of exposure to 5 days/week of exposure.

5. A Worker Adjustment Factor for operation was implemented to adjust the concentration calculated by emission rates and modeling dispersion factors. The WAF adjusts the model from 24 hours/day to 10 hours/day of operation and from 7 days/week of exposure to 5 days/week of exposure.

Abbreviations:

AT - averaging time
BAAQMD - Bay Area Air Quality Management District
DBR - daily breathing rate
ED - exposure duration
EF - exposure frequency
FAH - fraction of time at home
IF_{inh} - intake factor
kg - kilogram
L - liter
m^3 - cubic meter
OEHHA - Office of Environmental Health Hazard Assessment
WAF - Worker Adjustment Factor

Reference:

Air Toxics Control Programs Health Risk Assessment Guidelines. 2021. BAAQMD. December. Available online at: https://www.baaqmd.gov/~/media/dotgov/files/rules/reg-2-permits/2021-amendments/documents/20211215_hraguidelines-pdf.pdf?la=en
OEHHA. 2015. Air Toxics Hot Spots Program Risk Assessment Guidelines. Guidance Manual for Preparation of Health Risk Assessments. February.

Table 2
Summary of Project Worker Health Risks
Whole Foods - 2675 Geary
San Francisco, California

Receptor Type	Worker[1]		
Sources	**Excess Lifetime Cancer Risk (in a million)[2]**	**Non-Cancer Hazard Index[3]**	**$PM_{2.5}$ Concentration ($\mu g/m^3$, Annual Average)[4]**
Construction Sources			
Passenger Vehicles[5]	4.7E-04	1.7E-04	5.5E-04
Truck[5]	6.0E-06	1.4E-07	2.3E-06
Crane	0.0031	7.2E-05	3.3E-04
Construction Total	0.0036	2.4E-04	8.9E-04
Operational Sources			
Passenger Vehicles[5]	0.10	0.0027	0.0094
Truck[5]	0.026	4.4E-05	6.5E-04
TRU Exhaust	2.9	0.018	0.082
Truck Idling	0.68	0.0011	0.0055
Operations Total	3.68	0.022	0.10
Construction + Operations Total[6]	3.69	--	--
MEI Location			
UTMx	548,820	548,820	548,820
UTMy	4,181,780	4,181,780	4,181,780
Located in APEZ?	Yes	--	Yes

Notes:

1. All receptors are assumed to be exposed to construction risks for the duration of construction, which is 10 months in 2024. All receptors are assumed to be exposed to operational risks for 25 years beginning in 2025 at the start of operation.

2. Excess lifetime cancer risks are estimated as the upper-bound incremental probability that an individual will develop cancer over a lifetime as a direct result of exposure to potential carcinogens. The estimated risk is expressed as a unitless probability. The cancer risk attributed to the emissions associated with the Project was calculated based on the modeled annual average concentration of toxic air contaminants (TACs), the intake factor for worker receptors, the Cancer Potency Factors (CPF) for TACs, and the Age Sensitivity Factors (ASF). TACs in this project include DPM and speciated total organic gas (TOG).

3. The potential for exposure to result in adverse chronic noncancer effects is evaluated by comparing the estimated annual average air concentration to the noncancer chronic Reference Exposure Level (REL) for each chemical. When calculated for a single chemical, the comparison yields a ratio termed a chronic hazard quotient (HQ). To evaluate the potential for adverse chronic noncancer health effects from simultaneous exposure to multiple chemicals, the chronic hazard quotients for all chemicals are summed, yielding a hazard index (HI).
4. $PM_{2.5}$ concentration and Non-Cancer Hazard Index represent annual values.
5. Passenger and truck emissions considered in the health risk assessment include both exhaust and fugitive dust emissions.

6. Construction + operations totals were reported for excess lifetime cancer risk only since excess lifetime cancer risk is based on a 25-year exposure scenario. Chronic non-cancer HI and $PM_{2.5}$ concentration are based on annual averages; therefore, chronic non-cancer HI and $PM_{2.5}$ from construction and operations would not be additive since construction and operations would not occur at the same time. As shown in the table, the highest values of non-cancer HI and $PM_{2.5}$ concentrations occur during operations.

Abbreviations:

μg - microgram
ASF - age sensitivity factor
DPM - diesel particulate matter
HQ - hazard quotient
m^3 - cubic meter
OEHHA - Office of Environmental Health Hazard Assessment
PM - particulate matter
REL- reference exposure level
TAC - toxic air contaminants
TOG - total organic gas
TRU - transport refrigeration unit
HI - hazard index

Reference:

OEHHA. 2015. Air Toxics Hot Spots Program Risk Assessment Guidelines. Guidance Manual for Preparation of Health Risk Assessments. February.

Table 3
Cumulative Cancer Risk and PM2.5 Concentration
Whole Foods - 2675 Geary Blvd
San Francisco, California

Source Category	$PM_{2.5}$ Concentration ($\mu g/m^3$, Annual Average)	Excess Lifetime Cancer Risk (in a million)
Proposed Project[1]	0.10	3.7
2020 Citywide Background[2]	9.1	96
Total Project + Background	**9.2**	**100**
Future Construction Projects not in Citywide HRA		
3333 California Street[3]	0.0013	0.27
Geary Bus Rapid Transit Project[4]	0.0050	2.8
3461 Geary Blvd.[5]	-	1.7
Total Non-Project	**0.006**	**4.8**
Cumulative Total[6,7]	**9.2**	**105**

MEIW Location:

MEIW Type	UTMx [m]	UTMy [m]
On-Site Worker	548820	4181780

Notes:

1. The Proposed Project values account for impacts from construction and operation of the Proposed Project. Construction impacts are from off-road construction equipment (crane only) and on-road construction delivery and worker trips. Operational impacts are from passenger vehicle trips and delivery truck trips. Values shown here are the maximum impacts, which for excess lifetime cancer risk include impacts from construction and operations over a 25 year exposure duration and for PM2.5 concentration includes the maximum annual concentration which occurs during operations.

2. Background cancer risks and $PM_{2.5}$ concentrations for 2020 were obtained from the San Francisco Citywide model output database.

3. Health risk from 3333 California Street was analyzed in a previous EIR for the 3333 California Street Mixed Use Project (SCH: 2017092053). The cancer risk and $PM_{2.5}$ concentration values presented here are the modeled impacts from the 3333 California Street Project occuring at the Whole Foods Project's MEIW location shown above.

4. The maximum health risks from both construction and operation for the Geary Bus Rapid Transit (BRT) Project were taken from the 2015 DEIR and conservatively summed, added to the Whole Foods Project cancer risk, and assumed to occur at the Project MEIW as a conservative estimate. In reality, health risks from this future project are expected to be lower at the Project MEIW.

5. Accessed from the Air Quality Technical Memorandum - 3461 California Street, Case Number 2018-007764ENV

6. Cumulative total health impacts are the sum of the Proposed Project impacts, background impacts included in the Citywide model, and background impacts for future projects not included in the Citywide model.

7. Maximum Exposed Individual values from the cumulative projects were not specifically for a worker receptor, but were added to the Project daycare receptor as a conservative approach to calculate the cumulative total.

Abbreviations:

UTM - Universal Transverse Mercator

$PM_{2.5}$ - particulate matter 2.5 microns in size or less

DEIR - Draft Environmental Impact Report

m - meter

MEIW - Maximally Exposed Individual Worker

Citywide model - San Francisco Citywide Health Risk Assessment Model

References:

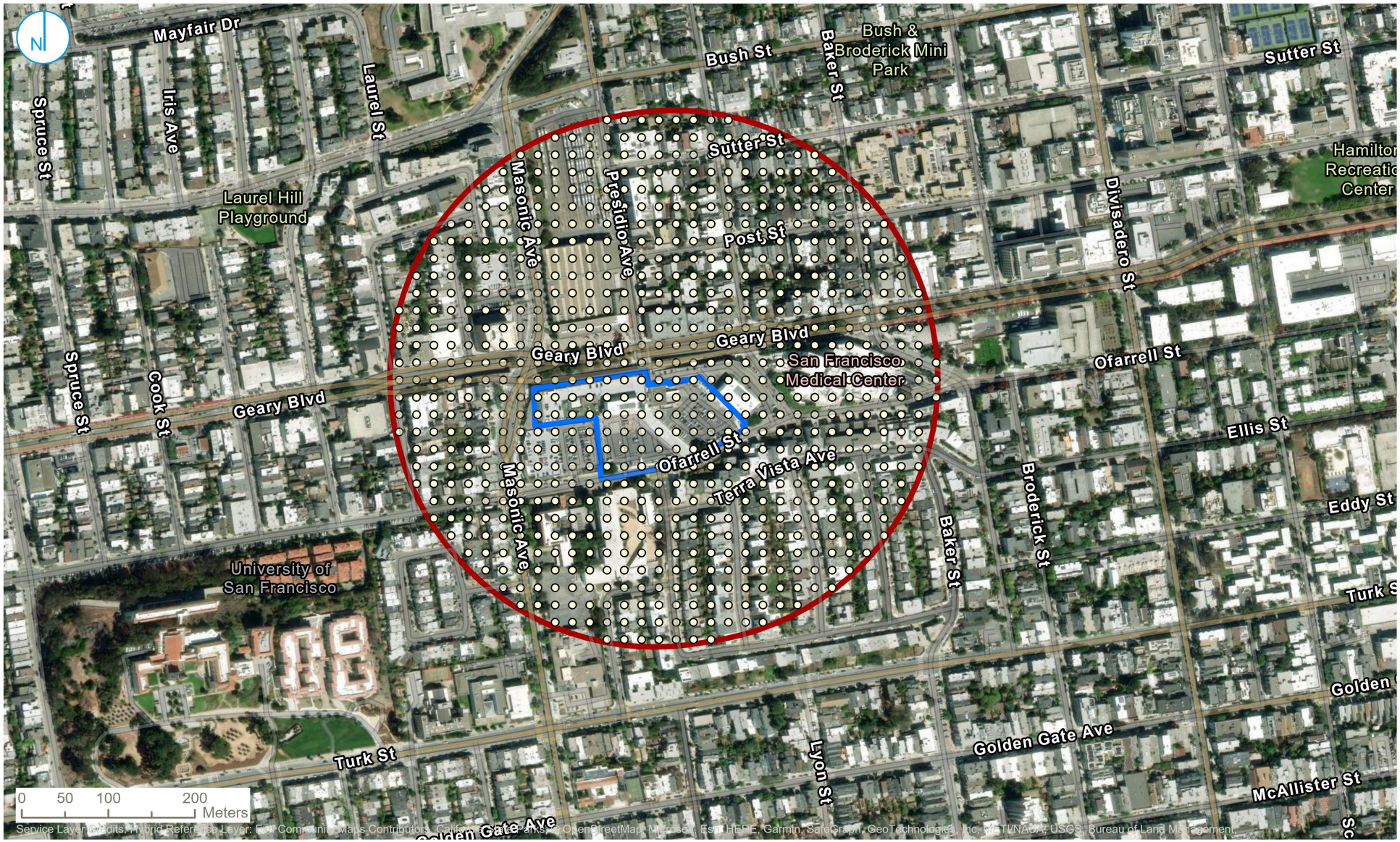
San Francisco County Transportation Authority, et al. 2015. Geary Corridor Bus Rapid Transit Project, Draft Environmental Impact Statement/Environmental Impact Report. September.

City and County of San Francisco, et al. 2018. 3333 California Street Mixed-Use Project, Draft Environmental Impact Report.

FIGURES

Figure 1: Project Boundary and Modeling Extent
Figure 2: Maximally Exposed Individual Worker

PROJECT: 1690022356 | DATED: 6/20/2022 | DESIGNER: MISIED



Project Boundary

Worker 1000ft Buffer

Worker Receptors 1000ft

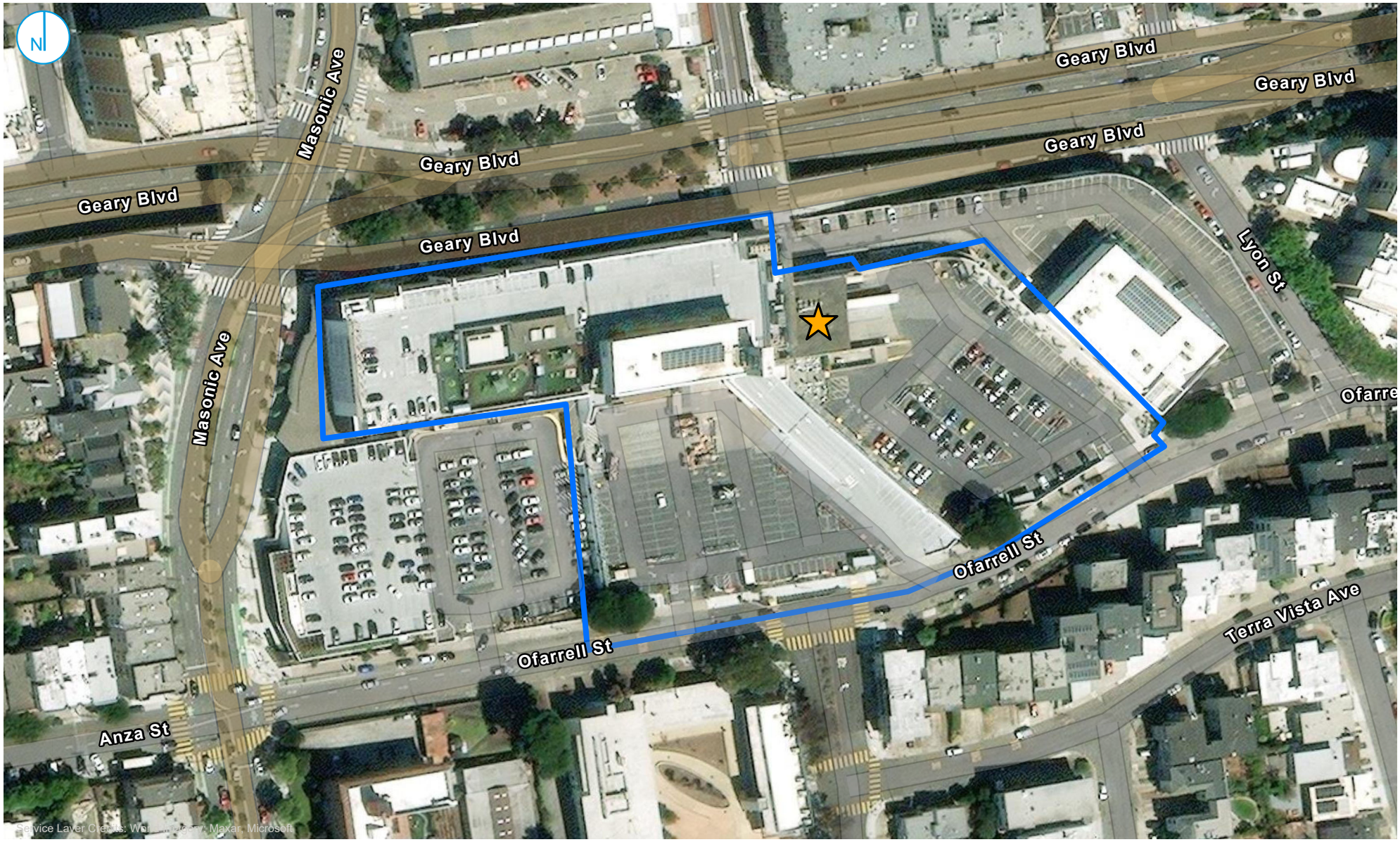
PROJECT BOUNDARY AND MODELING EXTENT

Whole Foods - 2675 Geary Blvd
San Francisco, California

FIGURE 01

RAMBOLL US CONSULTING, INC.
A RAMBOLL COMPANY

PROJECT: 1690022356 | DATED: 8/5/2022 | DESIGNER: LLI



Project Boundary

MEIW

0 50 100 200 Meters

MAXIMUM EXPOSED INDIVIDUAL WORKER LOCATIONS

Whole Foods - 2675 Geary Blvd
San Francisco, California

FIGURE 02

RAMBOLL US CONSULTING, INC.
A RAMBOLL COMPANY

RAMBOLL

APPENDIX D

Transportation Technical Memorandum

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June 13, 2022 Project# 22126.015

To: Rachel Schuett, Senior Environmental Planner
Environmental Planning Division, San Francisco Planning
49 South Van Ness Avenue, Suite 1400
San Francisco, CA 94103

From: Mike Alston, RSP; Sophia Semensky

RE: Transportation Memorandum
2675 Geary Boulevard

PURPOSE OF THIS MEMORANDUM

Kittelson & Associates, Inc. (Kittelson) has prepared this memorandum to present the travel demand and freight loading demand methodology and calculations for the proposed 2675 Geary Boulevard project ("project," Case No. 2019-004110ENV-02) in San Francisco, California. This memorandum also provides substantiation for air quality-related transportation data inputs subsequently used to model transportation-related emissions from the proposed project, in support of the environmental analysis.

Memorandum Organization

This memorandum is organized into the following sections which include data tables and substantiation as listed below:

- Project Description
  - Table 1. Proposed Project Characteristics
- Methodology
- Data Collection
- Project Travel Demand
  - Table 2. Weekday Travel Demand
  - Table 3. Vehicle Trips
  - Table 4. Customer Trips
  - Table 5. Employee Trips
- Project Freight Loading Demand
  - Table 6. Freight Trips
  - Table 7. Fleet Mix
  - Table 8. Loading Locations
  - Table 9. Loading Event Average Duration by Location
  - Table 10. Loading Event Average Duration by Vehicle Type
  - Table 11. Vehicle Miles Traveled by Freight Vehicle Type

Discussion preceding each table lists the data sources available and estimates based on each data source. The discussion then documents the source selected and explains how and why that data source was used. References to data sources are included as numbered endnotes; see Attachment A: Data Sources, for the complete reference. In addition, each section notes whether the analysis was completed for transportation environmental review or as an input to air quality analysis.

Each table listed above includes the following information:

- The item to be estimated
- The data and details on the calculation (where applicable)
- The data selected for analysis (including a source citation)

Attachment A and Attachment B include the data sources and support documents used to derive project analysis estimates. They are referenced throughout this memorandum when the corresponding analysis and estimates are discussed.

- Attachment A: Data Sources
  - **Attachment A-1: Weekday versus Weekend Transaction Data.** These data were used to estimate weekend project travel alongside weekday project travel in order to estimate overall average daily estimates.
  - **Attachment A-2: FHWA to EMFAC Vehicle Crosswalk.** This attachment is a support tool developed to convert fleet mix data collected in a particular format to a vehicle classification system appropriate for air quality analysis.
  - **Attachment A-3: Excerpt from San Francisco Travel Demand Update: Data Collection and Analysis.** This attachment includes the standard travel demand estimates consistent with the San Francisco TIA Guidelines (TIA Guidelines).
- Attachment B: Data Tables
  - **Table B-1. Data Sources + Store Amenities.** This table compares the project characteristics of the Whole Foods stores available for data analysis.
  - **Table B-2. Available Data by Source.** This table compares the available data from each source and shows which sources provided which data for estimation.
  - **Table B-3. Trip Generation Data.** This table shows the comparative results of potential travel demand analysis methodologies (including choice of source data).
  - **Table B-4. Freight Loading Data:** This table shows the available data sources for estimating project freight travel demand.

PROJECT DESCRIPTION

The project site is a vacant 49,825 -square-foot retail space within an existing 250,843-square-foot shopping center, the "City Center," located at the southeast corner of Masonic Avenue and Geary Boulevard, in the Western Addition Neighborhood of San Francisco (Assessor's Block 1094, Lot 001). The project site also includes an existing parking lot with 117 vehicle parking spaces (Parking Lot C) and a loading dock in Parking Lot E.

The project sponsor proposes to renovate an existing vacant retail space on level 3 of the City Center shopping center for a new Whole Foods Market grocery store. The proposed project would include a 49,825-square-foot grocery store with a 25,030-square-foot sales floor**.** The remaining 24,795 square feet would be dedicated to other uses: seating areas, checkout, self-checkout, and back-of-house uses such as offices, restrooms, freezers, kitchens, and storage areas for online orders.[i,ii] The grocery store would sell

[i] These areas store products ordered online and collected in store by Whole Foods Market employees for pickup or delivery. Customers can order groceries and other in-store products online through Whole Foods Market or Amazon Prime.

[ii] Note: Although trips for retail land uses (including freight trips) are typically generated based on the size of the sales floor, all trip calculations are based on the entire store volume (gross square footage). This provides a conservative approach to analysis.

grocery items, prepared foods, medicine, household products, beverages, and other retail items. The store would have a lounge and seating area with a capacity of 50 people.

The analysis presented in this memorandum (and used for subsequent air quality analysis) was based on a prior project description that included a larger store (54,290 gross square feet). As a result, the estimates presented in this memorandum are conservative estimates (i.e., higher and more impactful from an environmental impact perspective compared to the revised project description).

Table 1. Proposed Project Characteristics

Project Characteristics	Existing	Proposed
Interior area (square feet)	49,825	49,825
Land use	Vacant Retail	Grocery Store
Rooftop mechanical penthouse (square feet)	930	1,630
Hours of loading	–	5 AM – 3 PM
Store hours	–	8 AM – 10 PM
Vehicle parking spaces	117 (Lot C)	117 (Lot C)
Bicycle parking spaces	8 (Lot E)	8 (Lot E)
Americans with Disabilities Act (ADA) parking spaces	1 van ADA; 4 standard ADA	1 van ADA; 4 standard ADA

Source: Whole Foods Market, 2021

METHODOLOGY

This section describes the methodology used to develop project travel demand and freight loading estimates.

Transportation analysis for environmental review typically proceeds with a proposed designated land use and unknown future tenants. For example, a project may specify a "retail – supermarket" use but not have a proposed retailer. As a result, analysis will typically include general assumptions associated with the land use type.

However, for the proposed project the project sponsor is the prospective tenant, Whole Foods Market. Therefore, Kittelson and the San Francisco Planning Department ("planning department") collected data from Whole Foods Market sites within San Francisco, including observation-based counts at the Whole Foods Market at 2001 Market Street (in 2017 and 2021). Additional Whole Foods specific data was collected by the planning department for other studies, such as the Balboa Reservoir EIR, or via data requests to Whole Foods Market. See Appendix A for further detail. Where possible, specific data for Whole Foods operations was used to improve the accuracy of estimates for the proposed project compared to more general input assumptions for the "retail – supermarket" land use type.

Whole Foods Operations

At the time this analysis was completed (early 2022), Whole foods operated seven stores in San Francisco and a local distribution center in Richmond, California.

DATA COLLECTION

Kittelson compared data at the 2001 Market Street Whole Foods Market site. This included data collected in 2017 for the TIA Guidelines update [8] and Kittelson data collected in 2021. A comparison of data in 2017 and 2021 helped identify travel demand and freight loading demand methodology and calculations for the proposed project, including to account for whether changes related to the Whole Foods business model (addition of Amazon lockers and Amazon Fresh grocery delivery) and travel pattern changes related to COVID-19 (started in March 2020 in San Francisco) meaningfully altered Whole Foods travel characteristics over time.

According to the San Francisco Travel Demand Update: Data Collection and Analysis report[9], the Whole Foods store at 2001 Market Street is 23,751 square feet. The store operating hours are 8:00 AM to 10:00 PM, seven days a week.

2021 DATA COLLECTION

Travel activity data was collected on July 20 and 21, 2021 at the 2001 Market Street Whole Foods store [5]. The data collection effort included:

- Person Trip Generation:
  - Total person trip generation by time of day
  - Person trip generation per thousand square feet
  - Trip generation (daily and peak hour person-trips per 1,000 square feet)
- Passenger Loading
  - Total of passenger loading vehicles by time of day
  - Length of each activity and average duration
  - Location of loading activity, including use of formal loading space or other curb or street location
  - Peak hour loading rate within the peak period for passenger loading (5 to 8 PM)
- Commercial Loading
  - Total of commercial loading vehicles by time of day and type of vehicle
  - Length of stay for vehicles and average duration
  - Location of loading activity, including use of formal loading space or other curb or street location
  - Peak hour loading rate within the peak period for commercial loading (11 AM to 2 PM)

In 2021, the 2001 Market Street store included Amazon Fresh service and Amazon lockers onsite for parcel delivery. The 2001 Market Street store included an onsite coffee bar and two interior eateries, similar to the proposed project. Activity associated with the onsite coffee bar and eateries was not separately observed or counted.

2017 REFERENCE DATA

The June 29, 2018, San Francisco Travel Demand Update: Data Collection and Analysis report included data collection at representative retail sites and documented those data in technical appendices [9]. Those data include 2017 travel demand data collected at the site.

At the time of the 2017 data collection, the 2001 Market Street Whole Foods site did not include Amazon Fresh service and Amazon lockers onsite for parcel delivery. (The Amazon purchase of Whole Foods was reported in June 2017.) The site did include the onsite coffee bar and two interior eateries at the time, similar to the proposed project.

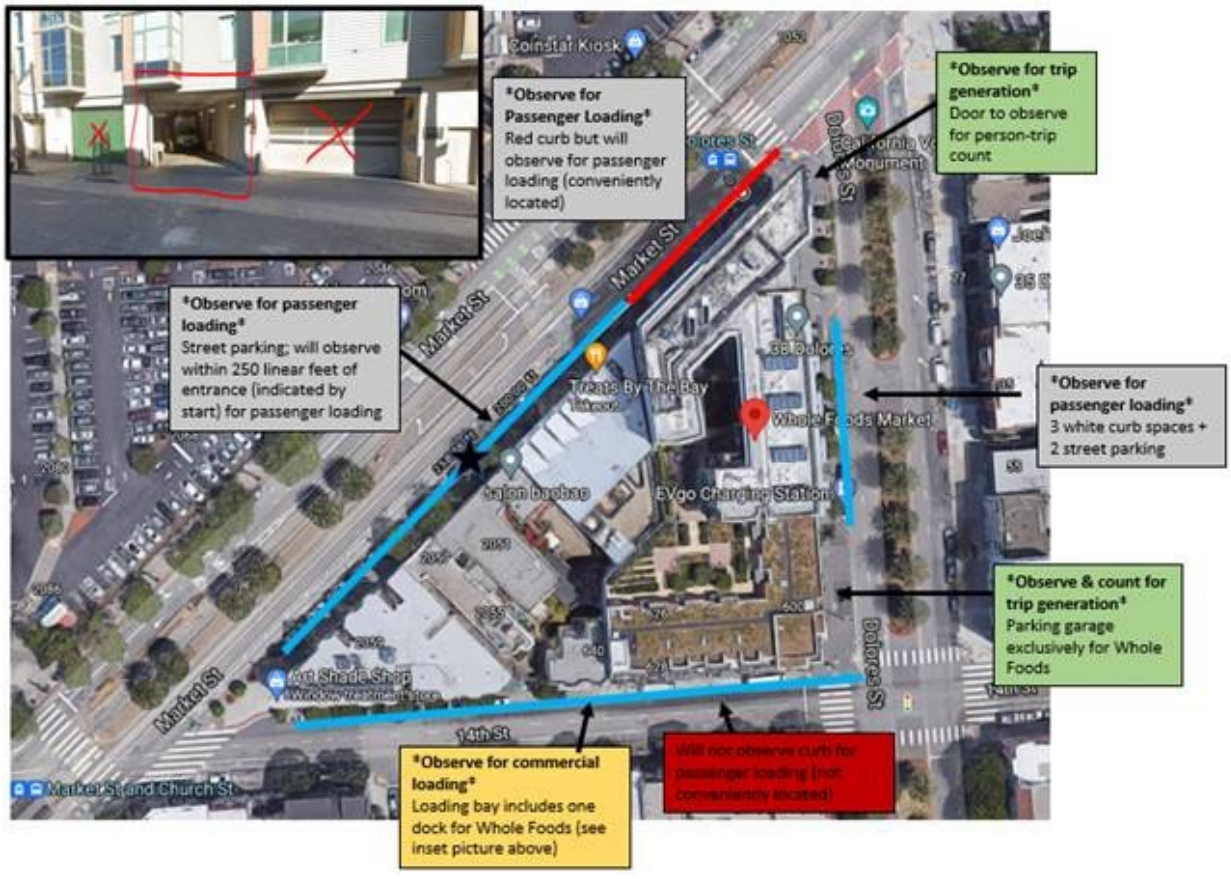
The following data was collected at the 2001 Market Street site as part of the TIA Guidelines update project (source: San Francisco Travel Demand Update: Data Collection and Analysis report Appendix D, page 2):

- **Person-trip** video counts on May 24, 2017
- **Mode share** intercept surveys on April 27, 2017
- **Loading activity** time lapse data on May 24, 2017

Site and Data Collection Logistics

Figure 1 shows an aerial image of the 2001 Market Street site block face; data observation locations are described below.

Figure 1: Data Collection Site Plan



PERSON TRIPS

Person trips were counted between 8 AM and 10 PM (the store's operating hours) on Tuesday, July 20, 2021, and Wednesday, July 21, 2021. Person trips were counted by observing and tallying at the following locations (refer to Figure 1):

- In/out activity at the doorway onto Dolores and Market (direct person trip count)
- Vehicle entries and exits to parking garage, with an assumed 1.4 average vehicle occupancy (indirect person trip count; this is the average vehicle occupancy reported by the Travel Demand Tool for this site) [8]

PASSENGER LOADING ACTIVITY

Passenger loading was counted between 8 AM and 10 PM (the store's operating hours) on the same two weekdays. Passenger loading activity was counted by observing and tallying at the following locations (refer to figure 1):

- Three white curb loading spaces and four street parking spaces along Dolores Street
- Red curb along Market Street which is within 250 linear feet of the Whole Foods entrance
- Street parking within 250 linear feet of Whole Foods entrance

The type of event (pickup/drop-off), time of day, location, and duration was recorded for all events, as well as qualitative observations (e.g., double parking). The cameras were set up and observed between 5 AM and 12 AM so that all commercial loading activity in these locations was recorded.

COMMERCIAL LOADING ACTIVITY

Per a July 8, 2021, conversation with onsite staff, Whole Foods suppliers use the loading dock along 14th Street (see Figure 1) to deliver groceries [13]. Drivers making deliveries for Amazon Lockers typically use available white curb space or short-term parking. Third-party vendors park and use the main entrance. There are no yellow curb commercial loading zones along the project side of the street within 250 linear feet of the Whole Foods entrance. Commercial activity was observed and tallied between 5 AM and 12 AM on the same two weekdays at the following locations:

- The loading dock on 14th Street
- Any commercial loading activity observed at the passenger loading sites
- Any incidental commercial loading activity observed at the garage entrance/exit
- Any obvious commercial deliveries being made through the front door (e.g., pushing a handcart)

The vehicle type, time of day, location, and duration was reported for all commercial loading activity. For third-party vendors making commercial deliveries through the front door, the duration was estimated based on the arrival and departure through the front doors.

OTHER AVAILABLE DATA SOURCES

Kittelson compiled and summarized the original data collection, allowing for comparison to the following other sources of data:

- The TIA Guidelines published travel demand rates for grocery store use [8]
- The June 29, 2018, San Francisco Travel Demand Update: Data Collection and Analysis report, including the technical appendices (for 2017 travel information at the 2001 Market site [9]

- Commercial loading data collected at the 1150 Ocean Avenue Whole Foods site on March 10, 2019 [3]
- Published documents associated with the proposed project:
  - Transportation Coordination Memo, May 4, 2020, which provided data from the 1765 California Site collected in 2019 [7]
  - Appeal of Exemption Determination, November 9, 2020
  - Hypothetical Loading Demand Analysis Memo, November 6, 2020

As part of the transportation analysis, Kittelson discussed the range of travel demand estimates indicated by available data and analyzed the project with a reasonable and appropriately conservative estimate.

PROJECT TRAVEL DEMAND

This section presents the project's travel demand, including:

- Table 2. Weekday Travel Demand
- Table 3. Vehicle Trips
- Table 4. Customer Trips
- Table 5. Employee Trips

Weekday Travel Demand

Kittelson and the department reviewed the data discussed in the Data Collection section of this memorandum to identify the appropriate data to use for the project's travel demand (see Attachment B: Data Tables).

As shown in Table B-2: Available Data by Source (Attachment B), daily and weekday PM peak hour person trip rates were available from the following sources:

- 2001 Market Street (2017) [6]
- 2001 Market Street (2021) [5]
- The 2675 Geary Blvd Planning Department Transportation Coordination Memo [7]
- The TIA Guidelines (2019) [8]

Daily and weekday PM peak hour person trip rates are shown in Table B-3: Trip Generation Data.

For weekday daily person trips: Kittelson used the TIA Guidelines rate of 297 weekday daily person trips per 1,000 gross square feet, which includes trips by all ways of travel. Kittelson conservatively selected this daily person trip rate because of the variation of observed rates (173.27 to 322) and because it is higher than the person rate observed in the 2001 Market Street (2021) data collection (173.27).

Kittelson then applied the mode split and average vehicle occupancy rates for the project location from the TIA Guidelines and incorporated those rates into the SF Travel Demand Tool [1] to determine the number of daily and PM peak hour Automobile, TNC/Taxi, Transit, Bicycle, Walking, and Private Shuttle person trips. The results from the travel demand analysis are summarized in Table 2. Weekday Travel Demand.

Table 2. Weekday Travel Demand

Mode Choice	Daily Trips	PM Peak Hour Trips
Automobile Person Trips	4,176	305
TNC/Taxi Person Trips	226	16
Muni Bus/Rail Person Trips	1,903	139
Bicycle Person Trips	451	33
Walking Person Trips	9,287	678
Private Shuttle Person Trips	81	6
Total Person Trips	16,124	1,177
Total Vehicle Trips[1]	2,620	216
Total Vehicle Trips (Private Vehicles + TNC/Taxi)[iii]	2,846	232

Source: Refer to Table B-3

1 Total Vehicle Trips = Automobile Person Trips/Average Vehicle Occupancy

Weekend Vehicle Trips

Kittelson estimated the average daily vehicle trips and PM Peak Hour vehicle trips (including weekends) for air quality model inputs. To develop average daily values (in contrast with the average weekday values already presented), Kittelson estimated weekend project-related travel compared to the weekday estimates provided in the preceding section and adjusted the overall estimates.

To develop weekend travel demand estimates in relation to weekday demand, Kittelson obtained and analyzed transaction and gross sales data from Whole Food's seven San Francisco stores [10]. The average number of weekend (Saturday and Sunday) transactions across all stores citywide was 5 percent higher than average weekday transactions which means 5 percent more trips across all modes. Therefore, a 5 percent growth was applied to estimate weekend project-related trips, and then a weighted average of weekend and weekday trips was taken to arrive at average daily vehicle trips.

Table 3. Vehicle Trips presents the average daily project vehicle trips.

The PM Peak Hour weekday vehicle trips are a direct output from the SF Travel Demand Tool [1]. The weekend trips can be estimated as 1.05 multiplied by the weekday trips. A weighted average of weekend and weekday trips was taken to yield the average daily and PM Peak Hour Vehicle Trips: 2,658 and 219, respectively.

[iii] Vehicle trips that were included in the air quality model only included trips by private vehicle and did not include taxi/TNC trips. However, the vehicle trips were based on a 54,290-square-foot floor area. The proposed project's floor area would be 49,285 square feet which would generate approximately 2,378 daily private vehicle trips and 205 taxi/TNC trips or 2,583 total vehicle trips which is less than the 2,620 vehicle trips that were included in the air quality model. Therefore, the number of vehicle trips was overestimated even with the omission of taxi/TNC trips.

Table 3. Vehicle Trips

Item to be Estimated	Data	Source
Total daily vehicle trips (weekday)	2,620 (rounded)	
Total daily vehicle trips (weekend)	2,620*1.05 = **2,751**(rounded)	Whole Foods data on weekend vs weekday gross sales and transactions [10]
Average daily vehicle trips	**2,658 trips** 297 daily trips per 1,000 square feet * 54.290 = 16,124 weekday daily person-trips 16,124.13 * 1.05 = 16,930 weekend daily person-trips Weighted average daily trips = 16,124*5/7 + 16,930*2/7 = 16,354.3 = 16,354 daily person trips (rounded) 16,354 daily trips * 26% (0.26) auto mode share / 1.6 average vehicle occupancy = 2,657.5 = 2,658 (rounded) daily vehicle trips (weekday))	Daily trip generation rate: TIA Guidelines (2019) [8] Mode Split: SF Travel Demand Tool (sftraveldemand.sfcta.org) [1] Whole Foods provided data on weekend vs weekday gross sales [10]
PM Peak Hour vehicle trips (weekday)	**216**	Mode Split and PM to daily trip relationship: SF Travel Demand Tool (sftraveldemand.sfcta.org) [1]
PM Peak Hour vehicle trips (weekend)	216*1.05 = 226.8 = **227** (rounded)	
PM Peak Hour vehicle trips (daily)	216 * 5/7 + 216*1.05*2/7 = 219.1 = **219** (rounded)	

Customer and Employee Trips

The number of weekday and weekend customer and employee daily and PM Peak Hour trips, as well as average trip length and Vehicles Mile Traveled (VMT) were estimated for the air quality analysis.

The average number of daily and PM Peak Hour trips (weekday, weekend, and average daily) was used from Table 3. Vehicle Trips, and the SF Travel Demand Tool was used to estimate the share of non-work vehicle trips as a percent of total trips [1]. Customer trips (non-work trips) are about 78 percent of daily vehicle trips, so that factor was applied to total vehicle trips to estimate the customer share. As before, weekday trips were converted to weekend trips with a multiplication factor of 1.05 [10].

Average customer trip lengths were estimated using the TIA Guidelines trip distribution guidelines to route vehicle trips to the centroid of each distributed geography, with a weighted average of trip lengths taken

[8]. The VMT for weekday, weekend, and combined was then generated by multiplying the average trip length by the corresponding number of daily trips.

As shown in Table 4. Customer Trips, the average customer trip length as estimated would be 4.99 miles. However, this estimate may overstate the actual average customer trip length for a few reasons. Grocery stores and other local-serving retail uses often reduce trip lengths by providing a closer destination for existing shopping demand near the project site. In this case, some portion of project-related trips would be redirected from existing longer shopping trips, allowing shoppers to travel a shorter distance.

Also, the trip length estimates are based on the guidelines and represent a sample trip distribution for the use type. Given that the project site is near the center of San Francisco (which is seven miles by seven miles), an average vehicle trip length of 4.99 miles would indicate that customers would be driving to this store instead of other, closer Whole Foods stores or other grocery stores (e.g., Marin County or the farthest western portions of the Richmond and Sunset neighborhoods).

Table 4. Customer Trips

Item to be Estimated	Data	Source
Daily customer vehicle trips (weekday)	2,620 * 0.78 = **2,056 vehicle trips** (rounded)	Daily trip generation rate: TIA Guidelines (2019) [8] Mode Split: SF Travel Demand Tool (sftraveldemand.sfcta.org)[1]
PM peak hour customer vehicle trips (weekday)	216 * 0.78 = **152 vehicle trips** (rounded)	2001 Market Street (2021) Original Data Collection [5] TIA Guidelines [8] Mode Split
Daily customer vehicle trips (weekend)	2,056 * 1.05 = **2,159 vehicle trips** (rounded)	2001 Market Street (2021) Original Data Collection [5] Whole Foods market estimates of # of employees on weekdays vs. weekends
PM peak hour customer vehicle trips (weekend)	152 * 1.05 = **160 vehicle trips** (rounded)	2001 Market Street (2021) Original Data Collection [5]
Average daily customer vehicle trips	2,056*5/7+2,159*2/7 = **2,085 vehicle trips** (rounded)	Daily trip generation rate: TIA Guidelines (2019) [8] Mode Split: SF Travel Demand Tool (sftraveldemand.sfcta.org) [1]
Average day PM peak hour customer trips	152*5/7 + 160*2/7 = **154 vehicle trips**	Daily trip generation rate: TIA Guidelines (2019) [8] Mode Split: SF Travel Demand Tool (sftraveldemand.sfcta.org) [1]
Average vehicle trip length for customers	**4.99 miles**	TIA Guidelines [8] Trip Distribution estimates
Total VMT for customers (weekday)	2,056 * 4.99 = **10,259 VMT**	

Item to be Estimated	Data	Source
Total VMT for customers (weekend)	2,159 * 4.99 = **10,772 VMT**	
Total daily VMT for customers	2,085 * 4.99 = **10,406 VMT**	

The employee trips were calculated using the same method as above: employee trips account for about 22 percent of daily vehicle trips, total vehicle trips were multiplied by 0.22 to arrive at an estimate. See Table 5. Employee Trips for detailed calculations. The average trip length was calculated by obtaining vehicle miles traveled (VMT) estimates by traffic analysis zone (TAZ) per retail employee and multiplying by the number of employees to result in VMT. The VMT estimates are provided by the San Francisco Chained Activity Modeling Process (SF-CHAMP) travel demand model [11]. Then, the VMT divided by the number of employee vehicle trips yields the average vehicle trip length. The number of employees was estimated by total number of daily person trips classified as work trips (22 percent): 3,332 (this is approximately 22 percent of the total person trips obtained and presented in Table 2. Weekday Travel Demand). Assuming these are one-way trips, and assuming three or four one-way trips per day per employee (a typical assumption for retail employee travel within San Francisco), the number of employees may be 25 to 33 percent of that, or 833 to 1,111 employees.

This estimate is likely conservative. Whole Foods anticipates a total of 200 employees with 35 to40 employees working each shift. Based on typical Whole Foods Market hours of 8:00 AM to 10:00 PM, the store would be open 14 hours per day, likely resulting in three shifts. Three shifts with 40 employees each would result in 120 employees per day. Again, assuming employees typically make three or four one-way trips per day (which accounts for trips taken off-site during a shift break), then if 120 employees take four trips per day, this would result in 480 daily employee trips, compared to 3,332, calculated above. In addition, the average trip length for employees is 21.6 miles. While that may be accurate for commute trips (two per day per employee), trips taken during an employee's shift are not likely to be that far; therefore, these calculations likely overestimate the VMT for employees.

Table 5. Employee Trips

Item to be Estimated	Data	Source
# of vehicle trips (weekday)	2,620 * 0.22 = **564 vehicle trips (rounded)**	2001 Market Street (2021) Original Data Collection [5] TIA Guidelines [8] Trip Distribution
# of PM peak hour vehicle trips (weekday)	216 * 0.22 = **64 vehicle trips** (rounded)	2001 Market Street (2021) Original Data Collection [5] TIA Guidelines [8] Trip Distribution
# of vehicle trips (weekend)	**564 * 1.05 =** 592.2 = **592 vehicle trips** (rounded)	2001 Market Street (2021) Original Data Collection [5]
# of PM peak hour vehicle trips (weekend)	64 * 1.05 = 67.2 = **67 vehicle trips** (rounded)	2001 Market Street (2021) Original Data Collection [5]
Average # of daily vehicle trips	564 * 5/7 + 564*1.05*2/7 = 572.1 **= 572 vehicle trips** (rounded)	2001 Market Street (2021) Original Data Collection [5] TIA Guidelines [8] Trip Distribution
Average # of PM peak hour vehicle trips	65*5/7 + 64*1.05*2/7 = 64.9 = **69 vehicle trips** (rounded)	
Average trip length for employees	21.6 (see below) Step 1: TIM VMT/retail employee = 7.41 Step 2: VMT/retail employee * # of employees = Total VMT: 7.41 * 1,666 = 12,345.1 Total VMT Step 3: total VMT/# of vehicle trips = 12,345.1 / 572 = **21.6 miles per employee vehicle trip**	TIM estimates (by TAZ) [11]
Total VMT for employees (weekday)	564 * 21.6 = **12,182 VMT**	
Total VMT for employees (weekend)	592 * 21.6 = **12,787 VMT**	
Total daily VMT for employees	572 * 21.6 = **12,355 VMT**	

FREIGHT LOADING DEMAND

Freight loading data were available from three Whole Foods locations as part of four studies (including the 2021 original data collection): 2001 Market Street (2021) [5], 1765 California Street (2019) [2], and 1150 Ocean Avenue (2019 & 2021) [3]. These locations include Amazon services, such as an Amazon Hub Locker and Amazon Returns, but these Amazon services are not proposed for 2675 Geary Boulevard.[iv] Therefore, the data collected likely overestimates freight loading demand for the proposed project: these activities are associated with additional trips: private trips to drop off Amazon returns, private trips to pick up deliveries from lockers, and commercial trips to collect returns and drop packages off to lockers.

For each item to be estimated, the data sources available were compared and the most conservative choice was generally chosen. The following section presents each item that was estimated, the sources, and an explanation of why the source was chosen. The following items were estimated:

- Freight Trips
  - Daily Freight Trips (Weekday)
  - Daily Freight Trips (Weekend)
  - Total Daily Freight Trips
- Fleet Mix (Total Daily Freight Trips by Vehicle Classification)
- Loading Locations
- Loading Event Average Duration by Location
- Loading Event Average Duration by Vehicle Type
- Vehicle Miles Traveled by Freight Delivery Vehicle Type (weekday/weekend daily vehicle miles traveled)

Freight Trips

The weekday, weekend, and average daily freight trips were estimated for the transportation analysis and as inputs to the air quality model. Freight loading trip data were available from four studies: 2001 Market Street (2021) [5], 1765 California Street (2019) [2] and 1150 Ocean Avenue (2019 & 2021) [3], so a freight trip rate (e.g., freight trips per square foot) was calculated for each data source using the average number of weekday freight trips and corresponding store square footage. Kittelson selected the 1765 California Street (2019) [2] rate of 1 trip per 1,000 square feet, because it provided the highest truck trip rate from among the four studies and represents an appropriately conservative estimate. Applying that rate to project's proposed square footage of 54,290[v], a total of 54 daily weekday freight trips was estimated. Table 6. Freight Trips shows the estimated demand.

Freight loading demand calculations look at the maximum freight trips on any given day and at peak times and do not distinguish between weekend and weekday trips. Whole Foods provided a log of freight delivery activity for the 1150 Ocean Avenue location at the Planning Department's request. Based on the data provided, weekend freight trip totals are about 45 percent of the total of weekday freight trips, leading to about 24 daily weekend freight trips for the proposed 2675 Geary location.

[iv] **Note:** although customers can order groceries and other in-store products online through Whole Foods Market or Amazon Prime for pick-up or delivery, the Amazon services, such as lockers or an Amazon return center would not be provided at this location.

[v] While the current project description has a square footage of 49,825, at the time of analysis, the square footage was proposed to be 54,290. As such, this analysis is conservative as it overestimates the number of freight trips.

Based on the above estimates, Kittelson estimated a weighted average daily (weekday and weekend) freight trips estimate of 0.84 trips per 1,000 square feet, as shown in Table 6. Freight Trips. The weighted average of weekday and weekend freight trips was used for the air quality analysis which accounts of emissions occurring every day of the year.

Table 6. Freight Trips

Item to be Estimated	Data	Source
Daily freight trips (weekday)	**54 daily freight trips** 1.0 trips per 1,000 square feet = 1.0 * 54.290 = 54.29 = 54 daily trips (rounded)	1765 California Street (2019) [2]
Daily freight trips (weekend)	**24 daily freight trips** 1.0 trips per 1,000 square feet * 45% (0.45) = 0.45 trips per 1,000 square feet * 54.290 = 24.43 = 24 daily trips (rounded)	1150 Ocean Avenue (2021) [3]
Total daily freight trips	**0.84 trips per 1,000 square feet =** **46 daily freight trips** [(5/7) * 1.0)] + [(2/7) *0.45] = 0.84 trips per 1,000 square feet = 46 trips (5/7 * 54 daily weekday freight loading trips) + (2/7 * 24 daily weekend freight loading trips) = 38.57 + 6.85 = 45.427 = 46 average daily freight trips (rounded)	1765 California Street (2019) [2] 1150 Ocean Avenue (2021 [3]

Fleet Mix

The total daily freight trips by vehicle classification were estimated for the air quality model in order to estimate the emissions associated with different vehicle types. There were two data sources available: 2001 Market Street (2021) [5] and 1150 Ocean Avenue (2021) [4]. Kittelson selected the 2001 Market Street data as the source for the fleet mix because the data were more heavily weighted toward larger trucks which have a higher rate of emissions; using this data provided a more conservative approach (i.e., worst-case). The 2001 Market Street (2021) data recorded the fleet mix using Federal Highway Administration (FHWA) vehicle classifications, and the air quality model requires fleet mix by Emission FACtor (EMFAC) Vehicle Weight Classification. Kittelson developed a translation from the FHWA vehicle classification types, which classify vehicles based on weight and number of axles, to EMFAC classifications, which classify vehicles based on engine type and resulting emissions (see Attachment A-2).

The EMFAC truck information was used for the following air quality model inputs:

- An estimate of overall vehicle fleet mix
- An estimate of average loading time per vehicle type (see the Loading Event Average Duration by Vehicle Type section, below).
- In conjunction with data collected about the presence of transportation refrigerated units (TRUs) on observed freight vehicles in the 2001 Market Street (2021) data, it enabled an estimate of TRUs per truck type for the proposed project (see the Loading Event Average Duration by Vehicle Type section, below).

The EMFAC vehicle fleet mix was calculated for both sources which confirmed that the vehicle types from 2001 Market Street (2021) would have a higher rate of emissions.

Table 7. Fleet Mix

Item to be Estimated	Data	Source
Medium-Duty Trucks (MDV)	46 trips x 13% = 5.98 trucks, rounds to **6 trucks**	2001 Market Street (2021) [5]
Light-Heavy-Duty Trucks, Gross Vehicle Weight Rating (GVWR) 8,501-10,000 lbs (LHDT1)	46 trips x 0 % = **0 trucks**	MDV – 13% LHDT1 – 0% LDT2 – 18% MHDT – 49% HHDT – 20%
Light-Duty Trucks, GVWR < 6,000 lbs (LDT2)	46 trips x 18 % = 8.28 trucks, rounds to **8 trucks**	
Medium-Heavy Duty Trucks (MHDT)	46 trips x 49 % = 22.54 trucks, rounds to **23 trucks**	
Heavy-Heavy Duty Trucks (HHDT)	46 trips x 20 % = 9.2 trucks, rounds to **9 trucks**	

Loading Locations

The air quality modeling analysis includes emissions estimates in relation to their location; therefore, the estimated freight loading trips were assigned to one of two locations for air quality analysis: loading dock or parking lot.

Whole Foods Markets receive deliveries from vehicles of several different sizes grouped as 65-foot (tractor trailer), 30-48-foot vehicles, and vehicles under 30 feet long. Each vehicle type has a different height and loading door configuration; some vehicles load from the tailgate and others from a side door. Larger trucks, such as tractor trailers have bed heights that closely align with 48-inch-high platforms; loading dock platforms most commonly are 44 to 48 inches high.[vi] Loading docks designed to accommodate these larger rear-loading vehicles are not designed to accommodate smaller and/or side-loading delivery vehicles; these vehicles typically unload from the street or parking lot and hand cart goods into the store.

The location of freight trips (loading docks vs hand cart) was estimated for both the transportation analysis and as an input to the air quality model. The observed data at 2001 Market Street (2021) [5] showed 41% of freight loading trips occurring at the loading dock and 59% delivered through the front door via hand truck.

[vi] https://www.safetyandhealthmagazine.com/articles/16472-osha-loading-dock-requirements. Accessed May 25, 2022.

This data was not collected for other Whole Foods locations, or as part of the 2017 data collection at 2001 Market Street.

At 2675 Geary, all deliveries would be received in a staffed receiving area from an existing 3,528-square-foot loading dock at the north end of Lot E, or would be hand carted to the receiving area from Lot E. There are four stalls within the loading dock, each of which can accommodate a 65-foot tractor trailer. Two stalls would be dedicated to Whole Foods Market.

There is a large concrete apron surrounding the freight elevator with adequate space for multiple trucks of various sizes to dwell while hand-carting deliveries to the freight elevator. Delivery vehicles could also park elsewhere within Lot E during loading activities. As such, loading spaces for smaller vehicles are not constrained (See Figure 2).

Figure 2: Existing and Proposed Site, Including Loading Dock



Source: Eagleview 2020

Given that the loading dock space is limited to two spaces, the analysis assumed a more conservative (i.e., higher demand) 50% of the freight loading trips would occur at the loading dock and 50% would occur from Lot E to the receiving area via hand truck.

Table 8. Loading Locations

Item to be Estimated	Data	Source
Loading dock	**23 trips** (50% of freight trips)	2001 Market Street (2021) [5]
Hand cart	**23 trips** (50% of freight trips)	2001 Market Street (2021) [5]

Loading Event Average Duration by Location

The loading event average duration by location was estimated for both the transportation analysis and as an input to the air quality model. Loading event durations were observed at 2001 Market Street (2021) [5] at both the loading dock and for deliveries via hand cart. As shown in Table 9, average loading durations were 20:49 minutes for events at the loading dock and 23:40 minutes for events by hand cart.

Table 9. Loading Event Average Duration by Location

Item to be Estimated	Data	Source
Loading dock	**20:49 minutes**	2001 Market Street (2021) [5]
Hand cart	**23:40 minutes**	2001 Market Street (2021) [5]

Loading Event Average Duration by Vehicle Type

The loading event average duration by vehicle type was estimated as an input to the air quality model. This information was necessary to determine the idling time for deliveries. Whole Foods does not allow trucks to idle while queuing for freight loading, state law allows 5 minutes of idling upon arrival and 5 minutes prior to departure. Additionally, for TRUs (refrigerated units), it was assumed that the motor that keeps the freight chilled (which is separate from the engine motor that powers the vehicle) would be operational (i.e., engine running) for the entire loading duration.

The fleet mix from 2001 Market Street (2021) [5] was used (as per the Fleet Mix section above), with average event duration pulled for each vehicle type.

Table 10. Loading Event Average Duration by Vehicle Type

Item to be Estimated	Data	Source
MDV	**21:18 (minutes: seconds)**	2001 Market Street (2021) [5]
LHDT1	**No data**	
LDT2	**29:24 (minutes: seconds)**	
MHDT	**20:23 (minutes: seconds)**	
HHDT	**23:39 (minutes: seconds)**	
Share of Truck Type with Refrigeration (TRUs)		
MDV	0% -- 6 x 0% = **0 TRUs**	2001 Market Street (2021) [5]
LHDT1	27% -- 0 x 27% = **0 TRUs**	MDV TRUs – 0%
LDT2	0% -- 8 x 0% = **0 TRUs**	LHDT1 TRUs – 27%
MHDT	27% -- 23 x 27% = 6.21, rounds up to **7 TRUs**	LDT2 TRUs – 0% MHDT TRUs – 27%
HHDT	58% -- 9 x 58% = 5.22, rounds up to **6 TRUs**	HHDT TRUs – 58%

Vehicle Miles Traveled by Freight Vehicle Type

Total VMT for the proposed project was estimated as an input to the air quality model which includes vehicle trips by employees, customers, and freight delivery vehicles. For the purposes of calculating emissions, all vehicle miles traveled are assigned to a vehicle type.

VMT calculations include number of trips and average trip length. VMT calculations are provided for each freight vehicle type.

The 2001 Market Street [5] data provided the number of deliveries per FHWA classification type, which was then translated to EMFAC vehicle classification type per the vehicle 'crosswalk' (Attachment A-2).

Estimated average trip length per EMFAC vehicle classification type was based on Whole Foods provided origin/destination data to 2675 Geary. It is conservatively estimated that each freight loading trip would consist of a truck making a round trip the distribution center to the store (2675 Geary) and back without stopping at another Whole Foods location. In all likelihood, each truck would be stopping at one or more Whole Foods stores within San Francisco.

MDVs, which are small passenger type vehicles, are likely to represent delivery trips made by specialty vendors from various locations, rather than from Whole Foods distribution centers. Therefore, the analysis assumed that this average trip length would be the same as for retail employees which is shown below and calculated in Table 5. Employee Trips.

Table 11. Vehicle Miles Traveled by Freight Vehicle Type

Item to be Estimated	Data	Source
	MDV	
# of Deliveries	5.7 trips (rounds to 6)	2001 Market Street (2021) [5]
Average trip length	21.6 miles (roundtrip)	Whole Foods provided origin/destination information; no MDVs in WF-provided data. [12] Average retail employee trip length based on TIM estimates (by TAZ), as shown below.
	LHDT1	
# of Deliveries	0 trips	2001 Market Street (2021) [5]
Average trip length	36.6 miles (roundtrip)	Whole Foods provided origin/destination information [12]; each trip assumed to be a round trip from origin to 2675 Geary and back
	LDT2	
# of Deliveries	7.8 trips (rounds to 8)	2001 Market Street (2021) [5]
Average trip length	101.6 miles (roundtrip)	Whole Foods provided origin/destination information[12]; each trip assumed to be a round trip from origin to 2675 Geary and back
	MHDT	
# of Deliveries	21.3 trips (rounds to 21)	2001 Market Street (2021) [5]
Average trip length	59.6 miles (roundtrip)	Whole Foods provided origin/destination information [12]; each trip assumed to be a round trip from origin to 2675 Geary and back
	HHDT	
# of Deliveries	8.7 trips (rounds to 9)	2001 Market Street (2021) [5]
Average trip length	117.6 miles (roundtrip)	Whole Foods provided origin/destination information [12]; each trip assumed to be a round trip from origin to 2675 Geary and back

ATTACHMENT A: DATA SOURCES

1. SF Travel Demand Tool

Data Source: *SF Travel Demand Tool*, San Francisco Planning Department and San Francisco County Transportation Authority. http://sftraveldemand.sfcta.org. Accessed May 24, 2022.

2. 1765 California Street (2019)

Data Source: *Transportation Coordination Memo, Record No. 2019-004110ENV.* Rachel Schuett, Transportation Planner, San Francisco Planning Department. May 4, 2020.

3. 1150 Ocean Avenue (2019)

Data Source: *Balboa Reservoir Draft Supplemental Environmental Impact Report*, San Francisco Planning Department, 2019. https://sfplanning.org/project/balboa-reservoir-and-community-advisory-committee-cac. Obtained May 24, 2022.

4. 1150 Ocean Avenue (2021)

Data Source: Whole Foods. Data request for 2675 Geary Boulevard. (2021)

5. 2001 Market Street (2021)

Data Source: Kittelson. 2675 Geary Boulevard. (2021) See description of data collection methodology in the Data Collection section in the main report.

6. 2001 Market Street (2017)

Data Source: Fehr & Peers. TIA Guidelines Update. (2017)

7. 2675 Geary Boulevard

Data Source: Planning Department. Transportation Coordination Memo for 2675 Geary Boulevard (Case No. 2019-004110ENV). (2020)

8. TIA Guidelines

Data Source: SF Transportation Impact Analysis Guidelines, San Francisco Planning Department https://default.sfplanning.org/publications_reports/TIA_Guidelines_NoApp.pdf. Accessed May 24, 2022.

9. San Francisco Travel Demand Update: Data Collection and Analysis

Data Source: San Francisco Planning Department. *San Francisco Travel Demand Update: Data Collection and Analysis*. June 29, 2018. Obtained from the planning department. Excerpt included as Attachment A-3.

10. Project sponsor-provided data on weekend vs weekday gross sales and transactions

Data Source: 2020-21 data on weekday and weekend average sales at Whole Foods locations in San Francisco. Obtained via email from Marija Reilly, September 9, 2021. Data included in Attachment A-1.

11. TIM Estimates by TAZ

Data Source: San Francisco Transportation Information Map, Version 9.1. San Francisco Planning Department, 2022. http://sfplanninggis.org/tim/. Accessed May 24, 2022.

12. Project sponsor-provided data on origins and destinations.

    Data Source: Whole Foods provided origin data of freight vehicles to 2675 Geary Blvd. Vehicle miles traveled was estimated based on the distance between addresses provided and 2675 Geary Blvd.

13. July 8, 2021, conversation with onsite staff

    Data Source: Per a July 8, 2021, phone conversation with onsite staff, Whole Foods suppliers use the loading dock along 14th Street to deliver groceries

Attachment A-1: Weekday versus Weekend Transaction Data

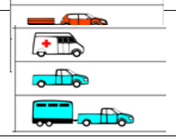
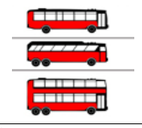
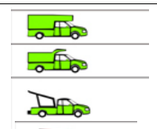
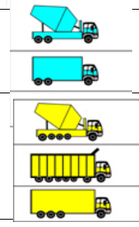
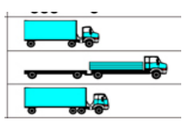
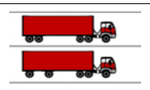
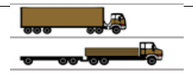
Table A1. Weekday and weekend average sales at Whole Foods locations in San Francisco

Location	Weekday avg sales	Weekend avg sales	PCF Diff weekend compared to weekday	WD Trxn Ct Avg	WE Trxn Ct Avg	PCT Diff weekend compared to weekday
Castro	$ 120,614	$ 146,270	+21%	2,308	2,493	+8%
Franklin	$ 128,855	$ 147,816	+15%	2,141	2,175	+2%
Haight	$ 65,722	$ 77,561	+18%	1,398	1,530	+9%
Noe Valley	$ 88,039	$ 107,350	+22%	1,802	1,899	+5%
Ocean Ave	$ 100,068	$ 120,526	+20%	1,843	1,982	+8%
Potrero Hill	$ 149,958	$ 184,819	+23%	2,500	2,635	+5%
Soma	$ 113,929	$ 127,742	+12%	2,023	2,050	+1%
San Francisco Metro	***$ 767,185***	***$ 912,084***	***+19%***	***14,015***	***14,764***	***+5%***

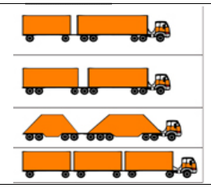
Attachment A-2: FHWA to EMFAC Vehicle Crosswalk

Table A2. FHWA to EMFAC Vehicle Crosswalk

Proposed FHWA to EMFAC crosswalk.
Cells in light green provide the mapping. Other cells provide supportive information.

FHWA Classification	FHWA Description	Representative Vehicle	Class Includes	Number of axles	Illustration	GVWR (approximate)	EPA Emissions Classification (approximate)	Associated EMFAC Vehicle / Code	EMFAC Description	EMFAC Truck / Non-Truck classification
1	Motorcycle	M	Motorcycles	2		-	-	MCY / MC	Motorcycles	Non-Trucks
2	Passenger Car	P	All cars cars with one-axle trailers cars with two-axle trailers	2, 3, or 4		< 6000 lb	Light Light Duty Trucks (<6000 lbs)	LDA / PC MDV / T3	Passenger cars Medium-Duty Trucks (GVWR 6000-8500 lbs)	Non-Trucks
3	Two-Axle, 4 Tire Single Unit	SU	pick-ups and vans pick-ups and vans with one- and two-axle trailers	2. 3. or 4		<10000 lb	Heavy Light Duty Trucks (6001 - 8500 lbs) Light Heavy Duty Engines (8501 - 19500 lbs)	LDT1 / T1 LDT2 / T2	Light-Duty Trucks (GVWR <6000 lbs. and ETW <= 3750 lbs) Light-Duty-Trucks (GVWR < 6000 lbs. and ETW 3751-5750 lbs)	Non-Trucks
4	Bus	BUS-12; BUS-14; CITY-BUS; S-BUS 11; S-BUS 12; A-BUS	two- and three-axle buses	2 or 3		19500 - 33000 lbs	Light Heavy Duty Engines (8501 - 19500 lbs)	SBUS / SB UBUS / UB OBUS / OB MH / MH	School Buses Urban buses Other buses Motor Homes	Non-Trucks
5	Two-Axle, 6 Tire Single Unit	SU-30	Two-axle trucks	2		10000 - 19,500 lbs		LHDT1 / T4 LHDT2 / T5 MHDT / T6	Light-Heavy-Duty Trucks (GVWR 8501-10000 lbs) Light-Heavy-Duty Trucks (GVWR 10001-14000 lbs) Medium Heavy-Duty Diesel …	Trucks
6	Three Axle Single Unit	SU-8 [SU-25]	Three-axle trucks Three-axle tractors without trailers	3		19500-26000 lb				
7	Four or More Axle Single Unit	WB-12 [WB-40]	Four-, five-, six- and seven-axle single-unit trucks	4 or more		>33000 lb	Medium Heavy Duty Engines (19501 - 33000 lbs)			
8	Four or Less Axle Single Unit	WB-12 [WB-40]	Two-axle trucks pulling one- and two-axle trailers Two-axle tractors pulling one- and two-axle trailers Three-axle tractors pulling one-axle trailers	3 or 4		>33000 lb				
9	Five Axle Single Trailer	*WB-15 [WB-50]*	Two-axle tractors pulling three-axle trailers Three-axle tractors pulling two-axle trailers	5		>33000 lb	Heavy Heavy Duty Engines Urban Bus (>33,001 lbs)	HHDT / T7	Heavy-Heavy Duty Diesel… Power Take Off	Trucks
10	Six or More Axle Single Trailer	WB-20 [WB-57 or WB-67]	Multiple configurations	6 or more		>33000 lb				
11	Five or Less Axle Multi Trailer	WB-20D [WB-67D]	Multiple configurations	4 or 5		>33000 lb				
12	Six Axle Multi Trailer	WB-30T	Multiple configurations	6		>33000 lb				

Proposed FHWA to EMFAC crosswalk.
Cells in light green provide the mapping. Other cells provide supportive information.

FHWA Classification	FHWA Description	Representative Vehicle	Class Includes	Number of axles	Illustration	GVWR (approximate)	EPA Emissions Classification (approximate)	Associated EMFAC Vehicle / Code	EMFAC Description	EMFAC Truck / Non-Truck classification
13	Seven or More Axle Multi Trailer	WB-33D [WB-109D]	Multiple configurations	7 or more		>33000 lb				

Resources:

Karner, Alex, et al. "Mitigating diesel truck impacts in environmental justice communities: Transportation planning and air quality in Barrio
Hallenbeck, Mark E., Olga I. Selezneva, and Rich Quinley. *Verification, refinement, and applicability of long-term pavement performance*
US Department of Energy Alternative Fuels Data Center website.

Attachment A-3: Excerpt from *San Francisco Travel Demand Update: Data Collection and Analysis*

Site Address	Land Use	Geography		Site Characteristics			Data Collection Dates		
		Super-district	Place Type	Building Size (ksf)	# of Dwelling Units	# of Hotel Rooms	Person Trip Video Counts	Intercept Surveys	Loading Time Lapse Data
345 Taylor Street	Hotel	1	Place Type 1	-	-	131	3/30/2017	5/26/2017	3/30/2017
1075 Sutter Street	Hotel	1	Place Type 1	-	-	177	3/30/2017	5/16/2017	3/30/2017
466 Bush Street	Hotel	1	Place Type 1	-	-	86	2/14/2017	11/8/2016	2/14/2017
524 Sutter Street	Hotel	1	Place Type 1	-	-	114	3/30/2017	11/8/2016	3/30/2017
535 Mission Street	Office	1	Place Type 1	354.000	-	-	-	11/10/2016	-
654 Mission Street	Office	1	Place Type 1	11.564	-	-	-	11/10/2016	-
300 Montgomery Street	Office	1	Place Type 1	211.947	-	-	3/30/2017	5/9/2017	-
417 Montgomery Street	Office	1	Place Type 1	94.537	-	-	3/30/2017	10/13/2016	-
221 Pine Street	Office	1	Place Type 1	26.808	-	-	3/30/2017	11/10/2016	3/30/2017
1000 Brannan Street	Office	1	Place Type 1	108.840	-	-	3/16/2017	5/9/2017	3/16/2017
50 Green Street	Office	1	Place Type 1	101.160	-	-	3/30/2017	10/13/2016	-
733 Front Street	Office	1	Place Type 1	9.268	-	-	3/30/2017	11/16/2016	3/30/2017
1190 Mission Street	Residential	1	Place Type 1	-	419	-	-	11/1/2016	-
255 Broadway	Residential	1	Place Type 1	-	61	-	2/14/2017	9/29/2016	2/14/2017
170 King Street	Residential	3	Place Type 1	-	202	-	-	4/19/2017	-
45 Lansing Street	Residential	1	Place Type 1	-	320	-	3/30/2017	5/10/2017	3/30/2017
2140 Polk Street	Retail	1	Place Type 1	4.996	-	-	3/30/2017	11/15/2016	3/30/2017
17 3rd Street	Retail	1	Place Type 1	13.333	-	-	4/6/2017	-	4/6/2017
26 4th Street	Retail	1	Place Type 1	15.689	-	-	4/6/2017	-	4/6/2017
225 Bush Street	Retail	1	Place Type 1	20.667	-	-	4/6/2017	-	4/6/2017
425 Market Street	Retail	1	Place Type 1	2.920	-	-	-	11/15/2016	-
100 California Street	Retail	1	Place Type 1	3.100	-	-	-	11/16/2016	-
768 Market Street	Retail	1	Place Type 1	3.457	-	-	-	11/15/2016	3/30/2017
928 Van Ness Avenue	Retail	1	Place Type 1	3.000	-	-	3/30/2017	-	-
2160 Market Street	Hotel	2	Place Type 2	-	-	64	3/23/2017	10/27/2016	3/23/2017
610 Fillmore Street	Hotel	2	Place Type 2	-	-	54	3/23/2017	10/18/2016	3/23/2017
1500 Sutter Street	Hotel	2	Place Type 2	-	-	83	4/4/2017	10/18/2016	4/4/2017
1901 Lombard Street	Hotel	2	Place Type 2	-	-	69	3/23/2017	5/16/2017	3/23/2017
2775 Van Ness Avenue	Hotel	2	Place Type 2	-	-	143	-	4/26/2017	-

Site Address	Land Use	Geography		Site Characteristics			Data Collection Dates		
		Super-district	Place Type	Building Size (ksf)	# of Dwelling Units	# of Hotel Rooms	Person Trip Video Counts	Intercept Surveys	Loading Time Lapse Data
1700 Owens Street	Office	3	Place Type 2	167.053	-	-	-	5/2/2017	-
455 Mission Bay Boulevard South	Office	3	Place Type 2	222.000	-	-	5/24/2017	10/25/2016	5/24/2017
500 Terry Francois Boulevard	Office	3	Place Type 2	319.279	-	-	-	5/3/2017	-
550 Terry Francois Boulevard	Office	3	Place Type 2	319.279	-	-	-	5/3/2017	-
1501 Mariposa Street	Office	3	Place Type 2	50.196	-	-	3/16/2017	-	3/16/2017
2333 Buchanan Street	Office	2	Place Type 2	73.151	-	-	-	4/27/2017	-
1808 Wedemeyer Street	Office	2	Place Type 2	154.756	-	-	3/23/2017	5/24/2017	-
1 Letterman Drive (Bldg C & D)	Office	2	Place Type 2	154.756	-	-	-	4/25/2017	-
1600 Market Street	Residential	2	Place Type 2	-	24	-	2/14/2017	5/17/2017	-
55 Page Street	Residential	2	Place Type 2	-	128	-	2/14/2017	5/10/2017	-
1998 Market Street	Residential	2	Place Type 2	-	115	-	2/14/2017	4/26/2017	-
2125 Bryant Street	Residential	3	Place Type 2	-	76	-	2/14/2017	5/23/2017	-
235 Berry Street	Residential	3	Place Type 2	-	111	-	2/14/2017	5/2/2017	2/14/2017
325 Berry Street	Residential	3	Place Type 2	-	110	-	-	5/4/2017	-
38 Dolores Street	Residential	3	Place Type 2	-	81	-	5/24/2017	5/23/2017	5/24/2017
2175 Market Street	Residential	3	Place Type 2	-	90	-	5/24/2017	5/16/2017	-
400 Duboce Avenue	Residential	2	Place Type 2	-	78	-	5/24/2017	4/12/2017	5/24/2017
2200 Sacramento Street	Residential	2	Place Type 2	-	127	-	3/30/2017	-	3/30/2017
2000 Broadway	Residential	2	Place Type 2	-	221	-	3/30/2017	-	3/30/2017
2200 Pacific Avenue	Residential	2	Place Type 2	-	65	-	3/30/2017	-	3/30/2017
2141 Chestnut Street	Retail	2	Place Type 2	14.421	-	-	2/14/2017	-	2/14/2017
2390 Market Street	Retail	2	Place Type 2	13.000	-	-	3/16/2017	-	-
3400 Cesar Chavez Street	Retail	3	Place Type 2	12.000	-	-	3/14/2017	4/13/2017	-
2001 Market Street	Retail	3	Place Type 2	23.751	-	-	5/24/2017	4/27/2017	5/24/2017
545 Valencia Street	Retail	3	Place Type 2	3.600	-	-	3/23/2017	10/12/2016	3/23/2017
2801 22nd Street	Retail	3	Place Type 2	4.410	-	-	3/23/2017	11/17/2016	-
2299 15th Street	Retail	2	Place Type 2	2.247	-	-	3/23/2017	11/2/2016	-
2076 Chestnut Street	Retail	2	Place Type 2	2.250	-	-	3/30/2017	5/24/2017	-
489 Castro Street	Retail	3	Place Type 2	2.395	-	-	3/16/2017	4/27/2017	-

Site Address	Land Use	Geography		Site Characteristics			Data Collection Dates		
		Super-district	Place Type	Building Size (ksf)	# of Dwelling Units	# of Hotel Rooms	Person Trip Video Counts	Intercept Surveys	Loading Time Lapse Data
735 7th Avenue	Retail	2	Place Type 2	27.725	-	-	3/14/2017	11/3/2016	3/14/2017
5843 Geary Boulevard	Retail	2	Place Type 2	6.500	-	-	3/14/2017	10/27/2016	3/14/2017
2159 Chestnut Street	Retail	2	Place Type 2	9.452	-	-	3/23/2017	-	3/23/2017
2654 Mission Street	Retail	3	Place Type 2	3.746	-	-	3/14/2017	10/25/2016	-
3100 Geary Boulevard	Retail	2	Place Type 2	7.690	-	-	3/23/2017	-	-
1234 Great Highway	Hotel	4	Place Type 3	-	-	20	-	5/18/2017	-
2600 Sloat Boulevard	Hotel	4	Place Type 3	-	-	33	5/24/2017	5/18/2017	-
5 Thomas Mellon Circle	Office	3	Place Type 3	100.393	-	-	-	5/24/2017	-
150 Executive Park Blvd	Office	3	Place Type 3	105.000	-	-	3/14/2017	5/4/2017	3/14/2017
250 Executive Park Blvd	Office	3	Place Type 3	114.089	-	-	3/14/2017	5/3/2017	3/14/2017
1290 20th Avenue	Residential	4	Place Type 3	-	42	-	3/23/2017	-	-
1150 Ocean Avenue	Residential	3	Place Type 3	-	173	-	5/17/2017	-	5/17/2017
55 Chumasero Drive	Residential	4	Place Type 3	-	152	-	5/24/2017	5/11/2017	5/24/2017
1501 Lincoln Way	Residential	4	Place Type 3	-	35	-	5/24/2017	-	-
2770, 2780, 2790 19th Avenue	Residential	4	Place Type 3	-	84	-	3/14/2017	-	-
100 Font Boulevard	Residential	4	Place Type 3	-	458	-	3/14/2017	5/11/2017	3/14/2017
1630 Ocean Avenue	Retail	3	Place Type 3	11.142	-	-	3/14/2017	4/18/2017	3/14/2017
3001 Taraval Street	Retail	4	Place Type 3	10.750	-	-	3/14/2017	10/21/2016	-
2550 Ocean Avenue	Retail	4	Place Type 3	7.072	-	-	3/23/2017	11/9/2016	-
1200 Irving Street	Retail	4	Place Type 3	36.999	-	-	5/24/2017	4/25/2017	5/24/2017
2350 Noriega Street	Retail	4	Place Type 3	36.120	-	-	3/14/2017	-	3/14/2017
265 Winston Drive	Retail	4	Place Type 3	15.000	-	-	3/14/2017	11/9/2016	3/14/2017
2025 Irving Street	Retail	4	Place Type 3	2.495	-	-	-	4/11/2017	-
4621 Mission Street	Retail	3	Place Type 3	3.757	-	-	3/14/2017	5/17/2017	-

ATTACHMENT B: DATA TABLES

Table B-1. Data Sources + Store Amenities

Source/ Project (Year)	Location	Store Size (gross SF)	Place Type	Store Amenities						
				Grocery Delivery and Pickup	Café Seating	Sandwich counter or taco bar	Coffee Bar	Wine Bar	Amazon Returns [1]	Amazon Hub – Locker [2]
Fehr & Peers TIA Guidelines Update (2017)[6]	2001 Market Street	33,030	2	Y	Y	Y	Y			
Kittelson 2675 Geary Boulevard (2021)[5]	2001 Market Street	33,030	2	Y	Y	Y	Y		Y	Y
Whole Foods Data request for 1600 Jackson Street (2019)[2]	1765 California Street	28,000	2	Y	Y	Y			Y	
Kittelson Balboa Reservoir EIR (2019)[3]	1150 Ocean Avenue	26,623	3	Y	Y	Y		Y	Y	
Whole Foods Data request for 2675 Geary Boulevard (2021)[4]	1150 Ocean Avenue	26,623	3	Y	Y	Y		Y	Y	
-n/a-	2675 Geary Blvd (proposed project)	54,290	2	Y	Y	Y	Y			

Notes:
[1] Amazon Returns. Amazon Returns allow customers to return Amazon.com order in-store to be mailed rather than mailing the packages themselves.
[2] Amazon Hub – Lockers+. Amazon Hub Lockers are secure lockers located within Whole Foods stores that allow for personal package pickup of Amazon.com order in-store (rather than home delivery).

Data was collected from the following Whole Foods locations at a time when these locations included Amazon services (Amazon Returns and/or Amazon Hub):

- 2001 Market Street (in 2021, but not in 2017)
- 1765 California Street
- 1150 Ocean Avenue

Given that these locations included Amazon services and these Amazon services are not proposed for 2675 Geary Boulevard, the data collected at these locations conservatively overestimates trip generation for the proposed project.

Table B-2. Available Data by Source

Source/Project (Year)	Location	Place Type	Store Size (gross square feet)	Trip Generation Information			Freight Loading Information				Passenger Loading Information		
				Daily Trips	Daily Vehicle Trips	PM Peak Hour Vehicle Trips	Daily Trips	Peak Hour Trips	Fleet Mix for Whole Foods	Average event durations	Daily	Temporal Distribution	Average event durations
Fehr & Peers TIA Guidelines Update (2017)	2001 Market Street	2	33,030	Y	Y								
Kittelson 2675 Geary Boulevard (2021)	2001 Market Street	2	33,030	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Whole Foods Data request for 1600 Jackson Street (2019)	1765 California Street	2	28,000				Y		Y				
Kittelson Balboa Reservoir EIR (2019)	1150 Ocean Avenue	3	26,623				Y		Y	Y			
Whole Foods Data request for 2675 Geary Boulevard (2021)	1150 Ocean Avenue	3	26,623				Y	Y	Y	Y			
Whole Foods Data request for 2675 Geary Boulevard (2021)	Various	Various	Various	Y	Y								
TIA Guidelines	2675 Geary Blvd (proposed project)	2	54,290	Y	Y	Y	Y	Y		Y			

Table B-3. Trip Generation Data

Source/Project (Year)	Location	Place Type	Store Size (SF)	Daily Person Trips		PM peak hour trips		Passenger Loading PM peak hour	
				# of Trips	Rate (per 1,000 SF)	# of Trips	Rate (per 1,000 SF)	Daily	PM Peak Hour
Fehr & Peers TIA Guidelines Update (2017)	2001 Market Street	2	33,030	9,464	286.53	n/a	n/a	n/a	n/a
Kittelson 2675 Geary Boulevard (2021)	2001 Market Street	2	33,030	5,723	173.27	638	19.3	77 (included in daily trip counts)	8.5 (included in daily trip counts)
Whole Foods Data request for 1600 Jackson Street (2019)	1765 California Street	2	28,000	n/a	n/a	n/a	n/a	n/a	n/a
Kittelson Balboa Reservoir EIR (2019)	1150 Ocean Avenue	3	26,623	n/a	n/a	n/a	n/a	n/a	n/a
Whole Foods Data request for 2675 Geary Boulevard (2021)	1150 Ocean Avenue	3	26,623	n/a	n/a	n/a	n/a	n/a	n/a
Planning Department Transportation Coordination Memo (2020)	2675 Geary Blvd (proposed project)	2	54,290 [1]	17,491	322	1,329	24.5		
TIA Guidelines (2019)	2675 Geary Blvd (proposed project)	2	54,290	16,124	297	1,178	21.7		

Notes:

[1] In the Transportation Coordination Memo (2020) the trip generation was calculated based on three different land uses: grocery store (49,780 square feet), restaurant (3,320 square feet) and coffee shop (1,190 square feet).

Table B-4. Freight Loading Data

Source/Project (Year)	Location	Place Type	Store Size (Square Feet)	Daily Trips	Daily Trips per 1,000 square feet	Peak Hour Trips	Delivery Type		Average event durations (minutes:seconds)		Fleet Mix	
							Loading Dock	Hand Truck	Loading Dock	Hand Truck	Vehicle Type	Refrigerated vs. Non-Refrigerated
Fehr & Peers TIA Guidelines Update (2017)	2001 Market Street	2	33,030									
Kittelson 2675 Geary Boulevard (2021)	2001 Market Street	2	33,030	31.5	0.95	5.5 events in peak hour	41%	59%	20:49	23:40	**MDV**[2] – 13% **LHDT1** – 0% **LDT2** – 18% **MHDT** – 49% **HHDT** – 20%	Refrigerated Vehicles - 25% Non-Refrigerated vehicles – 75%
Whole Foods Data request for 1600 Jackson Street (2019)	1765 California Street	2	28,000	28 [1]	1.00				35:21			
Kittelson Balboa Reservoir EIR (2019)	1150 Ocean Avenue	3	26,623	23	0.86				32:15		<30 foot – 33% 30-48 foot – 4% 65 foot – 7% Other – 56%	
Whole Foods Data request for 2675 Geary Boulevard (2021)	1150 Ocean Avenue	3	26,623	20.2	0.76		23 (50%)	23 (50%)			**MDV** – 0% **LHDT1** – 13% **LDT1** – 30% **MHDT** – 48% **HHDT** – 9%	Refrigerated Vehicles - 26% Non-Refrigerated vehicles – 74%
Whole Foods Data request for 2675 Geary Boulevard (2021)	Various	Various	Various									
Planning Department Transportation Coordination Memo (2020)	2675 Geary Blvd (proposed project)	2	54,290	28 [2]	0.52				34:12		30-48 foot –14% 65 foot – 14% Other – 72%	

Notes:

[1] Kittelson used the number from 1765 California Street, so 23 deliveries on an average day and 28 on a maximum delivery day.

[2] This number was based on the deliveries to the 1765 California Street store which include 23 deliveries on an average day and 28 on a maximum delivery day.

APPENDIX E

Noise Analysis Supporting Information

- Appendix E.1, 2675 Geary Boulevard – Whole Foods Market Noise Measurement Results and Recommendations (May 27, 2022, revised September 28, 2022)
- Appendix E.2, 2675 Geary Boulevard – Whole Foods Market Noise Measurement Results and Recommendations – Level 4 Measurements
- Appendix E.3, 2675 Geary Boulevard – Whole Foods Market Cooling Tower Alternatives, Noise Analysis Results and Recommendations

APPENDIX E.1

2675 Geary Boulevard – Whole Foods Market Noise Measurement Results and Recommendations

27 May 2022 (Revised 28 September 2022)

Rachel Schuett
San Francisco Planning
49 South Van Ness Avenue, Suite 1400
San Francisco, CA 94103
rachel.schuett@sfgov.org

Subject: 2675 Geary Boulevard – Whole Foods Market
Noise Measurement Results and Recommendations
Salter Project 21-0548

Dear Rachel:

We visited the site on 25 January 2022 to conduct noise measurements of existing mechanical equipment at the rooftop penthouse. We also completed an analysis of noise generated by the new mechanical equipment based on the drawings and noise data we have received. This letter summarizes our measurement results and calculations, as well as presents recommendations to reduce noise.

CRITERIA

San Francisco Police Code Article 29 Noise Ordinance

The City and County of San Francisco Police Code includes the following noise limits:

Section 2909(b) Commercial and Industrial Property Noise Limits

No person shall produce or allow to be produced by any machine, or device, music or entertainment or any combination of same, on commercial or industrial property over which the person has ownership or control, a noise level more than eight dBA[1] above the local ambient at any point outside of the property plane.

[1] A-Weighted Sound Level – The A-weighted sound pressure level, expressed in decibels (dB). Sometimes the unit of sound level is written as dBA. A weighting is a standard weighting that accounts for the sensitivity of human hearing to the range of audible frequencies. People perceive a 10 dB increase in sound level to be twice as loud.

Per San Francisco Department of Public Health guidelines[2], the ambient noise level can be conservatively represented by the measured L_{90}[3] noise level under most conditions.

Section 2909(d) Fixed Residential Interior Noise Limits

No fixed noise source may cause the noise level measured inside any sleeping or living room in any dwelling unit located on residential property to exceed 45 dBA between the hours of 10:00 p.m. to 7:00 a.m. or 55 dBA between the hours of 7:00 a.m. to 10:00 p.m. with windows open except where building ventilation is achieved through mechanical systems that allow windows to remain closed.

San Francisco General Plan

The City and County of San Francisco General Plan includes land use compatibility standards for community noise. For the land use category of "school classrooms, libraries, churches, hospitals, nursing homes, etc.," noise levels of L_{dn}[4] 62.5 dBA or lower are considered "satisfactory, with no special noise insulation requirements."

Per Environmental Science Associates, we understand that the L_{dn} 62.5 dBA standard is to be applied at the outdoor childcare facility adjacent to the new project equipment[5]. We understand that the childcare facility only operates during daytime hours (7:00 a.m. to 10:00 p.m.). Therefore, the standard can be defined as 62.5 dBA at the childcare facility's outdoor area.

EXISTING NOISE ENVIRONMENT

Property Line Noise Levels

We conducted long-term noise measurements at locations surrounding the project. Figure 1 shows the measurement locations (LT-1 through -3). Traffic is the primary noise source at these locations. Noise from the existing mechanical equipment serving the project space does not contribute to the noise environment at these locations.

---

2 San Francisco Police Code Article 29: Regulation of Noise, Guidelines for Noise Control Ordinance Monitoring and Enforcement, December 2014 Guidance

3 L_n – The sound level exceeded for a stated percentage (n) of a specified measurement period as described in ASTM E1686. L_{10}, L_{50}, and L_{90} are the levels exceeded 10, 50, and 90 percent of the time, respectively.

4 DNL (Day-Night Average Sound Level) – A descriptor for a 24-hour A-weighted average noise level. DNL accounts for the increased acoustical sensitivity of people to noise during the nighttime hours. DNL penalizes sound levels by 10 dB during the hours from 10 PM to 7 AM. For practical purposes, the DNL and CNEL are usually interchangeable. DNL is sometimes written as L_{dn}.

5 The "satisfactory" land use compatibility standard for school classrooms, libraries, churches, hospitals, nursing homes, etc. of L_{dn} 62.5 dBA is more restrictive than the "satisfactory" standard for playgrounds and parks of L_{dn} 67.5 dBA.

The measured noise levels at the long-term measurement locations are summarized in **Table 1**. Measurement data is included in **Appendix A**.

Table 1: Measured Noise Levels at Long-Term Measurement Locations

Measurement Location	Location Description	Measured Noise Levels (dBA)			
		Minimum L_{90} (1 hr.)	DNL	Average Daytime L_{eq} (1 hr.)	Average Nighttime L_{eq} (1 hr.)
LT-1	Geary Blvd. / Presidio Ave.	47	71	69	61
LT-2	Masonic Ave.	42	70	69	60
LT-3	O'Farrell St. / Anzavista Ave.	46	63	61	52

The measured minimum L_{90} noise levels are 47 dBA at LT-1 (near the north property line), 42 dBA at LT-2 (near the west property line), and 46 dBA at LT-3 (near the south property line). Per the San Francisco Police Code, ambient noise levels are to be considered no less than 45 dBA at locations other than residential interiors. The measured ambient noise levels are expected to be equivalent to the ambient noise levels at the noted nearby property planes.

The ambient noise levels are defined as 47 dBA at the north property plane (near LT-1), 45 dBA at the west property plane (near LT-2), and 46 dBA at the south property plane (near LT-3). The commercial and industrial property noise limits are 8 dBA above the ambient noise levels. Therefore, the noise limits are defined as **55 dBA** at the north property plane, **53 dBA** at the west property plane, and **54 dBA** at the south property plane.

Childcare Facility Noise Levels

To quantify the noise environment near the existing mechanical equipment, we conducted measurements of mechanical equipment noise at the childcare facility's rooftop outdoor space. **Figure 2** shows the measured noise levels generated by the existing mechanical equipment. This includes the equipment serving the former tenant at the project space as well as equipment serving other current tenant spaces (i.e., not related to the project). A set of exterior louvers at the penthouse wall, as shown in Figure 2, represents the primary transmission path for the mechanical noise.

Existing mechanical equipment noise ranges between 51 and 57 dBA at the childcare facility's outdoor area, depending on the specific location (see Figure 2). The overall existing equipment noise is clearly audible. The equipment specific to the former tenant at the project space (Best Buy) contributes somewhat to the overall noise levels.

The existing equipment noise levels, at 51 to 57 dBA, do not likely interfere with face-to-face speech communication, which occurs at approximately 60 dBA and above.

FUTURE EQUIPMENT NOISE

Based on the new mechanical equipment noise data (received 8 December 2021), mechanical plans (received 22 February 2022), and subsequent information provided by the Planning Department (email from 22 August 2022) regarding the height of the cooling tower base, we calculated the combined equipment noise levels at various locations. Our calculations are included in Appendix B.

San Francisco Police Code Daytime and Nighttime Noise Limits

We calculate noise from the new project mechanical equipment to be 66 dBA at the north property plane, which would exceed the Police Code Section 2909(b) commercial and industrial property noise limit of 55 dBA at the north property plane.

The loudest new equipment is the cooling tower (CT-1), which is calculated to be 66 dBA at the north property plane. Noise from the OSA units is calculated to be 57 dBA at the property plane. Therefore, noise reduction is needed for the cooling tower and the OSA units to meet the Police Code Section 2909(b) commercial and industrial property noise limit at the north property plane. All other equipment noise meets the north property plane noise limit of 55 dBA.

New project mechanical equipment is calculated to be no higher than 48 dBA at the west property plane and ~~51~~ 52 dBA at the south property plane. These calculated levels meet the Police Code Section 2909(b) commercial and industrial property noise limits at those property planes.

Noise from the new project mechanical equipment is calculated to be 41 dBA inside the nearest residence (the building at 2580 – 2590 Geary Boulevard), assuming open windows. This calculated level meets the Police Code Section 2909(d) residential interior daytime and nighttime noise limits.

Childcare Facility Noise Levels

We calculate noise from the new project equipment to be as high as ~~70~~ 71 dBA at the childcare facility's outdoor area. This level exceeds the General Plan land use compatibility standard for "school classrooms, libraries, churches, hospitals, nursing homes, etc." of 62.5 dBA.

Noise levels are calculated to be highest at the portion of the outdoor area nearest the new equipment (i.e., the northeast corner of the childcare facility's outdoor area). Compared to the existing mechanical equipment noise, the new equipment noise could be perceived as more than twice as loud.

Noise from the cooling tower is calculated to be ~~70~~ 71 dBA on its own at the outdoor space. Noise from other new equipment, including the packaged units OSAs-1 and -2, the refrigeration rack, and several exhaust fans, is calculated to be 57 dBA, which meets the 62.5 dBA standard. Therefore, noise reduction is needed only for the cooling tower to meet the standard at the childcare facility's outdoor area.

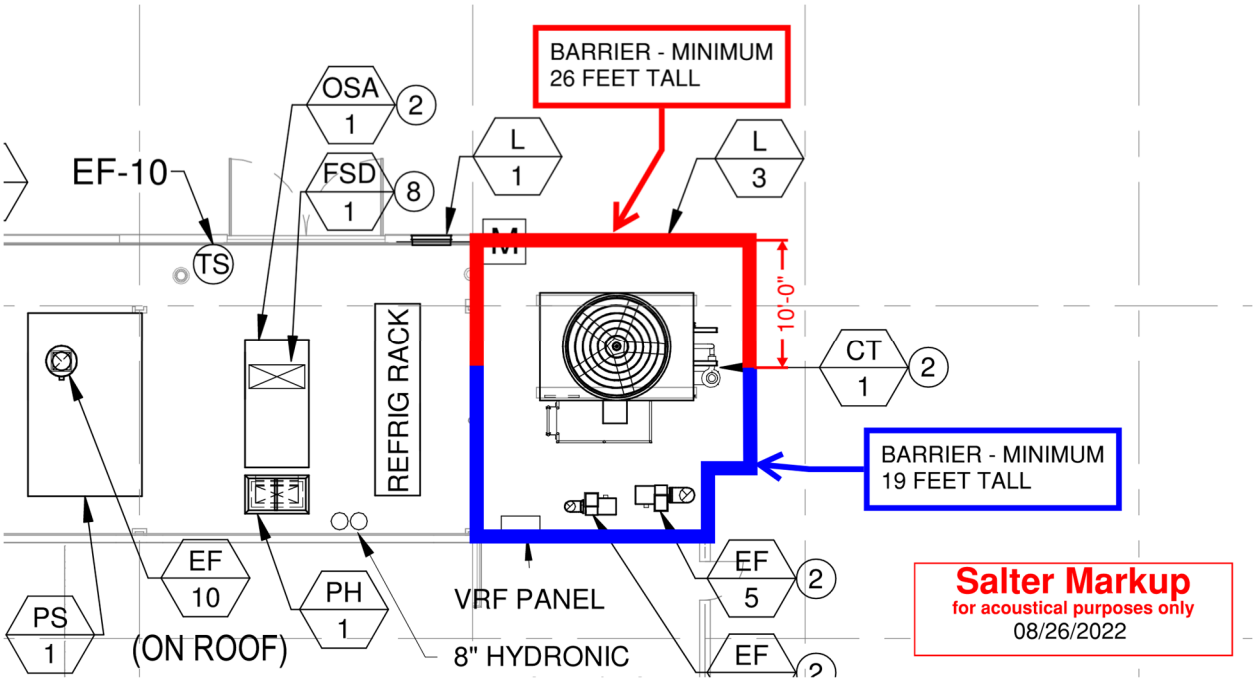
RECOMMENDATIONS

Recommendations for reducing noise from the new project equipment are as follows.

1. We understand that a new enclosure is planned at the mechanical equipment area. The barrier is approximately 10 feet tall as currently designed. We recommend that a taller barrier be provided.

   To meet the Police Code Section 2909(b) commercial and industrial property noise limit and the 62.5 dBA standard at the outdoor area, the barrier surrounding the cooling tower would need to be as shown in **Figure 3**.

Figure 3: Cooling Tower Barrier



The barrier would need to be ~~24~~ 26 feet tall at the section north of the equipment and would extend at least 10 feet from the northwest and northeast corners to the south (as shown in red). The remaining barrier sections (e.g., south of the equipment) would be ~~17~~ 19 feet tall (as shown in blue). This is based on the overall height of the cooling tower (including its base), which is approximately ~~21~~ 23 feet. To the west of the cooling tower, the barrier could extend up from the roof of the existing penthouse to provide total barrier heights that meet those described above.

The barriers should have a weight of at least 3 psf and should be solid without any gaps. A sound absorptive material should be provided at the inside surface of the barriers, facing the mechanical equipment. Typically, exterior-rated insulation is provided behind a perforated metal face.

2. We recommend that the louvers tagged as L-3 (near the cooling tower) be relocated to the section of the enclosure east of the cooling tower. Acoustical louvers are recommended for L-3 to meet the Police Code Section 2909(b) noise limit. The louvers should meet the minimum insertion loss shown below. This should be coordinated with the project mechanical engineer.

	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz
Acoustical Louver Minimum Insertion Loss (dB)	-	8	7	11	13	10	8

3. Reduction of OSA unit noise is also needed to meet the Police Code Section 2909(b) noise limit. We recommend providing five feet of internally lined duct with 1-inch-thick glass fiber duct liner between each of the OSA units and the outside air openings on the penthouse roof. This should be coordinated with the project mechanical engineer.

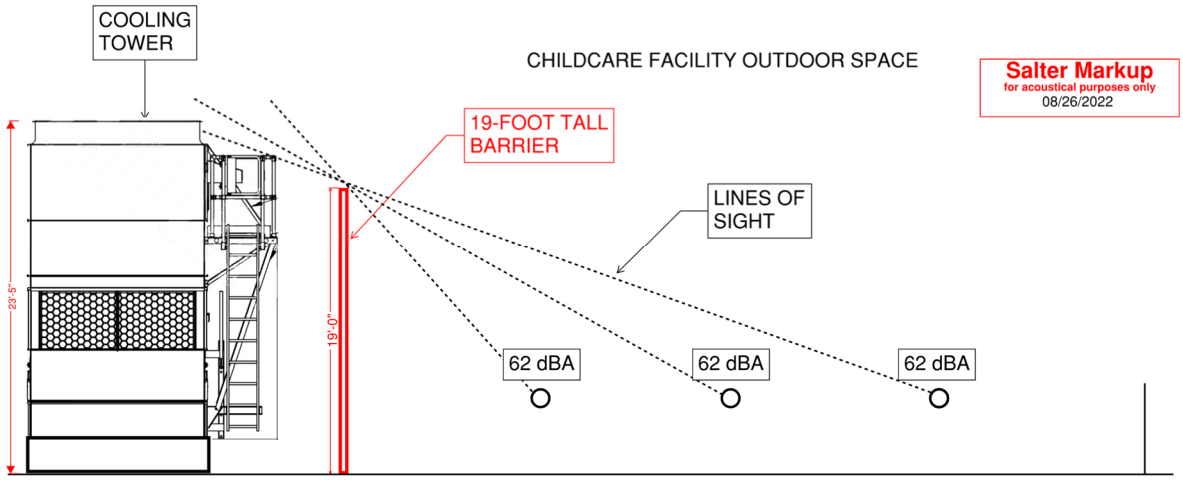
   a. As an alternative to internally lined duct, duct silencers could be provided at the same duct segments described above. Each of the silencers would need to meet the minimum insertion loss shown below.

	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz
Silencer Minimum Insertion Loss (dB)	-	-	6	6	12	10	6

With the noise reduction measures described above, we calculate noise from the cooling tower, OSA units, and all other new equipment to meet the 55 dBA noise limit at the north property plane, per Police Code Section 2909(b).

Noise from all new project equipment, with the recommended noise reduction measures, is also calculated to be ~~62.5~~ 62 dBA at the childcare facility's outdoor space. **Figure 4** shows the calculated noise levels at the outdoor space.

Figure 4: Cooling Tower Barrier and Calculated Noise Levels at Outdoor Space



At areas within the childcare facility outdoor space near the cooling tower, the ~~17~~ 19-foot-tall barrier completely blocks line-of-sight to the equipment (as shown in Figure 4). The barrier reduces cooling tower noise alone by ~~10~~ 11 dB at this location. The combined noise level is calculated to be ~~62.5~~ 62 dBA.

At areas of the outdoor space farther away from the cooling tower, the barrier partially blocks line-of-sight, reducing cooling tower noise by 5 dB. With the noise reduction provided by the barrier and the increased distance from the equipment, the combined noise level at these areas is 62 dBA.

* * *

This concludes our noise measurement results and recommendations letter. Please contact us with any questions.

Best,

SALTER

Nathan Sistek
Senior Consultant

Alex Salter, PE
Vice President

Enclosure

Salter

San Francisco

San Jose

Los Angeles

Honolulu

Seattle

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2675 GEARY BOULEVARD WHOLE FOODS
LONG-TERM NOISE MEASUREMENT LOCATIONS

FIGURE 1

Salter # 21-0548

NNS/AKS
05.27.22

Salter

San Francisco

San Jose

Los Angeles

Honolulu

Seattle

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2675 GEARY BOULEVARD WHOLE FOODS
EXISTING MECHANICAL NOISE MEASUREMENTS

FIGURE 2

Salter #	NNS/AKS
21–0548	05.27.22

APPENDIX A

NOISE MEASUREMENT DATA

Measurement Information

Filename: Auto_0001.rnh
Proj No.: 21-0548
Proj. Name 2675 Geary Whole Foods
Site No.: 1
Location: Presidio Ave
Height: 12 above grade
Distance: 25 from Presidio Ave
Distance: 35 from Geary (Upper Lvl WB)
Maj. Noise Sources: Traffic, Bus stop next to meter
Pre Cal:
Post Cal:
Weather: Clear
Notes:
Engr.: NNS

Meter Settings

Meter Name	P-1
Meter Type	NL-52S
freq. Weighting	A
Time Weighting	Slow
Ln Calc Type	Leq_1s
Wind Screen Correcti	Off
Diffuse Field	Off
Parsed Exceedance Le	90
Meter Exceedance Le	90

Data contained in this spreadsheet is parsed from the Lp File

EXCEEDANCE REPORT

Address	Date	Time	Dur	Leq	SEL	Max 1s Leq	Ov
1	25-Jan	11:57:05	0:00:07	86.3	94.8	93.4	0
2	25-Jan	12:19:14	0:00:07	82.8	91.3	90.3	0
3	25-Jan	12:21:44	0:00:09	89.2	98.8	95.4	0
4	25-Jan	12:53:58	0:00:07	86.4	94.8	93.6	0
5	25-Jan	13:01:28	0:00:08	88.5	97.5	93.7	0
6	25-Jan	13:18:20	0:00:11	92.7	103.1	98.2	0
7	25-Jan	14:10:37	0:00:07	85	93.4	90.6	0
8	25-Jan	15:49:15	0:00:07	86.4	94.8	91.2	0
9	25-Jan	17:20:14	0:00:07	85.4	93.9	90.4	0
10	25-Jan	17:32:15	0:00:07	85.8	94.3	91.4	0
11	25-Jan	18:23:16	0:00:10	90.3	100.3	95.9	0
12	25-Jan	22:41:05	0:00:07	82.9	91.3	90.2	0
13	25-Jan	23:31:14	0:00:07	85.5	93.9	90.5	0
14	26-Jan	7:23:57	0:00:07	83.8	92.3	90.2	0
15	26-Jan	7:49:07	0:00:08	88.3	97.4	94.3	0
16	26-Jan	8:04:51	0:00:08	87.2	96.3	92	0
17	26-Jan	9:21:01	0:00:08	95	104.1	102.2	0
18	26-Jan	12:15:12	0:00:07	83	91.5	90	0
19	26-Jan	12:20:06	0:00:08	93.3	102.3	101.7	0
20	26-Jan	12:47:56	0:00:08	86.8	95.8	92.9	0
21	26-Jan	13:04:55	0:00:07	82.6	91.1	90.3	0

Average Daytime Leq (7 am - 10 pm)

Minimum L90, 1 hr.

68.9

Average Nighttime Leq (10 pm - 7 am)

46.5

Average L90, 1 hr. (Arithmetic)

60.6

55.8

INTERVAL REPORT

Address	Date	Time	Duration	Leq	L1	L10	L33	L50	L90	Sub Leq	Excs	Ov	DNL
1	25-Jan-22	10:00:00	1:00:00	67.8	79.7	69.5	65.4	63.9	58.5	0	0	0	70.7
2	25-Jan-22	11:00:00	1:00:00	69.6	80.4	70.7	65.6	63.8	58.6	0	1	0	70.7
3	25-Jan-22	12:00:00	1:00:00	70	80.5	70	65.3	63.7	59	0	3	0	70.7
4	25-Jan-22	13:00:00	1:00:00	71.5	81.2	69.8	65.3	63.8	59.2	0	2	0	70.7
5	25-Jan-22	14:00:00	1:00:00	67.9	78.9	69.2	65.7	64.4	60.3	0	1	0	70.6
6	25-Jan-22	15:00:00	1:00:00	69.5	80.4	70.2	66.4	65.2	61.8	0	1	0	70.6
7	25-Jan-22	16:00:00	1:00:00	68.9	80	69.9	66.7	65.5	62.1	0	0	0	70.6
8	25-Jan-22	17:00:00	1:00:00	69.2	80.2	70	66.7	65.5	61.8	0	2	0	
9	25-Jan-22	18:00:00	1:00:00	69.3	79.9	68.9	65.3	64	59.7	0	1	0	
10	25-Jan-22	19:00:00	1:00:00	65.7	77.5	67.1	63.7	62.2	57.6	0	0	0	
11	25-Jan-22	20:00:00	1:00:00	65.6	78	66.4	61.9	60.2	55.4	0	0	0	
12	25-Jan-22	21:00:00	1:00:00	65.3	78.2	66	61.3	59.2	53.2	0	0	0	
13	25-Jan-22	22:00:00	1:00:00	63.2	74.6	63.9	59.3	56.7	50.4	0	1	0	
14	25-Jan-22	23:00:00	1:00:00	62.4	71.2	61.9	56.7	53.9	48.6	0	1	0	
15	26-Jan-22	0:00:00	1:00:00	60.8	71.7	59.9	54	51.8	47.6	0	0	0	
16	26-Jan-22	1:00:00	1:00:00	54.2	64.8	56.3	49.6	47.8	46.5	0	0	0	
17	26-Jan-22	2:00:00	1:00:00	55.5	67.9	56.4	50.5	48.6	46.7	0	0	0	
18	26-Jan-22	3:00:00	1:00:00	58.7	70.2	58.2	51.3	49.1	47	0	0	0	
19	26-Jan-22	4:00:00	1:00:00	58.8	70.6	58.5	51.6	49.4	47	0	0	0	
20	26-Jan-22	5:00:00	1:00:00	63.9	76.5	64.4	57.7	54.5	48.3	0	0	0	
21	26-Jan-22	6:00:00	1:00:00	67.7	80.5	68.2	62.5	60	53	0	0	0	
22	26-Jan-22	7:00:00	1:00:00	69.5	80.8	70.1	65.5	63.5	56.7	0	2	0	
23	26-Jan-22	8:00:00	1:00:00	70.4	81	71.2	67.3	65.9	60.6	0	1	0	
24	26-Jan-22	9:00:00	1:00:00	71.9	79.9	71.3	66.6	65.1	60	0	1	0	
25	26-Jan-22	10:00:00	1:00:00	68.9	80	70.5	65.7	64.2	59.2	0	0	0	
26	26-Jan-22	11:00:00	1:00:00	69.7	82.9	70.7	66.1	64.5	59.8	0	0	0	
27	26-Jan-22	12:00:00	1:00:00	71.2	80.4	70	65.7	64.2	59.3	0	3	0	
28	26-Jan-22	13:00:00	1:00:00	68.3	80.3	69.4	65.7	64	59.2	0	1	0	
29	26-Jan-22	14:00:00	1:00:00	68	79.1	69.7	65.7	64.4	60.1	0	0	0	
30	26-Jan-22	15:00:00	0:11:37	69.7	81.3	70.2	66.1	64.7	60.2	0	0	0	

Measurement Information

Filename: Auto_0001.rnh
Proj No.: 21-0548
Proj. Name 2675 Geary Whole Foods
Site No.: 2
Location: Masonic Ave
Height: 12 above grade
Distance: 55 from Masonic Ave (Center)
Distance: 185 from Geary (Upper Lvl EB)
Maj. Noise Sources: Traffic
Pre Cal:
Post Cal:
Weather: Clear
Notes:
Engr.: NNS

Meter Settings

Meter Name	V-5
Meter Type	NL-52S
freq. Weighting	A
Time Weighting	Slow
Ln Calc Type	Leq_1s
Wind Screen Correcti	Off
Diffuse Field	Off
Parsed Exceedance Le	90
Meter Exceedance Le	90

Data contained in this spreadsheet is parsed from the Lp File

EXCEEDANCE REPORT

Address	Date	Time	Dur	Leq	SEL	Max 1s Leq	Ov
1	25-Jan	10:40:48	0:00:09	86.8	96.3	91.1	0
2	25-Jan	13:18:33	0:00:08	94.4	103.5	100.6	0
3	25-Jan	15:22:06	0:00:07	84.6	93.1	90.1	0
4	25-Jan	16:43:43	0:00:10	88.2	98.2	95.1	0
5	25-Jan	18:45:58	0:00:08	92.9	101.9	100.7	0
6	25-Jan	21:31:54	0:00:07	87	95.4	91.2	0
7	26-Jan	9:20:23	0:00:07	85.8	94.3	90	0
8	26-Jan	9:21:23	0:00:13	92.3	103.4	97.4	0
9	26-Jan	12:45:42	0:00:19	92.2	105	97.2	0
10	26-Jan	13:18:08	0:00:07	89	97.5	95.7	0

Average Daytime Leq (7 am - 10 pm)
68.7

Minimum L90, 1 hr.
41.6

Average Nighttime Leq (10 pm - 7 am)
60.0

Average L90, 1 hr. (Arithmetic)
54.9

INTERVAL REPORT

Address	Date	Time	Duration	Leq	L1	L10	L33	L50	L90	Sub Leq	Excs	Ov	DNL
1	25-Jan-22	10:00:00	1:00:00	69.4	78.6	71.8	67.5	64.9	59	0	1	0	70.1
2	25-Jan-22	11:00:00	1:00:00	67.7	75.6	71	67.6	65.1	59.4	0	0	0	70.0
3	25-Jan-22	12:00:00	1:00:00	68.2	76.8	71.6	67.7	65.4	59.7	0	0	0	70.0
4	25-Jan-22	13:00:00	1:00:00	70.6	75.9	70.8	66.7	64.3	58.6	0	1	0	70.2
5	25-Jan-22	14:00:00	1:00:00	68.3	75.4	71	67.7	65.3	59.5	0	0	0	70.1
6	25-Jan-22	15:00:00	1:00:00	68.6	76.3	71.3	68.1	65.7	59.7	0	1	0	70.1
7	25-Jan-22	16:00:00	1:00:00	69.4	76.1	71.5	68.4	66.1	59.6	0	1	0	70.1

8	25-Jan-22	17:00:00	1:00:00	68.3	76.9	71.6	68.1	65.9	59.7	0	0	0
9	25-Jan-22	18:00:00	1:00:00	70.3	76.3	71.7	68	65.3	59	0	1	0
10	25-Jan-22	19:00:00	1:00:00	66.9	74.8	71.1	66.2	63.2	57	0	0	0
11	25-Jan-22	20:00:00	1:00:00	65.5	73.8	70.2	64.3	61.4	54.4	0	0	0
12	25-Jan-22	21:00:00	1:00:00	66.8	75	70.2	64.2	61	54.6	0	1	0
13	25-Jan-22	22:00:00	1:00:00	64.5	74.1	68.7	61.6	58.8	51.1	0	0	0
14	25-Jan-22	23:00:00	1:00:00	61.7	72.5	66	57.8	55	47.2	0	0	0
15	26-Jan-22	0:00:00	1:00:00	58.9	70.6	61.7	55	51.8	44.2	0	0	0
16	26-Jan-22	1:00:00	1:00:00	55.8	68.5	58.5	50.4	46.8	41.9	0	0	0
17	26-Jan-22	2:00:00	1:00:00	54.2	66.8	56	49.5	46.1	41.6	0	0	0
18	26-Jan-22	3:00:00	1:00:00	58.7	69.7	60.1	52.6	49.1	42.7	0	0	0
19	26-Jan-22	4:00:00	1:00:00	58.3	69.5	60.2	54	51	44.1	0	0	0
20	26-Jan-22	5:00:00	1:00:00	62.4	73.4	65.1	58.7	55.8	47.7	0	0	0
21	26-Jan-22	6:00:00	1:00:00	65.8	75.8	68.8	63	60.4	52.9	0	0	0
22	26-Jan-22	7:00:00	1:00:00	67.8	76.1	71.9	66.4	63.9	59	0	0	0
23	26-Jan-22	8:00:00	1:00:00	69.4	76.9	72.9	69	66	61	0	0	0
24	26-Jan-22	9:00:00	1:00:00	72.3	81.5	72.8	68.4	65.6	60.5	0	2	0
25	26-Jan-22	10:00:00	1:00:00	67.6	75.8	71.5	66.9	64.4	59.4	0	0	0
26	26-Jan-22	11:00:00	1:00:00	68	75.9	71.3	67.4	65.1	59.3	0	0	0
27	26-Jan-22	12:00:00	1:00:00	71.8	78.3	71.5	67.7	65.3	59.4	0	1	0
28	26-Jan-22	13:00:00	1:00:00	69	77.1	71.4	67.3	64.8	58.9	0	1	0
29	26-Jan-22	14:00:00	1:00:00	68.4	76.9	71.5	67.9	65.8	59.9	0	0	0
30	26-Jan-22	15:00:00	0:18:57	68	74.6	71.3	68.2	65.8	59.5	0	0	0

Measurement Information

Filename: Auto_0001.rnh
Proj No.: 21-0548
Proj. Name 2675 Geary Whole Foods
Site No.: 3
Location: Anzavista Ave
Height: 12 above grade
Distance: 35 from Anzavista Ave (Center)
Distance: 40 from O'Farrell St
Maj. Noise Sources: Traffic
Pre Cal:
Post Cal:
Weather: Clear
Notes:
Engr.: NNS

Meter Settings

Meter Name	T-3
Meter Type	NL-52S
freq. Weighting	A
Time Weighting	Slow
Ln Calc Type	Leq_1s
Wind Screen Correcti	Off
Diffuse Field	Off
Parsed Exceedance Le	85
Meter Exceedance Le	85

Data contained in this spreadsheet is parsed from the Lp File

EXCEEDANCE REPORT

Address	Date	Time	Dur	Leq	SEL	Max 1s Leq	Ov
1	25-Jan	10:27:13	0:00:10	85.9	95.9	90.4	0
2	25-Jan	13:20:36	0:00:09	84.3	93.9	89.4	0
3	25-Jan	14:10:24	0:00:08	83.1	92.1	88.9	0
4	25-Jan	15:25:32	0:00:07	82.1	90.5	85.6	0
5	26-Jan	8:25:40	0:00:07	80.3	88.8	87.3	0
6	26-Jan	10:02:25	0:00:09	86.5	96	91.5	0
7	26-Jan	13:06:06	0:00:07	81.5	90	87.2	0
8	26-Jan	14:10:57	0:00:07	80.5	89	85.7	0

Average Daytime Leq (7 am - 10 pm)
61.4

Minimum L90, 1 hr.
45.5

Average Nighttime Leq (10 pm - 7 am)
52.4

Average L90, 1 hr. (Arithmetic)
50.7

INTERVAL REPORT

Address	Date	Time	Duration	Leq	L1	L10	L33	L50	L90	Sub Leq	Excs	Ov	DNL
1	25-Jan-22	10:00:00	1:00:00	65.6	75.9	66.5	62.2	60.7	53.7	0	1	0	62.4
2	25-Jan-22	11:00:00	1:00:00	61.7	71	64.1	59.7	57.7	51.5	0	0	0	62.3
3	25-Jan-22	12:00:00	1:00:00	60.9	68.4	63.4	60.2	58.6	55.1	0	0	0	62.3
4	25-Jan-22	13:00:00	1:00:00	62.7	71.9	63.3	59.5	57.5	52.1	0	1	0	62.4
5	25-Jan-22	14:00:00	1:00:00	62.6	70.3	63.7	60.1	58.2	52.7	0	1	0	62.3
6	25-Jan-22	15:00:00	1:00:00	62	70.5	63.9	60.1	58.2	53.5	0	1	0	62.3
7	25-Jan-22	16:00:00	1:00:00	62	69.8	64.3	60.6	58.9	54.1	0	0	0	62.3
8	25-Jan-22	17:00:00	1:00:00	63.4	73.5	65.8	61.2	59.2	54	0	0	0	
9	25-Jan-22	18:00:00	1:00:00	61	68.9	63.6	60	58.2	53.1	0	0	0	

10	25-Jan-22	19:00:00	1:00:00	59.4	67.9	62.1	58.2	56.1	51.3	0	0	0
11	25-Jan-22	20:00:00	1:00:00	56.2	65.4	59.2	53.5	51.5	48.8	0	0	0
12	25-Jan-22	21:00:00	1:00:00	53.4	63.1	56.6	50.6	49.3	47.6	0	0	0
13	25-Jan-22	22:00:00	1:00:00	53	63.4	56.7	49.6	48.1	46.6	0	0	0
14	25-Jan-22	23:00:00	1:00:00	50.6	61.4	52	47.9	47.1	46.1	0	0	0
15	26-Jan-22	0:00:00	1:00:00	48.7	57.7	49.3	46.9	46.5	45.7	0	0	0
16	26-Jan-22	1:00:00	1:00:00	52	58.4	48.3	47.1	46.7	45.7	0	0	0
17	26-Jan-22	2:00:00	1:00:00	51.4	57.6	49.5	48.3	47.8	46.9	0	0	0
18	26-Jan-22	3:00:00	1:00:00	52.8	62.4	51	48.9	48.1	45.9	0	0	0
19	26-Jan-22	4:00:00	1:00:00	51.9	60.3	50.9	48	46.8	45.5	0	0	0
20	26-Jan-22	5:00:00	1:00:00	53.5	63.9	55.9	50.3	49.6	48.2	0	0	0
21	26-Jan-22	6:00:00	1:00:00	57.9	68.3	60.1	53.6	51.2	49.1	0	0	0
22	26-Jan-22	7:00:00	1:00:00	60.7	69.6	63.2	58.7	55.9	50.2	0	0	0
23	26-Jan-22	8:00:00	1:00:00	63.5	73	65.8	61.3	59.2	53.5	0	1	0
24	26-Jan-22	9:00:00	1:00:00	61.9	71.3	64.5	60.9	58.8	53.1	0	0	0
25	26-Jan-22	10:00:00	1:00:00	64.4	73.4	63.8	60	58.2	53	0	1	0
26	26-Jan-22	11:00:00	1:00:00	60.4	68.8	62.8	59.2	57.2	52.6	0	0	0
27	26-Jan-22	12:00:00	1:00:00	63.2	73	64.8	61.2	59.4	53.9	0	0	0
28	26-Jan-22	13:00:00	1:00:00	61.9	70.2	63.8	60	58.1	52.7	0	1	0
29	26-Jan-22	14:00:00	1:00:00	61.5	70.5	63.8	60.1	58.2	53.1	0	1	0
30	26-Jan-22	15:00:00	0:25:24	62.6	73.2	64.2	60.3	58	52.8	0	0	0

Meas Date	1/25/2022
Project #	21-0548
Project Name	2675 Geary Whole Foods
Project Location	SF
Record Deck	
Meter	R-3
Engineer(s)	NNS
Notes	
Download Path	P:\2021\21-0548_AKS_Whole Foods Geary\05 AC\01 CalcsMeas\2022-1-26 Meas\R-3 (Attended Mech Meas)\

File	Date	Time	Source	Receive	Comments	Test Type	Gain	FIIC/NIC	Annc. dBA	Lmin Msd. dBA
Auto_0001.rnh	1/25/2022	10:46:24	Ambient HVAC ON - Best Buy Equip OFF	ST-1 (45 ft from louvers)	Ambient HVAC audible from louvers, some noise from adjacent childcare play area	Ambient	20 to 90			52.4
Auto_0002.rnh	1/25/2022	10:47:13	Ambient HVAC ON - Best Buy Equip OFF	ST-1 (45 ft from louvers)	Repeat of above, attempt for less kid noise interference - Ambient HVAC audible from louv	Ambient	20 to 90			53.1
Auto_0003.rnh	1/25/2022	10:50:05	Ambient HVAC ON - Best Buy Equip OFF	ST-2 (45 ft from louvers)	Ambient HVAC audible from louvers, some noise from adjacent childcare play area	Ambient	20 to 90			58.8
Auto_0004.rnh	1/25/2022	10:56:35	Ambient HVAC ON - Best Buy Equip OFF	ST-3 (25 ft from louvers)	Ambient HVAC audible from louvers, some noise from adjacent childcare play area	Ambient	20 to 90			56.7
Auto_0005.rnh	1/25/2022	10:57:43	Ambient HVAC ON - Best Buy Equip OFF	ST-2 (45 ft from louvers)	Repeat of ST-2 above, with kids quieter - Ambient HVAC audible from louvers	Ambient	20 to 90			56.3
Auto_0006.rnh	1/25/2022	11:01:58	Ambient HVAC ON - Best Buy Equip ON	ST-3 (25 ft from louvers)	Barely audible increase in HVAC noise - some noise from adjacent childcare play area	HVAC	20 to 90			56.7
Auto_0007.rnh	1/25/2022	11:02:59	Ambient HVAC ON - Best Buy Equip ON	ST-2 (45 ft from louvers)	Barely audible increase in HVAC noise - some noise from adjacent childcare play area	HVAC	20 to 90			56
Auto_0008.rnh	1/25/2022	11:06:15	Ambient HVAC ON - Best Buy Equip ON	ST-1 (45 ft from louvers)	Barely audible increase in HVAC noise - some noise from adjacent childcare play area	HVAC	20 to 90			51

APPENDIX B

MECHANICAL EQUIPMENT NOISE CALCULATIONS

Project #	21-0548
Project Name:	2675 Geary Whole Foods
Date:	8/26/2022
Engineer:	NNS
Calc Title:	NEW Mech Outdoor at Outdoor Area Location 1

Notes

CRITERION: From email 3/17/22, 62.5 dBA

Criterion	62.5	dB
Criterion	62.5	dB

Meets criterion
Exceeds criterion

NEW Mech Outdoor at Outdoor Area Location 1 Summary

	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dBA
CT-1	78	76	68	66	65	61	59	59	**71**
OSA-1	42	39	52	45	50	50	43	39	**55**
OSA-2	40	37	50	43	48	48	41	37	**52**
EF-2	26	26	26	26	26	26	26	26	**33**
EF-5	33	33	33	33	33	33	33	33	**40**
EF-10	24	24	24	24	24	24	24	24	**31**
Refrig. Rack	39	39	39	39	39	39	39	39	**46**
Summed	**78**	**76**	**69**	**67**	**66**	**62**	**60**	**60**	**71**

		63	125	250	500	1000	2000	4000	8000	dBA							
CT-1	PWL	103	101	93	91	90	86	84	84	95		Source Ht	23	ft	Mech Unit Length	12	ft
Evapco ESW4 9-46M12-L	Rathe	-27	-27	-27	-27	-27	-27	-27	-27			Source Dist	15	ft	Mech Unit Width	20	ft
	Barrier	-1	-1	-1	-1	-1	-1	-1	-1			Receiver Ht	5	ft	Total Distance	28	ft
												Receiver Dist	13	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	10	ft			
	Total	78	76	68	66	65	61	59	59	**71**		Barrier Loss	0.6	dB			
OSA-1	PWL	84	78	92	87	88	87	80	76	93		Source Ht	13	ft	Mech Unit Length	3	ft
Valent APD450	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3			Source Dist	20	ft	Mech Unit Width	2	ft
	Rathe	-30	-30	-30	-30	-30	-30	-30	-30			Receiver Ht	5	ft	Total Distance	40	ft
	Barrier	-7	-7	-7	-7	-7	-7	-7	-7			Receiver Dist	20	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	42	39	52	45	50	50	43	39	**55**		Barrier Loss	6.9	dB			
OSA-2	PWL	84	78	92	87	88	87	80	76	93		Source Ht	13	ft	Mech Unit Length	3	ft
Valent APD450	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3			Source Dist	29	ft	Mech Unit Width	2	ft
	Rathe	-33	-33	-33	-33	-33	-33	-33	-33			Receiver Ht	5	ft	Total Distance	59	ft
	Barrier	-6	-6	-6	-6	-6	-6	-6	-6			Receiver Dist	30	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	40	37	50	43	48	48	41	37	**52**		Barrier Loss	6.3	dB			
EF-2	PWL	61	61	61	61	61	61	61	61	68		Source Ht	3	ft	Mech Unit Length	2	ft
USBI11DD	Rathe	-24	-24	-24	-24	-24	-24	-24	-24			Source Dist	4	ft	Mech Unit Width	2	ft
	Barrier	-15	-15	-15	-15	-15	-15	-15	-15			Receiver Ht	5	ft	Total Distance	20	ft
												Receiver Dist	16	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	10	ft			
	Total	26	26	26	26	26	26	26	26	**33**		Barrier Loss	15.0	dB			
EF-5	PWL	68	68	68	68	68	68	68	68	75		Source Ht	3	ft	Mech Unit Length	2	ft
USBI13DD	Rathe	-24	-24	-24	-24	-24	-24	-24	-24			Source Dist	4	ft	Mech Unit Width	2	ft
	Barrier	-15	-15	-15	-15	-15	-15	-15	-15			Receiver Ht	5	ft	Total Distance	20	ft
												Receiver Dist	16	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	10	ft			

	Total	33	33	33	33	33	33	33	33	**40**		Barrier Loss	15.0	dB				
EF-10	PWL	59	59	59	59	59	59	59	59	66		Source Ht	13	ft	Mech Unit Length	2	ft	
0	Rathe	-32	-32	-32	-32	-32	-32	-32	-32			Source Dist	20	ft	Mech Unit Width	2	ft	
	Barrier	-6	-6	-6	-6	-6	-6	-6	-6			Receiver Ht	5	ft	Total Distance	50	ft	
												Receiver Dist	30	ft				
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft				
	Total	24	24	24	24	24	24	24	24	**31**		Barrier Loss	5.8	dB				
Refrig. Rack	PWL	76	76	76	76	76	76	76	76	83		Source Ht	5	ft	Mech Unit Length	15	ft	
0	Rathe	-26	-26	-26	-26	-26	-26	-26	-26			Source Dist	5	ft	Mech Unit Width	5	ft	
	Penthouse																	
	Enclosure	-15	-15	-15	-15	-15	-15	-15	-15			Receiver Ht	5	ft	Total Distance	25	ft	
												Receiver Dist	20	ft				
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	0	ft				
	Total	39	39	39	39	39	39	39	39	**46**		Barrier Loss	0.0	dB				

Project #	21-0548
Project Name:	2675 Geary Whole Foods
Date:	8/26/2022
Engineer:	NNS
Calc Title:	NEW Mech Outdoor at Outdoor Area Location 1 (Barrier)
Notes	

CRITERION: From email 3/17/22, 62.5 dBA

Criterion	62.5	dB
Criterion	62.5	dB

Meets criterion

NEW Mech Outdoor at Outdoor Area Location 1 (Barrier) Summary

	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dBA
CT-1	68	66	58	56	55	51	49	49	**60**
OSA-1	42	39	52	45	50	50	43	39	**55**
OSA-2	40	37	50	43	48	48	41	37	**52**
EF-2	26	26	26	26	26	26	26	26	**33**
EF-5	33	33	33	33	33	33	33	33	**40**
EF-10	24	24	24	24	24	24	24	24	**31**
Refrig. Rack	39	39	39	39	39	39	39	39	**46**
Summed	**68**	**66**	**59**	**56**	**57**	**55**	**51**	**50**	**61.9**

		63	125	250	500	1000	2000	4000	8000	dBA							
CT-1	PWL	103	101	93	91	90	86	84	84	95		Source Ht	23	ft	Mech Unit Length	12	ft
Evapco ESW4 9-46M12-L	Rathe	-27	-27	-27	-27	-27	-27	-27	-27			Source Dist	15	ft	Mech Unit Width	20	ft
	Barrier	-11	-11	-11	-11	-11	-11	-11	-11			Receiver Ht	5	ft	Total Distance	28	ft
												Receiver Dist	13	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	19	ft			
	Total	68	66	58	56	55	51	49	49	**60**		Barrier Loss	11.3	dB			
OSA-1	PWL	84	78	92	87	88	87	80	76	93		Source Ht	13	ft	Mech Unit Length	3	ft
	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3								
Valent APD450												Source Dist	20	ft	Mech Unit Width	2	ft
	Rathe	-30	-30	-30	-30	-30	-30	-30	-30			Receiver Ht	5	ft	Total Distance	40	ft
	Barrier	-7	-7	-7	-7	-7	-7	-7	-7			Receiver Dist	20	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	42	39	52	45	50	50	43	39	**55**		Barrier Loss	6.9	dB			
OSA-2	PWL	84	78	92	87	88	87	80	76	93		Source Ht	13	ft	Mech Unit Length	3	ft
	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3								
Valent APD450												Source Dist	29	ft	Mech Unit Width	2	ft
	Rathe	-33	-33	-33	-33	-33	-33	-33	-33			Receiver Ht	5	ft	Total Distance	59	ft
	Barrier	-6	-6	-6	-6	-6	-6	-6	-6			Receiver Dist	30	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	40	37	50	43	48	48	41	37	**52**		Barrier Loss	6.3	dB			
EF-2	PWL	61	61	61	61	61	61	61	61	68		Source Ht	3	ft	Mech Unit Length	2	ft
USBI11DD	Rathe	-24	-24	-24	-24	-24	-24	-24	-24			Source Dist	4	ft	Mech Unit Width	2	ft
	Barrier	-15	-15	-15	-15	-15	-15	-15	-15			Receiver Ht	5	ft	Total Distance	20	ft
												Receiver Dist	16	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	10	ft			
	Total	26	26	26	26	26	26	26	26	**33**		Barrier Loss	15.0	dB			
EF-5	PWL	68	68	68	68	68	68	68	68	75		Source Ht	3	ft	Mech Unit Length	2	ft
USBI13DD	Rathe	-24	-24	-24	-24	-24	-24	-24	-24			Source Dist	4	ft	Mech Unit Width	2	ft
	Barrier	-15	-15	-15	-15	-15	-15	-15	-15			Receiver Ht	5	ft	Total Distance	20	ft
												Receiver Dist	16	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	10	ft			

	Total	33	33	33	33	33	33	33	33	**40**		Barrier Loss	15.0	dB				
EF-10	PWL	59	59	59	59	59	59	59	59	66		Source Ht	13	ft	Mech Unit Length	2	ft	
0	Rathe	-32	-32	-32	-32	-32	-32	-32	-32			Source Dist	20	ft	Mech Unit Width	2	ft	
	Barrier	-6	-6	-6	-6	-6	-6	-6	-6			Receiver Ht	5	ft	Total Distance	50	ft	
												Receiver Dist	30	ft				
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft				
	Total	24	24	24	24	24	24	24	24	**31**		Barrier Loss	5.8	dB				
Refrig. Rack	PWL	76	76	76	76	76	76	76	76	83		Source Ht	5	ft	Mech Unit Length	15	ft	
0	Rathe	-26	-26	-26	-26	-26	-26	-26	-26			Source Dist	5	ft	Mech Unit Width	5	ft	
	Penthouse																	
	Enclosure	-15	-15	-15	-15	-15	-15	-15	-15			Receiver Ht	5	ft	Total Distance	25	ft	
												Receiver Dist	20	ft				
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	0	ft				
	Total	39	39	39	39	39	39	39	39	**46**		Barrier Loss	0.0	dB				

Project #	21-0548
Project Name:	2675 Geary Whole Foods
Date:	8/26/2022
Engineer:	NNS
Calc Title:	NEW Mech Outdoor at Outdoor Area Location 2

Notes

CRITERION: From email 3/17/22, 62.5 dBA

Criterion	62.5	dB
Criterion	62.5	dB

Meets criterion
Exceeds criterion

NEW Mech Outdoor at Outdoor Area Location 2 Summary

	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dBA
CT-1	76	74	66	64	63	59	57	57	**68**
OSA-1	42	39	52	45	50	50	43	39	**55**
OSA-2	40	37	50	43	48	48	41	37	**52**
EF-2	23	23	23	23	23	23	23	23	**30**
EF-5	30	30	30	30	30	30	30	30	**37**
EF-10	24	24	24	24	24	24	24	24	**31**
Refrig. Rack	39	39	39	39	39	39	39	39	**46**
Summed	**76**	**74**	**66**	**64**	**64**	**60**	**57**	**57**	**68.6**

		63	125	250	500	1000	2000	4000	8000	dBA							
CT-1	PWL	103	101	93	91	90	86	84	84	95		Source Ht	23	ft	Mech Unit Length	12	ft
Evapco ESW4 9-46M12-L	Rathe	-30	-30	-30	-30	-30	-30	-30	-30			Source Dist	15	ft	Mech Unit Width	20	ft
	Barrier	0	0	0	0	0	0	0	0			Receiver Ht	5	ft	Total Distance	40	ft
												Receiver Dist	25	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	10	ft			
	Total	76	74	66	64	63	59	57	57	**68**		Barrier Loss	0.0	dB			
OSA-1	PWL	84	78	92	87	88	87	80	76	93		Source Ht	13	ft	Mech Unit Length	3	ft
Valent APD450	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3			Source Dist	20	ft	Mech Unit Width	2	ft
	Rathe	-31	-31	-31	-31	-31	-31	-31	-31			Receiver Ht	5	ft	Total Distance	45	ft
	Barrier	-6	-6	-6	-6	-6	-6	-6	-6			Receiver Dist	25	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	42	39	52	45	50	50	43	39	**55**		Barrier Loss	6.0	dB			
OSA-2	PWL	84	78	92	87	88	87	80	76	93		Source Ht	13	ft	Mech Unit Length	3	ft
Valent APD450	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3			Source Dist	29	ft	Mech Unit Width	2	ft
	Rathe	-33	-33	-33	-33	-33	-33	-33	-33			Receiver Ht	5	ft	Total Distance	59	ft
	Barrier	-6	-6	-6	-6	-6	-6	-6	-6			Receiver Dist	30	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	40	37	50	43	48	48	41	37	**52**		Barrier Loss	6.3	dB			
EF-2	PWL	61	61	61	61	61	61	61	61	68		Source Ht	3	ft	Mech Unit Length	2	ft
USBI11DD	Rathe	-27	-27	-27	-27	-27	-27	-27	-27			Source Dist	4	ft	Mech Unit Width	2	ft
	Barrier	-15	-15	-15	-15	-15	-15	-15	-15			Receiver Ht	5	ft	Total Distance	29	ft
												Receiver Dist	25	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	10	ft			
	Total	23	23	23	23	23	23	23	23	**30**		Barrier Loss	14.9	dB			
EF-5	PWL	68	68	68	68	68	68	68	68	75		Source Ht	3	ft	Mech Unit Length	2	ft
USBI13DD	Rathe	-27	-27	-27	-27	-27	-27	-27	-27			Source Dist	4	ft	Mech Unit Width	2	ft
	Barrier	-15	-15	-15	-15	-15	-15	-15	-15			Receiver Ht	5	ft	Total Distance	29	ft
												Receiver Dist	25	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	10	ft			

	Total	30	30	30	30	30	30	30	30	**37**		Barrier Loss	14.9	dB			
EF-10	PWL	59	59	59	59	59	59	59	59	66		Source Ht	13	ft	Mech Unit Length	2	ft
0	Rathe	-32	-32	-32	-32	-32	-32	-32	-32			Source Dist	20	ft	Mech Unit Width	2	ft
	Barrier	-6	-6	-6	-6	-6	-6	-6	-6			Receiver Ht	5	ft	Total Distance	50	ft
												Receiver Dist	30	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	24	24	24	24	24	24	24	24	**31**		Barrier Loss	5.8	dB			
Refrig. Rack	PWL	76	76	76	76	76	76	76	76	83		Source Ht	5	ft	Mech Unit Length	15	ft
0	Rathe	-26	-26	-26	-26	-26	-26	-26	-26			Source Dist	5	ft	Mech Unit Width	5	ft
	Penthouse																
	Enclosure	-15	-15	-15	-15	-15	-15	-15	-15			Receiver Ht	5	ft	Total Distance	25	ft
												Receiver Dist	20	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	0	ft			
	Total	39	39	39	39	39	39	39	39	**46**		Barrier Loss	0.0	dB			

Project #	21-0548
Project Name:	2675 Geary Whole Foods
Date:	8/26/2022
Engineer:	NNS
Calc Title:	NEW Mech Outdoor at Outdoor Area Location 2 (Barrier)
Notes	

CRITERION: From email 3/17/22, 62.5 dBA

Criterion	62.5	dB
Criterion	62.5	dB

Meets criterion

NEW Mech Outdoor at Outdoor Area Location 2 (Barrier) Summary

	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dBA
CT-1	69	67	59	57	56	52	50	50	**61**
OSA-1	42	39	52	45	50	50	43	39	**55**
OSA-2	40	37	50	43	48	48	41	37	**52**
EF-2	23	23	23	23	23	23	23	23	**30**
EF-5	30	30	30	30	30	30	30	30	**37**
EF-10	24	24	24	24	24	24	24	24	**31**
Refrig. Rack	39	39	39	39	39	39	39	39	**46**
Summed	**69**	**67**	**60**	**57**	**57**	**55**	**51**	**50**	**62.3**

		63	125	250	500	1000	2000	4000	8000	dBA							
CT-1	PWL	103	101	93	91	90	86	84	84	95		Source Ht	23	ft	Mech Unit Length	12	ft
Evapco ESW4 9-46M12-L	Rathe	-30	-30	-30	-30	-30	-30	-30	-30			Source Dist	15	ft	Mech Unit Width	20	ft
	Barrier	-8	-8	-8	-8	-8	-8	-8	-8			Receiver Ht	5	ft	Total Distance	40	ft
												Receiver Dist	25	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	19	ft			
	Total	69	67	59	57	56	52	50	50	**61**		Barrier Loss	7.6	dB			
OSA-1	PWL	84	78	92	87	88	87	80	76	93		Source Ht	13	ft	Mech Unit Length	3	ft
Valent APD450	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3			Source Dist	20	ft	Mech Unit Width	2	ft
	Rathe	-31	-31	-31	-31	-31	-31	-31	-31			Receiver Ht	5	ft	Total Distance	45	ft
	Barrier	-6	-6	-6	-6	-6	-6	-6	-6			Receiver Dist	25	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	42	39	52	45	50	50	43	39	**55**		Barrier Loss	6.0	dB			
OSA-2	PWL	84	78	92	87	88	87	80	76	93		Source Ht	13	ft	Mech Unit Length	3	ft
Valent APD450	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3			Source Dist	29	ft	Mech Unit Width	2	ft
	Rathe	-33	-33	-33	-33	-33	-33	-33	-33			Receiver Ht	5	ft	Total Distance	59	ft
	Barrier	-6	-6	-6	-6	-6	-6	-6	-6			Receiver Dist	30	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	40	37	50	43	48	48	41	37	**52**		Barrier Loss	6.3	dB			
EF-2	PWL	61	61	61	61	61	61	61	61	68		Source Ht	3	ft	Mech Unit Length	2	ft
USBI11DD	Rathe	-27	-27	-27	-27	-27	-27	-27	-27			Source Dist	4	ft	Mech Unit Width	2	ft
	Barrier	-15	-15	-15	-15	-15	-15	-15	-15			Receiver Ht	5	ft	Total Distance	29	ft
												Receiver Dist	25	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	10	ft			
	Total	23	23	23	23	23	23	23	23	**30**		Barrier Loss	14.9	dB			
EF-5	PWL	68	68	68	68	68	68	68	68	75		Source Ht	3	ft	Mech Unit Length	2	ft
USBI13DD	Rathe	-27	-27	-27	-27	-27	-27	-27	-27			Source Dist	4	ft	Mech Unit Width	2	ft
	Barrier	-15	-15	-15	-15	-15	-15	-15	-15			Receiver Ht	5	ft	Total Distance	29	ft
												Receiver Dist	25	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	10	ft			

	Total	30	30	30	30	30	30	30	30	**37**		Barrier Loss	14.9	dB			
EF-10	PWL	59	59	59	59	59	59	59	59	66		Source Ht	13	ft	Mech Unit Length	2	ft
0	Rathe	-32	-32	-32	-32	-32	-32	-32	-32			Source Dist	20	ft	Mech Unit Width	2	ft
	Barrier	-6	-6	-6	-6	-6	-6	-6	-6			Receiver Ht	5	ft	Total Distance	50	ft
												Receiver Dist	30	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	24	24	24	24	24	24	24	24	**31**		Barrier Loss	5.8	dB			
Refrig. Rack	PWL	76	76	76	76	76	76	76	76	83		Source Ht	5	ft	Mech Unit Length	15	ft
0	Rathe	-26	-26	-26	-26	-26	-26	-26	-26			Source Dist	5	ft	Mech Unit Width	5	ft
	Penthouse																
	Enclosure	-15	-15	-15	-15	-15	-15	-15	-15			Receiver Ht	5	ft	Total Distance	25	ft
												Receiver Dist	20	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	0	ft			
	Total	39	39	39	39	39	39	39	39	**46**		Barrier Loss	0.0	dB			

Project #	21-0548
Project Name:	2675 Geary Whole Foods
Date:	8/26/2022
Engineer:	NNS
Calc Title:	NEW Mech Outdoor at Outdoor Area Locations 3 & 4
Notes	

CRITERION: From email 3/17/22, 62.5 dBA

Criterion	62.5	dB
Criterion	62.5	dB

Meets criterion
Exceeds criterion

NEW Mech Outdoor at Outdoor Area Locations 3 & 4 Summary

	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dBA
CT-1	73	71	63	61	60	56	54	54	**66**
OSA-1	41	38	51	44	49	49	42	38	**54**
OSA-2	39	36	49	42	47	47	40	36	**52**
EF-2	19	19	19	19	19	19	19	19	**26**
EF-5	26	26	26	26	26	26	26	26	**33**
EF-10	24	24	24	24	24	24	24	24	**31**
Refrig. Rack	35	35	35	35	35	35	35	35	**42**
Summed	**73**	**71**	**64**	**62**	**61**	**58**	**55**	**55**	**66.1**

		63	125	250	500	1000	2000	4000	8000	dBA							
CT-1	PWL	103	101	93	91	90	86	84	84	95		Source Ht	23	ft	Mech Unit Length	12	ft
Evapco ESW4 9-46M12-L	Rathe	-33	-33	-33	-33	-33	-33	-33	-33			Source Dist	15	ft	Mech Unit Width	20	ft
	Barrier	0	0	0	0	0	0	0	0			Receiver Ht	5	ft	Total Distance	55	ft
												Receiver Dist	40	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	10	ft			
	Total	73	71	63	61	60	56	54	54	**66**		Barrier Loss	0.0	dB			
OSA-1	PWL	84	78	92	87	88	87	80	76	93		Source Ht	13	ft	Mech Unit Length	3	ft
Valent APD450	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3			Source Dist	20	ft	Mech Unit Width	2	ft
	Rathe	-32	-32	-32	-32	-32	-32	-32	-32			Receiver Ht	5	ft	Total Distance	55	ft
	Barrier	-6	-6	-6	-6	-6	-6	-6	-6			Receiver Dist	35	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	41	38	51	44	49	49	42	38	**54**		Barrier Loss	5.6	dB			
OSA-2	PWL	84	78	92	87	88	87	80	76	93		Source Ht	13	ft	Mech Unit Length	3	ft
Valent APD450	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3			Source Dist	29	ft	Mech Unit Width	2	ft
	Rathe	-34	-34	-34	-34	-34	-34	-34	-34			Receiver Ht	5	ft	Total Distance	64	ft
	Barrier	-6	-6	-6	-6	-6	-6	-6	-6			Receiver Dist	35	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	39	36	49	42	47	47	40	36	**52**		Barrier Loss	5.9	dB			
EF-2	PWL	61	61	61	61	61	61	61	61	68		Source Ht	3	ft	Mech Unit Length	2	ft
USBI11DD	Rathe	-31	-31	-31	-31	-31	-31	-31	-31			Source Dist	4	ft	Mech Unit Width	2	ft
	Barrier	-15	-15	-15	-15	-15	-15	-15	-15			Receiver Ht	5	ft	Total Distance	44	ft
												Receiver Dist	40	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	10	ft			
	Total	19	19	19	19	19	19	19	19	**26**		Barrier Loss	14.8	dB			
EF-5	PWL	68	68	68	68	68	68	68	68	75		Source Ht	3	ft	Mech Unit Length	2	ft
USBI13DD	Rathe	-31	-31	-31	-31	-31	-31	-31	-31			Source Dist	4	ft	Mech Unit Width	2	ft
	Barrier	-15	-15	-15	-15	-15	-15	-15	-15			Receiver Ht	5	ft	Total Distance	44	ft
												Receiver Dist	40	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	10	ft			

	Total	26	26	26	26	26	26	26	26	**33**		Barrier Loss	14.8	dB			
EF-10	PWL	59	59	59	59	59	59	59	59	66		Source Ht	13	ft	Mech Unit Length	2	ft
0	Rathe	-32	-32	-32	-32	-32	-32	-32	-32			Source Dist	20	ft	Mech Unit Width	2	ft
	Barrier	-6	-6	-6	-6	-6	-6	-6	-6			Receiver Ht	5	ft	Total Distance	55	ft
												Receiver Dist	35	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	24	24	24	24	24	24	24	24	**31**		Barrier Loss	5.6	dB			
Refrig. Rack	PWL	76	76	76	76	76	76	76	76	83		Source Ht	5	ft	Mech Unit Length	15	ft
0	Rathe	-30	-30	-30	-30	-30	-30	-30	-30			Source Dist	5	ft	Mech Unit Width	5	ft
	Penthouse																
	Enclosure	-15	-15	-15	-15	-15	-15	-15	-15			Receiver Ht	5	ft	Total Distance	40	ft
												Receiver Dist	35	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	0	ft			
	Total	35	35	35	35	35	35	35	35	**42**		Barrier Loss	0.0	dB			

Project #	21-0548
Project Name:	2675 Geary Whole Foods
Date:	8/26/2022
Engineer:	NNS
Calc Title:	NEW Mech Outdoor at Outdoor Area Locations 3 & 4 (Barrier)
Notes	

CRITERION: From email 3/17/22, 62.5 dBA

Criterion	62.5	dB
Criterion	62.5	dB

Meets criterion

NEW Mech Outdoor at Outdoor Area Locations 3 & 4 (Barrier) Summary

	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dBA
CT-1	68	66	58	56	55	51	49	49	**60**
OSA-1	41	38	51	44	49	49	42	38	**54**
OSA-2	39	36	49	42	47	47	40	36	**52**
EF-2	19	19	19	19	19	19	19	19	**26**
EF-5	26	26	26	26	26	26	26	26	**33**
EF-10	24	24	24	24	24	24	24	24	**31**
Refrig. Rack	35	35	35	35	35	35	35	35	**42**
Summed	**68**	**66**	**59**	**56**	**56**	**54**	**50**	**50**	**61.5**

		63	125	250	500	1000	2000	4000	8000	dBA							
CT-1	PWL	103	101	93	91	90	86	84	84	95		Source Ht	23	ft	Mech Unit Length	12	ft
Evapco ESW4 9-46M12-L	Rathe	-33	-33	-33	-33	-33	-33	-33	-33			Source Dist	15	ft	Mech Unit Width	20	ft
	Barrier	-6	-6	-6	-6	-6	-6	-6	-6			Receiver Ht	5	ft	Total Distance	55	ft
												Receiver Dist	40	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	19	ft			
	Total	68	66	58	56	55	51	49	49	**60**		Barrier Loss	5.6	dB			
OSA-1	PWL	84	78	92	87	88	87	80	76	93		Source Ht	13	ft	Mech Unit Length	3	ft
Valent APD450	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3			Source Dist	20	ft	Mech Unit Width	2	ft
	Rathe	-32	-32	-32	-32	-32	-32	-32	-32			Receiver Ht	5	ft	Total Distance	55	ft
	Barrier	-6	-6	-6	-6	-6	-6	-6	-6			Receiver Dist	35	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	41	38	51	44	49	49	42	38	**54**		Barrier Loss	5.6	dB			
OSA-2	PWL	84	78	92	87	88	87	80	76	93		Source Ht	13	ft	Mech Unit Length	3	ft
Valent APD450	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3			Source Dist	29	ft	Mech Unit Width	2	ft
	Rathe	-34	-34	-34	-34	-34	-34	-34	-34			Receiver Ht	5	ft	Total Distance	64	ft
	Barrier	-6	-6	-6	-6	-6	-6	-6	-6			Receiver Dist	35	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	39	36	49	42	47	47	40	36	**52**		Barrier Loss	5.9	dB			
EF-2	PWL	61	61	61	61	61	61	61	61	68		Source Ht	3	ft	Mech Unit Length	2	ft
USBI11DD	Rathe	-31	-31	-31	-31	-31	-31	-31	-31			Source Dist	4	ft	Mech Unit Width	2	ft
	Barrier	-15	-15	-15	-15	-15	-15	-15	-15			Receiver Ht	5	ft	Total Distance	44	ft
												Receiver Dist	40	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	10	ft			
	Total	19	19	19	19	19	19	19	19	**26**		Barrier Loss	14.8	dB			
EF-5	PWL	68	68	68	68	68	68	68	68	75		Source Ht	3	ft	Mech Unit Length	2	ft
USBI13DD	Rathe	-31	-31	-31	-31	-31	-31	-31	-31			Source Dist	4	ft	Mech Unit Width	2	ft
	Barrier	-15	-15	-15	-15	-15	-15	-15	-15			Receiver Ht	5	ft	Total Distance	44	ft
												Receiver Dist	40	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	10	ft			

	Total	26	26	26	26	26	26	26	26	**33**		Barrier Loss	14.8	dB			
EF-10	PWL	59	59	59	59	59	59	59	59	66		Source Ht	13	ft	Mech Unit Length	2	ft
0	Rathe	-32	-32	-32	-32	-32	-32	-32	-32			Source Dist	20	ft	Mech Unit Width	2	ft
	Barrier	-6	-6	-6	-6	-6	-6	-6	-6			Receiver Ht	5	ft	Total Distance	55	ft
												Receiver Dist	35	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	24	24	24	24	24	24	24	24	**31**		Barrier Loss	5.6	dB			
Refrig. Rack	PWL	76	76	76	76	76	76	76	76	83		Source Ht	5	ft	Mech Unit Length	15	ft
0	Rathe	-30	-30	-30	-30	-30	-30	-30	-30			Source Dist	5	ft	Mech Unit Width	5	ft
	Penthouse																
	Enclosure	-15	-15	-15	-15	-15	-15	-15	-15			Receiver Ht	5	ft	Total Distance	40	ft
												Receiver Dist	35	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	0	ft			
	Total	35	35	35	35	35	35	35	35	**42**		Barrier Loss	0.0	dB			

Project #	21-0548
Project Name:	2675 Geary Whole Foods
Date:	8/26/2022
Engineer:	NNS
Calc Title:	NEW Mech Outdoor at Nearest Residence (at LT-1, Geary & Presidio)

Notes SF Police Code - Residential interior limit - 45 dBA at night inside the nearest residence

Criterion	45	dB
Criterion	45	dB

Meets criterion

NEW Mech Outdoor at Nearest Residence (at LT-1, Geary & Presidio) Summary

	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dBA
CT-1	49	47	39	37	36	32	30	30	**41**
OSA-1	16	13	26	19	24	24	17	13	**29**
OSA-2	16	13	26	19	24	24	17	13	**29**
EF-2	-1	-1	-1	-1	-1	-1	-1	-1	**6**
EF-5	6	6	6	6	6	6	6	6	**13**
EF-10	-1	-1	-1	-1	-1	-1	-1	-1	**6**
Refrig. Rack	0	0	0	0	0	0	0	0	**7**
Summed	**49**	**47**	**39**	**37**	**36**	**33**	**30**	**30**	**41**

		63	125	250	500	1000	2000	4000	8000	dBA							
CT-1	PWL	103	101	93	91	90	86	84	84	95		Source Ht	78	ft	Mech Unit Length	12	ft
Evapco ESW4 9-46M12-L	Rathe	-47	-47	-47	-47	-47	-47	-47	-47			Source Dist	120	ft	Mech Unit Width	20	ft
	WINDOW LOSS	-10	-10	-10	-10	-10	-10	-10	-10			Receiver Ht	30	ft	Total Distance	300	ft
												Receiver Dist	180	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	49	47	39	37	36	32	30	30	**41**		Barrier Loss	3.7	dB			
OSA-1	PWL	84	78	92	87	88	87	80	76	93		Source Ht	68	ft	Mech Unit Length	3	ft
	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3								
Valent APD450												Source Dist	110	ft	Mech Unit Width	2	ft
	Rathe	-48	-48	-48	-48	-48	-48	-48	-48			Receiver Ht	30	ft	Total Distance	320	ft
	Barrier	-5	-5	-5	-5	-5	-5	-5	-5			Receiver Dist	210	ft			
	OPEN WINDOW LOSS	-10	-10	-10	-10	-10	-10	-10	-10								
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	16	13	26	19	24	24	17	13	**29**		Barrier Loss	5.0	dB			
OSA-2	PWL	84	78	92	87	88	87	80	76	93		Source Ht	68	ft	Mech Unit Length	3	ft
	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3								
Valent APD450												Source Dist	110	ft	Mech Unit Width	2	ft
	Rathe	-48	-48	-48	-48	-48	-48	-48	-48			Receiver Ht	30	ft	Total Distance	320	ft
	Barrier	-5	-5	-5	-5	-5	-5	-5	-5			Receiver Dist	210	ft			
	OPEN WINDOW LOSS	-10	-10	-10	-10	-10	-10	-10	-10								
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	16	13	26	19	24	24	17	13	**29**		Barrier Loss	5.0	dB			
EF-2	PWL	61	61	61	61	61	61	61	61	68		Source Ht	58	ft	Mech Unit Length	2	ft
USBI11DD	Rathe	-47	-47	-47	-47	-47	-47	-47	-47			Source Dist	120	ft	Mech Unit Width	2	ft
	Barrier	-8	-8	-8	-8	-8	-8	-8	-8			Receiver Ht	30	ft	Total Distance	300	ft
	WINDOW LOSS	-10	-10	-10	-10	-10	-10	-10	-10			Receiver Dist	180	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	-1	-1	-1	-1	-1	-1	-1	-1	**6**		Barrier Loss	8.2	dB			
EF-5	PWL	68	68	68	68	68	68	68	68	75		Source Ht	58	ft	Mech Unit Length	2	ft
USBI13DD	Rathe	-47	-47	-47	-47	-47	-47	-47	-47			Source Dist	120	ft	Mech Unit Width	2	ft
	Barrier	-8	-8	-8	-8	-8	-8	-8	-8			Receiver Ht	30	ft	Total Distance	300	ft

	WINDOW LOSS	-10	-10	-10	-10	-10	-10	-10	-10			Receiver Dist	180	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	6	6	6	6	6	6	6	6	**13**		Barrier Loss	8.2	dB			
EF-10	PWL	59	59	59	59	59	59	59	59	66		Source Ht	68	ft	Mech Unit Length	2	ft
0	Rathe	-48	-48	-48	-48	-48	-48	-48	-48			Source Dist	110	ft	Mech Unit Width	2	ft
	Barrier	-5	-5	-5	-5	-5	-5	-5	-5			Receiver Ht	30	ft	Total Distance	320	ft
	WINDOW LOSS	-10	-10	-10	-10	-10	-10	-10	-10			Receiver Dist	210	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	-1	-1	-1	-1	-1	-1	-1	-1	**6**		Barrier Loss	5.0	dB			
Refrig. Rack	PWL	76	76	76	76	76	76	76	76	83		Source Ht	60	ft	Mech Unit Length	15	ft
0	Rathe	-48	-48	-48	-48	-48	-48	-48	-48			Source Dist	110	ft	Mech Unit Width	5	ft
	Penthouse Enclosure	-15	-15	-15	-15	-15	-15	-15	-15			Receiver Ht	30	ft	Total Distance	320	ft
	Barrier	-7	-7	-7	-7	-7	-7	-7	-7								
	WINDOW LOSS	-10	-10	-10	-10	-10	-10	-10	-10			Receiver Dist	210	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	0	0	0	0	0	0	0	0	**7**		Barrier Loss	6.9	dB			

Project #	21-0548
Project Name:	2675 Geary Whole Foods
Date:	8/26/2022
Engineer:	NNS
Calc Title:	NEW Mech Outdoor Beyond Property Plane North
Notes	SF Police Code - Commercial Noise Limit - 8 dB increase above ambient. Ambient at LT-1 (min L90): 47 dBA. Limit is 55 dBA. Evaluated at north edge of building roof.

Criterion	55	dB
Criterion	55	dB

Meets criterion

Exceeds criterion

NEW Mech Outdoor Beyond Property Plane North Summary

	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dBA
CT-1	74	72	64	62	61	57	55	55	**66**
OSA-1	42	39	52	45	50	50	43	39	**55**
OSA-1 (Casing	40	33	40	33	34	26	17	14	**37**
OSA-2	40	37	50	43	48	48	41	37	**53**
OSA-2 (Casing	37	30	37	30	31	23	14	11	**35**
EF-2	20	20	20	20	20	20	20	20	**27**
EF-5	27	27	27	27	27	27	27	27	**34**
EF-10	23	23	23	23	23	23	23	23	**30**
Refrig. Rack	33	33	33	33	33	33	33	33	**40**
Summed	**74**	**72**	**64**	**62**	**61**	**58**	**55**	**55**	**66**

		63	125	250	500	1000	2000	4000	8000	dBA							
CT-1	PWL	103	101	93	91	90	86	84	84	95		Source Ht	23	ft	Mech Unit Length	12	ft
Evapco ESW4 9-46M12-L	Rathe	-32	-32	-32	-32	-32	-32	-32	-32			Source Dist	8	ft	Mech Unit Width	20	ft
	Barrier	0	0	0	0	0	0	0	0			Receiver Ht	5	ft	Total Distance	53	ft
												Receiver Dist	45	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	10	ft			
	Total	74	72	64	62	61	57	55	55	**66**		Barrier Loss	0.0	dB			
OSA-1	PWL	84	78	92	87	88	87	80	76	93		Source Ht	13	ft	Mech Unit Length	3	ft
Valent APD450	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3			Source Dist	9	ft	Mech Unit Width	2	ft
	Rathe	-32	-32	-32	-32	-32	-32	-32	-32			Receiver Ht	5	ft	Total Distance	54	ft
	Barrier	-5	-5	-5	-5	-5	-5	-5	-5			Receiver Dist	45	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	42	39	52	45	50	50	43	39	**55**		Barrier Loss	4.7	dB			
OSA-1 (Casing Radiated)	PWL	83	76	83	76	77	69	60	57	80		Source Ht	13	ft	Mech Unit Length	3	ft
Valent APD450												Source Dist	9	ft	Mech Unit Width	2	ft
	Rathe	-32	-32	-32	-32	-32	-32	-32	-32			Receiver Ht	5	ft	Total Distance	54	ft
	Penthouse Louver & Wall	-14	-14	-14	-14	-14	-14	-14	-14			Receiver Dist	45	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	0	ft			
	Total	40	33	40	33	34	26	17	14	**37**		Barrier Loss	0.0	dB			
OSA-2	PWL	84	78	92	87	88	87	80	76	93		Source Ht	13	ft	Mech Unit Length	3	ft
Valent APD450	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3			Source Dist	10	ft	Mech Unit Width	2	ft
	Rathe	-35	-35	-35	-35	-35	-35	-35	-35			Receiver Ht	5	ft	Total Distance	70	ft
	Barrier	-5	-5	-5	-5	-5	-5	-5	-5			Receiver Dist	60	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	40	37	50	43	48	48	41	37	**53**		Barrier Loss	4.6	dB			

OSA-2 (Casing Radiated)	PWL	83	76	83	76	77	69	60	57	80		Source Ht	13	ft	Mech Unit Length	3	ft
Valent APD450												Source Dist	10	ft	Mech Unit Width	2	ft
	Rathe	-35	-35	-35	-35	-35	-35	-35	-35			Receiver Ht	5	ft	Total Distance	70	ft
	Penthouse																
	Louver & Wall	-14	-14	-14	-14	-14	-14	-14	-14			Receiver Dist	60	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	0	ft			
	Total	37	30	37	30	31	23	14	11	**35**		Barrier Loss	0.0	dB			

EF-2	PWL	61	61	61	61	61	61	61	61	68		Source Ht	5	ft	Mech Unit Length	2	ft
USBI11DD	Rathe	-34	-34	-34	-34	-34	-34	-34	-34			Source Dist	20	ft	Mech Unit Width	2	ft
	Barrier	-10	-10	-10	-10	-10	-10	-10	-10			Receiver Ht	5	ft	Total Distance	65	ft
												Receiver Dist	45	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	10	ft			
	Total	20	20	20	20	20	20	20	20	**27**		Barrier Loss	10.1	dB			

EF-5	PWL	68	68	68	68	68	68	68	68	75		Source Ht	5	ft	Mech Unit Length	2	ft
USBI13DD	Rathe	-34	-34	-34	-34	-34	-34	-34	-34			Source Dist	20	ft	Mech Unit Width	2	ft
	Barrier	-10	-10	-10	-10	-10	-10	-10	-10			Receiver Ht	5	ft	Total Distance	65	ft
												Receiver Dist	45	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	10	ft			
	Total	27	27	27	27	27	27	27	27	**34**		Barrier Loss	10.1	dB			

EF-10	PWL	59	59	59	59	59	59	59	59	66		Source Ht	13	ft	Mech Unit Length	2	ft
0	Rathe	-34	-34	-34	-34	-34	-34	-34	-34			Source Dist	12	ft	Mech Unit Width	2	ft
	Barrier	-5	-5	-5	-5	-5	-5	-5	-5			Receiver Ht	5	ft	Total Distance	67	ft
												Receiver Dist	55	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	23	23	23	23	23	23	23	23	**30**		Barrier Loss	4.9	dB			

Refrig. Rack	PWL	76	76	76	76	76	76	76	76	83		Source Ht	5	ft	Mech Unit Length	15	ft
0	Rathe	-33	-33	-33	-33	-33	-33	-33	-33			Source Dist	0	ft	Mech Unit Width	5	ft
	Penthouse																
	Louver & Wall	-14	-14	-14	-14	-14	-14	-14	-14			Receiver Ht	5	ft	Total Distance	55	ft
	Barrier	0	0	0	0	0	0	0	0			Receiver Dist	55	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	0	ft			
	Total	33	33	33	33	33	33	33	33	**40**		Barrier Loss	0.0	dB			

Project #	21-0548
Project Name:	2675 Geary Whole Foods
Date:	8/26/2022
Engineer:	NNS
Calc Title:	NEW Mech Outdoor Beyond Property Plane North (North Barrier)

Criterion	55	dB
Criterion	55	dB

Notes SF Police Code - Commercial Noise Limit - 8 dB increase above ambient. Ambient at LT-1 (min L90): 47 dBA. Limit is 55 dBA. Evaluated at north edge of building roof.

Meets criterion

NEW Mech Outdoor Beyond Property Plane North (North Barrier) Summary

	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dBA
CT-1	61	59	51	49	48	44	42	42	**53**
OSA-1	41	38	49	39	38	41	35	31	**46**
OSA-1 (Casing	40	33	40	33	34	26	17	14	**37**
OSA-2	39	36	47	37	36	39	33	29	**44**
OSA-2 (Casing	37	30	37	30	31	23	14	11	**35**
EF-2	13	13	13	13	13	13	13	13	**20**
EF-5	20	20	20	20	20	20	20	20	**27**
EF-10	23	23	23	23	23	23	23	23	**30**
Refrig. Rack	33	33	33	33	33	33	33	33	**40**
Summed	**61**	**59**	**54**	**50**	**49**	**47**	**44**	**43**	**55**

		63	125	250	500	1000	2000	4000	8000	dBA							
CT-1	PWL	103	101	93	91	90	86	84	84	95		Source Ht	23	ft	Mech Unit Length	12	ft
Evapco ESW4 9-46M12-L	Rathe	-32	-32	-32	-32	-32	-32	-32	-32			Source Dist	8	ft	Mech Unit Width	20	ft
	Barrier	-13	-13	-13	-13	-13	-13	-13	-13			Receiver Ht	5	ft	Total Distance	53	ft
												Receiver Dist	45	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	26	ft			
	Total	61	59	51	49	48	44	42	42	**53**		Barrier Loss	12.8	dB			
OSA-1	PWL	84	78	92	87	88	87	80	76	93		Source Ht	13	ft	Mech Unit Length	3	ft
	5 ft Lined Duct & End	-9	-6	-9	-14	-16	-12	-11	-11								
Valent APD450	Reflection											Source Dist	9	ft	Mech Unit Width	2	ft
	Rathe	-32	-32	-32	-32	-32	-32	-32	-32			Receiver Ht	5	ft	Total Distance	54	ft
	Barrier	-5	-5	-5	-5	-5	-5	-5	-5			Receiver Dist	45	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	41	38	49	39	38	41	35	31	**46**		Barrier Loss	4.7	dB			
OSA-1 (Casing Radiated)	PWL	83	76	83	76	77	69	60	57	80		Source Ht	13	ft	Mech Unit Length	3	ft
Valent APD450												Source Dist	9	ft	Mech Unit Width	2	ft
	Rathe	-32	-32	-32	-32	-32	-32	-32	-32			Receiver Ht	5	ft	Total Distance	54	ft
	Penthouse Louver & Wall	-14	-14	-14	-14	-14	-14	-14	-14			Receiver Dist	45	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	0	ft			
	Total	40	33	40	33	34	26	17	14	**37**		Barrier Loss	0.0	dB			
OSA-2	PWL	84	78	92	87	88	87	80	76	93		Source Ht	13	ft	Mech Unit Length	3	ft
	5 ft Lined Duct & End	-9	-6	-9	-14	-16	-12	-11	-11								
Valent APD450	Reflection											Source Dist	10	ft	Mech Unit Width	2	ft
	Rathe	-35	-35	-35	-35	-35	-35	-35	-35			Receiver Ht	5	ft	Total Distance	70	ft
	Barrier	-5	-5	-5	-5	-5	-5	-5	-5			Receiver Dist	60	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			

	Total	39	36	47	37	36	39	33	29	**44**		Barrier Loss	4.6	dB				
OSA-2 (Casing Radiated)	PWL	83	76	83	76	77	69	60	57	80		Source Ht	13	ft	Mech Unit Length	3	ft	
Valent APD450												Source Dist	10	ft	Mech Unit Width	2	ft	
	Rathe	-35	-35	-35	-35	-35	-35	-35	-35			Receiver Ht	5	ft	Total Distance	70	ft	
	Penthouse																	
	Louver & Wall	-14	-14	-14	-14	-14	-14	-14	-14			Receiver Dist	60	ft				
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	0	ft				
	Total	37	30	37	30	31	23	14	11	**35**		Barrier Loss	0.0	dB				
EF-2	PWL	61	61	61	61	61	61	61	61	68		Source Ht	5	ft	Mech Unit Length	2	ft	
USBI11DD	Rathe	-34	-34	-34	-34	-34	-34	-34	-34			Source Dist	20	ft	Mech Unit Width	2	ft	
	Barrier	-18	-18	-18	-18	-18	-18	-18	-18			Receiver Ht	5	ft	Total Distance	65	ft	
												Receiver Dist	45	ft				
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	26	ft				
	Total	13	13	13	13	13	13	13	13	**20**		Barrier Loss	17.6	dB				
EF-5	PWL	68	68	68	68	68	68	68	68	75		Source Ht	5	ft	Mech Unit Length	2	ft	
USBI13DD	Rathe	-34	-34	-34	-34	-34	-34	-34	-34			Source Dist	20	ft	Mech Unit Width	2	ft	
	Barrier	-18	-18	-18	-18	-18	-18	-18	-18			Receiver Ht	5	ft	Total Distance	65	ft	
												Receiver Dist	45	ft				
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	26	ft				
	Total	20	20	20	20	20	20	20	20	**27**		Barrier Loss	17.6	dB				
EF-10	PWL	59	59	59	59	59	59	59	59	66		Source Ht	13	ft	Mech Unit Length	2	ft	
0	Rathe	-34	-34	-34	-34	-34	-34	-34	-34			Source Dist	12	ft	Mech Unit Width	2	ft	
	Barrier	-5	-5	-5	-5	-5	-5	-5	-5			Receiver Ht	5	ft	Total Distance	67	ft	
												Receiver Dist	55	ft				
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft				
	Total	23	23	23	23	23	23	23	23	**30**		Barrier Loss	4.9	dB				
Refrig. Rack	PWL	76	76	76	76	76	76	76	76	83		Source Ht	5	ft	Mech Unit Length	15	ft	
0	Rathe	-33	-33	-33	-33	-33	-33	-33	-33			Source Dist	0	ft	Mech Unit Width	5	ft	
	Penthouse																	
	Louver & Wall	-14	-14	-14	-14	-14	-14	-14	-14			Receiver Ht	5	ft	Total Distance	55	ft	
	Barrier	0	0	0	0	0	0	0	0			Receiver Dist	55	ft				
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	0	ft				
	Total	33	33	33	33	33	33	33	33	**40**		Barrier Loss	0.0	dB				

Project #	21-0548
Project Name:	2675 Geary Whole Foods
Date:	8/26/2022
Engineer:	NNS
Calc Title:	NEW Mech Outdoor Beyond Property Plane North (East Barrier)

Criterion	55	dB
Criterion	55	dB

Notes SF Police Code - Commercial Noise Limit - 8 dB increase above ambient. Ambient at LT-1 (min L90): 47 dBA. Limit is 55 dBA. Evaluated at north edge of building roof.

Meets criterion

NEW Mech Outdoor Beyond Property Plane North (East Barrier) Summary

	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dBA
CT-1	70	60	53	47	44	43	43	43	**53**
OSA-1	41	38	49	39	38	41	35	31	**46**
OSA-1 (Casing	40	33	40	33	34	26	17	14	**37**
OSA-2	39	36	47	37	36	39	33	29	**44**
OSA-2 (Casing	37	30	37	30	31	23	14	11	**35**
EF-2	28	20	21	17	15	18	20	20	**25**
EF-5	35	27	28	24	22	25	27	27	**32**
EF-10	23	23	23	23	23	23	23	23	**30**
Refrig. Rack	33	33	33	33	33	33	33	33	**40**
Summed	**70**	**60**	**56**	**49**	**46**	**46**	**45**	**44**	**55**

		63	125	250	500	1000	2000	4000	8000	dBA							
CT-1	PWL	103	101	93	91	90	86	84	84	95		Source Ht	5	ft	Mech Unit Length	12	ft
Evapco ESW4 9-46M12-L	Rathe	-36	-36	-36	-36	-36	-36	-36	-36			Source Dist	10	ft	Mech Unit Width	20	ft
	Louvers	0	-8	-7	-11	-13	-10	-8	-8			Receiver Ht	5	ft	Total Distance	80	ft
												Receiver Dist	70	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	0	ft			
	Total	70	60	53	47	44	43	43	43	**53**		Barrier Loss	0.0	dB			
OSA-1	PWL	84	78	92	87	88	87	80	76	93		Source Ht	13	ft	Mech Unit Length	3	ft
	5 ft Lined Duct & End	-9	-6	-9	-14	-16	-12	-11	-11								
Valent APD450	Reflection											Source Dist	9	ft	Mech Unit Width	2	ft
	Rathe	-32	-32	-32	-32	-32	-32	-32	-32			Receiver Ht	5	ft	Total Distance	54	ft
	Barrier	-5	-5	-5	-5	-5	-5	-5	-5			Receiver Dist	45	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	41	38	49	39	38	41	35	31	**46**		Barrier Loss	4.7	dB			
OSA-1 (Casing Radiated)	PWL	83	76	83	76	77	69	60	57	80		Source Ht	13	ft	Mech Unit Length	3	ft
Valent APD450												Source Dist	9	ft	Mech Unit Width	2	ft
	Rathe	-32	-32	-32	-32	-32	-32	-32	-32			Receiver Ht	5	ft	Total Distance	54	ft
	Penthouse Louver & Wall	-14	-14	-14	-14	-14	-14	-14	-14			Receiver Dist	45	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	0	ft			
	Total	40	33	40	33	34	26	17	14	**37**		Barrier Loss	0.0	dB			
OSA-2	PWL	84	78	92	87	88	87	80	76	93		Source Ht	13	ft	Mech Unit Length	3	ft
	5 ft Lined Duct & End	-9	-6	-9	-14	-16	-12	-11	-11								
Valent APD450	Reflection											Source Dist	10	ft	Mech Unit Width	2	ft
	Rathe	-35	-35	-35	-35	-35	-35	-35	-35			Receiver Ht	5	ft	Total Distance	70	ft
	Barrier	-5	-5	-5	-5	-5	-5	-5	-5			Receiver Dist	60	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			

	Total	39	36	47	37	36	39	33	29	**44**		Barrier Loss	4.6	dB			
OSA-2 (Casing Radiated)	PWL	83	76	83	76	77	69	60	57	80		Source Ht	13	ft	Mech Unit Length	3	ft
Valent APD450												Source Dist	10	ft	Mech Unit Width	2	ft
	Rathe	-35	-35	-35	-35	-35	-35	-35	-35			Receiver Ht	5	ft	Total Distance	70	ft
	Penthouse																
	Louver & Wall	-14	-14	-14	-14	-14	-14	-14	-14			Receiver Dist	60	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	0	ft			
	Total	37	30	37	30	31	23	14	11	**35**		Barrier Loss	0.0	dB			
EF-2	PWL	61	61	61	61	61	61	61	61	68		Source Ht	5	ft	Mech Unit Length	2	ft
USBI11DD	Rathe	-37	-37	-37	-37	-37	-37	-37	-37			Source Dist	20	ft	Mech Unit Width	2	ft
	Louvers	0	-8	-7	-11	-13	-10	-8	-8			Receiver Ht	5	ft	Total Distance	90	ft
												Receiver Dist	70	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	0	ft			
	Total	28	20	21	17	15	18	20	20	**25**		Barrier Loss	0.0	dB			
EF-5	PWL	68	68	68	68	68	68	68	68	75		Source Ht	5	ft	Mech Unit Length	2	ft
USBI13DD	Rathe	-37	-37	-37	-37	-37	-37	-37	-37			Source Dist	20	ft	Mech Unit Width	2	ft
	Louvers	0	-8	-7	-11	-13	-10	-8	-8			Receiver Ht	5	ft	Total Distance	90	ft
												Receiver Dist	70	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	0	ft			
	Total	35	27	28	24	22	25	27	27	**32**		Barrier Loss	0.0	dB			
EF-10	PWL	59	59	59	59	59	59	59	59	66		Source Ht	13	ft	Mech Unit Length	2	ft
0	Rathe	-34	-34	-34	-34	-34	-34	-34	-34			Source Dist	12	ft	Mech Unit Width	2	ft
	Barrier	-5	-5	-5	-5	-5	-5	-5	-5			Receiver Ht	5	ft	Total Distance	67	ft
												Receiver Dist	55	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	23	23	23	23	23	23	23	23	**30**		Barrier Loss	4.9	dB			
Refrig. Rack	PWL	76	76	76	76	76	76	76	76	83		Source Ht	5	ft	Mech Unit Length	15	ft
0	Rathe	-33	-33	-33	-33	-33	-33	-33	-33			Source Dist	0	ft	Mech Unit Width	5	ft
	Penthouse																
	Louver & Wall	-14	-14	-14	-14	-14	-14	-14	-14			Receiver Ht	5	ft	Total Distance	55	ft
	Barrier	0	0	0	0	0	0	0	0			Receiver Dist	55	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	0	ft			
	Total	33	33	33	33	33	33	33	33	**40**		Barrier Loss	0.0	dB			

Project #	21-0548
Project Name:	2675 Geary Whole Foods
Date:	8/26/2022
Engineer:	NNS
Calc Title:	NEW Mech Outdoor Beyond Property Plane West

Criterion	53	dB
Criterion	53	dB

Notes SF Police Code - Commercial Noise Limit - 8 dB increase above ambient. Ambient at LT-2 (min L90): 42 dBA. Minimum ambient: 45 dBA. Limit is 53 dBA. Evaluated at west property plane.

Meets criterion

NEW Mech Outdoor Beyond Property Plane West Summary

	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dBA
CT-1	47	45	37	35	34	30	28	28	**39**
OSA-1	19	16	29	22	27	27	20	16	**31**
OSA-2	20	17	30	23	28	28	21	17	**33**
EF-2	1	1	1	1	1	1	1	1	**8**
EF-5	8	8	8	8	8	8	8	8	**15**
EF-10	2	2	2	2	2	2	2	2	**9**
Refrig. Rack	2	2	2	2	2	2	2	2	**9**
Summed	**47**	**45**	**38**	**35**	**35**	**33**	**29**	**28**	**40**

		63	125	250	500	1000	2000	4000	8000	dBA
CT-1	PWL	103	101	93	91	90	86	84	84	95
Evapco ESW4 9-46M12-L	Rathe	-52	-52	-52	-52	-52	-52	-52	-52	
	Barrier	-7	-7	-7	-7	-7	-7	-7	-7	
	Safety Factor	3	3	3	3	3	3	3	3	
	Total	47	45	37	35	34	30	28	28	**39**

Source Ht	78	ft
Source Dist	220	ft
Receiver Ht	5	ft
Receiver Dist	300	ft
Barrier Ht	55	ft
Barrier Loss	7.2	dB

Mech Unit Length	12	ft
Mech Unit Width	20	ft
Total Distance	520	ft

		63	125	250	500	1000	2000	4000	8000	dBA
OSA-1	PWL	84	78	92	87	88	87	80	76	93
Valent APD450	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3	
	Rathe	-52	-52	-52	-52	-52	-52	-52	-52	
	Barrier	-9	-9	-9	-9	-9	-9	-9	-9	
	Safety Factor	3	3	3	3	3	3	3	3	
	Total	19	16	29	22	27	27	20	16	**31**

Source Ht	68	ft
Source Dist	195	ft
Receiver Ht	5	ft
Receiver Dist	300	ft
Barrier Ht	55	ft
Barrier Loss	8.8	dB

Mech Unit Length	3	ft
Mech Unit Width	2	ft
Total Distance	495	ft

		63	125	250	500	1000	2000	4000	8000	dBA
OSA-2	PWL	84	78	92	87	88	87	80	76	93
Valent APD450	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3	
	Rathe	-51	-51	-51	-51	-51	-51	-51	-51	
	Barrier	-8	-8	-8	-8	-8	-8	-8	-8	
	Safety Factor	3	3	3	3	3	3	3	3	
	Total	20	17	30	23	28	28	21	17	**33**

Source Ht	68	ft
Source Dist	170	ft
Receiver Ht	5	ft
Receiver Dist	300	ft
Barrier Ht	55	ft
Barrier Loss	8.1	dB

Mech Unit Length	3	ft
Mech Unit Width	2	ft
Total Distance	470	ft

		63	125	250	500	1000	2000	4000	8000	dBA
EF-2	PWL	61	61	61	61	61	61	61	61	68
USBI11DD	Rathe	-52	-52	-52	-52	-52	-52	-52	-52	
	Barrier	-12	-12	-12	-12	-12	-12	-12	-12	
	Safety Factor	3	3	3	3	3	3	3	3	
	Total	1	1	1	1	1	1	1	1	**8**

Source Ht	58	ft
Source Dist	220	ft
Receiver Ht	5	ft
Receiver Dist	300	ft
Barrier Ht	55	ft
Barrier Loss	11.6	dB

Mech Unit Length	2	ft
Mech Unit Width	2	ft
Total Distance	520	ft

		63	125	250	500	1000	2000	4000	8000	dBA
EF-5	PWL	68	68	68	68	68	68	68	68	75
USBI13DD	Rathe	-52	-52	-52	-52	-52	-52	-52	-52	
	Barrier	-12	-12	-12	-12	-12	-12	-12	-12	
	Safety Factor	3	3	3	3	3	3	3	3	

Source Ht	58	ft
Source Dist	220	ft
Receiver Ht	5	ft
Receiver Dist	300	ft
Barrier Ht	55	ft

Mech Unit Length	2	ft
Mech Unit Width	2	ft
Total Distance	520	ft

	Total	8	8	8	8	8	8	8	8	**15**		Barrier Loss	11.6	dB			
EF-10	PWL	59	59	59	59	59	59	59	59	66		Source Ht	68	ft	Mech Unit Length	2	ft
0	Rathe	-51	-51	-51	-51	-51	-51	-51	-51			Source Dist	180	ft	Mech Unit Width	2	ft
	Barrier	-8	-8	-8	-8	-8	-8	-8	-8			Receiver Ht	5	ft	Total Distance	480	ft
												Receiver Dist	300	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	2	2	2	2	2	2	2	2	**9**		Barrier Loss	8.3	dB			
Refrig. Rack	PWL	76	76	76	76	76	76	76	76	83		Source Ht	60	ft	Mech Unit Length	15	ft
0	Rathe	-52	-52	-52	-52	-52	-52	-52	-52			Source Dist	205	ft	Mech Unit Width	5	ft
	Penthouse																
	Enclosure	-15	-15	-15	-15	-15	-15	-15	-15			Receiver Ht	5	ft	Total Distance	505	ft
	Barrier	-11	-11	-11	-11	-11	-11	-11	-11			Receiver Dist	300	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	2	2	2	2	2	2	2	2	**9**		Barrier Loss	11.0	dB			

Project #	21-0548
Project Name:	2675 Geary Whole Foods
Date:	8/26/2022
Engineer:	NNS
Calc Title:	NEW Mech Outdoor Beyond Property Plane East

Notes SF Police Code - Commercial Noise Limit - 8 dB increase above ambient. Ambient at LT-3 (min L90): 46 dBA. Limit is 54 dBA. Evaluated at south property plane.

Criterion	54	dB
Criterion	54	dB

Meets criterion

NEW Mech Outdoor Beyond Property Plane East Summary

	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dBA
CT-1	59	57	49	47	46	42	40	40	**51**
OSA-1	28	25	38	31	36	36	29	25	**40**
OSA-2	28	25	38	31	36	36	29	25	**40**
EF-2	9	9	9	9	9	9	9	9	**16**
EF-5	17	17	17	17	17	17	17	17	**24**
EF-10	11	11	11	11	11	11	11	11	**18**
Refrig. Rack	10	10	10	10	10	10	10	10	**17**
Summed	**59**	**57**	**50**	**47**	**47**	**44**	**41**	**40**	**52**

		63	125	250	500	1000	2000	4000	8000	dBA							
CT-1	PWL	103	101	93	91	90	86	84	84	95		Source Ht	78	ft	Mech Unit Length	12	ft
Evapco ESW4 9-46M12-L	Rathe	-46	-46	-46	-46	-46	-46	-46	-46			Source Dist	60	ft	Mech Unit Width	20	ft
	Barrier	-1	-1	-1	-1	-1	-1	-1	-1			Receiver Ht	5	ft	Total Distance	270	ft
												Receiver Dist	210	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	59	57	49	47	46	42	40	40	**51**		Barrier Loss	0.7	dB			
OSA-1	PWL	84	78	92	87	88	87	80	76	93		Source Ht	68	ft	Mech Unit Length	3	ft
Valent APD450	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3			Source Dist	60	ft	Mech Unit Width	2	ft
	Rathe	-46	-46	-46	-46	-46	-46	-46	-46			Receiver Ht	5	ft	Total Distance	270	ft
	Barrier	-5	-5	-5	-5	-5	-5	-5	-5			Receiver Dist	210	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	28	25	38	31	36	36	29	25	**40**		Barrier Loss	5.0	dB			
OSA-2	PWL	84	78	92	87	88	87	80	76	93		Source Ht	68	ft	Mech Unit Length	3	ft
Valent APD450	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3			Source Dist	60	ft	Mech Unit Width	2	ft
	Rathe	-46	-46	-46	-46	-46	-46	-46	-46			Receiver Ht	5	ft	Total Distance	270	ft
	Barrier	-5	-5	-5	-5	-5	-5	-5	-5			Receiver Dist	210	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	28	25	38	31	36	36	29	25	**40**		Barrier Loss	5.0	dB			
EF-2	PWL	61	61	61	61	61	61	61	61	68		Source Ht	58	ft	Mech Unit Length	2	ft
USBI11DD	Rathe	-46	-46	-46	-46	-46	-46	-46	-46			Source Dist	50	ft	Mech Unit Width	2	ft
	Barrier	-9	-9	-9	-9	-9	-9	-9	-9			Receiver Ht	5	ft	Total Distance	260	ft
												Receiver Dist	210	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	9	9	9	9	9	9	9	9	**16**		Barrier Loss	9.0	dB			
EF-5	PWL	68	68	68	68	68	68	68	68	75		Source Ht	58	ft	Mech Unit Length	2	ft
USBI13DD	Rathe	-46	-46	-46	-46	-46	-46	-46	-46			Source Dist	50	ft	Mech Unit Width	2	ft
	Barrier	-9	-9	-9	-9	-9	-9	-9	-9			Receiver Ht	5	ft	Total Distance	260	ft
												Receiver Dist	210	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			

	Total	17	17	17	17	17	17	17	17	**24**		Barrier Loss	9.0	dB			
EF-10	PWL	59	59	59	59	59	59	59	59	66		Source Ht	68	ft	Mech Unit Length	2	ft
0	Rathe	-46	-46	-46	-46	-46	-46	-46	-46			Source Dist	60	ft	Mech Unit Width	2	ft
	Barrier	-5	-5	-5	-5	-5	-5	-5	-5			Receiver Ht	5	ft	Total Distance	270	ft
												Receiver Dist	210	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	11	11	11	11	11	11	11	11	**18**		Barrier Loss	5.0	dB			
Refrig. Rack	PWL	76	76	76	76	76	76	76	76	83		Source Ht	60	ft	Mech Unit Length	15	ft
0	Rathe	-46	-46	-46	-46	-46	-46	-46	-46			Source Dist	60	ft	Mech Unit Width	5	ft
	Penthouse																
	Enclosure	-15	-15	-15	-15	-15	-15	-15	-15			Receiver Ht	5	ft	Total Distance	270	ft
	Barrier	-9	-9	-9	-9	-9	-9	-9	-9			Receiver Dist	210	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	10	10	10	10	10	10	10	10	**17**		Barrier Loss	8.6	dB			

APPENDIX E.2

2675 Geary Boulevard – Whole Foods Market Noise Measurement Results and Recommendations – Level 4 Measurements

28 September 2022

Rachel Schuett
San Francisco Planning
49 South Van Ness Avenue, Suite 1400
San Francisco, CA 94103
rachel.schuett@sfgov.org

Subject: **2675 Geary Boulevard – Whole Foods Market**
Noise Measurement Results – Potential Playground Relocation
Salter Project: 21-0548

Dear Rachel:

We visited the site on 22 July 2022 to conduct noise measurements of existing environmental conditions at the Level 4 parking lot. The purpose of these measurements was to provide insight into the possibility of relocating the existing nearby childcare facility's outdoor space to reduce the project's noise impact from future rooftop MEP equipment by increasing the distance between the noise-generating equipment and the sensitive receptors on the playground. This letter summarizes our measurement results and observations.

PROJECT CRITERIA

San Francisco General Plan

The City and County of San Francisco General Plan includes land use compatibility standards for community noise. For the land use category of "school classrooms, libraries, churches, hospitals, nursing homes, etc.," noise levels of L_{dn}[1] 62.5 dBA or lower are considered "satisfactory, with no special noise insulation requirements."

Per Environmental Science Associates, we understand that the L_{dn} 62.5 dBA standard is to be applied at the outdoor childcare facility adjacent to the new project equipment[2]. We understand that the childcare facility only operates during daytime hours (7:00 a.m. to 10:00 p.m.). Therefore, the standard can be defined as 62.5 dBA at the childcare facility's outdoor area.

---

1 DNL (Day-Night Average Sound Level) – A descriptor for a 24-hour A-weighted average noise level. DNL accounts for the increased acoustical sensitivity of people to noise during the nighttime hours. DNL penalizes sound levels by 10 dB during the hours from 10 PM to 7 AM. For practical purposes, the DNL and CNEL are usually interchangeable. DNL is sometimes written as L_{dn}.

2 The "satisfactory" land use compatibility standard for school classrooms, libraries, churches, hospitals, nursing homes, etc. of L_{dn} 62.5 dBA is more restrictive than the "satisfactory" standard for playgrounds and parks of L_{dn} 67.5 dBA.

MEASUREMENT RESULTS AND OBSERVATIONS

Under consideration is a potential relocation of the existing outdoor childcare facility (playground area) to be along the western façade of the Level 4 parking lot. To characterize the existing environmental noise conditions along the western façade of the Level 4 parking lot, we conducted short-term noise measurements and general site observations at various locations throughout the rooftop. We observed the following noteworthy conditions:

1. Tesla charging stations are in place throughout the entire area of consideration, with fan noise from charging cars, as well as noise from the owners themselves (e.g., loud music playing while waiting). Therefore, it was challenging to obtain noise measurements that would accurately represent the future conditions under consideration, because the charging stations would not be present at this area. See photos below.







2. The installed electrical equipment boxes associated with the Tesla chargers generated considerable noise over intermittent periods of time. Similar to the conditions described above, it was not possible to conduct noise measurements in this area that would accurately represent the future conditions, assuming some or all of this equipment would be relocated. See photo below.



Working around these noise sources, two short-term noise measurements were conducted at the Level 4 parking lot. These locations are indicated in **Figure 1**. The measured noise levels at these locations are summarized in **Table 1**.

Table 1: Measured Noise Levels at Short-Term Measurement Locations

Measurement Location	Location Description	L_{eq}[3]	DNL*
ST-1	SW Corner	65 dBA	64 dBA
ST-2	North (Geary) Façade	62 dBA	63 dBA

*DNL estimated using offset from concurrent long-term noise data

[3] L_{eq} – The equivalent steady-state A-weighted sound level that, in a stated period of time, would contain the same acoustic energy as the time-varying sound level during the same period.

We conducted long-term noise measurements from 25 to 26 January 2022 at locations surrounding the project, per our Noise Measurement Results and Recommendations letter dated 27 May 2022 (Revised 28 September 2022). **Figure 1** shows the measurement locations (LTs -1 and -2). Traffic is the primary noise source at these locations. Noise from the existing mechanical equipment serving the project space does not contribute to the noise environment at these locations. This data, combined with temporary "long-term" noise monitors re-positioned at these exact locations during our second round of testing on 22 July 2022, was used to obtain the estimated DNLs presented in **Table 1**.

For reference, the measured noise levels at the long-term measurement locations are summarized in **Table 2**.

Table 2: Measured Noise Levels at Long-Term Measurement Locations (25 to 26 January 2022)

Measurement Location	Location Description	DNL
LT-1	Geary Blvd. / Presidio Ave.	71
LT-2	Masonic Ave.	70

As shown in **Table 1**, we calculate environmental noise to be as high as DNL 64 dBA in the area proposed for relocation of the playground. This level exceeds the General Plan land use compatibility standard for "school classrooms, libraries, churches, hospitals, nursing homes, etc." of 62.5 dBA.

Noise levels at the proposed playground relocation area also exceed the noise levels at the existing playground location, where we measured noise from the existing mechanical equipment to be 51 to 57 dBA, per our Noise Measurement Results and Recommendations letter dated 27 May 2022 (Revised 28 September 2022). Therefore, the area proposed for relocation would not reduce noise levels at sensitive receptors.

Additionally, the proposed playground relocation would not address the proposed project's mechanical equipment noise at the north property plane. The cooling tower and OSA units would remain in the same locations as originally proposed. Therefore, the equipment noise reduction measures summarized in our Noise Measurement Results and Recommendations letter, dated 27 May 2022 (Revised 28 September 2022), would still be needed.

* * *

This concludes our current comments. Please contact us with any questions.

Best,

SALTER



Skyler Carrico
Consultant



Alex Salter, PE
Vice President

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2675 GEARY BOULEVARD WHOLE FOODS
NOISE MEASUREMENT LOCATIONS

FIGURE 1

Salter # 21-0548

STC/AKS 07.29.22

APPENDIX E.3

2675 Geary Boulevard – Whole Foods Market Cooling Tower Alternatives, Noise Analysis Results and Recommendations

28 September 2022

Rachel Schuett
San Francisco Planning
49 South Van Ness Avenue, Suite 1400
San Francisco, CA 94103
rachel.schuett@sfgov.org

Subject: 2675 Geary Boulevard – Whole Foods Market
Cooling Tower Alternatives, Noise Analysis Results and Recommendations
Salter Project 21-0548

Dear Rachel:

We completed an analysis of several potential alternatives for the new cooling tower: alternative locations on Level 4 and Level 3, two alternative equipment selections in the original Level 4 location, and an alternative equipment selection at an alternative location on Level 3. Our analysis and recommendations for the original cooling tower are summarized in our Noise Measurement Results and Recommendations letter dated 27 May 2022 (Revised 28 September 2022).

We estimated noise levels generated by the mechanical equipment in the alternative scenarios based on the drawings and noise data we have received. This letter summarizes our analysis results and presents recommendations to reduce noise to meet the project criteria.

CRITERIA

San Francisco Police Code Article 29 Noise Ordinance

The City and County of San Francisco Police Code includes the following noise limits:

Section 2909(b) Commercial and Industrial Property Noise Limits

No person shall produce or allow to be produced by any machine, or device, music or entertainment or any combination of same, on commercial or industrial property over which the person has ownership or control, a noise level more than eight dBA[1] above the local ambient at any point outside of the property plane.

[1] A-Weighted Sound Level – The A-weighted sound pressure level, expressed in decibels (dB). Sometimes the unit of sound level is written as dBA. A weighting is a standard weighting that accounts for the sensitivity of human hearing to the range of audible frequencies. People perceive a 10 dB increase in sound level to be twice as loud.

Per San Francisco Department of Public Health guidelines[2], the ambient noise level can be conservatively represented by the measured L_{90}[3] noise level under most conditions.

We conducted long-term noise measurements at locations surrounding the project to quantify the ambient noise levels. **Figure 1** shows the measurement locations (LT-1 through -3).

The measured noise levels at the long-term measurement locations are summarized in **Table 1**.

Table 1: Measured Noise Levels and Property Plane Noise Limits

Measurement Location	Location Description	Nearby Property Plane	Measured Minimum L_{90} (1 hr.), dBA	Property Plane Noise Limit, dBA
LT-1	Geary Blvd. / Presidio Ave.	North	47	55
LT-2	Masonic Ave.	West	42	53
LT-3	O'Farrell St. / Anzavista Ave.	South	46	54

The measured minimum L_{90} noise levels are 47 dBA at LT-1 (near the north property line), 42 dBA at LT-2 (near the west property line), and 46 dBA at LT-3 (near the south property line). Per the San Francisco Police Code, ambient noise levels are to be considered no less than 45 dBA at locations other than residential interiors. The measured ambient noise levels are expected to be equivalent to the ambient noise levels at the noted nearby property planes.

The commercial and industrial property noise limits are 8 dB above the ambient noise levels. Based on the measured noise levels, the property plane noise limits were defined as **55 dBA** at the north property plane, **53 dBA** at the west property plane, and **54 dBA** at the south property plane. For more information, refer to our Noise Measurement Results and Recommendations letter dated 27 May 2022 (Revised 28 September 2022).

Section 2909(d) Fixed Residential Interior Noise Limits

No fixed noise source may cause the noise level measured inside any sleeping or living room in any dwelling unit located on residential property to exceed 45 dBA between the hours of 10:00 p.m. to 7:00 a.m. or 55 dBA between the hours of 7:00 a.m. to 10:00 p.m. with windows open except where building ventilation is achieved through mechanical systems that allow windows to remain closed.

---

[2] San Francisco Police Code Article 29: Regulation of Noise, Guidelines for Noise Control Ordinance Monitoring and Enforcement, December 2014 Guidance

[3] L_n – The sound level exceeded for a stated percentage (n) of a specified measurement period as described in ASTM E1686. L_{10}, L_{50}, and L_{90} are the levels exceeded 10, 50, and 90 percent of the time, respectively.

San Francisco General Plan

The City and County of San Francisco General Plan includes land use compatibility standards for community noise. For the land use category of "school classrooms, libraries, churches, hospitals, nursing homes, etc.," noise levels of L_{dn}[4] 62.5 dBA or lower are considered "satisfactory, with no special noise insulation requirements."

Per Environmental Science Associates, we understand that the L_{dn} 62.5 dBA standard is to be applied at the outdoor childcare facility adjacent to the new project equipment[5]. We understand that the childcare facility only operates during daytime hours (7:00 a.m. to 10:00 p.m.). Therefore, the standard can be defined as 62.5 dBA at the childcare facility's outdoor area.

PROPOSED PROJECT

The project's current design would result in noise levels that exceed the Police Code Section 2909(b) property plane limit at the north property plane and would exceed the General Plan land use compatibility standard for "school classrooms, libraries, churches, hospitals, nursing homes, etc." at the childcare outdoor area, per our Noise Measurement Results and Recommendations letter dated 27 May 2022 (Revised 28 September 2022). The primary noise generator would be the proposed project's cooling tower. The secondary noise generator would be the OSA units. With incorporation of the noise reduction measures identified in that letter for both the cooling tower and the OSA units, the project would meet the noise criteria.

COOLING TOWER ALTERNATIVES

Several alternatives for the cooling tower were proposed in lieu of the noise reduction measures identified in our Noise Measurement Results and Recommendations letter dated 27 May 2022 (Revised 28 September 2022). The goal of the alternatives is to reduce noise levels at the north property plane and the childcare facility outdoor area for the proposed cooling tower because it would generate the highest noise levels.

---

4 DNL (Day-Night Average Sound Level) – A descriptor for a 24-hour A-weighted average noise level. DNL accounts for the increased acoustical sensitivity of people to noise during the nighttime hours. DNL penalizes sound levels by 10 dB during the hours from 10 PM to 7 AM. For practical purposes, the DNL and CNEL are usually interchangeable. DNL is sometimes written as L_{dn}.

5 The "satisfactory" land use compatibility standard for school classrooms, libraries, churches, hospitals, nursing homes, etc. of L_{dn} 62.5 dBA is more restrictive than the "satisfactory" standard for playgrounds and parks of L_{dn} 67.5 dBA.

The proposed alternatives were informed by two noise reduction strategies: equipment relocation and equipment reselection. In general, relocating equipment can reduce noise levels if the distance to a noise receiver is increased, or if the new location would be shielded by existing structures (i.e., limiting line-of-sight to a receiver). Reselecting equipment for a quieter alternative unit (per the manufacturer) would constitute a reduction of the noise generated by the equipment, which in turn reduces noise levels at receivers.

Our assessment of the cooling tower alternatives is summarized below. The estimated noise levels are based on the mechanical equipment noise data (received 8 December 2021), alternative equipment noise data (received 4 August 2022), and mechanical plans (received 22 February 2022 and 17 August 2022). Our calculations are included in Appendix A.

Equipment Relocation, Level 4

An alternative location was proposed for the cooling tower on Level 4, north of the existing rooftop mechanical penthouse (as shown in Figure 2). Compared to the original location, east of the penthouse, the distance between the cooling tower and the childcare outdoor space would not increase substantially, nor would line-of-sight be substantially changed. In this proposed relocation, the cooling tower would be closer to the north property plane, therefore increasing noise levels at that area. Based on these findings, the alternative location on Level 4 was not selected for additional analysis.

Equipment Relocation, Level 3

An alternative location for the cooling tower was identified at the Level 3 parking area, east of the Whole Foods Market entrance (as shown in Figure 3). Compared to the original location, the Level 3 location is substantially farther from the childcare outdoor space and the north property plane as well as being partially shielded by the existing building. This alternative location would be closer to the south property plane. Our analysis of the proposed alternative location on Level 3 is summarized below.

San Francisco Police Code Noise Limits

Table 2 compares the estimated project equipment noise levels with the alternative cooling tower location on Level 3 to the property plane noise limits. The project equipment noise levels are estimated without any additional noise reduction measures (e.g., barriers).

Table 2: Project Noise at the Property Planes, Alternative Cooling Tower Location, Level 3

Property Plane	Noise Levels (dBA)	
	Property Plane Noise Limit	Project Equipment Noise
North	55	57
West	53	41
South	54	55

Based on the alternative cooling tower location on Level 3, we estimate noise from the new project mechanical equipment (including the OSA units and the cooling tower) to be 55 dBA at the south property plane and 57 dBA at the north property plane. Both of these levels would exceed the Police Code Section 2909(b) commercial and industrial property noise limits of 54 dBA and 55 dBA, respectively. Noise reduction measures would be needed for the cooling tower to meet the property plane noise limits.

Under the project's current design, noise from the OSA units is estimated to exceed the north property noise limit, per our Noise Measurement Results and Recommendations letter dated 27 May 2022 (Revised 28 September 2022). The OSA units would not change under this Alternative. Therefore, noise reduction measures would still be needed for the OSA units to meet the property plane noise limits.

New project mechanical equipment is estimated to be 41 dBA at the west property plane. This estimated level would meet the Police Code Section 2909(b) commercial and industrial property noise limit at the west property plane.

Noise from the new project mechanical equipment was estimated at the nearest residence. Noise is estimated to be 33 dBA inside the building at 2580-2590 Geary Boulevard, assuming open windows. This estimated level would meet the Police Code Section 2909(d) residential interior daytime and nighttime noise limits.

The alternative cooling tower location would be closer to residences south of the project. Therefore, noise was also estimated at the nearest residence to the cooling tower in the southern direction, the building at 300-314 Anzavista Avenue. New project mechanical equipment noise is estimated to be 41 dBA inside the building, assuming open windows. This estimated level would meet the Police Code Section 2909(d) residential interior daytime and nighttime noise limits.

Childcare Facility Noise Levels

Based on the alternative cooling tower location on Level 3, we estimate noise from the new project equipment to be no higher than 59 dBA at the childcare facility's outdoor area. This would meet the General Plan land use compatibility standard for "school classrooms, libraries, churches, hospitals, nursing homes, etc." of 62.5 dBA.

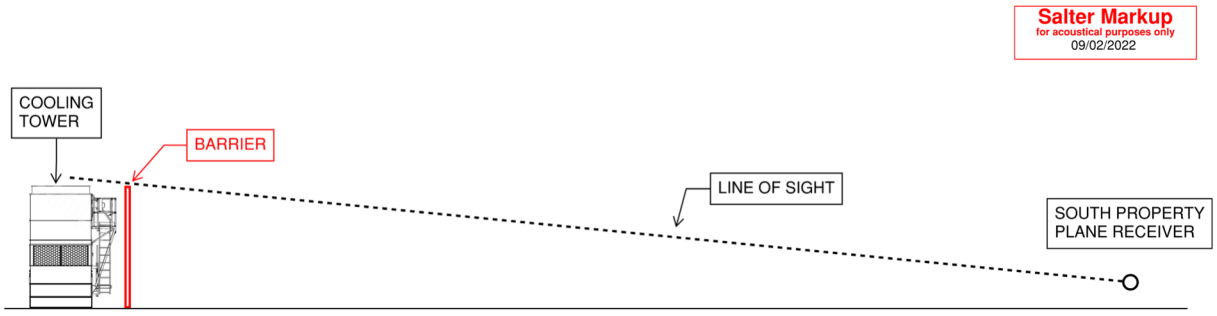
Recommendations

As requested, we have provided conceptual recommendations for reducing noise from the new project equipment, based on the alternative cooling tower location on Level 3.

1. To meet the Police Code Section 2909(b) commercial and industrial property noise limit at the south property plane, a barrier would be needed at the cooling tower. The barrier would enclose the cooling tower on all sides.
2. If louvers would be needed as part of the barrier (i.e., due to potential airflow requirements), acoustical louvers would be needed to meet the Police Code Section 2909(b) noise limit.
3. Reduction of OSA unit noise would be needed to meet the Police Code Section 2909(b) noise limit at the north property plane. We would recommend providing internally lined duct or duct silencers at the outside air ducts.

Figure 4 illustrates a conceptual barrier at the cooling tower.

Figure 4: Cooling Tower Barrier, Alternative Cooling Tower Location, Level 3



A barrier could block line-of-sight between the cooling tower and a receiver at the south property plane, therefore reducing noise levels.

Equipment Reselection – Air-Cooled Chiller

An air-cooled chiller (Daikin AWV014B) was identified by Whole Foods Market[6] as a potential alternative to the original cooling tower selection (Evapco ESW4 9-46M12-LP). The air-cooler chiller's rated noise data is equivalent to that of the original cooling tower, per the manufacturer's specifications. Note that this comparison is of manufacturer-provided noise levels, and therefore does not assume any noise reduction measures in place. This alternative equipment selection is not quieter than the original equipment, and therefore would not result in reduced noise levels. This alternative was not selected for additional analysis.

Equipment Reselection – Alternative Cooling Tower

An alternative cooling tower selection (Evapco ESW4 12-44L12-SP) was identified by Whole Foods Market. This alternative equipment's rated noise data is 8 dB lower than that of the original cooling tower selection, per the manufacturer's specifications. Note that this comparison is of manufacturer-provided noise levels, and therefore does not assume any noise reduction measures in place. Additionally, the alternative cooling tower is approximately 5 feet taller than the original cooling tower.

The alternative cooling tower would remain located in the original proposed location on Level 4, east of the existing mechanical penthouse. Our analysis of this alternative equipment selection is summarized below.

San Francisco Police Code Noise Limits

Table 3 compares the estimated project equipment noise levels with the alternative cooling tower selection to the property plane noise limits. The project equipment noise levels are estimated without any additional noise reduction measures (e.g., barriers).

6 Email from Roger Dean (DC Engineering) dated 26 July 2022

Table 3: Project Noise at the Property Planes, Alternative Cooling Tower

Property Plane	Noise Levels (dBA)	
	Property Plane Noise Limit	Project Equipment Noise
North	55	61
West	53	37
South	54	47

With the alternative cooling tower selection, we estimate noise from the new project mechanical equipment (including the OSA units and the cooling tower) to be 61 dBA at the north property plane, which would exceed the Police Code Section 2909(b) commercial and industrial property noise limit of 55 dBA. Noise reduction measures would be needed for the cooling tower to meet the property plane noise limits.

Under the project's current design, noise from the OSA units is estimated to exceed the north property plane noise limit, per our Noise Measurement Results and Recommendations letter dated 27 May 2022 (Revised 28 September 2022). The OSA units would not change under this Alternative. Therefore, noise reduction measures would still be needed for the OSA units to meet the property plane noise limits.

New project mechanical equipment is estimated to be 37 dBA at the west property plane and 47 dBA at the south property plane. These estimated levels would meet the Police Code Section 2909(b) commercial and industrial property noise limits at those property planes.

Noise from the new project mechanical equipment is estimated to be 36 dBA inside the nearest residence (the building at 2580-2590 Geary Boulevard), assuming open windows. This estimated level would meet the Police Code Section 2909(d) residential interior daytime and nighttime noise limits.

Childcare Facility Noise Levels

With the alternative cooling tower selection, we estimate noise from the new project equipment to be as high as 65 dBA at the childcare facility's outdoor area. This level exceeds the General Plan land use compatibility standard for "school classrooms, libraries, churches, hospitals, nursing homes, etc." of 62.5 dBA.

Noise levels are estimated to be highest at the portion of the outdoor area nearest the new equipment (i.e., the northeast corner of the childcare facility's outdoor area). Compared to the existing mechanical equipment noise, the new equipment noise could be perceived as about twice as loud. For more information, refer to our Noise Measurement Results and Recommendations letter dated 27 May 2022 (Revised 28 September 2022).

Noise reduction measures would be needed for the cooling tower to meet the standard at the childcare facility's outdoor area.

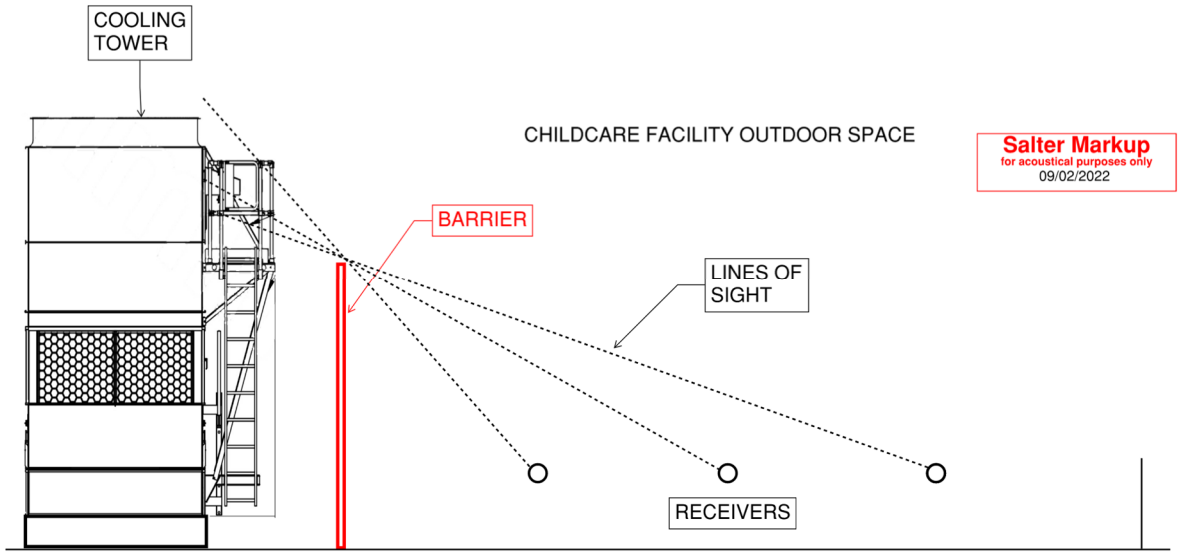
Recommendations

As requested, we have provided conceptual recommendations for reducing noise from the new project equipment, based on the alternative cooling tower selection.

1. To meet the Police Code Section 2909(b) commercial and industrial property noise limit and the 62.5 dBA standard at the outdoor area, a barrier would be needed at the cooling tower. The barrier would enclose the cooling tower on all sides.
2. We would recommend that the louvers tagged as L-3 (near the cooling tower) be specified as acoustical louvers and be relocated to the section of the enclosure east of the cooling tower.
3. Reduction of OSA unit noise would be needed to meet the Police Code Section 2909(b) noise limit at the north property plane. We would recommend providing internally lined duct or duct silencers at the outside air ducts.

Figure 5 illustrates a conceptual barrier at the cooling tower.

Figure 5: Cooling Tower Barrier, Alternative Cooling Tower Selection



A barrier could block line-of-sight between the cooling tower and the closest areas of the childcare facility outdoor space, therefore reducing noise levels.

Equipment Reselection and Relocation

An additional Alternative was identified in which the alternative cooling tower selection (Evapco ESW4 12-44L12-SP) would utilize the alternative location at the Level 3 parking area (as indicated in Figure 3). This would, in effect, be a combination of two of the Alternatives described above. Our analysis of this Alternative is summarized below.

San Francisco Police Code Noise Limits

Table 4 compares the estimated project equipment noise levels with the alternative cooling tower selection and alternative location to the property plane noise limits. The project equipment noise levels are estimated without any additional noise reduction measures (e.g., barriers).

Table 4: Project Noise at the Property Planes, Alternative Cooling Tower and Alternative Location

	Noise Levels (dBA)	
Property Plane	Property Plane Noise Limit	Project Equipment Noise
North	55	57
West	53	37
South	54	49

With the alternative cooling tower selection and alternative location, we estimate noise from the new project mechanical equipment (including the OSA units and the cooling tower) to be 57 dBA at the north property plane, which would exceed the Police Code Section 2909(b) commercial and industrial property noise limit of 55 dBA.

Under the project's current design, noise from the OSA units is estimated to exceed the north property plane noise limit, per our Noise Measurement Results and Recommendations letter dated 27 May 2022 (Revised 28 September 2022). The OSA units would not change under this Alternative. Therefore, noise reduction measures would still be needed for the OSA units to meet the property plane noise limits.

Excluding the OSA units, all other equipment noise (including the cooling tower) would meet the north property plane noise limit under this Alternative.

New project mechanical equipment is estimated to be 37 dBA at the west property plane and 49 dBA at the south property plane. These estimated levels would meet the Police Code Section 2909(b) commercial and industrial property noise limits at those property planes.

Noise from the new project mechanical equipment was estimated at the nearest residence. Noise is estimated to be 32 dBA inside the building at 2580-2590 Geary Boulevard, assuming open windows. This estimated level would meet the Police Code Section 2909(d) residential interior daytime and nighttime noise limits.

The alternative cooling tower location would be closer to residences south of the project. Therefore, noise was also estimated at the nearest residence to the cooling tower in the southern direction, the building at 300-314 Anzavista Avenue. New project mechanical equipment noise is estimated to be 35 dBA inside the building, assuming open windows. This estimated level would meet the Police Code Section 2909(d) residential interior daytime and nighttime noise limits.

Childcare Facility Noise Levels

Based on the alternative cooling tower selection and alternative location on Level 3, we estimate noise from the new project equipment to be no higher than 57 dBA at the childcare facility's outdoor area. This would meet the General Plan land use compatibility standard for "school classrooms, libraries, churches, hospitals, nursing homes, etc." of 62.5 dBA.

Recommendations

As requested, we have provided a conceptual recommendation for reducing noise from the OSA units to meet the Police Code Section 2909(b) noise limit at the north property plane. We would recommend providing internally lined duct or duct silencers at the outside air ducts.

* * *

This concludes our cooling tower alternatives letter. Please contact us with any questions.

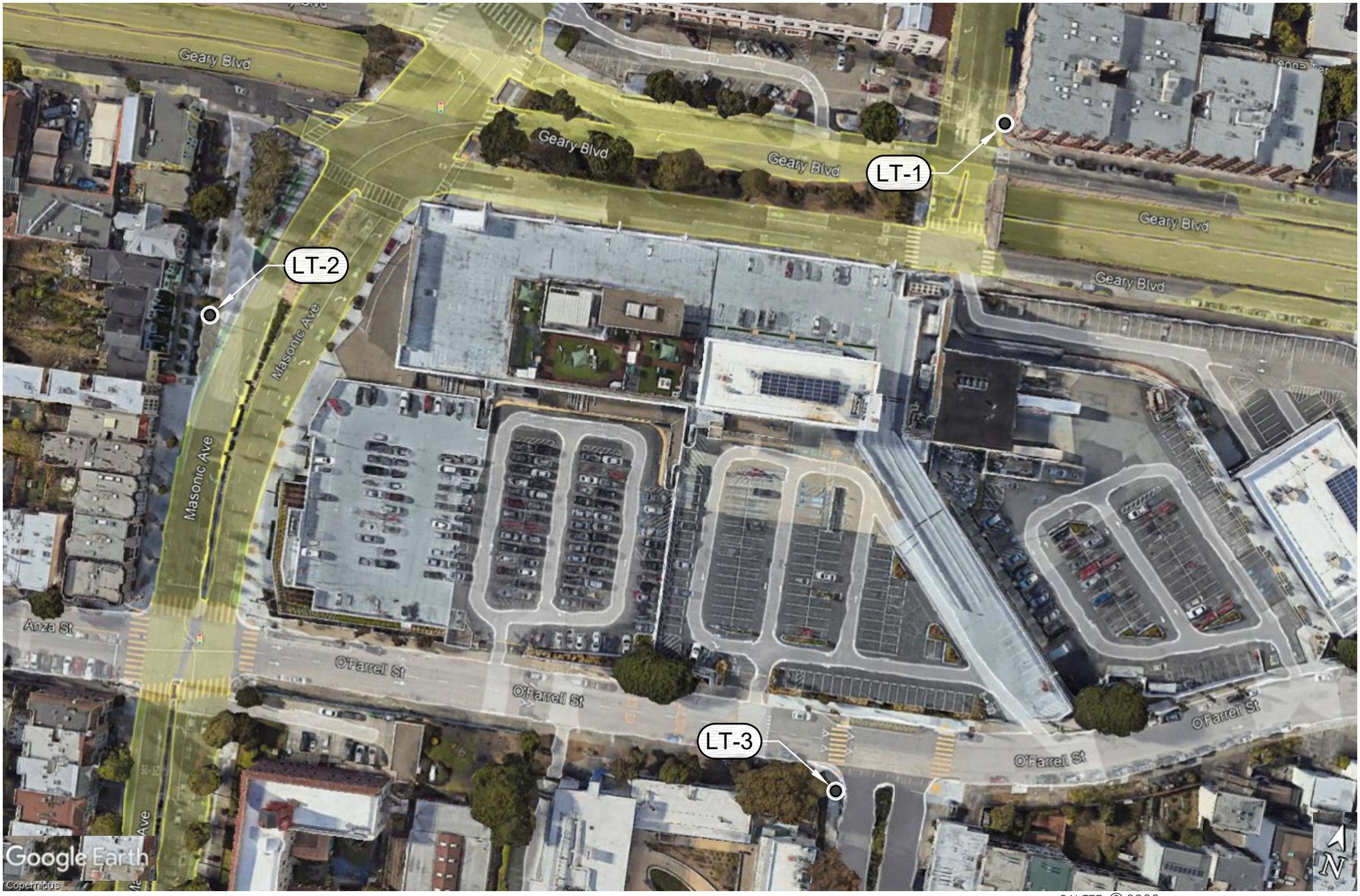
Best,

SALTER

Nathan Sistek
Senior Consultant

Alex Salter, PE
Vice President

Enclosure

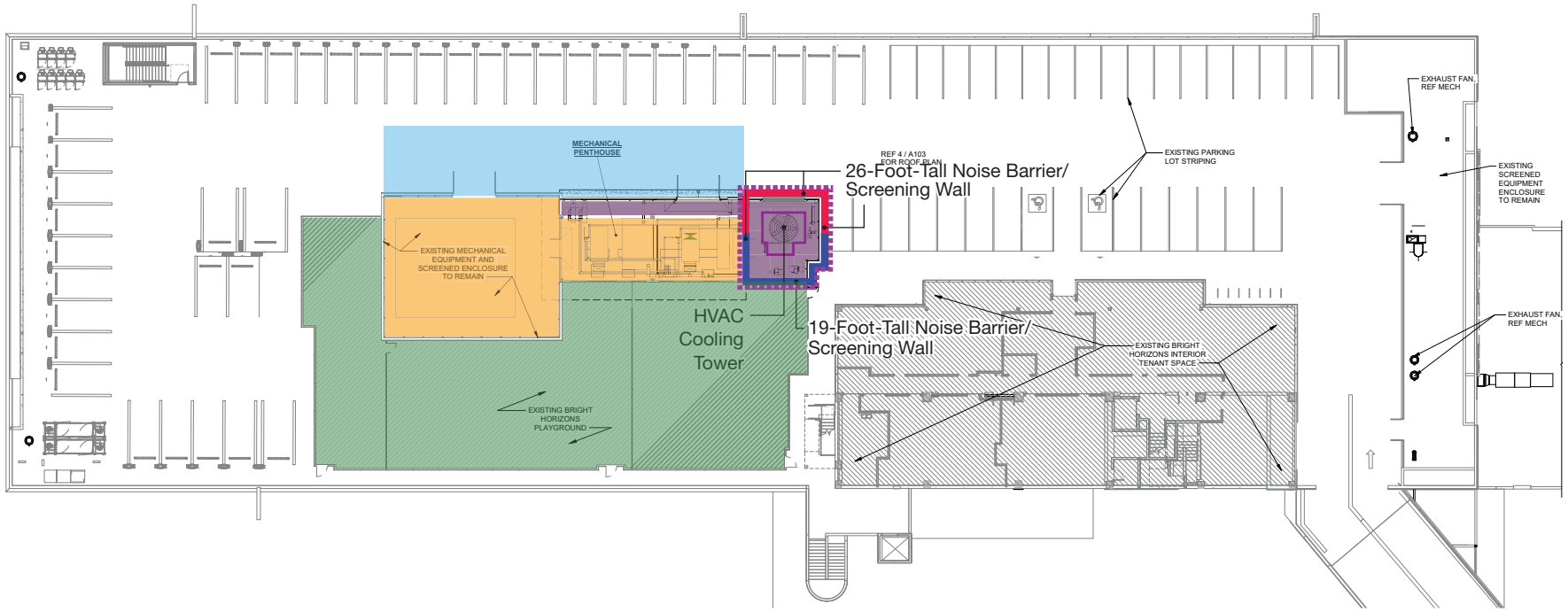


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2675 GEARY BOULEVARD WHOLE FOODS
LONG-TERM NOISE MEASUREMENT LOCATIONS

FIGURE 1

Salter #	NNS/AKS
21-0548	09.16.22

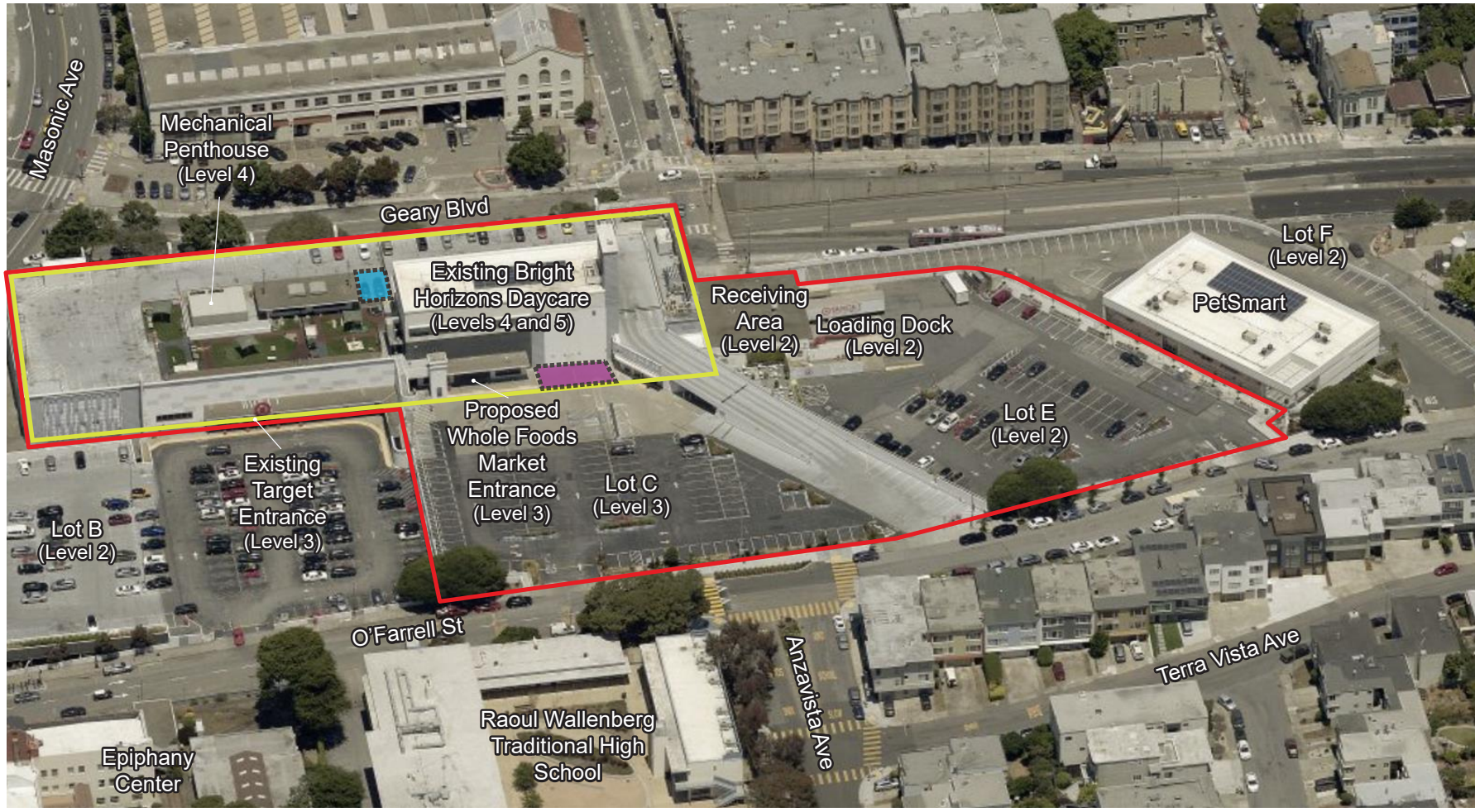


SOURCE: BRR Architecture, Inc

2675 Geary Boulevard Project

FIGURE 2

COOLING TOWER RELOCATION ALTERNATIVE (LEVEL 4)



SOURCE: Eagleview 2020

Whole Foods at 2675 Geary Boulevard Project

FIGURE 3

ALTERNATIVE B, NOISE EXPOSURE REDUCTION ALTERNATIVE - TALLER **COOLING TOWER ON LEVEL 3**

APPENDIX A

MECHANICAL EQUIPMENT NOISE CALCULATIONS

Project #	21-0548
Project Name:	2675 Geary Whole Foods
Date:	9/16/2022
Engineer:	NNS
Calc Title:	NEW Mech Outdoor at Outdoor Area Locations 1 & 2 (CT Level 3 Alt Location)
Notes	

Criterion	62.5	dB
Criterion	62.5	dB

CRITERION: From email 3/17/22, 62.5 dBA

Meets criterion

NEW Mech Outdoor at Outdoor Area Locations 1 & 2 (CT Level 3 Alt Location) Summary

	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dBA
CT-1	49	47	39	37	36	32	30	30	**41**
OSA-1	42	39	52	45	50	50	43	39	**55**
OSA-2	40	37	50	43	48	48	41	37	**52**
EF-2	26	26	26	26	26	26	26	26	**33**
EF-5	33	33	33	33	33	33	33	33	**40**
EF-10	24	24	24	24	24	24	24	24	**31**
Refrig. Rack	39	39	39	39	39	39	39	39	**46**
Summed	**50**	**48**	**55**	**48**	**53**	**53**	**46**	**44**	**57.5**

		63	125	250	500	1000	2000	4000	8000	dBA						
CT-1	PWL	103	101	93	91	90	86	84	84	95		Source Ht	23	ft	Mech Unit Length	12	ft
Evapco ESW4 9-46M12-L	Rathe	-40	-40	-40	-40	-40	-40	-40	-40			Source Dist	45	ft	Mech Unit Width	20	ft
	Barrier	-18	-18	-18	-18	-18	-18	-18	-18			Receiver Ht	21	ft	Total Distance	130	ft
												Receiver Dist	85	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	50	ft	(Building)		
	Total	49	47	39	37	36	32	30	30	**41**		Barrier Loss	17.5	dB			
OSA-1	PWL	84	78	92	87	88	87	80	76	93		Source Ht	13	ft	Mech Unit Length	3	ft
	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3								
Valent APD450												Source Dist	20	ft	Mech Unit Width	2	ft
	Rathe	-30	-30	-30	-30	-30	-30	-30	-30			Receiver Ht	5	ft	Total Distance	40	ft
	Barrier	-7	-7	-7	-7	-7	-7	-7	-7			Receiver Dist	20	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	42	39	52	45	50	50	43	39	**55**		Barrier Loss	6.9	dB			
OSA-2	PWL	84	78	92	87	88	87	80	76	93		Source Ht	13	ft	Mech Unit Length	3	ft
	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3								
Valent APD450												Source Dist	29	ft	Mech Unit Width	2	ft
	Rathe	-33	-33	-33	-33	-33	-33	-33	-33			Receiver Ht	5	ft	Total Distance	59	ft
	Barrier	-6	-6	-6	-6	-6	-6	-6	-6			Receiver Dist	30	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	40	37	50	43	48	48	41	37	**52**		Barrier Loss	6.3	dB			
EF-2	PWL	61	61	61	61	61	61	61	61	68		Source Ht	3	ft	Mech Unit Length	2	ft
USBI11DD	Rathe	-24	-24	-24	-24	-24	-24	-24	-24			Source Dist	4	ft	Mech Unit Width	2	ft
	Barrier	-15	-15	-15	-15	-15	-15	-15	-15			Receiver Ht	5	ft	Total Distance	20	ft
												Receiver Dist	16	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	10	ft			
	Total	26	26	26	26	26	26	26	26	**33**		Barrier Loss	15.0	dB			
EF-5	PWL	68	68	68	68	68	68	68	68	75		Source Ht	3	ft	Mech Unit Length	2	ft
USBI13DD	Rathe	-24	-24	-24	-24	-24	-24	-24	-24			Source Dist	4	ft	Mech Unit Width	2	ft
	Barrier	-15	-15	-15	-15	-15	-15	-15	-15			Receiver Ht	5	ft	Total Distance	20	ft
												Receiver Dist	16	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	10	ft			

	Total	33	33	33	33	33	33	33	33	**40**		Barrier Loss	15.0	dB			
EF-10	PWL	59	59	59	59	59	59	59	59	66		Source Ht	13	ft	Mech Unit Length	2	ft
0	Rathe	-32	-32	-32	-32	-32	-32	-32	-32			Source Dist	20	ft	Mech Unit Width	2	ft
	Barrier	-6	-6	-6	-6	-6	-6	-6	-6			Receiver Ht	5	ft	Total Distance	50	ft
												Receiver Dist	30	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	24	24	24	24	24	24	24	24	**31**		Barrier Loss	5.8	dB			
Refrig. Rack	PWL	76	76	76	76	76	76	76	76	83		Source Ht	5	ft	Mech Unit Length	15	ft
0	Rathe	-26	-26	-26	-26	-26	-26	-26	-26			Source Dist	5	ft	Mech Unit Width	5	ft
	Penthouse																
	Enclosure	-15	-15	-15	-15	-15	-15	-15	-15			Receiver Ht	5	ft	Total Distance	25	ft
												Receiver Dist	20	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	0	ft			
	Total	39	39	39	39	39	39	39	39	**46**		Barrier Loss	0.0	dB			

Project #	21-0548
Project Name:	2675 Geary Whole Foods
Date:	9/16/2022
Engineer:	NNS
Calc Title:	NEW Mech Outdoor at Outdoor Area Location 3 (CT Level 3 Alt Location)
Notes	

CRITERION: From email 3/17/22, 62.5 dBA

Criterion	62.5	dB
Criterion	62.5	dB

Meets criterion

NEW Mech Outdoor at Outdoor Area Location 3 (CT Level 3 Alt Location) Summary

	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dBA
CT-1	49	47	39	37	36	32	30	30	**41**
OSA-1	42	39	52	45	50	50	43	39	**54**
OSA-2	39	36	49	42	47	47	40	36	**52**
EF-2	26	26	26	26	26	26	26	26	**33**
EF-5	33	33	33	33	33	33	33	33	**40**
EF-10	24	24	24	24	24	24	24	24	**31**
Refrig. Rack	39	39	39	39	39	39	39	39	**46**
Summed	**50**	**48**	**54**	**48**	**52**	**52**	**46**	**43**	**56.8**

		63	125	250	500	1000	2000	4000	8000	dBA						
CT-1	PWL	103	101	93	91	90	86	84	84	95		Source Ht	23	ft	Mech Unit Length	12	ft
Evapco ESW4 9-46M12-L	Rathe	-40	-40	-40	-40	-40	-40	-40	-40			Source Dist	35	ft	Mech Unit Width	20	ft
	Barrier	-18	-18	-18	-18	-18	-18	-18	-18			Receiver Ht	21	ft	Total Distance	125	ft
												Receiver Dist	90	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	50	ft	(Building)		
	Total	49	47	39	37	36	32	30	30	**41**		Barrier Loss	17.6	dB			
OSA-1	PWL	84	78	92	87	88	87	80	76	93		Source Ht	13	ft	Mech Unit Length	3	ft
	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3								
Valent APD450												Source Dist	20	ft	Mech Unit Width	2	ft
	Rathe	-32	-32	-32	-32	-32	-32	-32	-32			Receiver Ht	5	ft	Total Distance	50	ft
	Barrier	-6	-6	-6	-6	-6	-6	-6	-6			Receiver Dist	30	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	42	39	52	45	50	50	43	39	**54**		Barrier Loss	5.8	dB			
OSA-2	PWL	84	78	92	87	88	87	80	76	93		Source Ht	13	ft	Mech Unit Length	3	ft
	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3								
Valent APD450												Source Dist	29	ft	Mech Unit Width	2	ft
	Rathe	-34	-34	-34	-34	-34	-34	-34	-34			Receiver Ht	5	ft	Total Distance	69	ft
	Barrier	-6	-6	-6	-6	-6	-6	-6	-6			Receiver Dist	40	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	39	36	49	42	47	47	40	36	**52**		Barrier Loss	5.8	dB			
EF-2	PWL	61	61	61	61	61	61	61	61	68		Source Ht	3	ft	Mech Unit Length	2	ft
USBI11DD	Rathe	-24	-24	-24	-24	-24	-24	-24	-24			Source Dist	4	ft	Mech Unit Width	2	ft
	Barrier	-15	-15	-15	-15	-15	-15	-15	-15			Receiver Ht	5	ft	Total Distance	20	ft
												Receiver Dist	16	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	10	ft			
	Total	26	26	26	26	26	26	26	26	**33**		Barrier Loss	15.0	dB			
EF-5	PWL	68	68	68	68	68	68	68	68	75		Source Ht	3	ft	Mech Unit Length	2	ft
USBI13DD	Rathe	-24	-24	-24	-24	-24	-24	-24	-24			Source Dist	4	ft	Mech Unit Width	2	ft
	Barrier	-15	-15	-15	-15	-15	-15	-15	-15			Receiver Ht	5	ft	Total Distance	20	ft
												Receiver Dist	16	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	10	ft			

	Total	33	33	33	33	33	33	33	33	**40**		Barrier Loss	15.0	dB			
EF-10	PWL	59	59	59	59	59	59	59	59	66		Source Ht	13	ft	Mech Unit Length	2	ft
0	Rathe	-32	-32	-32	-32	-32	-32	-32	-32			Source Dist	20	ft	Mech Unit Width	2	ft
	Barrier	-6	-6	-6	-6	-6	-6	-6	-6			Receiver Ht	5	ft	Total Distance	50	ft
												Receiver Dist	30	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	24	24	24	24	24	24	24	24	**31**		Barrier Loss	5.8	dB			
Refrig. Rack	PWL	76	76	76	76	76	76	76	76	83		Source Ht	5	ft	Mech Unit Length	15	ft
0	Rathe	-26	-26	-26	-26	-26	-26	-26	-26			Source Dist	5	ft	Mech Unit Width	5	ft
	Penthouse																
	Enclosure	-15	-15	-15	-15	-15	-15	-15	-15			Receiver Ht	5	ft	Total Distance	25	ft
												Receiver Dist	20	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	0	ft			
	Total	39	39	39	39	39	39	39	39	**46**		Barrier Loss	0.0	dB			

Project #	21-0548
Project Name:	2675 Geary Whole Foods
Date:	9/16/2022
Engineer:	NNS
Calc Title:	NEW Mech Outdoor at Outdoor Area Location 4 (CT Level 3 Alt Location)
Notes	

CRITERION: From email 3/17/22, 62.5 dBA

Criterion	62.5	dB
Criterion	62.5	dB

Meets criterion

NEW Mech Outdoor at Outdoor Area Location 4 (CT Level 3 Alt Location) Summary

	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dBA
CT-1	64	62	54	52	51	47	45	45	**56**
OSA-1	40	37	50	43	48	48	41	37	**53**
OSA-2	38	35	48	41	46	46	39	35	**51**
EF-2	20	20	20	20	20	20	20	20	**27**
EF-5	27	27	27	27	27	27	27	27	**34**
EF-10	22	22	22	22	22	22	22	22	**29**
Refrig. Rack	34	34	34	34	34	34	34	34	**41**
Summed	**64**	**62**	**56**	**53**	**54**	**52**	**48**	**47**	**59**

		63	125	250	500	1000	2000	4000	8000	dBA						
CT-1	PWL	103	101	93	91	90	86	84	84	95		Source Ht	23	ft	Mech Unit Length	12	ft
Evapco ESW4 9-46M12-L	Rathe	-39	-39	-39	-39	-39	-39	-39	-39			Source Dist	93	ft	Mech Unit Width	20	ft
	Barrier	-3	-3	-3	-3	-3	-3	-3	-3			Receiver Ht	21	ft	Total Distance	118	ft
												Receiver Dist	25	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	19	ft	(Parapet)		
	Total	64	62	54	52	51	47	45	45	**56**		Barrier Loss	2.6	dB			
OSA-1	PWL	84	78	92	87	88	87	80	76	93		Source Ht	13	ft	Mech Unit Length	3	ft
	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3								
Valent APD450												Source Dist	20	ft	Mech Unit Width	2	ft
	Rathe	-33	-33	-33	-33	-33	-33	-33	-33			Receiver Ht	5	ft	Total Distance	60	ft
	Barrier	-5	-5	-5	-5	-5	-5	-5	-5			Receiver Dist	40	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	40	37	50	43	48	48	41	37	**53**		Barrier Loss	5.3	dB			
OSA-2	PWL	84	78	92	87	88	87	80	76	93		Source Ht	13	ft	Mech Unit Length	3	ft
	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3								
Valent APD450												Source Dist	29	ft	Mech Unit Width	2	ft
	Rathe	-36	-36	-36	-36	-36	-36	-36	-36			Receiver Ht	5	ft	Total Distance	79	ft
	Barrier	-5	-5	-5	-5	-5	-5	-5	-5			Receiver Dist	50	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	38	35	48	41	46	46	39	35	**51**		Barrier Loss	5.5	dB			
EF-2	PWL	61	61	61	61	61	61	61	61	68		Source Ht	3	ft	Mech Unit Length	2	ft
USBI11DD	Rathe	-29	-29	-29	-29	-29	-29	-29	-29			Source Dist	4	ft	Mech Unit Width	2	ft
	Barrier	-15	-15	-15	-15	-15	-15	-15	-15			Receiver Ht	5	ft	Total Distance	39	ft
												Receiver Dist	35	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	10	ft			
	Total	20	20	20	20	20	20	20	20	**27**		Barrier Loss	14.8	dB			
EF-5	PWL	68	68	68	68	68	68	68	68	75		Source Ht	3	ft	Mech Unit Length	2	ft
USBI13DD	Rathe	-29	-29	-29	-29	-29	-29	-29	-29			Source Dist	4	ft	Mech Unit Width	2	ft
	Barrier	-15	-15	-15	-15	-15	-15	-15	-15			Receiver Ht	5	ft	Total Distance	39	ft
												Receiver Dist	35	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	10	ft			

	Total	27	27	27	27	27	27	27	27	**34**		Barrier Loss	14.8	dB			
EF-10	PWL	59	59	59	59	59	59	59	59	66		Source Ht	13	ft	Mech Unit Length	2	ft
0	Rathe	-35	-35	-35	-35	-35	-35	-35	-35			Source Dist	20	ft	Mech Unit Width	2	ft
	Barrier	-5	-5	-5	-5	-5	-5	-5	-5			Receiver Ht	5	ft	Total Distance	70	ft
												Receiver Dist	50	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	22	22	22	22	22	22	22	22	**29**		Barrier Loss	5.0	dB			
Refrig. Rack	PWL	76	76	76	76	76	76	76	76	83		Source Ht	5	ft	Mech Unit Length	15	ft
0	Rathe	-31	-31	-31	-31	-31	-31	-31	-31			Source Dist	5	ft	Mech Unit Width	5	ft
	Penthouse																
	Enclosure	-15	-15	-15	-15	-15	-15	-15	-15			Receiver Ht	5	ft	Total Distance	45	ft
												Receiver Dist	40	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	0	ft			
	Total	34	34	34	34	34	34	34	34	**41**		Barrier Loss	0.0	dB			

Project #	21-0548
Project Name:	2675 Geary Whole Foods
Date:	9/16/2022
Engineer:	NNS
Calc Title:	NEW Mech Outdoor at Residence (at LT-1, Geary & Presidio) (CT L3 Alt Location)
Notes	SF Police Code - Residential interior limit - 45 dBA at night inside the nearest residence

Criterion	45	dB
Criterion	45	dB

Meets criterion

NEW Mech Outdoor at Residence (at LT-1, Geary & Presidio) (CT L3 Alt Location) Summary

	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dBA
CT-1	31	29	21	19	18	14	12	12	**23**
OSA-1	16	13	26	19	24	24	17	13	**29**
OSA-2	16	13	26	19	24	24	17	13	**29**
EF-2	-1	-1	-1	-1	-1	-1	-1	-1	**6**
EF-5	6	6	6	6	6	6	6	6	**13**
EF-10	-1	-1	-1	-1	-1	-1	-1	-1	**6**
Refrig. Rack	0	0	0	0	0	0	0	0	**7**
Summed	**31**	**29**	**30**	**24**	**28**	**27**	**21**	**18**	**33**

		63	125	250	500	1000	2000	4000	8000	dBA							
CT-1	PWL	103	101	93	91	90	86	84	84	95		Source Ht	63	ft	Mech Unit Length	12	ft
Evapco ESW4 9-46M12-L	Rathe	-47	-47	-47	-47	-47	-47	-47	-47			Source Dist	20	ft	Mech Unit Width	20	ft
	Barrier	-18	-18	-18	-18	-18	-18	-18	-18			Receiver Ht	30	ft	Total Distance	300	ft
	WINDOW LOSS	-10	-10	-10	-10	-10	-10	-10	-10			Receiver Dist	280	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	90	ft	(Building)		
	Total	31	29	21	19	18	14	12	12	**23**		Barrier Loss	18.0	dB			
OSA-1	PWL	84	78	92	87	88	87	80	76	93		Source Ht	68	ft	Mech Unit Length	3	ft
	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3								
Valent APD450												Source Dist	110	ft	Mech Unit Width	2	ft
	Rathe	-48	-48	-48	-48	-48	-48	-48	-48			Receiver Ht	30	ft	Total Distance	320	ft
	Barrier	-5	-5	-5	-5	-5	-5	-5	-5			Receiver Dist	210	ft			
	OPEN WINDOW LOSS	-10	-10	-10	-10	-10	-10	-10	-10								
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	16	13	26	19	24	24	17	13	**29**		Barrier Loss	5.0	dB			
OSA-2	PWL	84	78	92	87	88	87	80	76	93		Source Ht	68	ft	Mech Unit Length	3	ft
	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3								
Valent APD450												Source Dist	110	ft	Mech Unit Width	2	ft
	Rathe	-48	-48	-48	-48	-48	-48	-48	-48			Receiver Ht	30	ft	Total Distance	320	ft
	Barrier	-5	-5	-5	-5	-5	-5	-5	-5			Receiver Dist	210	ft			
	OPEN WINDOW LOSS	-10	-10	-10	-10	-10	-10	-10	-10								
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	16	13	26	19	24	24	17	13	**29**		Barrier Loss	5.0	dB			
EF-2	PWL	61	61	61	61	61	61	61	61	68		Source Ht	58	ft	Mech Unit Length	2	ft
USBI11DD	Rathe	-47	-47	-47	-47	-47	-47	-47	-47			Source Dist	120	ft	Mech Unit Width	2	ft
	Barrier	-8	-8	-8	-8	-8	-8	-8	-8			Receiver Ht	30	ft	Total Distance	300	ft
	WINDOW LOSS	-10	-10	-10	-10	-10	-10	-10	-10			Receiver Dist	180	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	-1	-1	-1	-1	-1	-1	-1	-1	**6**		Barrier Loss	8.2	dB			
EF-5	PWL	68	68	68	68	68	68	68	68	75		Source Ht	58	ft	Mech Unit Length	2	ft
USBI13DD	Rathe	-47	-47	-47	-47	-47	-47	-47	-47			Source Dist	120	ft	Mech Unit Width	2	ft
	Barrier	-8	-8	-8	-8	-8	-8	-8	-8			Receiver Ht	30	ft	Total Distance	300	ft

	WINDOW LOSS	-10	-10	-10	-10	-10	-10	-10	-10			Receiver Dist	180	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	6	6	6	6	6	6	6	6	**13**		Barrier Loss	8.2	dB			
EF-10	PWL	59	59	59	59	59	59	59	59	66		Source Ht	68	ft	Mech Unit Length	2	ft
0	Rathe	-48	-48	-48	-48	-48	-48	-48	-48			Source Dist	110	ft	Mech Unit Width	2	ft
	Barrier	-5	-5	-5	-5	-5	-5	-5	-5			Receiver Ht	30	ft	Total Distance	320	ft
	WINDOW LOSS	-10	-10	-10	-10	-10	-10	-10	-10			Receiver Dist	210	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	-1	-1	-1	-1	-1	-1	-1	-1	**6**		Barrier Loss	5.0	dB			
Refrig. Rack	PWL	76	76	76	76	76	76	76	76	83		Source Ht	60	ft	Mech Unit Length	15	ft
0	Rathe	-48	-48	-48	-48	-48	-48	-48	-48			Source Dist	110	ft	Mech Unit Width	5	ft
	Penthouse Enclosure	-15	-15	-15	-15	-15	-15	-15	-15			Receiver Ht	30	ft	Total Distance	320	ft
	Barrier	-7	-7	-7	-7	-7	-7	-7	-7								
	WINDOW LOSS	-10	-10	-10	-10	-10	-10	-10	-10			Receiver Dist	210	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	0	0	0	0	0	0	0	0	**7**		Barrier Loss	6.9	dB			

Project # 21-0548
Project Name: 2675 Geary Whole Foods
Date: 9/16/2022
Engineer: NNS
Calc Title: NEW Mech Outdoor at Residence (O'Farrell St & Anzavista Ave, 300-314 Anzavista Ave) (CT L3 Alt Location)
Notes SF Police Code - Commercial Noise Limit - 8 dB increase above ambient. Ambient at LT-3 (min L90): 46 dBA. Limit is 54 dBA.
Evaluated at south property plane.

Criterion	54	dB
Criterion	54	dB

Meets criterion

NEW Mech Outdoor at Residence (O'Farrell St & Anzavista Ave, 300-314 Anzavista Ave) (CT L3 Alt Location) Summary

	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dBA
CT-1	48	46	38	36	35	31	29	29	**40**
OSA-1	16	13	26	19	24	24	17	13	**29**
OSA-2	16	13	26	19	24	24	17	13	**29**
EF-2	-2	-2	-2	-2	-2	-2	-2	-2	**5**
EF-5	5	5	5	5	5	5	5	5	**12**
EF-10	-1	-1	-1	-1	-1	-1	-1	-1	**6**
Refrig. Rack	4	4	4	4	4	4	4	4	**11**
Summed	**48**	**46**	**39**	**36**	**36**	**33**	**30**	**29**	**41**

		63	125	250	500	1000	2000	4000	8000	dBA							
CT-1	PWL	103	101	93	91	90	86	84	84	95		Source Ht	23	ft	Mech Unit Length	12	ft
Evapco ESW4 9-46M12-LI	Rathe	-48	-48	-48	-48	-48	-48	-48	-48			Source Dist	0	ft	Mech Unit Width	20	ft
	Barrier	0	0	0	0	0	0	0	0			Receiver Ht	20	ft	Total Distance	320	ft
	WINDOW LOSS	-10	-10	-10	-10	-10	-10	-10	-10			Receiver Dist	320	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	0	ft			
	Total	48	46	38	36	35	31	29	29	**40**		Barrier Loss	0.0	dB			
OSA-1	PWL	84	78	92	87	88	87	80	76	93		Source Ht	68	ft	Mech Unit Length	3	ft
	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3								
Valent APD450												Source Dist	60	ft	Mech Unit Width	2	ft
	Rathe	-50	-50	-50	-50	-50	-50	-50	-50			Receiver Ht	5	ft	Total Distance	430	ft
	Barrier	-2	-2	-2	-2	-2	-2	-2	-2			Receiver Dist	370	ft			
	OPEN WINDOW LOSS	-10	-10	-10	-10	-10	-10	-10	-10								
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	16	13	26	19	24	24	17	13	**29**		Barrier Loss	2.3	dB			
OSA-2	PWL	84	78	92	87	88	87	80	76	93		Source Ht	68	ft	Mech Unit Length	3	ft
	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3								
Valent APD450												Source Dist	60	ft	Mech Unit Width	2	ft
	Rathe	-50	-50	-50	-50	-50	-50	-50	-50			Receiver Ht	5	ft	Total Distance	430	ft
	Barrier	-2	-2	-2	-2	-2	-2	-2	-2			Receiver Dist	370	ft			
	OPEN WINDOW LOSS	-10	-10	-10	-10	-10	-10	-10	-10								
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	16	13	26	19	24	24	17	13	**29**		Barrier Loss	2.3	dB			
EF-2	PWL	61	61	61	61	61	61	61	61	68		Source Ht	58	ft	Mech Unit Length	2	ft
USBI11DD	Rathe	-50	-50	-50	-50	-50	-50	-50	-50			Source Dist	50	ft	Mech Unit Width	2	ft
	Barrier	-6	-6	-6	-6	-6	-6	-6	-6			Receiver Ht	5	ft	Total Distance	430	ft
	WINDOW LOSS	-10	-10	-10	-10	-10	-10	-10	-10			Receiver Dist	380	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	-2	-2	-2	-2	-2	-2	-2	-2	**5**		Barrier Loss	6.1	dB			
EF-5	PWL	68	68	68	68	68	68	68	68	75		Source Ht	58	ft	Mech Unit Length	2	ft
USBI13DD	Rathe	-50	-50	-50	-50	-50	-50	-50	-50			Source Dist	50	ft	Mech Unit Width	2	ft
	Barrier	-6	-6	-6	-6	-6	-6	-6	-6			Receiver Ht	5	ft	Total Distance	430	ft

	WINDOW LOSS	-10	-10	-10	-10	-10	-10	-10	-10			Receiver Dist	380	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	5	5	5	5	5	5	5	5	**12**		Barrier Loss	6.1	dB			
EF-10	PWL	59	59	59	59	59	59	59	59	66		Source Ht	68	ft	Mech Unit Length	2	ft
0	Rathe	-50	-50	-50	-50	-50	-50	-50	-50			Source Dist	60	ft	Mech Unit Width	2	ft
	Barrier	-2	-2	-2	-2	-2	-2	-2	-2			Receiver Ht	5	ft	Total Distance	430	ft
	WINDOW LOSS	-10	-10	-10	-10	-10	-10	-10	-10			Receiver Dist	370	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	-1	-1	-1	-1	-1	-1	-1	-1	**6**		Barrier Loss	2.3	dB			
Refrig. Rack	PWL	76	76	76	76	76	76	76	76	83		Source Ht	60	ft	Mech Unit Length	15	ft
0	Rathe	-50	-50	-50	-50	-50	-50	-50	-50			Source Dist	60	ft	Mech Unit Width	5	ft
	Penthouse Enclosure	-15	-15	-15	-15	-15	-15	-15	-15			Receiver Ht	5	ft	Total Distance	430	ft
	WINDOW LOSS	-10	-10	-10	-10	-10	-10	-10	-10			Receiver Dist	370	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	4	4	4	4	4	4	4	4	**11**		Barrier Loss	5.9	dB			

Project #	21-0548
Project Name:	2675 Geary Whole Foods
Date:	9/16/2022
Engineer:	NNS
Calc Title:	NEW Mech Outdoor Beyond Property Plane North (CT L3 Alt Location)
Notes	SF Police Code - Commercial Noise Limit - 8 dB increase above ambient. Ambient at LT-1 (min L90): 47 dBA. Limit is 55 dBA. Evaluated at north edge of building roof.

Criterion	55	dB
Criterion	55	dB

Meets criterion

Exceeds criterion

NEW Mech Outdoor Beyond Property Plane North (CT L3 Alt Location) Summary

	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dBA
CT-1	48	46	38	36	35	31	29	29	**40**
OSA-1	42	39	52	45	50	50	43	39	**55**
OSA-1 (Casing	40	33	40	33	34	26	17	14	**37**
OSA-2	40	37	50	43	48	48	41	37	**53**
OSA-2 (Casing	37	30	37	30	31	23	14	11	**35**
EF-2	20	20	20	20	20	20	20	20	**27**
EF-5	27	27	27	27	27	27	27	27	**34**
EF-10	23	23	23	23	23	23	23	23	**30**
Refrig. Rack	33	33	33	33	33	33	33	33	**40**
Summed	**50**	**48**	**54**	**48**	**52**	**52**	**46**	**42**	**57**

		63	125	250	500	1000	2000	4000	8000	dBA						
CT-1	PWL	103	101	93	91	90	86	84	84	95		Source Ht	23	ft	Mech Unit Length	12	ft
Evapco ESW4 9-46M12-L	Rathe	-41	-41	-41	-41	-41	-41	-41	-41			Source Dist	40	ft	Mech Unit Width	20	ft
	Barrier	-18	-18	-18	-18	-18	-18	-18	-18			Receiver Ht	21	ft	Total Distance	140	ft
												Receiver Dist	100	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	50	ft	(Building)		
	Total	48	46	38	36	35	31	29	29	**40**		Barrier Loss	17.5	dB			
OSA-1	PWL	84	78	92	87	88	87	80	76	93		Source Ht	13	ft	Mech Unit Length	3	ft
	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3								
Valent APD450												Source Dist	9	ft	Mech Unit Width	2	ft
	Rathe	-32	-32	-32	-32	-32	-32	-32	-32			Receiver Ht	5	ft	Total Distance	54	ft
	Barrier	-5	-5	-5	-5	-5	-5	-5	-5			Receiver Dist	45	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	42	39	52	45	50	50	43	39	**55**		Barrier Loss	4.7	dB			
OSA-1 (Casing Radiated)	PWL	83	76	83	76	77	69	60	57	80		Source Ht	13	ft	Mech Unit Length	3	ft
Valent APD450												Source Dist	9	ft	Mech Unit Width	2	ft
	Rathe	-32	-32	-32	-32	-32	-32	-32	-32			Receiver Ht	5	ft	Total Distance	54	ft
	Penthouse																
	Louver & Wall	-14	-14	-14	-14	-14	-14	-14	-14			Receiver Dist	45	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	0	ft			
	Total	40	33	40	33	34	26	17	14	**37**		Barrier Loss	0.0	dB			
OSA-2	PWL	84	78	92	87	88	87	80	76	93		Source Ht	13	ft	Mech Unit Length	3	ft
	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3								
Valent APD450												Source Dist	10	ft	Mech Unit Width	2	ft
	Rathe	-35	-35	-35	-35	-35	-35	-35	-35			Receiver Ht	5	ft	Total Distance	70	ft
	Barrier	-5	-5	-5	-5	-5	-5	-5	-5			Receiver Dist	60	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	40	37	50	43	48	48	41	37	**53**		Barrier Loss	4.6	dB			
OSA-2 (Casing Radiated)	PWL	83	76	83	76	77	69	60	57	80		Source Ht	13	ft	Mech Unit Length	3	ft

Valent APD450												Source Dist	10	ft	Mech Unit Width	2	ft
	Rathe	-35	-35	-35	-35	-35	-35	-35	-35			Receiver Ht	5	ft	Total Distance	70	ft
	Penthouse																
	Louver & Wall	-14	-14	-14	-14	-14	-14	-14	-14			Receiver Dist	60	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	0	ft			
	Total	37	30	37	30	31	23	14	11	**35**		Barrier Loss	0.0	dB			
EF-2	PWL	61	61	61	61	61	61	61	61	68		Source Ht	5	ft	Mech Unit Length	2	ft
USBI11DD	Rathe	-34	-34	-34	-34	-34	-34	-34	-34			Source Dist	20	ft	Mech Unit Width	2	ft
	Barrier	-10	-10	-10	-10	-10	-10	-10	-10			Receiver Ht	5	ft	Total Distance	65	ft
												Receiver Dist	45	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	10	ft			
	Total	20	20	20	20	20	20	20	20	**27**		Barrier Loss	10.1	dB			
EF-5	PWL	68	68	68	68	68	68	68	68	75		Source Ht	5	ft	Mech Unit Length	2	ft
USBI13DD	Rathe	-34	-34	-34	-34	-34	-34	-34	-34			Source Dist	20	ft	Mech Unit Width	2	ft
	Barrier	-10	-10	-10	-10	-10	-10	-10	-10			Receiver Ht	5	ft	Total Distance	65	ft
												Receiver Dist	45	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	10	ft			
	Total	27	27	27	27	27	27	27	27	**34**		Barrier Loss	10.1	dB			
EF-10	PWL	59	59	59	59	59	59	59	59	66		Source Ht	13	ft	Mech Unit Length	2	ft
0	Rathe	-34	-34	-34	-34	-34	-34	-34	-34			Source Dist	12	ft	Mech Unit Width	2	ft
	Barrier	-5	-5	-5	-5	-5	-5	-5	-5			Receiver Ht	5	ft	Total Distance	67	ft
												Receiver Dist	55	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	23	23	23	23	23	23	23	23	**30**		Barrier Loss	4.9	dB			
Refrig. Rack	PWL	76	76	76	76	76	76	76	76	83		Source Ht	5	ft	Mech Unit Length	15	ft
0	Rathe	-33	-33	-33	-33	-33	-33	-33	-33			Source Dist	0	ft	Mech Unit Width	5	ft
	Penthouse																
	Louver & Wall	-14	-14	-14	-14	-14	-14	-14	-14			Receiver Ht	5	ft	Total Distance	55	ft
	Barrier	0	0	0	0	0	0	0	0			Receiver Dist	55	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	0	ft			
	Total	33	33	33	33	33	33	33	33	**40**		Barrier Loss	0.0	dB			

Project # 21-0548
Project Name: 2675 Geary Whole Foods
Date: 9/16/2022
Engineer: NNS
Calc Title: NEW Mech Outdoor Beyond Property Plane North, OSA Noise Reduction (CT L3 Alt Location)
Notes SF Police Code - Commercial Noise Limit - 8 dB increase above ambient. Ambient at LT-1 (min L90): 47 dBA. Limit is 55 dBA.
Evaluated at north edge of building roof.

Criterion	55	dB
Criterion	55	dB

Meets criterion

NEW Mech Outdoor Beyond Property Plane North, OSA Noise Reduction (CT L3 Alt Location) Summary

	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dBA
CT-1	48	46	38	36	35	31	29	29	**40**
OSA-1	41	38	49	39	38	41	35	31	**46**
OSA-1 (Casing	40	33	40	33	34	26	17	14	**37**
OSA-2	39	36	47	37	36	39	33	29	**44**
OSA-2 (Casing	37	30	37	30	31	23	14	11	**35**
EF-2	20	20	20	20	20	20	20	20	**27**
EF-5	27	27	27	27	27	27	27	27	**34**
EF-10	23	23	23	23	23	23	23	23	**30**
Refrig. Rack	33	33	33	33	33	33	33	33	**40**
Summed	**50**	**47**	**52**	**44**	**43**	**44**	**39**	**38**	**50**

		63	125	250	500	1000	2000	4000	8000	dBA							
CT-1	PWL	103	101	93	91	90	86	84	84	95		Source Ht	23	ft	Mech Unit Length	12	ft
Evapco ESW4 9-46M12-L	Rathe	-41	-41	-41	-41	-41	-41	-41	-41			Source Dist	40	ft	Mech Unit Width	20	ft
	Barrier	-18	-18	-18	-18	-18	-18	-18	-18			Receiver Ht	21	ft	Total Distance	140	ft
												Receiver Dist	100	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	50	ft	(Building)		
	Total	48	46	38	36	35	31	29	29	**40**		Barrier Loss	17.5	dB			
OSA-1	PWL	84	78	92	87	88	87	80	76	93		Source Ht	13	ft	Mech Unit Length	3	ft
	5 ft Lined Duct & End Reflection	-9	-6	-9	-14	-16	-12	-11	-11								
Valent APD450												Source Dist	9	ft	Mech Unit Width	2	ft
	Rathe	-32	-32	-32	-32	-32	-32	-32	-32			Receiver Ht	5	ft	Total Distance	54	ft
	Barrier	-5	-5	-5	-5	-5	-5	-5	-5			Receiver Dist	45	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	41	38	49	39	38	41	35	31	**46**		Barrier Loss	4.7	dB			
OSA-1 (Casing Radiated)	PWL	83	76	83	76	77	69	60	57	80		Source Ht	13	ft	Mech Unit Length	3	ft
Valent APD450												Source Dist	9	ft	Mech Unit Width	2	ft
	Rathe	-32	-32	-32	-32	-32	-32	-32	-32			Receiver Ht	5	ft	Total Distance	54	ft
	Penthouse Louver & Wall	-14	-14	-14	-14	-14	-14	-14	-14			Receiver Dist	45	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	0	ft			
	Total	40	33	40	33	34	26	17	14	**37**		Barrier Loss	0.0	dB			
OSA-2	PWL	84	78	92	87	88	87	80	76	93		Source Ht	13	ft	Mech Unit Length	3	ft
	5 ft Lined Duct & End Reflection	-9	-6	-9	-14	-16	-12	-11	-11								
Valent APD450												Source Dist	10	ft	Mech Unit Width	2	ft
	Rathe	-35	-35	-35	-35	-35	-35	-35	-35			Receiver Ht	5	ft	Total Distance	70	ft
	Barrier	-5	-5	-5	-5	-5	-5	-5	-5			Receiver Dist	60	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	39	36	47	37	36	39	33	29	**44**		Barrier Loss	4.6	dB			

OSA-2 (Casing Radiated)	PWL	83	76	83	76	77	69	60	57	80		Source Ht	13	ft	Mech Unit Length	3	ft
Valent APD450												Source Dist	10	ft	Mech Unit Width	2	ft
	Rathe	-35	-35	-35	-35	-35	-35	-35	-35			Receiver Ht	5	ft	Total Distance	70	ft
	Penthouse																
	Louver & Wall	-14	-14	-14	-14	-14	-14	-14	-14			Receiver Dist	60	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	0	ft			
	Total	37	30	37	30	31	23	14	11	**35**		Barrier Loss	0.0	dB			

EF-2	PWL	61	61	61	61	61	61	61	61	68		Source Ht	5	ft	Mech Unit Length	2	ft
USBI11DD	Rathe	-34	-34	-34	-34	-34	-34	-34	-34			Source Dist	20	ft	Mech Unit Width	2	ft
	Barrier	-10	-10	-10	-10	-10	-10	-10	-10			Receiver Ht	5	ft	Total Distance	65	ft
												Receiver Dist	45	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	10	ft			
	Total	20	20	20	20	20	20	20	20	**27**		Barrier Loss	10.1	dB			

EF-5	PWL	68	68	68	68	68	68	68	68	75		Source Ht	5	ft	Mech Unit Length	2	ft
USBI13DD	Rathe	-34	-34	-34	-34	-34	-34	-34	-34			Source Dist	20	ft	Mech Unit Width	2	ft
	Barrier	-10	-10	-10	-10	-10	-10	-10	-10			Receiver Ht	5	ft	Total Distance	65	ft
												Receiver Dist	45	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	10	ft			
	Total	27	27	27	27	27	27	27	27	**34**		Barrier Loss	10.1	dB			

EF-10	PWL	59	59	59	59	59	59	59	59	66		Source Ht	13	ft	Mech Unit Length	2	ft
0	Rathe	-34	-34	-34	-34	-34	-34	-34	-34			Source Dist	12	ft	Mech Unit Width	2	ft
	Barrier	-5	-5	-5	-5	-5	-5	-5	-5			Receiver Ht	5	ft	Total Distance	67	ft
												Receiver Dist	55	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	23	23	23	23	23	23	23	23	**30**		Barrier Loss	4.9	dB			

Refrig. Rack	PWL	76	76	76	76	76	76	76	76	83		Source Ht	5	ft	Mech Unit Length	15	ft
0	Rathe	-33	-33	-33	-33	-33	-33	-33	-33			Source Dist	0	ft	Mech Unit Width	5	ft
	Penthouse																
	Louver & Wall	-14	-14	-14	-14	-14	-14	-14	-14			Receiver Ht	5	ft	Total Distance	55	ft
	Barrier	0	0	0	0	0	0	0	0			Receiver Dist	55	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	0	ft			
	Total	33	33	33	33	33	33	33	33	**40**		Barrier Loss	0.0	dB			

Project #	21-0548
Project Name:	2675 Geary Whole Foods
Date:	9/16/2022
Engineer:	NNS
Calc Title:	NEW Mech Outdoor Beyond Property Plane West (CT L3 Alt Location)

Criterion		53	dB
Criterion		53	dB

Notes SF Police Code - Commercial Noise Limit - 8 dB increase above ambient. Ambient at LT-2 (min L90): 42 dBA. Minimum ambient: 45 dBA. Limit is 53 dBA. Evaluated at west property plane.

Meets criterion

NEW Mech Outdoor Beyond Property Plane West (CT L3 Alt Location) Summary

	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dBA
CT-1	48	46	38	36	35	31	29	29	**40**
OSA-1	19	16	29	22	27	27	20	16	**31**
OSA-2	20	17	30	23	28	28	21	17	**33**
EF-2	1	1	1	1	1	1	1	1	**8**
EF-5	8	8	8	8	8	8	8	8	**15**
EF-10	2	2	2	2	2	2	2	2	**9**
Refrig. Rack	2	2	2	2	2	2	2	2	**9**
Summed	**48**	**46**	**39**	**36**	**36**	**34**	**30**	**30**	**41**

		63	125	250	500	1000	2000	4000	8000	dBA							
CT-1	PWL	103	101	93	91	90	86	84	84	95		Source Ht	57	ft	Mech Unit Length	12	ft
Evapco ESW4 9-46M12-L	Rathe	-54	-54	-54	-54	-54	-54	-54	-54			Source Dist	400	ft	Mech Unit Width	20	ft
	Barrier	-4	-4	-4	-4	-4	-4	-4	-4			Receiver Ht	5	ft	Total Distance	650	ft
												Receiver Dist	250	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	20	ft			
	Total	48	46	38	36	35	31	29	29	**40**		Barrier Loss	4.0	dB			
OSA-1	PWL	84	78	92	87	88	87	80	76	93		Source Ht	68	ft	Mech Unit Length	3	ft
	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3								
Valent APD450												Source Dist	195	ft	Mech Unit Width	2	ft
	Rathe	-52	-52	-52	-52	-52	-52	-52	-52			Receiver Ht	5	ft	Total Distance	495	ft
	Barrier	-9	-9	-9	-9	-9	-9	-9	-9			Receiver Dist	300	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	19	16	29	22	27	27	20	16	**31**		Barrier Loss	8.8	dB			
OSA-2	PWL	84	78	92	87	88	87	80	76	93		Source Ht	68	ft	Mech Unit Length	3	ft
	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3								
Valent APD450												Source Dist	170	ft	Mech Unit Width	2	ft
	Rathe	-51	-51	-51	-51	-51	-51	-51	-51			Receiver Ht	5	ft	Total Distance	470	ft
	Barrier	-8	-8	-8	-8	-8	-8	-8	-8			Receiver Dist	300	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	20	17	30	23	28	28	21	17	**33**		Barrier Loss	8.1	dB			
EF-2	PWL	61	61	61	61	61	61	61	61	68		Source Ht	58	ft	Mech Unit Length	2	ft
USBI11DD	Rathe	-52	-52	-52	-52	-52	-52	-52	-52			Source Dist	220	ft	Mech Unit Width	2	ft
	Barrier	-12	-12	-12	-12	-12	-12	-12	-12			Receiver Ht	5	ft	Total Distance	520	ft
												Receiver Dist	300	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	1	1	1	1	1	1	1	1	**8**		Barrier Loss	11.6	dB			
EF-5	PWL	68	68	68	68	68	68	68	68	75		Source Ht	58	ft	Mech Unit Length	2	ft
USBI13DD	Rathe	-52	-52	-52	-52	-52	-52	-52	-52			Source Dist	220	ft	Mech Unit Width	2	ft
	Barrier	-12	-12	-12	-12	-12	-12	-12	-12			Receiver Ht	5	ft	Total Distance	520	ft
												Receiver Dist	300	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			

	Total	8	8	8	8	8	8	8	8	**15**		Barrier Loss	11.6	dB			
EF-10	PWL	59	59	59	59	59	59	59	59	66		Source Ht	68	ft	Mech Unit Length	2	ft
0	Rathe	-51	-51	-51	-51	-51	-51	-51	-51			Source Dist	180	ft	Mech Unit Width	2	ft
	Barrier	-8	-8	-8	-8	-8	-8	-8	-8			Receiver Ht	5	ft	Total Distance	480	ft
												Receiver Dist	300	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	2	2	2	2	2	2	2	2	**9**		Barrier Loss	8.3	dB			
Refrig. Rack	PWL	76	76	76	76	76	76	76	76	83		Source Ht	60	ft	Mech Unit Length	15	ft
0	Rathe	-52	-52	-52	-52	-52	-52	-52	-52			Source Dist	205	ft	Mech Unit Width	5	ft
	Penthouse																
	Enclosure	-15	-15	-15	-15	-15	-15	-15	-15			Receiver Ht	5	ft	Total Distance	505	ft
	Barrier	-11	-11	-11	-11	-11	-11	-11	-11			Receiver Dist	300	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	2	2	2	2	2	2	2	2	**9**		Barrier Loss	11.0	dB			

Project #	21-0548
Project Name:	2675 Geary Whole Foods
Date:	9/16/2022
Engineer:	NNS
Calc Title:	NEW Mech Outdoor Beyond Property Plane South (CT L3 Alt Location)
Notes	SF Police Code - Commercial Noise Limit - 8 dB increase above ambient. Ambient at LT-3 (min L90): 46 dBA. Limit is 54 dBA. Evaluated at south property plane.

Criterion	54	dB
Criterion	54	dB

Meets criterion

NEW Mech Outdoor Beyond Property Plane South (CT L3 Alt Location) Summary

	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dBA
CT-1	62	60	52	50	49	45	43	43	**54**
OSA-1	28	25	38	31	36	36	29	25	**40**
OSA-2	28	25	38	31	36	36	29	25	**40**
EF-2	9	9	9	9	9	9	9	9	**16**
EF-5	17	17	17	17	17	17	17	17	**24**
EF-10	11	11	11	11	11	11	11	11	**18**
Refrig. Rack	10	10	10	10	10	10	10	10	**17**
Summed	**62**	**60**	**53**	**50**	**50**	**46**	**44**	**43**	**54.8**

		63	125	250	500	1000	2000	4000	8000	dBA
CT-1	PWL	103	101	93	91	90	86	84	84	95
Evapco ESW4 9-46M12-LI	Rathe	-44	-44	-44	-44	-44	-44	-44	-44	
	Barrier	0	0	0	0	0	0	0	0	
	Safety Factor	3	3	3	3	3	3	3	3	
	Total	62	60	52	50	49	45	43	43	**54**

Source Ht	23	ft
Source Dist	0	ft
Receiver Ht	5	ft
Receiver Dist	200	ft
Barrier Ht	0	ft
Barrier Loss	0.0	dB

Mech Unit Length	12	ft
Mech Unit Width	20	ft
Total Distance	200	ft

		63	125	250	500	1000	2000	4000	8000	dBA
OSA-1	PWL	84	78	92	87	88	87	80	76	93
Valent APD450	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3	
	Rathe	-46	-46	-46	-46	-46	-46	-46	-46	
	Barrier	-5	-5	-5	-5	-5	-5	-5	-5	
	Safety Factor	3	3	3	3	3	3	3	3	
	Total	28	25	38	31	36	36	29	25	**40**

Source Ht	68	ft
Source Dist	60	ft
Receiver Ht	5	ft
Receiver Dist	210	ft
Barrier Ht	55	ft
Barrier Loss	5.0	dB

Mech Unit Length	3	ft
Mech Unit Width	2	ft
Total Distance	270	ft

		63	125	250	500	1000	2000	4000	8000	dBA
OSA-2	PWL	84	78	92	87	88	87	80	76	93
Valent APD450	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3	
	Rathe	-46	-46	-46	-46	-46	-46	-46	-46	
	Barrier	-5	-5	-5	-5	-5	-5	-5	-5	
	Safety Factor	3	3	3	3	3	3	3	3	
	Total	28	25	38	31	36	36	29	25	**40**

Source Ht	68	ft
Source Dist	60	ft
Receiver Ht	5	ft
Receiver Dist	210	ft
Barrier Ht	55	ft
Barrier Loss	5.0	dB

Mech Unit Length	3	ft
Mech Unit Width	2	ft
Total Distance	270	ft

		63	125	250	500	1000	2000	4000	8000	dBA
EF-2	PWL	61	61	61	61	61	61	61	61	68
USBI11DD	Rathe	-46	-46	-46	-46	-46	-46	-46	-46	
	Barrier	-9	-9	-9	-9	-9	-9	-9	-9	
	Safety Factor	3	3	3	3	3	3	3	3	
	Total	9	9	9	9	9	9	9	9	**16**

Source Ht	58	ft
Source Dist	50	ft
Receiver Ht	5	ft
Receiver Dist	210	ft
Barrier Ht	55	ft
Barrier Loss	9.0	dB

Mech Unit Length	2	ft
Mech Unit Width	2	ft
Total Distance	260	ft

		63	125	250	500	1000	2000	4000	8000	dBA
EF-5	PWL	68	68	68	68	68	68	68	68	75
USBI13DD	Rathe	-46	-46	-46	-46	-46	-46	-46	-46	
	Barrier	-9	-9	-9	-9	-9	-9	-9	-9	
	Safety Factor	3	3	3	3	3	3	3	3	

Source Ht	58	ft
Source Dist	50	ft
Receiver Ht	5	ft
Receiver Dist	210	ft
Barrier Ht	55	ft

Mech Unit Length	2	ft
Mech Unit Width	2	ft
Total Distance	260	ft

	Total	17	17	17	17	17	17	17	17	**24**		Barrier Loss	9.0	dB			
EF-10	PWL	59	59	59	59	59	59	59	59	66		Source Ht	68	ft	Mech Unit Length	2	ft
0	Rathe	-46	-46	-46	-46	-46	-46	-46	-46			Source Dist	60	ft	Mech Unit Width	2	ft
	Barrier	-5	-5	-5	-5	-5	-5	-5	-5			Receiver Ht	5	ft	Total Distance	270	ft
												Receiver Dist	210	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	11	11	11	11	11	11	11	11	**18**		Barrier Loss	5.0	dB			
Refrig. Rack	PWL	76	76	76	76	76	76	76	76	83		Source Ht	60	ft	Mech Unit Length	15	ft
0	Rathe	-46	-46	-46	-46	-46	-46	-46	-46			Source Dist	60	ft	Mech Unit Width	5	ft
	Penthouse																
	Enclosure	-15	-15	-15	-15	-15	-15	-15	-15			Receiver Ht	5	ft	Total Distance	270	ft
	Barrier	-9	-9	-9	-9	-9	-9	-9	-9			Receiver Dist	210	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	10	10	10	10	10	10	10	10	**17**		Barrier Loss	8.6	dB			

Project #	21-0548
Project Name:	2675 Geary Whole Foods
Date:	9/16/2022
Engineer:	NNS
Calc Title:	NEW Mech Outdoor Beyond Property Plane South (CT L3 Alt Location) (Barrier)
Notes	SF Police Code - Commercial Noise Limit - 8 dB increase above ambient. Ambient at LT-3 (min L90): 46 dBA. Limit is 54 dBA. Evaluated at south property plane.

Criterion	54	dB
Criterion	54	dB

Meets criterion

NEW Mech Outdoor Beyond Property Plane South (CT L3 Alt Location) (Barrier) Summary

	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dBA
CT-1	57	55	47	45	44	40	38	38	**49**
OSA-1	28	25	38	31	36	36	29	25	**40**
OSA-2	28	25	38	31	36	36	29	25	**40**
EF-2	9	9	9	9	9	9	9	9	**16**
EF-5	17	17	17	17	17	17	17	17	**24**
EF-10	11	11	11	11	11	11	11	11	**18**
Refrig. Rack	10	10	10	10	10	10	10	10	**17**
Summed	**57**	**55**	**48**	**45**	**45**	**42**	**39**	**38**	**50.2**

		63	125	250	500	1000	2000	4000	8000	dBA						
CT-1	PWL	103	101	93	91	90	86	84	84	95		Source Ht	23	ft	Mech Unit Length	12	ft
Evapco ESW4 9-46M12-L	Rathe	-44	-44	-44	-44	-44	-44	-44	-44			Source Dist	3	ft	Mech Unit Width	20	ft
	Barrier	-5	-5	-5	-5	-5	-5	-5	-5			Receiver Ht	5	ft	Total Distance	203	ft
												Receiver Dist	200	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	23	ft			
	Total	57	55	47	45	44	40	38	38	**49**		Barrier Loss	5.2	dB			
OSA-1	PWL	84	78	92	87	88	87	80	76	93		Source Ht	68	ft	Mech Unit Length	3	ft
	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3								
Valent APD450												Source Dist	60	ft	Mech Unit Width	2	ft
	Rathe	-46	-46	-46	-46	-46	-46	-46	-46			Receiver Ht	5	ft	Total Distance	270	ft
	Barrier	-5	-5	-5	-5	-5	-5	-5	-5			Receiver Dist	210	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	28	25	38	31	36	36	29	25	**40**		Barrier Loss	5.0	dB			
OSA-2	PWL	84	78	92	87	88	87	80	76	93		Source Ht	68	ft	Mech Unit Length	3	ft
	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3								
Valent APD450												Source Dist	60	ft	Mech Unit Width	2	ft
	Rathe	-46	-46	-46	-46	-46	-46	-46	-46			Receiver Ht	5	ft	Total Distance	270	ft
	Barrier	-5	-5	-5	-5	-5	-5	-5	-5			Receiver Dist	210	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	28	25	38	31	36	36	29	25	**40**		Barrier Loss	5.0	dB			
EF-2	PWL	61	61	61	61	61	61	61	61	68		Source Ht	58	ft	Mech Unit Length	2	ft
USBI11DD	Rathe	-46	-46	-46	-46	-46	-46	-46	-46			Source Dist	50	ft	Mech Unit Width	2	ft
	Barrier	-9	-9	-9	-9	-9	-9	-9	-9			Receiver Ht	5	ft	Total Distance	260	ft
												Receiver Dist	210	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	9	9	9	9	9	9	9	9	**16**		Barrier Loss	9.0	dB			
EF-5	PWL	68	68	68	68	68	68	68	68	75		Source Ht	58	ft	Mech Unit Length	2	ft
USBI13DD	Rathe	-46	-46	-46	-46	-46	-46	-46	-46			Source Dist	50	ft	Mech Unit Width	2	ft
	Barrier	-9	-9	-9	-9	-9	-9	-9	-9			Receiver Ht	5	ft	Total Distance	260	ft
												Receiver Dist	210	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			

	Total	17	17	17	17	17	17	17	17	**24**		Barrier Loss	9.0	dB			
EF-10	PWL	59	59	59	59	59	59	59	59	66		Source Ht	68	ft	Mech Unit Length	2	ft
0	Rathe	-46	-46	-46	-46	-46	-46	-46	-46			Source Dist	60	ft	Mech Unit Width	2	ft
	Barrier	-5	-5	-5	-5	-5	-5	-5	-5			Receiver Ht	5	ft	Total Distance	270	ft
												Receiver Dist	210	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	11	11	11	11	11	11	11	11	**18**		Barrier Loss	5.0	dB			
Refrig. Rack	PWL	76	76	76	76	76	76	76	76	83		Source Ht	60	ft	Mech Unit Length	15	ft
0	Rathe	-46	-46	-46	-46	-46	-46	-46	-46			Source Dist	60	ft	Mech Unit Width	5	ft
	Penthouse																
	Enclosure	-15	-15	-15	-15	-15	-15	-15	-15			Receiver Ht	5	ft	Total Distance	270	ft
	Barrier	-9	-9	-9	-9	-9	-9	-9	-9			Receiver Dist	210	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	10	10	10	10	10	10	10	10	**17**		Barrier Loss	8.6	dB			

Project #	21-0548
Project Name:	2675 Geary Whole Foods
Date:	9/16/2022
Engineer:	NNS
Calc Title:	NEW Mech Outdoor at Outdoor Area Location 1 (Alt CT)
Notes	

CRITERION: From email 3/17/22, 62.5 dBA

Criterion	62.5	dB
Criterion	62.5	dB

Meets criterion

Exceeds criterion

NEW Mech Outdoor at Outdoor Area Location 1 (Alt CT) Summary

	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dBA
CT-1	68	62	59	58	58	56	55	54	**64**
OSA-1	42	39	52	45	50	50	43	39	**55**
OSA-2	40	37	50	43	48	48	41	37	**52**
EF-2	26	26	26	26	26	26	26	26	**33**
EF-5	33	33	33	33	33	33	33	33	**40**
EF-10	24	24	24	24	24	24	24	24	**31**
Refrig. Rack	39	39	39	39	39	39	39	39	**46**
Summed	**68**	**62**	**60**	**59**	**59**	**58**	**56**	**55**	**64.5**

		63	125	250	500	1000	2000	4000	8000	dBA						
CT-1	PWL	92	86	83	82	82	80	79	78	87	Source Ht	29	ft	Mech Unit Length	12	ft
Evapco ESW4 12-44L12-S	Rathe	-27	-27	-27	-27	-27	-27	-27	-27		Source Dist	15	ft	Mech Unit Width	20	ft
	Barrier	0	0	0	0	0	0	0	0		Receiver Ht	5	ft	Total Distance	28	ft
											Receiver Dist	13	ft			
	Safety Factor	3	3	3	3	3	3	3	3		Barrier Ht	10	ft			
	Total	68	62	59	58	58	56	55	54	**64**	Barrier Loss	0.0	dB			
OSA-1	PWL	84	78	92	87	88	87	80	76	93	Source Ht	13	ft	Mech Unit Length	3	ft
	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3							
Valent APD450											Source Dist	20	ft	Mech Unit Width	2	ft
	Rathe	-30	-30	-30	-30	-30	-30	-30	-30		Receiver Ht	5	ft	Total Distance	40	ft
	Barrier	-7	-7	-7	-7	-7	-7	-7	-7		Receiver Dist	20	ft			
	Safety Factor	3	3	3	3	3	3	3	3		Barrier Ht	11	ft			
	Total	42	39	52	45	50	50	43	39	**55**	Barrier Loss	6.9	dB			
OSA-2	PWL	84	78	92	87	88	87	80	76	93	Source Ht	13	ft	Mech Unit Length	3	ft
	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3							
Valent APD450											Source Dist	29	ft	Mech Unit Width	2	ft
	Rathe	-33	-33	-33	-33	-33	-33	-33	-33		Receiver Ht	5	ft	Total Distance	59	ft
	Barrier	-6	-6	-6	-6	-6	-6	-6	-6		Receiver Dist	30	ft			
	Safety Factor	3	3	3	3	3	3	3	3		Barrier Ht	11	ft			
	Total	40	37	50	43	48	48	41	37	**52**	Barrier Loss	6.3	dB			
EF-2	PWL	61	61	61	61	61	61	61	61	68	Source Ht	3	ft	Mech Unit Length	2	ft
USBI11DD	Rathe	-24	-24	-24	-24	-24	-24	-24	-24		Source Dist	4	ft	Mech Unit Width	2	ft
	Barrier	-15	-15	-15	-15	-15	-15	-15	-15		Receiver Ht	5	ft	Total Distance	20	ft
											Receiver Dist	16	ft			
	Safety Factor	3	3	3	3	3	3	3	3		Barrier Ht	10	ft			
	Total	26	26	26	26	26	26	26	26	**33**	Barrier Loss	15.0	dB			
EF-5	PWL	68	68	68	68	68	68	68	68	75	Source Ht	3	ft	Mech Unit Length	2	ft
USBI13DD	Rathe	-24	-24	-24	-24	-24	-24	-24	-24		Source Dist	4	ft	Mech Unit Width	2	ft
	Barrier	-15	-15	-15	-15	-15	-15	-15	-15		Receiver Ht	5	ft	Total Distance	20	ft
											Receiver Dist	16	ft			
	Safety Factor	3	3	3	3	3	3	3	3		Barrier Ht	10	ft			

	Total	33	33	33	33	33	33	33	33	**40**		Barrier Loss	15.0	dB			
EF-10	PWL	59	59	59	59	59	59	59	59	66		Source Ht	13	ft	Mech Unit Length	2	ft
0	Rathe	-32	-32	-32	-32	-32	-32	-32	-32			Source Dist	20	ft	Mech Unit Width	2	ft
	Barrier	-6	-6	-6	-6	-6	-6	-6	-6			Receiver Ht	5	ft	Total Distance	50	ft
												Receiver Dist	30	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	24	24	24	24	24	24	24	24	**31**		Barrier Loss	5.8	dB			
Refrig. Rack	PWL	76	76	76	76	76	76	76	76	83		Source Ht	5	ft	Mech Unit Length	15	ft
0	Rathe	-26	-26	-26	-26	-26	-26	-26	-26			Source Dist	5	ft	Mech Unit Width	5	ft
	Penthouse																
	Enclosure	-15	-15	-15	-15	-15	-15	-15	-15			Receiver Ht	5	ft	Total Distance	25	ft
												Receiver Dist	20	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	0	ft			
	Total	39	39	39	39	39	39	39	39	**46**		Barrier Loss	0.0	dB			

Project #	21-0548
Project Name:	2675 Geary Whole Foods
Date:	9/16/2022
Engineer:	NNS
Calc Title:	NEW Mech Outdoor at Outdoor Area Location 1 (Barrier) (Alt CT)
Notes	

CRITERION: From email 3/17/22, 62.5 dBA

Criterion	62.5	dB
Criterion	62.5	dB

Meets criterion

NEW Mech Outdoor at Outdoor Area Location 1 (Barrier) (Alt CT) Summary

	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dBA
CT-1	61	55	52	51	51	49	48	47	**56**
OSA-1	42	39	52	45	50	50	43	39	**55**
OSA-2	40	37	50	43	48	48	41	37	**52**
EF-2	26	26	26	26	26	26	26	26	**33**
EF-5	33	33	33	33	33	33	33	33	**40**
EF-10	24	24	24	24	24	24	24	24	**31**
Refrig. Rack	39	39	39	39	39	39	39	39	**46**
Summed	**61**	**55**	**56**	**53**	**55**	**54**	**50**	**49**	**59.9**

		63	125	250	500	1000	2000	4000	8000	dBA						
CT-1	PWL	92	86	83	82	82	80	79	78	87	Source Ht	29	ft	Mech Unit Length	12	ft
Evapco ESW4 12-44L12-S	Rathe	-27	-27	-27	-27	-27	-27	-27	-27		Source Dist	15	ft	Mech Unit Width	20	ft
	Barrier	-7	-7	-7	-7	-7	-7	-7	-7		Receiver Ht	5	ft	Total Distance	28	ft
											Receiver Dist	13	ft			
	Safety Factor	3	3	3	3	3	3	3	3		Barrier Ht	19	ft			
	Total	61	55	52	51	51	49	48	47	**56**	Barrier Loss	7.3	dB			
OSA-1	PWL	84	78	92	87	88	87	80	76	93	Source Ht	13	ft	Mech Unit Length	3	ft
	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3							
Valent APD450											Source Dist	20	ft	Mech Unit Width	2	ft
	Rathe	-30	-30	-30	-30	-30	-30	-30	-30		Receiver Ht	5	ft	Total Distance	40	ft
	Barrier	-7	-7	-7	-7	-7	-7	-7	-7		Receiver Dist	20	ft			
	Safety Factor	3	3	3	3	3	3	3	3		Barrier Ht	11	ft			
	Total	42	39	52	45	50	50	43	39	**55**	Barrier Loss	6.9	dB			
OSA-2	PWL	84	78	92	87	88	87	80	76	93	Source Ht	13	ft	Mech Unit Length	3	ft
	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3							
Valent APD450											Source Dist	29	ft	Mech Unit Width	2	ft
	Rathe	-33	-33	-33	-33	-33	-33	-33	-33		Receiver Ht	5	ft	Total Distance	59	ft
	Barrier	-6	-6	-6	-6	-6	-6	-6	-6		Receiver Dist	30	ft			
	Safety Factor	3	3	3	3	3	3	3	3		Barrier Ht	11	ft			
	Total	40	37	50	43	48	48	41	37	**52**	Barrier Loss	6.3	dB			
EF-2	PWL	61	61	61	61	61	61	61	61	68	Source Ht	3	ft	Mech Unit Length	2	ft
USBI11DD	Rathe	-24	-24	-24	-24	-24	-24	-24	-24		Source Dist	4	ft	Mech Unit Width	2	ft
	Barrier	-15	-15	-15	-15	-15	-15	-15	-15		Receiver Ht	5	ft	Total Distance	20	ft
											Receiver Dist	16	ft			
	Safety Factor	3	3	3	3	3	3	3	3		Barrier Ht	10	ft			
	Total	26	26	26	26	26	26	26	26	**33**	Barrier Loss	15.0	dB			
EF-5	PWL	68	68	68	68	68	68	68	68	75	Source Ht	3	ft	Mech Unit Length	2	ft
USBI13DD	Rathe	-24	-24	-24	-24	-24	-24	-24	-24		Source Dist	4	ft	Mech Unit Width	2	ft
	Barrier	-15	-15	-15	-15	-15	-15	-15	-15		Receiver Ht	5	ft	Total Distance	20	ft
											Receiver Dist	16	ft			
	Safety Factor	3	3	3	3	3	3	3	3		Barrier Ht	10	ft			

	Total	33	33	33	33	33	33	33	33	**40**		Barrier Loss	15.0	dB			
EF-10	PWL	59	59	59	59	59	59	59	59	66		Source Ht	13	ft	Mech Unit Length	2	ft
0	Rathe	-32	-32	-32	-32	-32	-32	-32	-32			Source Dist	20	ft	Mech Unit Width	2	ft
	Barrier	-6	-6	-6	-6	-6	-6	-6	-6			Receiver Ht	5	ft	Total Distance	50	ft
												Receiver Dist	30	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	24	24	24	24	24	24	24	24	**31**		Barrier Loss	5.8	dB			
Refrig. Rack	PWL	76	76	76	76	76	76	76	76	83		Source Ht	5	ft	Mech Unit Length	15	ft
0	Rathe	-26	-26	-26	-26	-26	-26	-26	-26			Source Dist	5	ft	Mech Unit Width	5	ft
	Penthouse																
	Enclosure	-15	-15	-15	-15	-15	-15	-15	-15			Receiver Ht	5	ft	Total Distance	25	ft
												Receiver Dist	20	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	0	ft			
	Total	39	39	39	39	39	39	39	39	**46**		Barrier Loss	0.0	dB			

Project #	21-0548
Project Name:	2675 Geary Whole Foods
Date:	9/16/2022
Engineer:	NNS
Calc Title:	NEW Mech Outdoor at Outdoor Area Location 2 (Alt CT)

Notes

CRITERION: From email 3/17/22, 62.5 dBA

Criterion	62.5	dB
Criterion	62.5	dB

Meets criterion

NEW Mech Outdoor at Outdoor Area Location 2 (Alt CT) Summary

	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dBA
CT-1	65	59	56	55	55	53	52	51	**61**
OSA-1	42	39	52	45	50	50	43	39	**55**
OSA-2	40	37	50	43	48	48	41	37	**52**
EF-2	23	23	23	23	23	23	23	23	**30**
EF-5	30	30	30	30	30	30	30	30	**37**
EF-10	24	24	24	24	24	24	24	24	**31**
Refrig. Rack	39	39	39	39	39	39	39	39	**46**
Summed	**65**	**59**	**58**	**56**	**57**	**56**	**53**	**52**	**62.3**

		63	125	250	500	1000	2000	4000	8000	dBA
CT-1	PWL	92	86	83	82	82	80	79	78	87
Evapco ESW4 12-44L12-S	Rathe	-30	-30	-30	-30	-30	-30	-30	-30	
	Barrier	0	0	0	0	0	0	0	0	
	Safety Factor	3	3	3	3	3	3	3	3	
	Total	65	59	56	55	55	53	52	51	**61**

Source Ht	29	ft
Source Dist	15	ft
Receiver Ht	5	ft
Receiver Dist	25	ft
Barrier Ht	10	ft
Barrier Loss	0.0	dB

Mech Unit Length	12	ft
Mech Unit Width	20	ft
Total Distance	40	ft

		63	125	250	500	1000	2000	4000	8000	dBA
OSA-1	PWL	84	78	92	87	88	87	80	76	93
Valent APD450	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3	
	Rathe	-31	-31	-31	-31	-31	-31	-31	-31	
	Barrier	-6	-6	-6	-6	-6	-6	-6	-6	
	Safety Factor	3	3	3	3	3	3	3	3	
	Total	42	39	52	45	50	50	43	39	**55**

Source Ht	13	ft
Source Dist	20	ft
Receiver Ht	5	ft
Receiver Dist	25	ft
Barrier Ht	11	ft
Barrier Loss	6.0	dB

Mech Unit Length	3	ft
Mech Unit Width	2	ft
Total Distance	45	ft

		63	125	250	500	1000	2000	4000	8000	dBA
OSA-2	PWL	84	78	92	87	88	87	80	76	93
Valent APD450	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3	
	Rathe	-33	-33	-33	-33	-33	-33	-33	-33	
	Barrier	-6	-6	-6	-6	-6	-6	-6	-6	
	Safety Factor	3	3	3	3	3	3	3	3	
	Total	40	37	50	43	48	48	41	37	**52**

Source Ht	13	ft
Source Dist	29	ft
Receiver Ht	5	ft
Receiver Dist	30	ft
Barrier Ht	11	ft
Barrier Loss	6.3	dB

Mech Unit Length	3	ft
Mech Unit Width	2	ft
Total Distance	59	ft

		63	125	250	500	1000	2000	4000	8000	dBA
EF-2	PWL	61	61	61	61	61	61	61	61	68
USBI11DD	Rathe	-27	-27	-27	-27	-27	-27	-27	-27	
	Barrier	-15	-15	-15	-15	-15	-15	-15	-15	
	Safety Factor	3	3	3	3	3	3	3	3	
	Total	23	23	23	23	23	23	23	23	**30**

Source Ht	3	ft
Source Dist	4	ft
Receiver Ht	5	ft
Receiver Dist	25	ft
Barrier Ht	10	ft
Barrier Loss	14.9	dB

Mech Unit Length	2	ft
Mech Unit Width	2	ft
Total Distance	29	ft

		63	125	250	500	1000	2000	4000	8000	dBA
EF-5	PWL	68	68	68	68	68	68	68	68	75
USBI13DD	Rathe	-27	-27	-27	-27	-27	-27	-27	-27	
	Barrier	-15	-15	-15	-15	-15	-15	-15	-15	
	Safety Factor	3	3	3	3	3	3	3	3	

Source Ht	3	ft
Source Dist	4	ft
Receiver Ht	5	ft
Receiver Dist	25	ft
Barrier Ht	10	ft

Mech Unit Length	2	ft
Mech Unit Width	2	ft
Total Distance	29	ft

	Total	30	30	30	30	30	30	30	30	**37**		Barrier Loss	14.9	dB			
EF-10	PWL	59	59	59	59	59	59	59	59	66		Source Ht	13	ft	Mech Unit Length	2	ft
0	Rathe	-32	-32	-32	-32	-32	-32	-32	-32			Source Dist	20	ft	Mech Unit Width	2	ft
	Barrier	-6	-6	-6	-6	-6	-6	-6	-6			Receiver Ht	5	ft	Total Distance	50	ft
												Receiver Dist	30	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	24	24	24	24	24	24	24	24	**31**		Barrier Loss	5.8	dB			
Refrig. Rack	PWL	76	76	76	76	76	76	76	76	83		Source Ht	5	ft	Mech Unit Length	15	ft
0	Rathe	-26	-26	-26	-26	-26	-26	-26	-26			Source Dist	5	ft	Mech Unit Width	5	ft
	Penthouse																
	Enclosure	-15	-15	-15	-15	-15	-15	-15	-15			Receiver Ht	5	ft	Total Distance	25	ft
												Receiver Dist	20	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	0	ft			
	Total	39	39	39	39	39	39	39	39	**46**		Barrier Loss	0.0	dB			

Project #	21-0548
Project Name:	2675 Geary Whole Foods
Date:	9/16/2022
Engineer:	NNS
Calc Title:	NEW Mech Outdoor at Outdoor Area Locations 3 & 4 (Alt CT)
Notes	

CRITERION: From email 3/17/22, 62.5 dBA

Criterion	62.5	dB
Criterion	62.5	dB

Meets criterion

NEW Mech Outdoor at Outdoor Area Locations 3 & 4 (Alt CT) Summary

	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dBA
CT-1	62	56	53	52	52	50	49	48	**58**
OSA-1	41	38	51	44	49	49	42	38	**54**
OSA-2	39	36	49	42	47	47	40	36	**52**
EF-2	19	19	19	19	19	19	19	19	**26**
EF-5	26	26	26	26	26	26	26	26	**33**
EF-10	24	24	24	24	24	24	24	24	**31**
Refrig. Rack	35	35	35	35	35	35	35	35	**42**
Summed	**63**	**57**	**56**	**53**	**55**	**54**	**51**	**49**	**60.1**

		63	125	250	500	1000	2000	4000	8000	dBA							
CT-1	PWL	92	86	83	82	82	80	79	78	87		Source Ht	29	ft	Mech Unit Length	12	ft
Evapco ESW4 12-44L12-S	Rathe	-33	-33	-33	-33	-33	-33	-33	-33			Source Dist	15	ft	Mech Unit Width	20	ft
	Barrier	0	0	0	0	0	0	0	0			Receiver Ht	5	ft	Total Distance	55	ft
												Receiver Dist	40	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	10	ft			
	Total	62	56	53	52	52	50	49	48	**58**		Barrier Loss	0.0	dB			
OSA-1	PWL	84	78	92	87	88	87	80	76	93		Source Ht	13	ft	Mech Unit Length	3	ft
	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3								
Valent APD450												Source Dist	20	ft	Mech Unit Width	2	ft
	Rathe	-32	-32	-32	-32	-32	-32	-32	-32			Receiver Ht	5	ft	Total Distance	55	ft
	Barrier	-6	-6	-6	-6	-6	-6	-6	-6			Receiver Dist	35	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	41	38	51	44	49	49	42	38	**54**		Barrier Loss	5.6	dB			
OSA-2	PWL	84	78	92	87	88	87	80	76	93		Source Ht	13	ft	Mech Unit Length	3	ft
	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3								
Valent APD450												Source Dist	29	ft	Mech Unit Width	2	ft
	Rathe	-34	-34	-34	-34	-34	-34	-34	-34			Receiver Ht	5	ft	Total Distance	64	ft
	Barrier	-6	-6	-6	-6	-6	-6	-6	-6			Receiver Dist	35	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	39	36	49	42	47	47	40	36	**52**		Barrier Loss	5.9	dB			
EF-2	PWL	61	61	61	61	61	61	61	61	68		Source Ht	3	ft	Mech Unit Length	2	ft
USBI11DD	Rathe	-31	-31	-31	-31	-31	-31	-31	-31			Source Dist	4	ft	Mech Unit Width	2	ft
	Barrier	-15	-15	-15	-15	-15	-15	-15	-15			Receiver Ht	5	ft	Total Distance	44	ft
												Receiver Dist	40	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	10	ft			
	Total	19	19	19	19	19	19	19	19	**26**		Barrier Loss	14.8	dB			
EF-5	PWL	68	68	68	68	68	68	68	68	75		Source Ht	3	ft	Mech Unit Length	2	ft
USBI13DD	Rathe	-31	-31	-31	-31	-31	-31	-31	-31			Source Dist	4	ft	Mech Unit Width	2	ft
	Barrier	-15	-15	-15	-15	-15	-15	-15	-15			Receiver Ht	5	ft	Total Distance	44	ft
												Receiver Dist	40	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	10	ft			

	Total	26	26	26	26	26	26	26	26	**33**		Barrier Loss	14.8	dB			
EF-10	PWL	59	59	59	59	59	59	59	59	66		Source Ht	13	ft	Mech Unit Length	2	ft
0	Rathe	-32	-32	-32	-32	-32	-32	-32	-32			Source Dist	20	ft	Mech Unit Width	2	ft
	Barrier	-6	-6	-6	-6	-6	-6	-6	-6			Receiver Ht	5	ft	Total Distance	55	ft
												Receiver Dist	35	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	24	24	24	24	24	24	24	24	**31**		Barrier Loss	5.6	dB			
Refrig. Rack	PWL	76	76	76	76	76	76	76	76	83		Source Ht	5	ft	Mech Unit Length	15	ft
0	Rathe	-30	-30	-30	-30	-30	-30	-30	-30			Source Dist	5	ft	Mech Unit Width	5	ft
	Penthouse																
	Enclosure	-15	-15	-15	-15	-15	-15	-15	-15			Receiver Ht	5	ft	Total Distance	40	ft
												Receiver Dist	35	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	0	ft			
	Total	35	35	35	35	35	35	35	35	**42**		Barrier Loss	0.0	dB			

Project #	21-0548
Project Name:	2675 Geary Whole Foods
Date:	9/16/2022
Engineer:	NNS
Calc Title:	NEW Mech Outdoor at Nearest Residence (at LT-1, Geary & Presidio) (Alt CT)

Notes SF Police Code - Residential interior limit - 45 dBA at night inside the nearest residence

Criterion	45	dB
Criterion	45	dB

Meets criterion

NEW Mech Outdoor at Nearest Residence (at LT-1, Geary & Presidio) (Alt CT) Summary

	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dBA
CT-1	38	32	29	28	28	26	25	24	**33**
OSA-1	16	13	26	19	24	24	17	13	**29**
OSA-2	16	13	26	19	24	24	17	13	**29**
EF-2	-1	-1	-1	-1	-1	-1	-1	-1	**6**
EF-5	6	6	6	6	6	6	6	6	**13**
EF-10	-1	-1	-1	-1	-1	-1	-1	-1	**6**
Refrig. Rack	0	0	0	0	0	0	0	0	**7**
Summed	**38**	**32**	**32**	**29**	**31**	**30**	**26**	**25**	**36**

		63	125	250	500	1000	2000	4000	8000	dBA							
CT-1	PWL	92	86	83	82	82	80	79	78	87		Source Ht	84	ft	Mech Unit Length	12	ft
Evapco ESW4 12-44L12-S	Rathe	-47	-47	-47	-47	-47	-47	-47	-47			Source Dist	120	ft	Mech Unit Width	20	ft
	WINDOW LOSS	-10	-10	-10	-10	-10	-10	-10	-10			Receiver Ht	30	ft	Total Distance	300	ft
												Receiver Dist	180	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	38	32	29	28	28	26	25	24	**33**		Barrier Loss	0.8	dB			
OSA-1	PWL	84	78	92	87	88	87	80	76	93		Source Ht	68	ft	Mech Unit Length	3	ft
	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3								
Valent APD450												Source Dist	110	ft	Mech Unit Width	2	ft
	Rathe	-48	-48	-48	-48	-48	-48	-48	-48			Receiver Ht	30	ft	Total Distance	320	ft
	Barrier	-5	-5	-5	-5	-5	-5	-5	-5			Receiver Dist	210	ft			
	OPEN WINDOW LOSS	-10	-10	-10	-10	-10	-10	-10	-10								
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	16	13	26	19	24	24	17	13	**29**		Barrier Loss	5.0	dB			
OSA-2	PWL	84	78	92	87	88	87	80	76	93		Source Ht	68	ft	Mech Unit Length	3	ft
	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3								
Valent APD450												Source Dist	110	ft	Mech Unit Width	2	ft
	Rathe	-48	-48	-48	-48	-48	-48	-48	-48			Receiver Ht	30	ft	Total Distance	320	ft
	Barrier	-5	-5	-5	-5	-5	-5	-5	-5			Receiver Dist	210	ft			
	OPEN WINDOW LOSS	-10	-10	-10	-10	-10	-10	-10	-10								
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	16	13	26	19	24	24	17	13	**29**		Barrier Loss	5.0	dB			
EF-2	PWL	61	61	61	61	61	61	61	61	68		Source Ht	58	ft	Mech Unit Length	2	ft
USBI11DD	Rathe	-47	-47	-47	-47	-47	-47	-47	-47			Source Dist	120	ft	Mech Unit Width	2	ft
	Barrier	-8	-8	-8	-8	-8	-8	-8	-8			Receiver Ht	30	ft	Total Distance	300	ft
	WINDOW LOSS	-10	-10	-10	-10	-10	-10	-10	-10			Receiver Dist	180	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	-1	-1	-1	-1	-1	-1	-1	-1	**6**		Barrier Loss	8.2	dB			
EF-5	PWL	68	68	68	68	68	68	68	68	75		Source Ht	58	ft	Mech Unit Length	2	ft
USBI13DD	Rathe	-47	-47	-47	-47	-47	-47	-47	-47			Source Dist	120	ft	Mech Unit Width	2	ft
	Barrier	-8	-8	-8	-8	-8	-8	-8	-8			Receiver Ht	30	ft	Total Distance	300	ft

	WINDOW LOSS	-10	-10	-10	-10	-10	-10	-10	-10			Receiver Dist	180	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	6	6	6	6	6	6	6	6	**13**		Barrier Loss	8.2	dB			
EF-10	PWL	59	59	59	59	59	59	59	59	66		Source Ht	68	ft	Mech Unit Length	2	ft
0	Rathe	-48	-48	-48	-48	-48	-48	-48	-48			Source Dist	110	ft	Mech Unit Width	2	ft
	Barrier	-5	-5	-5	-5	-5	-5	-5	-5			Receiver Ht	30	ft	Total Distance	320	ft
	WINDOW LOSS	-10	-10	-10	-10	-10	-10	-10	-10			Receiver Dist	210	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	-1	-1	-1	-1	-1	-1	-1	-1	**6**		Barrier Loss	5.0	dB			
Refrig. Rack	PWL	76	76	76	76	76	76	76	76	83		Source Ht	60	ft	Mech Unit Length	15	ft
0	Rathe	-48	-48	-48	-48	-48	-48	-48	-48			Source Dist	110	ft	Mech Unit Width	5	ft
	Penthouse Enclosure	-15	-15	-15	-15	-15	-15	-15	-15			Receiver Ht	30	ft	Total Distance	320	ft
	Barrier	-7	-7	-7	-7	-7	-7	-7	-7								
	WINDOW LOSS	-10	-10	-10	-10	-10	-10	-10	-10			Receiver Dist	210	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	0	0	0	0	0	0	0	0	**7**		Barrier Loss	6.9	dB			

Project #	21-0548
Project Name:	2675 Geary Whole Foods
Date:	9/16/2022
Engineer:	NNS
Calc Title:	NEW Mech Outdoor Beyond Property Plane North (Alt CT)
Notes	SF Police Code - Commercial Noise Limit - 8 dB increase above ambient. Ambient at LT-1 (min L90): 47 dBA. Limit is 55 dBA. Evaluated at north edge of building roof.

Criterion	55	dB
Criterion	55	dB

Meets criterion

Exceeds criterion

NEW Mech Outdoor Beyond Property Plane North (Alt CT) Summary

	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dBA
CT-1	63	57	54	53	53	51	50	49	**58**
OSA-1	42	39	52	45	50	50	43	39	**55**
OSA-1 (Casing	40	33	40	33	34	26	17	14	**37**
OSA-2	40	37	50	43	48	48	41	37	**53**
OSA-2 (Casing	37	30	37	30	31	23	14	11	**35**
EF-2	20	20	20	20	20	20	20	20	**27**
EF-5	27	27	27	27	27	27	27	27	**34**
EF-10	23	23	23	23	23	23	23	23	**30**
Refrig. Rack	33	33	33	33	33	33	33	33	**40**
Summed	**63**	**57**	**57**	**54**	**56**	**55**	**51**	**50**	**61**

		63	125	250	500	1000	2000	4000	8000	dBA						
CT-1	PWL	92	86	83	82	82	80	79	78	87		Source Ht	29	ft	Mech Unit Length	12	ft
Evapco ESW4 12-44L12-S	Rathe	-32	-32	-32	-32	-32	-32	-32	-32			Source Dist	8	ft	Mech Unit Width	20	ft
	Barrier	0	0	0	0	0	0	0	0			Receiver Ht	5	ft	Total Distance	53	ft
												Receiver Dist	45	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	10	ft			
	Total	63	57	54	53	53	51	50	49	**58**		Barrier Loss	0.0	dB			
OSA-1	PWL	84	78	92	87	88	87	80	76	93		Source Ht	13	ft	Mech Unit Length	3	ft
	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3								
Valent APD450												Source Dist	9	ft	Mech Unit Width	2	ft
	Rathe	-32	-32	-32	-32	-32	-32	-32	-32			Receiver Ht	5	ft	Total Distance	54	ft
	Barrier	-5	-5	-5	-5	-5	-5	-5	-5			Receiver Dist	45	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	42	39	52	45	50	50	43	39	**55**		Barrier Loss	4.7	dB			
OSA-1 (Casing Radiated)	PWL	83	76	83	76	77	69	60	57	80		Source Ht	13	ft	Mech Unit Length	3	ft
Valent APD450												Source Dist	9	ft	Mech Unit Width	2	ft
	Rathe	-32	-32	-32	-32	-32	-32	-32	-32			Receiver Ht	5	ft	Total Distance	54	ft
	Penthouse																
	Louver & Wall	-14	-14	-14	-14	-14	-14	-14	-14			Receiver Dist	45	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	0	ft			
	Total	40	33	40	33	34	26	17	14	**37**		Barrier Loss	0.0	dB			
OSA-2	PWL	84	78	92	87	88	87	80	76	93		Source Ht	13	ft	Mech Unit Length	3	ft
	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3								
Valent APD450												Source Dist	10	ft	Mech Unit Width	2	ft
	Rathe	-35	-35	-35	-35	-35	-35	-35	-35			Receiver Ht	5	ft	Total Distance	70	ft
	Barrier	-5	-5	-5	-5	-5	-5	-5	-5			Receiver Dist	60	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	40	37	50	43	48	48	41	37	**53**		Barrier Loss	4.6	dB			
OSA-2 (Casing Radiated)	PWL	83	76	83	76	77	69	60	57	80		Source Ht	13	ft	Mech Unit Length	3	ft

Valent APD450												Source Dist	10	ft	Mech Unit Width	2	ft
	Rathe	-35	-35	-35	-35	-35	-35	-35	-35			Receiver Ht	5	ft	Total Distance	70	ft
	Penthouse																
	Louver & Wall	-14	-14	-14	-14	-14	-14	-14	-14			Receiver Dist	60	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	0	ft			
	Total	37	30	37	30	31	23	14	11	**35**		Barrier Loss	0.0	dB			
EF-2	PWL	61	61	61	61	61	61	61	61	68		Source Ht	5	ft	Mech Unit Length	2	ft
USBI11DD	Rathe	-34	-34	-34	-34	-34	-34	-34	-34			Source Dist	20	ft	Mech Unit Width	2	ft
	Barrier	-10	-10	-10	-10	-10	-10	-10	-10			Receiver Ht	5	ft	Total Distance	65	ft
												Receiver Dist	45	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	10	ft			
	Total	20	20	20	20	20	20	20	20	**27**		Barrier Loss	10.1	dB			
EF-5	PWL	68	68	68	68	68	68	68	68	75		Source Ht	5	ft	Mech Unit Length	2	ft
USBI13DD	Rathe	-34	-34	-34	-34	-34	-34	-34	-34			Source Dist	20	ft	Mech Unit Width	2	ft
	Barrier	-10	-10	-10	-10	-10	-10	-10	-10			Receiver Ht	5	ft	Total Distance	65	ft
												Receiver Dist	45	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	10	ft			
	Total	27	27	27	27	27	27	27	27	**34**		Barrier Loss	10.1	dB			
EF-10	PWL	59	59	59	59	59	59	59	59	66		Source Ht	13	ft	Mech Unit Length	2	ft
0	Rathe	-34	-34	-34	-34	-34	-34	-34	-34			Source Dist	12	ft	Mech Unit Width	2	ft
	Barrier	-5	-5	-5	-5	-5	-5	-5	-5			Receiver Ht	5	ft	Total Distance	67	ft
												Receiver Dist	55	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	23	23	23	23	23	23	23	23	**30**		Barrier Loss	4.9	dB			
Refrig. Rack	PWL	76	76	76	76	76	76	76	76	83		Source Ht	5	ft	Mech Unit Length	15	ft
0	Rathe	-33	-33	-33	-33	-33	-33	-33	-33			Source Dist	0	ft	Mech Unit Width	5	ft
	Penthouse																
	Louver & Wall	-14	-14	-14	-14	-14	-14	-14	-14			Receiver Ht	5	ft	Total Distance	55	ft
	Barrier	0	0	0	0	0	0	0	0			Receiver Dist	55	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	0	ft			
	Total	33	33	33	33	33	33	33	33	**40**		Barrier Loss	0.0	dB			

Project #	21-0548
Project Name:	2675 Geary Whole Foods
Date:	9/16/2022
Engineer:	NNS
Calc Title:	NEW Mech Outdoor Beyond Property Plane North (North Barrier) (Alt CT)
Notes	SF Police Code - Commercial Noise Limit - 8 dB increase above ambient. Ambient at LT-1 (min L90): 47 dBA. Limit is 55 dBA. Evaluated at north edge of building roof.

Criterion	55	dB
Criterion	55	dB

Meets criterion

NEW Mech Outdoor Beyond Property Plane North (North Barrier) (Alt CT) Summary

	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dBA
CT-1	52	46	43	42	42	40	39	38	**48**
OSA-1	41	38	49	39	38	41	35	31	**46**
OSA-1 (Casing	40	33	40	33	34	26	17	14	**37**
OSA-2	39	36	47	37	36	39	33	29	**44**
OSA-2 (Casing	37	30	37	30	31	23	14	11	**35**
EF-2	12	12	12	12	12	12	12	12	**19**
EF-5	20	20	20	20	20	20	20	20	**27**
EF-10	23	23	23	23	23	23	23	23	**30**
Refrig. Rack	33	33	33	33	33	33	33	33	**40**
Summed	**53**	**48**	**52**	**45**	**45**	**45**	**42**	**40**	**52**

		63	125	250	500	1000	2000	4000	8000	dBA							
CT-1	PWL	92	86	83	82	82	80	79	78	87		Source Ht	29	ft	Mech Unit Length	12	ft
Evapco ESW4 12-44L12-S	Rathe	-33	-33	-33	-33	-33	-33	-33	-33			Source Dist	8	ft	Mech Unit Width	20	ft
	Barrier	-10	-10	-10	-10	-10	-10	-10	-10			Receiver Ht	5	ft	Total Distance	58	ft
												Receiver Dist	45	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	29	ft			
	Total	52	46	43	42	42	40	39	38	**48**		Barrier Loss	9.8	dB			
OSA-1	PWL	84	78	92	87	88	87	80	76	93		Source Ht	13	ft	Mech Unit Length	3	ft
	5 ft Lined Duct & End Reflection	-9	-6	-9	-14	-16	-12	-11	-11								
Valent APD450												Source Dist	9	ft	Mech Unit Width	2	ft
	Rathe	-32	-32	-32	-32	-32	-32	-32	-32			Receiver Ht	5	ft	Total Distance	54	ft
	Barrier	-5	-5	-5	-5	-5	-5	-5	-5			Receiver Dist	45	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	41	38	49	39	38	41	35	31	**46**		Barrier Loss	4.7	dB			
OSA-1 (Casing Radiated)	PWL	83	76	83	76	77	69	60	57	80		Source Ht	13	ft	Mech Unit Length	3	ft
Valent APD450												Source Dist	9	ft	Mech Unit Width	2	ft
	Rathe	-32	-32	-32	-32	-32	-32	-32	-32			Receiver Ht	5	ft	Total Distance	54	ft
	Penthouse Louver & Wall	-14	-14	-14	-14	-14	-14	-14	-14			Receiver Dist	45	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	0	ft			
	Total	40	33	40	33	34	26	17	14	**37**		Barrier Loss	0.0	dB			
OSA-2	PWL	84	78	92	87	88	87	80	76	93		Source Ht	13	ft	Mech Unit Length	3	ft
	5 ft Lined Duct & End Reflection	-9	-6	-9	-14	-16	-12	-11	-11								
Valent APD450												Source Dist	10	ft	Mech Unit Width	2	ft
	Rathe	-35	-35	-35	-35	-35	-35	-35	-35			Receiver Ht	5	ft	Total Distance	70	ft
	Barrier	-5	-5	-5	-5	-5	-5	-5	-5			Receiver Dist	60	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	39	36	47	37	36	39	33	29	**44**		Barrier Loss	4.6	dB			

OSA-2 (Casing Radiated)	PWL	83	76	83	76	77	69	60	57	80		Source Ht	13	ft	Mech Unit Length	3	ft
Valent APD450												Source Dist	10	ft	Mech Unit Width	2	ft
	Rathe	-35	-35	-35	-35	-35	-35	-35	-35			Receiver Ht	5	ft	Total Distance	70	ft
	Penthouse																
	Louver & Wall	-14	-14	-14	-14	-14	-14	-14	-14			Receiver Dist	60	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	0	ft			
	Total	37	30	37	30	31	23	14	11	**35**		Barrier Loss	0.0	dB			

EF-2	PWL	61	61	61	61	61	61	61	61	68		Source Ht	5	ft	Mech Unit Length	2	ft
USBI11DD	Rathe	-34	-34	-34	-34	-34	-34	-34	-34			Source Dist	20	ft	Mech Unit Width	2	ft
	Barrier	-18	-18	-18	-18	-18	-18	-18	-18			Receiver Ht	5	ft	Total Distance	65	ft
												Receiver Dist	45	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	29	ft			
	Total	12	12	12	12	12	12	12	12	**19**		Barrier Loss	17.9	dB			

EF-5	PWL	68	68	68	68	68	68	68	68	75		Source Ht	5	ft	Mech Unit Length	2	ft
USBI13DD	Rathe	-34	-34	-34	-34	-34	-34	-34	-34			Source Dist	20	ft	Mech Unit Width	2	ft
	Barrier	-18	-18	-18	-18	-18	-18	-18	-18			Receiver Ht	5	ft	Total Distance	65	ft
												Receiver Dist	45	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	29	ft			
	Total	20	20	20	20	20	20	20	20	**27**		Barrier Loss	17.9	dB			

EF-10	PWL	59	59	59	59	59	59	59	59	66		Source Ht	13	ft	Mech Unit Length	2	ft
0	Rathe	-34	-34	-34	-34	-34	-34	-34	-34			Source Dist	12	ft	Mech Unit Width	2	ft
	Barrier	-5	-5	-5	-5	-5	-5	-5	-5			Receiver Ht	5	ft	Total Distance	67	ft
												Receiver Dist	55	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	23	23	23	23	23	23	23	23	**30**		Barrier Loss	4.9	dB			

Refrig. Rack	PWL	76	76	76	76	76	76	76	76	83		Source Ht	5	ft	Mech Unit Length	15	ft
0	Rathe	-33	-33	-33	-33	-33	-33	-33	-33			Source Dist	0	ft	Mech Unit Width	5	ft
	Penthouse																
	Louver & Wall	-14	-14	-14	-14	-14	-14	-14	-14			Receiver Ht	5	ft	Total Distance	55	ft
	Barrier	0	0	0	0	0	0	0	0			Receiver Dist	55	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	0	ft			
	Total	33	33	33	33	33	33	33	33	**40**		Barrier Loss	0.0	dB			

Project #	21-0548
Project Name:	2675 Geary Whole Foods
Date:	9/16/2022
Engineer:	NNS
Calc Title:	NEW Mech Outdoor Beyond Property Plane North (East Barrier) (Alt CT)
Notes	SF Police Code - Commercial Noise Limit - 8 dB increase above ambient. Ambient at LT-1 (min L90): 47 dBA. Limit is 55 dBA. Evaluated at north edge of building roof.

Criterion	55	dB
Criterion	55	dB

Meets criterion

NEW Mech Outdoor Beyond Property Plane North (East Barrier) (Alt CT) Summary

	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dBA
CT-1	59	45	43	38	36	37	38	37	**45**
OSA-1	41	38	49	39	38	41	35	31	**46**
OSA-1 (Casing	40	33	40	33	34	26	17	14	**37**
OSA-2	39	36	47	37	36	39	33	29	**44**
OSA-2 (Casing	37	30	37	30	31	23	14	11	**35**
EF-2	28	20	21	17	15	18	20	20	**25**
EF-5	35	27	28	24	22	25	27	27	**32**
EF-10	23	23	23	23	23	23	23	23	**30**
Refrig. Rack	33	33	33	33	33	33	33	33	**40**
Summed	**59**	**47**	**52**	**44**	**43**	**45**	**42**	**40**	**51**

		63	125	250	500	1000	2000	4000	8000	dBA							
CT-1	PWL	92	86	83	82	82	80	79	78	87		Source Ht	29	ft	Mech Unit Length	12	ft
Evapco ESW4 12-44L12-S	Rathe	-36	-36	-36	-36	-36	-36	-36	-36			Source Dist	10	ft	Mech Unit Width	20	ft
	Louvers	0	-8	-7	-11	-13	-10	-8	-8			Receiver Ht	5	ft	Total Distance	80	ft
												Receiver Dist	70	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	0	ft			
	Total	59	45	43	38	36	37	38	37	**45**		Barrier Loss	0.0	dB			
OSA-1	PWL	84	78	92	87	88	87	80	76	93		Source Ht	13	ft	Mech Unit Length	3	ft
	5 ft Lined Duct & End Reflection	-9	-6	-9	-14	-16	-12	-11	-11								
Valent APD450												Source Dist	9	ft	Mech Unit Width	2	ft
	Rathe	-32	-32	-32	-32	-32	-32	-32	-32			Receiver Ht	5	ft	Total Distance	54	ft
	Barrier	-5	-5	-5	-5	-5	-5	-5	-5			Receiver Dist	45	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	41	38	49	39	38	41	35	31	**46**		Barrier Loss	4.7	dB			
OSA-1 (Casing Radiated)	PWL	83	76	83	76	77	69	60	57	80		Source Ht	13	ft	Mech Unit Length	3	ft
Valent APD450												Source Dist	9	ft	Mech Unit Width	2	ft
	Rathe	-32	-32	-32	-32	-32	-32	-32	-32			Receiver Ht	5	ft	Total Distance	54	ft
	Penthouse Louver & Wall	-14	-14	-14	-14	-14	-14	-14	-14			Receiver Dist	45	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	0	ft			
	Total	40	33	40	33	34	26	17	14	**37**		Barrier Loss	0.0	dB			
OSA-2	PWL	84	78	92	87	88	87	80	76	93		Source Ht	13	ft	Mech Unit Length	3	ft
	5 ft Lined Duct & End Reflection	-9	-6	-9	-14	-16	-12	-11	-11								
Valent APD450												Source Dist	10	ft	Mech Unit Width	2	ft
	Rathe	-35	-35	-35	-35	-35	-35	-35	-35			Receiver Ht	5	ft	Total Distance	70	ft
	Barrier	-5	-5	-5	-5	-5	-5	-5	-5			Receiver Dist	60	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	39	36	47	37	36	39	33	29	**44**		Barrier Loss	4.6	dB			

OSA-2 (Casing Radiated)	PWL	83	76	83	76	77	69	60	57	80		Source Ht	13	ft	Mech Unit Length	3	ft
Valent APD450												Source Dist	10	ft	Mech Unit Width	2	ft
	Rathe	-35	-35	-35	-35	-35	-35	-35	-35			Receiver Ht	5	ft	Total Distance	70	ft
	Penthouse																
	Louver & Wall	-14	-14	-14	-14	-14	-14	-14	-14			Receiver Dist	60	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	0	ft			
	Total	37	30	37	30	31	23	14	11	**35**		Barrier Loss	0.0	dB			

EF-2	PWL	61	61	61	61	61	61	61	61	68		Source Ht	5	ft	Mech Unit Length	2	ft
USBI11DD	Rathe	-37	-37	-37	-37	-37	-37	-37	-37			Source Dist	20	ft	Mech Unit Width	2	ft
	Louvers	0	-8	-7	-11	-13	-10	-8	-8			Receiver Ht	5	ft	Total Distance	90	ft
												Receiver Dist	70	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	0	ft			
	Total	28	20	21	17	15	18	20	20	**25**		Barrier Loss	0.0	dB			

EF-5	PWL	68	68	68	68	68	68	68	68	75		Source Ht	5	ft	Mech Unit Length	2	ft
USBI13DD	Rathe	-37	-37	-37	-37	-37	-37	-37	-37			Source Dist	20	ft	Mech Unit Width	2	ft
	Louvers	0	-8	-7	-11	-13	-10	-8	-8			Receiver Ht	5	ft	Total Distance	90	ft
												Receiver Dist	70	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	0	ft			
	Total	35	27	28	24	22	25	27	27	**32**		Barrier Loss	0.0	dB			

EF-10	PWL	59	59	59	59	59	59	59	59	66		Source Ht	13	ft	Mech Unit Length	2	ft
0	Rathe	-34	-34	-34	-34	-34	-34	-34	-34			Source Dist	12	ft	Mech Unit Width	2	ft
	Barrier	-5	-5	-5	-5	-5	-5	-5	-5			Receiver Ht	5	ft	Total Distance	67	ft
												Receiver Dist	55	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	23	23	23	23	23	23	23	23	**30**		Barrier Loss	4.9	dB			

Refrig. Rack	PWL	76	76	76	76	76	76	76	76	83		Source Ht	5	ft	Mech Unit Length	15	ft
0	Rathe	-33	-33	-33	-33	-33	-33	-33	-33			Source Dist	0	ft	Mech Unit Width	5	ft
	Penthouse																
	Louver & Wall	-14	-14	-14	-14	-14	-14	-14	-14			Receiver Ht	5	ft	Total Distance	55	ft
	Barrier	0	0	0	0	0	0	0	0			Receiver Dist	55	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	0	ft			
	Total	33	33	33	33	33	33	33	33	**40**		Barrier Loss	0.0	dB			

Project #	21-0548
Project Name:	2675 Geary Whole Foods
Date:	9/16/2022
Engineer:	NNS
Calc Title:	NEW Mech Outdoor Beyond Property Plane West (Alt CT)

Notes SF Police Code - Commercial Noise Limit - 8 dB increase above ambient. Ambient at LT-2 (min L90): 42 dBA. Minimum ambient: 45 dBA. Limit is 53 dBA. Evaluated at west property plane.

Criterion	53	dB
Criterion	53	dB

Meets criterion

NEW Mech Outdoor Beyond Property Plane West (Alt CT) Summary

	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dBA
CT-1	37	31	28	27	27	25	24	23	**33**
OSA-1	19	16	29	22	27	27	20	16	**31**
OSA-2	20	17	30	23	28	28	21	17	**33**
EF-2	1	1	1	1	1	1	1	1	**8**
EF-5	8	8	8	8	8	8	8	8	**15**
EF-10	2	2	2	2	2	2	2	2	**9**
Refrig. Rack	2	2	2	2	2	2	2	2	**9**
Summed	**37**	**31**	**34**	**29**	**32**	**31**	**27**	**25**	**37**

		63	125	250	500	1000	2000	4000	8000	dBA							
CT-1	PWL	92	86	83	82	82	80	79	78	87		Source Ht	84	ft	Mech Unit Length	12	ft
Evapco ESW4 12-44L12-S	Rathe	-52	-52	-52	-52	-52	-52	-52	-52			Source Dist	220	ft	Mech Unit Width	20	ft
	Barrier	-6	-6	-6	-6	-6	-6	-6	-6			Receiver Ht	5	ft	Total Distance	520	ft
												Receiver Dist	300	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	37	31	28	27	27	25	24	23	**33**		Barrier Loss	5.9	dB			
OSA-1	PWL	84	78	92	87	88	87	80	76	93		Source Ht	68	ft	Mech Unit Length	3	ft
	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3								
Valent APD450												Source Dist	195	ft	Mech Unit Width	2	ft
	Rathe	-52	-52	-52	-52	-52	-52	-52	-52			Receiver Ht	5	ft	Total Distance	495	ft
	Barrier	-9	-9	-9	-9	-9	-9	-9	-9			Receiver Dist	300	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	19	16	29	22	27	27	20	16	**31**		Barrier Loss	8.8	dB			
OSA-2	PWL	84	78	92	87	88	87	80	76	93		Source Ht	68	ft	Mech Unit Length	3	ft
	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3								
Valent APD450												Source Dist	170	ft	Mech Unit Width	2	ft
	Rathe	-51	-51	-51	-51	-51	-51	-51	-51			Receiver Ht	5	ft	Total Distance	470	ft
	Barrier	-8	-8	-8	-8	-8	-8	-8	-8			Receiver Dist	300	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	20	17	30	23	28	28	21	17	**33**		Barrier Loss	8.1	dB			
EF-2	PWL	61	61	61	61	61	61	61	61	68		Source Ht	58	ft	Mech Unit Length	2	ft
USBI11DD	Rathe	-52	-52	-52	-52	-52	-52	-52	-52			Source Dist	220	ft	Mech Unit Width	2	ft
	Barrier	-12	-12	-12	-12	-12	-12	-12	-12			Receiver Ht	5	ft	Total Distance	520	ft
												Receiver Dist	300	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	1	1	1	1	1	1	1	1	**8**		Barrier Loss	11.6	dB			
EF-5	PWL	68	68	68	68	68	68	68	68	75		Source Ht	58	ft	Mech Unit Length	2	ft
USBI13DD	Rathe	-52	-52	-52	-52	-52	-52	-52	-52			Source Dist	220	ft	Mech Unit Width	2	ft
	Barrier	-12	-12	-12	-12	-12	-12	-12	-12			Receiver Ht	5	ft	Total Distance	520	ft
												Receiver Dist	300	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			

	Total	8	8	8	8	8	8	8	8	**15**		Barrier Loss	11.6	dB			
EF-10	PWL	59	59	59	59	59	59	59	59	66		Source Ht	68	ft	Mech Unit Length	2	ft
0	Rathe	-51	-51	-51	-51	-51	-51	-51	-51			Source Dist	180	ft	Mech Unit Width	2	ft
	Barrier	-8	-8	-8	-8	-8	-8	-8	-8			Receiver Ht	5	ft	Total Distance	480	ft
												Receiver Dist	300	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	2	2	2	2	2	2	2	2	**9**		Barrier Loss	8.3	dB			
Refrig. Rack	PWL	76	76	76	76	76	76	76	76	83		Source Ht	60	ft	Mech Unit Length	15	ft
0	Rathe	-52	-52	-52	-52	-52	-52	-52	-52			Source Dist	205	ft	Mech Unit Width	5	ft
	Penthouse																
	Enclosure	-15	-15	-15	-15	-15	-15	-15	-15			Receiver Ht	5	ft	Total Distance	505	ft
	Barrier	-11	-11	-11	-11	-11	-11	-11	-11			Receiver Dist	300	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	2	2	2	2	2	2	2	2	**9**		Barrier Loss	11.0	dB			

Project #	21-0548
Project Name:	2675 Geary Whole Foods
Date:	9/16/2022
Engineer:	NNS
Calc Title:	NEW Mech Outdoor Beyond Property Plane South (Alt CT)
Notes	SF Police Code - Commercial Noise Limit - 8 dB increase above ambient. Ambient at LT-3 (min L90): 46 dBA. Limit is 54 dBA. Evaluated at south property plane.

Criterion	54	dB
Criterion	54	dB

Meets criterion

NEW Mech Outdoor Beyond Property Plane South (Alt CT) Summary

	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dBA
CT-1	49	43	40	39	39	37	36	35	**44**
OSA-1	28	25	38	31	36	36	29	25	**40**
OSA-2	28	25	38	31	36	36	29	25	**40**
EF-2	9	9	9	9	9	9	9	9	**16**
EF-5	17	17	17	17	17	17	17	17	**24**
EF-10	11	11	11	11	11	11	11	11	**18**
Refrig. Rack	10	10	10	10	10	10	10	10	**17**
Summed	**49**	**43**	**43**	**40**	**42**	**41**	**37**	**36**	**47**

		63	125	250	500	1000	2000	4000	8000	dBA
CT-1	PWL	92	86	83	82	82	80	79	78	87
Evapco ESW4 12-44L12-S	Rathe	-46	-46	-46	-46	-46	-46	-46	-46	
	Barrier	0	0	0	0	0	0	0	0	
	Safety Factor	3	3	3	3	3	3	3	3	
	Total	49	43	40	39	39	37	36	35	**44**

Source Ht	84	ft
Source Dist	60	ft
Receiver Ht	5	ft
Receiver Dist	210	ft
Barrier Ht	55	ft
Barrier Loss	0.0	dB

Mech Unit Length	12	ft
Mech Unit Width	20	ft
Total Distance	270	ft

		63	125	250	500	1000	2000	4000	8000	dBA
OSA-1	PWL	84	78	92	87	88	87	80	76	93
Valent APD450	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3	
	Rathe	-46	-46	-46	-46	-46	-46	-46	-46	
	Barrier	-5	-5	-5	-5	-5	-5	-5	-5	
	Safety Factor	3	3	3	3	3	3	3	3	
	Total	28	25	38	31	36	36	29	25	**40**

Source Ht	68	ft
Source Dist	60	ft
Receiver Ht	5	ft
Receiver Dist	210	ft
Barrier Ht	55	ft
Barrier Loss	5.0	dB

Mech Unit Length	3	ft
Mech Unit Width	2	ft
Total Distance	270	ft

		63	125	250	500	1000	2000	4000	8000	dBA
OSA-2	PWL	84	78	92	87	88	87	80	76	93
Valent APD450	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3	
	Rathe	-46	-46	-46	-46	-46	-46	-46	-46	
	Barrier	-5	-5	-5	-5	-5	-5	-5	-5	
	Safety Factor	3	3	3	3	3	3	3	3	
	Total	28	25	38	31	36	36	29	25	**40**

Source Ht	68	ft
Source Dist	60	ft
Receiver Ht	5	ft
Receiver Dist	210	ft
Barrier Ht	55	ft
Barrier Loss	5.0	dB

Mech Unit Length	3	ft
Mech Unit Width	2	ft
Total Distance	270	ft

		63	125	250	500	1000	2000	4000	8000	dBA
EF-2	PWL	61	61	61	61	61	61	61	61	68
USBI11DD	Rathe	-46	-46	-46	-46	-46	-46	-46	-46	
	Barrier	-9	-9	-9	-9	-9	-9	-9	-9	
	Safety Factor	3	3	3	3	3	3	3	3	
	Total	9	9	9	9	9	9	9	9	**16**

Source Ht	58	ft
Source Dist	50	ft
Receiver Ht	5	ft
Receiver Dist	210	ft
Barrier Ht	55	ft
Barrier Loss	9.0	dB

Mech Unit Length	2	ft
Mech Unit Width	2	ft
Total Distance	260	ft

		63	125	250	500	1000	2000	4000	8000	dBA
EF-5	PWL	68	68	68	68	68	68	68	68	75
USBI13DD	Rathe	-46	-46	-46	-46	-46	-46	-46	-46	
	Barrier	-9	-9	-9	-9	-9	-9	-9	-9	
	Safety Factor	3	3	3	3	3	3	3	3	

Source Ht	58	ft
Source Dist	50	ft
Receiver Ht	5	ft
Receiver Dist	210	ft
Barrier Ht	55	ft

Mech Unit Length	2	ft
Mech Unit Width	2	ft
Total Distance	260	ft

	Total	17	17	17	17	17	17	17	17	**24**		Barrier Loss	9.0	dB			
EF-10	PWL	59	59	59	59	59	59	59	59	66		Source Ht	68	ft	Mech Unit Length	2	ft
0	Rathe	-46	-46	-46	-46	-46	-46	-46	-46			Source Dist	60	ft	Mech Unit Width	2	ft
	Barrier	-5	-5	-5	-5	-5	-5	-5	-5			Receiver Ht	5	ft	Total Distance	270	ft
												Receiver Dist	210	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	11	11	11	11	11	11	11	11	**18**		Barrier Loss	5.0	dB			
Refrig. Rack	PWL	76	76	76	76	76	76	76	76	83		Source Ht	60	ft	Mech Unit Length	15	ft
0	Rathe	-46	-46	-46	-46	-46	-46	-46	-46			Source Dist	60	ft	Mech Unit Width	5	ft
	Penthouse																
	Enclosure	-15	-15	-15	-15	-15	-15	-15	-15			Receiver Ht	5	ft	Total Distance	270	ft
	Barrier	-9	-9	-9	-9	-9	-9	-9	-9			Receiver Dist	210	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	10	10	10	10	10	10	10	10	**17**		Barrier Loss	8.6	dB			

Project #	21-0548
Project Name:	2675 Geary Whole Foods
Date:	9/16/2022
Engineer:	NNS
Calc Title:	NEW Mech Outdoor at Outdoor Area Locations 1 & 2 (CT Level 3 Alt Location)
Notes	

CRITERION: From email 3/17/22, 62.5 dBA

Criterion	62.5	dB
Criterion	62.5	dB

Meets criterion

NEW Mech Outdoor at Outdoor Area Locations 1 & 2 (CT Level 3 Alt Location) Summary

	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dBA
CT-1	38	32	29	28	28	26	25	24	**33**
OSA-1	42	39	52	45	50	50	43	39	**55**
OSA-2	40	37	50	43	48	48	41	37	**52**
EF-2	26	26	26	26	26	26	26	26	**33**
EF-5	33	33	33	33	33	33	33	33	**40**
EF-10	24	24	24	24	24	24	24	24	**31**
Refrig. Rack	39	39	39	39	39	39	39	39	**46**
Summed	**46**	**44**	**54**	**48**	**53**	**53**	**46**	**44**	**57.4**

		63	125	250	500	1000	2000	4000	8000	dBA						
CT-1	PWL	92	86	83	82	82	80	79	78	87		Source Ht	23	ft	Mech Unit Length	12	ft
Evapco ESW4 12-44L12-S	Rathe	-40	-40	-40	-40	-40	-40	-40	-40			Source Dist	45	ft	Mech Unit Width	20	ft
	Barrier	-18	-18	-18	-18	-18	-18	-18	-18			Receiver Ht	21	ft	Total Distance	130	ft
												Receiver Dist	85	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	50	ft	(Building)		
	Total	38	32	29	28	28	26	25	24	**33**		Barrier Loss	17.5	dB			
OSA-1	PWL	84	78	92	87	88	87	80	76	93		Source Ht	13	ft	Mech Unit Length	3	ft
	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3								
Valent APD450												Source Dist	20	ft	Mech Unit Width	2	ft
	Rathe	-30	-30	-30	-30	-30	-30	-30	-30			Receiver Ht	5	ft	Total Distance	40	ft
	Barrier	-7	-7	-7	-7	-7	-7	-7	-7			Receiver Dist	20	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	42	39	52	45	50	50	43	39	**55**		Barrier Loss	6.9	dB			
OSA-2	PWL	84	78	92	87	88	87	80	76	93		Source Ht	13	ft	Mech Unit Length	3	ft
	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3								
Valent APD450												Source Dist	29	ft	Mech Unit Width	2	ft
	Rathe	-33	-33	-33	-33	-33	-33	-33	-33			Receiver Ht	5	ft	Total Distance	59	ft
	Barrier	-6	-6	-6	-6	-6	-6	-6	-6			Receiver Dist	30	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	40	37	50	43	48	48	41	37	**52**		Barrier Loss	6.3	dB			
EF-2	PWL	61	61	61	61	61	61	61	61	68		Source Ht	3	ft	Mech Unit Length	2	ft
USBI11DD	Rathe	-24	-24	-24	-24	-24	-24	-24	-24			Source Dist	4	ft	Mech Unit Width	2	ft
	Barrier	-15	-15	-15	-15	-15	-15	-15	-15			Receiver Ht	5	ft	Total Distance	20	ft
												Receiver Dist	16	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	10	ft			
	Total	26	26	26	26	26	26	26	26	**33**		Barrier Loss	15.0	dB			
EF-5	PWL	68	68	68	68	68	68	68	68	75		Source Ht	3	ft	Mech Unit Length	2	ft
USBI13DD	Rathe	-24	-24	-24	-24	-24	-24	-24	-24			Source Dist	4	ft	Mech Unit Width	2	ft
	Barrier	-15	-15	-15	-15	-15	-15	-15	-15			Receiver Ht	5	ft	Total Distance	20	ft
												Receiver Dist	16	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	10	ft			

	Total	33	33	33	33	33	33	33	33	**40**		Barrier Loss	15.0	dB			
EF-10	PWL	59	59	59	59	59	59	59	59	66		Source Ht	13	ft	Mech Unit Length	2	ft
0	Rathe	-32	-32	-32	-32	-32	-32	-32	-32			Source Dist	20	ft	Mech Unit Width	2	ft
	Barrier	-6	-6	-6	-6	-6	-6	-6	-6			Receiver Ht	5	ft	Total Distance	50	ft
												Receiver Dist	30	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	24	24	24	24	24	24	24	24	**31**		Barrier Loss	5.8	dB			
Refrig. Rack	PWL	76	76	76	76	76	76	76	76	83		Source Ht	5	ft	Mech Unit Length	15	ft
0	Rathe	-26	-26	-26	-26	-26	-26	-26	-26			Source Dist	5	ft	Mech Unit Width	5	ft
	Penthouse																
	Enclosure	-15	-15	-15	-15	-15	-15	-15	-15			Receiver Ht	5	ft	Total Distance	25	ft
												Receiver Dist	20	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	0	ft			
	Total	39	39	39	39	39	39	39	39	**46**		Barrier Loss	0.0	dB			

Project #	21-0548
Project Name:	2675 Geary Whole Foods
Date:	9/16/2022
Engineer:	NNS
Calc Title:	NEW Mech Outdoor at Outdoor Area Location 3 (CT Level 3 Alt Location)
Notes	

CRITERION: From email 3/17/22, 62.5 dBA

Criterion	62.5	dB
Criterion	62.5	dB

Meets criterion

NEW Mech Outdoor at Outdoor Area Location 3 (CT Level 3 Alt Location) Summary

	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dBA
CT-1	38	32	29	28	28	26	25	24	**33**
OSA-1	42	39	52	45	50	50	43	39	**54**
OSA-2	39	36	49	42	47	47	40	36	**52**
EF-2	26	26	26	26	26	26	26	26	**33**
EF-5	33	33	33	33	33	33	33	33	**40**
EF-10	24	24	24	24	24	24	24	24	**31**
Refrig. Rack	39	39	39	39	39	39	39	39	**46**
Summed	**46**	**43**	**54**	**47**	**52**	**52**	**46**	**43**	**56.7**

		63	125	250	500	1000	2000	4000	8000	dBA							
CT-1	PWL	92	86	83	82	82	80	79	78	87		Source Ht	23	ft	Mech Unit Length	12	ft
Evapco ESW4 12-44L12-S	Rathe	-40	-40	-40	-40	-40	-40	-40	-40			Source Dist	35	ft	Mech Unit Width	20	ft
	Barrier	-18	-18	-18	-18	-18	-18	-18	-18			Receiver Ht	21	ft	Total Distance	125	ft
												Receiver Dist	90	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	50	ft	(Building)		
	Total	38	32	29	28	28	26	25	24	**33**		Barrier Loss	17.6	dB			
OSA-1	PWL	84	78	92	87	88	87	80	76	93		Source Ht	13	ft	Mech Unit Length	3	ft
	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3								
Valent APD450												Source Dist	20	ft	Mech Unit Width	2	ft
	Rathe	-32	-32	-32	-32	-32	-32	-32	-32			Receiver Ht	5	ft	Total Distance	50	ft
	Barrier	-6	-6	-6	-6	-6	-6	-6	-6			Receiver Dist	30	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	42	39	52	45	50	50	43	39	**54**		Barrier Loss	5.8	dB			
OSA-2	PWL	84	78	92	87	88	87	80	76	93		Source Ht	13	ft	Mech Unit Length	3	ft
	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3								
Valent APD450												Source Dist	29	ft	Mech Unit Width	2	ft
	Rathe	-34	-34	-34	-34	-34	-34	-34	-34			Receiver Ht	5	ft	Total Distance	69	ft
	Barrier	-6	-6	-6	-6	-6	-6	-6	-6			Receiver Dist	40	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	39	36	49	42	47	47	40	36	**52**		Barrier Loss	5.8	dB			
EF-2	PWL	61	61	61	61	61	61	61	61	68		Source Ht	3	ft	Mech Unit Length	2	ft
USBI11DD	Rathe	-24	-24	-24	-24	-24	-24	-24	-24			Source Dist	4	ft	Mech Unit Width	2	ft
	Barrier	-15	-15	-15	-15	-15	-15	-15	-15			Receiver Ht	5	ft	Total Distance	20	ft
												Receiver Dist	16	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	10	ft			
	Total	26	26	26	26	26	26	26	26	**33**		Barrier Loss	15.0	dB			
EF-5	PWL	68	68	68	68	68	68	68	68	75		Source Ht	3	ft	Mech Unit Length	2	ft
USBI13DD	Rathe	-24	-24	-24	-24	-24	-24	-24	-24			Source Dist	4	ft	Mech Unit Width	2	ft
	Barrier	-15	-15	-15	-15	-15	-15	-15	-15			Receiver Ht	5	ft	Total Distance	20	ft
												Receiver Dist	16	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	10	ft			

	Total	33	33	33	33	33	33	33	33	**40**		Barrier Loss	15.0	dB			
EF-10	PWL	59	59	59	59	59	59	59	59	66		Source Ht	13	ft	Mech Unit Length	2	ft
0	Rathe	-32	-32	-32	-32	-32	-32	-32	-32			Source Dist	20	ft	Mech Unit Width	2	ft
	Barrier	-6	-6	-6	-6	-6	-6	-6	-6			Receiver Ht	5	ft	Total Distance	50	ft
												Receiver Dist	30	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	24	24	24	24	24	24	24	24	**31**		Barrier Loss	5.8	dB			
Refrig. Rack	PWL	76	76	76	76	76	76	76	76	83		Source Ht	5	ft	Mech Unit Length	15	ft
0	Rathe	-26	-26	-26	-26	-26	-26	-26	-26			Source Dist	5	ft	Mech Unit Width	5	ft
	Penthouse																
	Enclosure	-15	-15	-15	-15	-15	-15	-15	-15			Receiver Ht	5	ft	Total Distance	25	ft
												Receiver Dist	20	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	0	ft			
	Total	39	39	39	39	39	39	39	39	**46**		Barrier Loss	0.0	dB			

Project #	21-0548
Project Name:	2675 Geary Whole Foods
Date:	9/16/2022
Engineer:	NNS
Calc Title:	NEW Mech Outdoor at Outdoor Area Location 4 (CT Level 3 Alt Location)
Notes	

CRITERION: From email 3/17/22, 62.5 dBA

Criterion	62.5	dB
Criterion	62.5	dB

Meets criterion

NEW Mech Outdoor at Outdoor Area Location 4 (CT Level 3 Alt Location) Summary

	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dBA
CT-1	53	47	44	43	43	41	40	39	**49**
OSA-1	40	37	50	43	48	48	41	37	**53**
OSA-2	38	35	48	41	46	46	39	35	**51**
EF-2	20	20	20	20	20	20	20	20	**27**
EF-5	27	27	27	27	27	27	27	27	**34**
EF-10	22	22	22	22	22	22	22	22	**29**
Refrig. Rack	34	34	34	34	34	34	34	34	**41**
Summed	**54**	**48**	**53**	**48**	**51**	**51**	**46**	**43**	**56**

		63	125	250	500	1000	2000	4000	8000	dBA						
CT-1	PWL	92	86	83	82	82	80	79	78	87		Source Ht	23	ft	Mech Unit Length	12	ft
Evapco ESW4 12-44L12-S	Rathe	-39	-39	-39	-39	-39	-39	-39	-39			Source Dist	93	ft	Mech Unit Width	20	ft
	Barrier	-3	-3	-3	-3	-3	-3	-3	-3			Receiver Ht	21	ft	Total Distance	118	ft
												Receiver Dist	25	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	19	ft	(Parapet)		
	Total	53	47	44	43	43	41	40	39	**49**		Barrier Loss	2.6	dB			
OSA-1	PWL	84	78	92	87	88	87	80	76	93		Source Ht	13	ft	Mech Unit Length	3	ft
	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3								
Valent APD450												Source Dist	20	ft	Mech Unit Width	2	ft
	Rathe	-33	-33	-33	-33	-33	-33	-33	-33			Receiver Ht	5	ft	Total Distance	60	ft
	Barrier	-5	-5	-5	-5	-5	-5	-5	-5			Receiver Dist	40	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	40	37	50	43	48	48	41	37	**53**		Barrier Loss	5.3	dB			
OSA-2	PWL	84	78	92	87	88	87	80	76	93		Source Ht	13	ft	Mech Unit Length	3	ft
	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3								
Valent APD450												Source Dist	29	ft	Mech Unit Width	2	ft
	Rathe	-36	-36	-36	-36	-36	-36	-36	-36			Receiver Ht	5	ft	Total Distance	79	ft
	Barrier	-5	-5	-5	-5	-5	-5	-5	-5			Receiver Dist	50	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	38	35	48	41	46	46	39	35	**51**		Barrier Loss	5.5	dB			
EF-2	PWL	61	61	61	61	61	61	61	61	68		Source Ht	3	ft	Mech Unit Length	2	ft
USBI11DD	Rathe	-29	-29	-29	-29	-29	-29	-29	-29			Source Dist	4	ft	Mech Unit Width	2	ft
	Barrier	-15	-15	-15	-15	-15	-15	-15	-15			Receiver Ht	5	ft	Total Distance	39	ft
												Receiver Dist	35	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	10	ft			
	Total	20	20	20	20	20	20	20	20	**27**		Barrier Loss	14.8	dB			
EF-5	PWL	68	68	68	68	68	68	68	68	75		Source Ht	3	ft	Mech Unit Length	2	ft
USBI13DD	Rathe	-29	-29	-29	-29	-29	-29	-29	-29			Source Dist	4	ft	Mech Unit Width	2	ft
	Barrier	-15	-15	-15	-15	-15	-15	-15	-15			Receiver Ht	5	ft	Total Distance	39	ft
												Receiver Dist	35	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	10	ft			

	Total	27	27	27	27	27	27	27	27	**34**		Barrier Loss	14.8	dB			
EF-10	PWL	59	59	59	59	59	59	59	59	66		Source Ht	13	ft	Mech Unit Length	2	ft
0	Rathe	-35	-35	-35	-35	-35	-35	-35	-35			Source Dist	20	ft	Mech Unit Width	2	ft
	Barrier	-5	-5	-5	-5	-5	-5	-5	-5			Receiver Ht	5	ft	Total Distance	70	ft
												Receiver Dist	50	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	22	22	22	22	22	22	22	22	**29**		Barrier Loss	5.0	dB			
Refrig. Rack	PWL	76	76	76	76	76	76	76	76	83		Source Ht	5	ft	Mech Unit Length	15	ft
0	Rathe	-31	-31	-31	-31	-31	-31	-31	-31			Source Dist	5	ft	Mech Unit Width	5	ft
	Penthouse																
	Enclosure	-15	-15	-15	-15	-15	-15	-15	-15			Receiver Ht	5	ft	Total Distance	45	ft
												Receiver Dist	40	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	0	ft			
	Total	34	34	34	34	34	34	34	34	**41**		Barrier Loss	0.0	dB			

Project #	21-0548
Project Name:	2675 Geary Whole Foods
Date:	9/16/2022
Engineer:	NNS
Calc Title:	NEW Mech Outdoor at Residence (at LT-1, Geary & Presidio) (CT L3 Alt Location)
Notes	SF Police Code - Residential interior limit - 45 dBA at night inside the nearest residence

Criterion	45	dB
Criterion	45	dB

Meets criterion

NEW Mech Outdoor at Residence (at LT-1, Geary & Presidio) (CT L3 Alt Location) Summary

	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dBA
CT-1	20	14	11	10	10	8	7	6	**15**
OSA-1	16	13	26	19	24	24	17	13	**29**
OSA-2	16	13	26	19	24	24	17	13	**29**
EF-2	-1	-1	-1	-1	-1	-1	-1	-1	**6**
EF-5	6	6	6	6	6	6	6	6	**13**
EF-10	-1	-1	-1	-1	-1	-1	-1	-1	**6**
Refrig. Rack	0	0	0	0	0	0	0	0	**7**
Summed	**23**	**19**	**29**	**23**	**27**	**27**	**21**	**17**	**32**

		63	125	250	500	1000	2000	4000	8000	dBA							
CT-1	PWL	92	86	83	82	82	80	79	78	87		Source Ht	63	ft	Mech Unit Length	12	ft
Evapco ESW4 12-44L12-S	Rathe	-47	-47	-47	-47	-47	-47	-47	-47			Source Dist	20	ft	Mech Unit Width	20	ft
	Barrier	-18	-18	-18	-18	-18	-18	-18	-18			Receiver Ht	30	ft	Total Distance	300	ft
	WINDOW LOSS	-10	-10	-10	-10	-10	-10	-10	-10			Receiver Dist	280	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	90	ft	(Building)		
	Total	20	14	11	10	10	8	7	6	**15**		Barrier Loss	18.0	dB			
OSA-1	PWL	84	78	92	87	88	87	80	76	93		Source Ht	68	ft	Mech Unit Length	3	ft
	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3								
Valent APD450												Source Dist	110	ft	Mech Unit Width	2	ft
	Rathe	-48	-48	-48	-48	-48	-48	-48	-48			Receiver Ht	30	ft	Total Distance	320	ft
	Barrier	-5	-5	-5	-5	-5	-5	-5	-5			Receiver Dist	210	ft			
	OPEN WINDOW LOSS	-10	-10	-10	-10	-10	-10	-10	-10								
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	16	13	26	19	24	24	17	13	**29**		Barrier Loss	5.0	dB			
OSA-2	PWL	84	78	92	87	88	87	80	76	93		Source Ht	68	ft	Mech Unit Length	3	ft
	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3								
Valent APD450												Source Dist	110	ft	Mech Unit Width	2	ft
	Rathe	-48	-48	-48	-48	-48	-48	-48	-48			Receiver Ht	30	ft	Total Distance	320	ft
	Barrier	-5	-5	-5	-5	-5	-5	-5	-5			Receiver Dist	210	ft			
	OPEN WINDOW LOSS	-10	-10	-10	-10	-10	-10	-10	-10								
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	16	13	26	19	24	24	17	13	**29**		Barrier Loss	5.0	dB			
EF-2	PWL	61	61	61	61	61	61	61	61	68		Source Ht	58	ft	Mech Unit Length	2	ft
USBI11DD	Rathe	-47	-47	-47	-47	-47	-47	-47	-47			Source Dist	120	ft	Mech Unit Width	2	ft
	Barrier	-8	-8	-8	-8	-8	-8	-8	-8			Receiver Ht	30	ft	Total Distance	300	ft
	WINDOW LOSS	-10	-10	-10	-10	-10	-10	-10	-10			Receiver Dist	180	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	-1	-1	-1	-1	-1	-1	-1	-1	**6**		Barrier Loss	8.2	dB			
EF-5	PWL	68	68	68	68	68	68	68	68	75		Source Ht	58	ft	Mech Unit Length	2	ft
USBI13DD	Rathe	-47	-47	-47	-47	-47	-47	-47	-47			Source Dist	120	ft	Mech Unit Width	2	ft
	Barrier	-8	-8	-8	-8	-8	-8	-8	-8			Receiver Ht	30	ft	Total Distance	300	ft

	WINDOW LOSS	-10	-10	-10	-10	-10	-10	-10	-10			Receiver Dist	180	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	6	6	6	6	6	6	6	6	**13**		Barrier Loss	8.2	dB			
EF-10	PWL	59	59	59	59	59	59	59	59	66		Source Ht	68	ft	Mech Unit Length	2	ft
0	Rathe	-48	-48	-48	-48	-48	-48	-48	-48			Source Dist	110	ft	Mech Unit Width	2	ft
	Barrier	-5	-5	-5	-5	-5	-5	-5	-5			Receiver Ht	30	ft	Total Distance	320	ft
	WINDOW LOSS	-10	-10	-10	-10	-10	-10	-10	-10			Receiver Dist	210	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	-1	-1	-1	-1	-1	-1	-1	-1	**6**		Barrier Loss	5.0	dB			
Refrig. Rack	PWL	76	76	76	76	76	76	76	76	83		Source Ht	60	ft	Mech Unit Length	15	ft
0	Rathe	-48	-48	-48	-48	-48	-48	-48	-48			Source Dist	110	ft	Mech Unit Width	5	ft
	Penthouse Enclosure	-15	-15	-15	-15	-15	-15	-15	-15			Receiver Ht	30	ft	Total Distance	320	ft
	Barrier	-7	-7	-7	-7	-7	-7	-7	-7								
	WINDOW LOSS	-10	-10	-10	-10	-10	-10	-10	-10			Receiver Dist	210	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	0	0	0	0	0	0	0	0	**7**		Barrier Loss	6.9	dB			

Project #	21-0548
Project Name:	2675 Geary Whole Foods
Date:	9/16/2022
Engineer:	NNS
Calc Title:	NEW Mech Outdoor at Residence (O'Farrell St & Anzavista Ave, 300-314 Anzavista Ave) (CT L3 Alt Location)
Notes	SF Police Code - Commercial Noise Limit - 8 dB increase above ambient. Ambient at LT-3 (min L90): 46 dBA. Limit is 54 dBA. Evaluated at south property plane.

Criterion	54	dB
Criterion	54	dB

Meets criterion

NEW Mech Outdoor at Residence (O'Farrell St & Anzavista Ave, 300-314 Anzavista Ave) (CT L3 Alt Location) Summary

	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dBA
CT-1	37	31	28	27	27	25	24	23	**33**
OSA-1	16	13	26	19	24	24	17	13	**29**
OSA-2	16	13	26	19	24	24	17	13	**29**
EF-2	-2	-2	-2	-2	-2	-2	-2	-2	**5**
EF-5	5	5	5	5	5	5	5	5	**12**
EF-10	-1	-1	-1	-1	-1	-1	-1	-1	**6**
Refrig. Rack	4	4	4	4	4	4	4	4	**11**
Summed	**37**	**31**	**32**	**28**	**30**	**29**	**26**	**24**	**35**

		63	125	250	500	1000	2000	4000	8000	dBA							
CT-1	PWL	92	86	83	82	82	80	79	78	87		Source Ht	23	ft	Mech Unit Length	12	ft
Evapco ESW4 12-44L12-S	Rathe	-48	-48	-48	-48	-48	-48	-48	-48			Source Dist	0	ft	Mech Unit Width	20	ft
	Barrier	0	0	0	0	0	0	0	0			Receiver Ht	20	ft	Total Distance	320	ft
	WINDOW LOSS	-10	-10	-10	-10	-10	-10	-10	-10			Receiver Dist	320	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	0	ft			
	Total	37	31	28	27	27	25	24	23	**33**		Barrier Loss	0.0	dB			
OSA-1	PWL	84	78	92	87	88	87	80	76	93		Source Ht	68	ft	Mech Unit Length	3	ft
	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3								
Valent APD450												Source Dist	60	ft	Mech Unit Width	2	ft
	Rathe	-50	-50	-50	-50	-50	-50	-50	-50			Receiver Ht	5	ft	Total Distance	430	ft
	Barrier	-2	-2	-2	-2	-2	-2	-2	-2			Receiver Dist	370	ft			
	OPEN WINDOW LOSS	-10	-10	-10	-10	-10	-10	-10	-10								
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	16	13	26	19	24	24	17	13	**29**		Barrier Loss	2.3	dB			
OSA-2	PWL	84	78	92	87	88	87	80	76	93		Source Ht	68	ft	Mech Unit Length	3	ft
	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3								
Valent APD450												Source Dist	60	ft	Mech Unit Width	2	ft
	Rathe	-50	-50	-50	-50	-50	-50	-50	-50			Receiver Ht	5	ft	Total Distance	430	ft
	Barrier	-2	-2	-2	-2	-2	-2	-2	-2			Receiver Dist	370	ft			
	OPEN WINDOW LOSS	-10	-10	-10	-10	-10	-10	-10	-10								
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	16	13	26	19	24	24	17	13	**29**		Barrier Loss	2.3	dB			
EF-2	PWL	61	61	61	61	61	61	61	61	68		Source Ht	58	ft	Mech Unit Length	2	ft
USBI11DD	Rathe	-50	-50	-50	-50	-50	-50	-50	-50			Source Dist	50	ft	Mech Unit Width	2	ft
	Barrier	-6	-6	-6	-6	-6	-6	-6	-6			Receiver Ht	5	ft	Total Distance	430	ft
	WINDOW LOSS	-10	-10	-10	-10	-10	-10	-10	-10			Receiver Dist	380	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	-2	-2	-2	-2	-2	-2	-2	-2	**5**		Barrier Loss	6.1	dB			
EF-5	PWL	68	68	68	68	68	68	68	68	75		Source Ht	58	ft	Mech Unit Length	2	ft
USBI13DD	Rathe	-50	-50	-50	-50	-50	-50	-50	-50			Source Dist	50	ft	Mech Unit Width	2	ft
	Barrier	-6	-6	-6	-6	-6	-6	-6	-6			Receiver Ht	5	ft	Total Distance	430	ft

	WINDOW LOSS	-10	-10	-10	-10	-10	-10	-10	-10			Receiver Dist	380	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	5	5	5	5	5	5	5	5	**12**		Barrier Loss	6.1	dB			
EF-10	PWL	59	59	59	59	59	59	59	59	66		Source Ht	68	ft	Mech Unit Length	2	ft
0	Rathe	-50	-50	-50	-50	-50	-50	-50	-50			Source Dist	60	ft	Mech Unit Width	2	ft
	Barrier	-2	-2	-2	-2	-2	-2	-2	-2			Receiver Ht	5	ft	Total Distance	430	ft
	WINDOW LOSS	-10	-10	-10	-10	-10	-10	-10	-10			Receiver Dist	370	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	-1	-1	-1	-1	-1	-1	-1	-1	**6**		Barrier Loss	2.3	dB			
Refrig. Rack	PWL	76	76	76	76	76	76	76	76	83		Source Ht	60	ft	Mech Unit Length	15	ft
0	Rathe	-50	-50	-50	-50	-50	-50	-50	-50			Source Dist	60	ft	Mech Unit Width	5	ft
	Penthouse Enclosure	-15	-15	-15	-15	-15	-15	-15	-15			Receiver Ht	5	ft	Total Distance	430	ft
	WINDOW LOSS	-10	-10	-10	-10	-10	-10	-10	-10			Receiver Dist	370	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	4	4	4	4	4	4	4	4	**11**		Barrier Loss	5.9	dB			

Project #	21-0548
Project Name:	2675 Geary Whole Foods
Date:	9/16/2022
Engineer:	NNS
Calc Title:	NEW Mech Outdoor Beyond Property Plane North (CT L3 Alt Location)
Notes	SF Police Code - Commercial Noise Limit - 8 dB increase above ambient. Ambient at LT-1 (min L90): 47 dBA. Limit is 55 dBA. Evaluated at north edge of building roof.

Criterion	55	dB
Criterion	55	dB

Meets criterion

Exceeds criterion

NEW Mech Outdoor Beyond Property Plane North (CT L3 Alt Location) Summary

	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dBA
CT-1	37	31	28	27	27	25	24	23	**32**
OSA-1	42	39	52	45	50	50	43	39	**55**
OSA-1 (Casing	40	33	40	33	34	26	17	14	**37**
OSA-2	40	37	50	43	48	48	41	37	**53**
OSA-2 (Casing	37	30	37	30	31	23	14	11	**35**
EF-2	20	20	20	20	20	20	20	20	**27**
EF-5	27	27	27	27	27	27	27	27	**34**
EF-10	23	23	23	23	23	23	23	23	**30**
Refrig. Rack	33	33	33	33	33	33	33	33	**40**
Summed	**47**	**43**	**54**	**48**	**52**	**52**	**45**	**42**	**57**

		63	125	250	500	1000	2000	4000	8000	dBA						
CT-1	PWL	92	86	83	82	82	80	79	78	87		Source Ht	23	ft	Mech Unit Length	12	ft
Evapco ESW4 12-44L12-S	Rathe	-41	-41	-41	-41	-41	-41	-41	-41			Source Dist	40	ft	Mech Unit Width	20	ft
	Barrier	-18	-18	-18	-18	-18	-18	-18	-18			Receiver Ht	21	ft	Total Distance	140	ft
												Receiver Dist	100	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	50	ft	(Building)		
	Total	37	31	28	27	27	25	24	23	**32**		Barrier Loss	17.5	dB			
OSA-1	PWL	84	78	92	87	88	87	80	76	93		Source Ht	13	ft	Mech Unit Length	3	ft
	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3								
Valent APD450												Source Dist	9	ft	Mech Unit Width	2	ft
	Rathe	-32	-32	-32	-32	-32	-32	-32	-32			Receiver Ht	5	ft	Total Distance	54	ft
	Barrier	-5	-5	-5	-5	-5	-5	-5	-5			Receiver Dist	45	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	42	39	52	45	50	50	43	39	**55**		Barrier Loss	4.7	dB			
OSA-1 (Casing Radiated)	PWL	83	76	83	76	77	69	60	57	80		Source Ht	13	ft	Mech Unit Length	3	ft
Valent APD450												Source Dist	9	ft	Mech Unit Width	2	ft
	Rathe	-32	-32	-32	-32	-32	-32	-32	-32			Receiver Ht	5	ft	Total Distance	54	ft
	Penthouse																
	Louver & Wall	-14	-14	-14	-14	-14	-14	-14	-14			Receiver Dist	45	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	0	ft			
	Total	40	33	40	33	34	26	17	14	**37**		Barrier Loss	0.0	dB			
OSA-2	PWL	84	78	92	87	88	87	80	76	93		Source Ht	13	ft	Mech Unit Length	3	ft
	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3								
Valent APD450												Source Dist	10	ft	Mech Unit Width	2	ft
	Rathe	-35	-35	-35	-35	-35	-35	-35	-35			Receiver Ht	5	ft	Total Distance	70	ft
	Barrier	-5	-5	-5	-5	-5	-5	-5	-5			Receiver Dist	60	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	40	37	50	43	48	48	41	37	**53**		Barrier Loss	4.6	dB			
OSA-2 (Casing Radiated)	PWL	83	76	83	76	77	69	60	57	80		Source Ht	13	ft	Mech Unit Length	3	ft

Valent APD450												Source Dist	10	ft	Mech Unit Width	2	ft
	Rathe	-35	-35	-35	-35	-35	-35	-35	-35			Receiver Ht	5	ft	Total Distance	70	ft
	Penthouse																
	Louver & Wall	-14	-14	-14	-14	-14	-14	-14	-14			Receiver Dist	60	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	0	ft			
	Total	37	30	37	30	31	23	14	11	**35**		Barrier Loss	0.0	dB			
EF-2	PWL	61	61	61	61	61	61	61	61	68		Source Ht	5	ft	Mech Unit Length	2	ft
USBI11DD	Rathe	-34	-34	-34	-34	-34	-34	-34	-34			Source Dist	20	ft	Mech Unit Width	2	ft
	Barrier	-10	-10	-10	-10	-10	-10	-10	-10			Receiver Ht	5	ft	Total Distance	65	ft
												Receiver Dist	45	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	10	ft			
	Total	20	20	20	20	20	20	20	20	**27**		Barrier Loss	10.1	dB			
EF-5	PWL	68	68	68	68	68	68	68	68	75		Source Ht	5	ft	Mech Unit Length	2	ft
USBI13DD	Rathe	-34	-34	-34	-34	-34	-34	-34	-34			Source Dist	20	ft	Mech Unit Width	2	ft
	Barrier	-10	-10	-10	-10	-10	-10	-10	-10			Receiver Ht	5	ft	Total Distance	65	ft
												Receiver Dist	45	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	10	ft			
	Total	27	27	27	27	27	27	27	27	**34**		Barrier Loss	10.1	dB			
EF-10	PWL	59	59	59	59	59	59	59	59	66		Source Ht	13	ft	Mech Unit Length	2	ft
0	Rathe	-34	-34	-34	-34	-34	-34	-34	-34			Source Dist	12	ft	Mech Unit Width	2	ft
	Barrier	-5	-5	-5	-5	-5	-5	-5	-5			Receiver Ht	5	ft	Total Distance	67	ft
												Receiver Dist	55	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	23	23	23	23	23	23	23	23	**30**		Barrier Loss	4.9	dB			
Refrig. Rack	PWL	76	76	76	76	76	76	76	76	83		Source Ht	5	ft	Mech Unit Length	15	ft
0	Rathe	-33	-33	-33	-33	-33	-33	-33	-33			Source Dist	0	ft	Mech Unit Width	5	ft
	Penthouse																
	Louver & Wall	-14	-14	-14	-14	-14	-14	-14	-14			Receiver Ht	5	ft	Total Distance	55	ft
	Barrier	0	0	0	0	0	0	0	0			Receiver Dist	55	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	0	ft			
	Total	33	33	33	33	33	33	33	33	**40**		Barrier Loss	0.0	dB			

Project #	21-0548
Project Name:	2675 Geary Whole Foods
Date:	9/16/2022
Engineer:	NNS
Calc Title:	NEW Mech Outdoor Beyond Property Plane North, OSA Noise Reduction (CT L3 Alt Location)
Notes	SF Police Code - Commercial Noise Limit - 8 dB increase above ambient. Ambient at LT-1 (min L90): 47 dBA. Limit is 55 dBA. Evaluated at north edge of building roof.

Criterion	55	dB
Criterion	55	dB

Meets criterion

NEW Mech Outdoor Beyond Property Plane North, OSA Noise Reduction (CT L3 Alt Location) Summary

	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dBA
CT-1	37	31	28	27	27	25	24	23	**32**
OSA-1	41	38	49	39	38	41	35	31	**46**
OSA-1 (Casing	40	33	40	33	34	26	17	14	**37**
OSA-2	39	36	47	37	36	39	33	29	**44**
OSA-2 (Casing	37	30	37	30	31	23	14	11	**35**
EF-2	20	20	20	20	20	20	20	20	**27**
EF-5	27	27	27	27	27	27	27	27	**34**
EF-10	23	23	23	23	23	23	23	23	**30**
Refrig. Rack	33	33	33	33	33	33	33	33	**40**
Summed	**46**	**42**	**52**	**43**	**42**	**44**	**39**	**37**	**50**

		63	125	250	500	1000	2000	4000	8000	dBA							
CT-1	PWL	92	86	83	82	82	80	79	78	87		Source Ht	23	ft	Mech Unit Length	12	ft
Evapco ESW4 12-44L12-S	Rathe	-41	-41	-41	-41	-41	-41	-41	-41			Source Dist	40	ft	Mech Unit Width	20	ft
	Barrier	-18	-18	-18	-18	-18	-18	-18	-18			Receiver Ht	21	ft	Total Distance	140	ft
												Receiver Dist	100	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	50	ft	(Building)		
	Total	37	31	28	27	27	25	24	23	**32**		Barrier Loss	17.5	dB			
OSA-1	PWL	84	78	92	87	88	87	80	76	93		Source Ht	13	ft	Mech Unit Length	3	ft
	5 ft Lined Duct & End Reflection	-9	-6	-9	-14	-16	-12	-11	-11								
Valent APD450												Source Dist	9	ft	Mech Unit Width	2	ft
	Rathe	-32	-32	-32	-32	-32	-32	-32	-32			Receiver Ht	5	ft	Total Distance	54	ft
	Barrier	-5	-5	-5	-5	-5	-5	-5	-5			Receiver Dist	45	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	41	38	49	39	38	41	35	31	**46**		Barrier Loss	4.7	dB			
OSA-1 (Casing Radiated)	PWL	83	76	83	76	77	69	60	57	80		Source Ht	13	ft	Mech Unit Length	3	ft
Valent APD450												Source Dist	9	ft	Mech Unit Width	2	ft
	Rathe	-32	-32	-32	-32	-32	-32	-32	-32			Receiver Ht	5	ft	Total Distance	54	ft
	Penthouse Louver & Wall	-14	-14	-14	-14	-14	-14	-14	-14			Receiver Dist	45	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	0	ft			
	Total	40	33	40	33	34	26	17	14	**37**		Barrier Loss	0.0	dB			
OSA-2	PWL	84	78	92	87	88	87	80	76	93		Source Ht	13	ft	Mech Unit Length	3	ft
	5 ft Lined Duct & End Reflection	-9	-6	-9	-14	-16	-12	-11	-11								
Valent APD450												Source Dist	10	ft	Mech Unit Width	2	ft
	Rathe	-35	-35	-35	-35	-35	-35	-35	-35			Receiver Ht	5	ft	Total Distance	70	ft
	Barrier	-5	-5	-5	-5	-5	-5	-5	-5			Receiver Dist	60	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	39	36	47	37	36	39	33	29	**44**		Barrier Loss	4.6	dB			

OSA-2 (Casing Radiated)	PWL	83	76	83	76	77	69	60	57	80		Source Ht	13	ft	Mech Unit Length	3	ft
Valent APD450												Source Dist	10	ft	Mech Unit Width	2	ft
	Rathe	-35	-35	-35	-35	-35	-35	-35	-35			Receiver Ht	5	ft	Total Distance	70	ft
	Penthouse																
	Louver & Wall	-14	-14	-14	-14	-14	-14	-14	-14			Receiver Dist	60	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	0	ft			
	Total	37	30	37	30	31	23	14	11	**35**		Barrier Loss	0.0	dB			

EF-2	PWL	61	61	61	61	61	61	61	61	68		Source Ht	5	ft	Mech Unit Length	2	ft
USBI11DD	Rathe	-34	-34	-34	-34	-34	-34	-34	-34			Source Dist	20	ft	Mech Unit Width	2	ft
	Barrier	-10	-10	-10	-10	-10	-10	-10	-10			Receiver Ht	5	ft	Total Distance	65	ft
												Receiver Dist	45	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	10	ft			
	Total	20	20	20	20	20	20	20	20	**27**		Barrier Loss	10.1	dB			

EF-5	PWL	68	68	68	68	68	68	68	68	75		Source Ht	5	ft	Mech Unit Length	2	ft
USBI13DD	Rathe	-34	-34	-34	-34	-34	-34	-34	-34			Source Dist	20	ft	Mech Unit Width	2	ft
	Barrier	-10	-10	-10	-10	-10	-10	-10	-10			Receiver Ht	5	ft	Total Distance	65	ft
												Receiver Dist	45	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	10	ft			
	Total	27	27	27	27	27	27	27	27	**34**		Barrier Loss	10.1	dB			

EF-10	PWL	59	59	59	59	59	59	59	59	66		Source Ht	13	ft	Mech Unit Length	2	ft
0	Rathe	-34	-34	-34	-34	-34	-34	-34	-34			Source Dist	12	ft	Mech Unit Width	2	ft
	Barrier	-5	-5	-5	-5	-5	-5	-5	-5			Receiver Ht	5	ft	Total Distance	67	ft
												Receiver Dist	55	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	11	ft			
	Total	23	23	23	23	23	23	23	23	**30**		Barrier Loss	4.9	dB			

Refrig. Rack	PWL	76	76	76	76	76	76	76	76	83		Source Ht	5	ft	Mech Unit Length	15	ft
0	Rathe	-33	-33	-33	-33	-33	-33	-33	-33			Source Dist	0	ft	Mech Unit Width	5	ft
	Penthouse																
	Louver & Wall	-14	-14	-14	-14	-14	-14	-14	-14			Receiver Ht	5	ft	Total Distance	55	ft
	Barrier	0	0	0	0	0	0	0	0			Receiver Dist	55	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	0	ft			
	Total	33	33	33	33	33	33	33	33	**40**		Barrier Loss	0.0	dB			

Project #	21-0548
Project Name:	2675 Geary Whole Foods
Date:	9/16/2022
Engineer:	NNS
Calc Title:	NEW Mech Outdoor Beyond Property Plane West (CT L3 Alt Location)
Notes	SF Police Code - Commercial Noise Limit - 8 dB increase above ambient. Ambient at LT-2 (min L90): 42 dBA. Minimum ambient: 45 dBA. Limit is 53 dBA. Evaluated at west property plane.

Criterion	53	dB
Criterion	53	dB

Meets criterion

NEW Mech Outdoor Beyond Property Plane West (CT L3 Alt Location) Summary

	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dBA
CT-1	37	31	28	27	27	25	24	23	**33**
OSA-1	19	16	29	22	27	27	20	16	**31**
OSA-2	20	17	30	23	28	28	21	17	**33**
EF-2	1	1	1	1	1	1	1	1	**8**
EF-5	8	8	8	8	8	8	8	8	**15**
EF-10	2	2	2	2	2	2	2	2	**9**
Refrig. Rack	2	2	2	2	2	2	2	2	**9**
Summed	**37**	**31**	**34**	**29**	**32**	**31**	**27**	**25**	**37**

		63	125	250	500	1000	2000	4000	8000	dBA
CT-1	PWL	92	86	83	82	82	80	79	78	87
Evapco ESW4 12-44L12-S	Rathe	-54	-54	-54	-54	-54	-54	-54	-54	
	Barrier	-4	-4	-4	-4	-4	-4	-4	-4	
	Safety Factor	3	3	3	3	3	3	3	3	
	Total	37	31	28	27	27	25	24	23	**33**

Source Ht	57	ft
Source Dist	400	ft
Receiver Ht	5	ft
Receiver Dist	250	ft
Barrier Ht	20	ft
Barrier Loss	4.0	dB

Mech Unit Length	12	ft
Mech Unit Width	20	ft
Total Distance	650	ft

		63	125	250	500	1000	2000	4000	8000	dBA
OSA-1	PWL	84	78	92	87	88	87	80	76	93
Valent APD450	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3	
	Rathe	-52	-52	-52	-52	-52	-52	-52	-52	
	Barrier	-9	-9	-9	-9	-9	-9	-9	-9	
	Safety Factor	3	3	3	3	3	3	3	3	
	Total	19	16	29	22	27	27	20	16	**31**

Source Ht	68	ft
Source Dist	195	ft
Receiver Ht	5	ft
Receiver Dist	300	ft
Barrier Ht	55	ft
Barrier Loss	8.8	dB

Mech Unit Length	3	ft
Mech Unit Width	2	ft
Total Distance	495	ft

		63	125	250	500	1000	2000	4000	8000	dBA
OSA-2	PWL	84	78	92	87	88	87	80	76	93
Valent APD450	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3	
	Rathe	-51	-51	-51	-51	-51	-51	-51	-51	
	Barrier	-8	-8	-8	-8	-8	-8	-8	-8	
	Safety Factor	3	3	3	3	3	3	3	3	
	Total	20	17	30	23	28	28	21	17	**33**

Source Ht	68	ft
Source Dist	170	ft
Receiver Ht	5	ft
Receiver Dist	300	ft
Barrier Ht	55	ft
Barrier Loss	8.1	dB

Mech Unit Length	3	ft
Mech Unit Width	2	ft
Total Distance	470	ft

		63	125	250	500	1000	2000	4000	8000	dBA
EF-2	PWL	61	61	61	61	61	61	61	61	68
USBI11DD	Rathe	-52	-52	-52	-52	-52	-52	-52	-52	
	Barrier	-12	-12	-12	-12	-12	-12	-12	-12	
	Safety Factor	3	3	3	3	3	3	3	3	
	Total	1	1	1	1	1	1	1	1	**8**

Source Ht	58	ft
Source Dist	220	ft
Receiver Ht	5	ft
Receiver Dist	300	ft
Barrier Ht	55	ft
Barrier Loss	11.6	dB

Mech Unit Length	2	ft
Mech Unit Width	2	ft
Total Distance	520	ft

		63	125	250	500	1000	2000	4000	8000	dBA
EF-5	PWL	68	68	68	68	68	68	68	68	75
USBI13DD	Rathe	-52	-52	-52	-52	-52	-52	-52	-52	
	Barrier	-12	-12	-12	-12	-12	-12	-12	-12	
	Safety Factor	3	3	3	3	3	3	3	3	

Source Ht	58	ft
Source Dist	220	ft
Receiver Ht	5	ft
Receiver Dist	300	ft
Barrier Ht	55	ft

Mech Unit Length	2	ft
Mech Unit Width	2	ft
Total Distance	520	ft

	Total	8	8	8	8	8	8	8	8	**15**		Barrier Loss	11.6	dB			
EF-10	PWL	59	59	59	59	59	59	59	59	66		Source Ht	68	ft	Mech Unit Length	2	ft
0	Rathe	-51	-51	-51	-51	-51	-51	-51	-51			Source Dist	180	ft	Mech Unit Width	2	ft
	Barrier	-8	-8	-8	-8	-8	-8	-8	-8			Receiver Ht	5	ft	Total Distance	480	ft
												Receiver Dist	300	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	2	2	2	2	2	2	2	2	**9**		Barrier Loss	8.3	dB			
Refrig. Rack	PWL	76	76	76	76	76	76	76	76	83		Source Ht	60	ft	Mech Unit Length	15	ft
0	Rathe	-52	-52	-52	-52	-52	-52	-52	-52			Source Dist	205	ft	Mech Unit Width	5	ft
	Penthouse																
	Enclosure	-15	-15	-15	-15	-15	-15	-15	-15			Receiver Ht	5	ft	Total Distance	505	ft
	Barrier	-11	-11	-11	-11	-11	-11	-11	-11			Receiver Dist	300	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	2	2	2	2	2	2	2	2	**9**		Barrier Loss	11.0	dB			

Project #	21-0548
Project Name:	2675 Geary Whole Foods
Date:	9/16/2022
Engineer:	NNS
Calc Title:	NEW Mech Outdoor Beyond Property Plane South (CT L3 Alt Location)
Notes	SF Police Code - Commercial Noise Limit - 8 dB increase above ambient. Ambient at LT-3 (min L90): 46 dBA. Limit is 54 dBA. Evaluated at south property plane.

Criterion	54	dB
Criterion	54	dB

Meets criterion

NEW Mech Outdoor Beyond Property Plane South (CT L3 Alt Location) Summary

	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dBA
CT-1	51	45	42	41	41	39	38	37	**47**
OSA-1	28	25	38	31	36	36	29	25	**40**
OSA-2	28	25	38	31	36	36	29	25	**40**
EF-2	9	9	9	9	9	9	9	9	**16**
EF-5	17	17	17	17	17	17	17	17	**24**
EF-10	11	11	11	11	11	11	11	11	**18**
Refrig. Rack	10	10	10	10	10	10	10	10	**17**
Summed	**51**	**45**	**45**	**42**	**43**	**42**	**39**	**38**	**48.5**

		63	125	250	500	1000	2000	4000	8000	dBA							
CT-1	PWL	92	86	83	82	82	80	79	78	87		Source Ht	23	ft	Mech Unit Length	12	ft
Evapco ESW4 12-44L12-S	Rathe	-44	-44	-44	-44	-44	-44	-44	-44			Source Dist	0	ft	Mech Unit Width	20	ft
	Barrier	0	0	0	0	0	0	0	0			Receiver Ht	5	ft	Total Distance	200	ft
												Receiver Dist	200	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	0	ft			
	Total	51	45	42	41	41	39	38	37	**47**		Barrier Loss	0.0	dB			
OSA-1	PWL	84	78	92	87	88	87	80	76	93		Source Ht	68	ft	Mech Unit Length	3	ft
	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3								
Valent APD450												Source Dist	60	ft	Mech Unit Width	2	ft
	Rathe	-46	-46	-46	-46	-46	-46	-46	-46			Receiver Ht	5	ft	Total Distance	270	ft
	Barrier	-5	-5	-5	-5	-5	-5	-5	-5			Receiver Dist	210	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	28	25	38	31	36	36	29	25	**40**		Barrier Loss	5.0	dB			
OSA-2	PWL	84	78	92	87	88	87	80	76	93		Source Ht	68	ft	Mech Unit Length	3	ft
	End Reflection	-8	-5	-6	-8	-4	-3	-3	-3								
Valent APD450												Source Dist	60	ft	Mech Unit Width	2	ft
	Rathe	-46	-46	-46	-46	-46	-46	-46	-46			Receiver Ht	5	ft	Total Distance	270	ft
	Barrier	-5	-5	-5	-5	-5	-5	-5	-5			Receiver Dist	210	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	28	25	38	31	36	36	29	25	**40**		Barrier Loss	5.0	dB			
EF-2	PWL	61	61	61	61	61	61	61	61	68		Source Ht	58	ft	Mech Unit Length	2	ft
USBI11DD	Rathe	-46	-46	-46	-46	-46	-46	-46	-46			Source Dist	50	ft	Mech Unit Width	2	ft
	Barrier	-9	-9	-9	-9	-9	-9	-9	-9			Receiver Ht	5	ft	Total Distance	260	ft
												Receiver Dist	210	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	9	9	9	9	9	9	9	9	**16**		Barrier Loss	9.0	dB			
EF-5	PWL	68	68	68	68	68	68	68	68	75		Source Ht	58	ft	Mech Unit Length	2	ft
USBI13DD	Rathe	-46	-46	-46	-46	-46	-46	-46	-46			Source Dist	50	ft	Mech Unit Width	2	ft
	Barrier	-9	-9	-9	-9	-9	-9	-9	-9			Receiver Ht	5	ft	Total Distance	260	ft
												Receiver Dist	210	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			

	Total	17	17	17	17	17	17	17	17	**24**		Barrier Loss	9.0	dB			
EF-10	PWL	59	59	59	59	59	59	59	59	66		Source Ht	68	ft	Mech Unit Length	2	ft
0	Rathe	-46	-46	-46	-46	-46	-46	-46	-46			Source Dist	60	ft	Mech Unit Width	2	ft
	Barrier	-5	-5	-5	-5	-5	-5	-5	-5			Receiver Ht	5	ft	Total Distance	270	ft
												Receiver Dist	210	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	11	11	11	11	11	11	11	11	**18**		Barrier Loss	5.0	dB			
Refrig. Rack	PWL	76	76	76	76	76	76	76	76	83		Source Ht	60	ft	Mech Unit Length	15	ft
0	Rathe	-46	-46	-46	-46	-46	-46	-46	-46			Source Dist	60	ft	Mech Unit Width	5	ft
	Penthouse																
	Enclosure	-15	-15	-15	-15	-15	-15	-15	-15			Receiver Ht	5	ft	Total Distance	270	ft
	Barrier	-9	-9	-9	-9	-9	-9	-9	-9			Receiver Dist	210	ft			
	Safety Factor	3	3	3	3	3	3	3	3			Barrier Ht	55	ft			
	Total	10	10	10	10	10	10	10	10	**17**		Barrier Loss	8.6	dB			