2.8 Greenhouse Gas Emissions

	Potentially Significant Impact	Less-than-Significant with Mitigation	Less-than-Significant Impact	No Impact
Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☒	☐	☐
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☒	☐

2.8.1 Environmental Setting

The section briefly describes the environmental and regulatory setting for greenhouse gas (GHG) emissions and climate change. Impacts associated with sea level rise and flooding are addressed in Section 2.10, *Hydrology and Water Quality*.

2.8.1.1 Existing Conditions

GHG is any gas that absorbs infrared radiation in the atmosphere. This absorption traps heat within the atmosphere, maintaining the earth's surface temperature at a level higher than would be the case in the absence of GHGs. Increasing levels of GHGs resulting from human activities have increased levels of most of these naturally occurring gases in the atmosphere, which has and will continue to result in an increase in the temperature of the earth's lower atmosphere, a phenomenon that is commonly referred to as global warming. Warming of the earth's lower atmosphere induces a suite of additional changes, including changes in global precipitation patterns; ocean circulation, temperature, and acidity; global mean sea level; species distribution and diversity; and the timing of biological processes. These large-scale changes are collectively referred to as global climate change.

GHGs are both naturally occurring and artificial. Examples of GHGs that are produced both by natural processes and industry include carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). Examples of GHGs created and emitted primarily through human activities include fluorinated gases and sulfur hexafluoride (SF_6). The primary GHGs generated by construction activities are CO_2, CH_4, and N_2O. The Intergovernmental Panel on Climate Change (IPCC) estimates that CO_2 accounts for more than 75 percent of all anthropogenic (i.e., human-made) GHG emissions. Three-quarters of anthropogenic CO_2 emissions are the result of fossil fuel burning, and approximately one-quarter result from land use change (IPCC 2007). CH_4 is the second largest contributor of anthropogenic GHG emissions and is the result of growing rice, raising cattle, combustion, and mining coal (National Oceanic and Atmospheric Administration 2014). N_2O, while not as abundant as CO_2 or CH_4, is a powerful GHG. Sources of N_2O include agricultural processes, nylon production, fuel-fired power plants, nitric acid production, and vehicle emissions.

GHG emissions other than CO_2 are commonly converted into carbon dioxide equivalent (CO_2e), which takes into account the differing global warming potential (GWP) of different gases. For example, the IPCC Fourth Assessment Report (AR4) finds that N_2O has a GWP of 298 and CH_4 has a GWP of 25. Thus, emissions of 1 metric ton (MT) of N_2O and 1 MT of CH_4 are represented as the emissions of 298 MT and 25 MT of CO_2e, respectively. This method allows for the summation of different GHG emissions into a single total. Within California, GHG emissions in 2018 totaled approximately 425.3 million metric tons

(MMT) of CO_2e, of which, transportation is the largest source of GHG emissions (40 percent of total emissions), followed by industrial sources (21 percent) and electric power (15 percent of total emissions) (California Air Resources Board 2020).

2.8.1.2 Regulatory Setting

Federal and State

There are currently no federal laws specifically related to climate change, although regulation under the Clean Air Act is under development.

California has adopted statewide legislation to address various aspects of climate change and GHG emissions. Much of this legislation establishes a broad framework for the State's long-term GHG reduction and climate change adaptation program. The State's governors have also issued several EOs related to the State's evolving climate change policy. Of particular importance are AB 32 and SB 32, which outline the State's GHG reduction goals of achieving 1990 emissions levels by 2020 and a level 40 percent below 1990 emissions levels by 2030. In the absence of federal regulations, control of GHGs is generally regulated at the State level. It is typically approached by setting emission reduction targets for existing sources of GHGs, setting policies to promote renewable energy and increase energy efficiency, and developing statewide action plans.

ARB adopted the *2017 Climate Change Scoping Plan* in November 2017 to meet the GHG reduction requirement set forth in SB 32 (California Air Resources Board 2017). This updated Scoping Plan includes various elements, including doubling energy efficiency savings, increasing the low-carbon fuel standard from 10 to 18 percent, adding 4.2 million zero-emission vehicles on the road, implementing the Sustainable Freight Strategy, implementing a post-2020 Cap-and-Trade Program, creating walkable communities with expanded mass transit and other alternatives to traveling by car, and developing an Integrated Natural and Working Lands Action Plan to protect land-based carbon sinks.

Regional and Local

Bay Area Air Quality Management District

As discussed in Section 2.3, *Air Quality*, the BAAQMD has the primary responsibility for air quality management within Alameda County. The BAAQMD's (2017) CEQA Guidelines outline advisory operational thresholds for stationary source and land use development projects. In establishing its GHG significance thresholds, BAAQMD identified the emissions level that would not be expected to substantially conflict with AB 32 GHG reductions or to contribute substantially to a cumulative impact. For stationary-source projects, the mass emissions threshold is 10,000 $MTCO_2e$ per year. For land use development projects, the guidelines establish three potential analysis criteria for determining Project significance: compliance with a qualified GHG reduction strategy, a mass emissions threshold of 1,100 $MTCO_2e$ per year, and a GHG efficiency threshold of 4.6 $MTCO_2e$ per service population (projected jobs + projected residents). BAAQMD has no thresholds for transportation projects (Bay Area Air Quality Management District 2017a).

The BAAQMD CEQA Guidelines do not identify a GHG emissions threshold for construction-related emissions. However, the Guidelines recommend that GHG emissions from construction be quantified and disclosed, and that appropriate BMPs implemented to further reduce construction related GHG emissions.

The CEQA Guidelines also outline methods for quantifying GHG emissions as well as potential mitigation measures. As discussed in Section 2.3, *Air Quality*, the BAAQMD has also adopted air quality plans to protect the climate, including the *2017 Clean Air Plan: Spare the Air, Cool the Climate* (Bay Area Air Quality Management District 2017b). The *2017 Clean Air Plan* outlines feasible measures to reduce GHGs to 40 percent below 1990 levels by 2030 and 80 percent below 1990 levels by 2050.

City of Oakland Energy and Climate Action Plan

The Oakland ECAP was adopted by the City Council on July 20, 2020, to reduce citywide GHG emissions consistent with the City's 2020, 2030, and 2050 reduction goals. The purpose of the Oakland ECAP (City of Oakland 2012) is to identify and prioritize actions the City can take to reduce energy consumption and GHG emissions associated with Oakland. The ECAP outlines an equitable plan for Oakland to transition to a low-carbon economy and includes a number of actions that will facilitate the transition. The relevant actions in the ECAP to the Project include those in the transportation and land use sector.

City of Oakland Standard Conditions of Approval

As stated in Section 1.7.2, *Permits/Approvals*, the Oakland SCA includes conditions of approval for projects. The SCAs include a requirement to develop a GHG reduction plan for development projects or projects that involve a stationary source of GHG emissions, neither of which applies to the Project.

2.8.2 Discussion of Potential Impacts

a. The Project would have a less-than-significant impact with mitigation on the environment through direct and indirect generation of GHG emissions.

GHG emissions associated with the Project can be divided into those produced during construction and those produced during operations.

Construction GHG emissions would be generated from tailpipe exhaust (by onsite heavy-duty equipment, employee vehicles, haul trucks) and electricity usage (by an onsite office trailer). As discussed in Section 2.3.2 for Impact (b), the direct construction emissions from tailpipe exhaust were estimated using the CalEEMod, based on the construction phases, schedule, construction equipment, and off-haul debris developed by the Project's engineering consultant. The indirect emissions from electricity usage for the onsite office trailer were estimated according to electricity emission factors published by the Climate Registry (2014) and electricity intensity published the EPA (2014c) for commercial buildings which is similar to the office trailer.

Operational GHG emissions would include direct emissions from new vehicle trips and indirect emissions from electricity usage for proposed lighting. As discussed in Section in Section 2.3.2 for Impact (b), new vehicle trips were estimated using the CalEEMod. The default vehicle trip lengths and vehicle trip types from the CalEEMod for the "City Park" lane use were also used for the analysis. The indirect operational emissions from electricity usage for the proposed lighting were estimated according to electricity emission factors published by the Climate Registry (2014) and the proposed electricity usage provided by the Project's engineering consultant (Krcelic pers. comm.)

As noted in Section 2.3, *Air Quality*, for Impact (b), the construction emissions analysis was originally conducted in 2014, using the current version of CalEEMod at that time (version 2013.2.2). Although there have been subsequent updates to CalEEMod since 2014, the emissions presented in this analysis are considered to be a reasonable worst-case estimate for the reasons described in Section 2.3, *Air Quality*, Impact (b). **Table 2.8-1** summarizes the annual GHG emissions from associated with construction and

operation of the Project. Project construction is estimated to occur for approximately two years but within three calendar years. The construction and operation assumptions, CalEEMod inputs and outputs, and GHG emissions calculations are provided in **Appendix A**, Attachment 1.

Table 2.8-1. Summary of Construction and Operation GHG Emissions

Annual GHGs in (MT/year)	CO_2	CH_4	N_2O	Total CO_2e
Construction Emissions[a]				
Construction–Year 1[b]	179.27	0.02	0.00	179.65
Construction–Year 2	147.07	0.02	0.00	147.53
Construction–Year 3	21.62	0.00	0.00	21.66
Total Construction	352.45	0.04	0.00	353.36
Operational Emissions[c]				
Vehicle Trips	1,001	0.04	0.00	1,002
Electricity	14.72	0.00	0.00	14.81
Total Operation	1,016	0.04	0.00	1,017

Notes:

[a] From fuel usage by construction equipment, haul trucks, and worker commutes, and electricity usage by an office trailer.

[b] If the project is constructed as a single contract, project construction is anticipated to begin in October 2023 and finish in October 2025.

[c] From vehicle trips and electricity usage by lighting.

MT = metric tons

See **Appendix A**, Attachment 1 for assumptions, CalEEMod inputs and outputs, and emission calculation.

As indicated in **Table 2.8-1**, construction of the Project would generate 353 metric tons of GHG emissions. This is the equivalent of adding approximately 76 typical passenger cars (at 4.63 $MTCO_2e$/year per vehicle) to the road (Environmental Protection Agency 2020). The construction emissions are primarily the result of diesel-powered construction equipment exhaust and would be temporary and cease when construction activities are completed.

As discussed above, BAAQMD CEQA Guidelines (2017) do not identify a GHG emissions threshold for construction-related emissions (Bay Area Air Quality Management District 2017a). However, the Guidelines state that, with implementation of the BAAQMD recommended GHG reduction measures (**Mitigation Measure GHG-1**), the impact would be less than significant. Implementing **Mitigation Measure AQ-1**, which is required for impacts described in Section 2.3.3, would further reduce construction-related GHG emissions by limiting vehicle idling times and requiring regular maintenance of construction equipment. Therefore, the impact related to GHG emission impacts from Project construction is considered less than significant.

As discussed above, BAAQMD CEQA Guidelines (2017) do not identify a GHG emissions operational threshold for transportation projects (Bay Area Air Quality Management District 2017a). Under the worst-case scenario, operation of the Project would generate 1,017 MT of GHG emissions per year by new vehicle trips and lighting. As noted above, actual emissions would very likely be lower because of the later operational year and, thus, cleaner vehicle fleet. These emissions do not account for any reduction in vehicle miles traveled that would occur from bicycle trips displacing motor vehicle trips. It is currently possible for people to travel by bicycle from Oakland to Treasure Island. There also is a long-term plan to construct a bicycle path on the west span of the Bay Bridge, which would allow people to travel from

Oakland, past Treasure Island, to downtown San Francisco by bicycle or scooter. The Project would facilitate these connections and serve as the foundation for more connected bicycle infrastructure in the future. The emissions estimates in **Table 2.8-1** do not account for any current or future motor vehicle trip reductions that would occur as a result of the increase in bicycle and pedestrian connectivity. The 1,017 MT of emissions comprise primarily the increased vehicle trips to and from the parking lot. Consequently, the increase in GHG emissions is not considered to be significant because, overall, the Project may result in a beneficial effect by contributing to the development of infrastructure that would not require motorized vehicles between Oakland and Treasure Island (and ultimately San Francisco). With respect to the electricity-related emissions, the Project would use low-level lighting with LED lights along the Link. The lighting design could further reduce Project-related energy consumption and associated GHG emissions. Consequently, the impact related to GHG emission impacts from Project operation is considered to be less than significant.

b. The Project would result in a less-than-significant impact as a result of conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

The Project's GHG emissions, alone or considering other cumulative global emissions, would be insufficient to cause substantial climate change. As discussed above, the Project would result in an increase in GHG emissions, primarily from path users' vehicle trips to and from the parking lot. The emissions estimate presented above does not include any trip reduction effects from buildout of connected bicycle infrastructure between Oakland and Treasure Island or downtown San Francisco. That connectivity would allow future path users to travel between Oakland and San Francisco in non-motorized (and emissions-free) vehicles. In the Scoping Plan, increased pedestrian and bicycle trips are specifically mentioned as strategies to reduce GHG emissions in the transportation sector, which the Project would directly facilitate. As such, the Project would not conflict with the Scoping Plan or the goals of SB 32.

By encouraging non-motorized travel, the Project would also not conflict with the goals of *Plan Bay Area*, MTC's Sustainable Communities Strategy, which has a designated per capita GHG reduction target determined by ARB (Metropolitan Transportation Commission 2017).

As such, the Project would not conflict with a GHG emissions-reduction plan. Therefore, the impact would be less than significant.

2.8.3 Mitigation Measures

Mitigation Measure GHG-1: Implement BAAQMD Measures to Reduce Greenhouse Gas Emissions during Construction

BATA/Caltrans will ensure their construction contractor implements the following BMPs, to the extent feasible, to reduce GHG emissions from construction equipment, consistent with measures recommended by the BAAQMD in their CEQA Guidelines (2017):

a. Use alternative-fueled (e.g., biodiesel, electric) construction vehicles/equipment of at least 15 percent of the fleet.

b. Use local building materials of at least 10 percent (i.e., 10 percent of materials used will originate locally).

c. Recycle at least 50 percent of construction waste or demolition materials.