APPENDIX A

Transportation Demand Management Plan

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FEHR PEERS

DRAFT MEMORANDUM

Date: May 30, 2018

To: Elizabeth Kanner, ESA

From: Sam Tabibnia

Subject: 1750 Broadway – Transportation and Parking Demand Management Plan

OK17-0187

The proposed 1750 Broadway Project is required to prepare a Transportation and Parking Demand Management (TDM) Plan because it would generate more than 50 peak hour trips. Since the Project would generate less than 100 net new peak hour trips, the TDM Plan goal is to achieve a 10 percent vehicle trip reduction (VTR).

Project Description

The Project would be located at 1750 Broadway between 17th and 19th Streets in downtown Oakland. The building would consist of 307 multi-family dwelling units and about 5,000 square-feet of ground-level retail space.

Project Location

The Project is located in Downtown Oakland, a dense, pedestrian-friendly, urban area. The Project is located within a dense employment area and is within one-half mile of a variety of neighborhood-serving retail, restaurant and entertainment (such as bars and theaters) uses. The Project would also include a small retail component which would primarily serve residents and/or workers in Downtown Oakland.

The Project is adjacent to the 19th Street BART Station and is served by 18 bus lines, including AC Transit's trunk Lines 6, 72/72M/72R, and 51A; local buses; night buses; Transbay buses; and the "Free B," Oakland's free downtown circulator shuttle. The Project's location is expected to result in relatively high rate of pedestrian, bicycle, and transit trips.

In addition, AC Transit is currently designing the East Bay Bus Rapid Transit (BRT) Project, which would replace Routes 1 and 6 along Broadway in the Project vicinity and provide service between

Downtown Oakland and San Leandro. BRT buses would operate in mixed-flow lanes on Broadway. The nearest BRT stop to the Project site would be one block north of the Project on Broadway between 19th and 20th Streets.

The Project's proximity to both regional transit as well as employment centers and other neighborhood amenities is likely to result in relatively high rates of walking, bicycling and transit use by residents and visitors. This is evidenced in part by the travel patterns of the area's existing residents. Based on US Census data, **Table 1** summarizes the transportation mode split for employed residents' journey to work, and **Table 2** summarizes vehicle ownership for employed residents for the census tracts in the Project vicinity.

TABLE 1
JOURNEY TO WORK FOR EMPLOYED RESIDENTS

Transportation Mode	Percent of Employed Residents in Surrounding Census Tracts
Drove Alone	33%
Carpooled	6%
Public transportation	35%
Motorcycle	1%
Bicycle	5%
Walked	15%
Other	5%
Total	**100%**

Source: U.S. Census Bureau, 2011-2015 American Community Survey 5-Year Estimates, Census Tracts 4013, 4028- 4031, and 4035.01.

TABLE 2
VEHICLE OWNERSHIP FOR EMPLOYED RESIDENTS

Vehicle Ownership	Percent of Employed Residents in Surrounding Census Tracts
No vehicle available	17%
1 vehicle available	56%
2 vehicles available	21%
3 or more vehicles available	6%
Total	**100%**

Source: U.S. Census Bureau, 2011-2015 American Community Survey 5-Year Estimates, Census Tracts 4013, 4028- 4031, and 4035.01.

Although 83 percent of employed residents in the area own one or more vehicles, only 33 percent report driving alone to work. Overall, the greatest proportion of residents, approximately 35 percent, used public transportation to travel to work. The proportion of residents who walked to work was also relatively high, with 15 percent reporting walking to work.

The Project automobile trips generation is estimated to be slightly more than half of trips generated by a typical suburban residential development, as shown in **Table 3**. Similarly, the VMT per resident in the Project area is about 30 percent of the regional VMT per worker (the Project VMT per capita is 4.5 compared to the regional VMT of 15.0) as documented in the Project CEQA Analysis document.

TABLE 3
1750 BROADWAY
AUTOMOBILE TRIP GENERATION

Land Use	Units[1]	ITE Code	Daily	Weekday AM Peak Hour			Weekday PM Peak Hour		
				In	Out	Total	In	Out	Total
Proposed Uses									
Residential	307 DU	220[2]	1,980	31	123	154	122	65	187
Retail	5.0 KSF	820[3]	210	3	2	5	9	10	19
Subtotal			2,190	34	125	159	131	75	206
Non-Auto Reduction (-46.9%)[4]			-1,030	-16	-59	-75	-62	-35	-97
Proposed Uses Subtotal			*1,160*	*18*	*66*	*84*	*69*	*40*	*109*
Existing Uses									
Office	14.5 KSF	710[5]	160	20	3	23	4	18	22
Non-Auto Reduction (-46.9%)[4]			-80	-9	-1	-10	-2	-8	-10
Existing Uses Subtotal			*80*	*11*	*2*	*13*	*2*	*10*	*12*
Net New Project Trips			**1,080**	**7**	**64**	**71**	**67**	**30**	**97**

1. DU = Dwelling Units, KSF = 1,000 square feet.
2. ITE *Trip Generation (9th Edition)* land use category 220:
   Daily: T = 6.06*(X)+123.56
   AM Peak Hour: T = 0.49*(X)+3.73 (20% in, 80% out)
   PM Peak Hour: T = 0.55*(X)+17.65 (65% in, 35% out)
3. ITE *Trip Generation (9th Edition)* land use category 820 (Shopping Center):
   Daily: T = 42.7 * X
   AM Peak Hour: T = 0.96 * X (62% in, 38% out)
   PM Peak Hour: T = 3.71 * X (48% in, 52% out)
4. Reduction of 46.9% assumed. Based on City of Oakland *Transportation Impact Review Guidelines* using Census data for urban environments within 0.5 miles of a BART Station.
5. ITE *Trip Generation (9th Edition)* land use category 710 (General Office Building):
   Daily: Ln(T) = 11.03 * X
   AM Peak Hour: 1.56 * X (88% in, 12% out)
   PM Peak Hour: T = 1.49 * X (17% in, 83% out)

Source: Fehr & Peers, 2017.

Mandatory TDM Strategies

This section describes the mandatory strategies that shall be implemented at the Project. These strategies shall be directly implemented by the building management. **Table 4** lists these mandatory TDM strategies, and the effectiveness of each strategy based on research compiled in Quantifying Greenhouse Gas Mitigation Measures (California Air Pollution Control Officers Association (CAPCOA), August 2010). This report is a resource for local agencies to quantify the benefit, in terms of reduced travel demand, of implementing various TDM strategies.

TABLE 4
MANDATORY TDM PROGRAM COMPONENTS

TDM Strategy	Description	Estimated Vehicle Trip Reduction[1]
Infrastructure Improvements	Various Improvements	NA[2]
Unbundle Parking	Residents are required to pay for a parking space separately from their monthly rent	9-11%
Residential Parking Management	Restrict parking to one parking space per unit or less, thereby discouraging multiple car ownership	
Transit Incentives for Residents	Provide monthly transit benefit to each unit	1%-4%
Carshare parking spaces	Dedicated carshare parking spaces	<1%
Bicycle Parking Monitoring	Monitor usage of bicycle parking facilities	NA[2]
Marketing and Resident Education	Active marketing of BART, AC Transit, bicycle, bikesharing, and other non-auto modes	NA[2]
Total		**10-15%**

1. The focus of the CAPCOA document is reductions to VMT but the research used to generate the reductions also indicates vehicle trip reductions are applicable as well. For the purposes of this analysis the VTR is assumed to equal the VMT reduction. See the cited CAPCOA research for more information and related information on page 8 of the BAAQMD *Transportation Demand Management Tool User's Guide* (June 2012)
2. The effectiveness of this strategy cannot be quantified at this time. This does not necessarily imply that the strategy is ineffective. It only demonstrates that at the time of the CAPCOA report development, existing literature did not provide a robust methodology for calculating its effectiveness. In addition, many strategies are complementary to each other and isolating their specific effectiveness may not be feasible.

Sources: Fehr & Peers, 2017.

The mandatory strategies in Table 4 are generally targeted at Project residents. The retail employees and customers, and residential visitors are not directly targeted because the retail component of

the Project is rather small and would have few employees. In addition, the majority of the retail customers would be local residents and workers in Downtown Oakland who would mostly walk or bike to the site, and most residential visitors would visit the Project too infrequently to be aware of the TDM benefits or to make them cost effective. However, many of the mandatory strategies would also benefit the retail employees and customers, and residential visitors.

The VTR ranges in **Table 4** represent conservative assumptions about potential trip reduction at the low end of the range. Due to the location of the Project in an area that has very good transit bicycle, and pedestrian access, it is expected that the high end of the VTR range would be achieved with this TDM program.

A more detailed description of the TDM measures that comprise the mandatory TDM program is provided below:

- *Infrastructure Improvements* – the following infrastrucutre improvements in the Project vicinity, which were identified as part of the Site Plan Review for the Project, would improve the bicycling, walking, and transit systems in the area and furhter encourage the use of these modes:
    - Explore the feasibility and only if feasible, install directional curb ramps at all four corners of the Broadway/19th Street, Franklin Street/19th Street, and Broadway/ 17th Street intersections that the East Bay BRT Project would not upgrade. Considering that fire hydrants, signal poles, light poles, and/or storm drain inlets may be present at these locations, construction of curb extensions (bulbouts) may also be required at some locations to accommodate the directional curb ramps.
    - Explore the feasibility and only if feasible, install the City of Oakland 2017 Pedestrian Plan Update recommendations at the Broadway/17th Street and Broadway/19th Street intersections, which consist of converting signal operations to fixed pedestrian recall, reducing signal cycle lengths, and implementing Leading Pedestrian Interval.
    - Coordinate with City of Oakland and AC Transit to explore the feasibility and if feasible, install bus stop amenities such as shelter, bench, and trash receptacle at the bus stops on northbound Broadway just north of 17th Street and on southbound Broadway just north of 19th Streets and midblock between 15th and 17th Streets.
- *Unbundle Parking* – Unbundle the cost of parking from housing costs (required by Oakland Municipal Code, Section 17.116.310). This would result in residents paying one price for the residential unit and a separate price for parking, should they opt for a space. The cost of parking can be adjusted such that resident parking demand and supply are in equilibrium.

- *Residential Parking Management* – Restrict parking to one parking space per unit or less, thereby discouraging multiple car ownership and/or use. Exceptions will only be made for residents with management approved Reasonable Accommodation Requests. A Reasonable Accommodation Request shall need to demonstrate a hardship wherein a household requires more than one vehicle per unit. Examples could include households with multiple disabled residents requiring vehicles or households with multiple residents with places of work inaccessible via transit.

- *Transit Incentive for Residents* – Provide a monthly transit benefit to each dwelling unit in an amount equal to either one-half the price of an Adult 31-Day AC Transit Pass (valued at $81 as of November 2017) or an AC Transit EasyPass. (required by Oakland Municipal Code, Section 17.116.105).

- *Carshare Parking Spaces* – Dedicate at least two on-site parking spaces available for carsharing for free (required by Oakland Municipal Code, Section 17.116.105). Monitor the usage of the carsharing spaces and adjust if necessary.

- *Bicycle Parking Monitoring* – The Project is expeted to meet or exceed the City's requirements for short-term and long-term bicycle parking. Building management shall monitor the usage of these facilities and provide additional bicycle parking if necessary.

- *Marketing and Resident Education* – Site management shall provide residents and employees information about transportation options. This information would also be posted at central location(s) and be updated as necessary. This information shall include:

    - *Transit Routes* – Promote the use of transit by providing user-focused maps. These maps provide residents with wayfinding to nearby transit stops and transit-accessible destinations, and are particularly useful for those without access to portable mapping applications. The Project should consider installing TransitScreen real-time transit information in a visible location in the building lobby to provide residents with up-to-date transit arrival and departure times.

    - *Transit Fare Discounts* – Provide information about local discounted fare options offered by BART and AC Transit, including discounts for youth, elderly, persons with disabilities, and Medicare cardholders.

    - *Car Sharing* – Promote accessible car sharing programs, such as Zipcar, and Getaround by informing residents and employees of on-site and nearby car sharing locations and applicable membership information.

    - *Ridesharing* – Provide residents and employees with phone numbers and contact information for ride sharing options including Uber, Lyft, and Oakland taxi cab services.

- *Carpooling* – Provide residents and employees with phone numbers and contact information for carpool matching services such as the Metropolitan Transportation Commission's 511 RideMatching.
- *Walking and Biking Events* – Provide information about local biking and walking events, such as Oaklavia, as events are planned.
- *Bikeshare* – Educate residents and employees about nearby bike sharing station locations and membership information.

TDM Compliance

Since the proposed Project would generate fewer than 100 net peak hour automobile trips, the Project applicant is not required to submit annual compliance reports.

Please contact Sam with questions or comments.

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APPENDIX B

Additional Transportation Analysis

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FEHR PEERS

DRAFT MEMORANDUM

Date: May 30, 2018

To: Elizabeth Kanner, ESA

From: Sam Tabibnia

Subject: 1750 Broadway – Transportation Impact Review (non-CEQA)

OK17-0212

This memorandum summarizes the non-CEQA transportation assessment that Fehr & Peers completed for the proposed 1750 Broadway Project in Oakland. This document provides a brief description of the Project, followed by an estimation of the Project trip generation, a review of project site plan, and a collision analysis. The memorandum also provides recommendations that improve multi-modal access, circulation, and safety.

PROJECT DESCRIPTION

The Project is located on the east side of Broadway between 17th and 19th Streets in Downtown Oakland. The building would consist of 307 multi-family dwelling units and about 5,000 square-feet of ground-level retail space.

Based on the project site plan dated February 27, 2018, the Project would include a five-level parking garage with about 170 automobile parking spaces, including five ADA and two car-share spaces. The garage would be accessed through a left-in/left-out only driveway on 19th Street, which is a one-way westbound street. The garage would also accommodate long-term bicycle parking in secure bicycle rooms on the ground, second, and third levels.

The Project would demolish an existing 27,600 square-foot office building at the Project site. Approximately 14,500 square feet of the existing building is currently occupied.

TRIP GENERATION AND INTERSECTION COUNTS

Automobile Trip Generation

Trip generation is the process of estimating the number of vehicles that would likely access the Proposed Project on any given day. Since the Project site includes existing uses that would be demolished, the trip generation accounts for the trips generated by the current site that would be eliminated. **Table 1** summarizes the trip generation for the Project. Trip generation data published by the Institute of Transportation Engineers (ITE) in the *Trip Generation Manual* (Ninth Edition) was used as a starting point to estimate the vehicle trip generation.

ITE's *Trip Generation Manual* (Ninth Edition) is primarily based on data collected at single-use suburban sites where the automobile is often the only travel mode. However, the Project site is in a dense mixed-use urban environment where many trips are walk, bike, or transit trips. Since the Project is adjacent to the 19th Street BART Station, this analysis reduces the ITE based trip generation by about 47 percent to account for non-automobile trips. This reduction is consistent with the City of Oakland's TIRG and is based on US Census commute data for Alameda County from the 2014 5-Year Estimates of the American Community Survey (ACS), which shows that the non-automobile mode share for areas less than 0.5 miles from a BART Station is about 47 percent.

As summarized in **Table 1,** the net automobile trip generation for the Proposed Project is approximately 1,080 daily, 71 AM peak hour, and 97 PM peak hour automobile trips. Since the Proposed Project would generate more than 50 net new peak hour trips, the City of Oakland TIRG requires additional tasks, which are described at the end of this memorandum.

Non-Vehicular Trip Generation

Consistent with City of Oakland TIRG, **Table 2** presents the estimates of Project trip generation for all travel modes.

TABLE 1
AUTOMOBILE TRIP GENERATION

Land Use	Units[1]	ITE Code	Daily	Weekday AM Peak Hour			Weekday PM Peak Hour		
				In	Out	Total	In	Out	Total
Proposed Uses									
Residential	307 DU	220[2]	1,980	31	123	154	122	65	187
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Subtotal			2,190	34	125	159	131	75	206
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Net New Project Trips			**1,080**	**7**	**64**	**71**	**67**	**30**	**97**

1. DU = Dwelling Units, KSF = 1,000 square feet.
2. ITE *Trip Generation (9th Edition)* land use category 220:
   Daily: T = 6.06*(X)+123.56
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4. Reduction of 46.9% assumed. Based on City of Oakland *Transportation Impact Review Guidelines* using Census data for urban environments within 0.5 miles of a BART Station.
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   Daily: Ln(T) = 11.03 * X
   AM Peak Hour: 1.56 * X (88% in, 12% out)
   PM Peak Hour: T = 1.49 * X (17% in, 83% out)

Source: Fehr & Peers, 2017.

TABLE 2
TRIP GENERATION BY TRAVEL MODE

Mode	Mode Share Adjustment Factors[1]	Daily	Weekday AM Peak Hour	Weekday PM Peak Hour
Automobile	53.1%	1,080	72	97
Transit	29.7%	600	40	54
Bike	5.1%	100	7	9
Walk	10.5%	210	14	19
Total Trips		**1,990**	**133**	**179**

1. Based on *City of Oakland Transportation Impact Study Guidelines* assuming Project site is in an urban environment within 0.5 miles of a BART Station.
Source: Fehr & Peers, 2017.

Trip Distribution and Study Intersection Selection

The trip distribution and assignment process is used to estimate how the trips generated by the Proposed Project would be distributed across the roadway network. Directions of approach to and departure from the Project site are determined based on existing travel patterns, locations of complementary land uses, results of the Alameda County Transportation Commission's (ACTC) Travel Demand Model, and the one-way street network and turn restrictions in Downtown Oakland. **Figure 1** shows the resulting trip distribution.

Trips generated by the Project, as shown in Table 1, were assigned to the roadway network according to the trip distribution shown on Figure 1.

According to the City of Oakland's TIRG, the criteria for selecting study intersections include:

- All intersection(s) of streets adjacent to Project site;
- All signalized intersection(s), all-way stop-controlled intersection(s) or roundabouts where 100 or more peak hour trips are added by the Project;
- All signalized intersection(s) with 50 or more Project-related peak hour trips and existing LOS D-E-F; and
- Side-street stop-controlled intersection(s) where 50 or more peak hour trips are added by the Project to any individual movement other than the major-street through movement.

Following these criteria, the following three study intersections were selected:

1. Broadway/19th Street
2. Franklin Street/19th Street
3. Broadway/17th Street

Traffic data, consisting of automobile turning movement, as well as pedestrian and bicycle counts, were collected at the three intersections from 7:00 AM to 9:00 AM (weekday AM) and from 4:00 PM to 6:00 PM (weekday PM) on November 2, 2017. **Appendix A** presents the existing counts.

SITE PLAN REVIEW

An evaluation of access and circulation for all travel modes, based on the site plan dated February 27, 2018, is summarized below.

Automobile Access and Circulation

Residents would access the Project garage through a driveway on 19th Street, about 120 feet east of Broadway. The driveway would provide access to the five level garage, which would provide 170 automobile parking spaces, including five ADA and two car-share spaces. The driveway would also provide access to two residential loading spaces.

Since 19th Street is westbound only, the Project driveway would be limited to left-in-left-out only. The Project driveway would provide adequate sight distance between exiting motorists and pedestrians on the adjacent sidewalk because it would provide a clear line-of-sight between a motorist ten feet back from the sidewalk and a pedestrian 10 feet away on each side of the driveway. The garage driveway would also provide adequate sight distance between exiting motorists and automobiles and bicycles traveling on westbound 19th Street.

The parking garage would generally provide adequate internal circulation for vehicles. However, the curved ramps between the garage levels may not provide adequate space for two large automobiles to simultaneously pass in different directions. Considering that the garage would be restricted to project residents who would be familiar with the garage, installation of mirrors that would allow drivers to see oncoming vehicles would minimize potential conflicts.

Broadway, along the Project frontage provides an approximately 120 foot pull-out, which is currently designated as one metered parking (two hour time limit), a 25-foot yellow loading zone, and 70 feet of red no parking zone. The 19th Street frontage is designated as no parking between

Franklin Street and the Project site, and provides two metered parking spaces and a loading space between the Project site and Broadway. The Project would eliminate one of the existing curb-cuts on 19th Street, which can be designated for on-street parking.

> **Recommendation 1:** While not required to address a CEQA impact, the following should be considered as part of the final design for the Project:
>
> - Install mirrors on all curved ramps in the garage to ensure that motorists can see on-coming vehicles.
> - Designate one parking space near the residential lobby on 19th Street for passenger pick-up/drop off.
> - Convert one of the no parking zones in the Broadway pull-out to either a metered parking space or passenger pick-up/drop off.

Bicycle Access and Bicycle Parking

Chapter 17.117 of the Oakland Municipal Code requires long-term and short-term bicycle parking for new buildings. Long-term bicycle parking includes lockers or locked enclosures and short-term bicycle parking includes bicycle racks. The Code requires one long-term space for every four multi-family dwelling units and one short-term space for every 20 multi-family dwelling units. The Code requires the minimum level of bicycle parking, two long and short-term spaces, for the commercial component of the Project.

Table 3 presents the bicycle parking requirements for the Project. The Proposed Project is required to provide 79 long-term parking spaces and 17 short-term spaces. The Project site plan identifies long-term bicycle parking in secure bicycle rooms on the ground level that can accommodate up to 256 bicycles. The site plan also identifies additional long-term bicycle parking on the second and third levels. The bicycle room on the ground level can be accessed either through the main building lobby or through the 19th Street driveway. The bicycle rooms on the second and third levels can be accessed either through the main building lobby and using the elevators/stairs or through the 19th Street driveway and circulating through the garage.

The site plan identifies short-term bicycle parking spaces for 24 bicycles along the Project frontage on Broadway.

TABLE 3
BICYCLE PARKING REQUIREMENTS

Land Use	Size[1]	Long-Term		Short-Term	
		Spaces per Unit[2]	Spaces	Spaces per Unit[2]	Spaces
Residential	307	1:4 DU	77	1:20 DU	15
Retail	5.0 KSF	Min.	2	Min.	2
Total Required Bicycle Spaces			79		17
Total Bicycle Parking Provided			256		24
Bicycle Parking Met?			**Yes**		**Yes**

1. DU = dwelling unit; KSF = 1,000 square feet
2. Based on Oakland Municipal Code Sections 17.117.090 and 17.117.110

Source: Fehr & Peers, 2017

Currently, Class 2 bicycle lanes are provided one block east of the Project on northbound Franklin Street and two blocks west of the Project on southbound Webster Street. The nearest Ford Go Bike bikeshare station to the site is about one block north on Broadway, just south of 20th Street.

Pedestrian Access and Circulation

Primary pedestrian access for the residential component of the Project would be through a main lobby on the north side of the building on Broadway, which would connect to the residential, garage, and amenity levels through elevators and a stairwell. The residential lobby would also have a secondary access on 19th Street, adjacent to the Project driveway. The retail component of the Project would be along Broadway near the south side of the building. A secondary stairwell is provided on the southwest corner of the building.

Pedestrian facilities at the intersection adjacent to the site include:

- The Broadway/19th Street intersection provides diagonal curb ramps on all four corners, crosswalks on all four approaches, and pedestrian countdown signal heads in all directions. None of the diagonal curb ramps provide truncated domes. It is expected that the upcoming East Bay Bus Rapid Transit (BRT) Project would upgrade the signal equipment at this intersection and provide directional curb ramps on all intersection corners, except the southwest corner.
- The Franklin Street/19th Street intersection provides diagonal curb ramps on all four corners, crosswalks on all four approaches, and pedestrian countdown signal heads in all

directions. The diagonal curb ramp in the northwest corner of the intersection does not provide truncated domes.

- The Broadway/17th Street intersection provides directional curb ramps on the northeast and southwest corners, and diagonal curb ramps on the northwest and southeast corners, crosswalks on all four approaches, and pedestrian countdown signal heads in all directions. The directional curb ramps on the southwest corner of the intersection do not provide truncated domes.

The City of Oakland *2017 Pedestrian Plan Update* recommends several modifications at intersections along Broadway between 16th and 19th Streets, including converting signal operations to fixed pedestrian recall, reducing signal cycle lengths, and implementing Leading Pedestrian Interval (LPI).

Recommendation 2: While not required to address a CEQA impact, the following should be considered as part of the final design for the Project:

- Explore the feasibility and only if feasible, install directional curb ramps at all four corners of the Broadway/19th Street, Franklin Street/19th Street, and Broadway/ 17th Street intersections that the East Bay BRT Project would not upgrade. Considering that fire hydrants, signal poles, light poles, and/or storm drain inlets may be present at these locations, construction of curb extensions (bulbouts) may also be required at some locations to accommodate the directional curb ramps.
- Explore the feasibility and only if feasible, install the City of Oakland *2017 Pedestrian Plan Update* recommendations at the Broadway/17th Street and Broadway/19th Street intersections, which consist of converting signal operations to fixed pedestrian recall, reducing signal cycle lengths, and implementing Leading Pedestrian Interval.
- Explore the feasibility and only if feasible, install the City of Oakland *2017 Pedestrian Plan Update* recommendations at the Broadway/17th Street and Broadway/19th Street intersections, which consist of converting signal operations to fixed pedestrian recall, reducing signal cycle lengths, and implementing Leading Pedestrian Interval.

Transit Access

Transit service providers in the project vicinity include BART and AC Transit.

BART provides regional rail service throughout the East Bay and across the Bay. The Project is adjacent to the 19th Street BART Station. The nearest station portals are on east side of Broadway just to the north and south of the main lobby. The Project site currently provides an elevator between the sidewalk and the concourse level at the BART Station. The Proposed Project would not modify access between the Project site and the BART Station portals and would continue to accommodate the BART elevator at the southwest corner of the building.

AC Transit is the primary bus service provider in the City of Oakland. AC Transit operates multiple major routes along Broadway. The nearest bus stops to the Project site are:

- On the east side of Broadway (northbound), adjacent to the Project site. Routes 6, 12, 18, 33, 51A, 72/72M, and 800/802/805/851 (night service), and the Oakland Free Broadway shuttle ("Free B") serve this stop. No amenities are provided at this bus stop.
- On the west side of Broadway (southbound), just north of 19th Street. Routes 6, 18, 72/72M, and 800/802/805 (night service), and the Oakland Free Broadway shuttle ("Free B") serve this stop. This bus stop provides a bench and a trash receptacle. This stop can be accessed from the Project site by crossing Broadway at the signalized crossings at 19th Street.
- On the west side of Broadway (southbound), midblock between 17th and 15th Streets. Routes 6, 12, 18, 33, 51A, 72/72M, and 800/802/805/851 (night service), and the "Free B" shuttle serve this stop. No amenities are provided at this bus stop. This stop can be accessed from the Project site by crossing Broadway at the signalized crossings at 17th Street.

AC Transit is currently designing the East Bay BRT Project, which would replace Routes 1 and 6 along Broadway in the project vicinity. BRT buses would operate in mixed-flow lanes along Broadway. The nearest BRT stop to the Project site would be one block north of the Project on Broadway between 19th and 20th Streets. Both stops would be accessed from the Project site by crossing at the protected signalized intersections on Broadway at 19th Street.

No other major changes to the bus routes operating in the vicinity of the Project are planned and the Project would not modify access between the Project site and these bus stops.

Recommendation 3: While not required to address a CEQA impact, the following should be considered as part of the final design for the Project:

- Coordinate with City of Oakland and AC Transit to explore the feasibility and if feasible, install bus stop amenities such as shelter, bench, and trash receptacle at

the bus stops on northbound Broadway just north of 17th Street and on southbound Broadway just north of 19th Streets and midblock between 15th and 17th Streets.

Automobile Parking Requirements

The City of Oakland Municipal Code sets minimum and maximum parking requirements. According to Section 17.116.060, the residential component of the Proposed Project has no minimum required parking and a maximum of 1.25 parking spaces per residential unit. Section 17.116.080 establishes no minimum parking requirements for the retail component of the Proposed Project, with maximum allowable parking of one space per 300 square feet of the ground floor retail area.

Table 4 presents the off-street automobile parking requirements for the Proposed Project, per City of Oakland Municipal Code. Overall, the Proposed Project is not required to provide any parking and cannot provide more than a maximum of 364 spaces. Consistent with City of Oakland Municipal Code requirements, the Project would include 170residential parking spaces and no retail parking spaces.

TABLE 4
AUTOMOBILE PARKING CODE REQUIREMENTS

Land Use	Size[1]	Required Parking Supply		Parking Supply	Within Range?
		Minimum	Maximum		
Residential[2]	307 DU	0	384	170	**Yes**
Retail[3]	5.0 KSF	0	15	0	**Yes**
Total		**0**	**399**	**170**	**Yes**

1. DU = Dwelling Unit; KSF = 1,000 square feet.
2. City of Oakland off-street parking requirement for residential in the CBD-P and CBD-C zones is a minimum of zero spaces and a maximum of 1.25 spaces per unit (section 17.116.060).
3. City of Oakland off-street parking requirement for retail uses in the CBD-P and CBD-C zones is a minimum of zero spaces and a maximum of one space per 300 square foot of ground floor area (Section 17.116.080).

Source: Fehr & Peers, 2017

Consistent with City of Oakland Municipal Code section 17.116.105, the Project would designate two of the spaces in the garage for car-share use. In addition, consistent with Code Section 17.116.310, all parking spaces would be unbundled (leased separately) from the rent of the dwelling units.

Loading Requirements

The Project would provide two residential loading spaces that would be accessed through the Project driveway on 19th Street. Trucks would back into and head out of the loading berths.

City Municipal Code Section 17.116.120 requires one off-street loading dock for residential uses larger than 50,000 square feet, and Section 17.116.140 requires no off-street loading facilities for commercial uses smaller than 25,000 square feet. The Project would include two residential loading spaces, which satisfies the City's loading requirements.

COLLISION ANALYSIS

A five-year history (March 31, 2012 to March 31, 2017) of collision data in the Project vicinity were obtained from the Statewide Integrated Traffic Records System (SWITRS) and were evaluated for this collision analysis. **Table 5** summarizes the collision data by type and location and **Table 6** summarizes the collision data by severity and location.

As shown in **Table 5**, approximately 31 collisions were reported during this five-year timeframe along Broadway between 17th and 19th Streets and along 17th and 19th Streets between Broadway and Franklin Street. The top two collision types were sideswipe (26 percent) and bicycle-involved (23 percent) collisions and the majority of collisions were due to improper turning (32 percent) and failure to follow traffic signals and signs (26 percent). Pedestrians were involved in three (ten percent) of the reported collisions. Of the 31 reported collisions, nine (29 percent) resulted in injuries and none resulted in fatalities, as shown in **Table 6**.

The Highway Safety Manual (HSM, Predictive Method - Volume 2, Part C) provides a methodology to predict the number of collisions for intersections and street segments based on their specific characteristics, such as vehicle and pedestrian volume, number of lanes, signal phasing, on-street parking, and number of driveways. **Table 7** presents the predicted collision frequencies for the three study intersections and three study segments using the HSM Predictive Method for Urban and Suburban Arterials, and compares the predicted collision frequencies with the actual reported collision frequencies. **Appendix B** provides the detailed predicted collision frequency calculation sheets based on the HSM methodology. Intersections or roadway segments with collision frequencies greater than the predicted frequency are identified as locations that should be evaluated in greater detail for collision trends and potential modifications.

TABLE 5
COLLISIONS BY TYPE

Location	Head-on	Sideswipe	Rear-End	Broadside	Hit Object	Pedestrian-Involved	Bicycle-Involved	Total
Intersection								
17th Street/Broadway	1	5	1	2	0	1	1	11
19th Street/Broadway	0	1	0	2	0	2	4	9
19th Street/Franklin Street	1	2	0	2	1	0	1	7
Roadway Segment								
17th Street (between Broadway and Franklin Street)	0	0	1	0	0	0	0	1
19th Street (between Broadway and Franklin Street)	0	0	1	0	0	0	0	1
Broadway (Between 17th and 19th Streets)	0	0	1	0	0	0	1	2
Total	**2**	**8**	**4**	**6**	**1**	**3**	**7**	**31**

1. Based on five-year collision data reported from March 31, 2012 to March 31, 2017.
Source: Fehr & Peers, 2018

TABLE 6
SUMMARY OF INJURIES

Location	Property Damage Only Collisions	Injury Collisions	Fatality Collisions	Total	Person-Injuries			
					Bike	Ped	Driver/ Passenger	Total
Intersection								
17th Street/Broadway	9	2	0	11	1	1	0	2
19th Street/Broadway	4	5	0	9	2	1	2	5
19th Street/Franklin Street	6	1	0	7	1	0	0	1
Roadway Segment								
17th Street (between Broadway and Franklin Street)	1	0	0	1	0	0	0	0
19th Street (between Broadway and Franklin Street)	1	0	0	1	0	0	0	0
Broadway (Between 17th and 19th Streets)	1	1	0	2	1	0	0	1
Total	22	9	0	31	5	2	2	9

1. Based on SWITRS five-year collision data reported from March 31, 2012 to March 31, 2017.
Source: Fehr & Peers, 2018

TABLE 7
PREDICTED AND ACTUAL CRASH FREQUENCIES

Location	Predicted Crash Frequency[1] (per year)	Actual Crash Frequency[2] (per year)	Difference	Higher Than Predicted?
Intersection				
17th Street/Broadway	1.9	2.2	+0.3	**Yes**
19th Street/Broadway	2.1	1.8	-0.3	No
19th Street/Franklin Street	1.4	1.4	0.0	No
Roadway Segment				
17th Street (between Broadway and Franklin Street)	0.2	0.2	0.0	No
19th Street (between Broadway and Franklin Street)	0.3	0.2	-0.1	No
Broadway (between 17th and 19th Streets)	0.4	0.4	0.0	No

1. Based on the Highway Safety Manual Predictive Method (Volume 2, Part C)
2. Based on five-year collision data reported from March 31, 2012 to March 31, 2017.
Source: Fehr & Peers, 2018

As shown in **Table 7**, all study locations have a lower reported collision frequency than predicted by HSM, except the Broadway/17th Street intersection, where the collision frequency exceeds the predicted rate by 0.3 collisions per year

Eleven collisions were reported at this intersection during the five-year study period, consisting of five sideswipe, two broadside, one head-on, one rear-end, one vehicle/pedestrian, and one vehicle/ bicycle collision. Most of the reported collisions were due to improper turning (36 percent) and failure to follow traffic signals and signs (27 percent). The one vehicle/pedestrian collision occurred as a pedestrian was walking in the crosswalk while having the right-of-way, and the vehicle was traveling eastbound on 17th Street. The one vehicle/bicycle collision was a head-on collision that occurred while the vehicle was traveling eastbound on 17th Street and the bicycle was riding in the wrong direction. Each pedestrian and bicycle collisions resulted in one injury and no fatalities.

The eleven collisions reported at the Broadway/17th Street intersection varied in location and type with no discernable trends. As previously described, the intersection currently provides marked crosswalks on all four approaches, directional curb ramps at two of the four corners, countdown signal heads for both directions of all crosswalks, adequate time for pedestrians to cross each crosswalk at 3.5 feet per second, and there are no sight distance concerns between vehicles, pedestrians, and cyclists. Recommendation 2 would install direction curb ramps at the two intersection corner that do not have them, and consistent with the *2017 Pedestrian Plan Update* recommendations, convert signal operations to fixed pedestrian recall, reduce signal cycle length, and implement Leading Pedestrian Interval..

Since there are no discernable trends in the collision data at the intersection, we do not recommend any additional modifications at the Broadway/17th Street intersection, beyond the ones, beyond the ones described above.

Please contact Sam with questions or comments.

ATTACHMENTS

Figure 1 – Project Trip Distribution

Appendix A – Traffic Counts

Appendix B – Predicted Crash Frequency Calculation Sheets

LEGEND

Project Site | XX% Project Trip Distribution | Inbound Routes | Outbound Routes

Figure 1

Project Trip Distribution

APPENDIX A
TRAFFIC COUNTS

National Data & Surveying Services

Intersection Turning Movement Count

Location: Broadway & 19th St
City: Oakland
Control:

Project ID: 17-07908-002
Date: 11/2/2017

Total

NS/EW Streets:	Broadway				Broadway				19th St				19th St				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	2	53	0	0	0	44	7	0	0	0	0	0	4	20	9	0	139
7:15 AM	5	72	0	0	0	46	11	0	0	0	0	0	4	27	11	0	176
7:30 AM	3	61	0	0	0	60	9	0	0	0	0	0	8	25	16	0	182
7:45 AM	6	71	0	0	0	87	12	0	0	0	0	0	7	41	22	0	246
8:00 AM	8	82	0	0	0	92	13	0	0	0	0	0	8	56	15	0	274
8:15 AM	3	78	0	1	0	83	9	0	0	0	0	0	7	57	15	0	253
8:30 AM	1	76	0	0	0	103	9	0	0	0	0	0	9	44	25	0	267
8:45 AM	6	81	0	1	0	101	9	0	0	0	0	0	4	47	24	0	273
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	34	574	0	2	0	616	79	0	0	0	0	0	51	317	137	0	1810
APPROACH %'s :	5.57%	94.10%	0.00%	0.33%	0.00%	88.63%	11.37%	0.00%					10.10%	62.77%	27.13%	0.00%	
PEAK HR :	08:00 AM - 09:00 AM																TOTAL
PEAK HR VOL :	18	317	0	2	0	379	40	0	0	0	0	0	28	204	79	0	1067
PEAK HR FACTOR :	0.563	0.966	0.000	0.500	0.000	0.920	0.769	0.000	0.000	0.000	0.000	0.000	0.778	0.895	0.790	0.000	0.974
	0.936				0.935								0.984				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	7	67	0	0	0	125	12	0	0	0	0	0	18	124	21	0	374
4:15 PM	12	92	0	1	0	116	20	0	0	0	0	0	15	86	19	0	361
4:30 PM	5	72	0	0	0	113	5	0	0	0	0	0	17	98	29	0	339
4:45 PM	4	91	0	1	0	123	16	0	0	0	0	0	21	106	33	0	395
5:00 PM	7	103	0	0	0	131	10	0	0	0	0	0	22	118	32	0	423
5:15 PM	15	108	0	0	0	128	7	0	0	0	0	0	24	126	40	0	448
5:30 PM	9	96	0	0	0	133	13	0	0	0	0	0	21	119	31	0	422
5:45 PM	7	74	0	0	0	102	10	0	0	0	0	0	16	91	24	0	324
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	66	703	0	2	0	971	93	0	0	0	0	0	154	868	229	0	3086
APPROACH %'s :	8.56%	91.18%	0.00%	0.26%	0.00%	91.26%	8.74%	0.00%					12.31%	69.38%	18.31%	0.00%	
PEAK HR :	04:45 PM - 05:45 PM																TOTAL
PEAK HR VOL :	35	398	0	1	0	515	46	0	0	0	0	0	88	469	136	0	1688
PEAK HR FACTOR :	0.583	0.921	0.000	0.250	0.000	0.968	0.719	0.000	0.000	0.000	0.000	0.000	0.917	0.931	0.850	0.000	0.942
	0.882				0.961								0.912				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Broadway & 19th St
City: Oakland
Control: 0

Project ID: 17-07908-002
Date: 11/2/2017

Bikes

NS/EW Streets:	Broadway				Broadway				19th St				19th St				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	0	0	0	0	10	0	0	0	0	1	0	0	2	1	0	14
7:15 AM	0	3	0	0	0	6	0	0	0	1	0	0	2	1	0	0	13
7:30 AM	0	1	0	0	0	8	2	0	0	0	0	0	5	2	0	0	18
7:45 AM	0	2	0	0	0	11	1	0	0	0	0	0	4	0	2	0	20
8:00 AM	0	4	0	0	0	17	2	0	0	0	0	0	4	2	0	0	29
8:15 AM	0	2	0	0	0	10	0	0	1	0	1	0	1	3	1	0	19
8:30 AM	0	1	0	0	0	18	1	0	0	0	0	0	8	2	1	0	31
8:45 AM	0	1	0	0	0	20	0	0	0	0	2	0	3	1	2	0	29
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	14	0	0	0	100	6	0	1	1	4	0	27	13	7	0	173
APPROACH %'s :	0.00%	100.00%	0.00%	0.00%	0.00%	94.34%	5.66%	0.00%	16.67%	16.67%	66.67%	0.00%	57.45%	27.66%	14.89%	0.00%	
PEAK HR :	08:00 AM - 09:00 AM																TOTAL
PEAK HR VOL :	0	8	0	0	0	65	3	0	1	0	3	0	16	8	4	0	108
PEAK HR FACTOR :	0.000	0.500	0.000	0.000	0.000	0.813	0.375	0.000	0.250	0.000	0.375	0.000	0.500	0.667	0.500	0.000	0.871
		0.500				0.850				0.500				0.636			

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	2	4	0	0	1	2	1	0	0	0	0	0	0	0	0	0	10
4:15 PM	2	7	2	0	0	7	0	0	0	0	0	0	0	2	1	0	21
4:30 PM	3	9	0	0	0	6	2	0	0	0	0	0	1	3	2	0	26
4:45 PM	2	9	1	0	0	7	1	0	1	0	1	0	0	3	0	0	25
5:00 PM	1	8	0	0	0	2	1	0	1	0	0	0	0	3	0	0	16
5:15 PM	3	14	0	0	0	3	1	0	1	2	0	0	1	6	1	0	32
5:30 PM	2	8	1	0	0	4	1	0	1	0	2	0	0	7	1	0	27
5:45 PM	1	7	0	0	0	5	1	0	1	0	1	0	1	4	0	0	21
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	16	66	4	0	1	36	8	0	5	2	4	0	3	28	5	0	178
APPROACH %'s :	18.60%	76.74%	4.65%	0.00%	2.22%	80.00%	17.78%	0.00%	45.45%	18.18%	36.36%	0.00%	8.33%	77.78%	13.89%	0.00%	
PEAK HR :	04:45 PM - 05:45 PM																TOTAL
PEAK HR VOL :	8	39	2	0	0	16	4	0	4	2	3	0	1	19	2	0	100
PEAK HR FACTOR :	0.67	0.696	0.500	0.000	0.000	0.571	1.000	0.000	1.000	0.250	0.375	0.000	0.250	0.679	0.500	0.000	0.781
		0.721				0.625				0.750				0.688			

National Data & Surveying Services

Intersection Turning Movement Count

Location: Broadway & 19th St
City: Oakland
Project ID: 17-07908-002
Date: 11/2/2017

Pedestrians (Crosswalks)

NS/EW Streets:	Broadway		Broadway		19th St		19th St		
AM	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
7:00 AM	0	0	12	3	11	4	5	4	39
7:15 AM	3	3	10	4	12	8	3	6	49
7:30 AM	3	2	14	6	20	7	8	10	70
7:45 AM	7	9	18	12	29	8	6	13	102
8:00 AM	5	9	25	21	33	9	7	17	126
8:15 AM	19	8	15	15	25	14	34	17	147
8:30 AM	7	7	26	11	40	19	11	19	140
8:45 AM	9	8	24	55	48	34	38	26	242
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	53	46	144	127	218	103	112	112	915
APPROACH %'s :	53.54%	46.46%	53.14%	46.86%	67.91%	32.09%	50.00%	50.00%	
PEAK HR :	**08:00 AM - 09:00 AM**								TOTAL
PEAK HR VOL :	40	32	90	102	146	76	90	79	655
PEAK HR FACTOR :	0.526	0.889	0.865	0.464	0.760	0.559	0.592	0.760	0.677
	0.667		0.608		0.677		0.660		

PM	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
4:00 PM	10	15	16	38	31	35	20	23	188
4:15 PM	9	7	28	12	33	39	15	41	184
4:30 PM	4	11	22	8	28	21	16	24	134
4:45 PM	15	15	11	15	26	19	32	18	151
5:00 PM	20	15	14	19	25	55	27	36	211
5:15 PM	7	20	26	28	50	29	19	22	201
5:30 PM	16	26	17	40	47	21	23	15	205
5:45 PM	14	23	15	34	50	22	26	17	201
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	95	132	149	194	290	241	178	196	1475
APPROACH %'s :	41.85%	58.15%	43.44%	56.56%	54.61%	45.39%	47.59%	52.41%	
PEAK HR :	**04:45 PM - 05:45 PM**								TOTAL
PEAK HR VOL :	58	76	68	102	148	124	101	91	768
PEAK HR FACTOR :	0.725	0.731	0.654	0.638	0.740	0.564	0.789	0.632	0.910
	0.798		0.746		0.850		0.762		

National Data & Surveying Services

Intersection Turning Movement Count

Location: Franklin St & 19th St
City: Oakland
Control:

Project ID: 17-07908-003
Date: 11/2/2017

Total

NS/EW Streets:	Franklin St				Franklin St				19th St				19th St				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	32	34	0	0	0	0	0	0	0	0	0	0	0	48	16	0	130
7:15 AM	31	28	0	0	0	0	0	0	0	0	0	0	0	56	19	0	134
7:30 AM	42	45	0	0	0	0	0	0	0	0	0	0	0	64	13	0	164
7:45 AM	49	69	0	0	0	0	0	0	0	0	0	0	0	88	34	0	240
8:00 AM	47	69	0	0	0	0	0	0	0	0	0	0	0	103	31	0	250
8:15 AM	65	54	0	0	0	0	0	0	0	0	0	0	0	92	27	0	238
8:30 AM	61	71	0	0	0	0	0	0	0	0	0	0	0	106	32	0	270
8:45 AM	78	92	0	0	0	0	0	0	0	0	0	0	0	114	37	0	321
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	405	462	0	0	0	0	0	0	0	0	0	0	0	671	209	0	1747
APPROACH %'s :	46.71%	53.29%	0.00%	0.00%									0.00%	76.25%	23.75%	0.00%	
PEAK HR :	08:00 AM - 09:00 AM																TOTAL
PEAK HR VOL :	251	286	0	0	0	0	0	0	0	0	0	0	0	415	127	0	1079
PEAK HR FACTOR :	0.804	0.777	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.910	0.858	0.000	0.840
	0.790												0.897				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	40	95	0	0	0	0	0	0	0	0	0	0	0	93	32	0	260
4:15 PM	35	88	0	0	0	0	0	0	0	0	0	0	0	68	43	0	234
4:30 PM	43	100	0	0	0	0	0	0	0	0	0	0	0	85	45	0	273
4:45 PM	45	114	0	0	0	0	0	0	0	0	0	0	0	91	47	0	297
5:00 PM	58	134	0	0	0	0	0	0	0	0	0	0	0	92	51	0	335
5:15 PM	46	112	0	0	0	0	0	0	0	0	0	0	0	98	59	0	315
5:30 PM	48	102	0	0	0	0	1	0	0	0	0	0	0	95	54	0	300
5:45 PM	37	70	0	0	0	0	0	0	0	0	0	0	0	86	48	0	241
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	352	815	0	0	0	0	1	0	0	0	0	0	0	708	379	0	2255
APPROACH %'s :	30.16%	69.84%	0.00%	0.00%	0.00%	0.00%	100.00%	0.00%					0.00%	65.13%	34.87%	0.00%	
PEAK HR :	04:45 PM - 05:45 PM																TOTAL
PEAK HR VOL :	197	462	0	0	0	0	1	0	0	0	0	0	0	376	211	0	1247
PEAK HR FACTOR :	0.849	0.862	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.959	0.894	0.000	0.931
	0.858				0.250								0.935				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Franklin St & 19th St
City: Oakland
Control: 0

Project ID: 17-07908-003
Date: 11/2/2017

Bikes

NS/EW Streets:	Franklin St				Franklin St				19th St				19th St				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	4	1	0	6
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3
7:30 AM	1	2	0	0	0	0	0	0	0	0	1	0	0	6	0	0	10
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	11	2	0	13
8:00 AM	1	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	7
8:15 AM	0	3	0	0	0	0	0	0	0	0	0	0	1	5	4	0	13
8:30 AM	1	4	0	0	0	0	0	0	0	0	0	0	0	10	1	0	16
8:45 AM	0	7	0	0	0	1	0	0	0	0	0	0	0	7	5	0	20
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	3	17	0	0	0	1	0	0	0	0	1	0	1	52	13	0	88
APPROACH %'s :	15.00%	85.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%	0.00%	100.00%	0.00%	1.52%	78.79%	19.70%	0.00%	
PEAK HR :	08:00 AM - 09:00 AM																TOTAL
PEAK HR VOL :	2	14	0	0	0	1	0	0	0	0	0	0	1	28	10	0	56
PEAK HR FACTOR :	0.500	0.500	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.700	0.500	0.000	0.700
	0.571				0.250				0.813								

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	6	0	0	0	0	0	0	0	1	1	0	0	2	1	0	11
4:15 PM	0	3	2	0	0	0	0	0	0	0	0	0	0	3	1	0	9
4:30 PM	1	3	0	0	0	0	1	0	0	0	0	0	0	4	0	0	9
4:45 PM	0	6	0	0	0	0	1	0	1	0	0	0	0	3	3	0	14
5:00 PM	1	12	0	0	0	0	0	0	0	1	0	0	0	4	0	0	18
5:15 PM	0	15	0	0	0	0	1	0	0	0	0	0	0	5	3	0	24
5:30 PM	0	10	0	0	0	0	0	0	0	1	0	0	0	8	4	0	23
5:45 PM	0	9	0	0	0	0	0	0	0	0	0	0	0	4	2	0	15
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	2	64	2	0	0	0	3	0	1	3	1	0	0	33	14	0	123
APPROACH %'s :	2.94%	94.12%	2.94%	0.00%	0.00%	0.00%	100.00%	0.00%	20.00%	60.00%	20.00%	0.00%	0.00%	70.21%	29.79%	0.00%	
PEAK HR :	04:45 PM - 05:45 PM																TOTAL
PEAK HR VOL :	1	43	0	0	0	0	2	0	1	2	0	0	0	20	10	0	79
PEAK HR FACTOR :	0.25	0.717	0.000	0.000	0.000	0.000	0.500	0.000	0.250	0.500	0.000	0.000	0.000	0.625	0.625	0.000	0.823
	0.733				0.500				0.750				0.625				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Franklin St & 19th St
City: Oakland
Project ID: 17-07908-003
Date: 11/2/2017

Pedestrians (Crosswalks)

NS/EW Streets:	Franklin St		Franklin St		19th St		19th St		
AM	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
7:00 AM	22	4	27	4	12	7	9	0	85
7:15 AM	24	3	77	7	22	11	15	8	167
7:30 AM	39	2	75	9	23	10	23	2	183
7:45 AM	35	5	82	8	16	10	14	5	175
8:00 AM	61	5	74	14	24	16	28	6	228
8:15 AM	48	11	77	14	18	17	14	8	207
8:30 AM	54	5	95	12	43	20	30	8	267
8:45 AM	58	10	120	42	38	27	26	10	331
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	341	45	627	110	196	118	159	47	1643
APPROACH %'s :	88.34%	11.66%	85.07%	14.93%	62.42%	37.58%	77.18%	22.82%	
PEAK HR :	**08:00 AM - 09:00 AM**								TOTAL
PEAK HR VOL :	221	31	366	82	123	80	98	32	1033
PEAK HR FACTOR :	0.906	0.705	0.763	0.488	0.715	0.741	0.817	0.800	0.780
	0.926		0.691		0.781		0.855		

PM	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
4:00 PM	8	47	8	98	9	29	6	25	230
4:15 PM	5	28	18	63	14	27	11	20	186
4:30 PM	2	38	18	128	14	33	9	22	264
4:45 PM	12	46	11	84	17	25	4	24	223
5:00 PM	13	44	19	137	25	28	7	25	298
5:15 PM	11	37	13	89	20	27	7	13	217
5:30 PM	16	21	20	92	8	31	12	19	219
5:45 PM	7	25	16	55	8	19	6	18	154
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	74	286	123	746	115	219	62	166	1791
APPROACH %'s :	20.56%	79.44%	14.15%	85.85%	34.43%	65.57%	27.19%	72.81%	
PEAK HR :	**04:45 PM - 05:45 PM**								TOTAL
PEAK HR VOL :	52	148	63	402	70	111	30	81	957
PEAK HR FACTOR :	0.813	0.804	0.788	0.734	0.700	0.895	0.625	0.810	0.803
	0.862		0.745		0.854		0.867		

National Data & Surveying Services

Intersection Turning Movement Count

Location: Broadway & 17th St
City: Oakland
Control:

Project ID: 17-07908-004
Date: 11/2/2017

Total

NS/EW Streets:	Broadway				Broadway				17th St				17th St				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	51	5	0	6	39	0	0	7	61	2	0	0	0	0	0	171
7:15 AM	0	69	6	0	9	47	0	0	4	52	11	0	0	0	0	0	198
7:30 AM	0	55	10	0	8	56	0	0	11	79	7	0	0	0	1	0	227
7:45 AM	0	64	6	0	17	74	0	1	15	97	4	0	0	0	0	0	278
8:00 AM	0	74	8	0	17	87	0	0	18	132	6	0	0	0	0	0	342
8:15 AM	0	73	10	0	14	86	0	0	10	120	5	0	0	0	0	0	318
8:30 AM	0	65	4	0	22	88	0	0	8	117	10	0	0	0	0	0	314
8:45 AM	0	83	17	0	17	92	0	0	8	109	7	0	0	0	0	0	333
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	534	66	0	110	569	0	1	81	767	52	0	0	0	1	0	2181
APPROACH %'s :	0.00%	89.00%	11.00%	0.00%	16.18%	83.68%	0.00%	0.15%	9.00%	85.22%	5.78%	0.00%	0.00%	0.00%	100.00%	0.00%	
PEAK HR :	08:00 AM - 09:00 AM																TOTAL
PEAK HR VOL :	0	295	39	0	70	353	0	0	44	478	28	0	0	0	0	0	1307
PEAK HR FACTOR :	0.000	0.889	0.574	0.000	0.795	0.959	0.000	0.000	0.611	0.905	0.700	0.000	0.000	0.000	0.000	0.000	0.955
		0.835				0.961				0.881							

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	66	16	0	25	111	0	1	12	70	13	0	0	0	0	0	314
4:15 PM	0	75	16	0	33	105	0	0	20	62	14	0	0	0	0	0	325
4:30 PM	0	68	17	0	23	111	0	0	13	89	11	0	0	0	0	0	332
4:45 PM	0	79	19	0	38	105	0	0	18	78	10	0	0	0	0	0	347
5:00 PM	0	88	17	1	33	123	0	0	22	92	11	0	0	0	0	0	387
5:15 PM	0	94	14	0	29	124	0	0	16	89	19	0	0	0	0	0	385
5:30 PM	0	86	17	0	35	113	0	0	21	75	16	0	0	0	0	0	363
5:45 PM	0	89	17	0	25	88	0	0	24	89	12	0	0	0	0	0	344
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	645	133	1	241	880	0	1	146	644	106	0	0	0	0	0	2797
APPROACH %'s :	0.00%	82.80%	17.07%	0.13%	21.48%	78.43%	0.00%	0.09%	16.29%	71.88%	11.83%	0.00%					
PEAK HR :	04:45 PM - 05:45 PM																TOTAL
PEAK HR VOL :	0	347	67	1	135	465	0	0	77	334	56	0	0	0	0	0	1482
PEAK HR FACTOR :	0.000	0.923	0.882	0.250	0.888	0.938	0.000	0.000	0.875	0.908	0.737	0.000	0.000	0.000	0.000	0.000	0.957
		0.961				0.962				0.934							

National Data & Surveying Services

Intersection Turning Movement Count

Location: Broadway & 17th St
City: Oakland
Control: 0

Project ID: 17-07908-004
Date: 11/2/2017

Bikes

NS/EW Streets:	Broadway				Broadway				17th St				17th St				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	0	0	0	0	3	0	0	0	1	0	0	0	0	0	0	4
7:15 AM	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	4
7:30 AM	0	1	1	0	0	5	0	0	2	3	0	0	0	0	0	0	12
7:45 AM	0	3	0	0	0	5	0	0	1	4	0	0	0	1	0	0	14
8:00 AM	0	0	1	0	1	6	0	0	1	3	1	0	0	0	0	0	13
8:15 AM	0	3	0	0	1	7	0	0	2	3	0	0	0	0	0	0	16
8:30 AM	0	0	0	0	1	10	0	0	0	5	1	0	0	0	0	0	17
8:45 AM	0	2	0	0	0	12	1	0	1	9	0	0	0	0	0	0	25
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	11	2	0	3	50	1	0	7	28	2	0	0	1	0	0	105
APPROACH %'s :	0.00%	84.62%	15.38%	0.00%	5.56%	92.59%	1.85%	0.00%	18.92%	75.68%	5.41%	0.00%	0.00%	100.00%	0.00%	0.00%	
PEAK HR :	08:00 AM - 09:00 AM																TOTAL
PEAK HR VOL :	0	5	1	0	3	35	1	0	4	20	2	0	0	0	0	0	71
PEAK HR FACTOR :	0.000	0.417	0.250	0.000	0.750	0.729	0.250	0.000	0.500	0.556	0.500	0.000	0.000	0.000	0.000	0.000	0.710
		0.500				0.750				0.650							

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	5	1	0	1	2	0	0	2	2	0	0	0	0	0	0	13
4:15 PM	0	3	0	0	0	6	0	0	1	2	0	0	0	0	1	0	13
4:30 PM	0	4	0	0	2	5	1	0	1	3	0	0	0	0	0	0	16
4:45 PM	0	8	0	0	0	5	0	0	2	2	0	0	1	0	0	0	18
5:00 PM	0	4	2	0	1	2	0	0	0	5	0	0	0	0	0	0	14
5:15 PM	0	6	0	0	3	2	0	0	4	3	0	0	0	0	0	0	18
5:30 PM	0	7	1	0	2	5	0	0	0	0	0	0	2	1	1	0	19
5:45 PM	1	10	3	0	1	2	0	0	0	2	1	0	0	1	0	0	21
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	1	47	7	0	10	29	1	0	10	19	1	0	3	2	2	0	132
APPROACH %'s :	1.82%	85.45%	12.73%	0.00%	25.00%	72.50%	2.50%	0.00%	33.33%	63.33%	3.33%	0.00%	42.86%	28.57%	28.57%	0.00%	
PEAK HR :	04:45 PM - 05:45 PM																TOTAL
PEAK HR VOL :	0	25	3	0	6	14	0	0	6	10	0	0	3	1	1	0	69
PEAK HR FACTOR :	0.00	0.781	0.375	0.000	0.500	0.700	0.000	0.000	0.375	0.500	0.000	0.000	0.375	0.250	0.250	0.000	0.908
		0.875				0.714				0.571				0.313			

National Data & Surveying Services

Intersection Turning Movement Count

Location: Broadway & 17th St
City: Oakland
Project ID: 17-07908-004
Date: 11/2/2017

Pedestrians (Crosswalks)

NS/EW Streets:	Broadway		Broadway		17th St		17th St		
AM	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
7:00 AM	2	1	1	3	7	8	4	5	31
7:15 AM	6	4	5	5	16	9	5	8	58
7:30 AM	10	6	2	3	10	9	7	8	55
7:45 AM	15	5	4	5	13	18	11	14	85
8:00 AM	21	10	4	4	12	20	12	20	103
8:15 AM	9	9	9	11	19	29	14	24	124
8:30 AM	9	10	12	8	30	30	17	25	141
8:45 AM	19	20	7	5	31	42	20	36	180
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	91	65	44	44	138	165	90	140	777
APPROACH %'s :	58.33%	41.67%	50.00%	50.00%	45.54%	54.46%	39.13%	60.87%	
PEAK HR :	**08:00 AM - 09:00 AM**								TOTAL
PEAK HR VOL :	58	49	32	28	92	121	63	105	548
PEAK HR FACTOR :	0.690	0.613	0.667	0.636	0.742	0.720	0.788	0.729	0.761
	0.686		0.750		0.729		0.750		

PM	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
4:00 PM	14	5	12	7	26	20	20	28	132
4:15 PM	15	18	9	13	35	31	28	34	183
4:30 PM	11	23	11	12	29	24	22	29	161
4:45 PM	22	17	5	8	39	25	24	24	164
5:00 PM	23	15	15	5	37	39	28	40	202
5:15 PM	8	14	7	4	28	26	24	22	133
5:30 PM	28	30	8	7	32	36	22	22	185
5:45 PM	19	17	3	16	40	38	28	22	183
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	140	139	70	72	266	239	196	221	1343
APPROACH %'s :	50.18%	49.82%	49.30%	50.70%	52.67%	47.33%	47.00%	53.00%	
PEAK HR :	**04:45 PM - 05:45 PM**								TOTAL
PEAK HR VOL :	81	76	35	24	136	126	98	108	684
PEAK HR FACTOR :	0.723	0.633	0.583	0.750	0.872	0.808	0.875	0.675	0.847
	0.677		0.738		0.862		0.757		

APPENDIX B
PREDICTED CRASH FREQUENCY CALCULATION

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections

General Information		Location Information	
Analyst	Huma Husain	Roadway	
Agency or Company	Fehr & Peers	Intersection	17th Street and Broadway
Date Performed	11/28/17	Jurisdiction	Oakland, CA
		Analysis Year	2017

Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)		--	3SG
AADT $_{major}$ (veh/day)	$AADT_{MAX}$ = 58,100 (veh/day)	--	9,900
AADT $_{minor}$ (veh/day)	$AADT_{MAX}$ = 16,400 (veh/day)	--	5,500
Intersection lighting (present/not present)		Not Present	Present
Calibration factor, C_i		1.00	1.00
Data for unsignalized intersections only:		--	--
Number of major-road approaches with left-turn lanes (0,1,2)		0	0
Number of major-road approaches with right-turn lanes (0,1,2)		0	0
Data for signalized intersections only:		--	--
Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		0	2
Number of approaches with right-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		0	0
Number of approaches with left-turn signal phasing [for 3SG, use maximum value of 3]		--	3
Type of left-turn signal phasing for Leg #1		Permissive	Permissive
Type of left-turn signal phasing for Leg #2		--	Permissive
Type of left-turn signal phasing for Leg #3		--	Protected
Type of left-turn signal phasing for Leg #4 (if applicable)		--	Not Applicable
Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3]		0	0
Intersection red light cameras (present/not present)		Not Present	Not Present
Sum of all pedestrian crossing volumes (PedVol) -- Signalized intersections only			3,200
Maximum number of lanes crossed by a pedestrian (n_{lanesx})		--	5
Number of bus stops within 300 m (1,000 ft) of the intersection		0	10
Schools within 300 m (1,000 ft) of the intersection (present/not present)		Not Present	Present
Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection		0	10

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF 1i	*CMF 2i*	*CMF 3i*	*CMF 4i*	*CMF 5i*	*CMF 6i*	*CMF $_{COMB}$*
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
0.86	0.94	1.00	1.00	0.91	1.00	0.74

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{bimv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bimv}**
	from Table 12-10			from Table 12-10	from Equation 12-21		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-12.13	1.11	0.26	0.33	1.379	1.000	1.379	0.74	1.00	1.015
Fatal and Injury (FI)	-11.58	1.02	0.17	0.30	0.481	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.363	0.500	0.74	1.00	0.368
Property Damage Only (PDO)	-13.24	1.14	0.30	0.36	0.845	$(5)_{TOTAL}-(5)_{FI}$ = 0.637	0.879	0.74	1.00	0.647

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{bimv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{bimv\ (PDO)}$ (crashes/year)**	**Predicted N $_{bimv\ (TOTAL)}$ (crashes/year)**
	from Table 12-11	$(9)_{FI}$ from Worksheet 2C	from Table 12-11	$(9)_{PDO}$ from Worksheet 2C	$(9)_{PDO}$ from Worksheet 2C
Total	1.000	0.368	1.000	0.647	1.015
		$(2)*(3)_{FI}$		$(4)*(5)_{PDO}$	(3)+(5)
Rear-end collision	0.549	0.202	0.546	0.353	0.556
Head-on collision	0.038	0.014	0.020	0.013	0.027
Angle collision	0.280	0.103	0.204	0.132	0.235
Sideswipe	0.076	0.028	0.032	0.021	0.049
Other multiple-vehicle collision	0.057	0.021	0.198	0.128	0.149

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{bisv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bisv}**
	from Table 12-12			from Table 12-12	from Eqn. 12-24; (FI) from Eqn. 12-24 or 12-27		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-9.02	0.42	0.40	0.36	0.181	1.000	0.181	0.74	1.00	0.133
Fatal and Injury (FI)	-9.75	0.27	0.51	0.24	0.056	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.315	0.057	0.74	1.00	0.042
Property Damage Only (PDO)	-9.08	0.45	0.33	0.53	0.123	$(5)_{TOTAL}-(5)_{FI}$ = 0.685	0.124	0.74	1.00	0.091

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{bisv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{bisv\ (PDO)}$ (crashes/year)**	**Predicted N $_{bisv\ (TOTAL)}$ (crashes/year)**
	from Table 12-13	(9)$_{FI}$ from Worksheet 2E	from Table 12-13	(9)$_{PDO}$ from Worksheet 2E	(9)$_{PDO}$ from Worksheet 2E
Total	1.000	0.042	1.000	0.091	0.133
		(2)*(3)$_{FI}$		(4)*(5)$_{PDO}$	(3)+(5)
Collision with parked vehicle	0.001	0.000	0.001	0.000	0.000
Collision with animal	0.001	0.000	0.003	0.000	0.000
Collision with fixed object	0.653	0.027	0.895	0.082	0.109
Collision with other object	0.091	0.004	0.069	0.006	0.010
Other single-vehicle collision	0.045	0.002	0.018	0.002	0.004
Single-vehicle noncollision	0.209	0.009	0.014	0.001	0.010

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Stop-Controlled Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**Predicted N_{bimv}**	**Predicted N_{bisv}**	**Predicted N_{bi}**	**f_{pedi}**	**Calibration factor, C_i**	**Predicted N_{pedi}**
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-16		(4)*(5)*(6)
Total	--	--	--	--	1.00	--
Fatal and injury (FI)	--	--	--	--	1.00	--

Worksheet 2H -- Crash Modification Factors for Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections

(1)	(2)	(3)	(4)
CMF for Bus Stops	CMF for Schools	CMF for Alcohol Sales Establishments	Combined CMF
CMF_{1p}	CMF_{2p}	CMF_{3p}	
from Table 12-28	from Table 12-29	from Table 12-30	(1)*(2)*(3)
4.15	1.35	1.56	8.74

Worksheet 2I -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections

(1)	(2)					(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**SPF Coefficients**					**Overdispersion Parameter, k**	**$N_{pedbase}$**	**Combined CMF**	**Calibration factor, C_i**	**Predicted N_{pedi}**
	from Table 12-14						from Equation 12-29	(4) from Worksheet 2H		(4)*(5)*(6)
	a	b	c	d	e					
Total	-6.60	0.05	0.24	0.41	0.09	0.52	0.082	8.74	1.00	0.717
Fatal and Injury (FI)	--	--	--	--	--	--	--	--	1.00	0.717

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**Predicted N_{bimv}**	**Predicted N_{bisv}**	**Predicted N_{bi}**	**f_{bikei}**	**Calibration factor, C_i**	**Predicted N_{bikei}**
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-17		(4)*(5)*(6)
Total	1.015	0.133	1.148	0.011	1.00	0.013
Fatal and injury (FI)	--	--	--	--	1.00	0.013

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)
	Fatal and injury (FI)	**Property damage only (PDO)**	**Total**
Collision type	(3) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J	(5) from Worksheet 2D and 2F	(6) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.202	0.353	0.556
Head-on collisions (from Worksheet 2D)	0.014	0.013	0.027
Angle collisions (from Worksheet 2D)	0.103	0.132	0.235
Sideswipe (from Worksheet 2D)	0.028	0.021	0.049
Other multiple-vehicle collision (from Worksheet 2D)	0.021	0.128	0.149
Subtotal	0.368	0.647	1.015
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.000	0.000	0.000
Collision with animal (from Worksheet 2F)	0.000	0.000	0.000
Collision with fixed object (from Worksheet 2F)	0.027	0.082	0.109
Collision with other object (from Worksheet 2F)	0.004	0.006	0.010
Other single-vehicle collision (from Worksheet 2F)	0.002	0.002	0.004
Single-vehicle noncollision (from Worksheet 2F)	0.009	0.001	0.010
Collision with pedestrian (from Worksheet 2G or 2I)	0.717	0.000	0.717
Collision with bicycle (from Worksheet 2J)	0.013	0.000	0.013
Subtotal	0.772	0.091	0.863
Total	1.140	0.738	1.879

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections

(1)	(2)
Crash severity level	**Predicted average crash frequency, $N_{predicted\ int}$ (crashes/year)**
	(Total) from Worksheet 2K
Total	1.9
Fatal and injury (FI)	1.1
Property damage only (PDO)	0.7

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections

General Information		Location Information	
Analyst	Huma Husain	Roadway	
Agency or Company	Fehr & Peers	Intersection	19th Street and Broadway
Date Performed	11/28/17	Jurisdiction	Oakland, CA
		Analysis Year	2017

Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)		--	3SG
AADT $_{major}$ (veh/day)	$AADT_{MAX}$ = 58,100 (veh/day)	--	9,500
AADT $_{minor}$ (veh/day)	$AADT_{MAX}$ = 16,400 (veh/day)	--	6,600
Intersection lighting (present/not present)		Not Present	Present
Calibration factor, C_i		1.00	1.00
Data for unsignalized intersections only:		--	--
Number of major-road approaches with left-turn lanes (0,1,2)		0	0
Number of major-road approaches with right-turn lanes (0,1,2)		0	0
Data for signalized intersections only:		--	--
Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		0	0
Number of approaches with right-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		0	0
Number of approaches with left-turn signal phasing [for 3SG, use maximum value of 3]		--	3
Type of left-turn signal phasing for Leg #1		Permissive	Permissive
Type of left-turn signal phasing for Leg #2		--	Permissive
Type of left-turn signal phasing for Leg #3		--	Protected
Type of left-turn signal phasing for Leg #4 (if applicable)		--	Not Applicable
Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3]		0	0
Intersection red light cameras (present/not present)		Not Present	Not Present
Sum of all pedestrian crossing volumes (PedVol) -- Signalized intersections only			3,200
Maximum number of lanes crossed by a pedestrian (n_{lanesx})		--	5
Number of bus stops within 300 m (1,000 ft) of the intersection		0	12
Schools within 300 m (1,000 ft) of the intersection (present/not present)		Not Present	Present
Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection		0	10

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF 1i	*CMF 2i*	*CMF 3i*	*CMF 4i*	*CMF 5i*	*CMF 6i*	*CMF $_{COMB}$*
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
1.00	0.94	1.00	1.00	0.91	1.00	0.86

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{bimv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bimv}**
	from Table 12-10			from Table 12-10	from Equation 12-21		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-12.13	1.11	0.26	0.33	1.382	1.000	1.382	0.86	1.00	1.183
Fatal and Injury (FI)	-11.58	1.02	0.17	0.30	0.476	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.358	0.495	0.86	1.00	0.424
Property Damage Only (PDO)	-13.24	1.14	0.30	0.36	0.852	$(5)_{TOTAL}-(5)_{FI}$ = 0.642	0.886	0.86	1.00	0.759

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{bimv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{bimv\ (PDO)}$ (crashes/year)**	**Predicted N $_{bimv\ (TOTAL)}$ (crashes/year)**
	from Table 12-11	$(9)_{FI}$ from Worksheet 2C	from Table 12-11	$(9)_{PDO}$ from Worksheet 2C	$(9)_{PDO}$ from Worksheet 2C
Total	1.000	0.424	1.000	0.759	1.183
		$(2)*(3)_{FI}$		$(4)*(5)_{PDO}$	(3)+(5)
Rear-end collision	0.549	0.233	0.546	0.414	0.647
Head-on collision	0.038	0.016	0.020	0.015	0.031
Angle collision	0.280	0.119	0.204	0.155	0.273
Sideswipe	0.076	0.032	0.032	0.024	0.056
Other multiple-vehicle collision	0.057	0.024	0.198	0.150	0.174

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{bisv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bisv}**
	from Table 12-12			from Table 12-12	from Eqn. 12-24; (FI) from Eqn. 12-24 or 12-27		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-9.02	0.42	0.40	0.36	0.191	1.000	0.191	0.86	1.00	0.164
Fatal and Injury (FI)	-9.75	0.27	0.51	0.24	0.061	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.324	0.062	0.86	1.00	0.053
Property Damage Only (PDO)	-9.08	0.45	0.33	0.53	0.128	$(5)_{TOTAL}-(5)_{FI}$ = 0.676	0.129	0.86	1.00	0.111

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{bisv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{bisv\ (PDO)}$ (crashes/year)**	**Predicted N $_{bisv\ (TOTAL)}$ (crashes/year)**
	from Table 12-13	(9)$_{FI}$ from Worksheet 2E	from Table 12-13	(9)$_{PDO}$ from Worksheet 2E	(9)$_{PDO}$ from Worksheet 2E
Total	1.000	0.053	1.000	0.111	0.164
		(2)*(3)$_{FI}$		(4)*(5)$_{PDO}$	(3)+(5)
Collision with parked vehicle	0.001	0.000	0.001	0.000	0.000
Collision with animal	0.001	0.000	0.003	0.000	0.000
Collision with fixed object	0.653	0.035	0.895	0.099	0.134
Collision with other object	0.091	0.005	0.069	0.008	0.012
Other single-vehicle collision	0.045	0.002	0.018	0.002	0.004
Single-vehicle noncollision	0.209	0.011	0.014	0.002	0.013

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Stop-Controlled Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**Predicted N_{bimv}**	**Predicted N_{bisv}**	**Predicted N_{bi}**	**f_{pedi}**	**Calibration factor, C_i**	**Predicted N_{pedi}**
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-16		(4)*(5)*(6)
Total	--	--	--	--	1.00	--
Fatal and injury (FI)	--	--	--	--	1.00	--

Worksheet 2H -- Crash Modification Factors for Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections

(1)	(2)	(3)	(4)
CMF for Bus Stops	CMF for Schools	CMF for Alcohol Sales Establishments	Combined CMF
CMF_{1p}	CMF_{2p}	CMF_{3p}	
from Table 12-28	from Table 12-29	from Table 12-30	(1)*(2)*(3)
4.15	1.35	1.56	8.74

Worksheet 2I -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections

(1)	(2)					(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**SPF Coefficients**					**Overdispersion Parameter, k**	**$N_{pedbase}$**	**Combined CMF**	**Calibration factor, C_i**	**Predicted N_{pedi}**
	from Table 12-14						from Equation 12-29	(4) from Worksheet 2H		(4)*(5)*(6)
	a	b	c	d	e					
Total	-6.60	0.05	0.24	0.41	0.09	0.52	0.087	8.74	1.00	0.759
Fatal and Injury (FI)	--	--	--	--	--	--	--	--	1.00	0.759

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**Predicted N_{bimv}**	**Predicted N_{bisv}**	**Predicted N_{bi}**	**f_{bikei}**	**Calibration factor, C_i**	**Predicted N_{bikei}**
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-17		(4)*(5)*(6)
Total	1.183	0.164	1.346	0.011	1.00	0.015
Fatal and injury (FI)	--	--	--	--	1.00	0.015

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)
	Fatal and injury (FI)	**Property damage only (PDO)**	**Total**
Collision type	(3) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J	(5) from Worksheet 2D and 2F	(6) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.233	0.414	0.647
Head-on collisions (from Worksheet 2D)	0.016	0.015	0.031
Angle collisions (from Worksheet 2D)	0.119	0.155	0.273
Sideswipe (from Worksheet 2D)	0.032	0.024	0.056
Other multiple-vehicle collision (from Worksheet 2D)	0.024	0.150	0.174
Subtotal	0.424	0.759	1.183
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.000	0.000	0.000
Collision with animal (from Worksheet 2F)	0.000	0.000	0.000
Collision with fixed object (from Worksheet 2F)	0.035	0.099	0.134
Collision with other object (from Worksheet 2F)	0.005	0.008	0.012
Other single-vehicle collision (from Worksheet 2F)	0.002	0.002	0.004
Single-vehicle noncollision (from Worksheet 2F)	0.011	0.002	0.013
Collision with pedestrian (from Worksheet 2G or 2I)	0.759	0.000	0.759
Collision with bicycle (from Worksheet 2J)	0.015	0.000	0.015
Subtotal	0.827	0.111	0.937
Total	1.250	0.869	2.120

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections

(1)	(2)
Crash severity level	**Predicted average crash frequency, $N_{predicted\ int}$ (crashes/year)**
	(Total) from Worksheet 2K
Total	2.1
Fatal and injury (FI)	1.3
Property damage only (PDO)	0.9

Worksheet 2A -- General Information and Input Data for Urban and Suburban Arterial Intersections

General Information		Location Information	
Analyst	Huma Husain	Roadway	
Agency or Company	Fehr & Peers	Intersection	19th Street and Franklin Street
Date Performed	11/28/17	Jurisdiction	Oakland, CA
		Analysis Year	2017

Input Data		Base Conditions	Site Conditions
Intersection type (3ST, 3SG, 4ST, 4SG)		--	3SG
AADT $_{major}$ (veh/day)	$AADT_{MAX}$ = 58,100 (veh/day)	--	6,000
AADT $_{minor}$ (veh/day)	$AADT_{MAX}$ = 16,400 (veh/day)	--	5,800
Intersection lighting (present/not present)		Not Present	Present
Calibration factor, C_i		1.00	1.00
Data for unsignalized intersections only:		--	--
Number of major-road approaches with left-turn lanes (0,1,2)		0	0
Number of major-road approaches with right-turn lanes (0,1,2)		0	0
Data for signalized intersections only:		--	--
Number of approaches with left-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		0	0
Number of approaches with right-turn lanes (0,1,2,3,4) [for 3SG, use maximum value of 3]		0	0
Number of approaches with left-turn signal phasing [for 3SG, use maximum value of 3]		--	2
Type of left-turn signal phasing for Leg #1		Permissive	Protected
Type of left-turn signal phasing for Leg #2		--	Protected
Type of left-turn signal phasing for Leg #3		--	Not Applicable
Type of left-turn signal phasing for Leg #4 (if applicable)		--	Not Applicable
Number of approaches with right-turn-on-red prohibited [for 3SG, use maximum value of 3]		0	0
Intersection red light cameras (present/not present)		Not Present	Not Present
Sum of all pedestrian crossing volumes (PedVol) -- Signalized intersections only			3,200
Maximum number of lanes crossed by a pedestrian (n_{lanesx})		--	3
Number of bus stops within 300 m (1,000 ft) of the intersection		0	8
Schools within 300 m (1,000 ft) of the intersection (present/not present)		Not Present	Present
Number of alcohol sales establishments within 300 m (1,000 ft) of the intersection		0	10

Worksheet 2B -- Crash Modification Factors for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
CMF for Left-Turn Lanes	CMF for Left-Turn Signal Phasing	CMF for Right-Turn Lanes	CMF for Right Turn on Red	CMF for Lighting	CMF for Red Light Cameras	Combined CMF
CMF 1i	*CMF 2i*	*CMF 3i*	*CMF 4i*	*CMF 5i*	*CMF 6i*	*CMF $_{COMB}$*
from Table 12-24	from Table 12-25	from Table 12-26	from Equation 12-35	from Equation 12-36	from Equation 12-37	(1)*(2)*(3)*(4)*(5)*(6)
1.00	0.88	1.00	1.00	0.91	1.00	0.80

Worksheet 2C -- Multiple-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{bimv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bimv}**
	from Table 12-10			from Table 12-10	from Equation 12-21		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-12.13	1.11	0.26	0.33	0.802	1.000	0.802	0.80	1.00	0.645
Fatal and Injury (FI)	-11.58	1.02	0.17	0.30	0.291	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.375	0.301	0.80	1.00	0.242
Property Damage Only (PDO)	-13.24	1.14	0.30	0.36	0.485	$(5)_{TOTAL}-(5)_{FI}$ = 0.625	0.501	0.80	1.00	0.403

Worksheet 2D -- Multiple-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{bimv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{bimv\ (PDO)}$ (crashes/year)**	**Predicted N $_{bimv\ (TOTAL)}$ (crashes/year)**
	from Table 12-11	$(9)_{FI}$ from Worksheet 2C	from Table 12-11	$(9)_{PDO}$ from Worksheet 2C	$(9)_{PDO}$ from Worksheet 2C
Total	1.000	0.242	1.000	0.403	0.645
		$(2)*(3)_{FI}$		$(4)*(5)_{PDO}$	(3)+(5)
Rear-end collision	0.549	0.133	0.546	0.220	0.353
Head-on collision	0.038	0.009	0.020	0.008	0.000
Angle collision	0.280	0.068	0.204	0.082	0.150
Sideswipe	0.076	0.018	0.032	0.013	0.031
Other multiple-vehicle collision	0.057	0.014	0.198	0.080	0.094

Worksheet 2E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Arterial Intersections

(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**			**Overdispersion Parameter, k**	**Initial N_{bisv}**	**Proportion of Total Crashes**	**Adjusted N_{bimv}**	**Combined CMFs**	**Calibration Factor, C_i**	**Predicted N_{bisv}**
	from Table 12-12			from Table 12-12	from Eqn. 12-24; (FI) from Eqn. 12-24 or 12-27		$(4)_{TOTAL}$*(5)	(7) from Worksheet 2B		(6)*(7)*(8)
	a	b	c							
Total	-9.02	0.42	0.40	0.36	0.150	1.000	0.150	0.80	1.00	0.120
Fatal and Injury (FI)	-9.75	0.27	0.51	0.24	0.051	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.337	0.050	0.80	1.00	0.041
Property Damage Only (PDO)	-9.08	0.45	0.33	0.53	0.100	$(5)_{TOTAL}-(5)_{FI}$ = 0.663	0.099	0.80	1.00	0.080

Worksheet 2F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{bisv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{bisv\ (PDO)}$ (crashes/year)**	**Predicted N $_{bisv\ (TOTAL)}$ (crashes/year)**
	from Table 12-13	$(9)_{FI}$ from Worksheet 2E	from Table 12-13	$(9)_{PDO}$ from Worksheet 2E	$(9)_{PDO}$ from Worksheet 2E
Total	1.000	0.041	1.000	0.080	0.120
		$(2)*(3)_{FI}$		$(4)*(5)_{PDO}$	(3)+(5)
Collision with parked vehicle	0.001	0.000	0.001	0.000	0.000
Collision with animal	0.001	0.000	0.003	0.000	0.000
Collision with fixed object	0.653	0.026	0.895	0.071	0.098
Collision with other object	0.091	0.004	0.069	0.006	0.009
Other single-vehicle collision	0.045	0.002	0.018	0.001	0.003
Single-vehicle noncollision	0.209	0.008	0.014	0.001	0.010

Worksheet 2G -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Stop-Controlled Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**Predicted N_{bimv}**	**Predicted N_{bisv}**	**Predicted N_{bi}**	**f_{pedi}**	**Calibration factor, C_i**	**Predicted N_{pedi}**
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-16		(4)*(5)*(6)
Total	--	--	--	--	1.00	--
Fatal and injury (FI)	--	--	--	--	1.00	--

Worksheet 2H -- Crash Modification Factors for Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections

(1)	(2)	(3)	(4)
CMF for Bus Stops	CMF for Schools	CMF for Alcohol Sales Establishments	Combined CMF
CMF_{1p}	CMF_{2p}	CMF_{3p}	
from Table 12-28	from Table 12-29	from Table 12-30	(1)*(2)*(3)
4.15	1.35	1.56	8.74

Worksheet 2I -- Vehicle-Pedestrian Collisions for Urban and Suburban Arterial Signalized Intersections

(1)	(2)					(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**SPF Coefficients**					**Overdispersion Parameter, k**	**$N_{pedbase}$**	**Combined CMF**	**Calibration factor, C_i**	**Predicted N_{pedi}**
	from Table 12-14						from Equation 12-29	(4) from Worksheet 2H		(4)*(5)*(6)
	a	b	c	d	e					
Total	-6.60	0.05	0.24	0.41	0.09	0.52	0.077	8.74	1.00	0.675
Fatal and Injury (FI)	--	--	--	--	--	--	--	--	1.00	0.675

Worksheet 2J -- Vehicle-Bicycle Collisions for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**Predicted N_{bimv}**	**Predicted N_{bisv}**	**Predicted N_{bi}**	**f_{bikei}**	**Calibration factor, C_i**	**Predicted N_{bikei}**
	(9) from Worksheet 2C	(9) from Worksheet 2E	(2) + (3)	from Table 12-17		(4)*(5)*(6)
Total	0.645	0.120	0.766	0.011	1.00	0.008
Fatal and injury (FI)	--	--	--	--	1.00	0.008

Worksheet 2K -- Crash Severity Distribution for Urban and Suburban Arterial Intersections

(1)	(2)	(3)	(4)
	Fatal and injury (FI)	**Property damage only (PDO)**	**Total**
Collision type	(3) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J	(5) from Worksheet 2D and 2F	(6) from Worksheet 2D and 2F; (7) from 2G or 2I and 2J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 2D)	0.133	0.220	0.353
Head-on collisions (from Worksheet 2D)	0.009	0.008	0.000
Angle collisions (from Worksheet 2D)	0.068	0.082	0.150
Sideswipe (from Worksheet 2D)	0.018	0.013	0.031
Other multiple-vehicle collision (from Worksheet 2D)	0.014	0.080	0.094
Subtotal	0.242	0.403	0.628
SINGLE-VEHICLE			
Collision with parked vehicle (from Worksheet 2F)	0.000	0.000	0.000
Collision with animal (from Worksheet 2F)	0.000	0.000	0.000
Collision with fixed object (from Worksheet 2F)	0.026	0.071	0.098
Collision with other object (from Worksheet 2F)	0.004	0.006	0.009
Other single-vehicle collision (from Worksheet 2F)	0.002	0.001	0.003
Single-vehicle noncollision (from Worksheet 2F)	0.008	0.001	0.010
Collision with pedestrian (from Worksheet 2G or 2I)	0.675	0.000	0.675
Collision with bicycle (from Worksheet 2J)	0.008	0.000	0.008
Subtotal	0.724	0.080	0.804
Total	0.967	0.483	1.432

Worksheet 2L -- Summary Results for Urban and Suburban Arterial Intersections

(1)	(2)
Crash severity level	**Predicted average crash frequency, $N_{predicted\ int}$ (crashes/year)**
	(Total) from Worksheet 2K
Total	1.4
Fatal and injury (FI)	1.0
Property damage only (PDO)	0.5

Worksheet 1A -- General Information and Input Data for Urban and Suburban Roadway Segments

General Information		Location Information	
Analyst	Huma Husain	Roadway	17th Street
Agency or Company	Fehr & Peers	Roadway Section	Between Broadway and Franklin Street
Date Performed	11/28/17	Jurisdiction	Oakland, CA
		Analysis Year	2017

Input Data		Base Conditions	Site Conditions
Roadway type (2U, 3T, 4U, 4D, ST)		--	4D
Length of segment, L (mi)		--	0.06
AADT (veh/day)	$AADT_{MAX}$ = 66,000 (veh/day)	--	6,000
Type of on-street parking (none/parallel/angle)		None	Parallel (Comm/Ind)
Proportion of curb length with on-street parking		--	0.66
Median width (ft) - for divided only		15	Not Present
Lighting (present / not present)		Not Present	Present
Auto speed enforcement (present / not present)		Not Present	Not Present
Major commercial driveways (number)		--	2
Minor commercial driveways (number)		--	0
Major industrial / institutional driveways (number)		--	0
Minor industrial / institutional driveways (number)		--	0
Major residential driveways (number)		--	0
Minor residential driveways (number)		--	0
Other driveways (number)		--	0
Speed Category		--	Posted Speed 30 mph or Lower
Roadside fixed object density (fixed objects / mi)		0	88
Offset to roadside fixed objects (ft) [If greater than 30 or Not Present, input 30]		30	2
Calibration Factor, Cr		1.00	1.00

Worksheet 1B -- Crash Modification Factors for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)
CMF for On-Street Parking	CMF for Roadside Fixed Objects	CMF for Median Width	CMF for Lighting	CMF for Automated Speed Enforcement	Combined CMF
CMF 1r	*CMF 2r*	*CMF 3r*	*CMF 4r*	*CMF 5r*	*CMF comb*
from Equation 12-32	from Equation 12-33	from Table 12-22	from Equation 12-34	from Section 12.7.1	(1)*(2)*(3)*(4)*(5)
1.47	1.70	1.00	0.91	1.00	2.28

Worksheet 1C -- Multiple-Vehicle Nondriveway Collisions by Severity Level for Urban and Suburban Roadway Segments

(1)	(2)		(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**		**Overdispersion Parameter, k**	**Initial N_{brmv}**	**Proportion of Total Crashes**	**Adjusted N_{brmv}**	**Combined CMFs**	**Calibration Factor, Cr**	**Predicted N_{brmv}**
	from Table 12-3		from Table 12-3	from Equation 12-10		$(4)_{TOTAL}$*(5)	(6) from Worksheet 1B		(6)*(7)*(8)
	a	b							
Total	-12.34	1.36	1.32	0.036	1.000	0.036	2.28	1.00	0.082
Fatal and Injury (FI)	-12.76	1.28	1.31	0.012	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.306	0.011	2.28	1.00	0.025
Property Damage Only (PDO)	-12.81	1.38	1.34	0.027	$(5)_{TOTAL}-(5)_{FI}$ = 0.694	0.025	2.28	1.00	0.057

Worksheet 1D -- Multiple-Vehicle Nondriveway Collisions by Collision Type for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{brmv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{brmv\ (PDO)}$ (crashes/year)**	**Predicted N $_{brmv\ (TOTAL)}$ (crashes/year)**
	from Table 12-4	$(9)_{FI}$ from Worksheet 1C	from Table 12-4	$(9)_{PDO}$ from Worksheet 1C	$(9)_{TOTAL}$ from Worksheet 1C
Total	1.000	0.025	1.000	0.057	0.082
		$(2)*(3)_{FI}$		$(4)*(5)_{PDO}$	(3)+(5)
Rear-end collision	0.832	0.021	0.662	0.038	0.059
Head-on collision	0.020	0.001	0.007	0.000	0.001
Angle collision	0.040	0.001	0.036	0.002	0.003
Sideswipe, same direction	0.050	0.001	0.223	0.013	0.014
Sideswipe, opposite direction	0.010	0.000	0.001	0.000	0.000
Other multiple-vehicle collision	0.048	0.001	0.071	0.004	0.005

Worksheet 1E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Roadway Segments

(1)	(2)		(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**		**Overdispersion Parameter, k**	**Initial N_{brsv}**	**Proportion of Total Crashes**	**Adjusted N_{brsv}**	**Combined CMFs**	**Calibration Factor, Cr**	**Predicted N_{brsv}**
	from Table 12-5		from Table 12-5	from Equation 12-13		$(4)_{TOTAL}*(5)$	(6) from Worksheet 1B		(6)*(7)*(8)
	a	b							
Total	-5.05	0.47	0.86	0.023	1.000	0.023	2.28	1.00	0.052
Fatal and Injury (FI)	-8.71	0.66	0.28	0.003	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.137	0.003	2.28	1.00	0.007
Property Damage Only (PDO)	-5.04	0.45	1.06	0.019	$(5)_{TOTAL}-(5)_{FI}$ = 0.863	0.020	2.28	1.00	0.045

Worksheet 1F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{brsv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{brsv\ (PDO)}$ (crashes/year)**	**Predicted N $_{brsv\ (TOTAL)}$ (crashes/year)**
	from Table 12-6	$(9)_{FI}$ from Worksheet 1E	from Table 12-6	$(9)_{PDO}$ from Worksheet 1E	$(9)_{TOTAL}$ from Worksheet 1E
Total	1.000	0.007	1.000	0.045	0.052
		$(2)*(3)_{FI}$		$(4)*(5)_{PDO}$	(3)+(5)
Collision with animal	0.001	0.000	0.063	0.003	0.003
Collision with fixed object	0.500	0.004	0.813	0.037	0.040
Collision with other object	0.028	0.000	0.016	0.001	0.001
Other single-vehicle collision	0.471	0.003	0.108	0.005	0.008

Worksheet 1G -- Multiple-Vehicle Driveway-Related Collisions by Driveway Type for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)
Driveway Type	**Number of driveways, n_j**	**Crashes per driveway per year, N_j**	**Coefficient for traffic adjustment, t**	**Initial N_{brdwy}**	**Overdispersion parameter, k**
		from Table 12-7	from Table 12-7	Equation 12-16 $n_j * N_j * (AADT/15,000)^t$	from Table 12-7
Major commercial	2	0.033	1.106	0.024	--
Minor commercial	0	0.011	1.106	0.000	
Major industrial/institutional	0	0.036	1.106	0.000	
Minor industrial/institutional	0	0.005	1.106	0.000	
Major residential	0	0.018	1.106	0.000	
Minor residential	0	0.003	1.106	0.000	
Other	0	0.005	1.106	0.000	
Total	--	--	--	0.024	1.39

Worksheet 1H -- Multiple-Vehicle Driveway-Related Collisions by Severity Level for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**Initial N_{brdwy}**	**Proportion of total crashes (f_{dwy})**	**Adjusted N_{brdwy}**	**Combined CMFs**	**Calibration factor, C_r**	**Predicted N_{brdwy}**
	$(5)_{TOTAL}$ from Worksheet 1G	from Table 12-7	$(2)_{TOTAL}$ * (3)	(6) from Worksheet 1B		(4)*(5)*(6)
Total	0.024	1.000	0.024	2.28	1.00	0.055
Fatal and injury (FI)	--	0.284	0.007	2.28	1.00	0.016
Property damage only (PDO)	--	0.716	0.017	2.28	1.00	0.039

Worksheet 1I -- Vehicle-Pedestrian Collisions for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	**Predicted N_{brmv}**	**Predicted N_{brsv}**	**Predicted N_{brdwy}**	**Predicted N_{br}**	**f_{pedr}**	**Calibration factor, C_r**	**Predicted N_{pedr}**
	(9) from Worksheet 1C	(9) from Worksheet 1E	(7) from Worksheet 1H	(2)+(3)+(4)	from Table 12-8		(5)*(6)*(7)
Total	0.082	0.052	0.055	0.189	0.067	1.00	0.013
Fatal and injury (FI)	--	--	--	--	--	1.00	0.013

Worksheet 1J -- Vehicle-Bicycle Collisions for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	**Predicted N_{brmv}**	**Predicted N_{brsv}**	**Predicted N_{brdwy}**	**Predicted N_{br}**	**f_{biker}**	**Calibration factor, C_r**	**Predicted N_{biker}**
	(9) from Worksheet 1C	(9) from Worksheet 1E	(7) from Worksheet 1H	(2)+(3)+(4)	from Table 12-9		(5)*(6)*(7)
Total	0.082	0.052	0.055	0.189	0.013	1.00	0.002
Fatal and injury (FI)	--	--	--	--	--	1.00	0.002

Worksheet 1K -- Crash Severity Distribution for Urban and Suburban Roadway Segments			
(1)	(2)	(3)	(4)
Collision type	**Fatal and injury (FI)** (3) from Worksheet 1D and 1F; (7) from Worksheet 1H; and (8) from Worksheet 1I and 1J	**Property damage only (PDO)** (5) from Worksheet 1D and 1F; and (7) from Worksheet 1H	**Total** (6) from Worksheet 1D and 1F; (7) from Worksheet 1H; and (8) from Worksheet 1I and 1J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 1D)	0.021	0.038	0.059
Head-on collisions (from Worksheet 1D)	0.001	0.000	0.001
Angle collisions (from Worksheet 1D)	0.001	0.002	0.003
Sideswipe, same direction (from Worksheet 1D)	0.001	0.013	0.014
Sideswipe, opposite direction (from Worksheet 1D)	0.000	0.000	0.000
Driveway-related collisions (from Worksheet 1H)	0.016	0.039	0.055
Other multiple-vehicle collision (from Worksheet 1D)	0.001	0.004	0.005
Subtotal	0.041	0.096	0.137
SINGLE-VEHICLE			
Collision with animal (from Worksheet 1F)	0.000	0.003	0.003
Collision with fixed object (from Worksheet 1F)	0.004	0.037	0.040
Collision with other object (from Worksheet 1F)	0.000	0.001	0.001
Other single-vehicle collision (from Worksheet 1F)	0.003	0.005	0.008
Collision with pedestrian (from Worksheet 1I)	0.013	0.000	0.013
Collision with bicycle (from Worksheet 1J)	0.002	0.000	0.002
Subtotal	0.022	0.045	0.068
Total	0.063	0.142	0.205

Worksheet 1L -- Summary Results for Urban and Suburban Roadway Segments			
(1)	(2)	(3)	(4)
Crash Severity Level	**Predicted average crash frequency, $N_{predicted\ rs}$ (crashes/year)** (Total) from Worksheet 1K	**Roadway segment length, L (mi)**	**Crash rate (crashes/mi/year)** (2) / (3)
Total	0.205	0.06	3.4
Fatal and injury (FI)	0.1	0.06	1.1
Property damage only (PDO)	0.1	0.06	2.4

Worksheet 1A -- General Information and Input Data for Urban and Suburban Roadway Segments

General Information		Location Information	
Analyst	Huma Husain	Roadway	19th Street
Agency or Company	Fehr & Peers	Roadway Section	Between Broadway and Franklin Street
Date Performed	11/28/17	Jurisdiction	Oakland, CA
		Analysis Year	2017

Input Data		Base Conditions	Site Conditions
Roadway type (2U, 3T, 4U, 4D, ST)		--	4D
Length of segment, L (mi)		--	0.06
AADT (veh/day)	$AADT_{MAX}$ = 66,000 (veh/day)	--	6,600
Type of on-street parking (none/parallel/angle)		None	Parallel (Comm/Ind)
Proportion of curb length with on-street parking		--	0.3
Median width (ft) - for divided only		15	Not Present
Lighting (present / not present)		Not Present	Present
Auto speed enforcement (present / not present)		Not Present	Not Present
Major commercial driveways (number)		--	5
Minor commercial driveways (number)		--	0
Major industrial / institutional driveways (number)		--	0
Minor industrial / institutional driveways (number)		--	0
Major residential driveways (number)		--	0
Minor residential driveways (number)		--	0
Other driveways (number)		--	0
Speed Category		--	Posted Speed 30 mph or Lower
Roadside fixed object density (fixed objects / mi)		0	80
Offset to roadside fixed objects (ft) [If greater than 30 or Not Present, input 30]		30	2
Calibration Factor, Cr		1.00	1.00

Worksheet 1B -- Crash Modification Factors for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)
CMF for On-Street Parking	CMF for Roadside Fixed Objects	CMF for Median Width	CMF for Lighting	CMF for Automated Speed Enforcement	Combined CMF
CMF 1r	*CMF 2r*	*CMF 3r*	*CMF 4r*	*CMF 5r*	*CMF comb*
from Equation 12-32	from Equation 12-33	from Table 12-22	from Equation 12-34	from Section 12.7.1	(1)*(2)*(3)*(4)*(5)
1.21	1.64	1.00	0.91	1.00	1.81

Worksheet 1C -- Multiple-Vehicle Nondriveway Collisions by Severity Level for Urban and Suburban Roadway Segments

(1)	(2)		(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**		**Overdispersion Parameter, k**	**Initial N_{brmv}**	**Proportion of Total Crashes**	**Adjusted N_{brmv}**	**Combined CMFs**	**Calibration Factor, Cr**	**Predicted N_{brmv}**
	from Table 12-3		from Table 12-3	from Equation 12-10		$(4)_{TOTAL}$*(5)	(6) from Worksheet 1B		(6)*(7)*(8)
	a	b							
Total	-12.34	1.36	1.32	0.041	1.000	0.041	1.81	1.00	0.074
Fatal and Injury (FI)	-12.76	1.28	1.31	0.013	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.304	0.012	1.81	1.00	0.023
Property Damage Only (PDO)	-12.81	1.38	1.34	0.031	$(5)_{TOTAL}-(5)_{FI}$ = 0.696	0.029	1.81	1.00	0.052

Worksheet 1D -- Multiple-Vehicle Nondriveway Collisions by Collision Type for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{brmv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{brmv\ (PDO)}$ (crashes/year)**	**Predicted N $_{brmv\ (TOTAL)}$ (crashes/year)**
	from Table 12-4	$(9)_{FI}$ from Worksheet 1C	from Table 12-4	$(9)_{PDO}$ from Worksheet 1C	$(9)_{TOTAL}$ from Worksheet 1C
Total	1.000	0.023	1.000	0.052	0.074
		$(2)*(3)_{FI}$		$(4)*(5)_{PDO}$	(3)+(5)
Rear-end collision	0.832	0.019	0.662	0.034	0.053
Head-on collision	0.020	0.000	0.007	0.000	0.001
Angle collision	0.040	0.001	0.036	0.002	0.003
Sideswipe, same direction	0.050	0.001	0.223	0.012	0.013
Sideswipe, opposite direction	0.010	0.000	0.001	0.000	0.000
Other multiple-vehicle collision	0.048	0.001	0.071	0.004	0.005

Worksheet 1E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Roadway Segments

(1)	(2)		(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**		**Overdispersion Parameter, k**	**Initial N_{brsv}**	**Proportion of Total Crashes**	**Adjusted N_{brsv}**	**Combined CMFs**	**Calibration Factor, Cr**	**Predicted N_{brsv}**
	from Table 12-5		from Table 12-5	from Equation 12-13		$(4)_{TOTAL}*(5)$	(6) from Worksheet 1B		(6)*(7)*(8)
	a	b							
Total	-5.05	0.47	0.86	0.024	1.000	0.024	1.81	1.00	0.043
Fatal and Injury (FI)	-8.71	0.66	0.28	0.003	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.139	0.003	1.81	1.00	0.006
Property Damage Only (PDO)	-5.04	0.45	1.06	0.020	$(5)_{TOTAL}-(5)_{FI}$ = 0.861	0.021	1.81	1.00	0.037

Worksheet 1F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{brsv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{brsv\ (PDO)}$ (crashes/year)**	**Predicted N $_{brsv\ (TOTAL)}$ (crashes/year)**
	from Table 12-6	$(9)_{FI}$ from Worksheet 1E	from Table 12-6	$(9)_{PDO}$ from Worksheet 1E	$(9)_{TOTAL}$ from Worksheet 1E
Total	1.000	0.006	1.000	0.037	0.043
		$(2)*(3)_{FI}$		$(4)*(5)_{PDO}$	(3)+(5)
Collision with animal	0.001	0.000	0.063	0.002	0.002
Collision with fixed object	0.500	0.003	0.813	0.030	0.033
Collision with other object	0.028	0.000	0.016	0.001	0.001
Other single-vehicle collision	0.471	0.003	0.108	0.004	0.007

Worksheet 1G -- Multiple-Vehicle Driveway-Related Collisions by Driveway Type for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)
Driveway Type	**Number of driveways, n_j**	**Crashes per driveway per year, N_j**	**Coefficient for traffic adjustment, t**	**Initial N_{brdwy}**	**Overdispersion parameter, k**
		from Table 12-7	from Table 12-7	Equation 12-16 $n_j * N_j * (AADT/15,000)^t$	from Table 12-7
Major commercial	5	0.033	1.106	0.067	--
Minor commercial	0	0.011	1.106	0.000	
Major industrial/institutional	0	0.036	1.106	0.000	
Minor industrial/institutional	0	0.005	1.106	0.000	
Major residential	0	0.018	1.106	0.000	
Minor residential	0	0.003	1.106	0.000	
Other	0	0.005	1.106	0.000	
Total	--	--	--	0.067	1.39

Worksheet 1H -- Multiple-Vehicle Driveway-Related Collisions by Severity Level for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**Initial N_{brdwy}**	**Proportion of total crashes (f_{dwy})**	**Adjusted N_{brdwy}**	**Combined CMFs**	**Calibration factor, C_r**	**Predicted N_{brdwy}**
	$(5)_{TOTAL}$ from Worksheet 1G	from Table 12-7	$(2)_{TOTAL}$ * (3)	(6) from Worksheet 1B		(4)*(5)*(6)
Total	0.067	1.000	0.067	1.81	1.00	0.121
Fatal and injury (FI)	--	0.284	0.019	1.81	1.00	0.034
Property damage only (PDO)	--	0.716	0.048	1.81	1.00	0.086

Worksheet 1I -- Vehicle-Pedestrian Collisions for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	**Predicted N_{brmv}**	**Predicted N_{brsv}**	**Predicted N_{brdwy}**	**Predicted N_{br}**	**f_{pedr}**	**Calibration factor, C_r**	**Predicted N_{pedr}**
	(9) from Worksheet 1C	(9) from Worksheet 1E	(7) from Worksheet 1H	(2)+(3)+(4)	from Table 12-8		(5)*(6)*(7)
Total	0.074	0.043	0.121	0.238	0.067	1.00	0.016
Fatal and injury (FI)	--	--	--	--	--	1.00	0.016

Worksheet 1J -- Vehicle-Bicycle Collisions for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	**Predicted N_{brmv}**	**Predicted N_{brsv}**	**Predicted N_{brdwy}**	**Predicted N_{br}**	**f_{biker}**	**Calibration factor, C_r**	**Predicted N_{biker}**
	(9) from Worksheet 1C	(9) from Worksheet 1E	(7) from Worksheet 1H	(2)+(3)+(4)	from Table 12-9		(5)*(6)*(7)
Total	0.074	0.043	0.121	0.238	0.013	1.00	0.003
Fatal and injury (FI)	--	--	--	--	--	1.00	0.003

Worksheet 1K -- Crash Severity Distribution for Urban and Suburban Roadway Segments			
(1)	(2)	(3)	(4)
Collision type	**Fatal and injury (FI)** (3) from Worksheet 1D and 1F; (7) from Worksheet 1H; and (8) from Worksheet 1I and 1J	**Property damage only (PDO)** (5) from Worksheet 1D and 1F; and (7) from Worksheet 1H	**Total** (6) from Worksheet 1D and 1F; (7) from Worksheet 1H; and (8) from Worksheet 1I and 1J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 1D)	0.019	0.034	0.053
Head-on collisions (from Worksheet 1D)	0.000	0.000	0.001
Angle collisions (from Worksheet 1D)	0.001	0.002	0.003
Sideswipe, same direction (from Worksheet 1D)	0.001	0.012	0.013
Sideswipe, opposite direction (from Worksheet 1D)	0.000	0.000	0.000
Driveway-related collisions (from Worksheet 1H)	0.034	0.086	0.121
Other multiple-vehicle collision (from Worksheet 1D)	0.001	0.004	0.005
Subtotal	0.057	0.138	0.195
SINGLE-VEHICLE			
Collision with animal (from Worksheet 1F)	0.000	0.002	0.002
Collision with fixed object (from Worksheet 1F)	0.003	0.030	0.033
Collision with other object (from Worksheet 1F)	0.000	0.001	0.001
Other single-vehicle collision (from Worksheet 1F)	0.003	0.004	0.007
Collision with pedestrian (from Worksheet 1I)	0.016	0.000	0.016
Collision with bicycle (from Worksheet 1J)	0.003	0.000	0.003
Subtotal	0.025	0.037	0.063
Total	0.082	0.176	0.258

Worksheet 1L -- Summary Results for Urban and Suburban Roadway Segments			
(1)	(2)	(3)	(4)
Crash Severity Level	**Predicted average crash frequency, $N_{predicted\ rs}$ (crashes/year)**	**Roadway segment length, L (mi)**	**Crash rate (crashes/mi/year)**
	(Total) from Worksheet 1K		(2) / (3)
Total	0.3	0.06	4.3
Fatal and injury (FI)	0.1	0.06	1.4
Property damage only (PDO)	0.2	0.06	2.9

Worksheet 1A -- General Information and Input Data for Urban and Suburban Roadway Segments

General Information		Location Information	
Analyst	Huma Husain	Roadway	Broadway
Agency or Company	Fehr & Peers	Roadway Section	Between 17th and 19th Streets
Date Performed	11/28/17	Jurisdiction	Oakland, CA
		Analysis Year	2017

Input Data		Base Conditions	Site Conditions
Roadway type (2U, 3T, 4U, 4D, ST)		--	4U
Length of segment, L (mi)		--	0.07
AADT (veh/day)	$AADT_{MAX}$ = 40,100 (veh/day)	--	8,000
Type of on-street parking (none/parallel/angle)		None	Parallel (Comm/Ind)
Proportion of curb length with on-street parking		--	0.57
Median width (ft) - for divided only		15	Not Present
Lighting (present / not present)		Not Present	Present
Auto speed enforcement (present / not present)		Not Present	Not Present
Major commercial driveways (number)		--	0
Minor commercial driveways (number)		--	0
Major industrial / institutional driveways (number)		--	0
Minor industrial / institutional driveways (number)		--	0
Major residential driveways (number)		--	0
Minor residential driveways (number)		--	0
Other driveways (number)		--	0
Speed Category		--	Posted Speed 30 mph or Lower
Roadside fixed object density (fixed objects / mi)		0	162
Offset to roadside fixed objects (ft) [If greater than 30 or Not Present, input 30]		30	2
Calibration Factor, Cr		1.00	1.00

Worksheet 1B -- Crash Modification Factors for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)
CMF for On-Street Parking	CMF for Roadside Fixed Objects	CMF for Median Width	CMF for Lighting	CMF for Automated Speed Enforcement	Combined CMF
CMF 1r	*CMF 2r*	*CMF 3r*	*CMF 4r*	*CMF 5r*	*CMF comb*
from Equation 12-32	from Equation 12-33	from Table 12-22	from Equation 12-34	from Section 12.7.1	(1)*(2)*(3)*(4)*(5)
1.40	2.36	1.00	0.92	1.00	3.04

Worksheet 1C -- Multiple-Vehicle Nondriveway Collisions by Severity Level for Urban and Suburban Roadway Segments

(1)	(2)		(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**		**Overdispersion Parameter, k**	**Initial N_{brmv}**	**Proportion of Total Crashes**	**Adjusted N_{brmv}**	**Combined CMFs**	**Calibration Factor, Cr**	**Predicted N_{brmv}**
	from Table 12-3		from Table 12-3	from Equation 12-10		$(4)_{TOTAL}$*(5)	(6) from Worksheet 1B		(6)*(7)*(8)
	a	b							
Total	-11.63	1.33	1.01	0.097	1.000	0.097	3.04	1.00	0.294
Fatal and Injury (FI)	-12.08	1.25	0.99	0.030	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.328	0.032	3.04	1.00	0.096
Property Damage Only (PDO)	-12.53	1.38	1.08	0.062	$(5)_{TOTAL}-(5)_{FI}$ = 0.672	0.065	3.04	1.00	0.198

Worksheet 1D -- Multiple-Vehicle Nondriveway Collisions by Collision Type for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{brmv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{brmv\ (PDO)}$ (crashes/year)**	**Predicted N $_{brmv\ (TOTAL)}$ (crashes/year)**
	from Table 12-4	$(9)_{FI}$ from Worksheet 1C	from Table 12-4	$(9)_{PDO}$ from Worksheet 1C	$(9)_{TOTAL}$ from Worksheet 1C
Total	1.000	0.096	1.000	0.198	0.294
		$(2)*(3)_{FI}$		$(4)*(5)_{PDO}$	(3)+(5)
Rear-end collision	0.511	0.049	0.506	0.100	0.149
Head-on collision	0.077	0.007	0.004	0.001	0.008
Angle collision	0.181	0.017	0.130	0.026	0.043
Sideswipe, same direction	0.093	0.009	0.249	0.049	0.058
Sideswipe, opposite direction	0.082	0.008	0.031	0.006	0.014
Other multiple-vehicle collision	0.056	0.005	0.080	0.016	0.021

Worksheet 1E -- Single-Vehicle Collisions by Severity Level for Urban and Suburban Roadway Segments

(1)	(2)		(3)	(4)	(5)	(6)	(7)	(8)	(9)
Crash Severity Level	**SPF Coefficients**		**Overdispersion Parameter, k**	**Initial N_{brsv}**	**Proportion of Total Crashes**	**Adjusted N_{brsv}**	**Combined CMFs**	**Calibration Factor, Cr**	**Predicted N_{brsv}**
	from Table 12-5		from Table 12-5	from Equation 12-13		$(4)_{TOTAL}*(5)$	(6) from Worksheet 1B		(6)*(7)*(8)
	a	b							
Total	-7.99	0.81	0.91	0.034	1.000	0.034	3.04	1.00	0.105
Fatal and Injury (FI)	-7.37	0.61	0.54	0.011	$(4)_{FI}/((4)_{FI}+(4)_{PDO})$ = 0.281	0.010	3.04	1.00	0.029
Property Damage Only (PDO)	-8.50	0.84	0.97	0.027	$(5)_{TOTAL}-(5)_{FI}$ = 0.719	0.025	3.04	1.00	0.075

Worksheet 1F -- Single-Vehicle Collisions by Collision Type for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)
Collision Type	**Proportion of Collision Type$_{(FI)}$**	**Predicted N $_{brsv\ (FI)}$ (crashes/year)**	**Proportion of Collision Type $_{(PDO)}$**	**Predicted N $_{brsv\ (PDO)}$ (crashes/year)**	**Predicted N $_{brsv\ (TOTAL)}$ (crashes/year)**
	from Table 12-6	$(9)_{FI}$ from Worksheet 1E	from Table 12-6	$(9)_{PDO}$ from Worksheet 1E	$(9)_{TOTAL}$ from Worksheet 1E
Total	1.000	0.029	1.000	0.075	0.105
		$(2)*(3)_{FI}$		$(4)*(5)_{PDO}$	(3)+(5)
Collision with animal	0.001	0.000	0.001	0.000	0.000
Collision with fixed object	0.612	0.018	0.809	0.061	0.079
Collision with other object	0.020	0.001	0.029	0.002	0.003
Other single-vehicle collision	0.367	0.011	0.161	0.012	0.023

Worksheet 1G -- Multiple-Vehicle Driveway-Related Collisions by Driveway Type for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)
Driveway Type	**Number of driveways, n_j**	**Crashes per driveway per year, N_j**	**Coefficient for traffic adjustment, t**	**Initial N_{brdwy}**	**Overdispersion parameter, k**
		from Table 12-7	from Table 12-7	Equation 12-16 $n_j * N_j * (AADT/15,000)^t$	from Table 12-7
Major commercial	0	0.182	1.172	0.000	--
Minor commercial	0	0.058	1.172	0.000	
Major industrial/institutional	0	0.198	1.172	0.000	
Minor industrial/institutional	0	0.026	1.172	0.000	
Major residential	0	0.096	1.172	0.000	
Minor residential	0	0.018	1.172	0.000	
Other	0	0.029	1.172	0.000	
Total	--	--	--	0.000	0.81

Worksheet 1H -- Multiple-Vehicle Driveway-Related Collisions by Severity Level for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Crash Severity Level	**Initial N_{brdwy}**	**Proportion of total crashes (f_{dwy})**	**Adjusted N_{brdwy}**	**Combined CMFs**	**Calibration factor, C_r**	**Predicted N_{brdwy}**
	$(5)_{TOTAL}$ from Worksheet 1G	from Table 12-7	$(2)_{TOTAL}$ * (3)	(6) from Worksheet 1B		(4)*(5)*(6)
Total	0.000	1.000	0.000	3.04	1.00	0.000
Fatal and injury (FI)	--	0.342	0.000	3.04	1.00	0.000
Property damage only (PDO)	--	0.658	0.000	3.04	1.00	0.000

Worksheet 1I -- Vehicle-Pedestrian Collisions for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	**Predicted N_{brmv}**	**Predicted N_{brsv}**	**Predicted N_{brdwy}**	**Predicted N_{br}**	**f_{pedr}**	**Calibration factor, C_r**	**Predicted N_{pedr}**
	(9) from Worksheet 1C	(9) from Worksheet 1E	(7) from Worksheet 1H	(2)+(3)+(4)	from Table 12-8		(5)*(6)*(7)
Total	0.294	0.105	0.000	0.398	0.022	1.00	0.009
Fatal and injury (FI)	--	--	--	--	--	1.00	0.009

Worksheet 1J -- Vehicle-Bicycle Collisions for Urban and Suburban Roadway Segments

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Crash Severity Level	**Predicted N_{brmv}**	**Predicted N_{brsv}**	**Predicted N_{brdwy}**	**Predicted N_{br}**	**f_{biker}**	**Calibration factor, C_r**	**Predicted N_{biker}**
	(9) from Worksheet 1C	(9) from Worksheet 1E	(7) from Worksheet 1H	(2)+(3)+(4)	from Table 12-9		(5)*(6)*(7)
Total	0.294	0.105	0.000	0.398	0.011	1.00	0.004
Fatal and injury (FI)	--	--	--	--	--	1.00	0.004

Worksheet 1K -- Crash Severity Distribution for Urban and Suburban Roadway Segments			
(1)	(2)	(3)	(4)
Collision type	**Fatal and injury (FI)** (3) from Worksheet 1D and 1F; (7) from Worksheet 1H; and (8) from Worksheet 1I and 1J	**Property damage only (PDO)** (5) from Worksheet 1D and 1F; and (7) from Worksheet 1H	**Total** (6) from Worksheet 1D and 1F; (7) from Worksheet 1H; and (8) from Worksheet 1I and 1J
MULTIPLE-VEHICLE			
Rear-end collisions (from Worksheet 1D)	0.049	0.100	0.149
Head-on collisions (from Worksheet 1D)	0.007	0.001	0.008
Angle collisions (from Worksheet 1D)	0.017	0.026	0.043
Sideswipe, same direction (from Worksheet 1D)	0.009	0.049	0.058
Sideswipe, opposite direction (from Worksheet 1D)	0.008	0.006	0.014
Driveway-related collisions (from Worksheet 1H)	0.000	0.000	0.000
Other multiple-vehicle collision (from Worksheet 1D)	0.005	0.016	0.021
Subtotal	0.096	0.198	0.294
SINGLE-VEHICLE			
Collision with animal (from Worksheet 1F)	0.000	0.000	0.000
Collision with fixed object (from Worksheet 1F)	0.018	0.061	0.079
Collision with other object (from Worksheet 1F)	0.001	0.002	0.003
Other single-vehicle collision (from Worksheet 1F)	0.011	0.012	0.023
Collision with pedestrian (from Worksheet 1I)	0.009	0.000	0.009
Collision with bicycle (from Worksheet 1J)	0.004	0.000	0.004
Subtotal	0.043	0.075	0.118
Total	0.139	0.273	0.411

Worksheet 1L -- Summary Results for Urban and Suburban Roadway Segments			
(1)	(2)	(3)	(4)
Crash Severity Level	**Predicted average crash frequency, $N_{predicted\ rs}$ (crashes/year)** (Total) from Worksheet 1K	**Roadway segment length, L (mi)**	**Crash rate (crashes/mi/year)** (2) / (3)
Total	0.4	0.07	5.9
Fatal and injury (FI)	0.1	0.07	2.0
Property damage only (PDO)	0.3	0.07	3.9

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APPENDIX C

Health Risk Assessment

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APPENDIX C
Health Risk Assessment

The Health Risk Assessment (HRA) presented below includes a detailed assessment of the health risks from construction of the 1750 Broadway Project (Proposed Project). The Proposed Project's backup generator would be required to comply with the BAAQMD's permit requirements for a stationary source. The BAAQMD would not approve an Authority to Construct or a Permit to Operate any new or modified source of TACs that exceeds a cancer risk of 10 in one million or a chronic or acute hazard index of 1.0. Therefore, the health risks impact of the backup generator would be less than significant. The Proposed Project includes residential uses and is located within 1,000 feet of several BAAQMD permitted stationary sources and roadways with traffic volumes greater than 10,000 vehicles per day. Therefore, consistent with the requirements of SCA AIR-4, Exposure to Air Pollution (Toxic Air Contaminants), the analysis presented below also includes a screening level assessment of the cumulative risk to Proposed Project receptors from existing and proposed sources of TACs within 1,000 feet of the Project site.

The HRA consists of four principal components:

1. Estimation of TAC emissions from Project construction,
2. Estimation of TAC concentrations at existing sensitive receptors from the Proposed Project's construction emissions using refined air dispersion modeling,
3. Estimation of health risks from construction using the modeled concentrations at receptors and exposure parameters and comparison to significance thresholds developed by the BAAQMD and adopted by the City of Oakland, and
4. Identification of sources of TAC emissions and their emission levels located within a 1,000-foot radius from the Proposed Project as part of the cumulative assessment of health risks and comparison of the resulting cumulative health impacts to Proposed Project receptors with applicable health risk significance thresholds.

The HRA was conducted in accordance with technical guidelines developed by federal, state, and regional agencies, including U.S. Environmental Protection Agency (USEPA), California Environmental Protection Agency (CalEPA), California Office of Environmental Health Hazard Assessment (OEHHA) *Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments*[1] and the Bay Area Air Quality Management District (BAAQMD) *Air Toxics New Source Review (NSR) Program Health Risk Assessment Guidelines*.[2]

[1] Office of Environmental Health Hazard Assessment, *Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments*, February 2015, http://oehha.ca.gov/air/hot_spots/hotspots2015.html.

[2] BAAQMD, *BAAQMD Air Toxics New Source Review (NSR) Program Health Risk Assessment Guidelines*, January 2016.

1. Estimation of TAC Emissions from Project Construction

The primary TAC of concern emitted during Project construction is Diesel Particulate Matter (DPM), a primary component of diesel exhaust from construction equipment and heavy duty trucks transporting materials to and from the Project site. In August 1998, the CARB identified DPM as a TAC. DPM is a complex mixture of numerous individual gaseous and particulate compounds emitted from diesel-fueled combustion engines and contains at least 40 different TACs. DPM is formed primarily through the incomplete combustion of diesel fuel. DPM is removed from the atmosphere through physical processes including atmospheric fall-out and washout by rain. Humans can be exposed to airborne DPM by deposition on water, soil, and vegetation; although the main pathway of exposure is inhalation. Studies indicate that DPM poses the greatest health risk among airborne TACs.

For purposes of this assessment, consistent with OEHHA guidelines, exhaust emissions of PM_{10} are represented as DPM. Exhaust PM_{10} emissions from Project construction were derived from CalEEMod (Version 2016.3.1) using the following assumptions:

- Construction of 307 units of residential apartments and 5,000 square feet of retail use;
- Construction was assumed to begin in January 2019 and last for a period of 28 months;
- The duration of the various construction phases (e.g., demolition, grading, building construction, etc.) based on CalEEMod default values were adjusted to add up to the total Project construction duration of 28 months provided by the applicant (shown in **Table C-1**);
- The number and types of construction equipment used for each phase,[3] their size and activity level as well as the number of construction related worker, vendor and hauling trips during each phase were based on CalEEMod defaults for a 0.65 acre site (shown in **Tables C-2 and C-3**) and refined based on input from the applicant;
- Demolition of 27,600 square feet of existing structures; and
- Off-haul of 24,500 cubic yards of material during the grading phase.

TABLE C-1
PROJECT CONSTRUCTION SCHEDULE[a]

Construction Phase	Duration	Number of Workdays[b]
Demolition	1/1/2019 – 3/11/2019	49
Site Preparation	3/12/2019 – 3/18/2019	5
Grading	3/19/2019 – 4/1/2019	10
Building Construction	4/2/2019 – 2/19/2021	494
Paving	3/27/2021 – 4/30/2021	25
Architectural Coating	2/20/2021 – 3/26/2021	25
Total number of workdays over the construction duration		608

[a] Provided by applicant.
[b] Number of workdays are calculated assuming Monday – Friday construction. No construction on weekends is assumed.

[3] Cement and mortar mixers were removed from the default CalEEMod equipment list for paving as all cement and mortar used onsite was assumed to be brought in pre-mixed.

TABLE C-2
CONSTRUCTION EQUIPMENT USED BY PHASE[a]

Equipment	Number	No. of days Used	No. of Hours/Day Used
Demolition			
Concrete/Industrial Saw	1	49	8
Rubber Tired Dozer	1	49	1
Tractors/Loaders/Backhoes	2	49	6
Site Preparation			
Grader	1	5	8
Tractors/Loaders/Backhoes	1	5	8
Grading			
Concrete/Industrial Saw	1	10	8
Rubber Tired Dozer	1	10	1
Tractors/Loaders/Backhoes	1	10	6
Bore/Drill Rig [b, c]	4	10	8
Building Construction			
Cranes	1	494	4
Forklifts	2	494	6
Tractors/Loaders/Backhoes	2	494	8
Man hoist [b]	1	494	8
Welding Machine [b, d]	1	494	2.4
Paving			
Pavers	1	25	7
Rollers	1	25	7
Tractors/Loaders/Backhoes	1	25	7
Architectural Coating			
Air Compressor	1	25	6

[a] CalEEMod defaults for a 0.65-acre construction site. Cement and mortar mixers were not included in the inventory as all cement and mortar used on site would be brought in pre-mixed.
[b] Equipment added based on input from applicant.
[c] Applicant data provided was one bore/drill rig operating for 40 days, which was adjusted to 4 bore/drill rigs operating for 10 days to fit the 10-day grading phase duration
[d] Applicant data provided was one welding machine operating for 200 days and 6 hours a day, which was modified as one welding machine operating for the entire building construction phase of 494 days with 2.4 hours of use per day.

TABLE C-3
VEHICLE TRIPS BY CONSTRUCTION PHASE[a]

Construction Phase	Worker Commute Trips/Day	Vendor Trips/Day	Total Number of Hauling Trips
Demolition	10	0	126
Site Preparation	5	0	0
Grading	20	0	3,062
Building Construction	420 [b]	53	0
Architectural Coating	8	0	0
Paving	54	0	0

[a] CalEEMod default one-way vehicle trips.
[b] Updated based on input from applicant.

Exhaust PM_{10} emissions from on-site construction equipment and off-site vendor and hauling trips during the different phases were extracted from the CalEEMod output and are presented in **Table C-4** for both the uncontrolled and the mitigated scenarios. The mitigated scenario assumes use of Tier 4 engines as the most effective Verified Diesel Emission Control Strategies (VDECS) available for the engine type as certified by California Air Resources Board (CARB) consistent with SCA AIR-3(a)(ii) [City SCA-23(a)(ii)]. As required by the BAAQMD Guidelines, fugitive emissions are not included in this assessment and are addressed separately through dust control measures implemented as part of SCA AIR-1.

TABLE C-4
TOTAL PM_{10} EXHAUST EMISSIONS FROM PROJECT CONSTRUCTION

	Uncontrolled Scenario	Mitigated Scenario
On-Site DPM (as PM_{10} Exhaust) (tons)	0.25	0.009
Off-Site DPM (as PM_{10} Exhaust) (tons)	0.01	0.01
Total DPM (as PM_{10} Exhaust) (tons)	0.26	0.019
Number of construction workdays	608	608
Emission Rate (grams/second) [a, b]	0.013	0.0005

[a] Emission rate calculated assuming 8 hours of construction per day, Monday to Friday.
[b] Emission rate calculated assuming only 10 percent of off-site emissions as contributing to concentrations in the project vicinity.

2. Estimation of Ambient Concentrations at Existing Sensitive Receptors

Dispersion is the process by which atmospheric pollutants disseminate due to wind and vertical stability. The results of a dispersion analysis are used to assess pollutant concentrations at or near an emission source. The results of such an analysis allow predicted concentrations of pollutants to be compared directly to air quality standards and other criteria such as health risks based on modeled concentrations.

An air dispersion model is a mathematical formulation that is used to estimate the air quality concentrations at specific locations (receptors) surrounding a source of emissions given the rate of emissions, topography and prevailing meteorological conditions. The air dispersion model used in this assessment was the United States Environmental Protection Agency (EPA) AERMOD air dispersion model that is approved by the BAAQMD for air pollutant dispersion assessments. Specifically, the AERMOD model was used to estimate concentrations of DPM emissions at sensitive receptor locations using the Proposed Project's emission rate shown in **Table C-5**.

TABLE C-5
EXPOSURE PARAMETERS USED

Receptor Age	Exposure Duration (ED)[a] (years)	Age Sensitivity Factors (ASF)	Fraction of time at Home (FAH) (%)	Daily Breathing Rate (DBR) [b] (L/kg-day)
Residential Receptor - Infant				
3rd trimester	0.25	10	0.85	361
0 – 2 years	2	10	0.85	1090
2 – 9 years	1	3	0.72	631
Residential Receptor - Child				
2 – 9 years	3	3	0.72	631
Residential Receptor - Adult				
>16 years	3	1	0.73	261

NOTES
[a] Per BAAQMD guidance, a minimum 3-year exposure duration is assumed to estimate risks from project construction.
[b] BAAQMD Air Toxics New Source Review Program HRA Guidelines recommend using the 95th percentile rate for age groups less than 2 years old and the 80th percentile rate for age groups that are greater than or equal to 2 years old.

Both on-site emissions from construction and off-site emissions from heavy duty trucks were modeled together as an area source extending over the entire Project site. Only 10 percent of off-site emissions were considered in the modeling effort as contributing to concentrations in the Project vicinity. The release height for the source was specified as 5 meters above ground to account for the top of the equipment exhaust stack where the emissions are released to the atmosphere and the increase in the height of the emissions due to its heated exhaust. A variable emissions rate was used to represent Project construction activity that is expected to take place only on weekdays for 8 hours per day between 8 a.m. and 4 p.m. Five years of meteorological data from the Metropolitan Oakland International Airport was used to represent wind conditions at the Project site. Concentrations were modeled at the closest sensitive receptors are located at 1770 Broadway abutting the Project site's northern boundary.

The results of the dispersion modeling showed a maximum annual concentration of 0.366 micrograms per cubic meter ($\mu g/m^3$) for the uncontrolled scenario at closest receptors to the north. This would be considered the Maximum Exposed Individual Receptor (MEIR). Assuming the use of Tier 4 construction equipment, as specified in SCA AIR-3 (a)(ii), annual concentration at the MEIR would reduce to 0.015 $\mu g/m^3$.

3. Assessment of Health Risks from Project Construction to Existing Receptors

Assessment of health risks from Project construction was conducted following methodologies and exposure parameters recommended in OEHHA's Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments.[4] OEHHA's 2015 revisions to its Guidance Manual are primarily designed to ensure that the greater sensitivity of children to cancer and other health risks is reflected in HRAs. For example, OEHHA now recommends that risks be analyzed separately for multiple age groups, focusing especially on young children and

[4] Office of Environmental Health Hazard Assessment, *Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments*, February 2015, http://oehha.ca.gov/air/hot_spots/hotspots2015.html.

teenagers, rather than the past practice of analyzing risks to the general population, without distinction by age. OEHHA also now recommends that statistical "age sensitivity factors" be incorporated into a HRA, and that children's relatively high breathing rates be accounted for. On the other hand, the Guidance Manual revisions also include some changes that would reduce calculated health risks. For example, under the former guidance, OEHHA recommended that residential cancer risks be assessed by assuming 70 years of exposure at a residential receptor; under the revised Guidance Manual, this assumption is lessened to 30 years. This is based on studies showing that 30 years is a reasonable estimate of the 90th to 95th percentile of residency duration in the population. For short term projects such as construction activities, OEHHA recommends using the actual project duration. To ensure that short-term projects do not result in unanticipated higher cancer impacts due to short duration high-exposure rates, the BAAQMD recommends that the cancer risk be evaluated assuming that the average daily dose for short-term exposure lasts a minimum of three years for projects lasting three years or less.

Based on OEHHA recommendations, the cancer risk to residential receptors assumes that exposure occurs 24 hours per day for 350 days per year while accounting for a percentage of time at home. OEHHA evaluated information from activity pattern databases to estimate the fraction of time at home (FAH) during the day. This information was used to adjust exposure duration and cancer risk based on the assumption that a person is not present at home continuously for 24 hours and therefore exposure to emissions is not occurring when a person is away from their home.

Cancer risk at the MEIR was estimated using the OEHHA recommended method shown in the following equations and the cancer risk exposure parameters shown in **Table C-5**. Estimates were made using the mandatory minimum pathways, which for DPM is only through inhalation.

$$Risk_{inh\text{-}res} = DOSE_{air} \times CPF \times ASF \times ED/AT \times FAH$$

$Risk_{inh\text{-}res}$ = Residential inhalation cancer risk
$DOSE_{air}$ = Daily Inhalation Dose
CPF = Cancer Potency Factor for DPM = 1.1
ASF = Age Sensitivity Factors
ED = Exposure Duration in each age group (years)
AT = Averaging Time over lifetime cancer risk (years) = 70 years
FAH = Fraction of Time at Home (%)

$$DOSE_{air} = C_{air} \times DBR \times A \times EF \times 10^{-6}$$

C_{air} = Concentration of TAC in air ($\mu g/m^3$)
DBR = Daily Breathing Rate
A = Inhalation Absorption factor = 1.0 for DPM
EF = Exposure Frequency = 350/365 = 0.96

Chronic (long-term) adverse health impacts unrelated to cancer are measured against a hazard index (HI), which is defined as the ratio of the predicted incremental DPM exposure concentration from the Proposed Project to a reference exposure level (REL) that could cause adverse health effects. The RELs are published by OEHHA based on epidemiological research.

The chronic reference exposure level for DPM was established by the California OEHHA as 5 μg/m^3.[5]

Estimated health risks and maximum $PM_{2.5}$ concentrations to receptors of different age groups at the MEIR are shown in **Table C-6** below and compared to the BAAQMD project-level thresholds that have been adopted by the City of Oakland.

TABLE C-6
MAXIMUM HEALTH RISKS FROM PROJECT CONSTRUCTION

Health Risk at MEIR	Maximum Cancer Risk (in a million)	Chronic Risk (Hazard Index)	Maximum $PM_{2.5}$ concentration
Uncontrolled Scenario			
Residential Receptor - Infant	114	0.073	0.337
Residential Receptor - Child	23	0.073	0.337
Residential Receptor - Adult	3	0.073	0.337
With Tier 4 Equipment			
Residential Receptor - Infant	4.5	0.003	0.014
Residential Receptor - Child	0.9	0.003	0.014
Residential Receptor - Adult	0.13	0.003	0.014
Project-level Threshold	10	1.0	0.3
Significant?	**No**	**No**	**No**

As shown in the table, health risks (cancer and chronic) to receptors of all age groups and $PM_{2.5}$ concentrations resulting from Project construction would be less than the applicable significance thresholds with the use of Tier 4 equipment for construction. Therefore, the TAC impact of Project construction on existing receptors would be less than significant.

4. Cumulative Health Risks to Proposed Project Receptors

The BAAQMD's CEQA Air Quality Guidelines include standards and methods for determining the significance of cumulative health risk impacts. The method for determining cumulative health risk requires the tallying of health risk from permitted stationary sources, major roadways and any other identified substantial air toxic sources in the vicinity of a Project site (i.e., within a 1,000-foot radius) and then adding the individual sources to determine whether the BAAQMD's cumulative health risk thresholds are exceeded. Consistent with SCA AIR-4, Exposure to Air Pollution (Toxic Air Contaminants), the cumulative screening analysis for the proposed new receptors is shown in **Table C-7**. The screening analysis shows that health risks to the Proposed Project receptors would be less than the City's thresholds and hence, less than significant.

[5] California Office of Environmental Health Hazards Assessment - Acute, 8-hour, and Chronic Reference Exposure Levels, June 2014, http://www.oehha.ca.gov/air/allrels.html.

TABLE C-7
CUMULATIVE HEALTH IMPACTS TO NEW RECEPTORS

Source	Source Type	Distance from Project (feet)	Cancer Risk (persons per million)	Chronic Hazard Impact	$PM_{2.5}$ Concentration (µg/m3)
Existing Stationary Sources (BAAQMD Plant Number) within 1,000 feet					
Kaiser Foundation Health Plan (G9132) [a]	Closed	180	0.0	0.0	0.0
Sears #1039 (16802) [a]	Closed	300	0.0	0.0	0.0
Chevron Inc. (G11475)	Gas Station	565	0.57	0.001	0.0
PG&E (14173)	Diesel Engine	360	0.75	0.004	0.0013
AT&T Corp (18668)	Diesel Engine	845	0.17	0.002	0.0003
Kaiser Permanente (G11348) [a]	Closed	880	0.0	0.0	0.0
CIM Group Properties (20248)	Diesel Engine	880	1.03	0.009	0.0019
Douglas Parking Company (18179) [a]	Closed	560	0.0	0.0	0.0
Le Magic Cleaners (10397) [b]	Dry Cleaners	745	0.0	0.0	0.0
AC Transit General Office (14532)	Diesel Engine	320	2.22	0.009	0.0039
Pacific Bell (13494)	Diesel Engine	395	8.22	0.047	0.0143
Rotunda Partners II (14607)	Diesel Engine	660	0.15	0.002	0.0003
City of Oakland Env. Services Division (14502)	Diesel Engine	990	0.07	0.002	0.0001
City of Oakland Env. Services Division (14503)	Diesel Engine	990	0.07	0.001	0.0001
Pacific Bell telephone Co. (19999)	Diesel Engine	920	0.13	0.002	0.0
Major Roadways (with more than 10,000 AADT) within 1,000 feet					
Broadway	Roadway	20	11.7	--	0.23
Backup Generators at Proposed Projects within 1,000 feet					
1630 San Pablo Avenue [c,d]	Diesel Engine	735	0.7	0.004	0.001
1601 San Pablo Avenue [c,d]	Diesel Engine	865	0.5	0.004	0.001
1640 Broadway	Diesel Engine	305	0.51	0.004	0.001
1700 Webster Street [c]	Diesel Engine	710	0.7	0.004	0.001
1721 Webster Street [c]	Diesel Engine	525	1.0	0.004	0.002
301 19th Street [c,d]	Diesel Engine	825	0.5	0.004	0.001
1900 Broadway [c]	Diesel Engine	100	7.3	0.004	0.013
1955 Broadway [c,d]	Diesel Engine	530	1.0	0.004	0.002
2015 Telegraph Avenue [c]	Diesel Engine	900	0.4	0.004	0.001
2016 Telegraph Avenue [c]	Diesel Engine	800	0.6	0.004	0.001
		Project Generator [c]	10	0.004	0.018
		Cumulative Impacts [e]	38.3	0.112	0.276
		Cumulative Impacts using BAAQMD multiplier to existing and proposed stationary sources and roadways to account for 2015 OEHHA revisions [e]	48	0.112	0.276
		City of Oakland Cumulative Significance Criteria (new receptors)	100	10	0.8
		Potentially Significant Impact?	No	No	No

[a] Source no longer operating per BAAQMD.
[b] No longer a source of risk as equipment was updated to a closed loop system per BAAQMD.
[c] Risks posed by the generators are conservatively assumed to be at the maximum permitted value but will likely be less.
[d] Awaiting information from the City if the project includes a backup generator. The analysis presented here conservatively assumes that it does include one.
[e] Cumulative totals may not add up due to rounding.

SOURCE: BAAQMD, 2012; BAAQMD, 2015; BAAQMD, 2017; ESA, 2017.

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1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Enclosed Parking with Elevator	118.01	1000sqft	0.00	118,010.00	0
Apartments High Rise	307.00	Dwelling Unit	0.65	285,260.00	614
Regional Shopping Center	5.00	1000sqft	0.00	5,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	63
Climate Zone	5			**Operational Year**	2022
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Project data

Land Use - Project information

Construction Phase - CalEEMod default construction schedule adjusted to add up to the total construction duration of 28 months provided by the applicant.

Off-road Equipment -

Off-road Equipment - Other construction equipment (man hoist and welding machine) added to default equipment list based applicant input. Applicant data provided for the welding machine was 200 days of use for 6 hours a day, and modified to fit the building construction phase as 494 days of use for 2.4 hours a day.

Off-road Equipment - Bore/drill rig added based on applicant input. Applicant data provided was 1 bore/drill rig operating for 40 days adjusted to 4 bore/drill rigs operating for 10 days to fit into the 10 day phase duration

Off-road Equipment - Cement and mortar assumed to be brought in pre mixed.

Trips and VMT - Updated based on applicant input

Grading - Project data

Vehicle Trips - Project data

Woodstoves - No woodstoves assumed, Default number of fireplaces assumed - all gas burning

Energy Use - Updated to reflect 2016 Title 24 standards

Water And Wastewater - 20% reduction in indoor water use assumed to account for compliance with CalGreen standards,100% aerobic treatment of wastewater assumed.

Construction Off-road Equipment Mitigation - All construction equipment used assumed to meet Tier 4 Final standards in compliance with BACT requirements of City SCA 19(w)

Demolition -

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	40	0
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	8.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstructionPhase	NumDays	5.00	25.00
tblConstructionPhase	NumDays	100.00	494.00
tblConstructionPhase	NumDays	10.00	49.00
tblConstructionPhase	NumDays	2.00	10.00
tblConstructionPhase	NumDays	5.00	25.00
tblConstructionPhase	NumDays	1.00	5.00
tblEnergyUse	LightingElect	741.44	533.84
tblEnergyUse	LightingElect	2.63	2.50
tblEnergyUse	LightingElect	5.00	4.75
tblEnergyUse	T24E	502.89	362.08
tblEnergyUse	T24E	3.92	3.72
tblEnergyUse	T24E	2.35	2.23

tblEnergyUse	T24NG	8,824.58	6,353.70
tblEnergyUse	T24NG	3.92	3.72
tblFireplaces	NumberGas	46.05	273.00
tblFireplaces	NumberNoFireplace	12.28	34.00
tblFireplaces	NumberWood	52.19	0.00
tblGrading	AcresOfGrading	0.00	0.65
tblGrading	AcresOfGrading	2.50	0.65
tblGrading	MaterialExported	0.00	24,500.00
tblLandUse	BuildingSpaceSquareFeet	307,000.00	285,260.00
tblLandUse	LandUseSquareFeet	307,000.00	285,260.00
tblLandUse	LotAcreage	2.71	0.00
tblLandUse	LotAcreage	4.95	0.65
tblLandUse	LotAcreage	0.11	0.00
tblLandUse	Population	878.00	614.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	PhaseName		Grading
tblOffRoadEquipment	PhaseName		Building Construction
tblOffRoadEquipment	PhaseName		Building Construction
tblOffRoadEquipment	UsageHours	6.00	0.00
tblProjectCharacteristics	OperationalYear	2018	2022
tblTripsAndVMT	WorkerTripNumber	272.00	420.00
tblVehicleTrips	ST_TR	4.98	4.03
tblVehicleTrips	ST_TR	49.97	27.02
tblVehicleTrips	SU_TR	3.65	2.95

tblVehicleTrips	SU_TR	25.24	13.65
tblVehicleTrips	WD_TR	4.20	3.40
tblVehicleTrips	WD_TR	42.70	23.09
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	IndoorWaterUseRate	20,002,285.87	16,001,828.70
tblWater	IndoorWaterUseRate	370,362.61	296,290.09
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWoodstoves	NumberCatalytic	6.14	0.00
tblWoodstoves	NumberNoncatalytic	6.14	0.00

2.0 Emissions Summary

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					
2019	0.3913	3.3114	2.9887	8.5300e-003	0.4088	0.1245	0.5333	0.1090	0.1153	0.2243	0.0000	783.8753	783.8753	0.0896	0.0000	786.1145
2020	0.4134	3.0084	3.2852	8.7400e-003	0.4806	0.1223	0.6029	0.1289	0.1127	0.2416	0.0000	793.9512	793.9512	0.0929	0.0000	796.2726
2021	2.1217	0.4565	0.5457	1.3900e-003	0.0722	0.0191	0.0913	0.0193	0.0177	0.0370	0.0000	125.4766	125.4766	0.0161	0.0000	125.8796
Maximum	**2.1217**	**3.3114**	**3.2852**	**8.7400e-003**	**0.4806**	**0.1245**	**0.6029**	**0.1289**	**0.1153**	**0.2416**	**0.0000**	**793.9512**	**793.9512**	**0.0929**	**0.0000**	**796.2726**

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					
2019	0.2251	1.4094	3.1307	8.5300e-003	0.4088	0.0124	0.4212	0.1090	0.0119	0.1210	0.0000	783.8750	783.8750	0.0896	0.0000	786.1142
2020	0.2477	1.0922	3.4304	8.7400e-003	0.4806	0.0110	0.4916	0.1289	0.0106	0.1395	0.0000	793.9509	793.9509	0.0929	0.0000	796.2724
2021	2.0944	0.1473	0.5788	1.3900e-003	0.0722	1.4700e-003	0.0736	0.0193	1.4200e-003	0.0208	0.0000	125.4766	125.4766	0.0161	0.0000	125.8796
Maximum	**2.0944**	**1.4094**	**3.4304**	**8.7400e-003**	**0.4806**	**0.0124**	**0.4916**	**0.1289**	**0.0119**	**0.1395**	**0.0000**	**793.9509**	**793.9509**	**0.0929**	**0.0000**	**796.2724**

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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	N20	CO2e
Percent Reduction	**12.28**	**60.91**	**-4.70**	**0.00**	**0.00**	**90.67**	**19.64**	**0.00**	**90.26**	**44.09**	**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	**1-2-2019**	**4-1-2019**	0.9007	0.5489
2	**4-2-2019**	**7-1-2019**	0.9256	0.3559
3	**7-2-2019**	**10-1-2019**	0.9359	0.3600
4	**10-2-2019**	**1-1-2020**	0.9489	0.3735
5	**1-2-2020**	**4-1-2020**	0.8569	0.3404
6	**4-2-2020**	**7-1-2020**	0.8451	0.3286
7	**7-2-2020**	**10-1-2020**	0.8545	0.3324
8	**10-2-2020**	**1-1-2021**	0.8654	0.3440
9	**1-2-2021**	**4-1-2021**	0.8436	0.5305
10	**4-2-2021**	**7-1-2021**	1.7269	1.7105
		Highest	1.7269	1.7105

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	1.4196	0.0558	2.2956	3.1000e-004		0.0150	0.0150		0.0150	0.0150	0.0000	37.8069	37.8069	4.2500e-003	6.2000e-004	38.0994
Energy	0.0150	0.1280	0.0549	8.2000e-004		0.0103	0.0103		0.0103	0.0103	0.0000	755.8972	755.8972	0.0303	8.4000e-003	759.1589
Mobile	0.3102	2.0930	3.3414	0.0127	0.9816	0.0121	0.9937	0.2639	0.0114	0.2752	0.0000	1,174.9844	1,174.9844	0.0511	0.0000	1,176.2612
Stationary	0.0410	0.1835	0.1046	2.0000e-004		6.0400e-003	6.0400e-003		6.0400e-003	6.0400e-003	0.0000	19.0399	19.0399	2.6700e-003	0.0000	19.1066
Waste						0.0000	0.0000		0.0000	0.0000	29.7321	0.0000	29.7321	1.7571	0.0000	73.6600
Water						0.0000	0.0000		0.0000	0.0000	5.7663	38.7259	44.4922	0.0216	0.0129	48.8770
Total	**1.7858**	**2.4602**	**5.7966**	**0.0141**	**0.9816**	**0.0435**	**1.0251**	**0.2639**	**0.0428**	**0.3066**	**35.4984**	**2,026.4543**	**2,061.9527**	**1.8670**	**0.0219**	**2,115.1630**

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	1.4196	0.0558	2.2956	3.1000e-004		0.0150	0.0150		0.0150	0.0150	0.0000	37.8069	37.8069	4.2500e-003	6.2000e-004	38.0994
Energy	0.0150	0.1280	0.0549	8.2000e-004		0.0103	0.0103		0.0103	0.0103	0.0000	755.8972	755.8972	0.0303	8.4000e-003	759.1589
Mobile	0.3102	2.0930	3.3414	0.0127	0.9816	0.0121	0.9937	0.2639	0.0114	0.2752	0.0000	1,174.9844	1,174.9844	0.0511	0.0000	1,176.2612
Stationary	0.0410	0.1835	0.1046	2.0000e-004		6.0400e-003	6.0400e-003		6.0400e-003	6.0400e-003	0.0000	19.0399	19.0399	2.6700e-003	0.0000	19.1066
Waste						0.0000	0.0000		0.0000	0.0000	29.7321	0.0000	29.7321	1.7571	0.0000	73.6600
Water						0.0000	0.0000		0.0000	0.0000	5.7663	38.7259	44.4922	0.0216	0.0129	48.8770
Total	**1.7858**	**2.4602**	**5.7966**	**0.0141**	**0.9816**	**0.0435**	**1.0251**	**0.2639**	**0.0428**	**0.3066**	**35.4984**	**2,026.4543**	**2,061.9527**	**1.8670**	**0.0219**	**2,115.1630**

	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	1/2/2019	3/11/2019	5	49	
2	Site Preparation	Site Preparation	3/12/2019	3/18/2019	5	5	
3	Grading	Grading	3/19/2019	4/1/2019	5	10	
4	Building Construction	Building Construction	4/2/2019	2/19/2021	5	494	
5	Paving	Paving	2/20/2021	3/26/2021	5	25	
6	Architectural Coating	Architectural Coating	3/27/2021	4/30/2021	5	25	

Acres of Grading (Site Preparation Phase): 0.65

Acres of Grading (Grading Phase): 0.65

Acres of Paving: 0

Residential Indoor: 577,652; Residential Outdoor: 192,551; Non-Residential Indoor: 7,500; Non-Residential Outdoor: 2,500; Striped Parking Area: 7,081 (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	1.00	247	0.40
Demolition	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Site Preparation	Graders	1	8.00	187	0.41
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Bore/Drill Rigs	4	8.00	221	0.50
Grading	Concrete/Industrial Saws	1	8.00	81	0.73
Grading	Rubber Tired Dozers	1	1.00	247	0.40
Grading	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Building Construction	Cranes	1	4.00	231	0.29
Building Construction	Forklifts	2	6.00	89	0.20
Building Construction	Other Construction Equipment	1	8.00	172	0.42
Building Construction	Other Construction Equipment	1	2.40	172	0.42
Building Construction	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Paving	Cement and Mortar Mixers	0	0.00	9	0.56
Paving	Pavers	1	7.00	130	0.42
Paving	Rollers	1	7.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	7.00	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	4	10.00	0.00	126.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	2	5.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	3,062.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	7	420.00	53.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	3	8.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	54.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

3.2 Demolition - 2019

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					0.0136	0.0000	0.0136	2.0600e-003	0.0000	2.0600e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0234	0.2108	0.1885	2.9000e-004		0.0132	0.0132		0.0126	0.0126	0.0000	25.7746	25.7746	4.9100e-003	0.0000	25.8974
Total	**0.0234**	**0.2108**	**0.1885**	**2.9000e-004**	**0.0136**	**0.0132**	**0.0267**	**2.0600e-003**	**0.0126**	**0.0146**	**0.0000**	**25.7746**	**25.7746**	**4.9100e-003**	**0.0000**	**25.8974**

3.2 Demolition - 2019

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	5.7000e-004	0.0196	3.3400e-003	5.0000e-005	1.0700e-003	7.0000e-005	1.1400e-003	2.9000e-004	7.0000e-005	3.6000e-004	0.0000	4.8751	4.8751	2.5000e-004	0.0000	4.8814
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	9.3000e-004	7.1000e-004	7.1500e-003	2.0000e-005	1.9400e-003	1.0000e-005	1.9500e-003	5.2000e-004	1.0000e-005	5.3000e-004	0.0000	1.7770	1.7770	5.0000e-005	0.0000	1.7782
Total	**1.5000e-003**	**0.0203**	**0.0105**	**7.0000e-005**	**3.0100e-003**	**8.0000e-005**	**3.0900e-003**	**8.1000e-004**	**8.0000e-005**	**8.9000e-004**	**0.0000**	**6.6520**	**6.6520**	**3.0000e-004**	**0.0000**	**6.6596**

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					0.0136	0.0000	0.0136	2.0600e-003	0.0000	2.0600e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.2500e-003	0.0141	0.1924	2.9000e-004		4.3000e-004	4.3000e-004		4.3000e-004	4.3000e-004	0.0000	25.7745	25.7745	4.9100e-003	0.0000	25.8974
Total	**3.2500e-003**	**0.0141**	**0.1924**	**2.9000e-004**	**0.0136**	**4.3000e-004**	**0.0140**	**2.0600e-003**	**4.3000e-004**	**2.4900e-003**	**0.0000**	**25.7745**	**25.7745**	**4.9100e-003**	**0.0000**	**25.8974**

3.2 Demolition - 2019

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	5.7000e-004	0.0196	3.3400e-003	5.0000e-005	1.0700e-003	7.0000e-005	1.1400e-003	2.9000e-004	7.0000e-005	3.6000e-004	0.0000	4.8751	4.8751	2.5000e-004	0.0000	4.8814
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	9.3000e-004	7.1000e-004	7.1500e-003	2.0000e-005	1.9400e-003	1.0000e-005	1.9500e-003	5.2000e-004	1.0000e-005	5.3000e-004	0.0000	1.7770	1.7770	5.0000e-005	0.0000	1.7782
Total	**1.5000e-003**	**0.0203**	**0.0105**	**7.0000e-005**	**3.0100e-003**	**8.0000e-005**	**3.0900e-003**	**8.1000e-004**	**8.0000e-005**	**8.9000e-004**	**0.0000**	**6.6520**	**6.6520**	**3.0000e-004**	**0.0000**	**6.6596**

3.3 Site Preparation - 2019

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					3.4000e-004	0.0000	3.4000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.8000e-003	0.0223	0.0104	2.0000e-005		9.2000e-004	9.2000e-004		8.4000e-004	8.4000e-004	0.0000	2.1890	2.1890	6.9000e-004	0.0000	2.2063
Total	**1.8000e-003**	**0.0223**	**0.0104**	**2.0000e-005**	**3.4000e-004**	**9.2000e-004**	**1.2600e-003**	**4.0000e-005**	**8.4000e-004**	**8.8000e-004**	**0.0000**	**2.1890**	**2.1890**	**6.9000e-004**	**0.0000**	**2.2063**

3.3 Site Preparation - 2019

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	5.0000e-005	4.0000e-005	3.6000e-004	0.0000	1.0000e-004	0.0000	1.0000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0907	0.0907	0.0000	0.0000	0.0907
Total	**5.0000e-005**	**4.0000e-005**	**3.6000e-004**	**0.0000**	**1.0000e-004**	**0.0000**	**1.0000e-004**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**0.0907**	**0.0907**	**0.0000**	**0.0000**	**0.0907**

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					3.4000e-004	0.0000	3.4000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.0000e-004	1.2900e-003	0.0133	2.0000e-005		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005	0.0000	2.1890	2.1890	6.9000e-004	0.0000	2.2063
Total	**3.0000e-004**	**1.2900e-003**	**0.0133**	**2.0000e-005**	**3.4000e-004**	**4.0000e-005**	**3.8000e-004**	**4.0000e-005**	**4.0000e-005**	**8.0000e-005**	**0.0000**	**2.1890**	**2.1890**	**6.9000e-004**	**0.0000**	**2.2063**

3.3 Site Preparation - 2019

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	5.0000e-005	4.0000e-005	3.6000e-004	0.0000	1.0000e-004	0.0000	1.0000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0907	0.0907	0.0000	0.0000	0.0907
Total	**5.0000e-005**	**4.0000e-005**	**3.6000e-004**	**0.0000**	**1.0000e-004**	**0.0000**	**1.0000e-004**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**0.0907**	**0.0907**	**0.0000**	**0.0000**	**0.0907**

3.4 Grading - 2019

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					5.4900e-003	0.0000	5.4900e-003	2.3200e-003	0.0000	2.3200e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0104	0.1169	0.0798	2.5000e-004		4.7800e-003	4.7800e-003		4.4900e-003	4.4900e-003	0.0000	22.0840	22.0840	6.3300e-003	0.0000	22.2422
Total	**0.0104**	**0.1169**	**0.0798**	**2.5000e-004**	**5.4900e-003**	**4.7800e-003**	**0.0103**	**2.3200e-003**	**4.4900e-003**	**6.8100e-003**	**0.0000**	**22.0840**	**22.0840**	**6.3300e-003**	**0.0000**	**22.2422**

3.4 Grading - 2019

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	0.0140	0.4758	0.0812	1.2300e-003	0.0259	1.7200e-003	0.0277	7.1300e-003	1.6500e-003	8.7800e-003	0.0000	118.4716	118.4716	6.1700e-003	0.0000	118.6257
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	3.8000e-004	2.9000e-004	2.9200e-003	1.0000e-005	7.9000e-004	1.0000e-005	8.0000e-004	2.1000e-004	1.0000e-005	2.2000e-004	0.0000	0.7253	0.7253	2.0000e-005	0.0000	0.7258
Total	**0.0143**	**0.4761**	**0.0842**	**1.2400e-003**	**0.0267**	**1.7300e-003**	**0.0285**	**7.3400e-003**	**1.6600e-003**	**9.0000e-003**	**0.0000**	**119.1968**	**119.1968**	**6.1900e-003**	**0.0000**	**119.3515**

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					5.4900e-003	0.0000	5.4900e-003	2.3200e-003	0.0000	2.3200e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.0000e-003	0.0130	0.1250	2.5000e-004		4.0000e-004	4.0000e-004		4.0000e-004	4.0000e-004	0.0000	22.0840	22.0840	6.3300e-003	0.0000	22.2422
Total	**3.0000e-003**	**0.0130**	**0.1250**	**2.5000e-004**	**5.4900e-003**	**4.0000e-004**	**5.8900e-003**	**2.3200e-003**	**4.0000e-004**	**2.7200e-003**	**0.0000**	**22.0840**	**22.0840**	**6.3300e-003**	**0.0000**	**22.2422**

3.4 Grading - 2019

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	0.0140	0.4758	0.0812	1.2300e-003	0.0259	1.7200e-003	0.0277	7.1300e-003	1.6500e-003	8.7800e-003	0.0000	118.4716	118.4716	6.1700e-003	0.0000	118.6257
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	3.8000e-004	2.9000e-004	2.9200e-003	1.0000e-005	7.9000e-004	1.0000e-005	8.0000e-004	2.1000e-004	1.0000e-005	2.2000e-004	0.0000	0.7253	0.7253	2.0000e-005	0.0000	0.7258
Total	**0.0143**	**0.4761**	**0.0842**	**1.2400e-003**	**0.0267**	**1.7300e-003**	**0.0285**	**7.3400e-003**	**1.6600e-003**	**9.0000e-003**	**0.0000**	**119.1968**	**119.1968**	**6.1900e-003**	**0.0000**	**119.3515**

3.5 Building Construction - 2019

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	0.1607	1.6820	1.2678	1.9000e-003		0.0972	0.0972		0.0894	0.0894	0.0000	171.0029	171.0029	0.0541	0.0000	172.3555
Total	**0.1607**	**1.6820**	**1.2678**	**1.9000e-003**		**0.0972**	**0.0972**		**0.0894**	**0.0894**	**0.0000**	**171.0029**	**171.0029**	**0.0541**	**0.0000**	**172.3555**

3.5 Building Construction - 2019

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	0.0234	0.6643	0.1469	1.4500e-003	0.0341	4.2400e-003	0.0384	9.8700e-003	4.0600e-003	0.0139	0.0000	138.3551	138.3551	8.5300e-003	0.0000	138.5683
Worker	0.1558	0.1188	1.2004	3.3000e-003	0.3254	2.3200e-003	0.3278	0.0866	2.1400e-003	0.0887	0.0000	298.5302	298.5302	8.5100e-003	0.0000	298.7430
Total	**0.1792**	**0.7831**	**1.3473**	**4.7500e-003**	**0.3596**	**6.5600e-003**	**0.3661**	**0.0964**	**6.2000e-003**	**0.1026**	**0.0000**	**436.8853**	**436.8853**	**0.0170**	**0.0000**	**437.3113**

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	0.0234	0.1015	1.3577	1.9000e-003		3.1200e-003	3.1200e-003		3.1200e-003	3.1200e-003	0.0000	171.0027	171.0027	0.0541	0.0000	172.3553
Total	**0.0234**	**0.1015**	**1.3577**	**1.9000e-003**		**3.1200e-003**	**3.1200e-003**		**3.1200e-003**	**3.1200e-003**	**0.0000**	**171.0027**	**171.0027**	**0.0541**	**0.0000**	**172.3553**

3.5 Building Construction - 2019

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	0.0234	0.6643	0.1469	1.4500e-003	0.0341	4.2400e-003	0.0384	9.8700e-003	4.0600e-003	0.0139	0.0000	138.3551	138.3551	8.5300e-003	0.0000	138.5683
Worker	0.1558	0.1188	1.2004	3.3000e-003	0.3254	2.3200e-003	0.3278	0.0866	2.1400e-003	0.0887	0.0000	298.5302	298.5302	8.5100e-003	0.0000	298.7430
Total	**0.1792**	**0.7831**	**1.3473**	**4.7500e-003**	**0.3596**	**6.5600e-003**	**0.3661**	**0.0964**	**6.2000e-003**	**0.1026**	**0.0000**	**436.8853**	**436.8853**	**0.0170**	**0.0000**	**437.3113**

3.5 Building Construction - 2020

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	0.1970	2.0519	1.6698	2.5400e-003		0.1155	0.1155		0.1063	0.1063	0.0000	223.5906	223.5906	0.0723	0.0000	225.3985
Total	**0.1970**	**2.0519**	**1.6698**	**2.5400e-003**		**0.1155**	**0.1155**		**0.1063**	**0.1063**	**0.0000**	**223.5906**	**223.5906**	**0.0723**	**0.0000**	**225.3985**

3.5 Building Construction - 2020

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	0.0261	0.8161	0.1759	1.9200e-003	0.0456	3.7900e-003	0.0494	0.0132	3.6200e-003	0.0168	0.0000	183.6495	183.6495	0.0106	0.0000	183.9136
Worker	0.1903	0.1404	1.4396	4.2800e-003	0.4350	3.0200e-003	0.4380	0.1157	2.7800e-003	0.1185	0.0000	386.7110	386.7110	9.9800e-003	0.0000	386.9606
Total	**0.2163**	**0.9565**	**1.6154**	**6.2000e-003**	**0.4806**	**6.8100e-003**	**0.4874**	**0.1289**	**6.4000e-003**	**0.1353**	**0.0000**	**570.3606**	**570.3606**	**0.0205**	**0.0000**	**570.8742**

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	0.0313	0.1357	1.8149	2.5400e-003		4.1800e-003	4.1800e-003		4.1800e-003	4.1800e-003	0.0000	223.5904	223.5904	0.0723	0.0000	225.3982
Total	**0.0313**	**0.1357**	**1.8149**	**2.5400e-003**		**4.1800e-003**	**4.1800e-003**		**4.1800e-003**	**4.1800e-003**	**0.0000**	**223.5904**	**223.5904**	**0.0723**	**0.0000**	**225.3982**

3.5 Building Construction - 2020

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	0.0261	0.8161	0.1759	1.9200e-003	0.0456	3.7900e-003	0.0494	0.0132	3.6200e-003	0.0168	0.0000	183.6495	183.6495	0.0106	0.0000	183.9136
Worker	0.1903	0.1404	1.4396	4.2800e-003	0.4350	3.0200e-003	0.4380	0.1157	2.7800e-003	0.1185	0.0000	386.7110	386.7110	9.9800e-003	0.0000	386.9606
Total	**0.2163**	**0.9565**	**1.6154**	**6.2000e-003**	**0.4806**	**6.8100e-003**	**0.4874**	**0.1289**	**6.4000e-003**	**0.1353**	**0.0000**	**570.3606**	**570.3606**	**0.0205**	**0.0000**	**570.8742**

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	0.0238	0.2462	0.2256	3.5000e-004		0.0134	0.0134		0.0123	0.0123	0.0000	30.7203	30.7203	9.9400e-003	0.0000	30.9687
Total	**0.0238**	**0.2462**	**0.2256**	**3.5000e-004**		**0.0134**	**0.0134**		**0.0123**	**0.0123**	**0.0000**	**30.7203**	**30.7203**	**9.9400e-003**	**0.0000**	**30.9687**

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	2.9500e-003	0.1020	0.0216	2.6000e-004	6.2700e-003	2.1000e-004	6.4800e-003	1.8100e-003	2.0000e-004	2.0200e-003	0.0000	24.9920	24.9920	1.3700e-003	0.0000	25.0263
Worker	0.0241	0.0172	0.1802	5.7000e-004	0.0598	4.0000e-004	0.0602	0.0159	3.7000e-004	0.0163	0.0000	51.2925	51.2925	1.2300e-003	0.0000	51.3232
Total	**0.0271**	**0.1193**	**0.2018**	**8.3000e-004**	**0.0660**	**6.1000e-004**	**0.0667**	**0.0177**	**5.7000e-004**	**0.0183**	**0.0000**	**76.2845**	**76.2845**	**2.6000e-003**	**0.0000**	**76.3495**

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	4.3000e-003	0.0186	0.2494	3.5000e-004		5.7000e-004	5.7000e-004		5.7000e-004	5.7000e-004	0.0000	30.7203	30.7203	9.9400e-003	0.0000	30.9687
Total	**4.3000e-003**	**0.0186**	**0.2494**	**3.5000e-004**		**5.7000e-004**	**5.7000e-004**		**5.7000e-004**	**5.7000e-004**	**0.0000**	**30.7203**	**30.7203**	**9.9400e-003**	**0.0000**	**30.9687**

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	2.9500e-003	0.1020	0.0216	2.6000e-004	6.2700e-003	2.1000e-004	6.4800e-003	1.8100e-003	2.0000e-004	2.0200e-003	0.0000	24.9920	24.9920	1.3700e-003	0.0000	25.0263
Worker	0.0241	0.0172	0.1802	5.7000e-004	0.0598	4.0000e-004	0.0602	0.0159	3.7000e-004	0.0163	0.0000	51.2925	51.2925	1.2300e-003	0.0000	51.3232
Total	**0.0271**	**0.1193**	**0.2018**	**8.3000e-004**	**0.0660**	**6.1000e-004**	**0.0667**	**0.0177**	**5.7000e-004**	**0.0183**	**0.0000**	**76.2845**	**76.2845**	**2.6000e-003**	**0.0000**	**76.3495**

3.6 Paving - 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	6.8100e-003	0.0702	0.0771	1.1000e-004		3.8800e-003	3.8800e-003		3.5700e-003	3.5700e-003	0.0000	10.0221	10.0221	3.2400e-003	0.0000	10.1031
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**6.8100e-003**	**0.0702**	**0.0771**	**1.1000e-004**		**3.8800e-003**	**3.8800e-003**		**3.5700e-003**	**3.5700e-003**	**0.0000**	**10.0221**	**10.0221**	**3.2400e-003**	**0.0000**	**10.1031**

3.6 Paving - 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	3.2000e-004	2.3000e-004	2.3800e-003	1.0000e-005	7.9000e-004	1.0000e-005	8.0000e-004	2.1000e-004	0.0000	2.2000e-004	0.0000	0.6785	0.6785	2.0000e-005	0.0000	0.6789
Total	**3.2000e-004**	**2.3000e-004**	**2.3800e-003**	**1.0000e-005**	**7.9000e-004**	**1.0000e-005**	**8.0000e-004**	**2.1000e-004**	**0.0000**	**2.2000e-004**	**0.0000**	**0.6785**	**0.6785**	**2.0000e-005**	**0.0000**	**0.6789**

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	1.4000e-003	6.0600e-003	0.0863	1.1000e-004		1.9000e-004	1.9000e-004		1.9000e-004	1.9000e-004	0.0000	10.0220	10.0220	3.2400e-003	0.0000	10.1031
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.4000e-003**	**6.0600e-003**	**0.0863**	**1.1000e-004**		**1.9000e-004**	**1.9000e-004**		**1.9000e-004**	**1.9000e-004**	**0.0000**	**10.0220**	**10.0220**	**3.2400e-003**	**0.0000**	**10.1031**

3.6 Paving - 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	3.2000e-004	2.3000e-004	2.3800e-003	1.0000e-005	7.9000e-004	1.0000e-005	8.0000e-004	2.1000e-004	0.0000	2.2000e-004	0.0000	0.6785	0.6785	2.0000e-005	0.0000	0.6789
Total	**3.2000e-004**	**2.3000e-004**	**2.3800e-003**	**1.0000e-005**	**7.9000e-004**	**1.0000e-005**	**8.0000e-004**	**2.1000e-004**	**0.0000**	**2.2000e-004**	**0.0000**	**0.6785**	**0.6785**	**2.0000e-005**	**0.0000**	**0.6789**

3.7 Architectural Coating - 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					
Archit. Coating	2.0588					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.7400e-003	0.0191	0.0227	4.0000e-005		1.1800e-003	1.1800e-003		1.1800e-003	1.1800e-003	0.0000	3.1916	3.1916	2.2000e-004	0.0000	3.1970
Total	**2.0615**	**0.0191**	**0.0227**	**4.0000e-005**		**1.1800e-003**	**1.1800e-003**		**1.1800e-003**	**1.1800e-003**	**0.0000**	**3.1916**	**3.1916**	**2.2000e-004**	**0.0000**	**3.1970**

3.7 Architectural Coating - 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	2.1600e-003	1.5400e-003	0.0161	5.0000e-005	5.3400e-003	4.0000e-005	5.3700e-003	1.4200e-003	3.0000e-005	1.4500e-003	0.0000	4.5797	4.5797	1.1000e-004	0.0000	4.5824
Total	**2.1600e-003**	**1.5400e-003**	**0.0161**	**5.0000e-005**	**5.3400e-003**	**4.0000e-005**	**5.3700e-003**	**1.4200e-003**	**3.0000e-005**	**1.4500e-003**	**0.0000**	**4.5797**	**4.5797**	**1.1000e-004**	**0.0000**	**4.5824**

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	2.0588					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.7000e-004	1.6100e-003	0.0229	4.0000e-005		5.0000e-005	5.0000e-005		5.0000e-005	5.0000e-005	0.0000	3.1916	3.1916	2.2000e-004	0.0000	3.1970
Total	**2.0591**	**1.6100e-003**	**0.0229**	**4.0000e-005**		**5.0000e-005**	**5.0000e-005**		**5.0000e-005**	**5.0000e-005**	**0.0000**	**3.1916**	**3.1916**	**2.2000e-004**	**0.0000**	**3.1970**

3.7 Architectural Coating - 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	2.1600e-003	1.5400e-003	0.0161	5.0000e-005	5.3400e-003	4.0000e-005	5.3700e-003	1.4200e-003	3.0000e-005	1.4500e-003	0.0000	4.5797	4.5797	1.1000e-004	0.0000	4.5824
Total	**2.1600e-003**	**1.5400e-003**	**0.0161**	**5.0000e-005**	**5.3400e-003**	**4.0000e-005**	**5.3700e-003**	**1.4200e-003**	**3.0000e-005**	**1.4500e-003**	**0.0000**	**4.5797**	**4.5797**	**1.1000e-004**	**0.0000**	**4.5824**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.3102	2.0930	3.3414	0.0127	0.9816	0.0121	0.9937	0.2639	0.0114	0.2752	0.0000	1,174.9844	1,174.9844	0.0511	0.0000	1,176.2612
Unmitigated	0.3102	2.0930	3.3414	0.0127	0.9816	0.0121	0.9937	0.2639	0.0114	0.2752	0.0000	1,174.9844	1,174.9844	0.0511	0.0000	1,176.2612

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments High Rise	1,043.80	1,237.21	905.65	2,429,001	2,429,001
Enclosed Parking with Elevator	0.00	0.00	0.00		
Regional Shopping Center	115.45	135.10	68.25	195,519	195,519
Total	1,159.25	1,372.31	973.90	2,624,519	2,624,519

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments High Rise	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3
Enclosed Parking with Elevator	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Regional Shopping Center	9.50	7.30	7.30	16.30	64.70	19.00	54	35	11

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Enclosed Parking with Elevator	0.560371	0.039285	0.190378	0.108244	0.016023	0.005202	0.023981	0.045200	0.002184	0.002561	0.005524	0.000326	0.000721
Apartments High Rise	0.560371	0.039285	0.190378	0.108244	0.016023	0.005202	0.023981	0.045200	0.002184	0.002561	0.005524	0.000326	0.000721
Regional Shopping Center	0.560371	0.039285	0.190378	0.108244	0.016023	0.005202	0.023981	0.045200	0.002184	0.002561	0.005524	0.000326	0.000721

5.0 Energy Detail

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	607.7865	607.7865	0.0275	5.6900e-003	610.1680
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	607.7865	607.7865	0.0275	5.6900e-003	610.1680
NaturalGas Mitigated	0.0150	0.1280	0.0549	8.2000e-004		0.0103	0.0103		0.0103	0.0103	0.0000	148.1108	148.1108	2.8400e-003	2.7200e-003	148.9909
NaturalGas Unmitigated	0.0150	0.1280	0.0549	8.2000e-004		0.0103	0.0103		0.0103	0.0103	0.0000	148.1108	148.1108	2.8400e-003	2.7200e-003	148.9909

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments High Rise	2.75339e+006	0.0149	0.1269	0.0540	8.1000e-004		0.0103	0.0103		0.0103	0.0103	0.0000	146.9314	146.9314	2.8200e-003	2.6900e-003	147.8046
Enclosed Parking with Elevator	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
Regional Shopping Center	22100	1.2000e-004	1.0800e-003	9.1000e-004	1.0000e-005		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005	0.0000	1.1793	1.1793	2.0000e-005	2.0000e-005	1.1864
Total		**0.0150**	**0.1280**	**0.0549**	**8.2000e-004**		**0.0103**	**0.0103**		**0.0103**	**0.0103**	**0.0000**	**148.1108**	**148.1108**	**2.8400e-003**	**2.7100e-003**	**148.9909**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments High Rise	2.75339e+006	0.0149	0.1269	0.0540	8.1000e-004		0.0103	0.0103		0.0103	0.0103	0.0000	146.9314	146.9314	2.8200e-003	2.6900e-003	147.8046
Enclosed Parking with Elevator	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
Regional Shopping Center	22100	1.2000e-004	1.0800e-003	9.1000e-004	1.0000e-005		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005	0.0000	1.1793	1.1793	2.0000e-005	2.0000e-005	1.1864
Total		**0.0150**	**0.1280**	**0.0549**	**8.2000e-004**		**0.0103**	**0.0103**		**0.0103**	**0.0103**	**0.0000**	**148.1108**	**148.1108**	**2.8400e-003**	**2.7100e-003**	**148.9909**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments High Rise	1.2811e+006	372.6881	0.0169	3.4900e-003	374.1484
Enclosed Parking with Elevator	756444	220.0583	9.9500e-003	2.0600e-003	220.9205
Regional Shopping Center	51700	15.0401	6.8000e-004	1.4000e-004	15.0991
Total		**607.7865**	**0.0275**	**5.6900e-003**	**610.1680**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments High Rise	1.2811e+006	372.6881	0.0169	3.4900e-003	374.1484
Enclosed Parking with Elevator	756444	220.0583	9.9500e-003	2.0600e-003	220.9205
Regional Shopping Center	51700	15.0401	6.8000e-004	1.4000e-004	15.0991
Total		**607.7865**	**0.0275**	**5.6900e-003**	**610.1680**

6.0 Area Detail

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	1.4196	0.0558	2.2956	3.1000e-004		0.0150	0.0150		0.0150	0.0150	0.0000	37.8069	37.8069	4.2500e-003	6.2000e-004	38.0994
Unmitigated	1.4196	0.0558	2.2956	3.1000e-004		0.0150	0.0150		0.0150	0.0150	0.0000	37.8069	37.8069	4.2500e-003	6.2000e-004	38.0994

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	0.2059					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.1412					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	3.4400e-003	0.0294	0.0125	1.9000e-004		2.3800e-003	2.3800e-003		2.3800e-003	2.3800e-003	0.0000	34.0811	34.0811	6.5000e-004	6.2000e-004	34.2837
Landscaping	0.0690	0.0263	2.2831	1.2000e-004		0.0126	0.0126		0.0126	0.0126	0.0000	3.7257	3.7257	3.6000e-003	0.0000	3.8157
Total	**1.4196**	**0.0558**	**2.2956**	**3.1000e-004**		**0.0150**	**0.0150**		**0.0150**	**0.0150**	**0.0000**	**37.8069**	**37.8069**	**4.2500e-003**	**6.2000e-004**	**38.0993**

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	0.2059					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.1412					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	3.4400e-003	0.0294	0.0125	1.9000e-004		2.3800e-003	2.3800e-003		2.3800e-003	2.3800e-003	0.0000	34.0811	34.0811	6.5000e-004	6.2000e-004	34.2837
Landscaping	0.0690	0.0263	2.2831	1.2000e-004		0.0126	0.0126		0.0126	0.0126	0.0000	3.7257	3.7257	3.6000e-003	0.0000	3.8157
Total	**1.4196**	**0.0558**	**2.2956**	**3.1000e-004**		**0.0150**	**0.0150**		**0.0150**	**0.0150**	**0.0000**	**37.8069**	**37.8069**	**4.2500e-003**	**6.2000e-004**	**38.0993**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	44.4922	0.0216	0.0129	48.8770
Unmitigated	44.4922	0.0216	0.0129	48.8770

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments High Rise	16.0018 / 12.6101	43.6898	0.0212	0.0127	47.9949
Enclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	0.29629 / 0.226996	0.8024	3.9000e-004	2.3000e-004	0.8820
Total		**44.4922**	**0.0216**	**0.0129**	**48.8770**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments High Rise	16.0018 / 12.6101	43.6898	0.0212	0.0127	47.9949
Enclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	0.29629 / 0.226996	0.8024	3.9000e-004	2.3000e-004	0.8820
Total		**44.4922**	**0.0216**	**0.0129**	**48.8770**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	29.7321	1.7571	0.0000	73.6600
Unmitigated	29.7321	1.7571	0.0000	73.6600

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments High Rise	141.22	28.6664	1.6941	0.0000	71.0198
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	5.25	1.0657	0.0630	0.0000	2.6402
Total		**29.7321**	**1.7571**	**0.0000**	**73.6600**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments High Rise	141.22	28.6664	1.6941	0.0000	71.0198
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	5.25	1.0657	0.0630	0.0000	2.6402
Total		**29.7321**	**1.7571**	**0.0000**	**73.6600**

9.0 Operational Offroad

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
Emergency Generator	1	1	50	1000	0.73	Diesel

Boilers

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

User Defined Equipment

Equipment Type	Number

10.1 Stationary Sources

Unmitigated/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
Equipment Type	tons/yr										MT/yr					
Emergency Generator - Diesel (750 - 9999 HP)	0.0410	0.1835	0.1046	2.0000e-004		6.0400e-003	6.0400e-003		6.0400e-003	6.0400e-003	0.0000	19.0399	19.0399	2.6700e-003	0.0000	19.1066
Total	**0.0410**	**0.1835**	**0.1046**	**2.0000e-004**		**6.0400e-003**	**6.0400e-003**		**6.0400e-003**	**6.0400e-003**	**0.0000**	**19.0399**	**19.0399**	**2.6700e-003**	**0.0000**	**19.1066**

11.0 Vegetation

1750 Broadway - Existing Uses

Alameda County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	14.50	1000sqft	0.65	14,500.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	63
Climate Zone	5			**Operational Year**	2019
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Project information

Vehicle Trips - Adjusted based on traffic report

Energy Use - Using historical energy use

Table Name	Column Name	Default Value	New Value
tblEnergyUse	LightingElect	4.34	3.67
tblEnergyUse	T24E	5.42	4.30
tblEnergyUse	T24NG	22.58	18.41
tblLandUse	LotAcreage	0.33	0.65
tblProjectCharacteristics	OperationalYear	2018	2019
tblVehicleTrips	ST_TR	2.46	1.62
tblVehicleTrips	SU_TR	1.05	0.69
tblVehicleTrips	WD_TR	11.03	7.26

2.0 Emissions Summary

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					
2017	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
Maximum	**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**

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					
2017	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
Maximum	**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**

	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)
		Highest		

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0642	0.0000	1.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.6000e-004	2.6000e-004	0.0000	0.0000	2.8000e-004
Energy	1.5200e-003	0.0138	0.0116	8.0000e-005		1.0500e-003	1.0500e-003		1.0500e-003	1.0500e-003	0.0000	68.8933	68.8933	2.7200e-003	7.8000e-004	69.1937
Mobile	0.0280	0.1766	0.3115	9.9000e-004	0.0715	1.3800e-003	0.0729	0.0192	1.3000e-003	0.0205	0.0000	90.7617	90.7617	4.3300e-003	0.0000	90.8700
Waste						0.0000	0.0000		0.0000	0.0000	2.7384	0.0000	2.7384	0.1618	0.0000	6.7841
Water						0.0000	0.0000		0.0000	0.0000	0.8176	5.6650	6.4826	0.0842	2.0400e-003	9.1951
Total	**0.0937**	**0.1904**	**0.3232**	**1.0700e-003**	**0.0715**	**2.4300e-003**	**0.0739**	**0.0192**	**2.3500e-003**	**0.0216**	**3.5560**	**165.3203**	**168.8763**	**0.2531**	**2.8200e-003**	**176.0432**

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	0.0642	0.0000	1.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.6000e-004	2.6000e-004	0.0000	0.0000	2.8000e-004
Energy	1.5200e-003	0.0138	0.0116	8.0000e-005		1.0500e-003	1.0500e-003		1.0500e-003	1.0500e-003	0.0000	68.8933	68.8933	2.7200e-003	7.8000e-004	69.1937
Mobile	0.0280	0.1766	0.3115	9.9000e-004	0.0715	1.3800e-003	0.0729	0.0192	1.3000e-003	0.0205	0.0000	90.7617	90.7617	4.3300e-003	0.0000	90.8700
Waste						0.0000	0.0000		0.0000	0.0000	2.7384	0.0000	2.7384	0.1618	0.0000	6.7841
Water						0.0000	0.0000		0.0000	0.0000	0.8176	5.6650	6.4826	0.0842	2.0400e-003	9.1951
Total	**0.0937**	**0.1904**	**0.3232**	**1.0700e-003**	**0.0715**	**2.4300e-003**	**0.0739**	**0.0192**	**2.3500e-003**	**0.0216**	**3.5560**	**165.3203**	**168.8763**	**0.2531**	**2.8200e-003**	**176.0432**

	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	Architectural Coating	Architectural Coating	10/30/2017	10/29/2017	5	5	
2	Building Construction	Building Construction	10/30/2017	10/29/2017	5	100	
3	Demolition	Demolition	10/30/2017	10/29/2017	5	10	
4	Grading	Grading	10/30/2017	10/29/2017	5	2	
5	Paving	Paving	10/30/2017	10/29/2017	5	5	
6	Site Preparation	Site Preparation	10/30/2017	10/29/2017	5	1	

Acres of Grading (Site Preparation Phase): 0.5

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 21,750; Non-Residential Outdoor: 7,250; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Cement and Mortar Mixers	4	6.00	9	0.56
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Grading	Concrete/Industrial Saws	1	8.00	81	0.73
Building Construction	Cranes	1	4.00	231	0.29
Building Construction	Forklifts	2	6.00	89	0.20
Site Preparation	Graders	1	8.00	187	0.41
Paving	Pavers	1	7.00	130	0.42
Paving	Rollers	1	7.00	80	0.38
Demolition	Rubber Tired Dozers	1	1.00	247	0.40
Grading	Rubber Tired Dozers	1	1.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Demolition	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Grading	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Paving	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Architectural Coating	1	1.00	0.00		10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	5	5.00	2.00		10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Demolition	4	10.00	0.00		10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	10.00	0.00		10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	7	18.00	0.00		10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	2	5.00	0.00		10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Architectural Coating - 2017

Unmitigated Construction On-Site

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

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	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
Total	**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**

3.2 Architectural Coating - 2017

Mitigated Construction On-Site

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

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	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
Total	**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**

3.3 Building Construction - 2017

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	0.0000	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
Total	**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**

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	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
Total	**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**

3.3 Building Construction - 2017

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	0.0000	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
Total	**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**

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	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
Total	**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**

3.4 Demolition - 2017

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	0.0000	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
Total	**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**

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	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
Total	**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**

3.4 Demolition - 2017

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	0.0000	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
Total	**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**

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	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
Total	**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**

3.5 Grading - 2017

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	0.0000	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
Off-Road	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
Total	**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**

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	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
Total	**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**

3.5 Grading - 2017

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	0.0000	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
Off-Road	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
Total	**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**

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	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
Total	**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**

3.6 Paving - 2017

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	0.0000	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
Paving	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
Total	**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**

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	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
Total	**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**

3.6 Paving - 2017

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	0.0000	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
Paving	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
Total	**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**

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	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
Total	**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**

3.7 Site Preparation - 2017

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	0.0000	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
Off-Road	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
Total	**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**

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	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
Total	**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**

3.7 Site Preparation - 2017

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	0.0000	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
Off-Road	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
Total	**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**

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	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
Total	**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**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0280	0.1766	0.3115	9.9000e-004	0.0715	1.3800e-003	0.0729	0.0192	1.3000e-003	0.0205	0.0000	90.7617	90.7617	4.3300e-003	0.0000	90.8700
Unmitigated	0.0280	0.1766	0.3115	9.9000e-004	0.0715	1.3800e-003	0.0729	0.0192	1.3000e-003	0.0205	0.0000	90.7617	90.7617	4.3300e-003	0.0000	90.8700

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Office Building	105.27	23.49	10.01	191,127	191,127
Total	105.27	23.49	10.01	191,127	191,127

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
General Office Building	9.50	7.30	7.30	33.00	48.00	19.00	77	19	4

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Office Building	0.556416	0.041967	0.190895	0.111485	0.018156	0.005234	0.022193	0.041963	0.002079	0.002948	0.005586	0.000300	0.000779

5.0 Energy Detail

Historical Energy Use: Y

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	53.8666	53.8666	2.4400e-003	5.0000e-004	54.0777
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	53.8666	53.8666	2.4400e-003	5.0000e-004	54.0777
NaturalGas Mitigated	1.5200e-003	0.0138	0.0116	8.0000e-005		1.0500e-003	1.0500e-003		1.0500e-003	1.0500e-003	0.0000	15.0267	15.0267	2.9000e-004	2.8000e-004	15.1160
NaturalGas Unmitigated	1.5200e-003	0.0138	0.0116	8.0000e-005		1.0500e-003	1.0500e-003		1.0500e-003	1.0500e-003	0.0000	15.0267	15.0267	2.9000e-004	2.8000e-004	15.1160

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					
General Office Building	281590	1.5200e-003	0.0138	0.0116	8.0000e-005		1.0500e-003	1.0500e-003		1.0500e-003	1.0500e-003	0.0000	15.0267	15.0267	2.9000e-004	2.8000e-004	15.1160
Total		**1.5200e-003**	**0.0138**	**0.0116**	**8.0000e-005**		**1.0500e-003**	**1.0500e-003**		**1.0500e-003**	**1.0500e-003**	**0.0000**	**15.0267**	**15.0267**	**2.9000e-004**	**2.8000e-004**	**15.1160**

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					
General Office Building	281590	1.5200e-003	0.0138	0.0116	8.0000e-005		1.0500e-003	1.0500e-003		1.0500e-003	1.0500e-003	0.0000	15.0267	15.0267	2.9000e-004	2.8000e-004	15.1160
Total		**1.5200e-003**	**0.0138**	**0.0116**	**8.0000e-005**		**1.0500e-003**	**1.0500e-003**		**1.0500e-003**	**1.0500e-003**	**0.0000**	**15.0267**	**15.0267**	**2.9000e-004**	**2.8000e-004**	**15.1160**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Office Building	185165	53.8666	2.4400e-003	5.0000e-004	54.0777
Total		**53.8666**	**2.4400e-003**	**5.0000e-004**	**54.0777**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Office Building	185165	53.8666	2.4400e-003	5.0000e-004	54.0777
Total		**53.8666**	**2.4400e-003**	**5.0000e-004**	**54.0777**

6.0 Area Detail

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	0.0642	0.0000	1.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.6000e-004	2.6000e-004	0.0000	0.0000	2.8000e-004
Unmitigated	0.0642	0.0000	1.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.6000e-004	2.6000e-004	0.0000	0.0000	2.8000e-004

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	7.5600e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0566					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.0000e-005	0.0000	1.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.6000e-004	2.6000e-004	0.0000	0.0000	2.8000e-004
Total	**0.0642**	**0.0000**	**1.3000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.6000e-004**	**2.6000e-004**	**0.0000**	**0.0000**	**2.8000e-004**

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	7.5600e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0566					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.0000e-005	0.0000	1.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.6000e-004	2.6000e-004	0.0000	0.0000	2.8000e-004
Total	**0.0642**	**0.0000**	**1.3000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.6000e-004**	**2.6000e-004**	**0.0000**	**0.0000**	**2.8000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	6.4826	0.0842	2.0400e-003	9.1951
Unmitigated	6.4826	0.0842	2.0400e-003	9.1951

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Office Building	2.57714 / 1.57954	6.4826	0.0842	2.0400e-003	9.1951
Total		**6.4826**	**0.0842**	**2.0400e-003**	**9.1951**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Office Building	2.57714 / 1.57954	6.4826	0.0842	2.0400e-003	9.1951
Total		**6.4826**	**0.0842**	**2.0400e-003**	**9.1951**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	2.7384	0.1618	0.0000	6.7841
Unmitigated	2.7384	0.1618	0.0000	6.7841

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Office Building	13.49	2.7384	0.1618	0.0000	6.7841
Total		**2.7384**	**0.1618**	**0.0000**	**6.7841**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Office Building	13.49	2.7384	0.1618	0.0000	6.7841
Total		**2.7384**	**0.1618**	**0.0000**	**6.7841**

9.0 Operational Offroad

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

3. AERMOD_1750 Broadway_Uncontrolled

```
**
****************************************
**
** AERMOD Input Produced by:
** AERMOD View Ver. 9.0.0
** Lakes Environmental Software Inc.
** Date: 11/27/2017
** File: C:\Lakes\AERMOD View\1750 Broadway\1750 Broadway.ADI
**
****************************************
**
**
****************************************
** AERMOD Control Pathway
****************************************
**
**
CO STARTING
   TITLEONE C:\Lakes\AERMOD View\1750 Broadway\1750 Broadway.isc
   MODELOPT DFAULT CONC
   AVERTIME ANNUAL
   POLLUTID PM_10
   RUNORNOT RUN
   ERRORFIL "1750 Broadway.err"
CO FINISHED
**
****************************************
** AERMOD Source Pathway
****************************************
**
**
SO STARTING
** Source Location **
** Source ID - Type - X Coord. - Y Coord. **
   LOCATION PAREA1       AREAPOLY   564323.018  4184661.222        9.000
** Source Parameters **
   SRCPARAM PAREA1       4.8982E-06     5.000         6
   AREAVERT PAREA1       564323.018 4184661.222 564364.609 4184639.684
   AREAVERT PAREA1       564395.801 4184705.783 564378.720 4184714.695
   AREAVERT PAREA1       564367.579 4184690.187 564343.814 4184702.812

** Variable Emissions Type: "By Hour / Seven Days (HRDOW7)"
** Variable Emission Scenario: "Scenario 1"
   EMISFACT PAREA1       HRDOW7 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT PAREA1       HRDOW7 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0
   EMISFACT PAREA1       HRDOW7 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT PAREA1       HRDOW7 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT PAREA1       HRDOW7 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0
   EMISFACT PAREA1       HRDOW7 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT PAREA1       HRDOW7 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT PAREA1       HRDOW7 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0
   EMISFACT PAREA1       HRDOW7 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT PAREA1       HRDOW7 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
```

```
   EMISFACT PAREA1       HRDOW7 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0
   EMISFACT PAREA1       HRDOW7 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT PAREA1       HRDOW7 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT PAREA1       HRDOW7 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0
   EMISFACT PAREA1       HRDOW7 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT PAREA1       HRDOW7 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT PAREA1       HRDOW7 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT PAREA1       HRDOW7 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT PAREA1       HRDOW7 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT PAREA1       HRDOW7 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT PAREA1       HRDOW7 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
   SRCGROUP SRCGP1   PAREA1
   SRCGROUP ALL
SO FINISHED
**
****************************************
** AERMOD Receptor Pathway
****************************************
**
**
RE STARTING
   INCLUDED "1750 Broadway.rou"
RE FINISHED
**
****************************************
** AERMOD Meteorology Pathway
****************************************
**
**
ME STARTING
   SURFFILE "C:\Users\jni\Desktop\1750 Broadway - 
170514\HRA\724930\724930.SFC"
   PROFFILE "C:\Users\jni\Desktop\1750 Broadway - 
170514\HRA\724930\724930.PFL"
   SURFDATA 23230 2009 OAKLAND/WSO_AP
   UAIRDATA 23230 2009 OAKLAND/WSO_AP
   PROFBASE 10.0 METERS
ME FINISHED
**
****************************************
** AERMOD Output Pathway
****************************************
**
**
OU STARTING
** Auto-Generated Plotfiles
   PLOTFILE ANNUAL ALL "1750 Broadway.AD\AN00GALL.PLT" 31
   PLOTFILE ANNUAL SRCGP1 "1750 Broadway.AD\AN00G001.PLT" 32
   SUMMFILE "1750 Broadway.sum"
OU FINISHED

 ***********************************
 *** SETUP Finishes Successfully ***
 ***********************************
```

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```
 *** AERMOD - VERSION  15181 ***   *** C:\Lakes\AERMOD View\1750
Broadway\1750 Broadway.isc                 ***        11/27/17
 *** AERMET - VERSION  14134 ***   ***
***        06:01:46

PAGE   1
 **MODELOPTs:   RegDFAULT CONC      ELEV      RURAL

                                             ***     MODEL SETUP OPTIONS
SUMMARY       ***
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - -

 **Model Is Setup For Calculation of Average CONCentration Values.

   --  DEPOSITION LOGIC  --
 **NO GAS DEPOSITION Data Provided.
 **NO PARTICLE DEPOSITION Data Provided.
 **Model Uses NO DRY DEPLETION.  DRYDPLT  =  F
 **Model Uses NO WET DEPLETION.  WETDPLT  =  F

 **Model Uses RURAL Dispersion Only.

 **Model Uses Regulatory DEFAULT Options:
         1. Stack-tip Downwash.
         2. Model Accounts for ELEVated Terrain Effects.
         3. Use Calms Processing Routine.
         4. Use Missing Data Processing Routine.
         5. No Exponential Decay.

 **Other Options Specified:
         CCVR_Sub - Meteorological data includes CCVR substitutions
         TEMP_Sub - Meteorological data includes TEMP substitutions

 **Model Assumes No FLAGPOLE Receptor Heights.

 **The User Specified a Pollutant Type of:  PM_10

 **Model Calculates ANNUAL Averages Only

 **This Run Includes:      1 Source(s);       2 Source Group(s); and
2 Receptor(s)

                with:      0 POINT(s), including
                           0 POINTCAP(s) and      0 POINTHOR(s)
                 and:      0 VOLUME source(s)
                 and:      1 AREA type source(s)
                 and:      0 LINE source(s)
                 and:      0 OPENPIT source(s)


 **Model Set To Continue RUNning After the Setup Testing.

 **The AERMET Input Meteorological Data Version Date:  14134
```

```
 **Output Options Selected:
          Model Outputs Tables of ANNUAL Averages by Receptor
          Model Outputs External File(s) of High Values for Plotting
(PLOTFILE Keyword)
          Model Outputs Separate Summary File of High Ranked Values
(SUMMFILE Keyword)

 **NOTE:  The Following Flags May Appear Following CONC Values:  c for
Calm Hours
                                                                 m for
Missing Hours
                                                                 b for
Both Calm and Missing Hours

 **Misc. Inputs:  Base Elev. for Pot. Temp. Profile (m MSL) =    10.00 ;
Decay Coef. =    0.000     ;  Rot. Angle =     0.0
                  Emission Units = GRAMS/SEC
;  Emission Rate Unit Factor =   0.10000E+07
                  Output Units   = MICROGRAMS/M**3

 **Approximate Storage Requirements of Model =      3.5 MB of RAM.

 **Detailed Error/Message File:   1750 Broadway.err
 **File for Summary of Results:   1750 Broadway.sum
```

**MODELOPTs: RegDFAULT CONC ELEV RURAL

*** AREAPOLY SOURCE DATA ***

NUMBER SOURCE ID	EMISSION RATE PART. CATS.	EMISSION RATE (GRAMS/SEC /METER**2)	LOCATION OF AREA X (METERS)	Y (METERS)	BASE ELEV. (METERS)	RELEASE HEIGHT (METERS)	NUMBER OF VERTS.	INIT. SZ	URBAN SOURCE	EMISSION RATE SCALAR VARY BY
PAREA1	0	0.48982E-05	564323.0	4184661.2	9.0	5.00	6	0.00	NO	HRDOW7

**MODELOPTs: RegDFAULT CONC ELEV RURAL

*** SOURCE IDs DEFINING SOURCE GROUPS ***

SRCGROUP ID	SOURCE IDs
SRCGP1	PAREA1 ,
ALL	PAREA1 ,

**MODELOPTs: RegDFAULT CONC ELEV RURAL

* SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY AND BY DAY OF WEEK (HRDOW7) *

SOURCE ID = PAREA1 ; SOURCE TYPE = AREAPOLY :

HOUR	SCALAR	HOUR	SCALAR	HOUR	SCALAR	HOUR	SCALAR	HOUR	SCALAR	HOUR	SCALAR	HOUR	SCALAR	HOUR	SCALAR
DAY OF WEEK = MONDAY															
1	.0000E+00	2	.0000E+00	3	.0000E+00	4	.0000E+00	5	.0000E+00	6	.0000E+00	7	.0000E+00	8	.0000E+00
9	.1000E+01	10	.1000E+01	11	.1000E+01	12	.1000E+01	13	.1000E+01	14	.1000E+01	15	.1000E+01	16	.1000E+01
17	.0000E+00	18	.0000E+00	19	.0000E+00	20	.0000E+00	21	.0000E+00	22	.0000E+00	23	.0000E+00	24	.0000E+00
DAY OF WEEK = TUESDAY															
1	.0000E+00	2	.0000E+00	3	.0000E+00	4	.0000E+00	5	.0000E+00	6	.0000E+00	7	.0000E+00	8	.0000E+00
9	.1000E+01	10	.1000E+01	11	.1000E+01	12	.1000E+01	13	.1000E+01	14	.1000E+01	15	.1000E+01	16	.1000E+01
17	.0000E+00	18	.0000E+00	19	.0000E+00	20	.0000E+00	21	.0000E+00	22	.0000E+00	23	.0000E+00	24	.0000E+00
DAY OF WEEK = WEDNESDY															
1	.0000E+00	2	.0000E+00	3	.0000E+00	4	.0000E+00	5	.0000E+00	6	.0000E+00	7	.0000E+00	8	.0000E+00
9	.1000E+01	10	.1000E+01	11	.1000E+01	12	.1000E+01	13	.1000E+01	14	.1000E+01	15	.1000E+01	16	.1000E+01
17	.0000E+00	18	.0000E+00	19	.0000E+00	20	.0000E+00	21	.0000E+00	22	.0000E+00	23	.0000E+00	24	.0000E+00
DAY OF WEEK = THURSDAY															
1	.0000E+00	2	.0000E+00	3	.0000E+00	4	.0000E+00	5	.0000E+00	6	.0000E+00	7	.0000E+00	8	.0000E+00
9	.1000E+01	10	.1000E+01	11	.1000E+01	12	.1000E+01	13	.1000E+01	14	.1000E+01	15	.1000E+01	16	.1000E+01
17	.0000E+00	18	.0000E+00	19	.0000E+00	20	.0000E+00	21	.0000E+00	22	.0000E+00	23	.0000E+00	24	.0000E+00
DAY OF WEEK = FRIDAY															
1	.0000E+00	2	.0000E+00	3	.0000E+00	4	.0000E+00	5	.0000E+00	6	.0000E+00	7	.0000E+00	8	.0000E+00
9	.1000E+01	10	.1000E+01	11	.1000E+01	12	.1000E+01	13	.1000E+01	14	.1000E+01	15	.1000E+01	16	.1000E+01
17	.0000E+00	18	.0000E+00	19	.0000E+00	20	.0000E+00	21	.0000E+00	22	.0000E+00	23	.0000E+00	24	.0000E+00
DAY OF WEEK = SATURDAY															
1	.0000E+00	2	.0000E+00	3	.0000E+00	4	.0000E+00	5	.0000E+00	6	.0000E+00	7	.0000E+00	8	.0000E+00

```
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00   13
.0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00   21
.0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                 DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00    5
.0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00   13
.0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00   21
.0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
```

**MODELOPTs: RegDFAULT CONC ELEV RURAL

*** DISCRETE CARTESIAN RECEPTORS ***
(X-COORD, Y-COORD, ZELEV, ZHILL, ZFLAG)
(METERS)

(564361.6, 4184711.0, 8.0, 8.0, 0.0); (564346.0, 4184563.2, 10.0, 10.0, 0.0);

**MODELOPTs: RegDFAULT CONC   ELEV   RURAL

*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
(1=YES; 0=NO)

```
            1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
            1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
            1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
            1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
            1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
            1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
            1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
            1 1 1 1 1 1 1 1 1 1   1 1 1 1 1
```

NOTE: METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
(METERS/SEC)

1.54,   3.09,   5.14,   8.23, 10.80,

**MODELOPTs: RegDFAULT CONC ELEV RURAL

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: C:\Users\jni\Desktop\1750 Broadway - 170514\HRA\724930\724930.SFC Met Version: 14134
Profile file: C:\Users\jni\Desktop\1750 Broadway - 170514\HRA\724930\724930.PFL
Surface format: FREE
Profile format: FREE
Surface station no.: 23230 Upper air station no.: 23230
Name: OAKLAND/WSO_AP Name: OAKLAND/WSO_AP
Year: 2009 Year: 2009

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
09	01	01	1	01	-17.2	0.303	-9.000	-9.000	-999.	401.	147.2	0.63	0.86	1.00	2.36	81.	10.0	282.5	2.0
09	01	01	1	02	-21.8	0.383	-9.000	-9.000	-999.	569.	234.6	0.63	0.86	1.00	2.86	68.	10.0	282.0	2.0
09	01	01	1	03	-26.3	0.460	-9.000	-9.000	-999.	749.	337.1	0.63	0.86	1.00	3.36	84.	10.0	280.9	2.0
09	01	01	1	04	-15.4	0.270	-9.000	-9.000	-999.	368.	116.1	0.47	0.86	1.00	2.36	53.	10.0	280.9	2.0
09	01	01	1	05	-26.3	0.460	-9.000	-9.000	-999.	749.	336.3	0.63	0.86	1.00	3.36	73.	10.0	280.4	2.0
09	01	01	1	06	-21.9	0.383	-9.000	-9.000	-999.	573.	232.9	0.63	0.86	1.00	2.86	82.	10.0	280.4	2.0
09	01	01	1	07	-22.0	0.383	-9.000	-9.000	-999.	569.	232.5	0.63	0.86	1.00	2.86	95.	10.0	279.9	2.0
09	01	01	1	08	-11.2	0.196	-9.000	-9.000	-999.	238.	60.6	0.63	0.86	0.76	1.76	73.	10.0	279.9	2.0
09	01	01	1	09	-2.2	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.45	0.86	0.39	0.00	0.	10.0	280.4	2.0
09	01	01	1	10	6.8	0.266	0.264	0.016	98.	329.	-250.8	0.63	0.86	0.27	1.76	91.	10.0	280.9	2.0
09	01	01	1	11	15.5	-9.000	-9.000	-9.000	177.	-999.	-99999.0	0.45	0.86	0.22	0.00	0.	10.0	282.0	2.0
09	01	01	1	12	96.1	0.393	1.019	0.014	401.	591.	-57.4	0.22	0.86	0.21	3.36	266.	10.0	281.4	2.0

```
 09 01 01   1 13  102.5  0.395  1.092  0.014  462.  595.    -54.4  0.22
0.86   0.20    3.36  283.   10.0  282.0    2.0
 09 01 01   1 14   89.9  0.297  1.066  0.015  489.  394.    -26.5  0.22
0.86   0.21    2.36  249.   10.0  282.0    2.0
 09 01 01   1 15   62.1  0.383  0.954  0.014  507.  569.    -82.1  0.22
0.86   0.24    3.36  242.   10.0  282.5    2.0
 09 01 01   1 16   23.1  0.665  0.690  0.006  513. 1300.  -1150.4  0.52
0.86   0.33    4.86  304.   10.0  282.5    2.0
 09 01 01   1 17  -37.0  0.486 -9.000 -9.000 -999.  846.    280.6  0.22
0.86   0.56    4.86  291.   10.0  281.4    2.0
 09 01 01   1 18  -52.2  0.480 -9.000 -9.000 -999.  799.    191.9  0.52
0.86   1.00    3.86  307.   10.0  280.9    2.0
 09 01 01   1 19  -25.6  0.224 -9.000 -9.000 -999.  327.     39.8  0.52
0.86   1.00    2.36  334.   10.0  280.4    2.0
 09 01 01   1 20  -11.1  0.119 -9.000 -9.000 -999.  115.     13.8  0.52
0.86   1.00    1.76  317.   10.0  280.4    2.0
 09 01 01   1 21  -10.3  0.119 -9.000 -9.000 -999.   98.     14.7  0.52
0.86   1.00    1.76  320.   10.0  280.4    2.0
 09 01 01   1 22 -999.0 -9.000 -9.000 -9.000 -999. -999. -99999.0  0.45
0.86   1.00    0.00    0.   10.0  280.9    2.0
 09 01 01   1 23 -999.0 -9.000 -9.000 -9.000 -999. -999. -99999.0  0.45
0.86   1.00    0.00    0.   10.0  281.4    2.0
 09 01 01   1 24 -999.0 -9.000 -9.000 -9.000 -999. -999. -99999.0  0.45
0.86   1.00    0.00    0.   10.0  281.4    2.0


 First hour of profile data
 YR MO DY HR HEIGHT F  WDIR    WSPD AMB_TMP sigmaA  sigmaW  sigmaV
 09 01 01 01   10.0 1   81.    2.36   282.6   99.0  -99.00  -99.00

 F indicates top of profile (=1) or below (=0)
```

**MODELOPTs: RegDFAULT CONC ELEV RURAL

*** THE ANNUAL AVERAGE CONCENTRATION VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: SRCGP1 ***
INCLUDING SOURCE(S): PAREA1 ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM_10 IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
564361.64	4184710.98	0.36551	564346.04	4184563.19	0.01025

**MODELOPTs: RegDFAULT CONC ELEV RURAL

*** THE ANNUAL AVERAGE CONCENTRATION VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: ALL ***
INCLUDING SOURCE(S): PAREA1 ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM_10 IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
564361.64	4184710.98	0.36551	564346.04	4184563.19	0.01025

**MODELOPTs: RegDFAULT CONC ELEV RURAL

*** THE SUMMARY OF MAXIMUM ANNUAL RESULTS AVERAGED OVER 5 YEARS ***

** CONC OF PM_10 IN MICROGRAMS/M**3 **

NETWORK GROUP ID	AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	GRID-ID
SRCGP1	1ST HIGHEST VALUE IS	0.36551 AT (564361.64, 4184710.98, 8.00, 8.00, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.01025 AT (564346.04, 4184563.19, 10.00, 10.00, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.00000 AT (0.00, 0.00, 0.00, 0.00, 0.00)		
	4TH HIGHEST VALUE IS	0.00000 AT (0.00, 0.00, 0.00, 0.00, 0.00)		
	5TH HIGHEST VALUE IS	0.00000 AT (0.00, 0.00, 0.00, 0.00, 0.00)		
	6TH HIGHEST VALUE IS	0.00000 AT (0.00, 0.00, 0.00, 0.00, 0.00)		
	7TH HIGHEST VALUE IS	0.00000 AT (0.00, 0.00, 0.00, 0.00, 0.00)		
	8TH HIGHEST VALUE IS	0.00000 AT (0.00, 0.00, 0.00, 0.00, 0.00)		
	9TH HIGHEST VALUE IS	0.00000 AT (0.00, 0.00, 0.00, 0.00, 0.00)		
	10TH HIGHEST VALUE IS	0.00000 AT (0.00, 0.00, 0.00, 0.00, 0.00)		
ALL	1ST HIGHEST VALUE IS	0.36551 AT (564361.64, 4184710.98, 8.00, 8.00, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.01025 AT (564346.04, 4184563.19, 10.00, 10.00, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.00000 AT (0.00, 0.00, 0.00, 0.00, 0.00)		
	4TH HIGHEST VALUE IS	0.00000 AT (0.00, 0.00, 0.00, 0.00, 0.00)		
	5TH HIGHEST VALUE IS	0.00000 AT (0.00, 0.00, 0.00, 0.00, 0.00)		

```
          6TH HIGHEST VALUE IS       0.00000 AT (       0.00,
0.00,     0.00,     0.00,    0.00)
          7TH HIGHEST VALUE IS       0.00000 AT (       0.00,
0.00,     0.00,     0.00,    0.00)
          8TH HIGHEST VALUE IS       0.00000 AT (       0.00,
0.00,     0.00,     0.00,    0.00)
          9TH HIGHEST VALUE IS       0.00000 AT (       0.00,
0.00,     0.00,     0.00,    0.00)
         10TH HIGHEST VALUE IS       0.00000 AT (       0.00,
0.00,     0.00,     0.00,    0.00)


 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
```

**MODELOPTs: RegDFAULT CONC ELEV RURAL

*** Message Summary : AERMOD Model Execution ***

--------- Summary of Total Messages --------

A Total of 0 Fatal Error Message(s)
A Total of 1 Warning Message(s)
A Total of 7953 Informational Message(s)

A Total of 43872 Hours Were Processed

A Total of 7152 Calm Hours Identified

A Total of 801 Missing Hours Identified (1.83 Percent)

******** FATAL ERROR MESSAGES ********
*** NONE ***

******** WARNING MESSAGES ********
MX W481 43873 MAIN: Data Remaining After End of Year. Number of Hours= 48

****
*** AERMOD Finishes Successfully ***
****

4. AERMOD_1750 Broadway_Tier4Final

```
**
****************************************
**
** AERMOD Input Produced by:
** AERMOD View Ver. 9.0.0
** Lakes Environmental Software Inc.
** Date: 11/27/2017
** File: C:\Lakes\AERMOD View\1750 Broadway\1750 Broadway.ADI
**
****************************************
**
**
****************************************
** AERMOD Control Pathway
****************************************
**
**
CO STARTING
   TITLEONE C:\Lakes\AERMOD View\1750 Broadway\1750 Broadway.isc
   MODELOPT DFAULT CONC
   AVERTIME ANNUAL
   POLLUTID PM_10
   RUNORNOT RUN
   ERRORFIL "1750 Broadway.err"
CO FINISHED
**
****************************************
** AERMOD Source Pathway
****************************************
**
**
SO STARTING
** Source Location **
** Source ID - Type - X Coord. - Y Coord. **
   LOCATION PAREA1       AREAPOLY   564323.018  4184661.222        9.000
** Source Parameters **
   SRCPARAM PAREA1       1.9578E-07     5.000         6
   AREAVERT PAREA1       564323.018 4184661.222 564364.609 4184639.684
   AREAVERT PAREA1       564395.801 4184705.783 564378.720 4184714.695
   AREAVERT PAREA1       564367.579 4184690.187 564343.814 4184702.812

** Variable Emissions Type: "By Hour / Seven Days (HRDOW7)"
** Variable Emission Scenario: "Scenario 1"
   EMISFACT PAREA1       HRDOW7 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT PAREA1       HRDOW7 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0
   EMISFACT PAREA1       HRDOW7 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT PAREA1       HRDOW7 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT PAREA1       HRDOW7 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0
   EMISFACT PAREA1       HRDOW7 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT PAREA1       HRDOW7 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT PAREA1       HRDOW7 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0
   EMISFACT PAREA1       HRDOW7 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT PAREA1       HRDOW7 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
```

```
   EMISFACT PAREA1       HRDOW7 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0
   EMISFACT PAREA1       HRDOW7 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT PAREA1       HRDOW7 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT PAREA1       HRDOW7 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0
   EMISFACT PAREA1       HRDOW7 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT PAREA1       HRDOW7 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT PAREA1       HRDOW7 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT PAREA1       HRDOW7 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT PAREA1       HRDOW7 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT PAREA1       HRDOW7 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT PAREA1       HRDOW7 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
   SRCGROUP SRCGP1   PAREA1
   SRCGROUP ALL
SO FINISHED
**
****************************************
** AERMOD Receptor Pathway
****************************************
**
**
RE STARTING
   INCLUDED "1750 Broadway.rou"
RE FINISHED
**
****************************************
** AERMOD Meteorology Pathway
****************************************
**
**
ME STARTING
   SURFFILE "C:\Users\jni\Desktop\1750 Broadway -
170514\HRA\724930\724930.SFC"
   PROFFILE "C:\Users\jni\Desktop\1750 Broadway -
170514\HRA\724930\724930.PFL"
   SURFDATA 23230 2009 OAKLAND/WSO_AP
   UAIRDATA 23230 2009 OAKLAND/WSO_AP
   PROFBASE 10.0 METERS
ME FINISHED
**
****************************************
** AERMOD Output Pathway
****************************************
**
**
OU STARTING
** Auto-Generated Plotfiles
   PLOTFILE ANNUAL ALL "1750 Broadway.AD\AN00GALL.PLT" 31
   PLOTFILE ANNUAL SRCGP1 "1750 Broadway.AD\AN00G001.PLT" 32
   SUMMFILE "1750 Broadway.sum"
OU FINISHED

 ***********************************
 *** SETUP Finishes Successfully ***
 ***********************************
```

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**MODELOPTs: RegDFAULT CONC   ELEV   RURAL

*** MODEL SETUP OPTIONS SUMMARY ***

- -

**Model Is Setup For Calculation of Average CONCentration Values.

-- DEPOSITION LOGIC --
**NO GAS DEPOSITION Data Provided.
**NO PARTICLE DEPOSITION Data Provided.
**Model Uses NO DRY DEPLETION. DRYDPLT = F
**Model Uses NO WET DEPLETION. WETDPLT = F

**Model Uses RURAL Dispersion Only.

**Model Uses Regulatory DEFAULT Options:
1. Stack-tip Downwash.
2. Model Accounts for ELEVated Terrain Effects.
3. Use Calms Processing Routine.
4. Use Missing Data Processing Routine.
5. No Exponential Decay.

**Other Options Specified:
CCVR_Sub - Meteorological data includes CCVR substitutions
TEMP_Sub - Meteorological data includes TEMP substitutions

**Model Assumes No FLAGPOLE Receptor Heights.

**The User Specified a Pollutant Type of: PM_10

**Model Calculates ANNUAL Averages Only

**This Run Includes: 1 Source(s);   2 Source Group(s); and 2 Receptor(s)

```
                with:      0 POINT(s), including
                           0 POINTCAP(s) and      0 POINTHOR(s)
                 and:      0 VOLUME source(s)
                 and:      1 AREA type source(s)
                 and:      0 LINE source(s)
                 and:      0 OPENPIT source(s)
```

**Model Set To Continue RUNning After the Setup Testing.

**The AERMET Input Meteorological Data Version Date: 14134

```
 **Output Options Selected:
          Model Outputs Tables of ANNUAL Averages by Receptor
          Model Outputs External File(s) of High Values for Plotting
(PLOTFILE Keyword)
          Model Outputs Separate Summary File of High Ranked Values
(SUMMFILE Keyword)

 **NOTE:  The Following Flags May Appear Following CONC Values:  c for
Calm Hours
                                                                 m for
Missing Hours
                                                                 b for
Both Calm and Missing Hours

 **Misc. Inputs:  Base Elev. for Pot. Temp. Profile (m MSL) =    10.00 ;
Decay Coef. =    0.000     ;  Rot. Angle =     0.0
                  Emission Units = GRAMS/SEC
;  Emission Rate Unit Factor =   0.10000E+07
                  Output Units   = MICROGRAMS/M**3

 **Approximate Storage Requirements of Model =      3.5 MB of RAM.

 **Detailed Error/Message File:   1750 Broadway.err
 **File for Summary of Results:   1750 Broadway.sum
```

**MODELOPTs: RegDFAULT CONC ELEV RURAL

*** AREAPOLY SOURCE DATA ***

SOURCE ID	NUMBER PART. CATS.	EMISSION RATE (GRAMS/SEC /METER**2)	LOCATION OF AREA X (METERS)	Y (METERS)	BASE ELEV. (METERS)	RELEASE HEIGHT (METERS)	NUMBER OF VERTS.	INIT. SZ	URBAN SOURCE	EMISSION RATE SCALAR VARY BY
PAREA1	0	0.19578E-06	564323.0	4184661.2	9.0	5.00	6	0.00	NO	HRDOW7

**MODELOPTs: RegDFAULT CONC ELEV RURAL

*** SOURCE IDs DEFINING SOURCE GROUPS ***

SRCGROUP ID	SOURCE IDs
SRCGP1	PAREA1 ,
ALL	PAREA1 ,

**MODELOPTs: RegDFAULT CONC ELEV RURAL

* SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY AND BY DAY OF WEEK (HRDOW7) *

SOURCE ID = PAREA1 ; SOURCE TYPE = AREAPOLY :

HOUR	SCALAR	HOUR	SCALAR	HOUR	SCALAR	HOUR	SCALAR	HOUR	SCALAR	HOUR	SCALAR	HOUR	SCALAR	HOUR	SCALAR

DAY OF WEEK = MONDAY

1	.0000E+00	2	.0000E+00	3	.0000E+00	4	.0000E+00	5	.0000E+00	6	.0000E+00	7	.0000E+00	8	.0000E+00
9	.1000E+01	10	.1000E+01	11	.1000E+01	12	.1000E+01	13	.1000E+01	14	.1000E+01	15	.1000E+01	16	.1000E+01
17	.0000E+00	18	.0000E+00	19	.0000E+00	20	.0000E+00	21	.0000E+00	22	.0000E+00	23	.0000E+00	24	.0000E+00

DAY OF WEEK = TUESDAY

1	.0000E+00	2	.0000E+00	3	.0000E+00	4	.0000E+00	5	.0000E+00	6	.0000E+00	7	.0000E+00	8	.0000E+00
9	.1000E+01	10	.1000E+01	11	.1000E+01	12	.1000E+01	13	.1000E+01	14	.1000E+01	15	.1000E+01	16	.1000E+01
17	.0000E+00	18	.0000E+00	19	.0000E+00	20	.0000E+00	21	.0000E+00	22	.0000E+00	23	.0000E+00	24	.0000E+00

DAY OF WEEK = WEDNESDY

1	.0000E+00	2	.0000E+00	3	.0000E+00	4	.0000E+00	5	.0000E+00	6	.0000E+00	7	.0000E+00	8	.0000E+00
9	.1000E+01	10	.1000E+01	11	.1000E+01	12	.1000E+01	13	.1000E+01	14	.1000E+01	15	.1000E+01	16	.1000E+01
17	.0000E+00	18	.0000E+00	19	.0000E+00	20	.0000E+00	21	.0000E+00	22	.0000E+00	23	.0000E+00	24	.0000E+00

DAY OF WEEK = THURSDAY

1	.0000E+00	2	.0000E+00	3	.0000E+00	4	.0000E+00	5	.0000E+00	6	.0000E+00	7	.0000E+00	8	.0000E+00
9	.1000E+01	10	.1000E+01	11	.1000E+01	12	.1000E+01	13	.1000E+01	14	.1000E+01	15	.1000E+01	16	.1000E+01
17	.0000E+00	18	.0000E+00	19	.0000E+00	20	.0000E+00	21	.0000E+00	22	.0000E+00	23	.0000E+00	24	.0000E+00

DAY OF WEEK = FRIDAY

1	.0000E+00	2	.0000E+00	3	.0000E+00	4	.0000E+00	5	.0000E+00	6	.0000E+00	7	.0000E+00	8	.0000E+00
9	.1000E+01	10	.1000E+01	11	.1000E+01	12	.1000E+01	13	.1000E+01	14	.1000E+01	15	.1000E+01	16	.1000E+01
17	.0000E+00	18	.0000E+00	19	.0000E+00	20	.0000E+00	21	.0000E+00	22	.0000E+00	23	.0000E+00	24	.0000E+00

DAY OF WEEK = SATURDAY

1	.0000E+00	2	.0000E+00	3	.0000E+00	4	.0000E+00	5	.0000E+00	6	.0000E+00	7	.0000E+00	8	.0000E+00

```
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00   13
.0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00   21
.0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                 DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00    5
.0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00   13
.0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00   21
.0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
```

**MODELOPTs: RegDFAULT CONC ELEV RURAL

*** DISCRETE CARTESIAN RECEPTORS ***
(X-COORD, Y-COORD, ZELEV, ZHILL, ZFLAG)
(METERS)

(564361.6, 4184711.0, 8.0, 8.0, 0.0); (564346.0, 4184563.2, 10.0, 10.0, 0.0);

**MODELOPTs: RegDFAULT CONC   ELEV   RURAL

*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
(1=YES; 0=NO)

```
            1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1
1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
            1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1
1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
            1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1
1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
            1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1
1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
            1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1
1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
            1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1
1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
            1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1
1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
            1 1 1 1 1 1 1 1 1 1   1 1 1 1 1
```

NOTE: METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
(METERS/SEC)

1.54,   3.09,   5.14,   8.23, 10.80,

**MODELOPTs: RegDFAULT CONC ELEV RURAL

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: C:\Users\jni\Desktop\1750 Broadway - 170514\HRA\724930\724930.SFC Met Version: 14134
Profile file: C:\Users\jni\Desktop\1750 Broadway - 170514\HRA\724930\724930.PFL
Surface format: FREE
Profile format: FREE
Surface station no.: 23230 Upper air station no.: 23230
Name: OAKLAND/WSO_AP Name: OAKLAND/WSO_AP
Year: 2009 Year: 2009

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
09	01	01	1	01	-17.2	0.303	-9.000	-9.000	-999.	401.	147.2	0.63	0.86	1.00	2.36	81.	10.0	282.5	2.0
09	01	01	1	02	-21.8	0.383	-9.000	-9.000	-999.	569.	234.6	0.63	0.86	1.00	2.86	68.	10.0	282.0	2.0
09	01	01	1	03	-26.3	0.460	-9.000	-9.000	-999.	749.	337.1	0.63	0.86	1.00	3.36	84.	10.0	280.9	2.0
09	01	01	1	04	-15.4	0.270	-9.000	-9.000	-999.	368.	116.1	0.47	0.86	1.00	2.36	53.	10.0	280.9	2.0
09	01	01	1	05	-26.3	0.460	-9.000	-9.000	-999.	749.	336.3	0.63	0.86	1.00	3.36	73.	10.0	280.4	2.0
09	01	01	1	06	-21.9	0.383	-9.000	-9.000	-999.	573.	232.9	0.63	0.86	1.00	2.86	82.	10.0	280.4	2.0
09	01	01	1	07	-22.0	0.383	-9.000	-9.000	-999.	569.	232.5	0.63	0.86	1.00	2.86	95.	10.0	279.9	2.0
09	01	01	1	08	-11.2	0.196	-9.000	-9.000	-999.	238.	60.6	0.63	0.86	0.76	1.76	73.	10.0	279.9	2.0
09	01	01	1	09	-2.2	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.45	0.86	0.39	0.00	0.	10.0	280.4	2.0
09	01	01	1	10	6.8	0.266	0.264	0.016	98.	329.	-250.8	0.63	0.86	0.27	1.76	91.	10.0	280.9	2.0
09	01	01	1	11	15.5	-9.000	-9.000	-9.000	177.	-999.	-99999.0	0.45	0.86	0.22	0.00	0.	10.0	282.0	2.0
09	01	01	1	12	96.1	0.393	1.019	0.014	401.	591.	-57.4	0.22	0.86	0.21	3.36	266.	10.0	281.4	2.0

```
 09 01 01   1 13  102.5  0.395  1.092  0.014  462.  595.    -54.4  0.22
0.86   0.20    3.36  283.   10.0  282.0    2.0
 09 01 01   1 14   89.9  0.297  1.066  0.015  489.  394.    -26.5  0.22
0.86   0.21    2.36  249.   10.0  282.0    2.0
 09 01 01   1 15   62.1  0.383  0.954  0.014  507.  569.    -82.1  0.22
0.86   0.24    3.36  242.   10.0  282.5    2.0
 09 01 01   1 16   23.1  0.665  0.690  0.006  513. 1300.  -1150.4  0.52
0.86   0.33    4.86  304.   10.0  282.5    2.0
 09 01 01   1 17  -37.0  0.486 -9.000 -9.000 -999.  846.    280.6  0.22
0.86   0.56    4.86  291.   10.0  281.4    2.0
 09 01 01   1 18  -52.2  0.480 -9.000 -9.000 -999.  799.    191.9  0.52
0.86   1.00    3.86  307.   10.0  280.9    2.0
 09 01 01   1 19  -25.6  0.224 -9.000 -9.000 -999.  327.     39.8  0.52
0.86   1.00    2.36  334.   10.0  280.4    2.0
 09 01 01   1 20  -11.1  0.119 -9.000 -9.000 -999.  115.     13.8  0.52
0.86   1.00    1.76  317.   10.0  280.4    2.0
 09 01 01   1 21  -10.3  0.119 -9.000 -9.000 -999.   98.     14.7  0.52
0.86   1.00    1.76  320.   10.0  280.4    2.0
 09 01 01   1 22 -999.0 -9.000 -9.000 -9.000 -999. -999. -99999.0  0.45
0.86   1.00    0.00    0.   10.0  280.9    2.0
 09 01 01   1 23 -999.0 -9.000 -9.000 -9.000 -999. -999. -99999.0  0.45
0.86   1.00    0.00    0.   10.0  281.4    2.0
 09 01 01   1 24 -999.0 -9.000 -9.000 -9.000 -999. -999. -99999.0  0.45
0.86   1.00    0.00    0.   10.0  281.4    2.0


 First hour of profile data
 YR MO DY HR HEIGHT F  WDIR    WSPD AMB_TMP sigmaA  sigmaW  sigmaV
 09 01 01 01   10.0 1   81.    2.36   282.6   99.0  -99.00  -99.00

 F indicates top of profile (=1) or below (=0)
```

**MODELOPTs: RegDFAULT CONC ELEV RURAL

*** THE ANNUAL AVERAGE CONCENTRATION VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: SRCGP1 ***
INCLUDING SOURCE(S): PAREA1 ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM_10 IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
564361.64	4184710.98	0.01461	564346.04	4184563.19	0.00041

**MODELOPTs: RegDFAULT CONC ELEV RURAL

*** THE ANNUAL AVERAGE CONCENTRATION VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: ALL ***
INCLUDING SOURCE(S): PAREA1 ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM_10 IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
564361.64	4184710.98	0.01461	564346.04	4184563.19	0.00041

**MODELOPTs: RegDFAULT CONC ELEV RURAL

*** THE SUMMARY OF MAXIMUM ANNUAL RESULTS AVERAGED OVER 5 YEARS ***

** CONC OF PM_10 IN MICROGRAMS/M**3 **

NETWORK GROUP ID	AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	GRID-ID
SRCGP1	1ST HIGHEST VALUE IS	0.01461 AT (564361.64, 4184710.98, 8.00, 8.00, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.00041 AT (564346.04, 4184563.19, 10.00, 10.00, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.00000 AT (0.00, 0.00, 0.00, 0.00, 0.00)		
	4TH HIGHEST VALUE IS	0.00000 AT (0.00, 0.00, 0.00, 0.00, 0.00)		
	5TH HIGHEST VALUE IS	0.00000 AT (0.00, 0.00, 0.00, 0.00, 0.00)		
	6TH HIGHEST VALUE IS	0.00000 AT (0.00, 0.00, 0.00, 0.00, 0.00)		
	7TH HIGHEST VALUE IS	0.00000 AT (0.00, 0.00, 0.00, 0.00, 0.00)		
	8TH HIGHEST VALUE IS	0.00000 AT (0.00, 0.00, 0.00, 0.00, 0.00)		
	9TH HIGHEST VALUE IS	0.00000 AT (0.00, 0.00, 0.00, 0.00, 0.00)		
	10TH HIGHEST VALUE IS	0.00000 AT (0.00, 0.00, 0.00, 0.00, 0.00)		
ALL	1ST HIGHEST VALUE IS	0.01461 AT (564361.64, 4184710.98, 8.00, 8.00, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.00041 AT (564346.04, 4184563.19, 10.00, 10.00, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.00000 AT (0.00, 0.00, 0.00, 0.00, 0.00)		
	4TH HIGHEST VALUE IS	0.00000 AT (0.00, 0.00, 0.00, 0.00, 0.00)		
	5TH HIGHEST VALUE IS	0.00000 AT (0.00, 0.00, 0.00, 0.00, 0.00)		

```
          6TH HIGHEST VALUE IS       0.00000 AT (       0.00,
0.00,     0.00,     0.00,    0.00)
          7TH HIGHEST VALUE IS       0.00000 AT (       0.00,
0.00,     0.00,     0.00,    0.00)
          8TH HIGHEST VALUE IS       0.00000 AT (       0.00,
0.00,     0.00,     0.00,    0.00)
          9TH HIGHEST VALUE IS       0.00000 AT (       0.00,
0.00,     0.00,     0.00,    0.00)
         10TH HIGHEST VALUE IS       0.00000 AT (       0.00,
0.00,     0.00,     0.00,    0.00)


 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
```

**MODELOPTs: RegDFAULT CONC ELEV RURAL

*** Message Summary : AERMOD Model Execution ***

--------- Summary of Total Messages --------

A Total of 0 Fatal Error Message(s)
A Total of 1 Warning Message(s)
A Total of 7953 Informational Message(s)

A Total of 43872 Hours Were Processed

A Total of 7152 Calm Hours Identified

A Total of 801 Missing Hours Identified (1.83 Percent)

******** FATAL ERROR MESSAGES ********
*** NONE ***

******** WARNING MESSAGES ********
MX W481 43873 MAIN: Data Remaining After End of Year. Number of Hours= 48

****
*** AERMOD Finishes Successfully ***
****

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APPENDIX D

Historical Context

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APPENDIX D
1750 Broadway Historical Context

The existing building on the Project site was constructed to house the Bank of Tokyo and has been occupied by various banking institutions for the majority of its life. The following provides a brief history on banking in California, including a brief history of the existing building's first occupant: the Bank of Tokyo. This is followed by a summary of the existing building's architectural context, a description of the existing building, and a summary of its eligibility as a historical resource under CEQA Guidelines (Section 15064.5) (see **Figure D-1**).

Banking in California/Bank of Tokyo

The following excerpt is from the Economic History Association's article *Banking in the Western U.S.*

> In the early frontier years, private individuals and outposts of the Hudson Bay Company and other trading companies provided banking services. As states west of the Mississippi began developing after the 1840s, capital flowed fairly readily from the east coast and also from foreign sources. This is particularly true of California. Gold was discovered in early 1848, and the population exploded. San Francisco and Sacramento quickly became cities. By 1852, numerous banks representing investors from St. Louis, Boston, New York and even other countries were operating in San Francisco. Lazard Freres, a French bank, has remained there to the present time. St. Louis, an earlier financial center of the west, and New York banks were well represented until the mid-1850s, when a bank panic forced the reevaluation of distant branches or subsidiaries. As California grew, spurred at first by gold production and then by the Nevada silver discoveries in the1860s, San Francisco became the financial center of the western states….
>
> Although the character of the individuals in control was of foremost importance, housing the bank in a solid structure also reassured customers. Because depositors worried about "wildcat banks" which accepted deposits, then relocated far away to discourage withdrawals, it was hard to gather deposits without proof of stability. So the bank was often the most solid structure in town. Although there are a few spectacular instances of bankers leaving town with deposits, the system generally worked extremely well with minimal regulation…

The Bank of Tokyo, originally the Yokohama Specie Bank, was one of these international banks with early roots in the United States. The Yokohama Specie Bank was established in 1880 with its first offices in Japan and New York, with an office in London opening the following year.[1] Within

[1] MUFG Bank of Tokyo-Mitsubishi, *Origins of Our Bank*, http://www.bk.mufg.jp/global/aboutus/origins/index.html, accessed November 2, 2017.

Yokohama Specie Bank's global network in the mid-1930s

SOURCE: Bank of Tokyo-Mitsubishi UFJ website,
http://www.bk.mufg.jp/global/aboutus/origins/index.html

Figure D-1
Existing Building Architectural Context

the first two decades of the twentieth century it had established major trading centers throughout the Pacific region.[2]

In 1945, Yokohama Specie Bank reorganized and became known as the Bank of Tokyo.[3] In 1954, it was specializing in foreign exchange.[4] In the 1970s, the bank opened several more offices in Europe, the United States, and Asia. In 1973, the Bank of Tokyo opened in Oakland. Other Bay Area branches at the time included two locations in San Francisco, two in San Jose, and one in Los Altos; the main office was at 64 Sutter Street in San Francisco.[5]

In 1996, the Bank of Tokyo and the Mitsubishi Bank, Ltd. merged, forming the world's largest bank.[6]

> Bank of Tokyo-Mitsubishi Ltd., the world's largest bank, was formed in April 1996 from the merger of and Bank of Tokyo, Ltd. The new superbank combined Mitsubishi's extensive network of domestic branches with Bank of Tokyo's overseas strength, and includes operations in a wide range of banking and financial services. Prior to the merger, Mitsubishi Bank and Bank of Tokyo were two of the healthiest banks in Japan and had survived, relatively unscathed, the Japanese lending crisis of the early 1990s.

"Mitsubishi Bank was only one of many companies that originated as a division of the giant Mitsubishi trading conglomerate and were later incorporated as independent companies."[7]

1750 Broadway History and Brutalism

In 1972-73, the existing building on the Project site was constructed to house the Bank of Tokyo's first East Bay branch (see **Figures D-2 and D-3**).[8] Advertising at the time noted that the "[b]ank lobby features the Japanese old world charm of circular windows, plantings and even a stream trickling by outside,"[9] and that the building had been constructed with an ATM in the 19th Street BART Station under the bank, as part of the "Bank-By-BART System."[10] The Bank of Tokyo's remote teller was located on the BART mezzanine one level below the bank's street level lobby.

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2 MUFG Bank of Tokyo-Mitsubishi, *Origins of Our Bank*, http://www.bk.mufg.jp/global/aboutus/origins/index.html, accessed November 2, 2017.

3 MUFG Bank of Tokyo-Mitsubishi, *Origins of Our Bank*, http://www.bk.mufg.jp/global/aboutus/origins/index.html, accessed November 2, 2017.

4 MUFG Bank of Tokyo-Mitsubishi, *Origins of Our Bank*, http://www.bk.mufg.jp/global/aboutus/origins/index.html, accessed November 2, 2017.

5 The Sunday Tribune, Bank of Tokyo advertisement, May 13, 1973.

6 Funding Universe, http://www.fundinguniverse.com/company-histories/bank-of-tokyo-mitsubishi-ltd-history/

7 Funding Universe, *Bank of Tokyo-Mitsubishi Ltd.*, http://www.fundinguniverse.com/company-histories/bank-of-tokyo-mitsubishi-ltd-history/, accessed November 2, 2017.

8 Oakland Tribune, *Shinto Ceremony Starts Bank Job*, February 24, 1972.

9 The Sunday Tribune, Bank of Tokyo advertisement, May 13, 1973

10 The Sunday Tribune, Bank of Tokyo advertisement, May 13, 1973

West Façade

West Façade

SOURCE: ESA, 2017

1750 Broadway Project . 170514

Figure D-2

Existing Building Façade

East Façade (parking lot in foreground)

West Façade

1750 Broadway Project . 170514

SOURCE: ESA, 2017

Figure D-3
Existing Building Façade (Cont.)

Subsequent occupants of the building, all banks, are noted as the California First Bank (1982), Union Bank (1988-c1996), and the Community Bank of the Bay (c1996-2000).[11]

The existing building was designed by the architectural firm Van Bourg & Nakamura and built by the contractor Branagh Inc.[12,13] The building was designed in the Brutalist architectural style that was popular at the time. A brief history of the origins and characteristics of Brutalism is below.

The existing building exhibits the Modern architectural style often referred to as "Brutalist" due to its exposed concrete construction and expressionistic massing, whereby the interior disposition of spaces is clearly articulated on the exterior façade. Brutalist structures tend to be geometric in style and are usually constructed of large amounts of poured concrete with a rough blocky appearance. British architects Alison and Peter Smithson invented the term in 1953 from the French béton brut, or "raw concrete." Swiss architect Le Corbusier originally used this phrase to describe the poured board-marked concrete with which he constructed many of his post-World War II buildings.[14] Brutalism gained considerable momentum in continental Europe and the United Kingdom during the mid-twentieth century, as economically depressed (and World War II-ravaged) communities sought inexpensive construction and design methods for low-cost housing, commercial, and government buildings. Brutalism was also promoted as a positive option for forward-moving, modern urban housing. This style, which was prevalent in America in the 1960s and 1970s, and San Francisco between 1960 and 1980, is often found at university campuses and within civic or institutional settings.

Brutalist buildings usually are formed with striking repetitive angular geometries. Concrete is the material most widely associated with Brutalist architecture, although not all Brutalist buildings are formed from that material. Instead, a building may achieve its Brutalist quality through a rough, blocky appearance, and the expression of its structural materials, forms, and (in some cases) services on its exterior. When concrete is used, the buildings often reveal the texture of the wooden forms used for the in-situ casting. Another common theme in Brutalist designs is the exposure of the building's functions—ranging from their structure and services to their human use—in the exterior of the building.

Character defining architectural features of the Brutalist style include:

- Rough unadorned poured concrete construction
- Massive form and heavy cubic shapes
- Visible imprints of wood grain forms
- Recessed windows that read as voids
- Repeating geometric patterns

[11] Oakland Cultural Heritage Survey Identification Sheet, 1995

[12] Oakland Cultural Heritage Survey Field Form, January 5, 1982.

[13] Oakland Cultural Heritage Survey Identification Sheet, 1995.

[14] Brown, Mary. 2010. *San Francisco Modern Architecture and Landscape Design 1935-1970 Historic Context Statement.* San Francisco City and County Planning Department.

- Strong right angles and simple cubic forms
- Deeply shadowed irregular openings
- Rectangular block-like shapes
- Precast concrete panels with exposed joinery
- Other materials include glass, steel and occasionally brick

1750 Broadway Description and Summary of Eligibility

The existing building on the Project site (1740-1750 Broadway, Parcel #8-623-13) is three stories, rectangular in plan, has a flat roof. The west (primary) façade fronts Broadway, the east façade fronts the parking lot at the rear of the parcel, and the north and south facades abut the neighboring buildings. Both the west and east facades appear to have the same level of architectural treatment; the Broadway (west) frontage was accessed by pedestrian customers and the east frontage was accessed from the associated parking lot. Both the east and west façade are dominated by poured "raw" concrete panels, although the first floor panels are color treated a medium grey.

The west (primary) façade is asymmetrical and comprised of a series of concrete panels and large fixed pane windows. A double height glass curtain wall is roughly centered on this façade and recessed from the outmost plane of the building. A narrow strip of landscaping is present between the public sidewalk and the glass curtain wall; recessed lighting is present above this area. The landscaping and round windows appear to be the extent of the Japanese influence remaining on the exterior. The south end of the west facade includes the BART access elevator and two porthole windows (level with the first and second floors). The north end includes a large porthole window centered on the floor plate between the first and second floors. These porthole windows are called *marumado* or *yoshinomado in Japanese design*; they are most often used for ventilation and to provide a beautiful view, usually towards a garden. Upon exiting the BART elevator, a pedestrian could look through one of these windows into the landscaped area on the west façade. The second floor of the west façade also includes ribbon windows (a series of windows forming a continuous horizontal band) at either end. The third floor consists of seven recessed areas divided by either square columns or pilasters that continue from the first floor at grade to the tops of the third floor windows. Each recess includes four fixed pane windows. Two flag poles are on two of the three square columns at the second floor. All of the windows are tinted a dark grey.

The existing building on the Project site is not listed on the California Register of Historical Resources or on Oakland's Designated Landmarks or Heritage Properties lists. In 1982, the Oakland Cultural Heritage Survey recorded the existing building at 1750 Broadway rating it a B+/B[15] and noted the building style as "modern w. Japanese flavor." The building was built in 1973 making it 44 years old; too young to meet the 50-year-old age requirement to be considered a CEQA resource. The building does not exhibit "exceptional importance" as defined by the U.S.

[15] Historical and Architectural Rating System – "B: Major Importance: Especially fine architectural example, major historical importance (about 600 total). Examples: Plaza Building, California Cotton Mills, Fruitvale Hotel, Herbert Hoover House."

Department of the Interior, and therefore is not eligible under *Criteria Consideration G: Properties That Have Achieved Significance Within the Past Fifty Years*.[16] As such, for the purposes of CEQA, the existing building at 1750 Broadway is not considered a historical resource.

Proposed Project Design

Project design acknowledges the history of the existing building and Project site. As noted above, the Bank of Tokyo building design included a recessed entry garden on the ground floor that provided a sense of Japanese charm and tranquility at the building entry. The Project design would re-instate this notion of charm and tranquility by introducing similar elements and textures at the lobby entries along Broadway and 19th Street.

[16] The U.S. Department of the Interior explains that "exceptional importance" may be applied to the extraordinary importance of an event or to an entire category of resources so fragile that survivors of any age are unusual.

APPENDIX E

Wind Study

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1750 BROADWAY

OAKLAND, CA

PEDESTRIAN WIND STUDY
RWDI #1702965
November 21, 2017

SUBMITTED TO
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EXECUTIVE SUMMARY

The wind conditions around the proposed 1750 Broadway development are discussed in detail within the content of this report and are summarized as follows:

- Wind speeds at all grade level locations are predicted to meet the wind hazard criterion in all three tested configurations.
- In the Existing configuration, the majority of the locations tested passed the 11 mph criterion. Wind speeds slightly increase with the addition of the “project” however are lowered again with the addition of the future buildings.

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1 INTRODUCTION

Rowan Williams Davies & Irwin Inc. (RWDI) was retained by ESA to assess and consult on the pedestrian wind conditions on and around the proposed 1750 Broadway (Project) in Oakland, California. The Project site, as shown in Image 1, is bound between 19th Street to the north, Franklin Street to the east, 17th Street to the south and Broadway to the west.

The purpose of the study is to assess the wind environment around the Project in terms of pedestrian comfort and safety. The quantitative assessment was based on wind speed measurements on a scale model of the project and its surroundings in a boundary-layer wind tunnel.

This report summarizes the methodology of wind tunnel studies for pedestrian wind conditions, describes the Oakland wind criteria and presents the local wind conditions and their effects on pedestrians.

Image 1: Site Plan – Aerial View of Site and Surroundings (Google™ Earth)

2 METHODOLOGY

2.1 Wind Tunnel Study Model

To assess the wind environment around the proposed Project, a 1:400 (1" = 33') scale model of the project site and surroundings was constructed for the wind tunnel tests and the following configurations were tested:

A – Existing: Existing site with existing surroundings, including buildings that are approved/under-construction (Image 2a);

B – Existing + Project: Proposed 1750 Broadway development present with existing and approved/under construction surrounding buildings, (Image 2b); and,

C – Project + Cumulative: Proposed 1750 Broadway development present with existing and approved/under-construction surrounding buildings as well as anticipated future buildings (Image 2c).

The scale model of the proposed Project (as shown in Images 2b and 2c) was constructed using the design information and drawings listed in Appendix A. The wind tunnel model included all relevant surrounding buildings and topography within an approximately 1600ft radius of the study site. The boundary-layer wind conditions beyond the modelled area were also simulated in RWDI's wind tunnel. The wind tunnel model was instrumented with up to 39 wind speed sensors to measure mean and gust wind speeds at a full-scale height of 5 ft. The placement of wind measurement locations was based on our experience and understanding of the pedestrian usage for this site, and reviewed by ESA. These measurements were recorded for 36 equally incremented wind directions.

Image 2a: Wind Tunnel Study Model - Existing

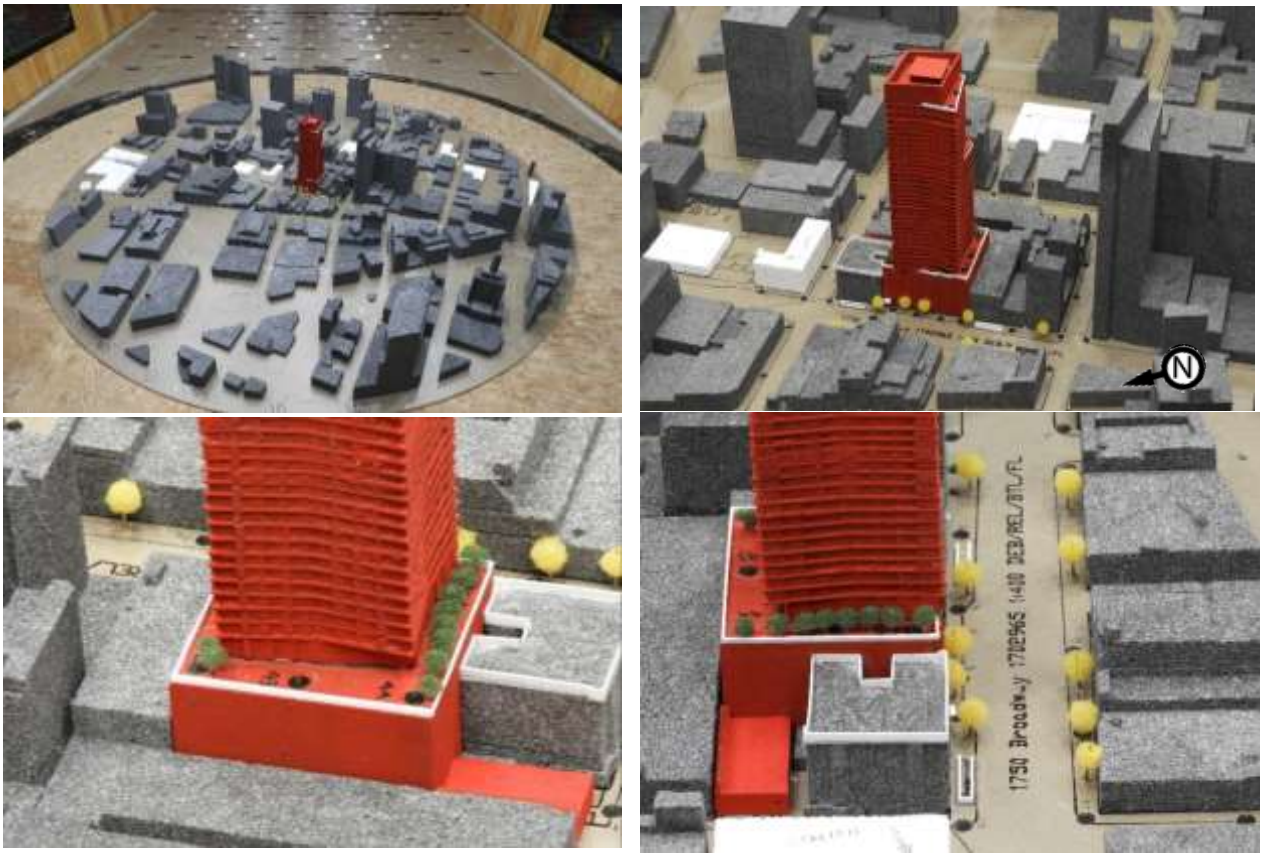


Image 2b: Wind Tunnel Study Model –Existing + Project

Image 2c: Wind Tunnel Study Model – Project + Cumulative

2.2 Meteorological Data

Wind statistics recorded at the Metropolitan Oakland International Airport between 1984 and 2014 were analyzed for annual wind conditions. Image 3 graphically depicts the directional distributions of annual wind frequencies and speeds. Winds are frequent from the northwest through west-southwest directions throughout the year, as indicated by the wind rose. Strong winds of a mean speed greater than 20 mph measured at the airport (at an anemometer height of 33 feet) occur 3.0% of the time annually.

Wind statistics from the Metropolitan Oakland International Airport were combined with the wind tunnel data in order to predict the frequency of occurrence of full-scale wind speeds. The full-scale wind predictions were then compared with the City of Oakland Significant Wind Impact Criterion.

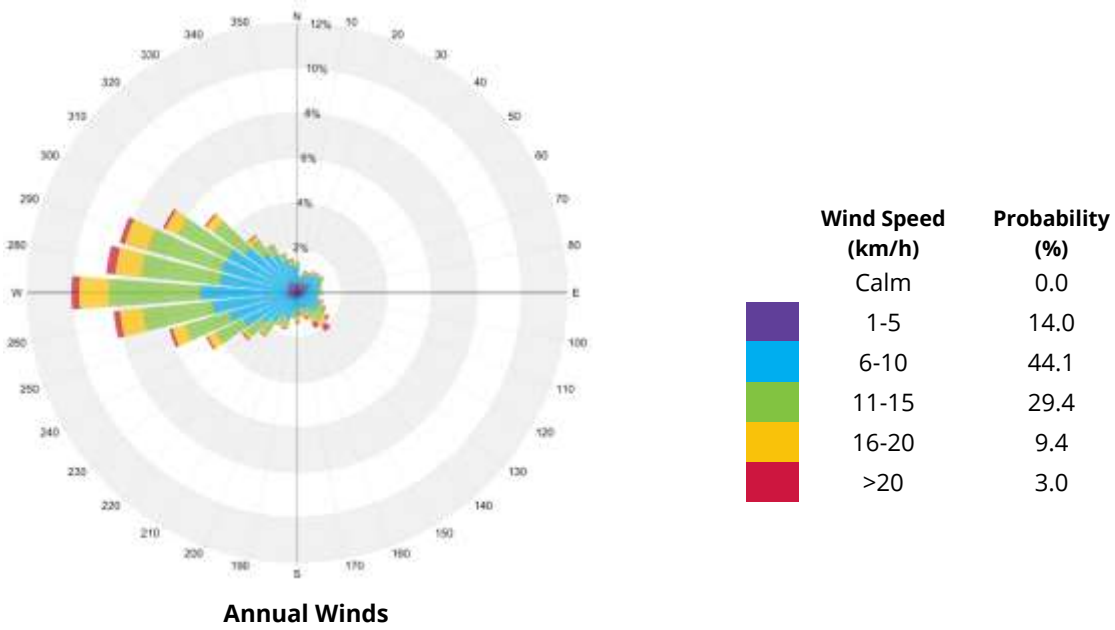


Image 3: Directional distribution of winds approaching Metropolitan Oakland International Airport from 1984 to 2014

2.3 Planning Code Requirements

A wind analysis needs to be done if the height of the project is 100 feet or greater (measured to the roof) and one of the following conditions exists: (a) the project is located adjacent to a substantial water body (i.e. Oakland Estuary, Lake Merritt or San Francisco Bay); or (b) the project is located Downtown. Since the proposed project (approximately 430 feet tall) exceeds 100 feet in height and is located Downtown, it is subject to the thresholds of significance.

For the purposes of this study, the City of Oakland considers a significant wind impact to occur if a project were to "Create winds exceeding 36 mph for more than one hour during daylight hours during the year". The Planning Code defines these wind speeds in terms of equivalent wind speeds, and average wind speed (mean velocity), adjusted to include the level of gustiness and turbulence. Equivalent wind speeds were calculated according to

the specifications in the City of Oakland Significant Wind Impact Criterion, whereby the mean hourly wind speed is increased when the turbulence intensity is greater than 15% according to the following formula:

$$\boldsymbol{EWS = V_m \times (2 \times TI + 0.7)}$$

where $\boldsymbol{EWS}$ = equivalent wind speed

$\boldsymbol{V_m}$ = mean pedestrian-level wind speed

$\boldsymbol{TI}$ = turbulence intensity

2.4 Pedestrian Comfort

Although not applicable towards Significant Wind Impacts as defined by the City of Oakland, wind comfort speeds have been calculated for informational purposes. The comfort criteria are that wind speeds do not exceed 11 mph for more than 10% of the time during the year, when calculated for daylight hours, in substantial pedestrian use areas. A lower wind speed threshold of 7 mph may be considered for public seating areas where calmer wind conditions are ideal.

2.5 In-Construction and Cumulative Buildings

Anticipated future buildings were included in the Project plus Cumulative configurations. These sites are shown in Image 4 and listed in the table below.

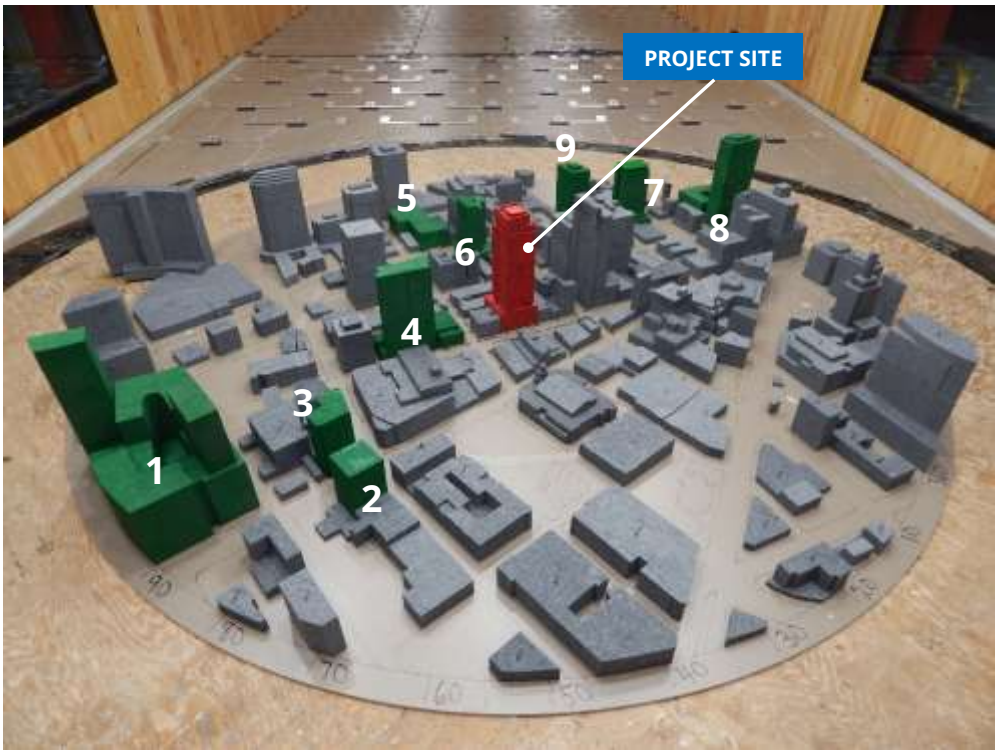


Image 4: Cumulative buildings

CUMULATIVE BUILDING LIST			
1	2100 Telegraph	**6**	1721 Webster
2	2015 Telegraph	**7**	1433 Webster
3	2016 Telegraph	**8**	1314 Franklin
4	1900 Broadway	**9**	1510 Webster
5	301 19th Street		

3 PREDICTED WIND CONDITIONS

This section presents the results of the wind tunnel measurements analyzed in terms of equivalent wind speeds as defined by the equation in Section 2.3. The text in the report simply refers to the data as wind speeds.

Table 1 presents the wind hazard results for the three configurations tested, and lists the wind speed predicted to be exceeded one hour per year at each measurement point. The predicted number of hours per year that the City of Oakland Significant Wind Impact Criterion (one-minute wind speed of 36 mph) is exceeded is also provided. A letter "e" in the last column of each configuration indicates an exceedance of the wind hazard.

Also included in Table 1, are the wind comfort results for the five configurations tested. For each measurement point, the measured 10% exceeded (90th percentile) equivalent wind speed and the percentage of time that the wind speed exceeds 11 mph are shown for areas considered to be used primarily for walking. A letter "e" in the last column of each configuration indicates a wind comfort exceedance above 11 mph.

3.1 Wind Hazard Conditions

3.1.1 Configuration A – Existing

All of the 39 grade level locations tested for the Existing configuration pass the hazard criterion and wind speeds average 24 mph (Figure 1a and Table 1).

3.1.2 Configuration B – Existing + Project

The Existing + Project Configuration was tested with existing street trees along Broadway. Again, all 39 grade level locations are expected to pass the wind safety criterion. (Figure 1b and Table 1). Compared to the Existing Configuration, the average wind speed is predicted to increase slightly to 27 mph.

3.1.3 Configuration C – Project + Cumulative

In the Project + Cumulative Configuration, wind speeds are again not expected to increase and cause any hazard conditions at any of the tested locations. (Figure 1c and Table 1). Wind speeds are expected to reduce with the inclusion of the future buildings with the average wind speed predicted to be 25 mph.

3.2 Wind Comfort Conditions

In the Existing configuration, the wind speeds in the vicinity of the project site are predicted to be moderate, with those at the majority of locations meeting the 11 mph criterion (Figure 2a and Table 2). Wind speeds higher than the 11 mph criterion are expected to the south at the intersection of Broadway and 17th and to the east along Franklin (Figure 2a). Of the 39 tested locations, 11 go over the 11 mph criterion with wind speeds averaging 10 mph.

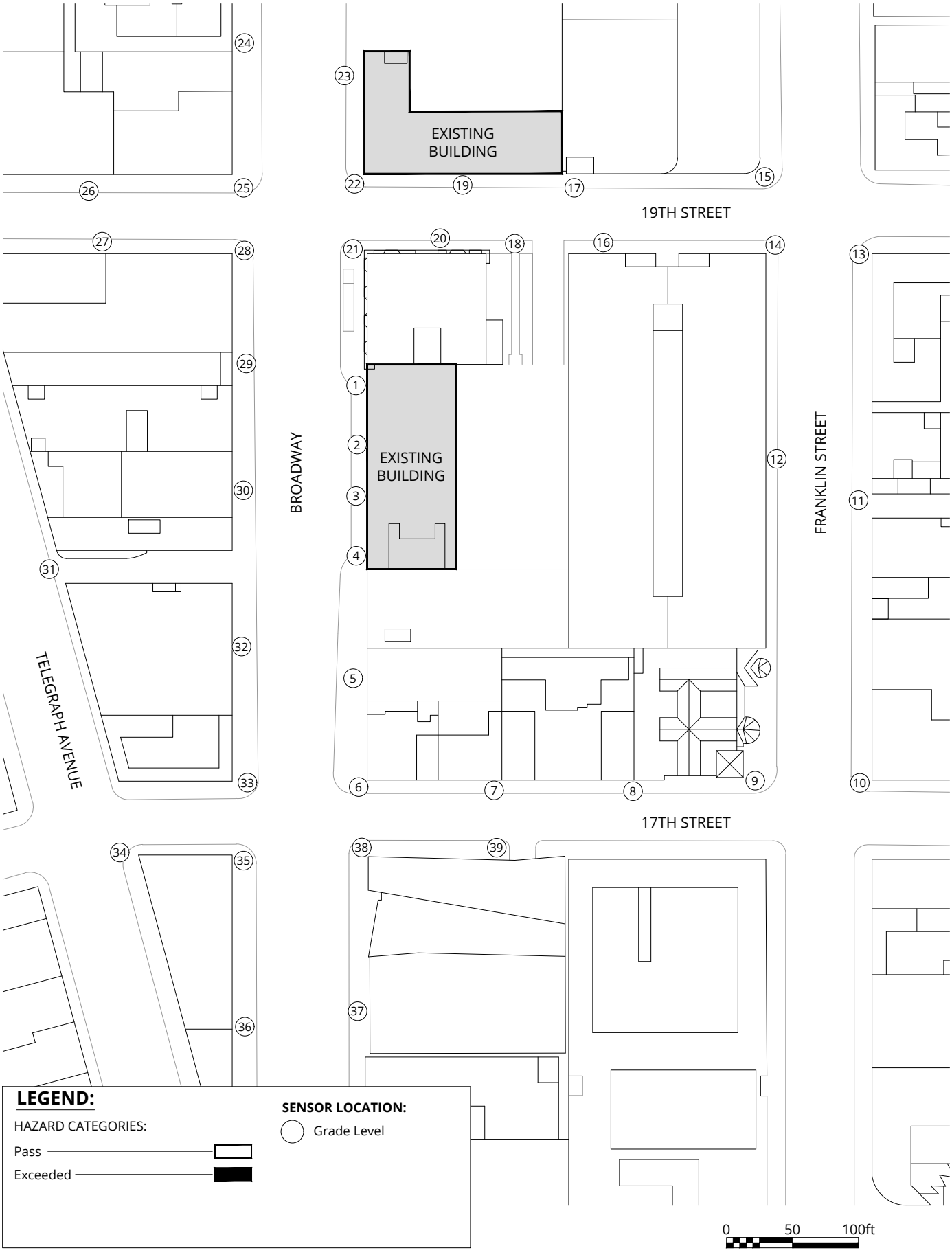
With the addition of the proposed project, wind activity in the areas surrounding the project are predicted to increase in general. The resulting wind speeds are expected to be higher than the 11 mph criterion at additional locations around the project (Figures 2b). The number of locations expected to be higher than the criterion increase to 22 with wind speeds averaging 11 mph.

The future buildings improve the wind conditions compared the Existing plus Project Configuration (Figure 2c) and reduce the number of exceedances to 17 locations, wind speeds remain averaging 11 mph.

4 APPLICABILITY

The wind conditions presented in this report pertain to the proposed 1750 Broadway development as detailed in the architectural design drawings listed in Appendix A. Should there be any design changes that deviate from this list of drawings, the wind condition predictions presented may change. Therefore, if changes in the design are made, it is recommended that RWDI be contacted and requested to review their potential effects on wind conditions.

FIGURES



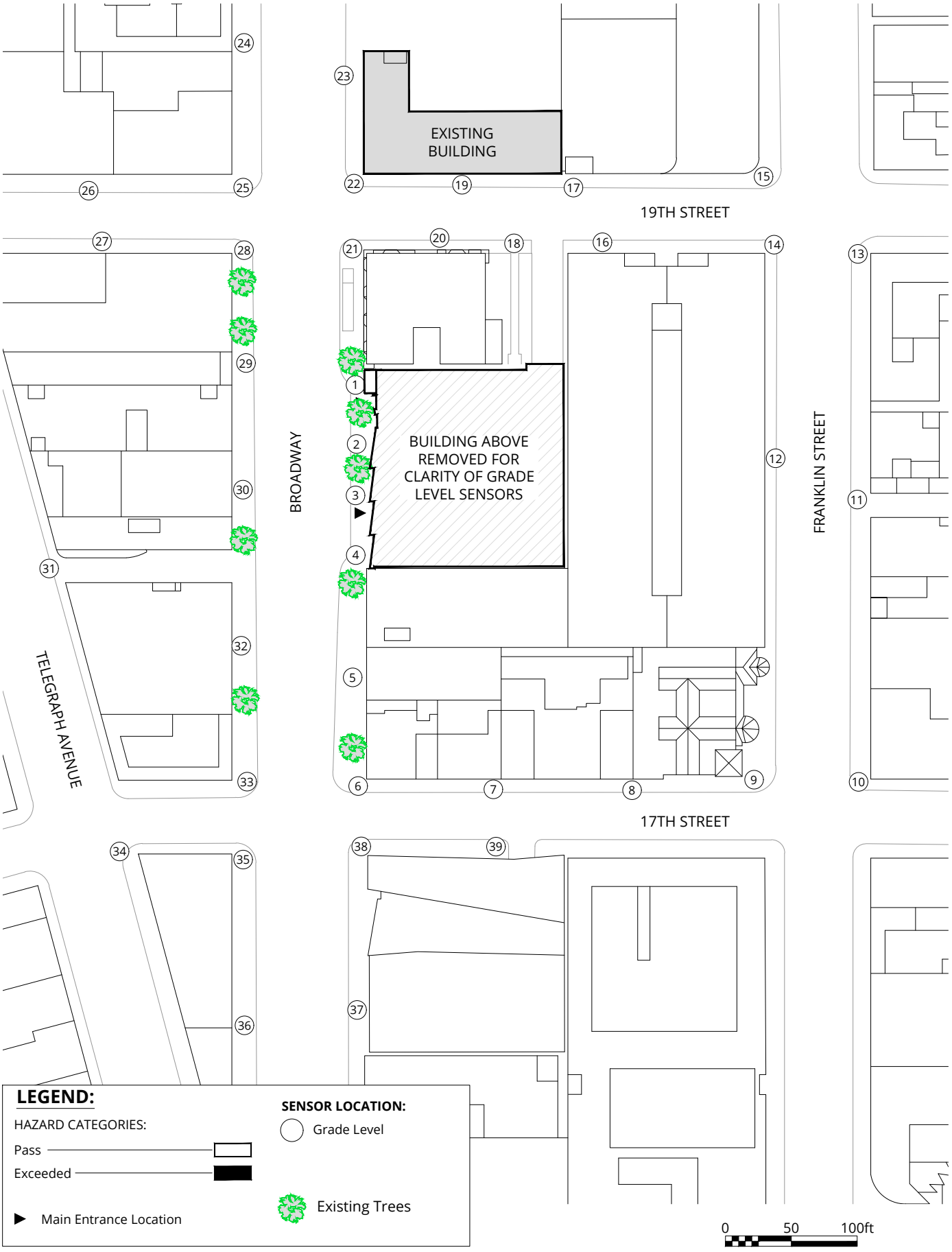
Pedestrian Wind Hazard Conditions
Existing
Annual (January to December)

1750 Broadway - Oakland, CA

Project #1702965

True North

Drawn by:	ck	Figure:	1a
Approx. Scale:	1"=100'		
Date Revised:	Sept. 26, 2017		



Pedestrian Wind Hazard Conditions

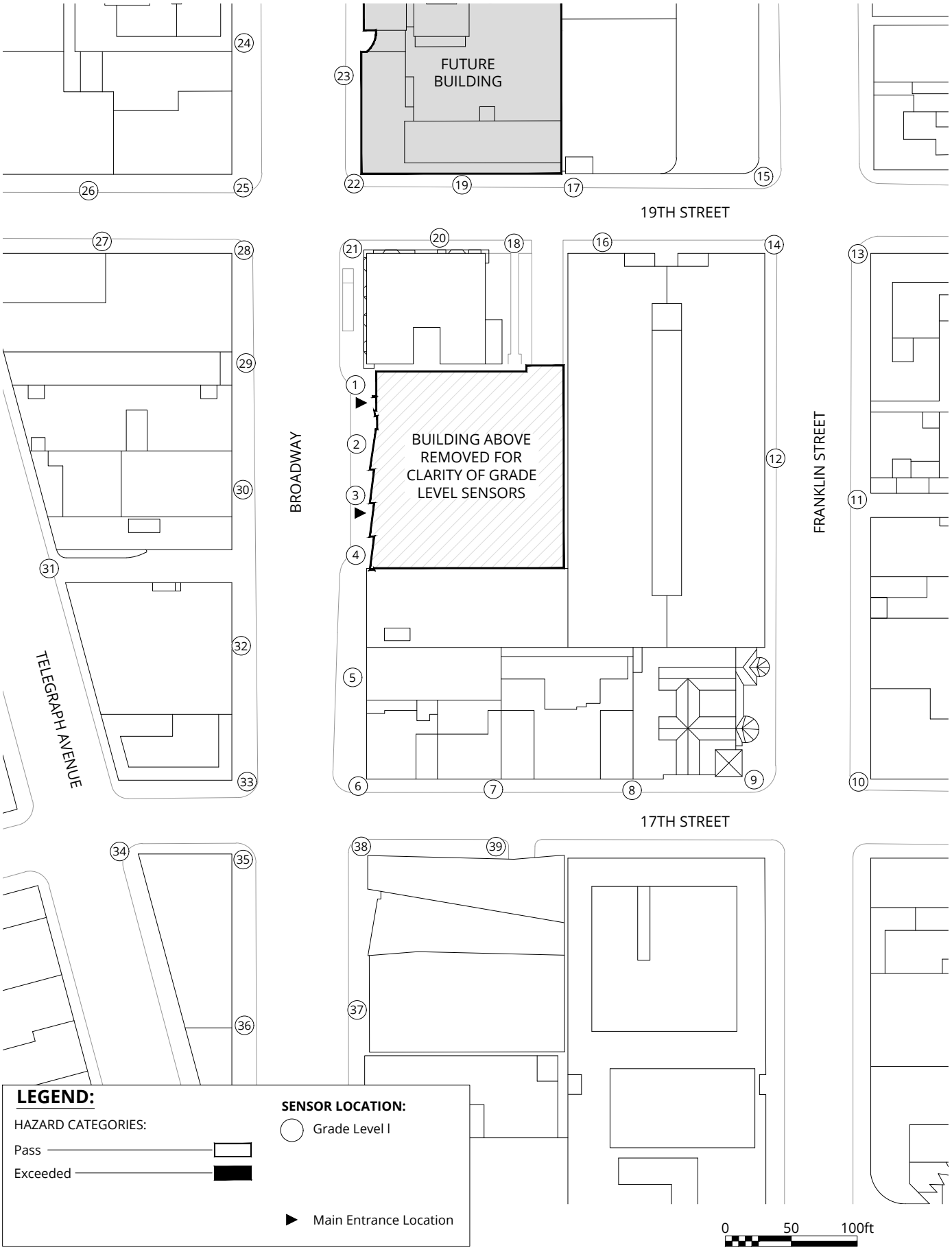
Existing + Project
Annual (January to December)

1750 Broadway - Oakland, CA

Project #1702965

True North

Drawn by:	ck	Figure:	1b
Approx. Scale:	1"=100'		
Date Revised:	Nov. 20, 2017		



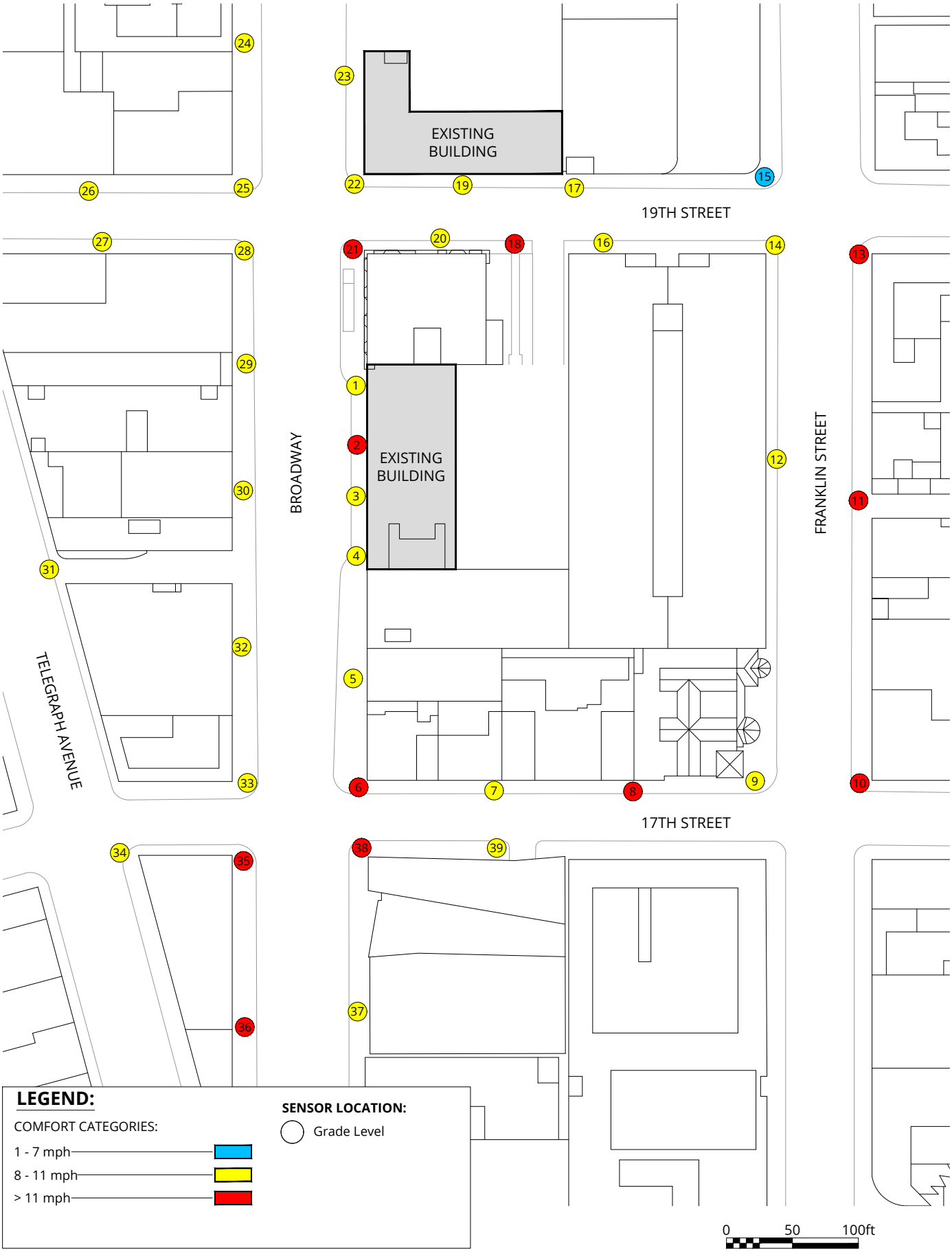
Pedestrian Wind Hazard Conditions
Project + Cumulative
Annual (January to December)

1750 Broadway - Oakland, CA

Project #1702965

True North

Drawn by:	ck	Figure:	1c
Approx. Scale:	1"=100'		
Date Revised:	Nov. 20, 2017		



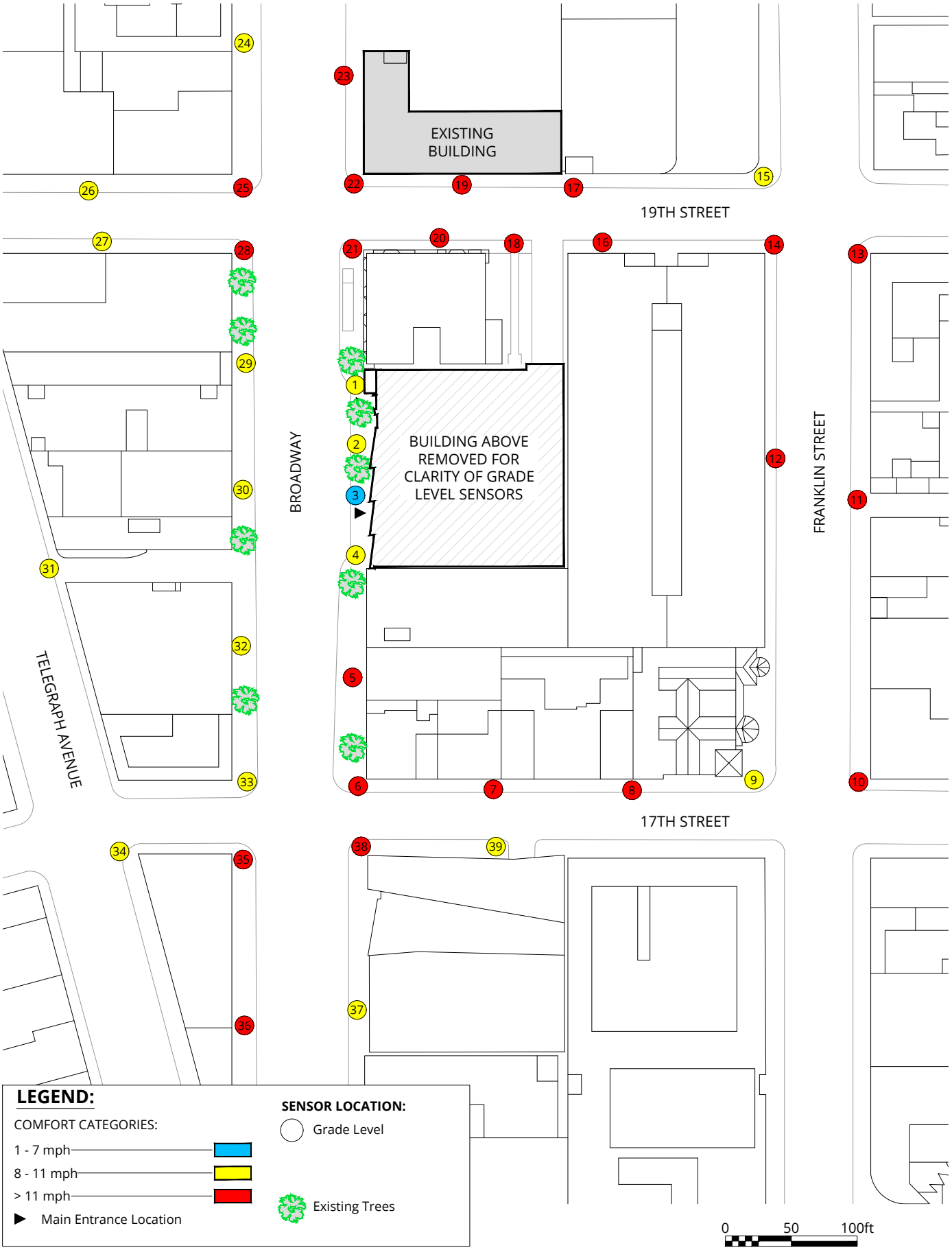
Pedestrian Wind Comfort Conditions
Existing
Annual (January to December)

1750 Broadway - Oakland, CA

Project #1702965

True North

Drawn by:	ck	Figure:	2a
Approx. Scale:	1"=100'		
Date Revised:	Sept. 26, 2017		



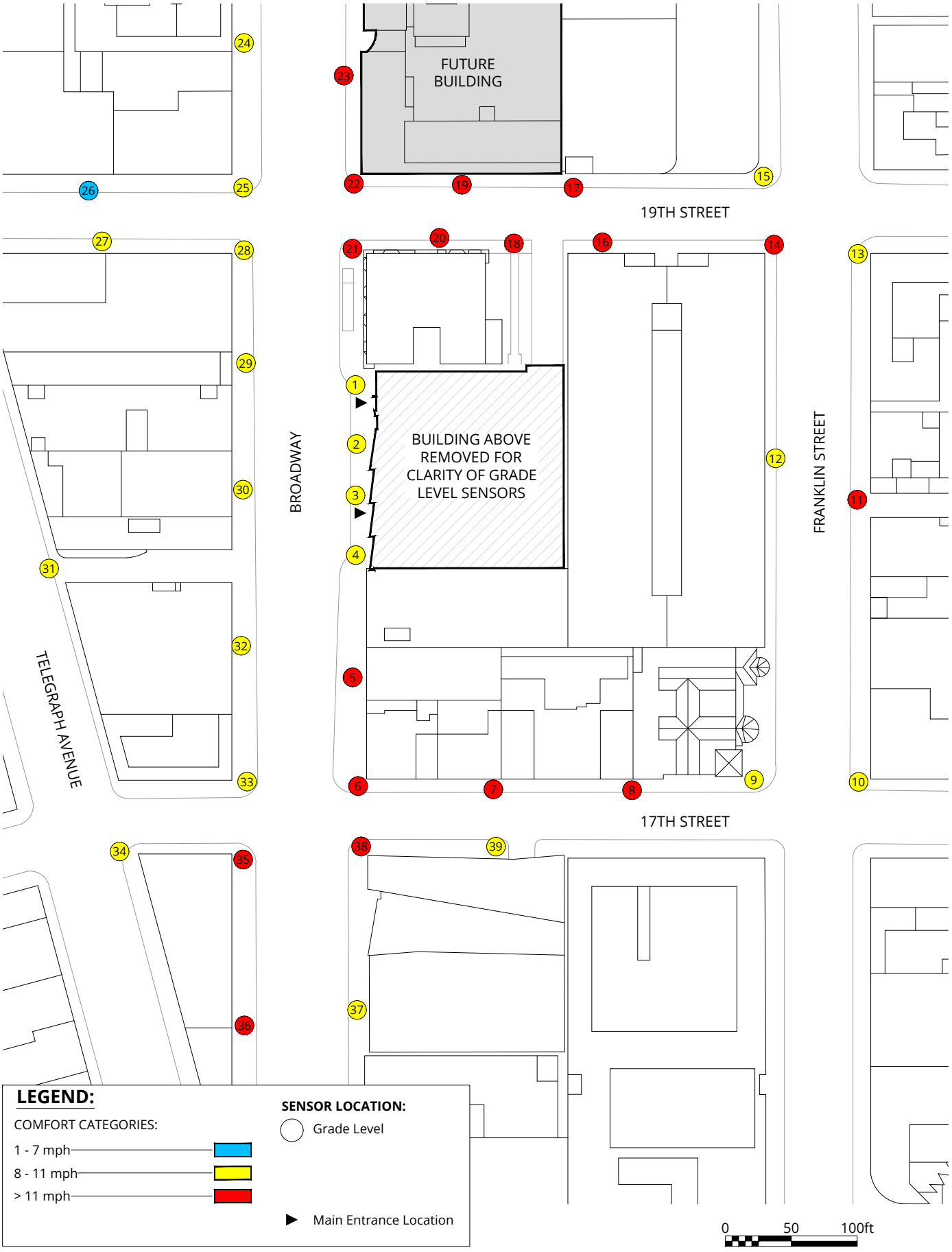
Pedestrian Wind Comfort Conditions
Existing + Project
Annual (January to December)

1750 Broadway - Oakland, CA

Project #1702965

True North

Drawn by: ck	Figure: 2b
Approx. Scale:	1"=100'
Date Revised:	Nov. 20, 2017



Pedestrian Wind Comfort Conditions
Project + Cumulative
Annual (January to December)

1750 Broadway - Oakland, CA

Project #1702965

True North

Drawn by:	ck	Figure:	2c
Approx. Scale:	1"=100'		
Date Revised:	Nov. 20, 2017		

TABLES

TABLE 1: WIND HAZARD RESULTS
HAZARD CRITERION SPEED = 36 MPH
GRADE LEVEL LOCATIONS

References	A Existing			B Existing + Project				C Project + Cumulative			
Location Number	Wind Speed Exceeded 1hr/year (mph)	Hours/ Year Wind Speeds Exceed Hazard Criterion	Exceeds	Wind Speed Exceeded 1hr/year (mph)	Hours/ Year Wind Speeds Exceed Hazard Criterio	Hours Change Relative to Existing	Exceeds	Wind Speed Exceeded 1 hr/year (mph)	Hours/ Year Wind Speeds Exceed Hazard Criterio	Hours Change Relative to Existing	Exceeds
1	25	0		19	0	0		20	0	0	
2	26	0		22	0	0		20	0	0	
3	24	0		21	0	0		20	0	0	
4	23	0		21	0	0		21	0	0	
5	23	0		25	0	0		27	0	0	
6	30	0		30	0	0		29	0	0	
7	26	0		27	0	0		25	0	0	
8	31	0		31	0	0		27	0	0	
9	31	0		30	0	0		27	0	0	
10	29	0		32	0	0		28	0	0	
11	26	0		33	0	0		27	0	0	
12	26	0		28	0	0		26	0	0	
13	25	0		28	0	0		23	0	0	
14	21	0		28	0	0		26	0	0	
15	20	0		20	0	0		23	0	0	
16	19	0		26	0	0		26	0	0	
17	22	0		24	0	0		25	0	0	
18	25	0		28	0	0		30	0	0	
19	22	0		32	0	0		32	0	0	
20	24	0		32	0	0		30	0	0	
21	25	0		31	0	0		35	0	0	
22	23	0		34	0	0		31	0	0	
23	22	0		28	0	0		26	0	0	
24	20	0		25	0	0		25	0	0	
25	21	0		25	0	0		25	0	0	
26	19	0		24	0	0		16	0	0	
27	24	0		21	0	0		20	0	0	
28	23	0		27	0	0		23	0	0	
29	19	0		19	0	0		26	0	0	
30	20	0		28	0	0		27	0	0	
31	21	0		21	0	0		17	0	0	

TABLE 1: WIND HAZARD RESULTS
HAZARD CRITERION SPEED = 36 MPH
GRADE LEVEL LOCATIONS

References	A Existing			B Existing + Project				C Project + Cumulative			
Location Number	Wind Speed Exceeded 1hr/year (mph)	Hours/ Year Wind Speeds Exceed Hazard Criterion	Exceeds	Wind Speed Exceeded 1hr/year (mph)	Hours/ Year Wind Speeds Exceed Hazard Criterio	Hours Change Relative to Existing	Exceeds	Wind Speed Exceeded 1 hr/year (mph)	Hours/ Year Wind Speeds Exceed Hazard Criterio	Hours Change Relative to Existing	Exceeds
32	22	0		24	0	0		22	0	0	
33	26	0		26	0	0		25	0	0	
34	26	0		26	0	0		21	0	0	
35	28	0		30	0	0		27	0	0	
36	32	0		32	0	0		31	0	0	
37	27	0		27	0	0		25	0	0	
38	31	0		35	0	0		31	0	0	
39	27	0		28	0	0		25	0	0	
Average speed, Total hours, Total exceedances	**24 mph**	**0 hrs**	**0 of 39**	**27 mph**	**0 hrs**	**0 hrs**	**0 of 39**	**25 mph**	**0 hrs**	**0 hrs**	**0 of 39**

TABLE 2: WIND COMFORT RESULTS
COMFORT CRITERION SPEED = 11 MPH
GRADE LEVEL LOCATIONS

References	A Existing			B Existing + Project				C Project + Cumulative			
Location Number	Wind Speed Exceeded 10% of the time (mph)	Percent of Time Wind Speed Exceeds 11 mph	Exceeds	Wind Speed Exceeded 10% of Time (mph)	Percent of Time Wind Speed Exceeds 11 mph	Speed Change Relative to Existing	Exceeds	Wind Speed Exceeded 10% of Time (mph)	Percent of Time Wind Speed Exceeds 11 mph	Speed Change Relative to Existing	Exceeds
1	11	10		9	2	-2		10	5	-1	
2	12	14	e	10	7	-2		8	2	-4	
3	11	10		7	2	-4		8	2	-3	
4	11	10		9	4	-2		10	5	-1	
5	10	7		12	13	2	e	13	19	3	e
6	12	16	e	14	21	2	e	13	20	1	e
7	11	10		12	13	1	e	12	12	1	e
8	12	15	e	12	15	0	e	12	12	0	e
9	9	5		9	5	0		9	3	0	
10	12	16	e	14	21	2	e	11	10	-1	
11	13	17	e	15	23	2	e	12	15	-1	e
12	11	10		12	16	1	e	11	10	0	
13	12	14	e	13	17	1	e	11	10	-1	
14	9	4		13	18	4	e	12	16	3	e
15	7	1		8	2	1		11	10	4	
16	9	3		12	15	3	e	12	16	3	e
17	8	2		12	13	4	e	12	14	4	e
18	12	14	e	13	20	1	e	15	28	3	e
19	10	7		15	30	5	e	15	28	5	e
20	11	10		15	27	4	e	14	25	3	e
21	12	12	e	15	28	3	e	17	36	5	e
22	10	7		15	28	5	e	15	27	5	e
23	10	6		13	19	3	e	12	13	2	e
24	8	2		11	10	3		11	10	3	
25	10	6		12	15	2	e	10	6	0	
26	8	2		8	3	0		7	1	-1	
27	10	8		9	5	-1		9	4	-1	
28	10	8		12	14	2	e	11	10	1	
29	8	3		9	3	1		10	7	2	
30	9	2		10	6	1		10	7	1	

TABLE 2: WIND COMFORT RESULTS
COMFORT CRITERION SPEED = 11 MPH
GRADE LEVEL LOCATIONS

References	A Existing			B Existing + Project				C Project + Cumulative			
Location Number	Wind Speed Exceeded 10% of the time (mph)	Percent of Time Wind Speed Exceeds 11 mph	Exceeds	Wind Speed Exceeded 10% of Time (mph)	Percent of Time Wind Speed Exceeds 11 mph	Speed Change Relative to Existing	Exceeds	Wind Speed Exceeded 10% of Time (mph)	Percent of Time Wind Speed Exceeds 11 mph	Speed Change Relative to Existing	Exceeds
31	9	4		9	3	0		8	1	-1	
32	9	3		11	10	2		10	7	1	
33	10	7		11	10	1		10	7	0	
34	9	4		10	8	1		9	5	0	
35	12	15	e	12	13	0	e	12	12	0	e
36	12	12	e	12	15	0	e	12	14	0	e
37	11	10		11	10	0		11	10	0	
38	13	18	e	13	21	0	e	13	20	0	e
39	11	10		11	10	0		11	10	0	
Average speed, Average % of time, Total exceedances	**10 mph**	**9%**	**11 of 39**	**11 mph**	**13%**	**1 mph**	**22 of 39**	**11 mph**	**12%**	**1 mph**	**17 of 39**

APPENDIX A

Drawing List for Model Construction

The drawings and information listed below were received from ESA and were used to construct the scale model of the proposed 2100 Telegraph Avenue. Should there be any design changes that deviate from this list of drawings, the results may change. Therefore, if changes in the design are made, it is recommended that RWDI be contacted and requested to review their potential effects on wind conditions.

File Name	File Type	Date Received (dd/mm/yyyy)
A108-1	dwg	01/11/2017
20171024_1750 Broadway_2017-detached	Rvt	24/102017
20170830-1750 Broadway	dwg	01/09/2017

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APPENDIX F

Greenhouse Gas Emissions

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APPENDIX F

Screening Analysis for Greenhouse Gases and Climate Change

The analysis presented below determines if the proposed 1750 Broadway project (Proposed Project) in the City of Oakland is required to prepare a Greenhouse Gas (GHG) Reduction Plan in accordance with the City's current Standard Condition of Approvals (SCAs). SCA 42 requires a project applicant to prepare a GHG Reduction Plan to increase energy efficiency and reduce GHG emissions to the greatest extent feasible below the BAAQMD's thresholds of significance. The GHG Reduction Plan would be required to include a detailed GHG emissions inventory and a comprehensive set of quantified GHG emissions reduction measures.

The City's current SCA for a GHG Reduction Plan (SCA 42) applies to any project that meets **one or more** of the following three scenarios and has a net increase in GHG emissions:

Scenario A: Projects which:

(a) involve a land use development (i.e., a project that does not require a permit from the Bay Area Air Quality Management District [BAAQMD] to operate),
(b) exceed the GHG emissions screening criteria contained in the BAAQMD CEQA Guidelines, AND
(c) after a GHG analysis is prepared, would exceed both of the City's applicable thresholds of significance (1,100 metric tons of carbon dioxide equivalents [CO2e] annually and 4.6 metric tons of CO_2e per service population annually).

Scenario B: Projects which

(a) involve a land use development,
(b) Exceed the GHG emissions screening criteria contained in the BAAQMD CEQA Guidelines,
(c) after a GHG analysis is prepared, would exceed at least one of the City's applicable thresholds of significance (1,100 metric tons of CO2e annually or 4.6 metric tons of CO_2e per service population annually), AND
(d) are considered to be "Very Large Projects."

Scenario C: Projects which

(a) involve a stationary source of GHG (i.e., a project that requires a permit from BAAQMD to operate) AND
(b) after a GHG analysis is prepared, would exceed the City's applicable threshold of significance (10,000 metric tons of CO_2e annually).

The BAAQMD's screening criteria are included in Table 3-1 of the *BAAQMD's 2010 CEQA Air Quality Guidelines*. The screening criteria indicate which projects, based on land use and size, would have impacts that would be considered less than significant without a quantitative analysis of project emissions. The City's numerical thresholds of significance for GHG emissions from proposed land use developments and stationary sources are also derived from the BAAQMD's 2010 CEQA Air Quality Guidelines.

Table F-1 compares the Proposed Project to the criteria associated with each of the City of Oakland's three GHG emissions scenarios for SCA 42. For a project to be subject to SCA 42 (and be required to prepare a GHG Reduction Plan), the project must meet all the criteria of one or more of the scenarios. As indicated in Table F-1, the Proposed Project would not trigger the GHG Reduction Plan requirement because all the criteria under Scenario A, B or C of SCA 42 are not fully satisfied. Supporting analysis for the findings summarized in Table F-1 is provided below.

TABLE F-1
COMPARISON OF PROPOSED PROJECT WITH SCERANIOS FOR SCA 42

Scenario	Criterion (a)	Criterion (b)	Criterion (c)	Criterion (d)	Applies to Project?
Scenario A	Involve land use development?	Exceeds BAAQMD's screening criteria? [a]	Exceeds both of the City's applicable thresholds? [b]	------	No
1750 Broadway	Yes (mixed use)	Yes (307 residential units and 5,000 square feet retail)	No (See Table F-4)	------	
Scenario B	Involve land use development?	Exceeds BAAQMD's screening criteria? [a]	Exceeds one of the City's applicable thresholds? [b]	Very Large Project?	No
1750 Broadway	Yes (mixed use)	Yes (307 residential units and 5,000 square feet retail)	No (See Table F-4)	No (See Table F-2)	
Scenario C	Involve a stationary source?	Exceeds the City's applicable thresholds? [c]	------	------	No
1750 Broadway	Yes	No	------	-----	

NOTES:

[a] Based on Table 3-1 of the BAAQMD's 2010 *CEQA Air Quality Guidelines*, a mid-rise apartment building with 87 or less dwelling units OR a strip mall/regional shopping center with 19,000 or less square feet of area would have GHG emission levels below the City's applicable thresholds.

[b] For land use developments, the City's threshold of significance are 1,100 metric tons of CO_2e annually and 4.6 metric tons of CO2e per service population annually.

[c] For stationary sources, the City's threshold of significance is 10,000 metric tons of CO_2e annually.

Comparison of Proposed Project with the City's Criteria for a "Very Large Project"

As outlined in Scenario B of SCA 42 (Table F-1), the Proposed Project should be compared to the City's criteria for identifying a Very Large Project. The City defines a Very Large Project as any of the following:

i. Residential development of more than 500 dwelling units;

ii. Shopping center or business establishment employing more than 1,000 persons or encompassing more than 500,000 square feet of floor space;

iii. Commercial office building employing more than 1,000 persons or encompassing more than 250,000 square feet of floor space;

iv. Hotel/motel development of more than 500 rooms;

v. Industrial, manufacturing, processing plant, or industrial park planned to house more than 1,000 persons, occupying more than 40 acres of land, or encompassing more than 650,000 square feet of floor area; or

vi. Any combination of smaller versions of the above that, when combined, result in equivalent annual GHG emissions as the above.

The Proposed Project would not exceed any of the criteria i. through v. above for a Very Large Project. The proposed 307 residential units are below the 500-dwelling unit threshold. The retail component of the Proposed Project would employ 14 persons (well below 1,000 persons) and at 5,000 square feet, would be less than 500,000 square feet of floor space. The Proposed Project would not include any hotel, commercial or industrial/manufacturing uses.

Table F-2 shows the combined residential and retail uses, and evaluates each component of the project as a percentage of the criteria for Very Large Projects. If the sum of these percentages adds up to 100 or more, then the project would constitute a Very Large Project. As shown in Table F-2, the combined project components would not result in equivalent GHG emissions that represent a Very Large Project. Therefore, the Proposed Project would not be considered a Very Large Project.

TABLE F-2
COMPARISON OF PROPOSED PROJECT WITH CRITERION F FOR A VERY LARGE PROJECT

Land Use	Unit Metric	Proposed Project	Very Large Project	Project Component's Percentage of a Very Large Project
Residential	Dwelling Units	307	500	61%
Retail	Square feet	5,000	500,000	1%
Total of all Project Components				62%

Quantification of Project GHG Emissions

As outlined in Scenarios A and B of SCA 42 (Table F-1), the Project's GHG emissions from land use development should be estimated and compared to the City's thresholds of significance to determine if a GHG Reduction Plan is required. The Proposed Project would include a stationary source in the form of a diesel backup generator, which would be considered under Scenario C. The BAAQMD recommends using the most current version of the California Emissions Estimator Model (CalEEMod) to estimate construction and operational emissions of GHGs for a proposed project. CalEEMod utilizes widely accepted emission factors and appropriate default data for a variety of land-use projects that can be used if site-specific information is not available to estimate

emissions. The primary input data used to estimate emissions associated with each of the Proposed Project's land-use types are summarized in **Table F-3**. A copy of the CalEEMod output report for the Proposed Project, which summarizes the input parameters, assumptions, and findings, is included in Appendix C, Health Risk Assessment.

TABLE F-3
SUMMARY OF LAND USE INPUT PARAMETERS FOR CALEEMOD

Project Land Use Type	CalEEMod Land Use Type	1750 Broadway Project Uses
Apartments	Apartments High Rise	307 units
Retail	Regional Shopping Center	5,000 square feet
Parking and Other Uses	Enclosed Parking with Elevator	118,010 square feet

Emissions of GHGs during Project construction and operation were estimated using the CalEEMod input parameters summarized in Table F-3 and the following information:

- Debris from demolition of approximately 27,600 square feet of existing building space and 24,500 cubic yards of off-haul volume was assumed to calculate emissions from off-site hauling trips.
- Based on the design of the East Bay Municipal Utility District's wastewater treatment plant, emissions estimated from wastewater treatment assumed a process with 100 percent aerobic biodegradation and 100 percent anaerobic digestion with cogeneration.
- Based on the project design, no woodstoves and only gas fireplaces (CalEEMod default number) were included in the project operations.
- Sequestration from landscaping was assumed to be negligible and, therefore, was not included in the analysis.

The 2016 California Building Energy Efficiency Standards (Title 24, Part 6) that became effective on January 1, 2017 use 28 percent less energy for lighting, heating, cooling, ventilation, and water heating for residential uses and five percent less energy for non-residential uses than the default 2013 Standards used in CalEEMod.2016.3.1.[1] This reduction in energy use was included in the analysis to estimate GHG emissions for the Proposed Project. The City of Oakland has also adopted a Green Building Ordinance for private development projects. In accordance with the Green Building Ordinance, the Proposed Project must implement mandatory measures from the statewide CALGreen Code and complete a Green Building Compliance Checklist (e.g., LEED or GreenPoint Rater).[2] Compliance with the mandatory measures described under the current CALGreen Code would reduce indoor water use by approximately 20 percent.[3] These GHG reductions were also included in the analysis for the Proposed Project.

[1] California Energy Commission, *2016 Building Energy Efficiency Standards – Frequently Asked Questions*, available at http://www.energy.ca.gov/title24/2016standards/rulemaking/documents/2016_Building_Energy_Efficiency_Standards_FAQ.pdf.
[2] Rating system and checklist determined by City of Oakland Planning Department based on square footage of each use.
[3] CaGreen, *2013 CalGreen Residential Mandatory Measures*, effective January 1, 2014.

In accordance with the City of Oakland's CEQA guidance for evaluating the GHG thresholds of significance, the construction CO_2e emissions were annualized over a project life period of 40 years and then added to the estimated CO_2e emissions during operation. The average annual CO_2e emissions per service population were determined based on a service population of 628 persons.

According to the CEQA streamlining provisions described under Senate Bill (SB) 375, certain "mixed-use residential projects" that are consistent with the general use designation, density, building intensity, and applicable policies specified in a Sustainable Communities Strategy (SCS) do not need to analyze climate change impacts resulting from cars and light-duty trucks. As defined in Public Resources Code (PRC) Section 21159.28(d), a mixed-use residential project is a project where at least 75 percent of the total building square footage of the project consists of residential use or a "Transit Priority Project" as defined in PRC Section 21155(b). A Transit Priority Project must contain the following:

1) At least 50 percent residential use based on total building square footage and, if the project contains between 26 and 50 percent non-residential uses, a floor area ratio (FAR) of not less than 0.75;

2) A minimum net density of at least 20 dwelling units per acre; and

3) Be within 0.5 mile of a major transit stop or high-quality transit corridor[4] included in a regional transportation plan.

The Proposed Project would be approximately 290,260 square feet in size (excluding parking and circulation) with approximately 285,260 square feet of residential uses, and therefore would contain residential uses in approximately 98 percent of the total development area—well above the 50 percent required to qualify the Proposed Project as a Transit Priority Project. The Project site is 0.65 acres in area, and the Proposed Project would include 307 dwelling units; therefore, the net density would be approximately 472 dwelling units per acre. The 19th Street BART station entrance is on the Project site and 12th Street BART station is located approximately 0.3 miles south of the Project site. AC Transit, the primary bus service provider for the City of Oakland also operates several routes in the vicinity of the Proposed Project with stops within one-half mile from the Project site. Broadway qualifies as a "High Quality Transit Corridor" because fixed bus route services are provided through AC Transit with service intervals no longer than 15 minutes during peak commute hours.

As discussed above, the Proposed Project satisfies requirements 1), 2) and 3) and would therefore qualify as a Transit Priority Project (and thereby a mixed-use residential project per PRC Section 21159.28[d]). Therefore, project mobile source emissions have not been included in the project GHG inventory and calculation of emissions per service population.

The total average annual CO_2e emissions and the total average annual CO_2e emissions per service population for the Proposed Project are compared to the City's thresholds in **Table F-4** below.

[4] A high-quality transit corridor means a corridor with fixed route bus service with service intervals no longer than 15 minutes during peak commute hours.

TABLE F-4
PROPOSED PROJECT GHG EMISSIONS[a]

Project Component	CO_2e[b]
Area Source Emissions	38.1
Energy Emissions	759.2
Mobile Emissions[c]	1176.3
Solid Waste	73.7
Water and Wastewater[d]	48.9
Annual Construction Emissions (Averaged over 40 years)	42.7
Less Existing Emissions	-176
Net Increase with Mobile Sources	1,963
Net Increase without Mobile Sources	**786**
City of Oakland Threshold	1,100
Service population [e] (614 residents and 14 employees)	628
Net Increase in Emissions per Service Population	**1.25**
City Emissions per Service Population Threshold	4.6
Significant?	**No**

[a] Project operational emissions estimates were made using CalEEMod, version 2016.3.1.
[b] CO_2e – Carbon dioxide equivalents
[c] GHG emissions from mobile sources relied on inputs from the Transportation Analysis by Fehr & Peers.
[d] 20 percent reduction in indoor water use assumed in compliance with CalGreen code.
[e] The service population is the total number of residents and employees of a project.

SOURCE: ESA, 2017

Estimated project GHG emissions would be less than both the thresholds of 1,100 metric tons of CO_2e per year and 4.6 metric tons of CO_2e per service population. Therefore, the Proposed Project's operational GHG emissions would be less than significant.

Emissions from the Proposed Project's backup generator were also estimated using CalEEMod and the estimated emissions are presented in **Table F-5**. These emissions are considered separately against the 10,000 tons per year stationary source threshold, which is not exceeded. Therefore, under the City's significance thresholds, the total operational GHG emissions would be less-than-significant.

TABLE F-5
AVERAGE GREENHOUSE GAS EMISSIONS FROM THE BACKUP GENERATOR

Source	CO_2e[b] (metric tons per year)
Project Backup Generator	19.1
City of Oakland's Threshold	10,000
Exceeds Threshold?	**No**

[a] CO2e – Carbon dioxide equivalents

Conclusion

The analysis above indicates that the Proposed Project would not be required to prepare a GHG Reduction Plan as it does not meet all the criteria described under any of the Scenarios A, B or C of SCA 42.

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APPENDIX G

Shadow Study

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PREVISION DESIGN

DRAFT CEQA SHADOW SECTION: 1750 Broadway, Oakland

January 25, 2018

Shade and Shadow

Based on City of Oakland significance threshold criteria, potential adverse effects pertaining to shadow from new buildings within the downtown area of Oakland were considered as described below. Under City of Oakland thresholds of significance, a project would have a significant shadow impact if it would:

A. introduce landscape that would now or in the future cast substantial shadows on existing solar collectors;

B. cast shadow that substantially impairs the function of a building using passive solar heat collection, solar collectors for hot water heating, or photovoltaic solar collectors;

C. cast shadow that substantially impairs the beneficial use of any public or quasi-public park, lawn, garden, or open space; or

D. cast shadow on an historic resource such that the shadow would materially impair the resource's historic significance by materially altering those physical characteristics of the resource that convey its historical significance and that justify its designation as an historic resource.

A shadow analysis has been prepared for the project (Exhibits A.1-1 to A.3-3), which shows shadows that would be cast by the building at 9:00 a.m., 12:00 p.m., and 3:00 p.m. for the summer solstice (June 21st), spring/fall equinoxes (March 20th and September 22nd), and winter solstice (December 21st), based on City of Oakland significance threshold criteria. Additionally, graphics showing the extents of net new shading that would be generated by future projects, the "cumulative conditions", are presented as Exhibits C.1-1 to C.3-3.

Project Shading Effects:

The shadow analysis demonstrates that between the hours of 9am and 3pm, the project would cast net new shadow throughout the year as far as westward across San Pablo Avenue, northwest to William Street, northeast across 20th Street, and eastward across Webster Street.

The project would not introduce any landscape that would affect solar collectors, however the project would generate net new shadow that would affect existing rooftop solar collectors, public parks/open spaces, and historic resources. The affected features and sites are detailed below.

PREVISION DESIGN

Sites affected by net new shadow from the project on solar collectors:

555 19th Street Rooftop Solar Panels

Times of year shading would occur:	From early February through early May, and again from mid-August through early November
Range of times affected throughout the year:	Between approximately 9 am through 9:45 am
Shading Effects during Summer Months:	No new shadow
Shading Effects during Fall & Spring:	Shading would be cast on rooftop panels starting from 9 am and remaining until as late as approximately 9:45 am. Shadow would first affect the southernmost panels then move northward affecting panels on the central and northern roof areas before moving off the building.
Shading Effects during Winter Months:	No new shadow
Shading Significance:	Based on the short morning shadow duration over a portion of the year affecting a small number of panels, the presence of new shading would not *substantially* impair the functioning of the solar panels and, as such, would not be considered a significant impact.

540 17th Street Rooftop Solar Panels

Times of year shading would occur:	A few days or around the Summer Solstice (June 21)
Range of times affected throughout the year:	Between approximately 9 am through 9:05 am
Shading Effects during Summer Months:	Shadow would fall on a few solar panels in the northeast corner of the rooftop array starting from 9 am and remaining until approximately 9:05 am
Shading Effects during Fall & Spring:	No new shadow
Shading Effects during Winter Months:	No new shadow
Shading Significance:	Based on the very short early morning shadow duration over a very small portion of the year affecting a small number of panels, the presence of new shading would not *substantially* impair the functioning of the solar panels and, as such, would not be considered a significant impact.

PREVISION DESIGN

733 Broadway Rooftop Solar Panels

Times of year shading would occur:	From mid-March through early mid-September.
Range of times affected throughout the year:	Between approximately 9 am through 10:40 am
Shading Effects during Summer Months:	Shadow would fall on the centrally-located solar panel array starting from 9 am and remaining until approximately 10:40 am
Shading Effects during Fall & Spring:	Little to no new shadow would be present on the equinoxes, with shading encroaching on panels in late spring and early autumn array starting from 9 am and remaining as late as 9:30 am
Shading Effects during Winter Months:	No new shadow
Shading Significance:	Based on the morning shadow and duration over only a portion of the year, the presence of new shading would not *substantially* impair the functioning of the solar panels and, as such, would not be considered a significant impact.

No other solar collectors in the vicinity would be affected by net new shadow from the project.

Parks and/or public open spaces affected by net new shadow from the project:

Henry J. Kaiser Memorial Park

Times of year shading would occur:	From approximately early November through early February
Range of times affected throughout the year:	Between approximately 9 am through 10:05 am
Shading Effects during Summer Months:	No new shadow
Shading Effects during Fall & Spring:	No new shadow
Shading Effects during Winter Months:	New shadow would be cast across the southwest portion of the park at 9am with shading moving towards the northwest corner until leaving the park no later than 10:05am. All areas of the park would receive some net new shadow over the affected period, with the largest area of new shadow covering up to around 75% of the park area at around 9:30 am.
Shading Significance	While the profile of the largest shadow covers a large portion of the park, the shadow occurs for a short period of time during winter mornings which are not typically times of highest use. Based on this, the presence of new shading would not *substantially* impair the beneficial use of the park and therefore would not be considered a significant impact.

No other parks and/or public open spaces in the vicinity would be affected by net new shadow from the project. The new Project shadow would occur for approximately 1 hour and 5 minutes during the winter, in the mornings, at a time not of typical high use. Therefore, the new Project shadow would not substantially impair the use of the park and would not be considered a significant impact.

Sites affected by net new shadow from the project on historic resources:

1807 Telegraph (Fox Theatre)

Times of year shading would occur:	From approximately mid-August through early May
Range of times affected throughout the year:	Between approximately 9 am through 11:15 am
Shading Effects during Summer Months:	No new shadow would be cast between early May and mid-August, however in later August some new shadow would fall starting around 10 am and move from west to east until it moves off the building around 11 am. Features affected would include windows along the southern and southeastern building frontages.
Shading Effects during Fall & Spring:	New shadow would be cast on eastern (street/entry) facade starting from 9 am and move from south to north until it moves off the building no later than 11 am. Features affected would include windows along the southern and eastern building frontages as well as the theatre marquee.
Shading Effects during Winter Months:	New shadow would be cast on eastern (street/entry) facade starting from 9 am and move from south to north until it moves off the building no later than 11 am. Features affected would include windows along the eastern building frontages and the theatre marquee.
Shading Significance	The presence of new shadow would not materially alter the physical characteristics of the resource that convey its historical significance, and therefore would not be considered a significant impact.

1910 Telegraph Avenue

Times of year shading would occur:	From approximately early September through early April
Range of times affected throughout the year:	Between approximately 9:10 am through 12:30 pm
Shading Effects during Summer Months:	No new shadow
Shading Effects during Fall & Spring:	New shadow would be cast on the southern street elevation and rooftop starting at approximately 11:15 am and remaining until approximately 12:30 pm.
Shading Effects during Winter Months:	New shadow would be cast on the southern street elevation and rooftop starting at approximately 9:10 am and remaining until approximately 11:45 am.

1910 Telegraph Avenue

Shading Significance	The presence of new shadow would not materially alter the physical characteristics of the resource that convey its historical significance, and therefore would not be considered a significant impact.

1935 Broadway

Times of year shading would occur:	From mid-September through late-March
Range of times affected throughout the year:	Between approximately 10:25 am through 1:20 pm
Shading Effects during Summer Months:	No new shadow
Shading Effects during Fall & Spring:	New shadow would be cast on the southern side wall, eastern street elevation, and rooftop starting at approximately 12:40 pm, and move eastward until approximately 1:20 pm when new shadow would move past the building.
Shading Effects during Winter Months:	New shadow would be cast on the southern side wall, eastern street elevation, and rooftop starting at approximately 10:25 am and move eastward until approximately 1pm when new shadow would move past the building.
Shading Significance	The presence of new shadow would not materially alter the physical characteristics of the resource that convey its historical significance, and therefore would not be considered a significant impact.

No other historic resources in the vicinity would be affected by net new shadow from the project.

Project + Cumulative Shading Effects:

The cumulative conditions analysis assesses the project's potential impacts along with other proposed projects in the vicinity that have the potential to cast shadow on sites affected by project shading. The following proposed (cumulative) projects were modeled and added to the analysis to identify possible shadow interaction between these projects and 1750 Broadway:

1. 1431 Jefferson
2. 1601 San Pablo
3. 585 22nd Street
4. 2015 Telegraph
5. 2016 Telegraph
6. 2100 Telegraph
7. 1640 Broadway
8. 1900 Broadway
9. 1721 Webster
10. 2044 Franklin
11. 19th & Harrison
12. 2 Kaiser Plaza
13. 222 19th Street

While the individual projects above may contribute new shadow to some of the same sites, the analysis demonstrated that shadow cast by 1750 Broadway above *would not* interact with shading cast by these cumulative projects during the same periods of shading on sites reviewed by this study.

Conclusion:

Overall, based on the factors discussed in this section and considering the City of Oakland thresholds of significance, new shadow from the project would not have a significant impact.

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PREVISION DESIGN

Proposed Project
Existing (current) Shadows
New Shading by Proposed Project

1750 BROADWAY

Shading diagrams on the Summer Solstice

A.1-1

Historic Resource Sites
1. 1901-1923 San Pablo Avenue
2. 1939-1963 San Pablo Avenue
3. 2101 Telegraph
4. 518 20th Street
5. 1807 Telegraph (Fox Theatre)
6. 2525 Broadway (Paramount Theatre)
7. 1910 Telegraph
8. 1935 Broadway
9. 1st Church of Christ Scientist
10. 1800 Franklin (Leamington Hotel)
11. 1803 Webster
12. 1700 Franklin
13. 1701 Webster
14. 1635 Webster
15. 1830 Webster
16. 1732 Webster
17. 1628 Webster

Solar Collector Sites
1. 2000 San Pablo Avenue
2. 540 21st Street
3. 555 19th Street
4. 540 17th Street
5. 733 Broadway
6. 285 17th Street

Public Parks and Open Spaces
1. Frank H. Ogawa Plaza
2. Henry J. Kaiser Memorial Park
3. Snow Park
4. Lakeside Park

SUMMER SOLSTICE
JUNE 21

9:00 AM

PREVISION DESIGN

Proposed Project
Existing (current) Shadows
New Shading by Proposed Project

1750 BROADWAY

Shading diagrams on the Summer Solstice

A.1-2

Historic Resource Sites
1. 1901-1923 San Pablo Avenue
2. 1939-1963 San Pablo Avenue
3. 2101 Telegraph
4. 518 20th Street
5. 1807 Telegraph (Fox Theatre)
6. 2525 Broadway (Paramount Theatre)
7. 1910 Telegraph
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6. 285 17th Street

Public Parks and Open Spaces
1. Frank H. Ogawa Plaza
2. Henry J. Kaiser Memorial Park
3. Snow Park
4. Lakeside Park

SUMMER SOLSTICE
JUNE 21

12:00 PM

PREVISION DESIGN

Proposed Project
Existing (current) Shadows
New Shading by Proposed Project

1750 BROADWAY

Shading diagrams on the Summer Solstice

A.1-3

Historic Resource Sites
1. 1901-1923 San Pablo Avenue
2. 1939-1963 San Pablo Avenue
3. 2101 Telegraph
4. 518 20th Street
5. 1807 Telegraph (Fox Theatre)
6. 2525 Broadway (Paramount Theatre)
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Public Parks and Open Spaces
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3. Snow Park
4. Lakeside Park

SUMMER SOLSTICE
JUNE 21

3:00 PM

PREVISION DESIGN

Proposed Project
Existing (current) Shadows
New Shading by Proposed Project

1750 BROADWAY

Shading diagrams on the Vernal/Autumnal Equinoxes

A.2-1

Historic Resource Sites
1. 1901-1923 San Pablo Avenue
2. 1939-1963 San Pablo Avenue
3. 2101 Telegraph
4. 518 20th Street
5. 1807 Telegraph (Fox Theatre)
6. 2525 Broadway (Paramount Theatre)
7. 1910 Telegraph
8. 1935 Broadway
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3. Snow Park
4. Lakeside Park

VERNAL/AUTUMNAL EQUINOX
MARCH 20 & SEPTEMBER 22

9:00 AM

PREVISION DESIGN

Proposed Project
Existing (current) Shadows
New Shading by Proposed Project

1750 BROADWAY

Shading diagrams on the Vernal/Autumnal Equinoxes

A.2-2

Historic Resource Sites
1. 1901-1923 San Pablo Avenue
2. 1939-1963 San Pablo Avenue
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5. 1807 Telegraph (Fox Theatre)
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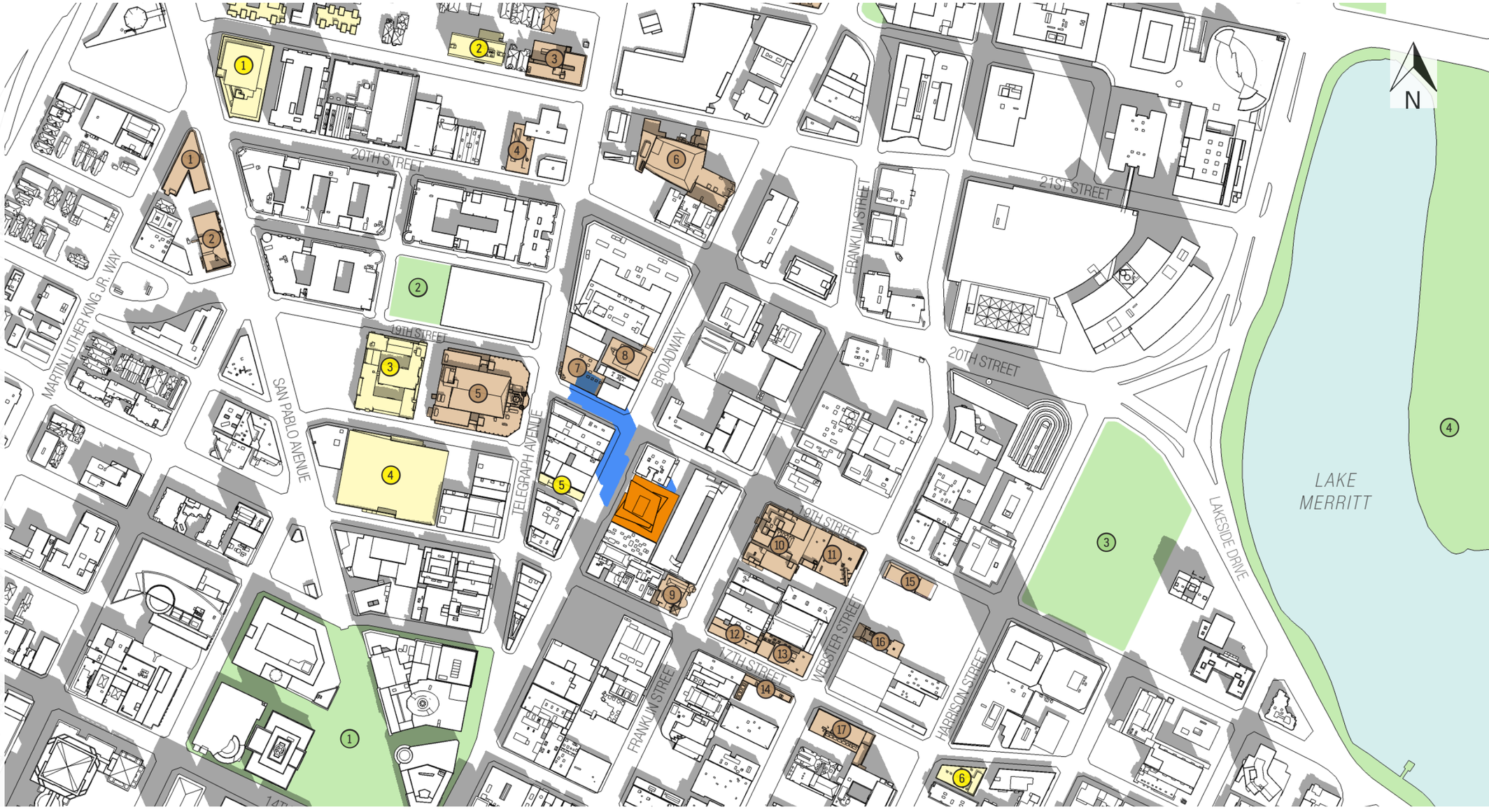
3. Snow Park
4. Lakeside Park



VERNAL/AUTUMNAL EQUINOX
MARCH 20 & SEPTEMBER 22

12:00 PM

PREVISION DESIGN

Proposed Project
Existing (current) Shadows
New Shading by Proposed Project

1750 BROADWAY

Shading diagrams on the Vernal/Autumnal Equinoxes

A.2-3

Historic Resource Sites
1. 1901-1923 San Pablo Avenue
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4. Lakeside Park

VERNAL/AUTUMNAL EQUINOX
MARCH 20 & SEPTEMBER 22

3:00 PM

PREVISION DESIGN

Proposed Project
Existing (current) Shadows
New Shading by Proposed Project

1750 BROADWAY

Shading diagrams on the Winter Solstice

A.3-1

Historic Resource Sites
1. 1901-1923 San Pablo Avenue
2. 1939-1963 San Pablo Avenue
3. 2101 Telegraph
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5. 1807 Telegraph (Fox Theatre)
6. 2525 Broadway (Paramount Theatre)
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17. 1628 Webster

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Public Parks and Open Spaces
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2. Henry J. Kaiser Memorial Park
3. Snow Park
4. Lakeside Park

WINTER SOLSTICE
DECEMBER 21

9:00 AM

PREVISION DESIGN

Proposed Project
Existing (current) Shadows
New Shading by Proposed Project

1750 BROADWAY

Shading diagrams on the Winter Solstice

A.3-2

Historic Resource Sites
1. 1901-1923 San Pablo Avenue
2. 1939-1963 San Pablo Avenue
3. 2101 Telegraph
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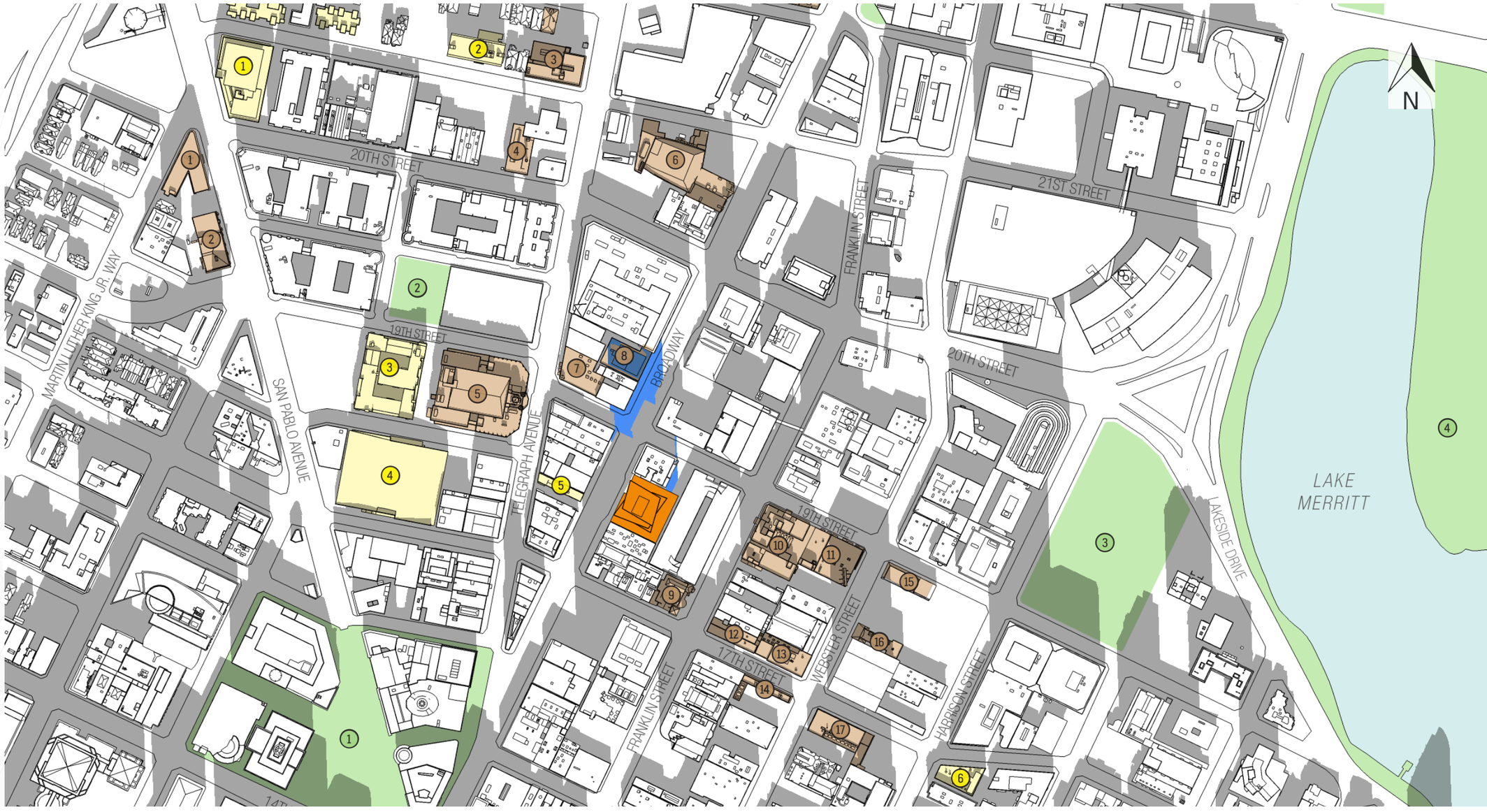

WINTER SOLSTICE
DECEMBER 21

12:00 PM

PREVISION DESIGN

Proposed Project
Existing (current) Shadows
New Shading by Proposed Project

1750 BROADWAY

Shading diagrams on the Winter Solstice

A.3-3

Historic Resource Sites
1. 1901-1923 San Pablo Avenue
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4. Lakeside Park

WINTER SOLSTICE
DECEMBER 21

3:00 PM

PREVISION DESIGN

1750 BROADWAY + CUMULATIVE

Cumulative shading diagrams on the Summer Solstice

C.1-1

- Proposed Project
- Existing (current) Shadows
- New Shading by Proposed Project
- New Shading from Cumulative Projects

Historic Resource Sites

1. 1901-1923 San Pablo Avenue
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16. 1732 Webster
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Solar Collector Sites

1. 2000 San Pablo Avenue
2. 540 21st Street
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5. 733 Broadway
6. 285 17th Street

Public Parks and Open Spaces

1. Frank H. Ogawa Plaza
2. Henry J. Kaiser Memorial Park
3. Snow Park
4. Lakeside Park

Cumulative Projects

1. 1431 Jefferson
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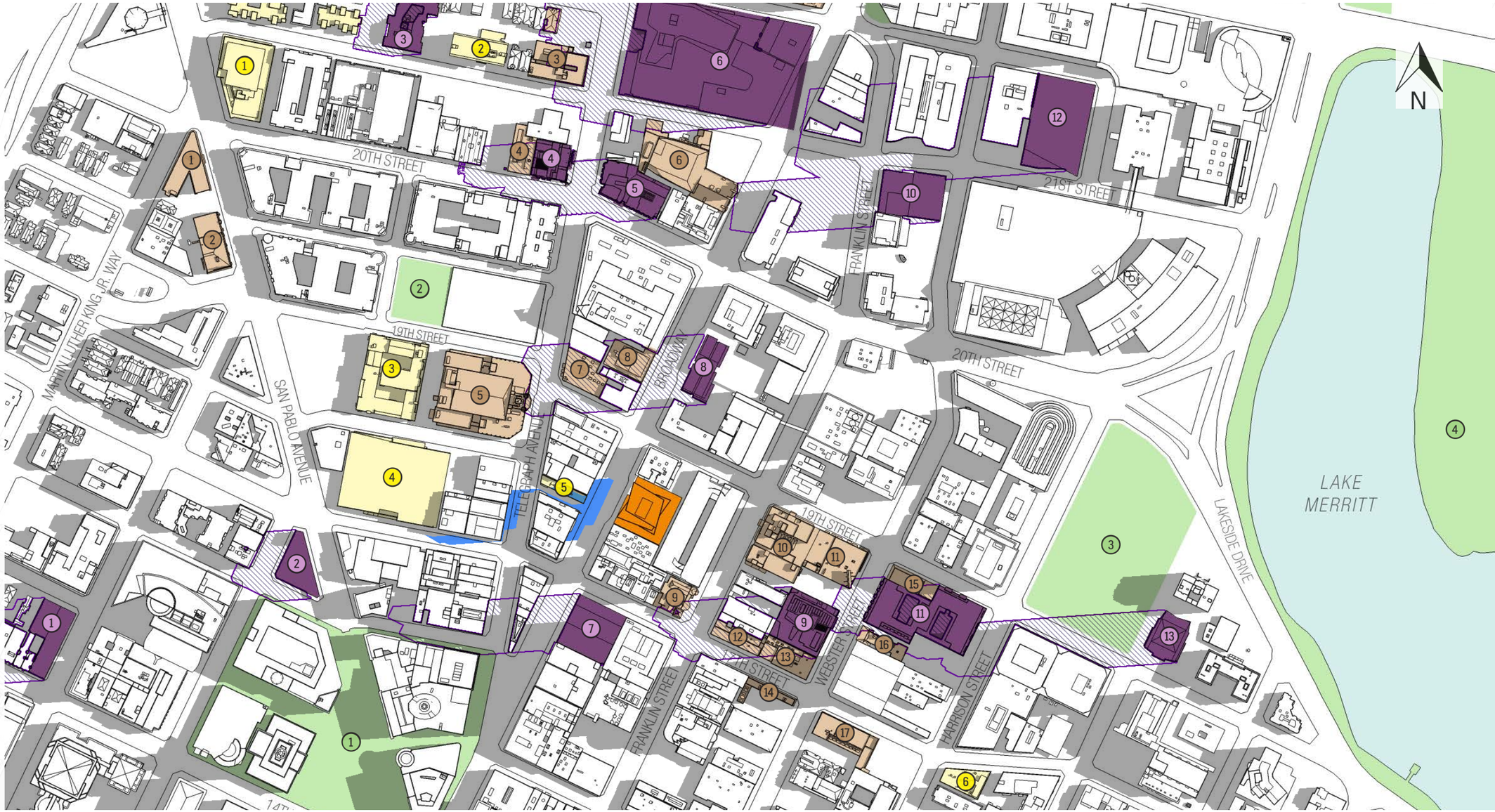
5. 2016 Telegraph
6. 2100 Telegraph
7. 1640 Broadway
8. 1900 Broadway
9. 1721 Webster
10. 2044 Franklin
11. 19th & Harrison
12. 2 Kaiser Plaza
13. 222 19th Street



SUMMER SOLSTICE
JUNE 21

9:00 AM

PREVISION DESIGN

1750 BROADWAY + CUMULATIVE

Cumulative shading diagrams on the Summer Solstice

C.1-2

- Proposed Project
- Existing (current) Shadows
- New Shading by Proposed Project
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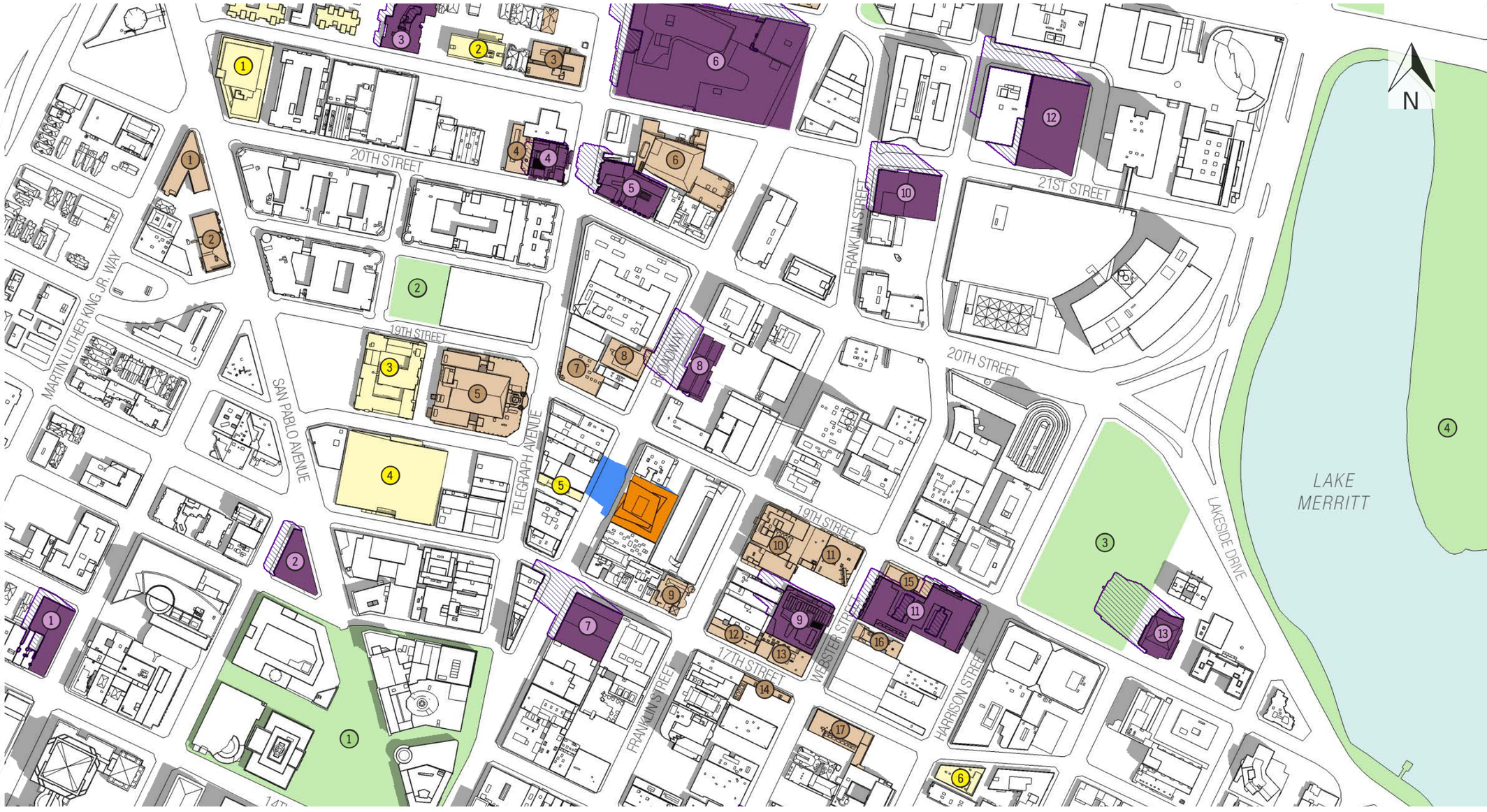

SUMMER SOLSTICE
JUNE 21

12:00 PM

PREVISION DESIGN

1750 BROADWAY + CUMULATIVE

Cumulative shading diagrams on the Summer Solstice

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SUMMER SOLSTICE
JUNE 21

3:00 PM

PREVISION DESIGN

1750 BROADWAY + CUMULATIVE

Cumulative shading diagrams on the Vernal/Autumnal Equinoxes

C.2-1

- Proposed Project
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VERNAL/AUTUMNAL EQUINOX
MARCH 20 & SEPTEMBER 22

9:00 AM

PREVISION DESIGN

1750 BROADWAY + CUMULATIVE

Cumulative shading diagrams on the Vernal/Autumnal Equinoxes

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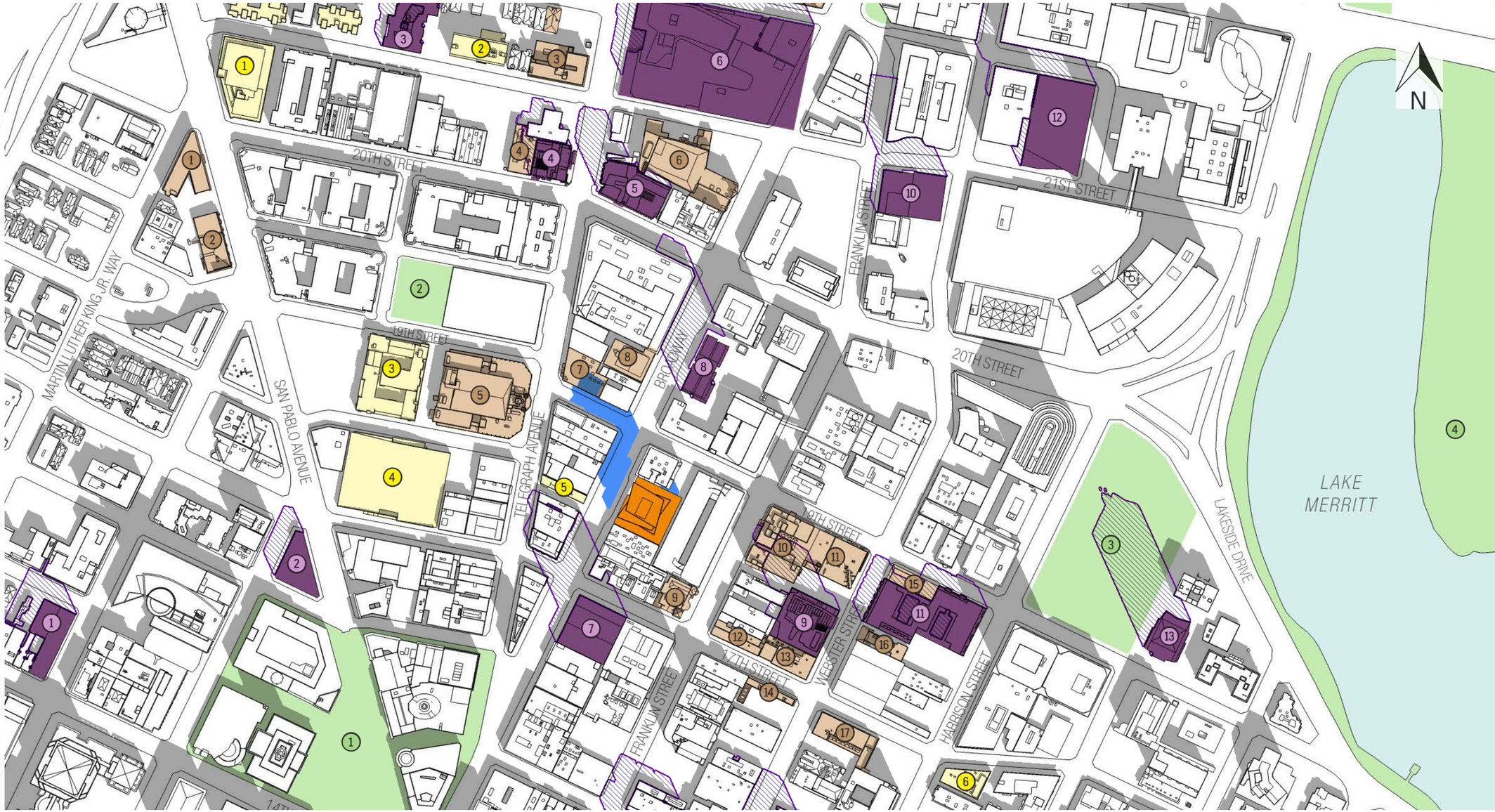

VERNAL/AUTUMNAL EQUINOX
MARCH 20 & SEPTEMBER 22

12:00 PM

PREVISION DESIGN

1750 BROADWAY + CUMULATIVE

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VERNAL/AUTUMNAL EQUINOX
MARCH 20 & SEPTEMBER 22

3:00 PM

PREVISION DESIGN

1750 BROADWAY + CUMULATIVE

Cumulative shading diagrams on the Winter Solstice

C.3-1

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WINTER SOLSTICE
DECEMBER 21

9:00 AM

PREVISION DESIGN

1750 BROADWAY + CUMULATIVE

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WINTER SOLSTICE
DECEMBER 21

3:00 PM