File No. 151269

Committee Item No. ______
Board Item No. 33

COMMITTEE/BOARD OF SUPERVISORS

AGENDA PACKET CONTENTS LIST

Committee: ______ **Date:** ______
Board of Supervisors Meeting **Date:** January 26, 2016

Cmte Board

Cmte	Board	
☐	☐	**Motion**
☐	☐	**Resolution**
☐	☐	**Ordinance**
☐	☐	**Legislative Digest**
☐	☐	**Budget and Legislative Analyst Report**
☐	☐	**Youth Commission Report**
☐	☒	**Introduction Form**
☐	☐	**Department/Agency Cover Letter and/or Report**
☐	☐	**MOU**
☐	☐	**Grant Information Form**
☐	☐	**Grant Budget**
☐	☐	**Subcontract Budget**
☐	☐	**Contract/Agreement**
☐	☐	**Form 126 – Ethics Commission**
☐	☐	**Award Letter**
☐	☐	**Application**
☐	☐	**Public Correspondence**

OTHER **(Click the text below for a direct link to the document)**

Cmte	Board	
☐	☒	Appeal Letter - December 17, 2015
☐	☒	Public Comment Letters
☐	☒	Planning Department Response - January 19, 2016
☐	☒	SFMTA Response - January 19, 2016
☐	☒	Appellant Supplemental Appeal Letter - January 14, 2016
☐	☒	Hearing Notices and Clerical Documents
☐	☐	
☐	☐	
☐	☐	

Prepared by: John Carroll **Date:** January 21, 2016
Prepared by: ______ **Date:** ______

LOZEAU DRURY

rebecca@lozeaudrury.com

2015 DEC 17 PM 1:10

December 17, 2015

Via Hand Delivery and Electronic Mail
President London Breed
c/o Ms. Angela Calvillo, Clerk of the Board
Board of Supervisors of the City and County of San Francisco
1 Dr. Carlton B. Goodlett Place
City Hall, Room 244
San Francisco, CA 94102-4689
Email: Board.of.Supervisors@sfgov.org

Re: Appeal of SFMTA Resolution No. 15-161, CEQA Categorical Exemption Determinations for Commuter Shuttle Permit Program

Dear President Breed and Honorable Members of the Board of Supervisors:

I am writing on behalf of the Coalition for Fair, Legal and Environmental Transit ("Coalition"), Service Employees International Union Local Union 1021 ("SEIU 1021"), Sue Vaughan, and Robert Planthold (collectively, "Appellants") concerning the San Francisco Municipal Transportation Agency ("SFMTA") Commuter Shuttle Permit Program and recent amendments to Transportation Code, Division II, to establish a Commuter Shuttle Permit Program to authorize certain shuttle buses to stop in designated Muni stops and passenger loading zones for the purpose of loading or unloading passengers, and establish permit conditions for such permits ("Shuttle Project").

The Coalition is a non-profit unincorporated association based in the City and County of San Francisco, and comprised of San Francisco residents who are concerned about the failure of the City to conduct CEQA review for the Shuttle Project to analyze and mitigate impacts including displacement, air pollution, pedestrian and bicycle safety, public transportation impacts and other impacts. SEIU 1021 is a non-profit public and private service employees' union with over 6,000 members living in the City and County of San Francisco. SEIU is concerned that its members are being forced out of the City in part as a result of commuter shuttles. SEIU 1021 is also concerned that its members are being exposed to air pollution, pedestrian and bicycle safety risks, and other environmental impacts as a result of the Shuttle Project. Ms. Vaughan and Mr. Planthold are San Francisco Resident concerned with the City's failure to conduct CEQA review and the City's adoption of a program that conflicts with the California Vehicle Code.

LOZEAU DRURY LLP

T 510.836.4200
F 510.836.4205

410 12th Street, Suite 250
Oakland, Ca 94607

www.lozeaudrury.com
rebecca@lozeaudrury.com

December 17, 2015

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c/o Ms. Angela Calvillo, Clerk of the Board
Board of Supervisors of the City and County of San Francisco
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Appellants live within areas of displacement, traffic, air quality, bicycle and pedestrian safety impacts and other impacts of the Shuttle Project, and regularly use public thoroughfares and public transportation in areas that will be impacted by the Shuttle Project.

A. Decision Being Appealed (Admin. Code §§ 31.16(a); (b)(1), (e).

Pursuant to San Francisco Administrative Code ("Admin. Code") Section 31.16, Appellants hereby appeal the November 17, 2015 decision of SFMTA Board of Directors approving Resolution No. 15-161 (the "Approval Action"), including but not limited to:

(1) Approval of amendments to the Transportation Code to authorize a commuter shuttle permit program to allow commuter shuttle service providers to use designated Muni zones and white curb loading zones for passenger loading and unloading;
(2) Adoption of a Commuter Shuttle Program Policy to govern the SFMTA's implementation of the commuter shuttle permit program, improving approval of the designated Muni zones and white curb zones;
(3) Determination that the Shuttle Project is exempt from environmental review pursuant to Title 14 of the California Code of Regulations section 15301 and 15308 as a Class 1 and Class 8 categorical exemption from CEQA; and
(4) Concurrence with the October 22, 2015 San Francisco Planning Department determination that the Project it exempt from environmental review ("CEQA Concurrence").

Pursuant to Admin. Code Section 31.16(b)(1), true and correct copies of Resolution No. 15-161 and the related San Francisco Planning Department's CEQA determination are attached hereto as **Exhibit A**. Pursuant to Admin Code Section 31.16(b)(1), a copy of this Appeal Letter is simultaneously being submitted to the Environmental Review Officer.

B. Grounds for Appeal (Admin. Code § 31.16(b)(1), (e)).

Appellants urge the Board of Supervisors to reverse the Approval Action for the Shuttle Project on the grounds that the Project is not exempt from the requirements of the California Environmental Quality Act, Pub. Res. Code §§ 21000, et seq. ("CEQA"). Specifically, the Shuttle Project is not subject to a categorical exemption under 14 Cal. Code Regs. ("CCR") §§ 15301 or 15308 because the Shuttle Project goes beyond the limited scope of those exemptions. Moreover, even if the exemptions did apply, which they do not, they would be inapplicable in this instance because the Shuttle Project will result in significant environmental impacts due to unusual circumstances. These include impacts on the residents of San Francisco, including Appellants.

In addition, Appellants urge the Board of Supervisors to reverse the Approval Action because the Shuttle Project is preempted by the California Vehicle Code. In direct conflict with section 22500(e) of the California Vehicle Code's prohibition against private buses stopping in public "red-curb" bus stops, the Shuttle Project expressly ***allows*** the same action. The California Supreme Court has held that cities (including charter cities) may not enact ordinances that conflict with the State Vehicle Code, because the Vehicle Code expressly preempts local regulation. *O'Connell v. City of Stockton* (2007) 41 Cal.4th 1061, 1074. Since the Shuttle Project expressly allows private buses to stop in public bus stops, and since this action is expressly prohibited by State law, the City policy is preempted by state law and is unlawful.

C. Additional Appeal Procedures.

Appeal of SFMTA's Approval Action to the Board of Supervisors is authorized under CEQA and the Admin. Code. Pub. Res. Code § 21151(c); Admin. Code § 31.16(b), (e). This Appeal is timely because it is being filed within 30 days of November 17, 2015, the date of SFMTA's Approval Action of the Project. See Admin. Code § 31.16(e)(1), (2)(A), (B); see Resolution No. 15-161, p. 3 ("this is the Approval Action as defined by San Francisco Administrative Code Chapter 31").

Appellants expressly reserve the right to submit additional written and oral comments, and additional evidence in support of this Appeal, to the City and County of San Francisco and its departments ("City") and to the Board of Supervisors up to and including the final hearing on this Appeal and any and all subsequent permitting proceedings or approvals undertaken by the City or any other permitting agency for the Project. PRC § 21177(a); *Bakersfield Citizens for Local Control v. Bakersfield* (2004) 124 Cal. App. 4th 1184, 1199-1203; *see Galante Vineyards v. Monterey Water Dist.* (1997) 60 Cal. App. 4th 1109, 1121; Admin Code §§ 31.16(b)(4), (5), (6).

Thank you for consideration of this Appeal. Please place this Appeal Letter in the Administrative Record for the Shuttle Project, and provide Appellants with timely notice of the hearing date set for this Appeal. Admin. Code § 31.16(b)(4).

Sincerely,

Rebecca L. Davis
Lozeau | Drury LLP

Enclosures

cc. Environmental Review Officer
(pursuant to SF Administrative Code § 31.16(b)(1))

EXHIBIT A

SAN FRANCISCO
MUNICIPAL TRANSPORTATION AGENCY
BOARD OF DIRECTORS

RESOLUTION No. 15-161

WHEREAS, The use of shuttle buses to provide commuter shuttle service for the benefit of employees, students and others is a growing means of sustainable transportation in San Francisco and the greater Bay Area, and has become increasingly common in the past several years; and,

WHEREAS, Commuter shuttles are free under law to drive on most of San Francisco's streets, and the SFMTA cannot ban shuttles from the City; and,

WHEREAS, Shuttle bus service provides alternatives to single-occupant vehicle trips, and is associated with reduced auto ownership and with increased use of transit, walking, and bicycling for non-commute trips; and,

WHEREAS, The increase in shuttle buses on San Francisco's streets has led to an increase in issues related to Muni operations, street safety, and complaints from residents; and,

WHEREAS, As part of an effort to address these issues, in 2014, the SFMTA created a pilot program (the "Pilot") to gather accurate and up-to-date information on commuter shuttle activity and operations and to determine if active regulation of shuttles can reduce traffic conflicts and other issues; and,

WHEREAS, Under the Pilot, the SFMTA created a permit program and established a shuttle zone network of designated Muni zones and white loading zones around the City that would be made available to shuttle service providers participating in the program, based upon input from the service providers, SFMTA transit service planning and engineering staff, and the community; and,

WHEREAS, Over the course of the Pilot, the SFMTA made the substantial changes and updates to the shuttle zone network to respond to issues such as street improvements, Muni service changes, shuttle ridership demand, construction, community concerns, and other operational considerations; and,

WHEREAS, The present Pilot shuttle zone network is the SFMTA's best estimate of an effective shuttle zone network; and,

WHEREAS, The SFMTA undertook an extensive evaluation of the Pilot to determine whether the method of regulation used in the Pilot should be continued beyond the pilot period; and,

WHEREAS, The Pilot Evaluation Report found that: the vast majority of community feedback focused on large shuttles being unwelcome on residential streets; effective and accurate real-time shuttle vehicle data assists the SFMTA in regulating and managing commuter shuttle activity; 47% of shuttle riders said they would drive alone to work if a shuttle were not available; shuttles reduce the amount of vehicle miles traveled on the region's streets by nearly 4.3 million miles each month; an average of 2.7% of shuttle stop-events resulted in blocking Muni access to a zone; shuttles block travel and bike lanes about 35% of the time that they stop to load or unload; and more enforcement staffing at shuttle zones and along shuttle routes would assist in keeping traffic flowing smoothly throughout the shuttle zone network and help speed Muni; and,

WHEREAS, After evaluating the Pilot, SFMTA staff developed a Commuter Shuttle Program Policy to establish an ongoing Commuter Shuttle Program that would continue much of the regulatory approach put in place by the Pilot, with several improvements and enhancements based upon the Pilot Evaluation Report and input from elected officials, community members, the SFMTA's transit and traffic engineering teams, shuttle service providers, employers, and other interested stakeholders; and,

WHEREAS, The proposed Commuter Shuttle Program would require participating shuttle service providers to phase in the use of newer vehicles in order to lower greenhouse gas emissions from the shuttle fleet overall; and,

WHEREAS, The proposed Commuter Shuttle Program would require buses participating in the program that are over 35 feet long to travel on the major and minor arterial street network as defined by the California Department of Transportation; and,

WHEREAS, The proposed Commuter Shuttle Program would allow shuttles that are free and open to the public to use the shuttle zone network without charge as long as those shuttles comply with all other Commuter Shuttle Program requirements; and,

WHEREAS, The proposed Commuter Shuttle Program would require real-time GPS data collection and reporting to help better manage commuter shuttle operations and target enforcement; and,

WHEREAS, The proposed Commuter Shuttle Program would require increased data sharing from participating shuttle service providers, and requires that participating shuttle service providers demonstrate for each vehicle that data feeds are regular and accurate before receiving a permit; and,

WHEREAS, The proposed Commuter Shuttle Program would require participating shuttle service providers to comply with the San Francisco Board of Supervisors' March 2015 Labor Harmony Resolution, including the submission of a Service Disruption Prevention Plan that describes the shuttle service providers' efforts to ensure efficient and consistent service in the event of potential disruptions, including labor disputes; and,

WHEREAS, The permit fee for participation in the proposed Commuter Shuttle Program would be a per-stop fee which will be determined by aggregating the costs to the SFMTA that result from the program and dividing that total cost by the annual number of stop-events that all program participants plan to make; and,

WHEREAS, The Commuter Shuttle Program Policy includes the network of designated Muni zones and passenger loading zones that would be available to participating shuttle service providers; and

WHEREAS, The Commuter Shuttle Program Policy also includes capital improvements at shuttle zones and corridors, with such costs recovered, at least in part, as part of the fee for participation in the program; and,

WHEREAS, The per-stop fee amount for the proposed Commuter Shuttle Program will be calculated once the SFMTA has completed the review and approval process for program participation, and will be brought to the SFMTA Board of Directors at a future date for approval and appropriate amendment of the Transportation Code; and,

WHEREAS, On October 22, 2015, the San Francisco Planning Department determined that the proposed Commuter Shuttle Program and Transportation Code amendments are exempt from environmental review pursuant to Title 14 of the California Code of Regulations Sections 15301 and 15308 as a Class 1 and Class 8 categorical exemption from the California Environmental Quality Act (CEQA), the SFMTA Board of Directors concurs with this determination, the Planning Department's determination is on file with the Secretary to the SFMTA Board of Directors, and this is the Approval Action as defined by San Francisco Administrative Code Chapter 31; now, therefore, be it

RESOLVED, That the San Francisco Municipal Transportation Agency Board of Directors finds that substantial evidence in the record, as set forth in the California Environmental Quality Act findings in Attachment A to this resolution, supports the determination that the proposed Commuter Shuttle Program and Transportation Code amendments are exempt from environmental review pursuant to Title 14 of the California Code of Regulations section 15301 and 15308 as a Class 1 and Class 8 categorical exemption from CEQA, and incorporates said findings by this reference as though fully set forth herein; and, be it further,

RESOLVED, That the San Francisco Municipal Transportation Agency Board of Directors amends the Transportation Code, Division II, to authorize a permit program to allow commuter shuttle service providers to use designated Muni zones and white curb loading zones for passenger loading and unloading; and, be it further

RESOLVED, That the San Francisco Municipal Transportation Agency Board of Directors adopts the Commuter Shuttle Program Policy to govern the SFMTA's implementation of the Commuter Shuttle Program, including the network of designated Muni zones and passenger loading zones that would be available to participating shuttle service providers.

I certify that the foregoing resolution was adopted by the San Francisco Municipal Transportation Agency Board of Directors at its meeting of November 17, 2015.

R. Boomer

Secretary to the Board of Directors
San Francisco Municipal Transportation Agency

RESOLUTION #15-161

[Transportation Code – Establishing Permanent Commuter Shuttle Permit Program]

Resolution amending the Transportation Code, Division II to establish a Commuter Shuttle Permit Program to authorize certain shuttle buses to stop in designated Muni stops and passenger loading zones for the purpose of loading or unloading passengers, and establish permit conditions for such permits.

NOTE: Additions are single-underline Times New Roman; deletions are ~~strike-through Times New Roman~~.

The Municipal Transportation Agency Board of Directors of the City and County of San Francisco enacts the following regulations:

Section 1. Article 900 of Division II of the Transportation Code is hereby amended by revising Section 914, to read as follows:

Sec. 914. COMMUTER SHUTTLE STOP PERMITS.

(a) **Definitions**. As used in this Section 914, the following words and phrases shall have the following meanings:

Designated Stop. An SFMTA bus stop or a white zone designated by SFMTA as a stop available for loading and/or unloading of passengers by Shuttle Service Providers that have been issued a Shuttle Permit under this Section 914.

Director. The Director of Transportation or his or her designee.

Shuttle Bus. A motor vehicle designed, used or maintained by or for a charter-party carrier of passengers, a passenger stage corporation, or any highway carrier of passengers required to register with the California Public Utilities Commission that is being operated in Shuttle Service. A Shuttle Bus shall

also include any bus that is owned, or being operated on behalf of, a governmental entity and being operated in Shuttle Service.

Shuttle Permit. A permit issued by the SFMTA that authorizes a Shuttle Service Provider to load and/or unload passengers at specified Designated Stops in one or more Shuttle Buses.

Shuttle Placard. A placard issued by SFMTA that is visible from outside the Shuttle Bus at front and rear locations as specified by the SFMTA and that identifies the Shuttle Permit authorizing the Shuttle Bus to use Designated Stops.

Shuttle Service. Transportation by Shuttle Buses offered for the exclusive or primary use of a discrete group or groups, such as clients, patients, students, paid or unpaid staff, visitors, and/or residents, between an organization or entity's facilities or between the organization or entity's facilities and other locations, on a regularly-scheduled basis.

Shuttle Service Provider. Any Person using Shuttle Buses to provide Shuttle Service within the City.

Stop Event. An instance of stopping by a Shuttle Bus at a Designated Stop for the purpose of loading and/or unloading passengers.

(b) **Findings.**

(1) The use of Shuttle Buses for the purpose of providing Shuttle Service is a growing means of transportation in San Francisco and the greater Bay Area.

(2) Shuttle Service provides significant benefits to the community by replacing single occupant trips with more efficient transportation, contributing to a reduction in parking demand, and supporting the City's goal of ~~having of 50 percent of all~~ increasing trips made by sustainable modes ~~by 2018~~.

(3) Shuttle Service currently operating in San Francisco reduces vehicle miles traveled (VMT) in the City by approximately 4,300,000 ~~at least 45 million~~ miles

~~annually~~each month~~, and reduces greenhouse gas emissions from trips originating or ending in the City by 11,000 metric tons annually~~.

(4) Unregulated use of Muni stops by Shuttle Service Providers ~~has resulted~~results in unintended adverse impacts, including delaying transit bus service, increasing traffic congestion, diverting bicyclists from bicycle lanes into mixed-flow lanes, and diverting motor vehicle traffic into adjacent travel lanes, and preventing transit buses from being able to access the curb in order to load and unload passengers.

(5) Prior to implementing a commuter shuttle pilot program in August, 2014, the~~The~~ SFMTA ~~'s~~ lacked ~~of~~ complete information about Shuttle Service operations, including routes, frequency of service and stops, which had ~~has~~ been a barrier to resolving and preventing conflicts with Shuttle Service Providers' operations, including adverse impacts on Muni service and increased traffic congestion.

(6) Inconsistent or inaccurate identification of, and lack of contact information for, Shuttle Service Providers ~~has~~ previously made it difficult for the SFMTA to effectively and timely communicate with Shuttle Service Providers to prevent or resolve conflicts and makes enforcement of traffic and parking regulations difficult.

(7) Regulation by the SFMTA of the use of stops ~~use~~ by Shuttle Services to provide safe loading and unloading zones for Shuttle Services, whose cumulative ridership is equivalent to that of a small transit system, is consistent with the City's Transit First policy.

(8) The commuter shuttle pilot program implemented in August 2014~~established under this Section 914 is intended to~~ enabled SFMTA to evaluate whether shared use of Muni stops by Shuttle Buses is consistent with efficient operation of the City's public transit system. An evaluation of the pilot program conducted by SFMTA showed that the pilot program was successful in addressing the

issues described above, and also showed ways that the program could be improved. SFMTA now seeks to establish a program that continues the successful aspects of the pilot program while building upon the lessons learned.

(c) **General Permit Program Requirements.**

(1) The Director is authorized to implement a ~~pilot~~ program for the issuance of Shuttle Permits beginning on a date designated by the Director. ~~The duration of the pilot program shall not exceed 18 months from the date of commencement designated by the Director.~~

(2) The Director may issue a Shuttle Permit for the use of Designated Stops upon receipt of an application from a Shuttle Service Provider on a form prescribed by the SFMTA which application meets the requirements of this Section 914.

(3) The Shuttle Permit shall authorize the Shuttle Service Provider to receive a specified number of Shuttle Placards issued by SFMTA.

(4) The Director is authorized to establish up to 200 Designated Stops for the purposes of this ~~pilot~~ program. The Director may establish additional Designated Stops following a public hearing.

(d) **Shuttle Permit Application Requirements.** Each application for a permit or renewal of a permit shall contain the following information:

(1) The name, business location, telephone number, fax number and email address of the Shuttle Service Provider;

(2) The name, title and contact information of one or more persons representing the Shuttle Service Provider to be notified by SFMTA in the event of a problem or permit violation relating to the Permittee's Shuttle Service;

(3) The total number of Shuttle Buses the Shuttle Service Provider intends to use to deliver Shuttle Service using Designated Stops~~, and the make,~~

~~passenger capacity and license plate number of each of its Shuttle Buses that would be authorized, when bearing a Shuttle Placard, to use one or more Designated Stops~~;

(4) The total number of Shuttle Placards requested;

(5) The number of shuttle routes for which the permit applicant is proposing to provide Shuttle Service, including the frequency of service on each route, the neighborhoods served by each route, the origin and terminus of each route, and the frequency of Shuttle Service on each route. In lieu of a map, the permit applicant may provide a narrative statement describing the routes. The applicant need only identify the route to the extent that it lies within the City. Where the point of origin or termination is outside of the City, the applicant need only provide the county in which the point of origin or termination is located;

(6) A list of the Designated Stops the permit applicant proposes to use on each shuttle route, along with the proposed frequency of use of each Designated Stop per day, resulting in a calculation of the total number of Stop Events per day at Designated Stops; and

(7) If applicable, d~~D~~ocumentation of the Applicant's registration status with the California Public Utilities Commission ("CPUC"), including any Charter Party Carrier ("TCP") authorization or permits, or registration as a private carrier of passengers, and documentation that the Applicant maintains insurance in compliance with the applicable requirements imposed by the CPUC.

(8) The application shall require the applicant to acknowledge that the Permittee, by acceptance of the permit, agrees to indemnify and hold the City and County of San Francisco, its departments, commissions, boards, officers, employees and agents ("Indemnitees") harmless from and against any and all claims, demands, actions or causes of action which may be made against the Indemnitees for the recovery of damages for the injury to or death of any person or persons or for the damage to any property resulting

directly or indirectly from the activity authorized by the permit, including, regardless of the negligence of the Indemnitees.

(9) Applicant shall provide a Service Disruption Prevention Plan which describes Permittee's efforts to maintain consistent and efficient service in the event of potential disruptions.

(A) The Service Disruption Prevention Plan must address, at a minimum:

(i) How bus breakdowns or stalls (mechanical or otherwise) will be remedied quickly so as not to block access to bus zones or impede the free flow of traffic;

(ii) Sufficient bus availability to satisfy ridership demand;

(iii) Sufficient back-up driver staffing in the event that drivers are unable to work due to sickness or other reason;

(iv) Contingency routing plans in the case of construction, special events, parades, celebrations, rallies, protests or other activity that may block access to certain city streets; and

(v) A description of the means by which Applicant has considered the San Francisco Board of Supervisors' March 2015 Labor Harmony Resolution, including steps taken to avoid potential disruptions by addressing the principles and concerns set forth in such Resolution, and any agreements or documents evidencing such steps, as well as information regarding shuttle driver schedules (including any split-shifts), work hours, working conditions, and wages.

(B) The Service Disruption Prevention Plan may, but is not required to, include statements from third parties describing the Applicant's efforts to prevent service disruptions.

(C) The SFMTA will post the Service Disruption Prevention Plan for each Permittee on the SFMTA website.

(D) The Permittee shall provide notice to SFMTA of any labor dispute in which it is involved that has the potential to cause a disruption of service.

(e) **Permit Issuance.** After evaluating an applicant's permit application, the Director shall grant the Permit as requested, or grant the Permit with modifications, or deny the Permit. Where the Permit is granted with modifications or denied, the notice shall explain the basis for the Director's decision. The Director may issue procedures for reviewing the Director's decision upon request of the permit applicant.

(f) **Shuttle Placard Application Requirements.** For each vehicle to be used in the Commuter Shuttle Program, Shuttle Service Providers shall apply for a Shuttle Placard. Each application for a Shuttle Placard or renewal of a Shuttle Placard shall contain the following information for the Shuttle Bus that would be authorized, when bearing the Shuttle Placard, to use Designated Stops:

(1) The manufacturer and vehicle make or model name;

(2) The length, gross vehicle weight rating, and passenger capacity;

(3) The model year, or, in the case of vehicles older than model year 2012 that were not previously authorized for use in Shuttle Service under the pilot program, documentation demonstrating compliance with applicable emissions standards for model year 2012;

(4) The type of fuel or power used; and

(5) The license plate number and vehicle registration information.

(g) **Shuttle Placard Issuance.** After evaluating an applicant's Shuttle Placard application, the Director shall grant the Shuttle Placard as requested, or deny the Shuttle Placard application and state the reason(s) for the denial.

(~~f~~h) **Shuttle Permit Terms and Conditions.** The Director shall establish terms and conditions for Shuttle Permits. In addition to any other requirements imposed by the Director, Permits shall include the following terms:

(1) Any Shuttle Bus being operated in Shuttle Service under the Shuttle Permit shall be listed on the ~~permit~~ Permittee's Shuttle Placard application and shall display a valid SFMTA-issued Shuttle Placard visible from outside the Shuttle Bus at front and rear locations on the Shuttle Bus as specified by the SFMTA, at all times such vehicle is being operated in Shuttle Service in the City. A Shuttle Placard~~s~~ may be used only for the vehicle listed on the application for that Shuttle Placard, and may not be transferred to any other vehicle~~between any Shuttle Buses in the Shuttle Service Provider's fleet that are listed on the Permit~~.

(2) A Shuttle Bus bearing valid Shuttle Placards shall be allowed to stop at any Designated Stop subject to the following conditions:

(A) The Shuttle Bus shall give priority to any transit buses that are approaching or departing a Designated Stop;

(B) The Shuttle Bus shall not stop at any Muni stops other than Designated Stops;

(C) The Shuttle Bus shall use Designated Stops only for active loading or unloading of passengers when in the course of actively providing Shuttle Service, and such loading and unloading shall be conducted as quickly as possible without compromising the safety of passengers, pedestrians, bicyclists or other motorists;

(D) Loading and unloading of passengers shall not take place in, or impede travel in, a lane of traffic or bicycle lane.

(3) A Shuttle Permit and Shuttle Placard shall not exempt a Shuttle Bus from any other Parking restrictions or traffic regulations except as authorized by this Section 914, and a Shuttle Bus stopping or parking at any Muni stop, including a Designated Stop, in violation of the terms and conditions set forth in this Subsection (~~f~~h) may be cited for violation of California Vehicle Code Section 22500(i).

(4) The Permittee shall comply with all applicable federal, state, and local laws, including this Code, the California Vehicle Code, and applicable CPUC requirements, including those for registration, insurance, vehicle inspection, and regulation of drivers;

(5) The Permittee shall equip each Shuttle Bus with an on-board device capable of providing real-time location data to the SFMTA in accordance with specifications issued by the Director, and shall maintain a continuous feed of the specified data at all times when the Shuttle Bus is being used to provide Shuttle Service within the City. The Permittee shall begin providing a continuous feed of such data to the SFMTA on the first day that the Permittee begins providing Shuttle Service under the Permit unless the Director establishes an alternate date. ~~Notwithstanding the foregoing requirements stated in this subsection (f)(5), if the Permittee is unable to provide the required data in accordance with specifications issued by the Director, the Permittee shall install an on-board device (OBD) prescribed by the SFMTA in each Shuttle Bus.~~ The SFMTA shall not be responsible for any equipment, or for the failure of any equipment, installed inside any Shuttle Bus for any reason, including for the purpose of complying with this Section 914. If a Shuttle Bus becomes unable to provide the required data for any reason, Permittee shall not operate that Shuttle Bus in Shuttle Service without first notifying SFMTA of the identity of the bus, the route affected, and the time at which Permittee expects the data transmission to be restored. To facilitate SFMTA's monitoring of Shuttle Bus operations, the Director may issue regulations limiting the duration that a Shuttle Bus may operate in Shuttle Service without being able to provide the required data.

(6) The Permittee shall provide the following data regarding its Shuttle Buses, updated each month: average daily Stop Events per Designated Stop for all Shuttle Buses, monthly vehicle miles traveled by Shuttle Buses in commuter shuttle service in San

Francisco (including any deadheading), average daily boardings in commuter shuttle service in San Francisco, average daily occupancy for each Shuttle Bus upon exiting San Francisco (if applicable), average daily occupancy for each Shuttle Bus upon arrival at destination, and average number of daily Shuttle Buses in operation.

(~~6~~7) The Permittee shall, in a timely manner and as otherwise required by law, pay all traffic and parking citations issued to its Shuttle Buses in the course of providing Shuttle Service, as well as all permit fees and penalties for permit violations as set forth in subsections (~~h~~j) and (~~j~~l) below, subject to the Permittee's right under applicable law to contest such citations or penalties.

(~~7~~8) Where the Director determines that the continued use of a particular Shuttle Bus listed on a Shuttle Provider's permit application would constitute a risk to public safety, the Director shall notify the Shuttle Provider in writing, and said Shuttle Bus shall immediately be ineligible to use any Designated Stops unless and until the Shuttle Provider has proven to the satisfaction of the Director that the Shuttle Bus no longer constitutes a risk to public safety.

(9) Permitted Shuttle Buses that exceed 35 feet in length travelling in San Francisco may travel only on the major and minor arterial street network for the City of San Francisco, as determined by the California Department of Transportation.

(10) Permittee shall certify that all of its operators who drive permitted Shuttle Buses in San Francisco have viewed the SFMTA's Large Vehicle Urban Driving Safety video, which will be made available to all permit applicants.

(11) Any Shuttle Service Provider providing Shuttle Service that is free to the public and provided by Shuttle Buses that display the words "Free to the Public" clearly legible on the loading side of the Shuttle Bus in letters at least four inches tall, shall be exempt from otherwise applicable permit fees for Stop Events made by such Shuttle Buses.

(12) All Shuttle Buses not already approved for use under the SFMTA's commuter shuttle pilot program as of January 31, 2016 must be either model year 2012 or newer, or be equipped with a power source that complies with emissions standards applicable to the 2012 class of vehicle. As of January 1, 2020, all Shuttle Buses used by Permittees for Shuttle Service must be model year 2012 or newer. After January 1, 2020, all Shuttle Buses used by Permittees for Shuttle Service must be no more than eight model years old.

(~~g~~i) **Duration of Shuttle Permits and Shuttle Placards.** Shuttle Permits and Shuttle Placards ~~initially~~ issued under this Section 914 shall expire one year from the effective date of the ordinance establishing the commuter shuttle permit program on a permanent basis, and annually thereafter~~six months from the date of commencement of the pilot program designated by the Director pursuant to subsection (c)(1)~~, unless a shorter term is requested by the Permittee, the Permit is revoked, or the Director for good cause finds a shorter term is warranted. ~~Permits issued or renewed on or after that six months' date shall expire 18 months from the date of program commencement, unless a shorter term is requested by the Permittee, the Permit is revoked or the Director for good cause finds a shorter term is required.~~

(~~h~~j) **Fees.**

(1) Unless exempted under subsection (h)(11), Shuttle Service Providers shall pay a Designated Stop use and permit fee as set forth in Section 902. The fee is intended to cover the costs incurred by ~~to~~ SFMTA as a result of permit program implementation, administration, enforcement, and evaluation. The Designated Stop use fee ~~component~~ shall be determined by multiplying the total number of anticipated daily Stop Events stated in the permit application ~~-~~for each Permittee by the per stop fee set forth ~~below~~ in Section 902. The Director is authorized, in his or her discretion, to impose pro-rated Designated Stop use fees

where a Shuttle Service Provider applies for a permit or permit modification following date of commencement of the ~~pilot~~ program.

(2) Permittees shall be billed for the Designated Stop use and permit fee upon issuance or renewal of the Permit, and on a monthly basis thereafter. The Designated Stop use and permit fee shall be due and payable within 30 days from the date of invoice. Fees remaining unpaid 30 days after the date of invoice shall be subject to a 10% ~~percent~~ penalty plus interest at the rate of ~~one percent~~ 1% per month on the outstanding balance, which shall be added to the fee amount from the date that payment is due.

(3) SFMTA shall reconcile the number of Stop Events for each Shuttle Service Provider against the actual stop data provided to the SFMTA on a semi-annual basis, but reserves the right to conduct such reconciliation on a more frequent basis if necessary. Where the SFMTA determines that a Shuttle Service Provider has used Designated Stops more frequently than authorized under the Provider's Permit, the Provider shall pay the additional Designated Stop use fee due. Where SFMTA determines that the Permittee's use of Designated Stops exceeds the authorized number of daily Stop Events by 10% ~~percent~~ or more, the Provider shall pay the additional Designated Stop use fee due, plus a 10% ~~percent~~ penalty. All such fees shall be due within 30 days from the date of invoice. Fees remaining unpaid after that date shall be subject to interest at the rate of ~~one~~ 1% ~~percent~~ per month on the outstanding balance, which shall be added to the fee amount from the date that payment is due.

(~~i~~k) **Grounds for Suspension or Revocation.**

(1) The Director may suspend or revoke a permit issued under this Section 914 upon written notice of revocation and opportunity for hearing. The Director is authorized to promulgate hearing and review procedures for permit suspension and revocation proceedings. Upon revocation or suspension, the

Shuttle Service Provider shall surrender such Permit and the Shuttle Placards authorized under the Permit in accordance with the instructions in the notice of suspension or revocation.

(2) Where the Director determines that public safety is at risk, or where the Permittee's continued operation as a Shuttle Service Provider would be in violation of the California Public Utilities Code or the California Vehicle Code, the Director is authorized to suspend a permit issued under this Section 914 immediately upon written notice of suspension to the Permittee, provided that the Director shall provide the Permittee with the opportunity for a hearing on the suspension within five business days of the date of notice of suspension.

(3) A permit issued under this Section 914 may be suspended or revoked under this paragraph following the Director's determination after an opportunity for hearing that:

(A) the Permittee has failed to abide by any permit condition;

(B) the Permittee knowingly or intentionally provided false or inaccurate information on a permit application;

(C) one or more of Permittee's Shuttle Buses have, in the course of providing Shuttle Service, repeatedly and egregiously violated parking or traffic laws;

(D) the Permittee's continued operation as a Shuttle Service Provider would constitute a public safety risk; or

(E) the Permittee's continued operation as a Shuttle Service Provider would be in violation of the California Public Utilities Code or the California Vehicle Code.

(~~j~~l) **Administrative Penalties.**

(1) This Section shall govern the imposition, assessment and collection of administrative penalties imposed for violations of permit conditions set forth under Subsection 914(~~f~~h).

(2) The SFMTA Board of Directors finds:

(A) That it is in the best interest of the City, its residents, visitors and those who travel on City streets to provide an administrative penalty mechanism for enforcement of Shuttle Bus permit conditions; and

(B) That the administrative penalty scheme established by this section is intended to compensate the public for the injury or damage caused by Shuttle Buses being operated in violation of the permit conditions set forth under Subsection 914(~~f~~h). The administrative penalties authorized under this section are intended to be reasonable and not disproportionate to the damage or injury to the City and the public caused by the prohibited conduct.

(C) The procedures set forth in this Section are adopted pursuant to Government Code Section 53069.4, which governs the imposition, enforcement, collection, and administrative review of administrative citations and fines by local agencies, and pursuant to the City's home rule power over its municipal affairs.

(3) Any Service Provider that is operating a Shuttle Bus in violation of the permit conditions set forth under Subsection 914(~~f~~h) may be subject to the issuance of a citation and imposition of an administrative penalty under this Subsection 914(~~j~~l).

(4) Administrative penalties may not exceed $250 for each violation. In determining the amount of the penalty, the officer or employee who issued the citation may take any or all of the following factors into consideration:

(A) The duration of the violation;

(B) The frequency, recurrence and number of violations by the same violator;

(C) The seriousness of the violation;

(D) The good faith efforts of the violator to correct the violation;

(E) The economic impact of the fine on the violator;

(F) The injury or damage, if any, suffered by any member of the public;

(G) The impact of the violation on the community;

(H) The amount of City staff time expended investigating or addressing the violation;

(I) The amount of fines imposed by the charging official in similar situations;

(J) Such other factors as justice may require.

(5) The Director of Transportation is authorized to designate officers or employees of the Municipal Transportation Agency to issue citations imposing administrative penalties for violations of the permit conditions set forth in Subsection 914(~~f~~h), hereafter referred to as the "Charging Official."

(6) Administrative Citation. A Charging Official who determines that there has been a violation of the permit conditions set forth in Subsection 914(~~f~~h), may issue an administrative citation to the Shuttle Service Provider permitted under this Section 914. The Charging Official shall either serve the citation personally on the Shuttle Service Provider or serve it by certified U.S. mail sent to the address indicated on the Shuttle Service Provider's permit application.

(7) The citation shall contain the following information: the name of the person or entity cited; the date, time, address or location, and nature of the violation; the date the citation is issued; the name and signature of the Charging Official; the amount of the administrative penalty, acceptable forms of payment of the penalty; and that the penalty is due and payable to the SFMTA within 15 business days from (A) the date of issuance of the citation if served personally,

or (B) the date of receipt of the citation if served by certified U.S. Mail. The citation shall also state that the person or entity cited that it has the right to appeal the citation, as provided in Subsection 914(~~j~~l).

(8) Request for Hearing; Hearing.

(A) A person or entity may appeal the issuance of a citation by filing a written request with the SFMTA Hearing Division within 15 business days from (i) the date of the issuance of a citation that is served personally or (ii) the date of receipt if the citation is served by certified U.S. Mail. The failure of the person or entity cited to appeal the citation shall constitute a failure to exhaust administrative remedies and shall preclude the person or entity cited from obtaining judicial review of the validity of the citation.

(B) At the time that the appeal is filed, the appellant must deposit with the SFMTA Hearing Division the full amount of the penalty required under the citation.

(C) The SFMTA Hearing Division shall take the following actions within 10 days of receiving an appeal: appoint a hearing officer, set a date for the hearing, which date shall be no less than 10 and no more than 60 days from the date that the appeal was filed, and send written notice of the hearing date to the appellant and the Charging Official.

(D) Upon receiving notice that the SFMTA Hearing Division has scheduled a hearing on an appeal, the Charging Official shall, within three City business days, serve the hearing officer with records, materials, photographs, and other evidence supporting the citation. The hearing officer may grant a request to allow later service and may find good cause to continue the hearing because of the delay.

(E) The hearing officer shall conduct all appeal hearings under this Chapter and shall be responsible for deciding all matters relating to the hearing

procedures not otherwise specified in this Section. The Charging Official shall have the burden of proof in the hearing. The hearing officer may continue the hearing at his or her own initiative or at the request of either party, and may request additional information from either party to the proceeding. The hearing need not be conducted according to technical rules of evidence and witnesses. Any relevant evidence is admissible if it is the sort of evidence on which responsible persons are accustomed to rely in the conduct of serious affairs.

(F) The following provisions shall also apply to the appeal procedure:

(i) A citation that complies with the requirements of Section 914(~~j~~l)(7) and any additional evidence submitted by the Charging Official shall be prima facie evidence of the facts contained therein;

(ii) The appellant shall be given the opportunity to present evidence concerning the citation; and

(iii) The hearing officer may accept testimony by declaration under penalty of perjury relating to the citation from any party if he or she determines it appropriate to do so.

(iv) After considering all of the testimony and evidence submitted by the parties, the hearing officer shall issue a written decision upholding, modifying or vacating the citation and shall set forth the reasons for the determination. This shall be a final administrative determination.

(v) If the hearing officer upholds the citation, the hearing officer shall inform the appellant of its right to seek judicial review pursuant to California Government Code Section 53069.4. If the citation is upheld, the City shall retain the amount of the fine that the appellant deposited with the City.

(vi) If the hearing officer vacates the citation, the City shall promptly refund the deposit. If the hearing officer partially vacates the citation,

the City shall promptly refund that amount of the deposit that corresponds to the hearing officer's determination. The refund shall include interest at the average rate earned on the City's portfolio for the period of time that the City held the deposit as determined by the Controller.

(G) Any person aggrieved by the action of the hearing officer taken pursuant to this Chapter may obtain review of the administrative decision by filing a petition for review in accordance with the timelines and provisions set forth in California Government Code Section 53069.4.

(H) If a final order of a court of competent jurisdiction determines that the SFMTA has not properly imposed a fine pursuant to the provisions of this Section, and if the fine has been deposited with the SFMTA as required by Section 914(~~j~~l)(8)(B), the SFMTA shall promptly refund the amount of the deposited fine, consistent with the court's determination, together with interest at the average rate earned on the City's portfolio.

(9) Upon request by a Shuttle Service Provider owing administrative penalties for violation of permit conditions set forth under Subsection 914(~~f~~h), the SFMTA may enter into a payment plan with that Shuttle Service Provider. Any such payment plan shall not extend the time for payment beyond 90 days from the otherwise applicable due date for the most recent penalty encompassed by the payment plan. In no event shall SFMTA establish more than three such payment plans for any individual Shuttle Service Provider~~ during the term of this pilot program~~.

(10) Administrative penalties shall be deposited in the Municipal Transportation Fund and may be expended only by the SFMTA.

Section 2. Effective Date. This ordinance shall become effective 31 days after enactment. Enactment occurs when the San Francisco Municipal Transportation Agency Board of Directors approves this ordinance.

Section 3. Scope of Ordinance. In enacting this ordinance, the San Francisco Municipal Transportation Agency Board of Directors intends to amend only those words, phrases, paragraphs, subsections, sections, articles, numbers, letters, punctuation marks, charts, diagrams, or any other constituent parts of the Transportation Code that are explicitly shown in this ordinance as additions or deletions in accordance with the "Note" that appears under the official title of the ordinance.

APPROVED AS TO FORM:
DENNIS J. HERRERA, City Attorney

By:

DAVID A. GREENBURG
Deputy City Attorney

I certify that the foregoing resolution was adopted by the San Francisco Municipal Transportation Agency Board of Directors at its meeting of November 17, 2015.

R. Boomer

Secretary to the Board of Directors
San Francisco Municipal Transportation Agency

ATTACHMENT A

California Environmental Quality Act Findings

Based upon substantial evidence in the record of this proceeding and pursuant to the California Environmental Quality Act ("CEQA"), California Public Resources Code Sections 21000 et seq.; the Guidelines for Implementation of CEQA, 14 California Code of Regulations Sections 15000 et seq.; and Chapter 31 of the San Francisco Administrative Code, the San Francisco Municipal Transportation Agency Board of Directors makes and adopts the following findings of fact in support of the determination that the proposed Commuter Shuttle Program and Transportation Code amendments (herein after "Commuter Shuttle Program") are exempt from environmental review under the Class 1 and Class 8 categorical exemptions from CEQA:

1. Based on substantial evidence in the record, including the data, information, and analysis identified in these findings, the San Francisco Planning Department determined that the physical improvements proposed as part of the Commuter Shuttle Program is exempt from environmental review under Section 15301 of the CEQA Guidelines (Class 1), which exempts from environmental review minor alterations to existing highways and streets, sidewalks, gutters, bicycle and pedestrian trails, and similar facilities. Based on substantial evidence in the record, the proposed modifications to install minor improvements such as signage, boarding islands, and bus bulbs, are minor modifications of existing roadways, and are therefore exempt from environmental review under CEQA.

2. Based on substantial evidence in the record, including the data, information, and analysis identified in these findings, the San Francisco Planning Department determined that the Commuter Shuttle Program is exempt from environmental review under the Section 15308 of the CEQA Guidelines (Class 8), which exempts from environmental review actions taken by regulatory agencies, as authorized by state or local ordinance, to assure the maintenance, restoration, enhancement, or protection of the environment where the regulatory process involves procedures for protection of the environment. The record demonstrates that, in the absence of regulations governing commuter shuttle operations, those operations can lead to conflicts with Muni and with vehicular, bicycle, and pedestrian traffic and safety. The record also demonstrates that, if commuter shuttle operations were not available within the City, then 47% of shuttle riders would instead drive alone to work or school, leading to increased traffic congestion and air emissions throughout the region. The record further demonstrates that ongoing commuter shuttle operations that are controlled, monitored, and enforced through the Commuter Shuttle Program will enhance the environment. The Commuter Shuttle Program includes features that will enhance and protect the environment, such as fleet turnover requirements, restrictions on stopping outside of major and minor arterials, idling limits, and minor

roadway modifications that will improve vehicular, bicycle, and pedestrian safety, decrease conflicts between commuter shuttles and other transportation modes, and improve regional traffic congestion and air emissions. Accordingly, based on substantial evidence in the record, the Commuter Shuttle Program is an action taken by the San Francisco Municipal Transportation Agency to assure the enhancement and protection of the environment, and does not result in construction activities or a relaxation of standards allowing environmental degradation.

3. Based on substantial evidence in the record, and the specific factual findings above, there is no reasonable possibility that the Commuter Shuttle Program will have a significant adverse effect on the environment due to unusual circumstances. Specifically, the Planning Department and the San Francisco Municipal Transportation Agency Board of Directors have determined that the Commuter Shuttle Program does not have any features distinguishing it from other projects in the Class 1 and Class 8 exemptions under CEQA, and the program will not have any significant environmental effects under CEQA. The physical changes that will occur as part of the program are minor in scale and number and do not involve environmentally sensitive locations. Further, the program does not present unusual circumstances because the San Francisco Municipal Transportation Agency regularly adjusts and adapts its traffic control regulations, and makes minor alterations to existing roadways, such as signage, bulbouts and boarding islands, for purposes of reducing vehicular conflicts, protecting bicyclists and pedestrians, and increasing the efficiency of existing roadway systems.

4. In the absence of a Commuter Shuttle Program, commuter shuttles could and would be expected to operate on non-arterial streets without commercial vehicle weight restrictions; and to load and unload passengers at near-side bus stops, white zones, vacant curb areas, or even in travel lanes on both arterial and non-arterial streets. These practices, which the Commuter Shuttle Program would regulate or prohibit, often result in delays to traffic and Muni service, and affect the safety of Muni patrons by requiring them to enter roadways to board Muni buses, and can affect the safety of both bicyclists and pedestrians. Key components of the Commuter Shuttle Program will reduce substantially the possibility and likelihood of these unregulated practices and effects, and there is substantial evidence in the record before this Board that there will be no significant adverse impacts to public transit or to bicyclist or pedestrian safety.

5. The Commuter Shuttle Program directs commuter shuttle activity of large commuter shuttle buses toward major and minor arterial streets as determined by the California Department of Transportation, and away from non-arterial streets in residential neighborhoods. Based on the data gathered by San Francisco Municipal Transportation Agency staff during the Pilot Program, and analyzed by the San Francisco Planning

Department's Environmental Planning Division, and other information presented to this Board, there is substantial evidence in the record that the relatively minor increase in commuter shuttle activity on arterial streets and at arterial intersections compared to existing traffic will not substantially degrade traffic capacity or operations, and there will be no significant adverse impact on traffic operations on arterial roadways or at intersections.

6. As part of the Commuter Shuttle Program, certain commuter shuttles may utilize designated Muni bus stop zones for shuttle loading and unloading. Based on the data gathered by San Francisco Municipal Transportation Agency staff during the Pilot Program, and analyzed by the San Francisco Planning Department's Environmental Planning Division, and other information presented to this Board, there is no significant impact on Muni operations.

7. Commuter shuttles share roadways in San Francisco with bicycles and pedestrians. The Commuter Shuttle Program will modify certain commuter shuttle stop lengths and locations on an ongoing basis, will add additional enforcement at high-activity locations, including the assignment of more traffic control officers, and will require program participants to certify that drivers have completed driver safety training consistent with the San Francisco Municipal Transportation Agency's Large Vehicle Urban Driving Safety Program. Based on the data gathered by San Francisco Municipal Transportation Agency staff during the Pilot Program, and analyzed by the San Francisco Planning Department's Environmental Planning Division, and other information presented to this Board, there is substantial evidence in the record that there will be no significant adverse impacts to bicycle or pedestrian facilities from the Commuter Shuttle Program.

8. Based on substantial evidence in the record, the Commuter Shuttle Program will not result in significant adverse impacts to commercial loading.

9. At the direction of the San Francisco Planning Department, Ramboll Environ, an air quality expert consultant whose credentials are contained in the record, prepared an Air Quality Technical Report to assess regional criteria air pollutants and potential localized health risk impacts that might be associated with the Commuter Shuttle Program. Ramboll Environ analyzed likely emissions from commuter shuttles, and factored in the Commuter Shuttle Program requirement that all new commuter shuttles entering the Program have model year 2012 or equivalent engines, and that by 2020, all active commuter shuttles be no more than eight years old or equivalent, requiring fleet turnover on a rolling basis. Based on these Program requirements, as well as data gathered by San Francisco Municipal Transportation Agency staff during the Pilot Program, Ramboll Environ determined that emissions of the criteria air pollutants reactive organic gases,

particulate matter, and carbon dioxide would decrease, while nitrogen oxide emissions would increase as a result of use of diesel-powered buses; the nitrogen oxide emissions, however, would be below the thresholds of significance propounded by the Bay Area Air Quality Management District, and accordingly, based on substantial evidence in the record, no significant criteria air pollutant impacts would occur.

10. Ramboll Environ also conducted a localized health risk assessment of toxic air contaminants, taking into account San Francisco's unique Air Pollutant Exposure Zones, where a lower threshold of significance is used than what is propounded by the Bay Area Air Quality Management District. Ramboll Environ modeled four representative local impact zones and determined that increases in lifetime cancer risk and shuttle-generated particulate matter emissions would be below these lower applicable thresholds of significance, and accordingly, based on substantial evidence in the record, no significant localized health risk impacts would occur.

11. The Commuter Shuttle Program could also add noise, both during construction of capital improvements and during operations; however, the Program would not result in environmental degradation. Because construction will be required to comply with the San Francisco Noise Ordinance, as well as the Public Works Code and other Department of Public Works regulations, and because it would be temporary, indirect construction noise impacts will be less than significant. The San Francisco Planning Department considered and relied on the noise analysis contained in the 2014 Transit Effectiveness Project Environmental Impact Report to estimate noise that could be generated by commuter shuttles, and the Planning Department determined that the minor amount of noise generated by commuter shuttles would be considered common and generally acceptable in an urban area, and therefore, based on substantial evidence in the record, the Commuter Shuttle Program will not cause a significant noise impact or environmental degradation.

12. Although some members of the public have asserted that the commuter shuttles contribute to increased housing costs and housing displacement, the Commuter Shuttle Program will not eliminate any housing units. Any physical impacts associated with increased housing costs would be related to the construction of replacement housing for displaced residents, or increased trip lengths and emissions for displaced residents. However, there is no demonstrable evidence of physical displacement of individuals from housing units attributable to commuter shuttles, and if such displacement were to occur as a result of the Commuter Shuttle Program, there is no basis to assess where such individuals would relocate and what their travel behavior would entail. Because there is no demonstrated causative link between shuttle use and housing demand or price, and there is no foreseeable displacement associated with the Program, analysis of any such

impacts would be speculative with regard to their scale and nature. Based on substantial evidence in the record, the Commuter Shuttle Program will not cause any significant adverse impacts related to or caused by housing displacement.

13. The Commuter Shuttle Program will not result in any changes in land use, urban design or long range views, cultural resources, biological resources, greenhouse gas emissions, wind, shadow, utilities and service systems, geology and soils, hydrology or water quality, mineral resources or agricultural and forest resources, and no new hazardous waste will be generated. In addition, Commuter Shuttle Program implementation may reduce already less-than-significant effects on emergency vehicle access by reducing congestion. Based on substantial evidence in the record, the Commuter Shuttle Program will not cause any significant adverse impacts or environmental degradation in these impact areas.

SAN FRANCISCO
PLANNING DEPARTMENT

Certificate of Determination
Exemption from Environmental Review

1650 Mission St.
Suite 400
San Francisco,
CA 94103-2479

Reception:
415.558.6378

Fax:
415.558.6409

Planning
Information:
415.558.6377

Case No.:	2015-007975ENV
Project Title:	SFMTA – Commuter Shuttle Program
Project Sponsor:	San Francisco Municipal Transportation Agency Hank Willson – (415) 701-5041
Staff Contact:	Christopher Espiritu – (415) 575-9022 christopher.espiritu@sfgov.org

PROJECT DESCRIPTION:

The San Francisco Municipal Transportation Agency (SFMTA) proposes to implement a Commuter Shuttle Program (herein referred to as "proposed project or proposed Program") which would regulate commuter shuttle activity on San Francisco streets. The proposed project would continue and expand the guidelines and requirements established for the 18-month, Commuter Shuttle Pilot Program (herein referred to as "Pilot") implemented between August 2014 and January 2016. The program would involve the issuance of permits to eligible commuter shuttle operators for the use of public curb space, including designated passenger loading zones and bus stops. In addition, the proposed project would include capital improvements, such as transit boarding islands and curb extensions (bulb-outs). The proposed project would require approval by the SFMTA Board of Directors.

EXEMPT STATUS:

Categorical Exemption, Class 1 and Class 8 (California Environmental Quality Act [CEQA] Guidelines Section 15301 and 15308). See page 25.

DETERMINATION:

I do hereby certify that the above determination has been made pursuant to State and local requirements.

Sarah B. Jones
Environmental Review Officer

October 22, 2015
Date

cc: Hank Willson, SFMTA, Project Sponsor
Viktoriya Wise, SFMTA

Distribution List
Board of Supervisors, All Districts, (via Clerk of the Board)
Virna Byrd, M.D.F.

BACKGROUND

The number of privately operated shuttles in San Francisco has grown in recent years. Numerous employers, educational institutions, medical facilities, office buildings, and transportation management associations offer shuttle service to their employees, students, and clients. Some development projects are required to provide shuttle services as part of their conditions of approval (and the impacts of their shuttle services are considered within the development project's environmental review), and an employer may comply with San Francisco's Commuter Benefits Ordinance and the Bay Area's Commuter Benefits Program by offering a free commute shuttle to employees. The majority of the commuter shuttles are closed systems that provide service to a specific population and are not open to the general public. Most shuttles are provided for free to employees (or students, tenants, etc.). There are two distinct markets within the shuttle sector: those that operate within San Francisco (intra-city) and those that operate between San Francisco and another county (inter-city regional). Shuttles support local San Francisco and regional goals by decreasing single occupancy vehicle (SOV) trips, vehicle miles traveled (VMT), and private vehicle ownership.

Prior to August 2014 and the implementation of the Pilot Program, San Francisco did not regulate commuter shuttle activity on City streets. Shuttles operated throughout the City on both large arterial streets, such as Van Ness Avenue and Mission Streets, and smaller residential streets. Shuttles loaded and unloaded passengers in a variety of zones, including passenger loading (white) zones, Muni bus stops (red) zones, and other vacant curb space. When curb space was unavailable, shuttles often would load or unload passengers within a travel lane. The lack of rules and guidelines for where and when loading and unloading activities were permitted, and the lack of vacant space in general, resulted in confusion for shuttle operators and neighborhood residents, inconsistent enforcement, and real and perceived conflicts with other transportation modes.

To address these issues, in January 2014, the SFMTA Board of Directors approved an 18-month Pilot to test sharing of designated Muni zones and establish permitted commuter shuttle-only passenger loading (white) zones for use by eligible commuter shuttles that paid a fee and received a permit containing the terms and conditions for use of the shared zones. The Pilot Program began in August 2014, and created a network of shared stops for use by Muni and commuter shuttle buses that applied to participate, and restricted parking for some hours of the day in certain locations to create passenger loading (white) zones exclusively for the use of permitted commuter shuttles.

Program Objectives

Prior to the implementation of the Pilot Program, commuter shuttles travelled on City streets with few constraints beyond legislated commercial vehicle or weight restrictions. The City's regulatory and enforcement capacity involved restrictions on commercial vehicles under San Francisco *Transportation Code*, Section 503, which restricted commercial passenger vehicles (with seating capacity of nine or more persons) from certain streets and areas of the City. In addition, Section 501 of the *Transportation Code* restricted the operation of a vehicle with gross weight in excess of 6,000 pounds on specific streets.

Beyond these restrictions, the SFMTA does not have the authority to prevent commuter shuttles from operating on a majority of non-weight-restricted streets throughout the City.[1]

Commuter shuttles, like most vehicles in San Francisco, generally are free to drive on San Francisco's streets. However, without a network of approved zones, private commuter shuttle operators have imperfect choices to make about where to load and unload passengers, as sufficient unregulated or vacant curb space is mostly unavailable. Commuter shuttles would have few options, including: stopping in the travel lane (adjacent to parked cars), which blocks through traffic and bicycles, presents safety hazards for riders boarding and alighting, and risks a parking citation; or stopping at a Muni stop, which enables safer curbside access, but in the absence of regulations governing shuttle operations can delay Muni and risks a parking citation. The objectives of the proposed Commuter Shuttle Program would include:

- Provide a safe environment for all street users in support of the SFMTA's Vision Zero policy to eliminate all traffic deaths
- Prevent service disruptions, including any related to labor relations issues
- Ensure that commuter shuttles do not adversely affect operations of public transportation in San Francisco
- Consistently and fairly apply and enforce any regulations/policies governing shuttle operations
- Work collaboratively with shuttle sector to refine policies and resolve concerns and conflicts
- Integrate commuter shuttles into the existing multi-modal transportation system
- Establish a program structure that meets current needs and has the potential to evolve as the sector grows and evolves
- Ensure more focused enforcement, ease of administration and on-going oversight

Commuter Shuttle Pilot Program (August 2014 to January 2016)

Prior to the Pilot, SFMTA could only estimate the number of commuter shuttles in operation, the location of stops, hours of shuttle operation, routes and other operational characteristics. The Pilot allowed SFMTA to collect data regarding the movement of, usage of, and reaction to commuter shuttles in San Francisco, and determine whether management of the commuter shuttles through shared stops, permits and payment of a permit fee could reduce conflicts and complaints. SFMTA used the data collected during the Pilot to evaluate the Pilot and design the proposed Commuter Shuttle Program

The Pilot applied to privately operated transportation services that move commuters to, from, and within San Francisco. Services that are arranged by an employer, building, or institution to provide transportation for home-to-work, work-to-home, last-mile to work, or work site to work site were eligible to participate in the Pilot. Exceptions for eligibility were defined during the implementation of the Pilot

[1] San Francisco Transportation Code, Article 500, Sections 501 and 503. Available at: http://library.amlegal.com/nxt/gateway.dll/California/ transportation/divisionii/article500sizeweightloadrestrictions. Accessed October 2015.

and would remain under the Commuter Shuttle Program. Services that replicate Muni routes or are not licensed by the California Public Utilities Commission were not eligible for the program.

Under the Pilot, the SFMTA established specific requirements for shuttle types and providers, and identified providers that were not eligible to participate, including:

- Tour buses, recreational buses, and long-distance interurban buses
- Party buses
- School buses
- On-call point-to-point services (airport shuttles, limousines, other on-demand transportation)
- Private individual-fare transportation (jitneys, ride-share or transportation network companies (TNCs))
- Vanpool vehicles

As of October 2015, 17 commuter shuttle operators have been approved to participate in the Pilot. Most commuter shuttle vehicles in the Pilot were either cutaway buses (buses/shuttles formed by a small- to medium- truck chassis attached to the cabin of a truck or van, also called "mini buses") or motor coaches (also called "over the road" coaches) of either 40 or 45 feet in length designed for transporting passengers on intercity trips. To implement the Pilot Program, the SFMTA designated, and marked with appropriate signage, approximately 100 Muni zones and approximately 20 limited-hours shuttle-only loading zones for participating shuttle providers to load and unload passengers. Commuter shuttle zones are indicated by signs and painted curbs (red curbs at Muni zones, and white curbs at loading zones). The Pilot Program did not include modifications to existing Muni transit routes and did not remove (or relocate) any existing Muni bus stops.

The Pilot did not dictate the routing of individual shuttles, however, all shuttle providers were required to comply with San Francisco's commercial vehicle, weight, and passenger restrictions for designated streets. Additionally, permitted commuter shuttles were encouraged, through outreach by SFMTA staff to the shuttle providers, to select routes that follow arterial streets and avoid residential streets.

Under the Pilot, modifications to the public right-of-way were required for the removal or restriction of a limited number of existing on-street parking spaces in order to extend the length of some Muni and shuttle-only loading zones. The addition of shuttle-only loading zones typically required the use of up to 100 feet of curb space for loading during certain hours. All changes to zone locations or lengths during the Pilot Program were submitted for public review and comment at SFMTA engineering hearings.

The Pilot Program shuttle zone network was established through consultation with shuttle operators, community groups, residents, and SFMTA transit service planning and traffic engineering staff. Attachment A shows a map of the shuttle network under the Pilot and locations of Muni zones and passenger loading (white) zones currently designated as shuttle-only loading zones under the Pilot. At the launch of the Pilot, there were 106 zones (14 passenger loading zones, 92 Muni zones). Over the course of the Pilot, the shuttle network was expanded to 125 zones (21 passenger loading zones and 104 shared Muni zones) with 41 stops that have been removed, added or adjusted due to a variety of reasons,

including: construction projects, network gaps in service, residential opposition, rescinded Muni stops, stop location requests from permit holders, and Muni Forward projects.

Under the Pilot, the most frequently used zones were observed to have as many as 100 shuttle stop-events per day, while some zones saw no stop-events at all. The corridors or locations with the most shuttle traffic in the Pilot include Lombard Street, Van Ness Avenue, Divisadero/Castro Streets, Valencia Street, Union/Powell Streets in North Beach, 24th/25th Streets in the Mission/Noe Valley, 30th Street in Noe Valley, and Townsend/Fourth Street near the Caltrain station.

Based on the data that SFMTA has been able to gather regarding operations of commuter shuttles, staff has learned that approximately 90% of shuttle operations occur during peak hours, 6am-10am and 4pm-8pm, with the remaining 10% occurring over off-peak hours 5am-6am, 10am-4pm, and 8pm-12am.[2]

COMMUTER SHUTTLE PROGRAM PROJECT DESCRIPTION

Based on information collected under the Pilot, the SFMTA proposes to establish the Commuter Shuttle Program subsequent to the conclusion of the 18-month Pilot (February 2016). Similar to the Pilot, the proposed Commuter Shuttle Program would apply to privately operated transportation services that move commuters to, from, and within San Francisco. The Commuter Shuttle Program would, at the outset, utilize the shuttle zone network in place at the conclusion of the Pilot.

The Pilot shuttle zone network is the SFMTA's best estimate of an effective zone network at the time of the Commuter Shuttle Program's launch. As further described below, the shuttle zone network would continue to evolve as necessary to best meet the transportation needs. Under the Program, SFMTA would receive consistent feedback from the community and consider changes to the shuttle network. Any proposed changes to the stops and the overall shuttle network would require public comment and testimony, prior to approval, at an engineering hearing and/or by the SFMTA Board of Directors. Both of these venues are open to the public and include a public comment/testimony component.

The program would be a mechanism by which the SFMTA can regulate the travel routes and stops of commuter shuttles in San Francisco. As part of the Commuter Shuttle Program, the SFMTA would continue to designate, and mark with appropriate signage, select Muni zones and passenger loading zones for commuter shuttle use. Of the 125 combined stops/zones (104 Muni zones and 21 passenger loading zones) that exist today under the Pilot, all 125 stops/zones would remain under the Commuter Shuttle Program.

In contrast with the Pilot, under the Commuter Shuttle Program, permitted shuttle vehicles longer than 35 feet would be required to limit travel to major and minor arterial street network as determined by the California Department of Transportation (Caltrans). This additional requirement was included to address the most frequent comment from members of the public about the Pilot, and it also ensures that large

[2] Information provided by Kathleen Phu, SFMTA, September 2015.

buses use the street network that was best designed to handle large vehicles. Attachment B shows a map of major and minor arterial streets where large shuttle vehicles may operate under the Program. In general, large shuttle vehicles would be required to operate on major and minor arterial street networks and avoid steep and/or narrow streets whenever possible. Permitted shuttles would be required to comply with all relevant street and lane restrictions.

Similar to the Pilot, approximately 90% of shuttle operations are assumed to occur during peak hours 6am-10am and 4pm-8pm, with the remaining 10% occurring over off-peak hours 5am-6am, 10am-4pm, and 8pm-12am.[3]

In addition to the stop locations and routes described above, program regulations would also include the following, in order for a shuttle provider to receive a permit:

1. Permittee vehicles (shuttles) must display a placard issued by SFMTA at specified location on the front and rear of vehicles at all times when operating commuter service in San Francisco.
2. Permittee must comply with operating guidelines:
    a. Muni priority: Muni buses have priority at and approaching or departing Designated Stops.
    b. Yield to Muni: Where Muni or other public transit buses are approaching a Designated Stop and when safe to do so, allow such buses to pass so they may stop at Designated Stops first.
    c. Stay within the network: Permittees shall stop only at Designated Stops or other non-Muni zones, and may not stop at Muni zones outside the network.
    d. Active loading; No staging or idling: Designated Stops may be used only for active loading and unloading; shuttles must load and unload riders as quickly and safely as possible. Staging must take place outside of any Designated Stops, consistent with parking regulations. Unnecessarily idling is not permitted, even while staging.
    e. Move forward: Shuttle drivers shall pull forward in a Designated Stop to leave room for Muni or other shuttles.
    f. Pull in: Shuttle drivers shall pull all the way to, and parallel with, the curb for passenger boarding and alighting; shuttle vehicles shall not block travel or bicycle lanes; loading and unloading shall not take place in a vehicle or bicycle lane, or in a manner that impedes travel in these lanes.
    g. Comply with all applicable traffic laws: Shuttles shall operate in accordance with all applicable state and local traffic laws.
    h. Circulation: Shuttle vehicles longer than 35 feet may travel only on the major and minor arterial street network as determined by the California Department of Transportation, as appears on the map of major and minor arterial streets attached as Attachment B. All shuttle vehicles shall stay on the major and minor arterial street networks and avoid

[3] Information provided by Kathleen Phu, SFMTA, September 2015.

steep and/or narrow streets to the extent possible. Permittees shall comply with all relevant street and lane restrictions.

i. Training: Permittees shall ensure that training for shuttle drivers addresses these operating guidelines.
j. Follow instructions from officials and traffic control devices: Shuttle drivers shall follow instructions from police officers, authorized SFMTA staff (including Parking Control Officers) and traffic control devices in the event of emergencies, construction work, special events, or other unusual traffic conditions.
k. Use of Designated Stops limited to permit-related activity. Shuttle vehicles that display a placard but are not making commuter shuttle-related trips may not use Designated Stops.

3. Permittee must comply with the San Francisco Board of Supervisors' March 2015 Labor Harmony Resolution by submitting a Service Disruption Prevention Plan that describes Permittee's efforts to ensure its efficient operations while avoiding any potential disruptions to SFMTA operations by addressing the principles and concerns set forth in such Resolution. Permittee must ensure its operations do not cause or contribute to any service disruptions. Failure to comply with this provision will result in denial or revocation of permits.
4. Permittee must certify that anyone who drives a shuttle in San Francisco has viewed the SFMTA's Large Vehicle Urban Driving Safety video, which can be accessed at https://youtu.be/_LbC3FQeZqc.
5. Permittee must indemnify SFMTA and the City of San Francisco for injuries or damage resulting from Permittee's use of Designated Stops, including associated bus shelters and other related sidewalk features.
6. Permittee vehicles must display a placard issued by SFMTA at specified location on the front and rear of vehicles at all times when operating commuter service in San Francisco.
7. Provide data feeds per SFMTA specifications, and demonstrate for each vehicle that data feeds are regular and accurate.
8. Pay permit fees. Any stop-events made by shuttle vehicles that are free for use by the public, and display the words "Free to the Public" on the loading side of the vehicle in letters at least four inches tall, are exempt from this permit fee requirement but are subject to all other permit terms.
9. Promptly pay any outstanding traffic citations.
10. Demonstrate compliance with all applicable regulatory requirements imposed by the CPUC, including registration/permitting, insurance, vehicle inspection requirements, and driver training.
11. All shuttle vehicles not already approved for use in the Pilot as of January 31, 2016 must be either model year 2012 or newer, or be equipped with a power source that complies with emissions standards applicable to the 2012 class of vehicle. As of January 1, 2020, all shuttle vehicles used by Permittees in the Commuter Shuttle Program must be model year 2012 or newer. After January 1, 2020, all shuttle vehicles used by Permittees in the Commuter Shuttle Program must be no more than eight model years old. SFMTA ensures compliance with this condition through the

annual permit renewal process, which requires submittal of vehicle registration and, in the case of vehicles older than model year 2012, documentation to show compliance with applicable emissions standards.

Capital Improvements

As part of the proposed Program, SFMTA would continue to designate and install appropriate signage on select Muni zones and passenger loading zones for shared Muni/commuter shuttle use. In addition, as appropriate, the Program would include the installation of several safety improvements to the existing right-of-way that would improve the stop network for both commuter shuttles and users of other modes, including: boarding islands, pedestrian bulbs, and bus bulbs.

These improvements, combined, would expand the sidewalk area for passengers waiting to board either Muni vehicles or commuter shuttles (depending on the location). Also, the addition of these improvements would enhance passenger loading and unloading activities by bringing Muni/shuttle passengers closer to buses, as well as reduce delays and potential conflicts from Muni vehicles and commuter shuttles re-entering the travel lane.

As listed in Table 1 below, SFMTA has identified the following capital improvements at existing stops/zones within the Pilot Program network. The locations listed below were selected by SFMTA, during the Pilot Program data collection, due to the level of activity at each location (number of shuttle stop events, Muni bus activity, and availability pedestrian/bicycle facilities). Further, as part of the Program, implementation and construction of the proposed capital improvements would be funded partially through the permit fees collected from shuttle providers through the Program.

Table 1. Capital Improvement Locations (Preliminary)

Locations	Potential Capital Improvement
8th/Market Muni zone/white zone SW corner	Boarding island
Arguello/Geary Muni zones (NW and SE corner)	Boarding islands
Valencia/25th Muni zone (SW corner)	Boarding island
7th/Market Muni zone (SW corner)	Boarding island (left-hand)
7th/Townsend Muni zone (NE corner)	Boarding island (left-hand)
O'Shaughnessy/Portola Muni zone (SW corner)	TSP
Castro/25th Muni zone (SE corner)	Bus bulb
Divisadero corridor (24 line)	TSP
Divisadero/California Muni zones (SW and NE corner)	Bus bulbs
Lombard/Pierce Muni zones (NW, SE corner)	Bus bulbs
Harrison corridor (8/27 lines)	TSP
Harrison/2nd Muni zone (NW corner)	Bus bulb
Harrison/4th Muni zone (NW corner)	Bus bulb
Harrison/7th Muni zone (NW corner)	Bus bulb
18th Street corridor (33 line)	TSP
Bryant corridor (27/47 lines)	TSP
Bryant/7th Muni zone (SE corner)	Bus bulb
North Point/Mason Muni zone (NW corner)	Bus bulb

Source: SFMTA, 2015

Project Approvals

The proposed project is subject to review by SFMTA staff and approval by the SFMTA Board of Directors. The Approval Action for the proposed project would be approved by the SFMTA Board of Directors, which would approve the Commuter Shuttle Program as well as proposed roadway improvements to be implemented or constructed on the public right-of-way. The Approval Action date establishes the start of the 30-day appeal period for this CEQA exemption determination pursuant to Section 31.04(h) of the San Francisco Administrative Code.

REMARKS:

Program Evaluation - Travel Survey

SFMTA conducted field data collection in June 2014, prior to the start of the Pilot Program to assess existing commuter shuttle activity on City streets, followed by a second field data collection effort in June 2015 to examine the effects of the Pilot Program on the transportation system, including effects on Muni operations and identify conflicts and other potential safety issues caused by commuter shuttle activity.

The 2015 field data collection effort observed commuter shuttle and Muni activity at 20 shuttle stop/zone locations including: 10 stops in the morning commute period (6:45-9:15am) and 10 stops in the evening

commute period (5:30-8:00pm). Field data was collected by SFMTA staff and included observations of stop activities at the selected locations, typically in 2 ½-hour increments.

In addition to data collection activities, SFMTA conducted an extensive evaluation of the Pilot and on October 5, 2015, the Commuter Shuttle Pilot Program Evaluation Report was published. As part of the evaluation, in June 2015, SFMTA distributed a survey to shuttle riders to determine the impact of shuttle availability on their transportation choices. According to survey results, 546 shuttle riders responded to the survey; 418 (77%) were intercity regional shuttle riders, while 128 (23%) rode intracity shuttles. This split of riders accurately represents the overall share of boardings for intercity (76%) and intracity shuttles (24%).

Shuttle riders are widely dispersed among neighborhoods in the City, though the top ten neighborhoods of origin are concentrated in the Mission and the northeastern quadrant of the city. The top ten neighborhoods house 55% of total survey respondents, while the remaining 45% of survey respondents are scattered across 56 other neighborhoods.

As shown in Table 2 below, the Evaluation Report found that 47% of shuttle riders said they would drive alone to work if a shuttle were not available, a finding that has allowed SFMTA to conclude that commuter shuttles do help accomplish local and regional objectives related to VMT reduction. Based on the survey data, availability of commuter shuttles influence the travel behavior for a substantial number of shuttle riders which results in the reduction of drive-alone trips. The survey also indicated that 29% of shuttle riders would use public transit in the absence of commuter shuttles, a finding that can inform SFMTA and regional transit providers' decisions regarding transit service to and from employment centers.

Table 2. Commuter Shuttle – Rider Survey

How would you get to work without the shuttle?	Riders	Percent of total
Drive alone	257	47.2%
Public transit	158	29.0%
Get a job closer to home	75	13.8%
Carpool	28	5.2%
Move closer to work	26	4.8%

Source: SFMTA, 2015

Program Evaluation - Shuttle Ridership

Shuttles participating in the Pilot program had approximately 356,997 boardings per month, or 17,000 on an average weekday. An estimated 270,252 of the monthly shuttle boardings were on intercity regional shuttle trips, and 86,745 were shuttle trips that began and ended in San Francisco. Assuming that most people boarded the shuttle twice in one day, this means that an average of 8,500 people ride a permitted shuttle each day. Further, shuttles load or unload an average of 5.7 people per stop-event among all designated shuttle zones and Muni/shuttle loading zones.

Approach to Analysis

Prior to the implementation of the Pilot, commuter shuttles operated on City streets with limited regulation. The Pilot established a means to collect data and manage commuter shuttle activity beyond citing shuttle buses for infractions. However, the approval of the Pilot program only provided for an 18-month operational period. No further regulation of the commuter shuttles is authorized beyond February 2016.

The California Environmental Quality Act (CEQA) mandates that the potential physical changes to the environment resulting from a project be analyzed, as compared to the baseline ("on the ground") conditions existing at the time of the environmental review. Although the Pilot program is operational at the time that this analysis has occurred, the Pilot would not continue after February 2016 and therefore a comparison of the conditions under the proposed Program to the conditions under the Pilot would not reflect an accurate analysis. Moreover, because the proposed Program is a refined and expanded version of the Pilot, analysis of current conditions (i.e., with the Pilot) as the baseline would understate the impacts of the proposed Program because the physical changes resulting from the proposed Program would be minimal; for example, use of the Pilot as a baseline would not reflect the localized emissions resulting from the designation of permitted shuttle stops. Therefore, for the purposes of this analysis, the pre-Pilot conditions represent the baseline existing conditions to provide the most conservative analysis and because the Pilot is a temporary program with a required end date.

The data collected during the Pilot period has been used to inform the conclusions of this analysis, providing a reliable basis for understanding the impacts of the proposed Commuter Shuttle Program.

Transportation

Prior to the Pilot, shuttle operators did not inform SFMTA of their stop locations. However, because the stop network for the Pilot was created based on shuttle providers' requested stop locations and there was no limit on the number of potential stops, it can be reasonably assumed that the Pilot program stop network is similar to the shuttle stop locations that were in use informally prior to the Pilot. One physical change resulting from the proposed Program would be that, rather than having full choice of stop locations, shuttle activity for larger vehicles would be directed away from non-arterial streets towards arterials. The traffic analysis below considers the impacts of this component of the proposed Program by quantifying potential additional shuttle vehicle activity in those arterial locations where the greatest number of shuttles would be routed away from non-arterial streets.

Table 2 below depicts a worst-case scenario showing the number of buses that would be moved to nearby arterial streets if all commuter shuttle traffic (both large and small vehicles) at four of the busiest non-arterial zones would move to a single nearby zone on an arterial, and not dispersed across several nearby zones. Table 3 shows that the shuttle activity at these four arterial streets currently constitutes 1.1% to 7% of the peak hour vehicle activity at these intersections, this maximum number of relocated commuter

shuttles, when added to existing shuttle activity at these stops, would account for between 1.7% and 9% of the average daily traffic on the streets to which they would be relocated.

Table 3. Stop Events at Designated Zones (with Commuter Shuttle Program)

Existing Non-Arterial Zone		Nearest Arterial Zone Alternative				Combined Totals After Relocation	
Existing Non-Arterial Zone (to be relocated)	**Stop Events[a]**	**Nearest Existing Arterial Zone[b]**	**Stop Events**	**Existing Arterial Traffic Counts[c]**	**Shuttle % of Current Traffic Counts**	**Total Stop Events** (after relocation)	**Shuttle % of Total Traffic Counts** (after relocation)
Castro/25th NW corner, near-side	20.0	24th/Church SW corner, near-side	9.6	342	6%	29.6	9%
Church/Market NE corner, AM/PM white zone	10.3	Castro/Market NE corner, PM white zone	10.3	311	3%	20.5	6%
30th/Church SW corner, flag stop	12.9	San Jose/Dolores NW corner, AM white zone	6.9	1159	1.1%	19.7	1.7%
Townsend/4th South side, Mid-block	22.7	Harrison/Embarcadero, white zone	8.7	341	7%	31.4	9.5%

Source: SFMTA, 2015

Notes:

a – Estimated commuter shuttle stop events per hour

b – Peak hour traffic counts collected by SFMTA in 2009, 2011, and 2012

c – Identified zone with existing shuttle stop where nearest non-arterial stop would be located.

Implementation of the proposed project may include the relocation of stop events and routes for large vehicles to arterial roadways. As shown in Table 3, the four arterial locations closest to the current non-arterial locations experiencing the highest level of shuttle activity could experience an increase in shuttle stop events due to the relocation of nearby non-arterial stops. However, with the relocation of shuttle stops and the subsequent increase in shuttle activity at each location, peak hour traffic volumes at intersections analyzed would increase by 0.6% to 3%, which would not represent a substantial increase from the addition of shuttle stop events due to the relocation of a non-arterial zone. Peak hour traffic volumes collected for each of the four locations listed above includes all vehicle types (including shuttles). The relocation of stops would not result in a substantial increase in the number of commuter shuttle vehicles (or other vehicles) at the locations analyzed above, with the increases in shuttle activity adding approximately one to three percent more shuttle vehicles than current conditions. Ultimately, commuter shuttles would remain approximately less than 10 percent of the vehicles that travel through

each location shown above during the peak hour. Moreover, as part of the Program, commuter shuttles are required to avoid using non-arterial streets, which would further reduce the number of shuttle vehicles on those streets. The relatively minor increase in shuttle activity, compared to the overall peak hour volumes, would not substantially degrade traffic operations and would not have a significant impact on traffic operations at arterial roadways.

Transit

One of the principal objectives in regulating commuter shuttles is to ensure that commuter shuttle conflicts with Muni were avoided or minimized whenever possible. To that end, the Pilot Program shuttle zone network included stops on lower-frequency Muni lines and exclusive shuttle loading zones near, but not shared with, Muni zones. Commuter shuttle activities, especially in designated shared Muni/Shuttle zones, were observed during the data collection effort in 2015. Table 4 below, compares the number of times that a Muni bus was blocked, at least temporarily, by a commuter shuttle bus from accessing a Muni zone, pre- and during-pilot.

Table 4. Average Number of Shuttle Stop-Events Resulting in Blocked Muni Buses (per hour)

Zone Location	Pre-Pilot Program	During-Pilot Program	Percentage (average per hour)
4th and Townsend	0.8	0	0%
16th and Mission	0	0	0%
16th and Mission/South Van Ness	0.4	0	0%
19th and Taraval/Wawona	0	0	0%
Castro and 24th/25th	0	0	0%
Church and 15th/16th	0	0	0%
Church and Market	0	0	0%
Divisadero and Haight/Oak PM	0	0.4	4%
Divisadero and Geary	1.2	0	0%
Divisadero and Haight AM	0.2	0.8	5%
Fillmore and Jackson	0.4	0.4	9%
Lombard and Pierce	0	0	0%
Van Ness and Market AM	0	0	0%
Valencia and 24th	0.86	1.6	10%
Valencia and 25th	0	0.4	2%
Van Ness and Market PM	0	0.8	5%
Van Ness and Sacramento	1.0	0.4	2%
Van Ness and California	0.8	0	0%
Van Ness and Union PM	0	3.2	18%
Van Ness and Union AM	1.2	0	0%
Program Average	**0.3**	**0.4**	3%

Source: SFMTA, 2015

Notes: Locations in **BOLD** include loading zones shared with Muni Buses

During data collection for the Pilot in June 2015, commuter shuttles blocking Muni vehicles were observed across several designated stops/zones. Results show that the occurrences of shuttles blocking Muni vehicles did not substantially increase between pre-Pilot conditions and after implementation of the Pilot Program. As shown in Table 4, twelve stops/zones were observed to not have any Muni buses blocked, compared to 11 stops/zones during the pre-pilot data collection. The average number of Muni buses blocked per hour was less than one Muni vehicle per hour (0.4 Muni vehicles during Pilot, 0.3 Muni vehicles pre-Pilot). Blocked Muni buses as a percentage of shuttles per hour shows that Commuter Shuttles blocking Muni buses occurred infrequently; an average of only 3% of shuttle stop-events blocked Muni access to a zone, and only in two locations did 10% or more shuttle stop-events block Muni.

Across all the field data collection locations during the Pilot, which saw 706 total stop-events, or 24% of the 2,978 stop-events that occur at all zones/stops on a typical day, 19 total Muni buses were temporarily prevented from accessing the Muni zone. As part of the proposed project, SFMTA would provide increased enforcement and monitoring at shuttle zones with a higher number of observed cases where commuter shuttles blocked Muni vehicles. The proposed project includes ongoing evaluation to actively respond to community concerns, identify safety issues, and would have the ability to modify shuttle network stops/zones to maintain consistent Muni operations.

For the purposes of a conservative analysis, SFMTA estimated that, by multiplying the average commuter shuttle dwell time (62.4 seconds) at designated stops/zones by 2,978 total daily stop-events, shuttles add a total of 83 minutes per day of delay into the Muni system. The resulting delay per Muni run (Muni makes over 1,200 runs every weekday) is approximately four seconds. The estimated delay added to existing Muni runs would be disperse throughout the Muni bus routes where shuttles also operate and would not be considered substantial. As shown above, the Commuter Shuttle Program would not substantially add delay to Muni lines operating along the same corridors as shuttles.

Further, the threshold of significance for determining peak period transit demand impacts to the SFMTA lines is defined by an "85 percent" capacity utilization performance standard. As determined by the SFMTA Board and the Planning Department, local transit lines should operate at or below 85 percent capacity utilization. This performance standard more accurately reflects actual operations and the likelihood of "pass-ups" (i.e., vehicles not stopping to pick up more passengers). The 85 percent capacity utilization standard would not be exceeded due to the Commuter Shuttle Program, since shuttles do not add to the capacity of existing Muni lines. Therefore, the proposed project would not result in a significant impact related to transit operations.

Bicycles

Similar to transit observations above, data collected by SFMTA during the Pilot indicated that commuter shuttles were observed to have infrequent operational conflicts with existing bicycle facilities. Though these occurrences were infrequent, commuter shuttles were observed to block the travel lane and/or bicycle lane when shuttles failed to maneuver all the way to the curb when accessing a zone, or when shuttles were denied access to the zone by another shuttle, a Muni vehicle, or another vehicle. During the

Pilot, these issues were addressed by extending shuttle zones, creating shuttle-only zones or directing shuttles to stop at low-frequency Muni zones where there were less likely to conflict with a Muni bus. Because of their infrequency, and the Program's ability to address any potential conflicts through modification of the shuttle stop length or location, the proposed Program would not be expected to result in a significant impact related to bicycles.

In addition, the Program requires commuter shuttles to pull all the way into, and maneuver the shuttle vehicle parallel with, the curb for passenger boarding and unloading. The Program would also prohibit shuttle vehicles from blocking travel or bicycle lanes and that loading and unloading do not take place in a vehicle or bicycle lane, or operate in a manner that impedes travel in these lanes. As appropriate, the SFMTA would create far-side shuttle loading zones to minimize the occurrence of shuttles blocking travel lanes and/or bike lanes, and increase enforcement at certain locations to ensure that shuttle drivers pull shuttle vehicles completely into the zone and out of traffic or bicycle lanes. Further, it is important to note that while the conflict with both travel lanes and bicycle lanes were observed, these incidents were very infrequent: the conflicts were observed at three of six near-side zones, and were not observed at all at any of the far-side or mid-block zones. Given the above, the proposed project would not result in a significant impact related to bicycles.

Pedestrians

Data collected during the Pilot indicated that commuter shuttles presented infrequent operational conflicts with pedestrian facilities. According to SFMTA and described below, pedestrian safety issues identified were related to the size of the commuter shuttle and placement of new shuttle stops/zones in relation to certain crosswalks. Observations conducted during the Pilot noted potential reduction in sight distance and whether commuter shuttles are preventing right-turning drivers from seeing pedestrians who may be crossing in front of a shuttle at a near-side stop. Because of the size of the commuter shuttles, shuttles at near-side stops/zones create a temporary restriction of the view of drivers attempting to make a right turn. Analysis of conditions indicated that the temporary restriction in sight distance is created only if all of the following conditions are met at the same time: (1) the commuter shuttle is stopped at the near side of the intersection, (2) a driver is attempting to turn right around the shuttle, and (3) pedestrians are crossing in front of the shuttle and may not be seen by the car driver. Because this issue only arises in limited circumstances, during data collection activities, SFMTA staff noted that these conditions were met only 16 times across the entire data collection period during the Pilot. While infrequent, these occurrences were one of the primary reasons that the Commuter Shuttle Program, upon implementation, would include identifying shuttle zones that may be moved from the near side of the intersection to the far side of the intersection. Also, as part of the Program, participants would be required to certify that shuttle drivers have completed driver safety training consistent with SFMTA's Large Vehicle Urban Driving Safety Program.

In addition, data collection activities during the Pilot Program observed instances where commuter shuttles blocked crosswalks. SFMTA staff noted that this usually occurs when a commuter shuttle driver misjudges the stop light cycle or attempts to access a zone that is already occupied by another vehicle.

Overall, analysis indicated that commuter shuttles actively blocking pedestrian facilities did not occur often during Pilot Program data collection. Shuttles blocked crosswalks six times out of 706 stop-events observed, or less than one percent of all stop events.

While data collected during the Pilot observed minimal conflicts with pedestrian facilities, the Commuter Shuttle Program would further reduce conflicts through increased enforcement at high-activity locations identified by SFMTA, the extension of the length of shuttle-only zones, and in certain cases as determined by SFMTA staff, the modification of near-side stops to far-side stops. By pursuing modifications to identified shuttle loading zones, such as relocating stops to the far-side of the street, both right-turning vehicles and pedestrians at a given crosswalk would not have an obstructed view of the intersection.

While there were intermittent occurrences of operational conflicts, the proposed project would not create a hazard and intermittent conflicts such as shuttle vehicles blocking Muni vehicles, travel lanes, or bicycle lanes would be reduced through the Commuter Shuttle Program. The proposed project, as mentioned previously, would identify specific locations (based on Pilot data collection) and pursue improvements to better manage the movement of vehicles, transit, bicycles, and pedestrians. The observations during the Pilot indicate that these improvements, as part of the project, would further reduce the conflicts between those modes of transportation and avoid instances where Muni passengers would need to board Muni vehicles on the street.

The proposed project would not include any narrowing of sidewalks or other components that could negatively affect pedestrian circulation within the project area. Based on the above, the proposed project would not result in significant impacts related to pedestrians.

Loading

The project, as proposed, would not eliminate any commercial loading zones or create additional demand for commercial loading activities. Under the Commuter Shuttle Program, use of existing passenger loading (white) zones and designated shared Muni/shuttle stops would not reduce the number of commercial loading (yellow) zones. Any elimination of existing loading zones would be evaluated for its impacts. However, the elimination of a loading zone does not typically result in a significant impact. Therefore, the proposed project would not result in significant commercial loading impacts.

If the Commuter Shuttle Program were not implemented, commuter shuttles would be expected to return to operating on non-arterial streets and other streets without restrictions such as residential streets; loading and unloading passengers at near-side bus stops, white zones or vacant curb areas; or loading and unloading passengers in travel lanes on both arterial and non-arterial streets, which could occasionally result in delays to traffic and Muni service or affect Muni patrons who might need to go out into the street to board, and could affect pedestrians crossing streets in front of commuter shuttles.

Other Environmental Topics

Air Quality

An Air Quality Technical Report (AQTR)[4] was prepared in order to assess the regional criteria air pollutant, and localized health risk impacts of the proposed project. The following summarizes the results of the AQTR, as well as provides some background information regarding threshold of significance.

Criteria Air Pollutants (Regional Analysis)

The Bay Area Air Quality Management District (BAAQMD) is the regional agency with jurisdiction over the nine-county San Francisco Bay Area Air Basin (SFBAAB), which includes San Francisco, Alameda, Contra Costa, Marin, San Mateo, Santa Clara, and Napa Counties and portions of Sonoma and Solano Counties. The BAAQMD is responsible for attaining and maintaining air quality in the SFBAAB within federal and state air quality standards, as established by the federal Clean Air Act (CAA) and the California Clean Air Act (CCAA), respectively.

In accordance with the state and federal Clean Air Acts, air pollutant standards are identified for the following six criteria air pollutants: ozone (O_3), carbon monoxide (CO), particulate matter (PM_{10} and $PM_{2.5}$), nitrogen dioxide (NO_2), sulfur dioxide (SO_2) and lead. These air pollutants are termed criteria air pollutants because they are regulated by developing specific public health- and welfare-based criteria as the basis for setting permissible levels. In general, the SFBAAB experiences low concentrations of most pollutants when compared to federal or state standards. The SFBAAB is designated as either in attainment[5] or unclassified for most criteria pollutants with the exception of ozone, $PM_{2.5}$, and PM_{10}, for which these pollutants are designated as non-attainment for either the state or federal standards.[6] By its very nature, regional air pollution is largely a cumulative impact in that no single project is sufficient in size to, by itself, result in non-attainment of air quality standards. Instead, a project's individual emissions contribute to existing cumulative air quality impacts. If a project's contribution to cumulative air quality impacts is considerable, then the project's impact on air quality would be considered significant.[7] The City is utilizing the significance thresholds developed by BAAQMD to analyze this project's criteria pollutant air quality impacts.

The proposed project would include capital improvements consisting of boarding islands, pedestrian bulbs, and bus bulbs. These capital improvements would require the use of construction equipment.

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4 Ramboll Environ. Final Air Quality Technical Report. SFMTA Commuter Shuttle Program. October 13, 2015.

5 "Attainment" status refers to those regions that are meeting federal and/or state standards for a specified criteria pollutant. "Non-attainment" refers to regions that do not meet federal and/or state standards for a specified criteria pollutant. "Unclassified" refers to regions where there is not enough data to determine the region's attainment status for a specified criteria air pollutant.

6 U.S. EPA. Green Book. Current Nonattainment Counties for All Criteria Pollutants. As of October 01, 2015. Available online: http://www3.epa.gov/airquality/greenbook/ancl.html

7 Bay Area Air Quality Management District (BAAQMD), *California Environmental Quality Act Air Quality Guidelines*, May 2011, page 2-1.

Given the limited use and amount of construction, the proposed project would not have the potential to result in significant construction criteria air pollutant impacts.

For the purposes of environmental review, shuttle growth was assumed to be 41 percent of the Pilot Program and was based available data collected by the SFMTA. Shuttle activities occurred on City streets even before the Pilot was implemented. Based on the number of commuter shuttle permits (placards) issued prior to the implementation of the Pilot and the Commuter Shuttle Program (beginning in 2016), SFMTA estimates that participation in the Program could increase by 41 percent.[8]

Potential commuter shuttle activity could grow as a result of increased demand for shuttle service from local and regional employers and their workers. This potential growth could occur with or without implementation of the proposed project. However, for environmental review purposes, the potential growth in the number of shuttles and stop events is being analyzed as related to the Program. Regional criteria air pollutant emissions may increase from the increase in potential commuter shuttle activity within San Francisco and to and from commuter shuttle destinations in the Bay Area. Therefore, regional criteria air pollutant emissions were estimated based upon the following assumptions: a 41 percent growth in commuter shuttle permits (placards) issued prior to the commencement of the Pilot (2014) and estimated Commuter Shuttle Program implementation (2016); commuter shuttle engine year, including model year 2012 equivalent or newer for all new commuter shuttle vehicles entering the Program and, by 2020, a requirement that all active commuter shuttle vehicle engines are no more than eight years old or equivalent (thus requiring fleet turnover of older vehicles); commuter shuttle data on fuel type, idling time, and trip length; and survey responses from individuals participating as commuter shuttle riders in the Pilot Program regarding their mode of commuter travel or location of home/job if commuter shuttles were not available.

Emissions from the proposed project display net reductions in ROG, PM_{10}, and $PM_{2.5}$emissions of 0.26, 0.05, and 0.05 tons per year, respectively, and net reductions in CO_2 of 1,149 metric tons per year. Emissions from the proposed project display net increases of NO_x by 6.6 tons per year. Increases in NO_x are attributable to the difference in emissions generated from a large diesel-fueled bus engine relative to a gasoline-fueled car. In 2018, NO_x emissions from the average shuttle are approximately 18 times greater per mile than a passenger car. However, the NOx emissions would still be below the thresholds of significance, as shown in Table 5. Therefore, no significant criteria air pollutant impacts would occur.

[8] Memo – Potential Increase in Commuter Shuttle Activity, from Hank Willson (SFMTA) to Melinda Hue (SF Planning Department), dated October 8, 2015.

Table 5. Estimated Criteria Air Pollutant Emissions

	ROG	NO_x	PM_{10}	$PM_{2.5}$	CO_2
Estimated emissions (pounds per day)[1]					
Project Emissions	-1.4	36	-0.3	-0.3	-6,939
Significance Threshold	54	54	82	54	n/a[2]
Estimated emissions (tons per year)[1]					
Project Emissions	-0.26	6.60	-0.05	-0.05	-1,149
Significance Threshold	10	10	15	10	n/a[2]

Source: Ramboll Environ, 2015.

1. Annual CO_2 emissions are in metric tons.
2. The City relies on compliance with the City's Greenhouse Gas Reduction Strategy instead of quantitative thresholds for determining significance.

Health Risks and Hazards (Localized Analysis)

In addition to criteria air pollutants, individual projects may emit toxic air contaminants (TACs). TACs collectively refer to a diverse group of air pollutants that are capable of causing chronic (i.e., of long-duration) and acute (i.e., potentially severe but short-term) adverse effects to human health, including carcinogenic effects. In an effort to identify areas of San Francisco most adversely affected by sources of TACs, San Francisco partnered with the BAAQMD to conduct a citywide health risk assessment based on an inventory and assessment of air pollution and exposures from mobile, stationary, and area sources within San Francisco. Areas with poor air quality, termed the "Air Pollutant Exposure Zone," were identified based on health-protective criteria that consider estimated cancer risk, exposures to fine particulate matter, proximity to freeways, and locations with particularly vulnerable populations.

The above citywide health risk modeling was also used as the basis in approving a series of amendments to the San Francisco Building and Health Codes, generally referred to as the Enhanced Ventilation Required for Urban Infill Sensitive Use Developments or Health Code, Article 38 (Ordinance 224-14, effective December 8, 2014) (Article 38). The purpose of Article 38 is to protect the public health and welfare by establishing an Air Pollutant Exposure Zone and imposing an enhanced ventilation requirement for all urban infill sensitive use development within the Air Pollutant Exposure Zone. The Air Pollutant Exposure Zone was also used as the basis in approving a series of amendments to the San Francisco Environment and Administrative Codes, generally referred to as the Clean Construction Ordinance, or Environment Code Section 25.

The threshold of significance used to evaluate health risks from new sources of TACs associated with the project is based on the potential for the proposed project to substantially affect the extent and severity of the Air Pollutant Exposure Zone at sensitive receptor locations. For projects that could result in sensitive

receptor locations meeting the Air Pollutant Exposure Zone criteria that otherwise would not occur without the project, a proposed project that would emit $PM_{2.5}$ concentration above 0.3 μg/m³ or result in an excess cancer risk greater than 10.0 per million would be considered a significant impact. The 0.3 μg/m³ $PM_{2.5}$ concentration and the excess cancer risk of 10.0 per million persons exposed are the levels below which the BAAQMD considers new sources not to make a considerable contribution to cumulative health risks.[9] For those locations already meeting the Air Pollutant Exposure Zone criteria, a lower significance standard is required to ensure that a proposed project's contribution to existing health risks would not be significant. In these areas a proposed project's $PM_{2.5}$ concentrations above 0.2 μg/m³ or an excess cancer risk greater than 7.0 per million would be considered a significant impact. The proposed project would include stops both within and outside the Air Pollutant Exposure Zone and thus all of the above thresholds of significance apply.

The proposed project would include limited construction activities for capital improvements. Project construction activities would result in short-term emissions of DPM and other TACs. The proposed project is subject to the Clean Construction Ordinance. While emission reductions from limiting idling, educating workers and the public and properly maintaining equipment are difficult to quantify, other measures in the Clean Construction Ordinance, specifically the requirement for equipment with Tier 2 engines and Level 3 Verified Diesel Emission Control Strategy (VDECS) can reduce construction emissions by 89 to 94 percent compared to equipment with engines meeting no emission standards and without a VDECS. Emissions reductions from the combination of Tier 2 equipment with level 3 VDECS is almost equivalent to requiring only equipment with Tier 4 Final engines, which is not yet readily available for engine sizes subject to the Clean Construction Ordinance. Therefore, compliance with the Clean Construction Ordinance would ensure construction emissions impacts on nearby sensitive receptors would not be significant.

Sensitive receptors may be exposed to increased emissions at existing stops as a result of the increased demand for shuttle service from local and regional employers and their workers. In addition, sensitive receptors that are currently not exposed to emissions from commuter shuttle stop events could be exposed in the future if new stops are added as part of the Program. Therefore, a localized health risk assessment was conducted to assess the excess cancer risk and $PM_{2.5}$ concentrations from the Program.

Four local impact zones were modeled to represent the localized health risk effects at any existing stop or proposed stop under the Program. The four local impact zones were chosen based on the following criteria: exhibit high volumes of stop events under the Pilot Program; represent average or above average idling times for idling times for commuter shuttle under the Pilot Program; representative of the geographic diversity within the City for stops (within and outside the Air Pollutant Exposure Zone, differing locations of sensitive receptors); and representative of configuration of stops (e.g., east-west vs. north-south, stops on both sides of the street).

[9] Bay Area Air Quality Management District, *California Environmental Quality Act Guidelines Update, Proposed Air Quality CEQA Thresholds of Significance*, May 3, 2010.

In order to assess potential impacts from locating a new stop anywhere in the City, for a baseline the modeling assumed that no shuttles currently stop at the four local impact zones. This represents a conservative analysis for some locations because with or without the Program the shuttles would be making stops at various locations throughout the City. However, this conservative approach allows for disclosure of air quality effects that occur today at some locations and provides information about health effects that could occur in the future if and/or when a new loading zone is created. In addition, localized health effects were based upon the following assumptions: an increase in the number of stop events that could occur between Pilot and Program conditions (estimated at 29 percent) at locations with a high volume stop events; the same commuter shuttle engine years (2012 or newer) as mentioned above for criteria air pollutants; commuter shuttle fuel type and idling time; and various methodologies consistent with BAAQMD guidance regarding assessing local risks and hazards.

As shown in Table 6, the estimated health risk and $PM_{2.5}$ concentrations from the Program would not exceed significance thresholds both within and outside the Air Pollutant Exposure Zone for residential sensitive receptors. Therefore, no significant localized health risk impacts would occur.

Table 6. Estimated Health Risks and Hazards

Air Pollutant Exposure Zone Location	Local Impact Zone	Lifetime Cancer Risk	Shuttle-Generated Annual $PM_{2.5}$ Concentrations
Outside	Van Ness & Union	5.6	0.02
Outside	Valencia & 24th/25th	4.3	0.01
	Significance Threshold	10.0	0.3
Within	Townsend & 4th	0.9	<0.01
Within	Market & 8th	2.8	<0.01
	Significance Threshold	7.0	0.2

Source: Ramboll Environ, 2015.

Noise

An analysis of the potential noise effects of adding transit service on streets in San Francisco was prepared for the Service Improvements analyzed in the Transit Effectiveness Project EIR (TEP EIR) in Chapter 4, Section 4.3, Noise and Vibration, on pp. 4.3-35 to 4.3-48.[10] The results of that analysis are relevant to the indirect changes in noise that could occur as the commuter shuttle program expands in the future.

The City considers temporary noise from construction performed in compliance with the San Francisco Noise Ordinance, Article 2.4 of the San Francisco Public Works Code/DPW Order No. 176-707, and the SFMTA Blue Book to be less than significant. These regulations require that construction not produce noise from any construction equipment (except impact tools) that would exceed 80 dBA at 100 feet or

[10] San Francisco Planning Department, *Transit Effectiveness Project Final Environmental Impact Report*, certified March 27, 2014, Case No. 2011.0558E (hereinafter "TEP EIR").

generate construction noise between 8:00 p.m. and 7:00 a.m. that exceeds the ambient noise level by 5 dBA at the nearest property line without procuring a Night Noise Permit. Pursuant to § 2907 of the San Francisco Noise Ordinance, impact tools and equipment must be equipped with intake and exhaust mufflers recommended by the manufacturers and approved by the Director of Public Works for maximum noise attenuation, and pavement breakers and jackhammers must be equipped with acoustically attenuating shields or shrouds.[11] Per the Night Noise Permit, the use of construction equipment that generates high level of noise and impact equipment is not allowed after 10:00 p.m.[12]

The Federal Transit Administration (FTA) developed a methodology and significance criteria to evaluate noise impacts from operation of surface transportation modes (i.e. passenger cars, trucks, buses, and rail) in their guidance document: *Transit Noise Impact and Vibration Assessment* (FTA Guidelines).[13] The FTA incremental noise impact criteria are based on US EPA recommended levels and studies of community annoyance from transportation noise. This approach was used in the TEP EIR to evaluate the noise impact from increases in transit vehicle trips on San Francisco streets.

The TEP EIR noise analysis evaluated construction impacts from adding pedestrian bulbs, bus bulbs, and boarding islands similar to those included in the proposed project.[14] The loudest noise levels are typically generated by impact equipment (e.g., hoe ram or jackhammers) that would be required for the demolition of the existing sidewalk and street and from paving equipment during street restoration.

The expected noise level from construction equipment used for the proposed capital improvements would not emit noise in excess of 80 dBA at 100 feet.[15] Therefore, with adherence to the San Francisco Noise Ordinance, including limiting the noise levels from individual pieces of construction equipment (other than impact tools) to 80 dBA at a distance of 100 feet, equipping impact tools with both intake and exhaust muffled, and obtaining a noise permit for night work from DPW, as well as compliance with the Public Works Code and other DPW regulations, indirect temporary construction noise impacts from the program would be less than significant.

The TEP EIR noise analysis studied the daily increase in operational ambient noise from increases in transit vehicle trips on streets with existing low (55 to 59 dBA Ldn), medium (60 to 69 dBA Ldn), and high (70 dBA Ldn and greater) ambient noise levels. The increases in numbers of standard diesel motor coaches ranged from about 115 per day on a street with low ambient noise levels (55 dBA Ldn) to over 500 per day on a street with high ambient noise levels (70 dBA Ldn).[16] The use of standard diesel motor coaches provided a conservative estimate of the noise that could be generated by increases in transit

[11] San Francisco Municipal Code, Police Code, Article 29 – Regulation of Noise. Available online at: http://www.sfdph.org/dph/files/EHSdocs/ehsNoise/NoiseOrd.pdf. Accessed June 3, 2013.

[12] TEP EIR p. 4.3.16.

[13] FTA, *Transit Noise and Vibration Impact Assessment*, May 2006. Available online at: www.fta.dot.gov/documents/FTA_Noise_and_Vibration_Manual.pdf. Accessed March 13, 2013.

[14] Note that implementing transit system priority signal systems would not require any construction activities.

[15] See TEP EIR Table 29, p. 4.3.31.

[16] TEP EIR Table 31, pp. 4.3.38-4.3.39.

vehicles in the analysis.[17] The results of the analysis of operational noise impacts in the TEP EIR show that adding substantial numbers of motor coaches to city streets, including streets that currently experience low ambient noise levels, would not result in significant increases in noise and would cause less-than-significant noise impacts.[18] Similarly, noise generated by the commuter shuttles would be comparable to those of the MUNI system if they were all standard diesel motor coaches.

As shown in Table 3 (Stop Events at Designated Zones [with Commuter Shuttle Program]), the commuter shuttle program could add up to three percent to the total number of shuttle vehicles to major and minor arterial roadways, assumed to have moderate to high ambient noise levels on a typical week day in San Francisco. It should be noted that as part of the program, shuttle motor coaches would be required to follow routes along arterial streets and avoid residential streets, thereby avoiding streets with low ambient noise levels. Therefore, it is reasonable to assume that, as for the TEP Service Improvements, the increase in noise levels during operation of the commuter shuttles would result in similar less-than-significant noise impacts.

Further, an approximate doubling of traffic volumes in the project area would be necessary to produce an increase in ambient noise levels noticeable to most people. As previously described, the proposed project would not cause a doubling in traffic volumes with the implementation of the Commuter Shuttle Program. The project's marginal increase to the existing shuttle activity at arterial roads (up to three percent) would not cause a noticeable increase in the ambient noise level in the project vicinity. The noise generated by commuter shuttles would be considered common and generally acceptable in an urban area, and would not be considered a significant impact.

Other CEQA Topics

Members of the public have expressed concern that commuter shuttles, the Pilot, and/or the proposed Program have caused an increase in housing costs, resulting in displacement. The increase in housing costs in San Francisco is a well-documented issue that is being addressed in a variety of ways. Prices have risen across the City as demand for housing has increased due to a variety of factors, including significant growth in employment opportunities within San Francisco and the Bay Area. As shown in Table 2 on p. 10, the ridership survey indicates that of the estimated 8,500 daily shuttle riders, only five percent (425 shuttle users) would move closer to their jobs were the commuter shuttles unavailable. Therefore, the availability and proximity of commuter shuttles do not appear to be contributing substantially to housing demand or prices in San Francisco.

CEQA Guidelines Section 15064(e) states that "economic and social changes resulting from a project shall not be treated as significant effects on the environment. Economic or social changes may be used, however, to determine that a physical change shall be regarded as a significant effect on the environment. Where a physical change is caused by economic or social effects of a project, the physical change may be

[17] TEP EIR pp. 4.3.36-4.3.37.

[18] EPT EIR Table 32, p. 4.3.46, and pp. 4.3-43 to 4.3-44

regarded as a significant effect in the same manner as any other physical change resulting from the project. Alternatively, economic and social effects of a physical change may be used to determine that the physical change is a significant effect on the environment. If the physical change causes adverse economic or social effects on people, those adverse effects may be used as a factor in determining whether the physical change is significant." The proposed Program would not result in elimination of any housing units. Any physical impacts associated with increased housing costs would be related to the construction of replacement housing for displaced residents, or increased trip lengths and emissions for displaced residents. However, there is no demonstrable evidence of physical displacement of individuals from housing units attributable to commuter shuttles, and if such displacement were to occur as a result of the proposed program, there is no basis to assess where such individuals would relocate and what their travel behavior would entail. Since there is no demonstrated causative link between commuter shuttle use and housing demand or price, and there is no foreseeable displacement associated with the proposed Program, analysis of any such impacts would be speculative with regard to their scale and nature.

The Commuter Shuttle Program would not result in any changes in land use, urban design or long range views, cultural resources, biological resources, greenhouse gas emissions, wind, shadow, utilities and service systems, geology and soils, hydrology or water quality, mineral resources or agricultural and forest resources. No new hazardous waste would be generated by the Commuter Shuttle Program. Implementation of the proposed project, may reduce already less-than-significant effects on emergency vehicle access.

EXEMPT STATUS

The California Environmental Quality Act (CEQA) Guidelines Section 15301, or Class 1, provides for the exemption from environmental review of minor alterations to existing highways and streets, sidewalks, gutters, bicycle and pedestrian trails, and similar facilities. The proposed project would include minor modifications to the existing arterials to install new commuter shuttle stops, as well as the installation of minor improvements such as signage, traffic islands, and bus bulbs. Therefore, the proposed project would be exempt from CEQA under Class 1.

CEQA Guidelines Section 15308, or Class 8, provides for exemption for actions taken by regulatory agencies, as authorized by state or local ordinance, to assure the maintenance, restoration, enhancement, or protection of the environment where the regulatory process involves procedures for protection of the environment. The proposed project would include the implementation of the Commuter Shuttle Program, which issues permits to eligible commuter shuttle providers meeting specific requirements and terms and would allow the use of designated public curb space. The program provides procedures intended to facilitate operation of commuter shuttles, enable vehicle trip reduction, and minimize impacts to users of other transportation modes in San Francisco. As such, it constitutes actions by SFMTA meant to enhance and protect the environment involving regulatory procedures for shuttle activity. Therefore, the proposed project would be exempt from CEQA under Class 8.

CONCLUSION

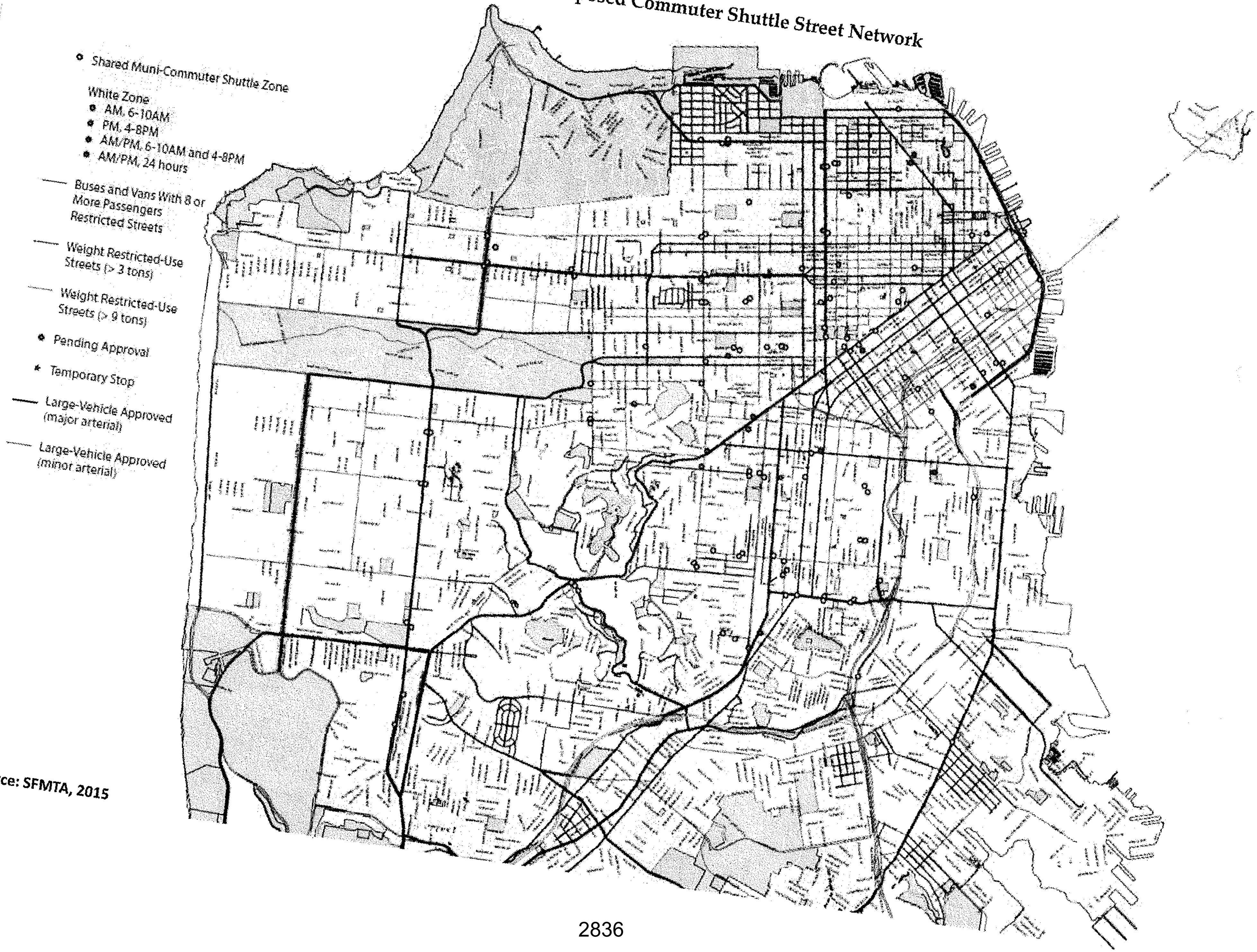
Guidelines Section 15300.2, subdivision (c), provides that a categorical exemption shall not be used for an activity where there is a reasonable possibility that the activity will have a significant effect on the environment due to unusual circumstances. As illustrated, herein there are no unusual circumstances surrounding the proposed project that would suggest a reasonable possibility of a significant effect. The proposed project would not substantially increase traffic on the existing street system and no significant environmental impact would occur. For the above reasons, the proposed project is appropriately exempt from environmental review.

The proposed project satisfies the criteria for exemption under the above-cited classification(s). In addition, none of the CEQA Guidelines Section 15300.2 exceptions to the use of a categorical exemption applies to the proposed project. For the above reasons, the proposed project is appropriately exempt from environmental review.

Attachment A: Pilot Program Shuttle Network

Source: SFMTA, 2015

Attachment B: Proposed Commuter Shuttle Street Network



Source: SFMTA, 2015

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Carroll, John (BOS)

From: Board of Supervisors, (BOS)
Sent: Thursday, January 21, 2016 10:13 AM
To: BOS-Supervisors; BOS Legislation, (BOS); Somera, Alisa (BOS)
Subject: File 151269-121272 FW: Board Agenda: Commuter Shuttle Appeal

Categories: 151269

-----Original Message-----
From: Rosie Gozali [mailto:rosie447@att.net]
Sent: Thursday, January 21, 2016 12:02 AM
To: Board of Supervisors, (BOS) <board.of.supervisors@sfgov.org>
Subject: Board Agenda: Commuter Shuttle Appeal

January 20, 2016

The Honorable London Breed
President, Board of Supervisors
1 Dr. Carlton B. Goodlett Place
San Francisco, CA 94102

Re. Jan. 26 Appeal of the permanent commuter shuttle program-support appeal

Dear President Breed and fellow Supervisors,

Im writing to you as a resident of San Francisco and someone who lives in a neighborhood which sees a lot of shuttle traffic daily. I urge your support for the appeal of the Permanent Commuter Shuttle Program which will be heard at the January 26th meeting. I feel strongly that an environmental impact report is very much needed to determine the impact this program has and will have on San Francisco's environment.

It is worrisome that 1.There are NO LIMITS on the number of shuttle buses that can be permitted.
2. There are NO LIMITS on the number of bus stops that can be added.
3. That Apple intends to build new campuses in the Silicon Valley area which will employ thousands and thousands of workers. Where will they live, and if they choose to live in S.F. what will be the impact on housing and will it mean more and more shuttle buses filling up our neighborhoods?

I do not understand why The SFMTA allows these shuttles to do what is prohibited to the tour buses. Please require this project to undergo a serious environmental review.

Sincerely,

Roselle Gozali
239 Clayton St. #6

Carroll, John (BOS)

From: Board of Supervisors, (BOS)
Sent: Thursday, January 21, 2016 10:15 AM
To: BOS Legislation, (BOS); Somera, Alisa (BOS)
Subject: File 151269-121272 FW: Please support the CEQA appeal of the permanent shuttle program on January 26, 2016
Attachments: Shuttle blocks man in wheelchair boarding Muni bus Fall 2015.jpg; Shuttle blocking Muni at Alamo Square.jpg; Shuttle pulls up beind the 28R November 2015.jpg; Muni bus displaced by tech shuttle; May 4, 2015.jpg; California and Van Ness Two Shuttle Buses Blocking Muni Bus 15-11-11 5-33 pm Comnposite With Text-1.jpg; California and Van Ness Muni Disembarking in Traffic 15-11-06 6-45 pm-3.jpg; California and Van Ness Muni Disembarking in Traffic 15-11-06 6-45 pm-2.jpg; California and Van Ness Muni Disembarking in Traffic 15-11-06 6-45 pm.jpg; California and Van Ness Muni Disembarking in Traffic 15-11-04 6-27 pm.jpg; California adn Van Ness Two Shuttles Blocking Traffic Lanes 15-11-10 6-17 pm.jpg; Blocked Muni Bus California and Van Ness 15-10-26-1.jpg; Blocked Muni Bus California and Van Ness 15-10-26.jpg; 24 Divisadero forced around tech shuttle in Muni stop; 05-01-2015.jpg; 24 Divis pulling into bus stop at Castro and 25th in back of Tech shuttle Spring 2015.jpg; 24 Divis pulling around shuttle on Castro at 26th Street Spring 2015.jpg

Categories: 151269

-----Original Message-----
From: Sue Vaughan [mailto:susan.e.vaughan@sonic.net]
Sent: Thursday, January 21, 2016 7:19 AM
To: Board of Supervisors, (BOS) <board.of.supervisors@sfgov.org>
Cc: Mar, Eric (BOS) <eric.mar@sfgov.org>; Farrell, Mark (BOS) <mark.farrell@sfgov.org>; Peskin, Aaron (BOS) <aaron.peskin@sfgov.org>; Tang, Katy (BOS) <katy.tang@sfgov.org>; Breed, London (BOS) <london.breed@sfgov.org>; Kim, Jane (BOS) <jane.kim@sfgov.org>; Yee, Norman (BOS) <norman.yee@sfgov.org>; Wiener, Scott <scott.wiener@sfgov.org>; Campos, David (BOS) <david.campos@sfgov.org>; Cohen, Malia (BOS) <malia.cohen@sfgov.org>; Avalos, John (BOS) <john.avalos@sfgov.org>
Subject: Please support the CEQA appeal of the permanent shuttle program on January 26, 2016

Dear Supervisors:

Attached are photos of shuttle interference with Muni buses. There are many more.

Please support the appeal of the permanent plan for the commuter shuttles on January 2016. The program has the potential for unlimited expansion -- an unlimited number of permits and unlimited number of stops. Additionally, while vehicles 35 feet and over may be restricted to major and minor arterials, vehicles of fewer than 35 feet will be permitted to operate on the rest of our streets (all San Francisco streets are residential streets).

Apple is planning to employ 31,000 people at campuses in Cupertino and North San Jose. Where are those employs going to live? How many additional shuttles do Apple and other expanding companies plan to run up and down the peninsula into San Francisco? What will be the additional air quality impacts? What will be the additional impacts to housing prices, evictions and economic displacement and the creation of sprawl and associated increases in GHG emissions and degradation of air quality?

Please support the appeal.

Apple plans hiring spree
http://www.cbsnews.com/news/apple-plans-hiring-spree-in-silicon-valley/

Companies that offer free transportation to employees get tax write offs http://www.bauersit.com/commuter-bus-programs/employer-benefits/

2008 story on the impact of tech shuttles on housing http://www.sfgate.com/entertainment/article/The-Google-Effect-How-the-company-s-shuttle-line-2539995.php

Apple expanding employee transportation program http://www.macrumors.com/2014/03/31/apple-expanding-employee-transportation-program/

More recent story on shuttle impact on housing prices http://www.theatlantic.com/business/archive/2015/10/sf-real-estate-apple/412372/

Apple pays $165 million in cash for North San Jose campus
http://www.bizjournals.com/sanjose/news/2015/09/25/apple-buys-more-north-san-jose-land-in-166m-deal.html

North San Jose expansion of Apple
http://www.mercurynews.com/business/ci_28879163/apple-expansion-north-san-jose-could-mean-18

60 Minutes episode in which Tim Cook tells Charlie Rose that the new Cupertino campus will hire 13,000 people:
http://www.cbsnews.com/videos/apples-tim-cook-talks-tech-and-privacy-with-60-minutes/

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Carroll, John (BOS)

From: Board of Supervisors, (BOS)
Sent: Thursday, January 21, 2016 1:27 PM
To: BOS Legislation, (BOS); Somera, Alisa (BOS)
Subject: File 151269- 121272 FW: Please support the environmental appeal to Commuter Shuttles!

Categories: 151269

From: ss@ssteuer.com [mailto:ss@ssteuer.com]
Sent: Thursday, January 21, 2016 1:09 PM
To: Board of Supervisors, (BOS) <board.of.supervisors@sfgov.org>
Cc: Mar, Eric (BOS) <eric.mar@sfgov.org>; Farrell, Mark (BOS) <mark.farrell@sfgov.org>; Peskin, Aaron (BOS) <aaron.peskin@sfgov.org>; Tang, Katy (BOS) <katy.tang@sfgov.org>; Breed, London (BOS) <london.breed@sfgov.org>; Kim, Jane (BOS) <jane.kim@sfgov.org>; Yee, Norman (BOS) <norman.yee@sfgov.org>; Wiener, Scott <scott.wiener@sfgov.org>; Campos, David (BOS) <david.campos@sfgov.org>; Cohen, Malia (BOS) <malia.cohen@sfgov.org>; Avalos, John (BOS) <john.avalos@sfgov.org>
Subject: Please support the environmental appeal to Commuter Shuttles!

Dear Supervisors,

This is a follow-up email to one sent a few days ago.
I'm forwarding just a few of the many photos taken of shuttle interfering with Muni buses.
Buses are polluting our streets with diesel fumes, congesting our neighborhoods, AND endangering pedestrians and Muni riders!

PLEASE, please support the appeal of the permanent plan for the commuter shuttles on January 2016.
The program has the potential for unlimited expansion —- an unlimited number of permits and unlimited number of stops. Additionally, while vehicles 35 feet and over may be restricted to major and minor arterials, vehicles of fewer than 35 feet will be permitted to operate on the rest of our streets (all San Francisco streets are residential streets).

Apple is planning to employ 31,000 people at campuses in Cupertino and North San Jose. Where are those employs going to live? How many additional shuttles do Apple and other expanding companies plan to run up and down the peninsula into San Francisco? What will be the additional air quality impacts? What will be the additional impacts to housing prices, evictions and economic displacement and the creation of sprawl and associated increases in GHG emissions and degradation of air quality?

Please support the appeal.

Apple plans hiring spree
http://www.cbsnews.com/news/apple-plans-hiring-spree-in-silicon-valley/

Companies that offer free transportation to employees get tax write offs
http://www.bauersit.com/commuter-bus-programs/employer-benefits/

2008 story on the impact of tech shuttles on housing
http://www.sfgate.com/entertainment/article/The-Google-Effect-How-the-company-s-shuttle-line-2539995.php

Apple expanding employee transportation program
http://www.macrumors.com/2014/03/31/apple-expanding-employee-transportation-program/

More recent story on shuttle impact on housing prices
http://www.theatlantic.com/business/archive/2015/10/sf-real-estate-apple/412372/

Apple pays $165 million in cash for North San Jose campus
http://www.bizjournals.com/sanjose/news/2015/09/25/apple-buys-more-north-san-jose-land-in-166m-deal.html

North San Jose expansion of Apple
http://www.mercurynews.com/business/ci_28879163/apple-expansion-north-san-jose-could-mean-18

60 Minutes episode in which Tim Cook tells Charlie Rose that the new Cupertino campus will hire 13,000 people:
http://www.cbsnews.com/videos/apples-tim-cook-talks-tech-and-privacy-with-60-minutes/

Thank you,
Sharon Steuer
Bernal Heights resident
Mission art studio
Your San Francisco Distr

ict


24 DIVISADERO

Note approaching Muni bus pulling around *two* unloading shuttle buses.


49
VAN NESS
N. Point
7108


SF VAN NESS


NO PARKING
6AM 8AM
TUES THURS

Carroll, John (BOS)

From: Board of Supervisors, (BOS)
Sent: Thursday, January 21, 2016 10:08 AM
To: BOS-Supervisors; BOS Legislation, (BOS); Calvillo, Angela (BOS); Somera, Alisa (BOS)
Subject: File 151269- 121272 FW: Appeal of the permanent commuter shuttle program

Categories: 151269

From: Iris Biblowitz [mailto:irisbiblowitz@hotmail.com]
Sent: Wednesday, January 20, 2016 4:52 PM
To: Board of Supervisors, (BOS) <board.of.supervisors@sfgov.org>
Subject: Appeal of the permanent commuter shuttle program

Dear Board of Supervisors - An Environmental Impact Report is critical to evaluate the effects of the current commuter shuttle program that has been dominating our streets for at least two years. As a nurse, I'm extremely concerned about the impact the commuter shuttles are having on seniors and people with disabilities' ability to get to their medical appointments. People have told me that they don't feel safe when Google and other commuter shuttles are stopping at MUNI bus stops. Poor visibility (the height of the shuttle buses) and having to go out into the street to get on MUNI, at times, has made people feel very vulnerable and as a consequence, have missed their medical appointments. People in wheelchairs and people with impaired vision have emphasized how unsafe they feel.

Over a year ago, there was an article about the percentage of evictions of seniors and people with disabilities (over 70%) who lived within 4 blocks of Google buses. I believe the commuter shuttles have contributed to the rapidly escalating number of evictions of long-time residents of the Mission (my neighborhood for 40 years), low- and -middle income tenants, latino and African-American families. I'm particularly concerned about the health effects of these evictions on people as well as the effects of pollution of these huge buses, driving all over the city and on many residential streets.

The permanent commuter shuttle program has no limits on the number of buses or bus stops, and as the tech industry continues to grow and take over our city and the Bay Area, I can only see more of these destructive effects on housing, peoples' health, and the environment.

Commuter shuttles (as well as companies like Uber and Lyft) create an apartheid system that could also have a detrimental effect on publiv transit.

I urge you to vote for the appeal of the permanent shuttle program, develop a thorough EIR, and to please think of how the corporate buses are affecting the humanity of San Francisco.

Thank you - Iris Biblowitz, RN

Carroll, John (BOS)

From: Board of Supervisors, (BOS)
Sent: Thursday, January 21, 2016 10:13 AM
To: BOS Legislation, (BOS); Somera, Alisa (BOS)
Subject: File 151269-121272 FW: Sierra Club supports the appeal of the permanent commuter shuttle program and calls for an EIR
Attachments: Sierra Club support of permanent commuter shuttle appeal 01-26- 2016 .pdf

Categories: 151269

-----Original Message-----
From: Sue Vaughan [mailto:susan.e.vaughan@sonic.net]
Sent: Wednesday, January 20, 2016 10:48 PM
To: Board of Supervisors, (BOS) <board.of.supervisors@sfgov.org>
Cc: Mar, Eric (BOS) <eric.mar@sfgov.org>; Farrell, Mark (BOS) <mark.farrell@sfgov.org>; Peskin, Aaron (BOS) <aaron.peskin@sfgov.org>; Tang, Katy (BOS) <katy.tang@sfgov.org>; Breed, London (BOS) <london.breed@sfgov.org>; Kim, Jane (BOS) <jane.kim@sfgov.org>; Yee, Norman (BOS) <norman.yee@sfgov.org>; Wiener, Scott <scott.wiener@sfgov.org>; Campos, David (BOS) <david.campos@sfgov.org>; Cohen, Malia (BOS) <malia.cohen@sfgov.org>; Avalos, John (BOS) <john.avalos@sfgov.org>; Becky Evans <rebecae@earthlink.net>; Arthur Feinstein <arthurfeinstein@earthlink.net>; John Rizzo <jrizzo@sprintmail.com>; Karen Babbitt <karenbabbitt@yahoo.com>; Linda Weiner <lwsf72@gmail.com>; Barry Hermanson <barry@hermansons.com>; Howard Strassner <ruthow1@gmail.com>
Subject: Sierra Club supports the appeal of the permanent commuter shuttle program and calls for an EIR

Please see the attached letter.

--
Sue Vaughan
(415) 668-3119
(415) 601-9297

SIERRA CLUB
FOUNDED 1892

San Francisco Group
SFG
85 Second Street
San Francisco, CA 94105
January 19, 2016

San Francisco Board of Supervisors President London Breed
1 Dr. Carlton B. Goodlett Place
Room 244
San Francisco, CA 94103-2414

Dear President Breed:

The Sierra Club opposes the categorical exemption for the permanent commuter shuttle program and demands that the City conduct a full environmental review of the program. The Sierra Club supports the appeal of the January 26, 2016 commuter shuttle program categorical exemption.

Additionally, the Sierra Club recognizes that private commuter and educational buses might serve the environment by getting cars off the road; however, it should be noted that a recent study indicates that if the buses did not exist, the majority of commuters would not drive to San Francisco. Instead, they would move to the peninsula, take public transit, or carpool. It should also be noted that the cumulative impact of these large buses contributes to air pollution, which has a documented effect on respiratory and cardiovascular disease.

Therefore, the Sierra Club supports an environmental impact report to determine the true environmental impacts of the availability of private commuter and educational buses. The EIR would include an assessment of air quality impacts beyond the limited assessment of August 2014 through January 2016 pilot program air quality impacts. An accurate and comprehensive air quality assessment will include an assessment based on the expected expansion of the program.

An accurate assessment will evaluate the nexus between the availability of the private shuttles and rising housing costs which lead to rising housing prices, economic dislocation and sprawling communities that require more driving and degrade air quality further.

The environmental impact report should assess prospects for increased conflicts with Muni, Golden Gate Transit, and SamTrans, and greater threats to senior citizens and the disabled who are attempting to access public buses, as the program is expected to expand and as the program contains no limits on the number of shuttles that can be permitted or stops that can be added.

The environmental impact report should gather accurate figures on the number of people who actually ride the shuttles to determine if their numbers are large enough to offset

The environmental impact report should assess the degree to which the availability of the shuttles diverts ridership from Caltrain, undermining a valuable public asset.

The city must also begin the disaggregation of private shuttle buses from public bus stops, restricted by California Vehicle Code 22500 (parking, standing, stopping in a bus zone) to common carriers and in some circumstances school buses.

Depending on the results of an environmental impact report, the city government may help facilitate their use outside of Muni bus stops.

Where necessary the city may create additional bus stop spaces even if it means taking parking spaces for a few hours.

The operators of the private commuter and educational buses should pay the full cost of the facilitation, including the cost of infrastructure upgrades, lost meter revenue, and salaries and benefits of program managers.

The companies that benefit from the private shuttle systems should mitigate for the environmental impacts of economic dislocations linked to the availability of the shuttles that lead to sprawl and longer commutes for people who get displaced or who cannot afford to live in San Francisco near their work. Taxpayers should not subsidize any portion of the cost or impacts of the shuttle program.

Fighting climate change will involve the expansion and improvement of PUBLIC transportation, not private transportation in competition with a public asset, curb space.

Sincerely,
Susan Vaughan
SF Group Chair

CC: Clerk of the Board Angela Calvillo, Supervisor Eric L. Mar, Supervisor Mark Farrell, Supervisor Aaron Peskin, Supervisor Katy Tang, Supervisor London Breed, Supervisor Jane Kim, Supervisor Norman Yee, Supervisor Scott Wiener, Supervisor David Campos, Supervisor Malia Cohen, Supervisor John Avalos

Carroll, John (BOS)

From: Carroll, John (BOS)
Sent: Wednesday, January 20, 2016 9:13 AM
To: Rebecca Davis (rebecca@lozeaudrury.com); Wise, Viktoriya (MTA); Willson, Hank (MTA); Espiritu, Christopher (CPC); Rahaim, John (CPC); Jones, Sarah (CPC); Starr, Aaron (CPC); Rodgers, AnMarie (CPC); Sanchez, Scott (CPC); Ionin, Jonas (CPC); Givner, Jon (CAT); Warren, Elaine (CAT); Zane Gresham (zgresham@mofo.com); Miles Imwalle (mlmwalle@mofo.com); David Gold (dgold@mofo.com); Dan Gershwin (DGershwin@mofo.com); Adrian Covert (acovert@bayareacouncil.org); Richard Drury (richard@lozeaudrury.com); Theresa Rettinghouse (theresa@lozeaudrury.com); Sue Vaughan (susan.e.vaughan@sonic.net); Wise, Viktoriya (MTA); Willson, Hank (MTA); Espiritu, Christopher (CPC); Rahaim, John (CPC); Jones, Sarah (CPC); Starr, Aaron (CPC); Rodgers, AnMarie (CPC); Sanchez, Scott (CPC); Ionin, Jonas (CPC); Givner, Jon (CAT); Warren, Elaine (CAT); BOS-Supervisors; BOS-Legislative Aides
Cc: Calvillo, Angela (BOS); Somera, Alisa (BOS); Carroll, John (BOS); BOS Legislation, (BOS)
Subject: Appeal Responses - CEQA Exemption Determination Appeal - Proposed Commuter Shuttle Permit Program - Appeal Hearing on January 26, 2016

Categories: 151269

Good morning,

Please find linked below appeal responses received by the Office of the Clerk of the Board from the SFMTA and the Planning Department, concerning the categorical exemption determination for the proposed Commuter Shuttle Permit Program.

SFMTA Response - January 19, 2016
Planning Response Letter - January 19, 2016 - LARGE FILE

The appeal hearing for this matter is scheduled for a 3:00 p.m. special order before the Board on January 26, 2016.

I invite you to review the entire matter on our Legislative Research Center by following the link below:

Board of Supervisors File No. 151269

Thank you,

John Carroll
Legislative Clerk
Board of Supervisors
San Francisco City Hall, Room 244
San Francisco, CA 94102
(415)554-4445 - Direct | (415)554-5163 - Fax
john.carroll@sfgov.org | bos.legislation@sfgov.org

Click here to complete a Board of Supervisors Customer Service Satisfaction form.

The Legislative Research Center provides 24-hour access to Board of Supervisors legislation and archived matters since August 1998.

Carroll, John (BOS)

From: Navarrete, Joy (CPC)
Sent: Tuesday, January 19, 2016 4:48 PM
To: BOS Legislation, (BOS); BOS-Legislative Aides; BOS-Supervisors; Carroll, John (BOS)
Cc: Rodgers, AnMarie (CPC); Calvillo, Angela (BOS); Jones, Sarah (CPC); Espiritu, Christopher (CPC); Wise, Viktoriya (MTA); Willson, Hank (MTA); Pearson, Audrey (CAT)
Subject: BOS File No. 151269 SFMTA Commuter Shuttle Program Appeal
Attachments: Appeal Response - SFMTA - Commuter Shuttle Program.pdf; Attachment A-C.pdf; Commuter Shuttle Final AQTR 101315 (FINAL) (2).pdf

Categories: 151269

TO: Angela Calvillo, Clerk of the Board
FROM: Sarah B. Jones, Environmental Review Officer, Planning Department
RE: BOS File No. 151269 [Planning Case No. 2015-007975ENV]
Appeal of the Categorical Exemption for SFMTA – Commuter Shuttle Program
HEARING DATE: January 26, 2016
Attached is a copy of the Planning Department's memorandum to the Board of Supervisors regarding the appeal of the categorical exemption for SFMTA – Commuter Shuttle Program. We have also emailed copies of the memorandum to the project sponsor (cc'ed) and appellant.
If you have any questions regarding this matter, please contact Christopher Espiritu at (415) 575-9022 or Christopher.Espiritu@sfgov.org.
Thank you.

Joy Navarrete, Senior Environmental Planner
San Francisco Planning Department
1650 Mission Street, Suite 400
San Francisco, CA 94103
P. 415-575-9040 F. 415-558-6409
www.sfplanning.org

SAN FRANCISCO
PLANNING DEPARTMENT

MEMO

1650 Mission St.
Suite 400
San Francisco,
CA 94103-2479

Reception:
415.558.6378

Fax:
415.558.6409

Planning
Information:
415.558.6377

Categorical Exemption Appeal

SFMTA – Commuter Shuttle Program

DATE:	January 19, 2016
TO:	Angela Calvillo, Clerk of the Board of Supervisors
FROM:	Sarah B. Jones, Environmental Review Officer – (415) 558-9048 Christopher Espiritu – (415) 575-9022
RE:	Planning Case No. 2015-007975ENV Appeal of Categorical Exemption for SFMTA – Commuter Shuttle Program
HEARING DATE:	January 26, 2016
ATTACHMENTS:	A – CEQA Categorical Exemption Determination B – SFMTA Resolution No. 15-161 C – Appeal Letters

PROJECT SPONSOR:	Hank Willson, Principal Analyst, San Francisco Municipal Transportation Agency (SFMTA), (415) 701-5041
APPELLANT:	Coalition for Fair, Legal and Environmental Transit, Service Employees International Union Local 1021, Sue Vaughan, and Robert Planthold

INTRODUCTION

This memorandum and the attached documents are a response to the letters of appeal to the Board of Supervisors (the "Board") regarding the Planning Department's (the "Department") issuance of a Categorical Exemption under the California Environmental Quality Act ("CEQA Determination") for the proposed SFMTA – Commuter Shuttle Program (the "Project" or "Program"). The appeal letter was received on December 17, 2015 with a supplemental appeal letter submitted on January 14, 2016.

The Department, pursuant to Title 14 of the CEQA Guidelines, issued a Categorical Exemption for the Project on October 22, 2015 finding that the proposed Project is exempt from the California Environmental Quality Act (CEQA) as a Class 1 and Class 8 categorical exemption.

The decision before the Board is whether to uphold the Department's decision to issue a categorical exemption and deny the appeal, or to overturn the Department's decision to issue a categorical exemption and return the project to the Department staff for additional environmental review.

PROJECT DESCRIPTION

The SFMTA proposes to implement a Commuter Shuttle Program which would regulate commuter shuttle activity on San Francisco streets. The Program would continue and amend the guidelines and requirements established under the 18-month Commuter Shuttle Pilot Program ("Pilot") implemented between August 2014 and January 2016. The Project involves the issuance of permits to eligible commuter shuttle operators for the use of public curb space, including designated passenger loading zones and bus stops. In addition, the Project would include minor capital improvements, such as transit boarding islands and curb extensions (bulb-outs).

Based on information collected during the Pilot, the SFMTA proposes to continue the Commuter Shuttle Program subsequent to the conclusion of the 18-month Pilot (February 2016), although with several amendments to the regulations. Similar to the Pilot, the proposed Commuter Shuttle Program would apply to privately operated transportation services that move commuters to, from, and within San Francisco. Participation in the Program is on a voluntary basis. The Commuter Shuttle Program would, at the outset, utilize the shuttle zone network in place at the conclusion of the Pilot.

The Pilot shuttle zone network is the SFMTA's best estimate of an effective zone network at the time of the Commuter Shuttle Program's launch. As further described below, the shuttle zone network would be amended as necessary to best meet the transportation needs of the City overall. Under the Program, SFMTA would maintain the ability to receive feedback about stop locations and would continue to consider changes to the shuttle network. Any proposed changes to the stops and the overall shuttle network would require public comment and testimony, prior to approval, at an engineering hearing and/or by the SFMTA Board of Directors. Both of these venues are open to the public and include a public comment/testimony component.

The Program would be a mechanism by which the SFMTA can regulate the travel routes and stops of commuter shuttles in San Francisco. As part of the Commuter Shuttle Program, the SFMTA would continue to designate, and indicate with appropriate signage or markings, select Muni zones and passenger loading zones for commuter shuttle use. Of the 125 combined stops/zones (88 Muni zones and 37 passenger loading zones) that exist today under the Pilot, all 125 stops/zones would remain under the Commuter Shuttle Program. However, as described below, large shuttle vehicles (over 35 feet in length) would be limited to certain stop locations.

In contrast with the Pilot, under the Commuter Shuttle Program, permitted shuttle vehicles longer than 35 feet would be required to limit travel to major and minor arterial street networks as determined by the California Department of Transportation (Caltrans). As noted by SFMTA staff, this additional requirement was included in order to address the most frequent comment from members of the public about the Pilot, and it also ensures that large buses use the street network that was best designed to handle larger vehicles. Attachment B shows a map of major and minor arterial streets where large shuttle vehicles may operate under the Program. In general, large shuttle vehicles would be required to operate on major and minor arterial street networks and avoid steep and/or narrow streets whenever possible. Permitted shuttles would be required to comply with all relevant street and lane restrictions, or would be subject to penalties, including permit revocation.

Similar to shuttle operations during the Pilot, approximately 90% of shuttle operations are assumed to occur during peak hours 6am-10am and 4pm-8pm, with the remaining 10% occurring over off-peak hours

5am-6am, 10am-4pm, and 8pm-12am. In addition, the project would continue and expand the operating guidelines for commuter shuttles established by the Pilot, which must be met in order to receive a permit to participate in the Commuter Shuttle Program.

BACKGROUND

On June 22, 2015, Hank Willson, Principal Planner with the SFMTA (hereinafter "Project Sponsor") filed an application with the Planning Department (hereinafter "Department") for a determination under CEQA of the proposed Commuter Shuttle Program which would continue and expand the guidelines and requirements established under the Commuter Shuttle Pilot Program.

On October 22, 2015, the Department determined that the Project was categorically exempt under CEQA Class 1 – Existing Facilities and Class 8 – Actions by Regulatory Agencies for Protection of the Environment, and that no further environmental review was required.

On November 17, 2015, the SFMTA Board of Directors (hereinafter the "SFMTA Board") conducted a duly noticed public hearing at a regularly scheduled meeting. The SFMTA Board adopted the Commuter Shuttle Program and amended Transportation Code, Division II, to establish a program to issue permits to eligible commuter shuttle providers to use designated Muni zones for the purpose of loading or unloading passengers, and to impose other permit conditions.

On December 17, 2015, an appeal of the Categorical Exemption Determination was filed by the Coalition for Fair, Legal and Environmental Transit, Service Employees International Union Local 1021, Sue Vaughan, and Robert Planthold ("Appellants").

On December 21, 2015, in a letter to the Clerk of the Board of Supervisors, the Environmental Review Officer found that the appeal of the Categorical Exemption Determination was timely, because an approval action (Resolution No. 15-161 approved by the SFMTA Board on November 17, 2015) had been taken for the project.

On January 14, 2016, in a letter to the Board of Supervisors, a supplemental appeal letter was issued by the Appellants.

CEQA GUIDELINES

Categorical Exemptions

Section 21084 of the California Public Resources Code requires that the CEQA Guidelines identify a list of classes of projects that have been determined not to have a significant effect on the environment and are exempt from further environmental review.

In response to that mandate, the State Secretary of Resources found that certain classes of projects, which are listed in CEQA Guidelines Sections 15301 through 15333, do not have a significant impact on the environment, and therefore are categorically exempt from the requirement for the preparation of further environmental review.

CEQA State Guidelines Section 15301, or Class 1, consists of minor alterations to existing highways and streets, sidewalks, gutters, bicycle and pedestrian trails, and similar facilities. The Project would include minor modifications to existing streets to establish new commuter shuttle stops, as well as the installation of minor improvements such as signage, traffic islands, and bus bulbs.

CEQA State Guidelines Section 15308, or Class 8, consists of actions taken by regulatory agencies, as authorized by state or local ordinance, to assure the maintenance, restoration, enhancement, or protection of the environment where the regulatory process involves procedures for protection of the environment. The proposed Project would include implementation of the Commuter Shuttle Program, which issues permits to eligible commuter shuttle providers meeting specific requirements and terms (including requirements related to emissions) and would allow the use of designated public curb space. The Program provides procedures intended to regulate operation of commuter shuttles, enable vehicle trip reduction, and minimize impacts to users of other transportation modes in San Francisco. As such, it constitutes actions by SFMTA meant to enhance and protect the environment involving regulatory procedures for shuttle activity.

In determining the significance of environmental effects caused by a project, CEQA State Guidelines Section 15064(f) states that the decision as to whether a project may have one or more significant effects shall be based on substantial evidence in the record of the lead agency. CEQA State Guidelines 15604(f)(5) offers the following guidance: "Argument, speculation, unsubstantiated opinion or narrative, or evidence that is clearly inaccurate or erroneous, or evidence that is not credible, shall not constitute substantial evidence. Substantial evidence shall include facts, reasonable assumption predicated upon facts, and expert opinion supported by facts."

APPELLANT ISSUES AND PLANNING DEPARTMENT RESPONSES

The concerns raised in the December 17, 2015 appeal letter and January 14, 2016 supplemental appeal letter are cited below and are followed by the Department's responses.

Issue 1: The Shuttle Project will have significant adverse environmental impacts on pedestrians, bicycle safety and air quality. The Appellants state that the Project would cause environmental impacts and that "appellants live within areas of displacement, traffic, air quality, bicycle and pedestrian safety impacts and other impacts of the Shuttle Project, and regularly use public thoroughfares and public transportation in areas that will be impacted by the Shuttle Project."

Response 1: The Project would not result in air quality, transportation, bicycle, and pedestrian impacts, and other impacts, including population impacts (displacement): See Responses 4-6 regarding air quality, below. As noted in the project description above, the Project would allow permitted commuter shuttle providers to use certain Muni stops and other loading zones for passenger loading and unloading. There are approximately 125 locations throughout the City that the shuttle providers use, many of which are Muni bus stops. As of October 2015, 17 commuter shuttle providers have been approved to participate in the program with approximately 8,500 boardings per day, mostly during morning and evening peak hours. As noted in the categorical exemption determination, commuter shuttles represent a relatively small percentage (under 10%) of overall traffic even at the intersections used most frequently.

The Appellant states that the Project will have significant impacts related to pedestrian and bicycle safety because during the Pilot, buses were observed to block bike lanes and more than 1,200 citations were issued mostly for double parking. Occasional blocked bicycle lanes and issuance of citations is not evidence of a significant environmental impact. As stated in the project description, the purpose of regulating the shuttles (and the increased PCO enforcement that would be funded in the Program) is to reduce conflicts observed in the absence of adequate regulation both prior to the Pilot and, to a lesser extent, during the Pilot period. The concerns raised by the appellant are effects of the shuttle buses, not of the proposed program to regulate and manage the shuttles in order to reduce these occasional conflicts. The Categorical Exemption concludes that the proposed program involving regulation of shuttle activity and capital improvements to better manage shuttles within the street network would not result in significant impacts.

The Department's Initial Study Checklist, which is based on Appendix G of the CEQA Guidelines, indicates that assessments of significant impacts on transportation and circulation should consider whether the Project would: a) conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system; b) conflict with an applicable congestion management program; c) result in a change in air traffic patterns; d) substantially increase hazards due to a design feature; e) result in inadequate emergency access; or f) conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities. As part of the Project, commuter shuttles are required to avoid using non-arterial streets, which would reduce the number of shuttle vehicles currently using on smaller non-arterial streets. The increase in shuttle activity would be relatively minor, compared to the overall peak hour traffic volumes, and therefore would not substantially degrade traffic operations and would not have a significant impact on traffic operations at arterial roadways. The minor capital improvements included in the proposed project would not materially change the existing physical environment nor would they result in new transportation impacts. Additionally, the proposed regulatory framework would allow the agency to continue to minimize conflicts through, among other avenues, enforcement and direct communication with shuttle providers. Without the Program, the SFMTA ability to regulate commuter shuttles would be limited and ad-hoc. Hence, the Program is intended to protect the environment.

As for Appellants concerns regarding displacement, CEQA Guidelines Section 15064(e) states that "economic and social changes resulting from a project shall not be treated as significant effects on the environment. Economic or social changes may be used, however, to determine that a physical change shall be regarded as a significant effect on the environment. Where a physical change is caused by economic or social effects of a project, the physical change may be regarded as a significant effect in the same manner as any other physical change resulting from the project. Alternatively, economic and social effects of a physical change may be used to determine that the physical change is a significant effect on the environment. If the physical change causes adverse economic or social effects on people, those adverse effects may be used as a factor in determining whether the physical change is significant." Issues related to the cost of housing are socioeconomic rather than physical and are relevant to CEQA only inasmuch as they are connected to physical environmental impacts. Under CEQA, a project may have a significant impact if it will displace substantial numbers of people, necessitating the construction of replacement housing elsewhere. The Program would not result in elimination of any housing units. Any physical impacts associated with increased housing costs due to the Program would be related to the construction of replacement housing for displaced residents, or increased trip lengths and emissions for displaced residents. However, there is no demonstrable evidence of physical displacement of individuals from housing units attributable to commuter shuttles, and if such displacement were to occur as a result of the proposed program, it would be speculative to assess where such individuals would relocate and what their travel behavior would entail. Because there is no demonstrated causative link between commuter shuttle use and housing demand or price, and there is no foreseeable displacement associated with the proposed Program, analysis of any such impacts would be speculative with regard to their scale and nature.

As defined by CEQA Guidelines Section 15384, "substantial evidence" means enough relevant information and reasonable inferences from this information that a fair argument can be made to support a conclusion, even though other conclusions might also be reached. The Appellants' claim that the Project would result in impacts related to displacement, air pollution, pedestrian and bicycle safety, public transportation impacts, and other impacts, is not supported by substantial evidence. Speculation and argument does not constitute evidence that a significant effect on the environment could occur. Therefore, the Project is appropriately exempt from environmental review, and no further environmental review is warranted.

Issue 2: The Shuttle Program is not eligible for the Class 1 and Class 8 exemption because it fails to assure protection of the environment under the Class 8 exemption and would have significant impacts. The Appellants claim that the Class 8 exemption is inapplicable to the Shuttle Project for three reasons: 1) the Shuttle Project will not assure protection of the environment; 2) the Project has significant adverse environmental impacts that preclude reliance on the Class 8 exemptions; and 3) the project relaxes standards set in the State Vehicle Code which will result in environmental degradation including impacts to local air quality, and pedestrian and bicycle safety.

Response 2: As stated in the project description, the Program would, on balance, result in protection of the environment by 1) regulating the shuttle bus activity to improve the operation of city streets, as compared to unregulated shuttle activity; and 2) requiring cleaner vehicles.

The Class 8 or section 15308 categorical exemption which "consists of actions taken by regulatory agencies, as authorized by state or local ordinance, to assure the maintenance, restoration, enhancement, or protection of the environment where the regulatory process involves procedures for protection of the environment." Because a categorical exemption is premised on a finding that the class of projects does not have a significant effect on the environment, an agency's finding that a particular proposed project comes within one of the exempt classes necessarily includes an implied finding that the project has no significant effect on the environment. An agency's categorical exemption determination will be affirmed if supported by substantial evidence that the project fell within the exempt category of projects.

As recognized by the San Francisco Department on the Environment's Policy Committee in their January 13, 2014 Resolution in Support of San Francisco Municipal Transportation Authority Commuter Shuttle Policy and Pilot Program, commuter shuttles are one mechanism by which San Francisco can achieve its greenhouse gas and sustainable transportation goals.[1] Based on the level of use of commuter shuttles (approximately 8,500 daily round trips) and the attendant reduction of single-occupant vehicle trips, there is evidence to support the conclusion that commuter shuttles benefit the environment. However, unregulated shuttle operations occasionally resulted in conflicts with pedestrians, bicycles, and MUNI vehicles. The proposed Program would result in further protection of the environment by reducing such conflicts, and, additionally protect the environment by requiring newer, and therefore cleaner, buses. Because of these environmental benefits, the Planning Department concluded that the Program would constitute actions taken by a regulatory agency to assure protection of the environment, and was authorized the Class 8 exemption.

The Class 8 exemption class does not exclude or eliminate from consideration regulatory programs that could result in *any* environmental impact. CEQA considers a wide range of types of physical environmental impacts, and efforts to bring about overall improvement of some types of environmental conditions could result in minor, insignificant impacts to other conditions. Such impacts would not disqualify a project from receiving an exemption under Class 8, and no such disqualification is stated in CEQA. Instead, as with all exemptions, the Planning Department conducted an analysis to determine whether there were unusual circumstances surrounding the project that would result in significant impacts. The exemption issued for the Program considered the potential for environmental impacts that would result from the Program as proposed, and concluded that there would not be any significant impacts and therefore the Program was exempt under Class 8, and the proposed capital improvements exempt under Class 1.

San Francisco's "Plastic Bag Ban" ordinance, adopted in 2012 also qualified for a Class 8 exemption. The Plastic Bag Ban exemption determination recognized that a ban on single-use plastic bags could result in environmental impacts associated with the production and distribution of paper bags, but concluded that a) the program constituted a regulatory program to assure protection of the environment, and b) the program would not result in demonstrable significant impacts. The Plastic Bag Ban exemption was upheld by the California Court of Appeal in December 2013 (*Save the Plastic Bag Coalition v. City and County of San Francisco et al.*, case number A137056,). When the Department finds, based on substantial evidence, that an actions taken by regulatory agencies to assure the maintenance, restoration, enhancement or protection of the environment where the regulatory process involves procedures for protection of the environment, a determination that the project is categorically exempt from CEQA under Class 8 is appropriate. The Appellants have not brought forth substantial evidence to refute this determination.

[1] http://sfenvironment.org/policy/support-of-san-francisco-municipal-transportation-authority-commuter-shuttle-policy-and-pilot-program, accessed January 19, 2016.

The Appellant also claims that the Program would have significant impacts, which themselves constitute "unusual circumstances" that preclude the use of a categorical exemption. The Department's exemption concluded that there were no unusual circumstances, such that the Program was not a project contemplated by the exemptions. The categorical exemption determination considers the possibility of significant impacts from the proposed Program and associated capital improvements, and concludes that the impacts of regulating the shuttle buses as proposed would not be significant. The issues that the Appellant has raised to support a conclusion that there would be significant impacts, such as the double parking and blocking of bicycle lanes by shuttles, illustrates a need for greater regulation of shuttles as proposed in the Program. These occasional conflicts are not due to the Program, and would not be avoided absent the Program. The Appellants' argument that the Program would result in significant impacts which therefore constitute unusual circumstances is not supported by evidence or logic.

Issue 3: The Shuttle project relaxes standards set forth in the State Vehicle Code, and as a result, causes significant adverse impacts to pedestrians, bicycle safety and public transit. The Appellants state that the Shuttle Project conflicts with the California Vehicle Code, which prohibits private shuttle buses from stopping in Muni zones. As a result, the Project relaxes state standards and causes adverse impacts to pedestrian safety, bicycle safety and public transit. Further, the Vehicle Code preempts the Shuttle Program

Response 3: The Program does not relax standards allowing environmental degradation. The Class 8 exemption does not include the relaxation of standards allowing environmental degradation. The Program, which regulates the operation, loading and unloading of commuter shuttles, and allows permitted commuter shuttles to load and unload in designated Muni zones does not relax standards, nor would the Program allow for the degradation of the environment. As noted in Response 2, the Program is a regulatory process that would enhance and protect the environment, by allowing the continued use of commuter shuttles, which results in the reduction of vehicle trips (the main sources of air quality impacts) and by requiring permitted shuttles to be year 2012 or newer, which results in fewer emissions than otherwise would be expected with unregulated shuttle activity. Further, the regulation of shuttles would reduce conflicts between shuttles and pedestrians or bicycles, therefore enhancing pedestrian and bicycle safety.

Whether the Vehicle Code preempts the SFMTA from allowing permitted shuttles to stop in Muni zones is not an issue under CEQA. The Planning Department appropriately considered the Program as proposed by SFMTA.

Issue 4: The Appellant states that the Project would result in significant impacts related to air quality, particularly health risk, due to lack of accounting for growth from the Commuter Shuttle Program. "First, the analysis fails to account for the 41% growth in participating shuttles that is anticipated by the City under the Shuttle Project."(Appeal, p. 10) "This increase in participation in the Program will result in a growth in the number of shuttles within San Francisco and will result in an increase in emissions from the shuttles. By failing to account for the health effects of DPM emissions from 41 percent more shuttles within the City, the health risk is greatly underestimated." (SWAPE Comment, p. 2)

Response 4: The Project would not result in significant impacts related to air quality and the air quality analysis did account for growth from the Commuter Shuttle Program. An Air Quality Technical Report[2] was prepared that included an analysis of the regional (criteria air pollutants) and local (health risk) impacts of the Program. The assumptions regarding growth from the Program for these two analyses were different, as explained below and in the exemption and Air Quality Technical Report.

There are two aspects of air quality analysis relevant to the Program. The first is regional air quality, comparing the emissions from trips completed in shuttle buses to the emissions from trips completed in single-occupant cars. The second is the local air quality at shuttle stop locations in San Francisco. With regard to regional air quality, as part of the Program, regional criteria air pollutant emissions may increase from the increase in potential commuter shuttle activity within San Francisco and destinations in the Bay Area. The air quality analysis assumed an increase in the number of commuter shuttle permits (i.e., vehicle placards). An increase in vehicle placards indicates an unmet demand for additional commuter shuttles from local and regional employers and their workers both within San Francisco and destinations in the Bay Area. In other words, a commuter shuttle operator would ostensibly not expand their fleet and obtain a new vehicle placard unless a demand for additional travel could not be met by existing commuter shuttles with vehicle placards.

The number of vehicle placards increased 19 percent during the Pilot program. There is no way to ascertain with certainty what growth would occur in the future. Demand for shuttles is driven by addition of employees at destination companies and their individual decisions. The analysis made a conservative assumption that the same level of growth in demand would occur under the Program (i.e. the number of vehicle placards would increase another 19 percent), and the overall growth in vehicle placards would be 41 percent over pre-Pilot operations.[3] This is a conservative assumption, as the Pilot occurred during a period of rapid growth in employment and economic activity (according to the San Francisco Controller's Office San Francisco Business Tax reform Annual Report 2015), and it is reasonable to assume that most companies or employers who provide shuttles have already taken advantage of the initial period of regulation (i.e they received permits under the Pilot). The criteria air pollutant emissions were quantified assuming a 41 percent growth in shuttle activity. Results show that the Program would result in a decrease in reactive organic gases (ROG) and particulate matter (both PM_{10} and $PM_{2.5}$) emissions of 0.26, 0.05, and 0.05 tons per year, respectively, and an increase in NOx by 6.6 tons per year. The increase in NOx, however, would be 34 percent below the threshold of significance of 10 tons per year. Therefore, as described, contrary to Appellants assertions, the regional criteria air pollutant analysis did account for growth from the Program.

While a portion of the observed increase in vehicle placards may represent unmet demand, it may also be a result of more shuttle providers participating in the program as the Pilot program became formalized. Additionally, while the number of vehicle placards would increase, not every shuttle that has a vehicle

[2] Ramboll Environ, Final Air Quality Technical Report, SFMTA Commuter Shuttle Program, October 13, 2015.
[3] During pre-Pilot conditions, a total of 593 vehicle placard requests were requested to the SFMTA. During the Pilot, the total number of vehicle placard requests rose to 703, or a 19 percent increase from pre-Pilot conditions. Assuming vehicle placards could increase by 19 percent from during Pilot (703) to Program (833), overall growth from pre-Pilot to Program (833) is 41 percent.

placards is used every day so the number of shuttles on the road at any given time would be fewer than the number of vehicle placards issued. Therefore, by assuming the same growth in demand with the Program (where the number of shuttle permits would increase another 19 percent), the overall growth in commuter shuttle permits would be 41 percent and is a conservative estimate of the increase in shuttle activity expected to occur daily.

As stated above, the second aspect of the air quality analysis considered local air quality at shuttle stops. Shuttle buses loading and unloading passenger could expose "sensitive receptors" (such as residents or students) to increased emissions at existing stops as a result of the increased numbers of shuttles. In addition, sensitive receptors that are currently not exposed to emissions from commuter shuttle stop-events could be exposed in the future if new stops are added as part of the Program. Thus, a localized health risk assessment was conducted to assess the excess cancer risk and particulate matter ($PM_{2.5}$) concentrations from the Program. The health risk effects from stop-events were analyzed because stop-events result in localized health effects due to the vehicle stopping, dwelling and idling to pick up and drop off passengers, and vehicular acceleration at a specific, fixed location. The health risk assessment assumes a percentage increase in stop-events.

The analysis assumes a 29 percent increase in stop-events, which was the observed stop event increase during the 13 months between June 2014 and July 2015 (pre-Pilot and during the Pilot). This number of events is different than the increase in vehicle placards because while each vehicle makes multiple stops, each vehicle does not stop at every stop location within the network and not all vehicles with vehicle placards are on the road at any given time. Assuming the same growth in stop-events with the Program, a 29 percent increase in stop events was applied to the number of stop-events observed during the Pilot at four high volume local impact zones. Again, this is a conservative assumption that would require that demand for shuttles continue to increase at the pace it occurred during a high-growth period, and none of the demand would be accommodated by existing shuttle vehicles. The 29 percent increase also reflects the proposed limitation of longer vehicles to arterial streets, since the increase in stop-event growth at any given location during the Pilot was occurring from some stop consolidation. Of the four zones considered, two were in locations in the city that experience higher levels of air pollution and where the City's air pollution exposure standards are more restrictive than the other two locations. In this way, the analysis captured the worst case scenario of the addition of emissions from a large number of stop events in each type of setting.

The modeling assumed that no shuttles currently stop at the four local impact zones in order to assess potential impacts from locating a new stop anywhere in the City. This represents a conservative analysis for some locations, because with or without the Program the shuttles stop at various locations throughout the City. However, this conservative approach allows for disclosure of air quality effects that occur currently at some locations, and provides information about health effects that could occur in the future if and/or when a new stop location is created. If a new stop location was created, or an existing stop location with minimal stop-events was to have a substantial increase in the number of stop-events, the analysis reasonably accounts for the health risk from new or increased stop-events at these locations.

Issue 5: The Appellant states that the Project would result in significant impacts related to air quality due to travel limitations for Commuter Shuttles longer than 35 feet on non-arterial streets and increased stop-events on arterial streets. "Second, the analysis failed to account for the increased stop-events that will occur because of the requirement that limits permitted shuttles longer than 35 feet to arterial streets." (Appeal, p. 10) "The Project, unlike the Pilot Program, will limit permitted shuttles longer than 35 feet to travel only on designated major and minor arterial streets (Certificate of Exemption, p.5). As a result, arterial streets will have increased shuttle activity and will experience an increase in stop-events due to travel limitations of large buses." (SWAPE Comment, p. 3) "...the Certificate of Exemption that states, "Under the Pilot, the most frequently used zones were observed to have as many as 100 shuttle stop-events per day..." (p. 5). These locations include Lombard Street, Van Ness Avenue, Divisadero/Castro Streets, Valencia Street, Union/Powell Streets in North Beach, 24th/25th Streets in the Mission/Noe Valley, 30th Street in Noe Valley, and Townsend/Fourth Street near the Caltrain station (p. 5). If any of these locations are already experiencing stops as high as 100 per day, restricting all current and future large buses to arterial streets will just increase the number of stops per day to much higher than 100 per day as well as increase traffic and congestions within the streets. Emissions from buses in traffic, in which the buses are continuously running for an extended period of time, combined with emission from the increased number of buses will result in an overall increase in emissions." (SWAPE Comment, p. 4)

Response 5: The 29 percent growth in stop-events reflects stop location consolidation that may occur through the Program's requirement to limit shuttles to arterial streets. The air quality analysis assumes a 29 percent growth in stop-events based on an observed stop event increase during the 13 months between June 2014 and July 2015. During this time, the SFMTA was consolidating stop locations the SFMTA formalized the Pilot program network. Therefore, contrary to Appellants assertions, the 29 percent growth in stop-events does reflect some stop location consolidation similar to that which may occur through the Program's requirement to limit shuttles to arterial streets. Assuming the same growth in stop-events with the Program, a 29 percent increase in stop-events was applied to the Pilot at four high volume local impact zones. Therefore, the localized health risk analysis did account for the consolidation of stop locations.

Issue 6: The Appellant states that the Project would result in significant impacts related to air quality because the Program does not limit the amount of Commuter Shuttles that can be permitted as part of the Permanent Program. "Finally, the analysis is flawed because there is no evidence that supports the City's estimate that the Project growth will be limited to 41%, when the Project allows for unlimited growth in shuttles, stop locations, and stop-events. The diesel emissions from commuter shuttles 'will most likely be much higher than anticipated and result in an increased health risk, potentially above the level of significance.'" (Appeal, p. 10) "...if the program is continued without a limitation on the number of buses, the growth could potentially be much greater than the assumed 41 percent. This scenario would then result in an unknown increase of emissions, much greater than what has been calculated. Because there is a potential for the Project to grow and put an unlimited number of shuttle buses within the City, the increased DPM emissions from the buses will most likely be much higher than anticipated and result in an increased health risk, potentially above the level of significance." (SWAPE, p. 2)

Response 6: Appellant has not provided substantial evidence to support that the Program would result in increased stop-event in excess of the growth assumptions assumed in the analysis nor do they provide substantial evidence that a greater amount of stop-events than that assumed would lead to significant air quality impacts. As discussed in Response 4, a 41 percent increase in vehicle placards was assumed in the analysis of regional criteria air pollutant emissions. The assumed 41 percent increase in vehicle placards is conservative (i.e., high) because this figure includes the initial demand for vehicle placards resulting from the formalization of the Pilot, during a period of sustained economic growth. Additionally, while the number of vehicle placards would increase, not every shuttle that has a vehicle placards is used every day, thus the number of shuttles on the road at any given time would be fewer than the number of vehicle placards issued. Therefore, the 41 percent increase in vehicle placards is reasonable, and a conservative estimate of anticipated shuttle activity expected to occur daily..

The Air Quality Technical Report modeled stops at Van Ness Avenue and Union Street (which had one of the highest number of stop-events observed in the system) under the Program with 116 stop-events (existing stop-events observed plus a 29 percent increase) per day at one stop location and 169 stop-events (existing stop-events observed plus a 29 percent increase) per day at the other stop location across Van Ness Avenue. Modeling results show that the collective 285 stop-events at Van Ness and Union Street would result in a health risk of 5.6 in a million which is 44 percent below the threshold of significance of 10 in a million. If these collective stop-events at Van Ness and Union were averaged over an 18-hour day (5am to 12am), a shuttle would have to stop almost every four minutes. In order for health risk to exceed the threshold of significance of 10 in a million, collective stop-events at Van Ness and Union would need to exceed 510 stop-events, an approximately 44 percent increase above the amount assumed in the analysis.[4] Averaging 510 stop-events over an 18-hour day would require stop-events approximately every two minutes. Another location that was modeled was Townsend Street and Fourth Street, which also had a relatively high number of stop events and is within . an area of the city that experiences higher levels of air pollution and have air pollution exposure standards that are more restrictive. Modeling of the 129 stop-events (existing stop-events observed plus a 29 percent increase) on the south side of Townsend Street near Fourth Street and 95 stop-events (existing stop-events observed plus a 29 percent increase) on northwest corner of Townsend Street and Fourth showed that the collective 224 stop-events would result in a health risk of 0.9 in a million which is 87 percent below the threshold of significance of 7 in a million.

CEQA requires analysis of reasonably probable and realistic scenarios. Based on the description above, an assumption of 29 percent growth on top of observed stop-events is conservative as a probable and realistic scenario. To assume higher growth would be exceeding the scope of a reasonably probable and realistic scenario. CEQA does not require lead agencies to engage in speculation to develop a "worst case" scenario. Furthermore, the Appellant has not provided substantial evidence to support that the Program would result in increased stop-event in excess of the growth assumptions assumed in the analysis nor do they provide substantial evidence that a greater amount of stop-events than that assumed would lead to significant air quality impacts.

[4] Ramboll Environ, Final Air Quality Technical Report, SFMTA Commuter Shuttle Program, Appendix E, October 13, 2015.

Issue 7: The City improperly relied on mitigation measures in finding the Shuttle Project exempt. In finding the Shuttle Project exempt, the City improperly relied on mitigation measures. The City's conclusion that the Project will not result in adverse impacts is founded on dozens of conditions that have been applied to mitigate and reduce the possibility of adverse environmental impacts.

Response 7: The Categorical Exemption Determination Included All Components of the Commuter Shuttle Program. CEQA Guidelines define a "project" as including "the whole of an action which has a potential for resulting in either a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment" (Guidelines, §15378, subd.(a)). A mitigation measure, by contrast, involves "feasible changes in any or all activities involved in the project in order to substantially lessen or avoid significant impacts on the environment" (Id., §15041, subd.(a)). The program components listed by the Appellants are not mitigation measures, but instead are integral parts of the Program. .

The case, *Wollmer v. City of Berkeley* (2011) 193 Cal.App.4th 1329 (Wollmer), supports the Department's conclusion. In that case, the trial court denied a petition for a writ of mandate to block an affordable housing development in Berkeley. The *Wollmer* court affirmed that decision and upheld the city's determination that the project was categorically exempt under CEQA Guidelines section 15332. One aspect of that project, which was an integral part from its inception, was that its developers would dedicate land for a left turn lane on Ashby Avenue, thereby reducing traffic impacts to less than significant, a necessary condition for the [CEQA] exemption.

The *Wollmer* court rejected appellant's contention that the dedication of land for the left turn was a "mitigation measure," finding instead that the dedication of a five-foot right-of-way was "a component of the project that assisted the City with an existing traffic issue." The court reasoned that the traffic problem preexisted the proposed project and the dedication that improved that problem "became part of the project design—it was never a proposed mitigation measure."

Similarly, in *Save the Plastic Bag Coalition v. City and County of San Francisco* (2013) 222 Cal.App.4th 863 ("*Coalition*"), the Planning Department issued a Categorical Exemption under Classes 7 and 8. The *Coalition* argued that the 10-cent fee for providing a compostable or paper bag may not be taken into account in determining whether the categorical exemptions apply. According to the *Coalition*, that fee was a "mitigation measure," the potential effectiveness of which can only be evaluated as part of a comprehensive environmental review. The court rejected the Coalition's contention that this aspect of the project was a "mitigation measure." The 10-cent per bag fee aspect of the ordinance was, from the inception, "part of the project design" which directly addressed the problem of single-use bags, a problem that preexisted the proposed project. It was not a "mitigation measure" to try to alleviate some perceived difficulties in the original plan.

Just so here. Aspects that are included as part of the Commuter Shuttle Program that will enhance and protect the environment, including the fleet turnover requirements, restrictions on stopping outside of major and minor arterial streets, idling limits, and minor roadway modifications that will improve vehicular, bicycle, and pedestrian safety, decrease conflicts between commuter shuttles and other transportation modes, and improve regional traffic congestion and air emissions, are integral parts of the

Program. The components address the concerns that emerged from unregulated and Pilot conditions (such as large buses on smaller streets, excess idling, and issues related to emissions) and were included to make the project best fit SFMTA's desire to manage commuter shuttles in a manner that accommodates all transportation modes and City residents; they do address significant impacts under CEQA.

San Francisco cannot prohibit shuttle activity on city streets, and the conflicts that occurred prior to the Pilot indicated to the City that regulation of shuttles was necessary. Indeed, by referring to the fundamental components included in the Program as a result of the positive outcomes of the Pilot as "mitigation," the Appellant acknowledges that the Program is a regulatory action to improve the environment - exactly the conclusion that the Department reached in issuing the Class 8 exemption.

Issue 8: The illegal operation of commuter shuttles cannot form a CEQA baseline. The Appellants contend that the illegal situation of "pilot shuttles" should not be the baseline for environmental review. It is not proper to include an activity that violates state law in the baseline, yet the City improperly uses the pre-pilot, illegal shuttle operations as the CEQA baseline. Every CEQA document must start from a "baseline" assumption.

Response 8: CEQA establishes that the baseline as the "existing physical condition." The physical condition that existed at the time of the analysis of the Program was a temporary condition authorized by the Pilot Program, until February 2016. Once the Pilot expires, SFMTA will not have an approved regulatory program for commuter shuttles. Analyzing the impacts of the Program compared to a temporary condition would not represent an accurate assessment of the whole of the project.

As stated in the Exemption, prior to the implementation of the Pilot, commuter shuttles operated on City streets without regulation. All vehicles are allowed to travel on City streets. The Pilot established a means to collect data and manage commuter shuttle activity beyond citing shuttle buses for infractions. However, the approval of the Pilot program only provided for an 18-month operational period, and is set to expire in February 2016.

The California Environmental Quality Act (CEQA) mandates that the potential physical changes to the environment resulting from a project be analyzed, as compared to the baseline ("on the ground") conditions existing at the time of the environmental review. Although the Pilot program was operational at the time the analysis occurred, the Pilot would not continue after February 2016 and therefore a comparison of the conditions under the proposed Program to the conditions under the Pilot would not reflect an accurate analysis.

Moreover, because the proposed Program is a refined and expanded version of the Pilot, analysis of current conditions (i.e., with the Pilot) as the baseline would understate the impacts of the proposed Program because it would only capture the "delta" between the Pilot and the Program. The physical changes resulting from the proposed Program would be minimal; for example, use of the Pilot as a baseline would not reflect the localized emissions resulting from the designation of permitted shuttle stops. The physical impacts of a permanent program were not assessed in the environmental review of the temporary program; for example, there was no justification for analyzing long-term air quality impacts for an 18-month program. Using conditions under the Pilot as the baseline would effectively constitute "piecemealing" of the program in a manner that minimized the impacts of each aspect of regulation. Therefore, for the purposes of the Exemption analysis, the pre-Pilot conditions represented the baseline existing conditions to provide the most conservative analysis, and because the Pilot is a temporary program.

The data collected during the Pilot period was used to inform the conclusions of the analysis, providing a reliable basis for understanding the impacts of the proposed Commuter Shuttle Program.

CONCLUSION

The Appellants have failed to establish that the City erred by concluding that the Shuttle Program was categorically exempt under Class 1 and Class 8; they have not provided evidence that the City was precluded from relying on a categorical exemption, nor have they squarely addressed or even fairly acknowledged the substantial evidence supporting the City's determinations under CEQA. Finally, the Appellants failed to carry its burden of establishing that the unusual circumstances exception to the CEQA categorical exemptions apply to the Commuter Shuttle Program.

For the reasons stated above and in the October 22, 2015 CEQA Categorical Exemption Determination, the CEQA Determination complies with the requirements of CEQA and the Project is appropriately exempt from environmental review pursuant to the cited exemptions. The Department therefore recommends that the Board uphold the CEQA Categorical Exemption Determination and deny the appeal of the CEQA Determination.

Attachment A

CEQA Categorical Exemption Determination

SAN FRANCISCO
PLANNING DEPARTMENT

Certificate of Determination
Exemption from Environmental Review

1650 Mission St.
Suite 400
San Francisco,
CA 94103-2479

Reception:
415.558.6378

Fax:
415.558.6409

Planning
Information:
415.558.6377

Case No.:	2015-007975ENV
Project Title:	SFMTA – Commuter Shuttle Program
Project Sponsor:	San Francisco Municipal Transportation Agency Hank Willson – (415) 701-5041
Staff Contact:	Christopher Espiritu – (415) 575-9022 christopher.espiritu@sfgov.org

PROJECT DESCRIPTION:

The San Francisco Municipal Transportation Agency (SFMTA) proposes to implement a Commuter Shuttle Program (herein referred to as "proposed project or proposed Program") which would regulate commuter shuttle activity on San Francisco streets. The proposed project would continue and expand the guidelines and requirements established for the 18-month, Commuter Shuttle Pilot Program (herein referred to as "Pilot") implemented between August 2014 and January 2016. The program would involve the issuance of permits to eligible commuter shuttle operators for the use of public curb space, including designated passenger loading zones and bus stops. In addition, the proposed project would include capital improvements, such as transit boarding islands and curb extensions (bulb-outs). The proposed project would require approval by the SFMTA Board of Directors.

EXEMPT STATUS:

Categorical Exemption, Class 1 and Class 8 (California Environmental Quality Act [CEQA] Guidelines Section 15301 and 15308). See page 25.

DETERMINATION:

I do hereby certify that the above determination has been made pursuant to State and local requirements.

Sarah B. Jones
Environmental Review Officer

October 22, 2015
Date

cc: Hank Willson, SFMTA, Project Sponsor
Viktoriya Wise, SFMTA

Distribution List
Board of Supervisors, All Districts, (via Clerk of the Board)
Virna Byrd, M.D.F.

BACKGROUND

The number of privately operated shuttles in San Francisco has grown in recent years. Numerous employers, educational institutions, medical facilities, office buildings, and transportation management associations offer shuttle service to their employees, students, and clients. Some development projects are required to provide shuttle services as part of their conditions of approval (and the impacts of their shuttle services are considered within the development project's environmental review), and an employer may comply with San Francisco's Commuter Benefits Ordinance and the Bay Area's Commuter Benefits Program by offering a free commute shuttle to employees. The majority of the commuter shuttles are closed systems that provide service to a specific population and are not open to the general public. Most shuttles are provided for free to employees (or students, tenants, etc.). There are two distinct markets within the shuttle sector: those that operate within San Francisco (intra-city) and those that operate between San Francisco and another county (inter-city regional). Shuttles support local San Francisco and regional goals by decreasing single occupancy vehicle (SOV) trips, vehicle miles traveled (VMT), and private vehicle ownership.

Prior to August 2014 and the implementation of the Pilot Program, San Francisco did not regulate commuter shuttle activity on City streets. Shuttles operated throughout the City on both large arterial streets, such as Van Ness Avenue and Mission Streets, and smaller residential streets. Shuttles loaded and unloaded passengers in a variety of zones, including passenger loading (white) zones, Muni bus stops (red) zones, and other vacant curb space. When curb space was unavailable, shuttles often would load or unload passengers within a travel lane. The lack of rules and guidelines for where and when loading and unloading activities were permitted, and the lack of vacant space in general, resulted in confusion for shuttle operators and neighborhood residents, inconsistent enforcement, and real and perceived conflicts with other transportation modes.

To address these issues, in January 2014, the SFMTA Board of Directors approved an 18-month Pilot to test sharing of designated Muni zones and establish permitted commuter shuttle-only passenger loading (white) zones for use by eligible commuter shuttles that paid a fee and received a permit containing the terms and conditions for use of the shared zones. The Pilot Program began in August 2014, and created a network of shared stops for use by Muni and commuter shuttle buses that applied to participate, and restricted parking for some hours of the day in certain locations to create passenger loading (white) zones exclusively for the use of permitted commuter shuttles.

Program Objectives

Prior to the implementation of the Pilot Program, commuter shuttles travelled on City streets with few constraints beyond legislated commercial vehicle or weight restrictions. The City's regulatory and enforcement capacity involved restrictions on commercial vehicles under San Francisco *Transportation Code*, Section 503, which restricted commercial passenger vehicles (with seating capacity of nine or more persons) from certain streets and areas of the City. In addition, Section 501 of the *Transportation Code* restricted the operation of a vehicle with gross weight in excess of 6,000 pounds on specific streets.

Beyond these restrictions, the SFMTA does not have the authority to prevent commuter shuttles from operating on a majority of non-weight-restricted streets throughout the City.[1]

Commuter shuttles, like most vehicles in San Francisco, generally are free to drive on San Francisco's streets. However, without a network of approved zones, private commuter shuttle operators have imperfect choices to make about where to load and unload passengers, as sufficient unregulated or vacant curb space is mostly unavailable. Commuter shuttles would have few options, including: stopping in the travel lane (adjacent to parked cars), which blocks through traffic and bicycles, presents safety hazards for riders boarding and alighting, and risks a parking citation; or stopping at a Muni stop, which enables safer curbside access, but in the absence of regulations governing shuttle operations can delay Muni and risks a parking citation. The objectives of the proposed Commuter Shuttle Program would include:

- Provide a safe environment for all street users in support of the SFMTA's Vision Zero policy to eliminate all traffic deaths
- Prevent service disruptions, including any related to labor relations issues
- Ensure that commuter shuttles do not adversely affect operations of public transportation in San Francisco
- Consistently and fairly apply and enforce any regulations/policies governing shuttle operations
- Work collaboratively with shuttle sector to refine policies and resolve concerns and conflicts
- Integrate commuter shuttles into the existing multi-modal transportation system
- Establish a program structure that meets current needs and has the potential to evolve as the sector grows and evolves
- Ensure more focused enforcement, ease of administration and on-going oversight

Commuter Shuttle Pilot Program (August 2014 to January 2016)

Prior to the Pilot, SFMTA could only estimate the number of commuter shuttles in operation, the location of stops, hours of shuttle operation, routes and other operational characteristics. The Pilot allowed SFMTA to collect data regarding the movement of, usage of, and reaction to commuter shuttles in San Francisco, and determine whether management of the commuter shuttles through shared stops, permits and payment of a permit fee could reduce conflicts and complaints. SFMTA used the data collected during the Pilot to evaluate the Pilot and design the proposed Commuter Shuttle Program

The Pilot applied to privately operated transportation services that move commuters to, from, and within San Francisco. Services that are arranged by an employer, building, or institution to provide transportation for home-to-work, work-to-home, last-mile to work, or work site to work site were eligible to participate in the Pilot. Exceptions for eligibility were defined during the implementation of the Pilot

[1] San Francisco Transportation Code, Article 500, Sections 501 and 503. Available at: http://library.amlegal.com/nxt/gateway.dll/California/ transportation/divisionii/article500sizeweightloadrestrictions. Accessed October 2015.

and would remain under the Commuter Shuttle Program. Services that replicate Muni routes or are not licensed by the California Public Utilities Commission were not eligible for the program.

Under the Pilot, the SFMTA established specific requirements for shuttle types and providers, and identified providers that were not eligible to participate, including:

- Tour buses, recreational buses, and long-distance interurban buses
- Party buses
- School buses
- On-call point-to-point services (airport shuttles, limousines, other on-demand transportation)
- Private individual-fare transportation (jitneys, ride-share or transportation network companies (TNCs))
- Vanpool vehicles

As of October 2015, 17 commuter shuttle operators have been approved to participate in the Pilot. Most commuter shuttle vehicles in the Pilot were either cutaway buses (buses/shuttles formed by a small- to medium- truck chassis attached to the cabin of a truck or van, also called "mini buses") or motor coaches (also called "over the road" coaches) of either 40 or 45 feet in length designed for transporting passengers on intercity trips. To implement the Pilot Program, the SFMTA designated, and marked with appropriate signage, approximately 100 Muni zones and approximately 20 limited-hours shuttle-only loading zones for participating shuttle providers to load and unload passengers. Commuter shuttle zones are indicated by signs and painted curbs (red curbs at Muni zones, and white curbs at loading zones). The Pilot Program did not include modifications to existing Muni transit routes and did not remove (or relocate) any existing Muni bus stops.

The Pilot did not dictate the routing of individual shuttles, however, all shuttle providers were required to comply with San Francisco's commercial vehicle, weight, and passenger restrictions for designated streets. Additionally, permitted commuter shuttles were encouraged, through outreach by SFMTA staff to the shuttle providers, to select routes that follow arterial streets and avoid residential streets.

Under the Pilot, modifications to the public right-of-way were required for the removal or restriction of a limited number of existing on-street parking spaces in order to extend the length of some Muni and shuttle-only loading zones. The addition of shuttle-only loading zones typically required the use of up to 100 feet of curb space for loading during certain hours. All changes to zone locations or lengths during the Pilot Program were submitted for public review and comment at SFMTA engineering hearings.

The Pilot Program shuttle zone network was established through consultation with shuttle operators, community groups, residents, and SFMTA transit service planning and traffic engineering staff. Attachment A shows a map of the shuttle network under the Pilot and locations of Muni zones and passenger loading (white) zones currently designated as shuttle-only loading zones under the Pilot. At the launch of the Pilot, there were 106 zones (14 passenger loading zones, 92 Muni zones). Over the course of the Pilot, the shuttle network was expanded to 125 zones (21 passenger loading zones and 104 shared Muni zones) with 41 stops that have been removed, added or adjusted due to a variety of reasons,

including: construction projects, network gaps in service, residential opposition, rescinded Muni stops, stop location requests from permit holders, and Muni Forward projects.

Under the Pilot, the most frequently used zones were observed to have as many as 100 shuttle stop-events per day, while some zones saw no stop-events at all. The corridors or locations with the most shuttle traffic in the Pilot include Lombard Street, Van Ness Avenue, Divisadero/Castro Streets, Valencia Street, Union/Powell Streets in North Beach, 24th/25th Streets in the Mission/Noe Valley, 30th Street in Noe Valley, and Townsend/Fourth Street near the Caltrain station.

Based on the data that SFMTA has been able to gather regarding operations of commuter shuttles, staff has learned that approximately 90% of shuttle operations occur during peak hours, 6am-10am and 4pm-8pm, with the remaining 10% occurring over off-peak hours 5am-6am, 10am-4pm, and 8pm-12am.[2]

COMMUTER SHUTTLE PROGRAM PROJECT DESCRIPTION

Based on information collected under the Pilot, the SFMTA proposes to establish the Commuter Shuttle Program subsequent to the conclusion of the 18-month Pilot (February 2016). Similar to the Pilot, the proposed Commuter Shuttle Program would apply to privately operated transportation services that move commuters to, from, and within San Francisco. The Commuter Shuttle Program would, at the outset, utilize the shuttle zone network in place at the conclusion of the Pilot.

The Pilot shuttle zone network is the SFMTA's best estimate of an effective zone network at the time of the Commuter Shuttle Program's launch. As further described below, the shuttle zone network would continue to evolve as necessary to best meet the transportation needs. Under the Program, SFMTA would receive consistent feedback from the community and consider changes to the shuttle network. Any proposed changes to the stops and the overall shuttle network would require public comment and testimony, prior to approval, at an engineering hearing and/or by the SFMTA Board of Directors. Both of these venues are open to the public and include a public comment/testimony component.

The program would be a mechanism by which the SFMTA can regulate the travel routes and stops of commuter shuttles in San Francisco. As part of the Commuter Shuttle Program, the SFMTA would continue to designate, and mark with appropriate signage, select Muni zones and passenger loading zones for commuter shuttle use. Of the 125 combined stops/zones (104 Muni zones and 21 passenger loading zones) that exist today under the Pilot, all 125 stops/zones would remain under the Commuter Shuttle Program.

In contrast with the Pilot, under the Commuter Shuttle Program, permitted shuttle vehicles longer than 35 feet would be required to limit travel to major and minor arterial street network as determined by the California Department of Transportation (Caltrans). This additional requirement was included to address the most frequent comment from members of the public about the Pilot, and it also ensures that large

[2] Information provided by Kathleen Phu, SFMTA, September 2015.

buses use the street network that was best designed to handle large vehicles. Attachment B shows a map of major and minor arterial streets where large shuttle vehicles may operate under the Program. In general, large shuttle vehicles would be required to operate on major and minor arterial street networks and avoid steep and/or narrow streets whenever possible. Permitted shuttles would be required to comply with all relevant street and lane restrictions.

Similar to the Pilot, approximately 90% of shuttle operations are assumed to occur during peak hours 6am-10am and 4pm-8pm, with the remaining 10% occurring over off-peak hours 5am-6am, 10am-4pm, and 8pm-12am.[3]

In addition to the stop locations and routes described above, program regulations would also include the following, in order for a shuttle provider to receive a permit:

1. Permittee vehicles (shuttles) must display a placard issued by SFMTA at specified location on the front and rear of vehicles at all times when operating commuter service in San Francisco.
2. Permittee must comply with operating guidelines:
    a. Muni priority: Muni buses have priority at and approaching or departing Designated Stops.
    b. Yield to Muni: Where Muni or other public transit buses are approaching a Designated Stop and when safe to do so, allow such buses to pass so they may stop at Designated Stops first.
    c. Stay within the network: Permittees shall stop only at Designated Stops or other non-Muni zones, and may not stop at Muni zones outside the network.
    d. Active loading; No staging or idling: Designated Stops may be used only for active loading and unloading; shuttles must load and unload riders as quickly and safely as possible. Staging must take place outside of any Designated Stops, consistent with parking regulations. Unnecessarily idling is not permitted, even while staging.
    e. Move forward: Shuttle drivers shall pull forward in a Designated Stop to leave room for Muni or other shuttles.
    f. Pull in: Shuttle drivers shall pull all the way to, and parallel with, the curb for passenger boarding and alighting; shuttle vehicles shall not block travel or bicycle lanes; loading and unloading shall not take place in a vehicle or bicycle lane, or in a manner that impedes travel in these lanes.
    g. Comply with all applicable traffic laws: Shuttles shall operate in accordance with all applicable state and local traffic laws.
    h. Circulation: Shuttle vehicles longer than 35 feet may travel only on the major and minor arterial street network as determined by the California Department of Transportation, as appears on the map of major and minor arterial streets attached as Attachment B. All shuttle vehicles shall stay on the major and minor arterial street networks and avoid

[3] Information provided by Kathleen Phu, SFMTA, September 2015.

steep and/or narrow streets to the extent possible. Permittees shall comply with all relevant street and lane restrictions.

i. Training: Permittees shall ensure that training for shuttle drivers addresses these operating guidelines.
j. Follow instructions from officials and traffic control devices: Shuttle drivers shall follow instructions from police officers, authorized SFMTA staff (including Parking Control Officers) and traffic control devices in the event of emergencies, construction work, special events, or other unusual traffic conditions.
k. Use of Designated Stops limited to permit-related activity. Shuttle vehicles that display a placard but are not making commuter shuttle-related trips may not use Designated Stops.

3. Permittee must comply with the San Francisco Board of Supervisors' March 2015 Labor Harmony Resolution by submitting a Service Disruption Prevention Plan that describes Permittee's efforts to ensure its efficient operations while avoiding any potential disruptions to SFMTA operations by addressing the principles and concerns set forth in such Resolution. Permittee must ensure its operations do not cause or contribute to any service disruptions. Failure to comply with this provision will result in denial or revocation of permits.
4. Permittee must certify that anyone who drives a shuttle in San Francisco has viewed the SFMTA's Large Vehicle Urban Driving Safety video, which can be accessed at https://youtu.be/_LbC3FQeZqc.
5. Permittee must indemnify SFMTA and the City of San Francisco for injuries or damage resulting from Permittee's use of Designated Stops, including associated bus shelters and other related sidewalk features.
6. Permittee vehicles must display a placard issued by SFMTA at specified location on the front and rear of vehicles at all times when operating commuter service in San Francisco.
7. Provide data feeds per SFMTA specifications, and demonstrate for each vehicle that data feeds are regular and accurate.
8. Pay permit fees. Any stop-events made by shuttle vehicles that are free for use by the public, and display the words "Free to the Public" on the loading side of the vehicle in letters at least four inches tall, are exempt from this permit fee requirement but are subject to all other permit terms.
9. Promptly pay any outstanding traffic citations.
10. Demonstrate compliance with all applicable regulatory requirements imposed by the CPUC, including registration/permitting, insurance, vehicle inspection requirements, and driver training.
11. All shuttle vehicles not already approved for use in the Pilot as of January 31, 2016 must be either model year 2012 or newer, or be equipped with a power source that complies with emissions standards applicable to the 2012 class of vehicle. As of January 1, 2020, all shuttle vehicles used by Permittees in the Commuter Shuttle Program must be model year 2012 or newer. After January 1, 2020, all shuttle vehicles used by Permittees in the Commuter Shuttle Program must be no more than eight model years old. SFMTA ensures compliance with this condition through the

annual permit renewal process, which requires submittal of vehicle registration and, in the case of vehicles older than model year 2012, documentation to show compliance with applicable emissions standards.

Capital Improvements

As part of the proposed Program, SFMTA would continue to designate and install appropriate signage on select Muni zones and passenger loading zones for shared Muni/commuter shuttle use. In addition, as appropriate, the Program would include the installation of several safety improvements to the existing right-of-way that would improve the stop network for both commuter shuttles and users of other modes, including: boarding islands, pedestrian bulbs, and bus bulbs.

These improvements, combined, would expand the sidewalk area for passengers waiting to board either Muni vehicles or commuter shuttles (depending on the location). Also, the addition of these improvements would enhance passenger loading and unloading activities by bringing Muni/shuttle passengers closer to buses, as well as reduce delays and potential conflicts from Muni vehicles and commuter shuttles re-entering the travel lane.

As listed in Table 1 below, SFMTA has identified the following capital improvements at existing stops/zones within the Pilot Program network. The locations listed below were selected by SFMTA, during the Pilot Program data collection, due to the level of activity at each location (number of shuttle stop events, Muni bus activity, and availability pedestrian/bicycle facilities). Further, as part of the Program, implementation and construction of the proposed capital improvements would be funded partially through the permit fees collected from shuttle providers through the Program.

Table 1. Capital Improvement Locations (Preliminary)

Locations	Potential Capital Improvement
8th/Market Muni zone/white zone SW corner	Boarding island
Arguello/Geary Muni zones (NW and SE corner)	Boarding islands
Valencia/25th Muni zone (SW corner)	Boarding island
7th/Market Muni zone (SW corner)	Boarding island (left-hand)
7th/Townsend Muni zone (NE corner)	Boarding island (left-hand)
O'Shaughnessy/Portola Muni zone (SW corner)	TSP
Castro/25th Muni zone (SE corner)	Bus bulb
Divisadero corridor (24 line)	TSP
Divisadero/California Muni zones (SW and NE corner)	Bus bulbs
Lombard/Pierce Muni zones (NW, SE corner)	Bus bulbs
Harrison corridor (8/27 lines)	TSP
Harrison/2nd Muni zone (NW corner)	Bus bulb
Harrison/4th Muni zone (NW corner)	Bus bulb
Harrison/7th Muni zone (NW corner)	Bus bulb
18th Street corridor (33 line)	TSP
Bryant corridor (27/47 lines)	TSP
Bryant/7th Muni zone (SE corner)	Bus bulb
North Point/Mason Muni zone (NW corner)	Bus bulb

Source: SFMTA, 2015

Project Approvals

The proposed project is subject to review by SFMTA staff and approval by the SFMTA Board of Directors. The Approval Action for the proposed project would be approved by the SFMTA Board of Directors, which would approve the Commuter Shuttle Program as well as proposed roadway improvements to be implemented or constructed on the public right-of-way. The Approval Action date establishes the start of the 30-day appeal period for this CEQA exemption determination pursuant to Section 31.04(h) of the San Francisco Administrative Code.

REMARKS:

Program Evaluation - Travel Survey

SFMTA conducted field data collection in June 2014, prior to the start of the Pilot Program to assess existing commuter shuttle activity on City streets, followed by a second field data collection effort in June 2015 to examine the effects of the Pilot Program on the transportation system, including effects on Muni operations and identify conflicts and other potential safety issues caused by commuter shuttle activity.

The 2015 field data collection effort observed commuter shuttle and Muni activity at 20 shuttle stop/zone locations including: 10 stops in the morning commute period (6:45-9:15am) and 10 stops in the evening

commute period (5:30-8:00pm). Field data was collected by SFMTA staff and included observations of stop activities at the selected locations, typically in 2 ½-hour increments.

In addition to data collection activities, SFMTA conducted an extensive evaluation of the Pilot and on October 5, 2015, the Commuter Shuttle Pilot Program Evaluation Report was published. As part of the evaluation, in June 2015, SFMTA distributed a survey to shuttle riders to determine the impact of shuttle availability on their transportation choices. According to survey results, 546 shuttle riders responded to the survey; 418 (77%) were intercity regional shuttle riders, while 128 (23%) rode intracity shuttles. This split of riders accurately represents the overall share of boardings for intercity (76%) and intracity shuttles (24%).

Shuttle riders are widely dispersed among neighborhoods in the City, though the top ten neighborhoods of origin are concentrated in the Mission and the northeastern quadrant of the city. The top ten neighborhoods house 55% of total survey respondents, while the remaining 45% of survey respondents are scattered across 56 other neighborhoods.

As shown in Table 2 below, the Evaluation Report found that 47% of shuttle riders said they would drive alone to work if a shuttle were not available, a finding that has allowed SFMTA to conclude that commuter shuttles do help accomplish local and regional objectives related to VMT reduction. Based on the survey data, availability of commuter shuttles influence the travel behavior for a substantial number of shuttle riders which results in the reduction of drive-alone trips. The survey also indicated that 29% of shuttle riders would use public transit in the absence of commuter shuttles, a finding that can inform SFMTA and regional transit providers' decisions regarding transit service to and from employment centers.

Table 2. Commuter Shuttle – Rider Survey

How would you get to work without the shuttle?	Riders	Percent of total
Drive alone	257	47.2%
Public transit	158	29.0%
Get a job closer to home	75	13.8%
Carpool	28	5.2%
Move closer to work	26	4.8%

Source: SFMTA, 2015

Program Evaluation - Shuttle Ridership

Shuttles participating in the Pilot program had approximately 356,997 boardings per month, or 17,000 on an average weekday. An estimated 270,252 of the monthly shuttle boardings were on intercity regional shuttle trips, and 86,745 were shuttle trips that began and ended in San Francisco. Assuming that most people boarded the shuttle twice in one day, this means that an average of 8,500 people ride a permitted shuttle each day. Further, shuttles load or unload an average of 5.7 people per stop-event among all designated shuttle zones and Muni/shuttle loading zones.

Approach to Analysis

Prior to the implementation of the Pilot, commuter shuttles operated on City streets with limited regulation. The Pilot established a means to collect data and manage commuter shuttle activity beyond citing shuttle buses for infractions. However, the approval of the Pilot program only provided for an 18-month operational period. No further regulation of the commuter shuttles is authorized beyond February 2016.

The California Environmental Quality Act (CEQA) mandates that the potential physical changes to the environment resulting from a project be analyzed, as compared to the baseline ("on the ground") conditions existing at the time of the environmental review. Although the Pilot program is operational at the time that this analysis has occurred, the Pilot would not continue after February 2016 and therefore a comparison of the conditions under the proposed Program to the conditions under the Pilot would not reflect an accurate analysis. Moreover, because the proposed Program is a refined and expanded version of the Pilot, analysis of current conditions (i.e., with the Pilot) as the baseline would understate the impacts of the proposed Program because the physical changes resulting from the proposed Program would be minimal; for example, use of the Pilot as a baseline would not reflect the localized emissions resulting from the designation of permitted shuttle stops. Therefore, for the purposes of this analysis, the pre-Pilot conditions represent the baseline existing conditions to provide the most conservative analysis and because the Pilot is a temporary program with a required end date.

The data collected during the Pilot period has been used to inform the conclusions of this analysis, providing a reliable basis for understanding the impacts of the proposed Commuter Shuttle Program.

Transportation

Prior to the Pilot, shuttle operators did not inform SFMTA of their stop locations. However, because the stop network for the Pilot was created based on shuttle providers' requested stop locations and there was no limit on the number of potential stops, it can be reasonably assumed that the Pilot program stop network is similar to the shuttle stop locations that were in use informally prior to the Pilot. One physical change resulting from the proposed Program would be that, rather than having full choice of stop locations, shuttle activity for larger vehicles would be directed away from non-arterial streets towards arterials. The traffic analysis below considers the impacts of this component of the proposed Program by quantifying potential additional shuttle vehicle activity in those arterial locations where the greatest number of shuttles would be routed away from non-arterial streets.

Table 2 below depicts a worst-case scenario showing the number of buses that would be moved to nearby arterial streets if all commuter shuttle traffic (both large and small vehicles) at four of the busiest non-arterial zones would move to a single nearby zone on an arterial, and not dispersed across several nearby zones. Table 3 shows that the shuttle activity at these four arterial streets currently constitutes 1.1% to 7% of the peak hour vehicle activity at these intersections, this maximum number of relocated commuter

shuttles, when added to existing shuttle activity at these stops, would account for between 1.7% and 9% of the average daily traffic on the streets to which they would be relocated.

Table 3. Stop Events at Designated Zones (with Commuter Shuttle Program)

Existing Non-Arterial Zone		Nearest Arterial Zone Alternative				Combined Totals After Relocation	
Existing Non-Arterial Zone (to be relocated)	Stop Events[a]	Nearest Existing Arterial Zone[b]	Stop Events	Existing Arterial Traffic Counts[c]	Shuttle % of Current Traffic Counts	Total Stop Events (after relocation)	Shuttle % of Total Traffic Counts (after relocation)
Castro/25th NW corner, near-side	20.0	24th/Church SW corner, near-side	9.6	342	6%	29.6	9%
Church/Market NE corner, AM/PM white zone	10.3	Castro/Market NE corner, PM white zone	10.3	311	3%	20.5	6%
30th/Church SW corner, flag stop	12.9	San Jose/Dolores NW corner, AM white zone	6.9	1159	1.1%	19.7	1.7%
Townsend/4th South side, Mid-block	22.7	Harrison/Embarcadero, white zone	8.7	341	7%	31.4	9.5%

Source: SFMTA, 2015

Notes:

a – Estimated commuter shuttle stop events per hour

b – Peak hour traffic counts collected by SFMTA in 2009, 2011, and 2012

c – Identified zone with existing shuttle stop where nearest non-arterial stop would be located.

Implementation of the proposed project may include the relocation of stop events and routes for large vehicles to arterial roadways. As shown in Table 3, the four arterial locations closest to the current non-arterial locations experiencing the highest level of shuttle activity could experience an increase in shuttle stop events due to the relocation of nearby non-arterial stops. However, with the relocation of shuttle stops and the subsequent increase in shuttle activity at each location, peak hour traffic volumes at intersections analyzed would increase by 0.6% to 3%, which would not represent a substantial increase from the addition of shuttle stop events due to the relocation of a non-arterial zone. Peak hour traffic volumes collected for each of the four locations listed above includes all vehicle types (including shuttles). The relocation of stops would not result in a substantial increase in the number of commuter shuttle vehicles (or other vehicles) at the locations analyzed above, with the increases in shuttle activity adding approximately one to three percent more shuttle vehicles than current conditions. Ultimately, commuter shuttles would remain approximately less than 10 percent of the vehicles that travel through

each location shown above during the peak hour. Moreover, as part of the Program, commuter shuttles are required to avoid using non-arterial streets, which would further reduce the number of shuttle vehicles on those streets. The relatively minor increase in shuttle activity, compared to the overall peak hour volumes, would not substantially degrade traffic operations and would not have a significant impact on traffic operations at arterial roadways.

Transit

One of the principal objectives in regulating commuter shuttles is to ensure that commuter shuttle conflicts with Muni were avoided or minimized whenever possible. To that end, the Pilot Program shuttle zone network included stops on lower-frequency Muni lines and exclusive shuttle loading zones near, but not shared with, Muni zones. Commuter shuttle activities, especially in designated shared Muni/Shuttle zones, were observed during the data collection effort in 2015. Table 4 below, compares the number of times that a Muni bus was blocked, at least temporarily, by a commuter shuttle bus from accessing a Muni zone, pre- and during-pilot.

Table 4. Average Number of Shuttle Stop-Events Resulting in Blocked Muni Buses (per hour)

Zone Location	Pre-Pilot Program	During-Pilot Program	Percentage (average per hour)
4th and Townsend	0.8	0	0%
16th and Mission	0	0	0%
16th and Mission/South Van Ness	0.4	0	0%
19th and Taraval/Wawona	0	0	0%
Castro and 24th/25th	0	0	0%
Church and 15th/16th	0	0	0%
Church and Market	0	0	0%
Divisadero and Haight/Oak PM	0	0.4	4%
Divisadero and Geary	1.2	0	0%
Divisadero and Haight AM	0.2	0.8	5%
Fillmore and Jackson	0.4	0.4	9%
Lombard and Pierce	0	0	0%
Van Ness and Market AM	0	0	0%
Valencia and 24th	0.86	1.6	10%
Valencia and 25th	0	0.4	2%
Van Ness and Market PM	0	0.8	5%
Van Ness and Sacramento	1.0	0.4	2%
Van Ness and California	0.8	0	0%
Van Ness and Union PM	0	3.2	18%
Van Ness and Union AM	1.2	0	0%
Program Average	0.3	0.4	3%

Source: SFMTA, 2015

Notes: Locations in **BOLD** include loading zones shared with Muni Buses

During data collection for the Pilot in June 2015, commuter shuttles blocking Muni vehicles were observed across several designated stops/zones. Results show that the occurrences of shuttles blocking Muni vehicles did not substantially increase between pre-Pilot conditions and after implementation of the Pilot Program. As shown in Table 4, twelve stops/zones were observed to not have any Muni buses blocked, compared to 11 stops/zones during the pre-pilot data collection. The average number of Muni buses blocked per hour was less than one Muni vehicle per hour (0.4 Muni vehicles during Pilot, 0.3 Muni vehicles pre-Pilot). Blocked Muni buses as a percentage of shuttles per hour shows that Commuter Shuttles blocking Muni buses occurred infrequently; an average of only 3% of shuttle stop-events blocked Muni access to a zone, and only in two locations did 10% or more shuttle stop-events block Muni.

Across all the field data collection locations during the Pilot, which saw 706 total stop-events, or 24% of the 2,978 stop-events that occur at all zones/stops on a typical day, 19 total Muni buses were temporarily prevented from accessing the Muni zone. As part of the proposed project, SFMTA would provide increased enforcement and monitoring at shuttle zones with a higher number of observed cases where commuter shuttles blocked Muni vehicles. The proposed project includes ongoing evaluation to actively respond to community concerns, identify safety issues, and would have the ability to modify shuttle network stops/zones to maintain consistent Muni operations.

For the purposes of a conservative analysis, SFMTA estimated that, by multiplying the average commuter shuttle dwell time (62.4 seconds) at designated stops/zones by 2,978 total daily stop-events, shuttles add a total of 83 minutes per day of delay into the Muni system. The resulting delay per Muni run (Muni makes over 1,200 runs every weekday) is approximately four seconds. The estimated delay added to existing Muni runs would be disperse throughout the Muni bus routes where shuttles also operate and would not be considered substantial. As shown above, the Commuter Shuttle Program would not substantially add delay to Muni lines operating along the same corridors as shuttles.

Further, the threshold of significance for determining peak period transit demand impacts to the SFMTA lines is defined by an "85 percent" capacity utilization performance standard. As determined by the SFMTA Board and the Planning Department, local transit lines should operate at or below 85 percent capacity utilization. This performance standard more accurately reflects actual operations and the likelihood of "pass-ups" (i.e., vehicles not stopping to pick up more passengers). The 85 percent capacity utilization standard would not be exceeded due to the Commuter Shuttle Program, since shuttles do not add to the capacity of existing Muni lines. Therefore, the proposed project would not result in a significant impact related to transit operations.

Bicycles

Similar to transit observations above, data collected by SFMTA during the Pilot indicated that commuter shuttles were observed to have infrequent operational conflicts with existing bicycle facilities. Though these occurrences were infrequent, commuter shuttles were observed to block the travel lane and/or bicycle lane when shuttles failed to maneuver all the way to the curb when accessing a zone, or when shuttles were denied access to the zone by another shuttle, a Muni vehicle, or another vehicle. During the

Pilot, these issues were addressed by extending shuttle zones, creating shuttle-only zones or directing shuttles to stop at low-frequency Muni zones where there were less likely to conflict with a Muni bus. Because of their infrequency, and the Program's ability to address any potential conflicts through modification of the shuttle stop length or location, the proposed Program would not be expected to result in a significant impact related to bicycles.

In addition, the Program requires commuter shuttles to pull all the way into, and maneuver the shuttle vehicle parallel with, the curb for passenger boarding and unloading. The Program would also prohibit shuttle vehicles from blocking travel or bicycle lanes and that loading and unloading do not take place in a vehicle or bicycle lane, or operate in a manner that impedes travel in these lanes. As appropriate, the SFMTA would create far-side shuttle loading zones to minimize the occurrence of shuttles blocking travel lanes and/or bike lanes, and increase enforcement at certain locations to ensure that shuttle drivers pull shuttle vehicles completely into the zone and out of traffic or bicycle lanes. Further, it is important to note that while the conflict with both travel lanes and bicycle lanes were observed, these incidents were very infrequent: the conflicts were observed at three of six near-side zones, and were not observed at all at any of the far-side or mid-block zones. Given the above, the proposed project would not result in a significant impact related to bicycles.

Pedestrians

Data collected during the Pilot indicated that commuter shuttles presented infrequent operational conflicts with pedestrian facilities. According to SFMTA and described below, pedestrian safety issues identified were related to the size of the commuter shuttle and placement of new shuttle stops/zones in relation to certain crosswalks. Observations conducted during the Pilot noted potential reduction in sight distance and whether commuter shuttles are preventing right-turning drivers from seeing pedestrians who may be crossing in front of a shuttle at a near-side stop. Because of the size of the commuter shuttles, shuttles at near-side stops/zones create a temporary restriction of the view of drivers attempting to make a right turn. Analysis of conditions indicated that the temporary restriction in sight distance is created only if all of the following conditions are met at the same time: (1) the commuter shuttle is stopped at the near side of the intersection, (2) a driver is attempting to turn right around the shuttle, and (3) pedestrians are crossing in front of the shuttle and may not be seen by the car driver. Because this issue only arises in limited circumstances, during data collection activities, SFMTA staff noted that these conditions were met only 16 times across the entire data collection period during the Pilot. While infrequent, these occurrences were one of the primary reasons that the Commuter Shuttle Program, upon implementation, would include identifying shuttle zones that may be moved from the near side of the intersection to the far side of the intersection. Also, as part of the Program, participants would be required to certify that shuttle drivers have completed driver safety training consistent with SFMTA's Large Vehicle Urban Driving Safety Program.

In addition, data collection activities during the Pilot Program observed instances where commuter shuttles blocked crosswalks. SFMTA staff noted that this usually occurs when a commuter shuttle driver misjudges the stop light cycle or attempts to access a zone that is already occupied by another vehicle.

Overall, analysis indicated that commuter shuttles actively blocking pedestrian facilities did not occur often during Pilot Program data collection. Shuttles blocked crosswalks six times out of 706 stop-events observed, or less than one percent of all stop events.

While data collected during the Pilot observed minimal conflicts with pedestrian facilities, the Commuter Shuttle Program would further reduce conflicts through increased enforcement at high-activity locations identified by SFMTA, the extension of the length of shuttle-only zones, and in certain cases as determined by SFMTA staff, the modification of near-side stops to far-side stops. By pursuing modifications to identified shuttle loading zones, such as relocating stops to the far-side of the street, both right-turning vehicles and pedestrians at a given crosswalk would not have an obstructed view of the intersection.

While there were intermittent occurrences of operational conflicts, the proposed project would not create a hazard and intermittent conflicts such as shuttle vehicles blocking Muni vehicles, travel lanes, or bicycle lanes would be reduced through the Commuter Shuttle Program. The proposed project, as mentioned previously, would identify specific locations (based on Pilot data collection) and pursue improvements to better manage the movement of vehicles, transit, bicycles, and pedestrians. The observations during the Pilot indicate that these improvements, as part of the project, would further reduce the conflicts between those modes of transportation and avoid instances where Muni passengers would need to board Muni vehicles on the street.

The proposed project would not include any narrowing of sidewalks or other components that could negatively affect pedestrian circulation within the project area. Based on the above, the proposed project would not result in significant impacts related to pedestrians.

Loading

The project, as proposed, would not eliminate any commercial loading zones or create additional demand for commercial loading activities. Under the Commuter Shuttle Program, use of existing passenger loading (white) zones and designated shared Muni/shuttle stops would not reduce the number of commercial loading (yellow) zones. Any elimination of existing loading zones would be evaluated for its impacts. However, the elimination of a loading zone does not typically result in a significant impact. Therefore, the proposed project would not result in significant commercial loading impacts.

If the Commuter Shuttle Program were not implemented, commuter shuttles would be expected to return to operating on non-arterial streets and other streets without restrictions such as residential streets; loading and unloading passengers at near-side bus stops, white zones or vacant curb areas; or loading and unloading passengers in travel lanes on both arterial and non-arterial streets, which could occasionally result in delays to traffic and Muni service or affect Muni patrons who might need to go out into the street to board, and could affect pedestrians crossing streets in front of commuter shuttles.

Other Environmental Topics

Air Quality

An Air Quality Technical Report (AQTR)[4] was prepared in order to assess the regional criteria air pollutant, and localized health risk impacts of the proposed project. The following summarizes the results of the AQTR, as well as provides some background information regarding threshold of significance.

Criteria Air Pollutants (Regional Analysis)

The Bay Area Air Quality Management District (BAAQMD) is the regional agency with jurisdiction over the nine-county San Francisco Bay Area Air Basin (SFBAAB), which includes San Francisco, Alameda, Contra Costa, Marin, San Mateo, Santa Clara, and Napa Counties and portions of Sonoma and Solano Counties. The BAAQMD is responsible for attaining and maintaining air quality in the SFBAAB within federal and state air quality standards, as established by the federal Clean Air Act (CAA) and the California Clean Air Act (CCAA), respectively.

In accordance with the state and federal Clean Air Acts, air pollutant standards are identified for the following six criteria air pollutants: ozone (O_3), carbon monoxide (CO), particulate matter (PM_{10} and $PM_{2.5}$), nitrogen dioxide (NO_2), sulfur dioxide (SO_2) and lead. These air pollutants are termed criteria air pollutants because they are regulated by developing specific public health- and welfare-based criteria as the basis for setting permissible levels. In general, the SFBAAB experiences low concentrations of most pollutants when compared to federal or state standards. The SFBAAB is designated as either in attainment[5] or unclassified for most criteria pollutants with the exception of ozone, $PM_{2.5}$, and PM_{10}, for which these pollutants are designated as non-attainment for either the state or federal standards.[6] By its very nature, regional air pollution is largely a cumulative impact in that no single project is sufficient in size to, by itself, result in non-attainment of air quality standards. Instead, a project's individual emissions contribute to existing cumulative air quality impacts. If a project's contribution to cumulative air quality impacts is considerable, then the project's impact on air quality would be considered significant.[7] The City is utilizing the significance thresholds developed by BAAQMD to analyze this project's criteria pollutant air quality impacts.

The proposed project would include capital improvements consisting of boarding islands, pedestrian bulbs, and bus bulbs. These capital improvements would require the use of construction equipment.

4 Ramboll Environ. Final Air Quality Technical Report. SFMTA Commuter Shuttle Program. October 13, 2015.

5 "Attainment" status refers to those regions that are meeting federal and/or state standards for a specified criteria pollutant. "Non-attainment" refers to regions that do not meet federal and/or state standards for a specified criteria pollutant. "Unclassified" refers to regions where there is not enough data to determine the region's attainment status for a specified criteria air pollutant.

6 U.S. EPA. Green Book. Current Nonattainment Counties for All Criteria Pollutants. As of October 01, 2015. Available online: http://www3.epa.gov/airquality/greenbook/ancl.html

7 Bay Area Air Quality Management District (BAAQMD), *California Environmental Quality Act Air Quality Guidelines*, May 2011, page 2-1.

Given the limited use and amount of construction, the proposed project would not have the potential to result in significant construction criteria air pollutant impacts.

For the purposes of environmental review, shuttle growth was assumed to be 41 percent of the Pilot Program and was based available data collected by the SFMTA. Shuttle activities occurred on City streets even before the Pilot was implemented. Based on the number of commuter shuttle permits (placards) issued prior to the implementation of the Pilot and the Commuter Shuttle Program (beginning in 2016), SFMTA estimates that participation in the Program could increase by 41 percent.[8]

Potential commuter shuttle activity could grow as a result of increased demand for shuttle service from local and regional employers and their workers. This potential growth could occur with or without implementation of the proposed project. However, for environmental review purposes, the potential growth in the number of shuttles and stop events is being analyzed as related to the Program. Regional criteria air pollutant emissions may increase from the increase in potential commuter shuttle activity within San Francisco and to and from commuter shuttle destinations in the Bay Area. Therefore, regional criteria air pollutant emissions were estimated based upon the following assumptions: a 41 percent growth in commuter shuttle permits (placards) issued prior to the commencement of the Pilot (2014) and estimated Commuter Shuttle Program implementation (2016); commuter shuttle engine year, including model year 2012 equivalent or newer for all new commuter shuttle vehicles entering the Program and, by 2020, a requirement that all active commuter shuttle vehicle engines are no more than eight years old or equivalent (thus requiring fleet turnover of older vehicles); commuter shuttle data on fuel type, idling time, and trip length; and survey responses from individuals participating as commuter shuttle riders in the Pilot Program regarding their mode of commuter travel or location of home/job if commuter shuttles were not available.

Emissions from the proposed project display net reductions in ROG, PM_{10}, and $PM_{2.5}$emissions of 0.26, 0.05, and 0.05 tons per year, respectively, and net reductions in CO_2 of 1,149 metric tons per year. Emissions from the proposed project display net increases of NO_x by 6.6 tons per year. Increases in NO_x are attributable to the difference in emissions generated from a large diesel-fueled bus engine relative to a gasoline-fueled car. In 2018, NO_x emissions from the average shuttle are approximately 18 times greater per mile than a passenger car. However, the NOx emissions would still be below the thresholds of significance, as shown in Table 5. Therefore, no significant criteria air pollutant impacts would occur.

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[8] Memo – Potential Increase in Commuter Shuttle Activity, from Hank Willson (SFMTA) to Melinda Hue (SF Planning Department), dated October 8, 2015.

Table 5. Estimated Criteria Air Pollutant Emissions

	ROG	NO_x	PM_{10}	$PM_{2.5}$	CO_2
Estimated emissions (pounds per day)[1]					
Project Emissions	-1.4	36	-0.3	-0.3	-6,939
Significance Threshold	54	54	82	54	n/a[2]
Estimated emissions (tons per year)[1]					
Project Emissions	-0.26	6.60	-0.05	-0.05	-1,149
Significance Threshold	10	10	15	10	n/a[2]

Source: Ramboll Environ, 2015.

1. Annual CO_2 emissions are in metric tons.
2. The City relies on compliance with the City's Greenhouse Gas Reduction Strategy instead of quantitative thresholds for determining significance.

Health Risks and Hazards (Localized Analysis)

In addition to criteria air pollutants, individual projects may emit toxic air contaminants (TACs). TACs collectively refer to a diverse group of air pollutants that are capable of causing chronic (i.e., of long-duration) and acute (i.e., potentially severe but short-term) adverse effects to human health, including carcinogenic effects. In an effort to identify areas of San Francisco most adversely affected by sources of TACs, San Francisco partnered with the BAAQMD to conduct a citywide health risk assessment based on an inventory and assessment of air pollution and exposures from mobile, stationary, and area sources within San Francisco. Areas with poor air quality, termed the "Air Pollutant Exposure Zone," were identified based on health-protective criteria that consider estimated cancer risk, exposures to fine particulate matter, proximity to freeways, and locations with particularly vulnerable populations.

The above citywide health risk modeling was also used as the basis in approving a series of amendments to the San Francisco Building and Health Codes, generally referred to as the Enhanced Ventilation Required for Urban Infill Sensitive Use Developments or Health Code, Article 38 (Ordinance 224-14, effective December 8, 2014) (Article 38). The purpose of Article 38 is to protect the public health and welfare by establishing an Air Pollutant Exposure Zone and imposing an enhanced ventilation requirement for all urban infill sensitive use development within the Air Pollutant Exposure Zone. The Air Pollutant Exposure Zone was also used as the basis in approving a series of amendments to the San Francisco Environment and Administrative Codes, generally referred to as the Clean Construction Ordinance, or Environment Code Section 25.

The threshold of significance used to evaluate health risks from new sources of TACs associated with the project is based on the potential for the proposed project to substantially affect the extent and severity of the Air Pollutant Exposure Zone at sensitive receptor locations. For projects that could result in sensitive

receptor locations meeting the Air Pollutant Exposure Zone criteria that otherwise would not occur without the project, a proposed project that would emit $PM_{2.5}$ concentration above 0.3 $\mu g/m^3$ or result in an excess cancer risk greater than 10.0 per million would be considered a significant impact. The 0.3 $\mu g/m^3$ $PM_{2.5}$ concentration and the excess cancer risk of 10.0 per million persons exposed are the levels below which the BAAQMD considers new sources not to make a considerable contribution to cumulative health risks.[9] For those locations already meeting the Air Pollutant Exposure Zone criteria, a lower significance standard is required to ensure that a proposed project's contribution to existing health risks would not be significant. In these areas a proposed project's $PM_{2.5}$ concentrations above 0.2 $\mu g/m^3$ or an excess cancer risk greater than 7.0 per million would be considered a significant impact. The proposed project would include stops both within and outside the Air Pollutant Exposure Zone and thus all of the above thresholds of significance apply.

The proposed project would include limited construction activities for capital improvements. Project construction activities would result in short-term emissions of DPM and other TACs. The proposed project is subject to the Clean Construction Ordinance. While emission reductions from limiting idling, educating workers and the public and properly maintaining equipment are difficult to quantify, other measures in the Clean Construction Ordinance, specifically the requirement for equipment with Tier 2 engines and Level 3 Verified Diesel Emission Control Strategy (VDECS) can reduce construction emissions by 89 to 94 percent compared to equipment with engines meeting no emission standards and without a VDECS. Emissions reductions from the combination of Tier 2 equipment with level 3 VDECS is almost equivalent to requiring only equipment with Tier 4 Final engines, which is not yet readily available for engine sizes subject to the Clean Construction Ordinance. Therefore, compliance with the Clean Construction Ordinance would ensure construction emissions impacts on nearby sensitive receptors would not be significant.

Sensitive receptors may be exposed to increased emissions at existing stops as a result of the increased demand for shuttle service from local and regional employers and their workers. In addition, sensitive receptors that are currently not exposed to emissions from commuter shuttle stop events could be exposed in the future if new stops are added as part of the Program. Therefore, a localized health risk assessment was conducted to assess the excess cancer risk and $PM_{2.5}$ concentrations from the Program.

Four local impact zones were modeled to represent the localized health risk effects at any existing stop or proposed stop under the Program. The four local impact zones were chosen based on the following criteria: exhibit high volumes of stop events under the Pilot Program; represent average or above average idling times for idling times for commuter shuttle under the Pilot Program; representative of the geographic diversity within the City for stops (within and outside the Air Pollutant Exposure Zone, differing locations of sensitive receptors); and representative of configuration of stops (e.g., east-west vs. north-south, stops on both sides of the street).

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9 Bay Area Air Quality Management District, *California Environmental Quality Act Guidelines Update, Proposed Air Quality CEQA Thresholds of Significance*, May 3, 2010.

In order to assess potential impacts from locating a new stop anywhere in the City, for a baseline the modeling assumed that no shuttles currently stop at the four local impact zones. This represents a conservative analysis for some locations because with or without the Program the shuttles would be making stops at various locations throughout the City. However, this conservative approach allows for disclosure of air quality effects that occur today at some locations and provides information about health effects that could occur in the future if and/or when a new loading zone is created. In addition, localized health effects were based upon the following assumptions: an increase in the number of stop events that could occur between Pilot and Program conditions (estimated at 29 percent) at locations with a high volume stop events; the same commuter shuttle engine years (2012 or newer) as mentioned above for criteria air pollutants; commuter shuttle fuel type and idling time; and various methodologies consistent with BAAQMD guidance regarding assessing local risks and hazards.

As shown in Table 6, the estimated health risk and $PM_{2.5}$ concentrations from the Program would not exceed significance thresholds both within and outside the Air Pollutant Exposure Zone for residential sensitive receptors. Therefore, no significant localized health risk impacts would occur.

Table 6. Estimated Health Risks and Hazards

Air Pollutant Exposure Zone Location	Local Impact Zone	Lifetime Cancer Risk	Shuttle-Generated Annual $PM_{2.5}$ Concentrations
Outside	Van Ness & Union	5.6	0.02
Outside	Valencia & 24th/25th	4.3	0.01
	Significance Threshold	10.0	0.3
Within	Townsend & 4th	0.9	<0.01
Within	Market & 8th	2.8	<0.01
	Significance Threshold	7.0	0.2

Source: Ramboll Environ, 2015.

Noise

An analysis of the potential noise effects of adding transit service on streets in San Francisco was prepared for the Service Improvements analyzed in the Transit Effectiveness Project EIR (TEP EIR) in Chapter 4, Section 4.3, Noise and Vibration, on pp. 4.3-35 to 4.3-48.[10] The results of that analysis are relevant to the indirect changes in noise that could occur as the commuter shuttle program expands in the future.

The City considers temporary noise from construction performed in compliance with the San Francisco Noise Ordinance, Article 2.4 of the San Francisco Public Works Code/DPW Order No. 176-707, and the SFMTA Blue Book to be less than significant. These regulations require that construction not produce noise from any construction equipment (except impact tools) that would exceed 80 dBA at 100 feet or

[10] San Francisco Planning Department, *Transit Effectiveness Project Final Environmental Impact Report*, certified March 27, 2014, Case No. 2011.0558E (hereinafter "TEP EIR").

generate construction noise between 8:00 p.m. and 7:00 a.m. that exceeds the ambient noise level by 5 dBA at the nearest property line without procuring a Night Noise Permit. Pursuant to § 2907 of the San Francisco Noise Ordinance, impact tools and equipment must be equipped with intake and exhaust mufflers recommended by the manufacturers and approved by the Director of Public Works for maximum noise attenuation, and pavement breakers and jackhammers must be equipped with acoustically attenuating shields or shrouds.[11] Per the Night Noise Permit, the use of construction equipment that generates high level of noise and impact equipment is not allowed after 10:00 p.m.[12]

The Federal Transit Administration (FTA) developed a methodology and significance criteria to evaluate noise impacts from operation of surface transportation modes (i.e. passenger cars, trucks, buses, and rail) in their guidance document: *Transit Noise Impact and Vibration Assessment* (FTA Guidelines).[13] The FTA incremental noise impact criteria are based on US EPA recommended levels and studies of community annoyance from transportation noise. This approach was used in the TEP EIR to evaluate the noise impact from increases in transit vehicle trips on San Francisco streets.

The TEP EIR noise analysis evaluated construction impacts from adding pedestrian bulbs, bus bulbs, and boarding islands similar to those included in the proposed project.[14] The loudest noise levels are typically generated by impact equipment (e.g., hoe ram or jackhammers) that would be required for the demolition of the existing sidewalk and street and from paving equipment during street restoration.

The expected noise level from construction equipment used for the proposed capital improvements would not emit noise in excess of 80 dBA at 100 feet.[15] Therefore, with adherence to the San Francisco Noise Ordinance, including limiting the noise levels from individual pieces of construction equipment (other than impact tools) to 80 dBA at a distance of 100 feet, equipping impact tools with both intake and exhaust muffled, and obtaining a noise permit for night work from DPW, as well as compliance with the Public Works Code and other DPW regulations, indirect temporary construction noise impacts from the program would be less than significant.

The TEP EIR noise analysis studied the daily increase in operational ambient noise from increases in transit vehicle trips on streets with existing low (55 to 59 dBA Ldn), medium (60 to 69 dBA Ldn), and high (70 dBA Ldn and greater) ambient noise levels. The increases in numbers of standard diesel motor coaches ranged from about 115 per day on a street with low ambient noise levels (55 dBA Ldn) to over 500 per day on a street with high ambient noise levels (70 dBA Ldn).[16] The use of standard diesel motor coaches provided a conservative estimate of the noise that could be generated by increases in transit

[11] San Francisco Municipal Code, Police Code, Article 29 – Regulation of Noise. Available online at: http://www.sfdph.org/dph/files/EHSdocs/ehsNoise/NoiseOrd.pdf. Accessed June 3, 2013.

[12] TEP EIR p. 4.3.16.

[13] FTA, *Transit Noise and Vibration Impact Assessment*, May 2006. Available online at: www.fta.dot.gov/documents/FTA_Noise_and_Vibration_Manual.pdf. Accessed March 13, 2013.

[14] Note that implementing transit system priority signal systems would not require any construction activities.

[15] See TEP EIR Table 29, p. 4.3.31.

[16] TEP EIR Table 31, pp. 4.3.38-4.3.39.

vehicles in the analysis.[17] The results of the analysis of operational noise impacts in the TEP EIR show that adding substantial numbers of motor coaches to city streets, including streets that currently experience low ambient noise levels, would not result in significant increases in noise and would cause less-than-significant noise impacts.[18] Similarly, noise generated by the commuter shuttles would be comparable to those of the MUNI system if they were all standard diesel motor coaches.

As shown in Table 3 (Stop Events at Designated Zones [with Commuter Shuttle Program]), the commuter shuttle program could add up to three percent to the total number of shuttle vehicles to major and minor arterial roadways, assumed to have moderate to high ambient noise levels on a typical week day in San Francisco. It should be noted that as part of the program, shuttle motor coaches would be required to follow routes along arterial streets and avoid residential streets, thereby avoiding streets with low ambient noise levels. Therefore, it is reasonable to assume that, as for the TEP Service Improvements, the increase in noise levels during operation of the commuter shuttles would result in similar less-than-significant noise impacts.

Further, an approximate doubling of traffic volumes in the project area would be necessary to produce an increase in ambient noise levels noticeable to most people. As previously described, the proposed project would not cause a doubling in traffic volumes with the implementation of the Commuter Shuttle Program. The project's marginal increase to the existing shuttle activity at arterial roads (up to three percent) would not cause a noticeable increase in the ambient noise level in the project vicinity. The noise generated by commuter shuttles would be considered common and generally acceptable in an urban area, and would not be considered a significant impact.

Other CEQA Topics

Members of the public have expressed concern that commuter shuttles, the Pilot, and/or the proposed Program have caused an increase in housing costs, resulting in displacement. The increase in housing costs in San Francisco is a well-documented issue that is being addressed in a variety of ways. Prices have risen across the City as demand for housing has increased due to a variety of factors, including significant growth in employment opportunities within San Francisco and the Bay Area. As shown in Table 2 on p. 10, the ridership survey indicates that of the estimated 8,500 daily shuttle riders, only five percent (425 shuttle users) would move closer to their jobs were the commuter shuttles unavailable. Therefore, the availability and proximity of commuter shuttles do not appear to be contributing substantially to housing demand or prices in San Francisco.

CEQA Guidelines Section 15064(e) states that "economic and social changes resulting from a project shall not be treated as significant effects on the environment. Economic or social changes may be used, however, to determine that a physical change shall be regarded as a significant effect on the environment. Where a physical change is caused by economic or social effects of a project, the physical change may be

[17] TEP EIR pp. 4.3.36-4.3.37.

[18] EPT EIR Table 32, p. 4.3.46, and pp. 4.3-43 to 4.3-44

regarded as a significant effect in the same manner as any other physical change resulting from the project. Alternatively, economic and social effects of a physical change may be used to determine that the physical change is a significant effect on the environment. If the physical change causes adverse economic or social effects on people, those adverse effects may be used as a factor in determining whether the physical change is significant." The proposed Program would not result in elimination of any housing units. Any physical impacts associated with increased housing costs would be related to the construction of replacement housing for displaced residents, or increased trip lengths and emissions for displaced residents. However, there is no demonstrable evidence of physical displacement of individuals from housing units attributable to commuter shuttles, and if such displacement were to occur as a result of the proposed program, there is no basis to assess where such individuals would relocate and what their travel behavior would entail. Since there is no demonstrated causative link between commuter shuttle use and housing demand or price, and there is no foreseeable displacement associated with the proposed Program, analysis of any such impacts would be speculative with regard to their scale and nature.

The Commuter Shuttle Program would not result in any changes in land use, urban design or long range views, cultural resources, biological resources, greenhouse gas emissions, wind, shadow, utilities and service systems, geology and soils, hydrology or water quality, mineral resources or agricultural and forest resources. No new hazardous waste would be generated by the Commuter Shuttle Program. Implementation of the proposed project, may reduce already less-than-significant effects on emergency vehicle access.

EXEMPT STATUS

The California Environmental Quality Act (CEQA) Guidelines Section 15301, or Class 1, provides for the exemption from environmental review of minor alterations to existing highways and streets, sidewalks, gutters, bicycle and pedestrian trails, and similar facilities. The proposed project would include minor modifications to the existing arterials to install new commuter shuttle stops, as well as the installation of minor improvements such as signage, traffic islands, and bus bulbs. Therefore, the proposed project would be exempt from CEQA under Class 1.

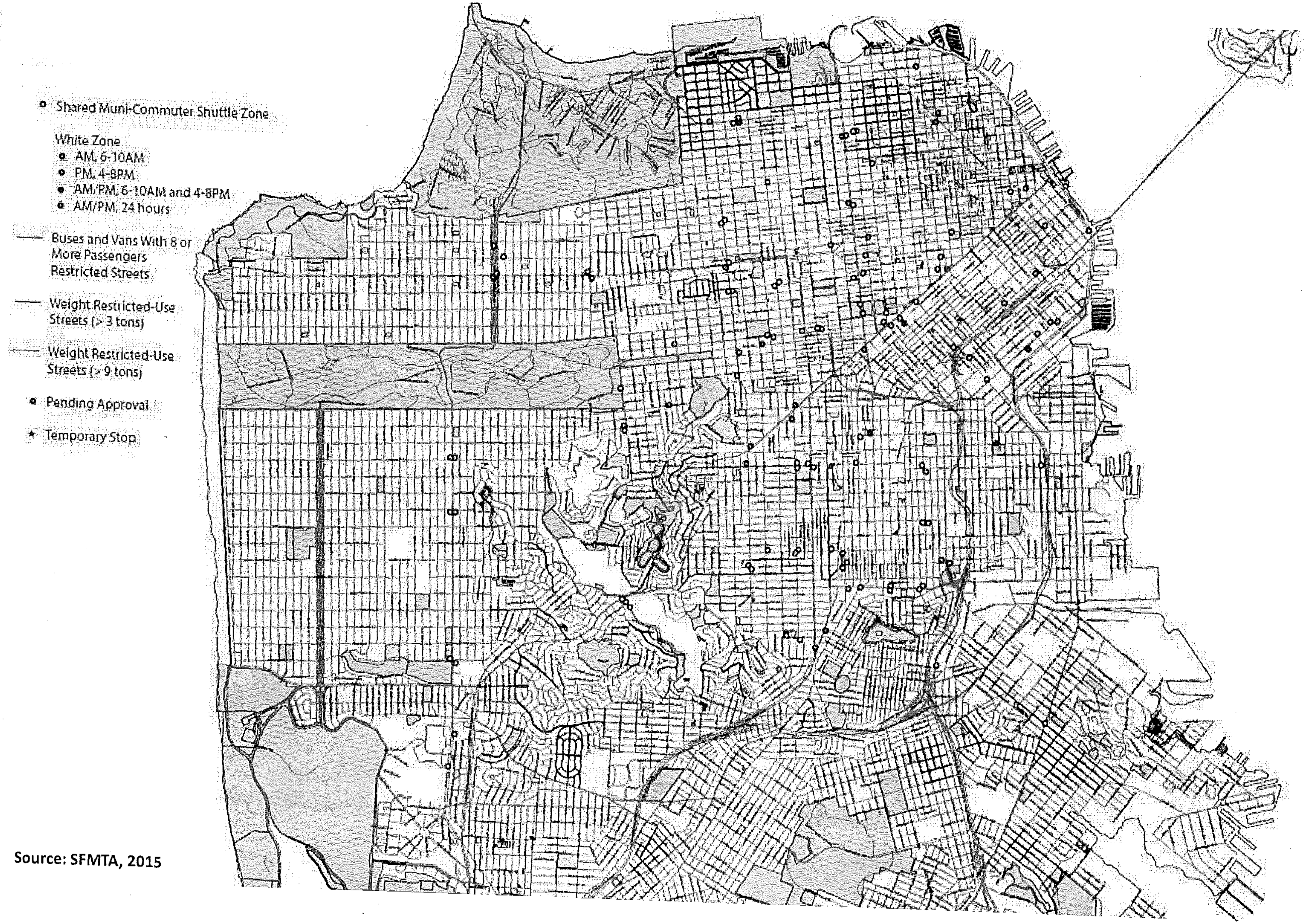
CEQA Guidelines Section 15308, or Class 8, provides for exemption for actions taken by regulatory agencies, as authorized by state or local ordinance, to assure the maintenance, restoration, enhancement, or protection of the environment where the regulatory process involves procedures for protection of the environment. The proposed project would include the implementation of the Commuter Shuttle Program, which issues permits to eligible commuter shuttle providers meeting specific requirements and terms and would allow the use of designated public curb space. The program provides procedures intended to facilitate operation of commuter shuttles, enable vehicle trip reduction, and minimize impacts to users of other transportation modes in San Francisco. As such, it constitutes actions by SFMTA meant to enhance and protect the environment involving regulatory procedures for shuttle activity. Therefore, the proposed project would be exempt from CEQA under Class 8.

CONCLUSION

Guidelines Section 15300.2, subdivision (c), provides that a categorical exemption shall not be used for an activity where there is a reasonable possibility that the activity will have a significant effect on the environment due to unusual circumstances. As illustrated, herein there are no unusual circumstances surrounding the proposed project that would suggest a reasonable possibility of a significant effect. The proposed project would not substantially increase traffic on the existing street system and no significant environmental impact would occur. For the above reasons, the proposed project is appropriately exempt from environmental review.

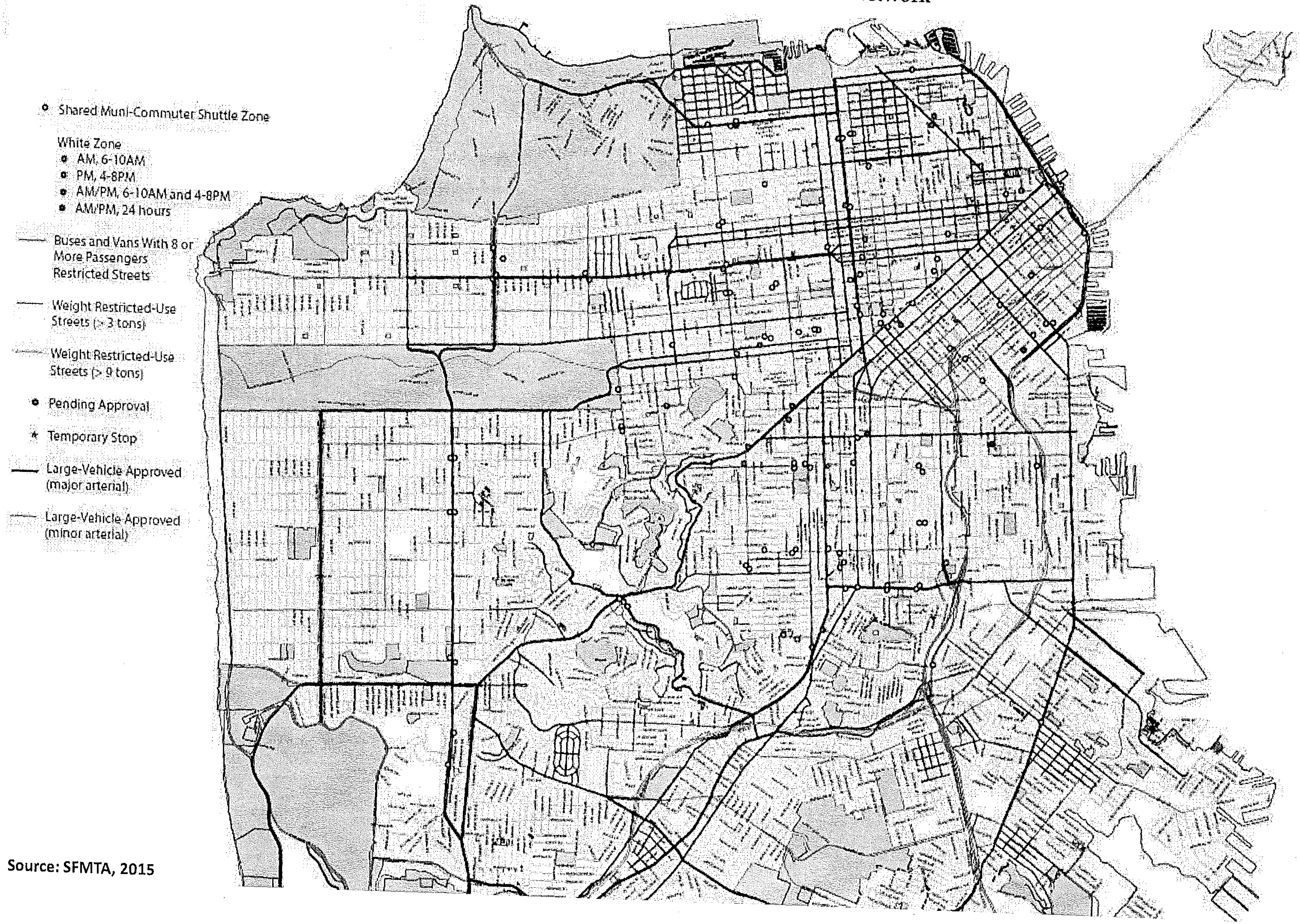
The proposed project satisfies the criteria for exemption under the above-cited classification(s). In addition, none of the CEQA Guidelines Section 15300.2 exceptions to the use of a categorical exemption applies to the proposed project. For the above reasons, the proposed project is appropriately exempt from environmental review.

Attachment A: Pilot Program Shuttle Network



Source: SFMTA, 2015

Attachment B: Proposed Commuter Shuttle Street Network



Source: SFMTA, 2015

Attachment B

SFMTA Resolution No. 15-161

SAN FRANCISCO
MUNICIPAL TRANSPORTATION AGENCY
BOARD OF DIRECTORS

RESOLUTION No. 15-161

WHEREAS, The use of shuttle buses to provide commuter shuttle service for the benefit of employees, students and others is a growing means of sustainable transportation in San Francisco and the greater Bay Area, and has become increasingly common in the past several years; and,

WHEREAS, Commuter shuttles are free under law to drive on most of San Francisco's streets, and the SFMTA cannot ban shuttles from the City; and,

WHEREAS, Shuttle bus service provides alternatives to single-occupant vehicle trips, and is associated with reduced auto ownership and with increased use of transit, walking, and bicycling for non-commute trips; and,

WHEREAS, The increase in shuttle buses on San Francisco's streets has led to an increase in issues related to Muni operations, street safety, and complaints from residents; and,

WHEREAS, As part of an effort to address these issues, in 2014, the SFMTA created a pilot program (the "Pilot") to gather accurate and up-to-date information on commuter shuttle activity and operations and to determine if active regulation of shuttles can reduce traffic conflicts and other issues; and,

WHEREAS, Under the Pilot, the SFMTA created a permit program and established a shuttle zone network of designated Muni zones and white loading zones around the City that would be made available to shuttle service providers participating in the program, based upon input from the service providers, SFMTA transit service planning and engineering staff, and the community; and,

WHEREAS, Over the course of the Pilot, the SFMTA made the substantial changes and updates to the shuttle zone network to respond to issues such as street improvements, Muni service changes, shuttle ridership demand, construction, community concerns, and other operational considerations; and,

WHEREAS, The present Pilot shuttle zone network is the SFMTA's best estimate of an effective shuttle zone network; and,

WHEREAS, The SFMTA undertook an extensive evaluation of the Pilot to determine whether the method of regulation used in the Pilot should be continued beyond the pilot period; and,

WHEREAS, The Pilot Evaluation Report found that: the vast majority of community feedback focused on large shuttles being unwelcome on residential streets; effective and accurate real-time shuttle vehicle data assists the SFMTA in regulating and managing commuter shuttle activity; 47% of shuttle riders said they would drive alone to work if a shuttle were not available; shuttles reduce the amount of vehicle miles traveled on the region's streets by nearly 4.3 million miles each month; an average of 2.7% of shuttle stop-events resulted in blocking Muni access to a zone; shuttles block travel and bike lanes about 35% of the time that they stop to load or unload; and more enforcement staffing at shuttle zones and along shuttle routes would assist in keeping traffic flowing smoothly throughout the shuttle zone network and help speed Muni; and,

WHEREAS, After evaluating the Pilot, SFMTA staff developed a Commuter Shuttle Program Policy to establish an ongoing Commuter Shuttle Program that would continue much of the regulatory approach put in place by the Pilot, with several improvements and enhancements based upon the Pilot Evaluation Report and input from elected officials, community members, the SFMTA's transit and traffic engineering teams, shuttle service providers, employers, and other interested stakeholders; and,

WHEREAS, The proposed Commuter Shuttle Program would require participating shuttle service providers to phase in the use of newer vehicles in order to lower greenhouse gas emissions from the shuttle fleet overall; and,

WHEREAS, The proposed Commuter Shuttle Program would require buses participating in the program that are over 35 feet long to travel on the major and minor arterial street network as defined by the California Department of Transportation; and,

WHEREAS, The proposed Commuter Shuttle Program would allow shuttles that are free and open to the public to use the shuttle zone network without charge as long as those shuttles comply with all other Commuter Shuttle Program requirements; and,

WHEREAS, The proposed Commuter Shuttle Program would require real-time GPS data collection and reporting to help better manage commuter shuttle operations and target enforcement; and,

WHEREAS, The proposed Commuter Shuttle Program would require increased data sharing from participating shuttle service providers, and requires that participating shuttle service providers demonstrate for each vehicle that data feeds are regular and accurate before receiving a permit; and,

WHEREAS, The proposed Commuter Shuttle Program would require participating shuttle service providers to comply with the San Francisco Board of Supervisors' March 2015 Labor Harmony Resolution, including the submission of a Service Disruption Prevention Plan that describes the shuttle service providers' efforts to ensure efficient and consistent service in the event of potential disruptions, including labor disputes; and,

WHEREAS, The permit fee for participation in the proposed Commuter Shuttle Program would be a per-stop fee which will be determined by aggregating the costs to the SFMTA that result from the program and dividing that total cost by the annual number of stop-events that all program participants plan to make; and,

WHEREAS, The Commuter Shuttle Program Policy includes the network of designated Muni zones and passenger loading zones that would be available to participating shuttle service providers; and

WHEREAS, The Commuter Shuttle Program Policy also includes capital improvements at shuttle zones and corridors, with such costs recovered, at least in part, as part of the fee for participation in the program; and,

WHEREAS, The per-stop fee amount for the proposed Commuter Shuttle Program will be calculated once the SFMTA has completed the review and approval process for program participation, and will be brought to the SFMTA Board of Directors at a future date for approval and appropriate amendment of the Transportation Code; and,

WHEREAS, On October 22, 2015, the San Francisco Planning Department determined that the proposed Commuter Shuttle Program and Transportation Code amendments are exempt from environmental review pursuant to Title 14 of the California Code of Regulations Sections 15301 and 15308 as a Class 1 and Class 8 categorical exemption from the California Environmental Quality Act (CEQA), the SFMTA Board of Directors concurs with this determination, the Planning Department's determination is on file with the Secretary to the SFMTA Board of Directors, and this is the Approval Action as defined by San Francisco Administrative Code Chapter 31; now, therefore, be it

RESOLVED, That the San Francisco Municipal Transportation Agency Board of Directors finds that substantial evidence in the record, as set forth in the California Environmental Quality Act findings in Attachment A to this resolution, supports the determination that the proposed Commuter Shuttle Program and Transportation Code amendments are exempt from environmental review pursuant to Title 14 of the California Code of Regulations section 15301 and 15308 as a Class 1 and Class 8 categorical exemption from CEQA, and incorporates said findings by this reference as though fully set forth herein; and, be it further,

RESOLVED, That the San Francisco Municipal Transportation Agency Board of Directors amends the Transportation Code, Division II, to authorize a permit program to allow commuter shuttle service providers to use designated Muni zones and white curb loading zones for passenger loading and unloading; and, be it further

RESOLVED, That the San Francisco Municipal Transportation Agency Board of Directors adopts the Commuter Shuttle Program Policy to govern the SFMTA's implementation of the Commuter Shuttle Program, including the network of designated Muni zones and passenger loading zones that would be available to participating shuttle service providers.

I certify that the foregoing resolution was adopted by the San Francisco Municipal Transportation Agency Board of Directors at its meeting of November 17, 2015.

____

Secretary to the Board of Directors
San Francisco Municipal Transportation Agency

RESOLUTION #15-161

[Transportation Code – Establishing Permanent Commuter Shuttle Permit Program]

Resolution amending the Transportation Code, Division II to establish a Commuter Shuttle Permit Program to authorize certain shuttle buses to stop in designated Muni stops and passenger loading zones for the purpose of loading or unloading passengers, and establish permit conditions for such permits.

NOTE: Additions are single-underline Times New Roman; deletions are ~~strike-through Times New Roman~~.

The Municipal Transportation Agency Board of Directors of the City and County of San Francisco enacts the following regulations:

Section 1. Article 900 of Division II of the Transportation Code is hereby amended by revising Section 914, to read as follows:

Sec. 914. COMMUTER **SHUTTLE STOP PERMITS.**

(a) **Definitions**. As used in this Section 914, the following words and phrases shall have the following meanings:

Designated Stop. An SFMTA bus stop or a white zone designated by SFMTA as a stop available for loading and/or unloading of passengers by Shuttle Service Providers that have been issued a Shuttle Permit under this Section 914.

Director. The Director of Transportation or his or her designee.

Shuttle Bus. A motor vehicle designed, used or maintained by or for a charter-party carrier of passengers, a passenger stage corporation, or any highway carrier of passengers required to register with the California Public Utilities Commission that is being operated in Shuttle Service. A Shuttle Bus shall

also include any bus that is owned, or being operated on behalf of, a governmental entity and being operated in Shuttle Service.

Shuttle Permit. A permit issued by the SFMTA that authorizes a Shuttle Service Provider to load and/or unload passengers at specified Designated Stops in one or more Shuttle Buses.

Shuttle Placard. A placard issued by SFMTA that is visible from outside the Shuttle Bus at front and rear locations as specified by the SFMTA and that identifies the Shuttle Permit authorizing the Shuttle Bus to use Designated Stops.

Shuttle Service. Transportation by Shuttle Buses offered for the exclusive or primary use of a discrete group or groups, such as clients, patients, students, paid or unpaid staff, visitors, and/or residents, between an organization or entity's facilities or between the organization or entity's facilities and other locations, on a regularly-scheduled basis.

Shuttle Service Provider. Any Person using Shuttle Buses to provide Shuttle Service within the City.

Stop Event. An instance of stopping by a Shuttle Bus at a Designated Stop for the purpose of loading and/or unloading passengers.

(b) **Findings.**

(1) The use of Shuttle Buses for the purpose of providing Shuttle Service is a growing means of transportation in San Francisco and the greater Bay Area.

(2) Shuttle Service provides significant benefits to the community by replacing single occupant trips with more efficient transportation, contributing to a reduction in parking demand, and supporting the City's goal of ~~having of 50 percent of all~~ increasing trips made by sustainable modes ~~by 2018~~.

(3) Shuttle Service currently operating in San Francisco reduces vehicle miles traveled (VMT) in the City by approximately 4,300,000~~at least 45 million~~ miles

~~annually~~each month~~, and reduces greenhouse gas emissions from trips originating or ending in the City by 11,000 metric tons annually~~.

(4) Unregulated use of Muni stops by Shuttle Service Providers ~~has resulted~~results in unintended adverse impacts, including delaying transit bus service, increasing traffic congestion, diverting bicyclists from bicycle lanes into mixed-flow lanes, and diverting motor vehicle traffic into adjacent travel lanes, and preventing transit buses from being able to access the curb in order to load and unload passengers.

(5) Prior to implementing a commuter shuttle pilot program in August, 2014, the~~The~~ SFMTA ~~'s~~ lacked ~~of~~ complete information about Shuttle Service operations, including routes, frequency of service and stops, which had ~~has~~ been a barrier to resolving and preventing conflicts with Shuttle Service Providers' operations, including adverse impacts on Muni service and increased traffic congestion.

(6) Inconsistent or inaccurate identification of, and lack of contact information for, Shuttle Service Providers ~~has~~ previously made it difficult for the SFMTA to effectively and timely communicate with Shuttle Service Providers to prevent or resolve conflicts and makes enforcement of traffic and parking regulations difficult.

(7) Regulation by the SFMTA of the use of stops ~~use~~ by Shuttle Services to provide safe loading and unloading zones for Shuttle Services, whose cumulative ridership is equivalent to that of a small transit system, is consistent with the City's Transit First policy.

(8) The commuter shuttle pilot program implemented in August 2014~~established under this Section 914 is intended to~~ enabled SFMTA to evaluate whether shared use of Muni stops by Shuttle Buses is consistent with efficient operation of the City's public transit system. An evaluation of the pilot program conducted by SFMTA showed that the pilot program was successful in addressing the

issues described above, and also showed ways that the program could be improved. SFMTA now seeks to establish a program that continues the successful aspects of the pilot program while building upon the lessons learned.

(c) **General Permit Program Requirements.**

(1) The Director is authorized to implement a ~~pilot~~ program for the issuance of Shuttle Permits beginning on a date designated by the Director. ~~The duration of the pilot program shall not exceed 18 months from the date of commencement designated by the Director.~~

(2) The Director may issue a Shuttle Permit for the use of Designated Stops upon receipt of an application from a Shuttle Service Provider on a form prescribed by the SFMTA which application meets the requirements of this Section 914.

(3) The Shuttle Permit shall authorize the Shuttle Service Provider to receive a specified number of Shuttle Placards issued by SFMTA.

(4) The Director is authorized to establish up to 200 Designated Stops for the purposes of this ~~pilot~~ program. The Director may establish additional Designated Stops following a public hearing.

(d) **Shuttle Permit Application Requirements.** Each application for a permit or renewal of a permit shall contain the following information:

(1) The name, business location, telephone number, fax number and email address of the Shuttle Service Provider;

(2) The name, title and contact information of one or more persons representing the Shuttle Service Provider to be notified by SFMTA in the event of a problem or permit violation relating to the Permittee's Shuttle Service;

(3) The total number of Shuttle Buses the Shuttle Service Provider intends to use to deliver Shuttle Service using Designated Stops~~, and the make,~~

~~passenger capacity and license plate number of each of its Shuttle Buses that would be authorized, when bearing a Shuttle Placard, to use one or more Designated Stops~~;

(4) The total number of Shuttle Placards requested;

(5) The number of shuttle routes for which the permit applicant is proposing to provide Shuttle Service, including the frequency of service on each route, the neighborhoods served by each route, the origin and terminus of each route, and the frequency of Shuttle Service on each route. In lieu of a map, the permit applicant may provide a narrative statement describing the routes. The applicant need only identify the route to the extent that it lies within the City. Where the point of origin or termination is outside of the City, the applicant need only provide the county in which the point of origin or termination is located;

(6) A list of the Designated Stops the permit applicant proposes to use on each shuttle route, along with the proposed frequency of use of each Designated Stop per day, resulting in a calculation of the total number of Stop Events per day at Designated Stops; and

(7) If applicable, d~~D~~ocumentation of the Applicant's registration status with the California Public Utilities Commission ("CPUC"), including any Charter Party Carrier ("TCP") authorization or permits, or registration as a private carrier of passengers, and documentation that the Applicant maintains insurance in compliance with the applicable requirements imposed by the CPUC.

(8) The application shall require the applicant to acknowledge that the Permittee, by acceptance of the permit, agrees to indemnify and hold the City and County of San Francisco, its departments, commissions, boards, officers, employees and agents ("Indemnitees") harmless from and against any and all claims, demands, actions or causes of action which may be made against the Indemnitees for the recovery of damages for the injury to or death of any person or persons or for the damage to any property resulting

directly or indirectly from the activity authorized by the permit, including, regardless of the negligence of the Indemnitees.

(9) Applicant shall provide a Service Disruption Prevention Plan which describes Permittee's efforts to maintain consistent and efficient service in the event of potential disruptions.

(A) The Service Disruption Prevention Plan must address, at a minimum:

(i) How bus breakdowns or stalls (mechanical or otherwise) will be remedied quickly so as not to block access to bus zones or impede the free flow of traffic;

(ii) Sufficient bus availability to satisfy ridership demand;

(iii) Sufficient back-up driver staffing in the event that drivers are unable to work due to sickness or other reason;

(iv) Contingency routing plans in the case of construction, special events, parades, celebrations, rallies, protests or other activity that may block access to certain city streets; and

(v) A description of the means by which Applicant has considered the San Francisco Board of Supervisors' March 2015 Labor Harmony Resolution, including steps taken to avoid potential disruptions by addressing the principles and concerns set forth in such Resolution, and any agreements or documents evidencing such steps, as well as information regarding shuttle driver schedules (including any split-shifts), work hours, working conditions, and wages.

(B) The Service Disruption Prevention Plan may, but is not required to, include statements from third parties describing the Applicant's efforts to prevent service disruptions.

(C) The SFMTA will post the Service Disruption Prevention Plan for each Permittee on the SFMTA website.

(D) The Permittee shall provide notice to SFMTA of any labor dispute in which it is involved that has the potential to cause a disruption of service.

(e) **Permit Issuance.** After evaluating an applicant's permit application, the Director shall grant the Permit as requested, or grant the Permit with modifications, or deny the Permit. Where the Permit is granted with modifications or denied, the notice shall explain the basis for the Director's decision. The Director may issue procedures for reviewing the Director's decision upon request of the permit applicant.

(f) **Shuttle Placard Application Requirements.** For each vehicle to be used in the Commuter Shuttle Program, Shuttle Service Providers shall apply for a Shuttle Placard. Each application for a Shuttle Placard or renewal of a Shuttle Placard shall contain the following information for the Shuttle Bus that would be authorized, when bearing the Shuttle Placard, to use Designated Stops:

(1) The manufacturer and vehicle make or model name;

(2) The length, gross vehicle weight rating, and passenger capacity;

(3) The model year, or, in the case of vehicles older than model year 2012 that were not previously authorized for use in Shuttle Service under the pilot program, documentation demonstrating compliance with applicable emissions standards for model year 2012;

(4) The type of fuel or power used; and

(5) The license plate number and vehicle registration information.

(g) **Shuttle Placard Issuance.** After evaluating an applicant's Shuttle Placard application, the Director shall grant the Shuttle Placard as requested, or deny the Shuttle Placard application and state the reason(s) for the denial.

(~~f~~h) **Shuttle Permit Terms and Conditions.** The Director shall establish terms and conditions for Shuttle Permits. In addition to any other requirements imposed by the Director, Permits shall include the following terms:

(1) Any Shuttle Bus being operated in Shuttle Service under the Shuttle Permit shall be listed on the ~~permit~~ Permittee's Shuttle Placard application and shall display a valid SFMTA-issued Shuttle Placard visible from outside the Shuttle Bus at front and rear locations on the Shuttle Bus as specified by the SFMTA, at all times such vehicle is being operated in Shuttle Service in the City. A Shuttle Placard~~s~~ may be used only for the vehicle listed on the application for that Shuttle Placard, and may not be transferred to any other vehicle~~between any Shuttle Buses in the Shuttle Service Provider's fleet that are listed on the Permit~~.

(2) A Shuttle Bus bearing valid Shuttle Placards shall be allowed to stop at any Designated Stop subject to the following conditions:

(A) The Shuttle Bus shall give priority to any transit buses that are approaching or departing a Designated Stop;

(B) The Shuttle Bus shall not stop at any Muni stops other than Designated Stops;

(C) The Shuttle Bus shall use Designated Stops only for active loading or unloading of passengers when in the course of actively providing Shuttle Service, and such loading and unloading shall be conducted as quickly as possible without compromising the safety of passengers, pedestrians, bicyclists or other motorists;

(D) Loading and unloading of passengers shall not take place in, or impede travel in, a lane of traffic or bicycle lane.

(3) A Shuttle Permit and Shuttle Placard shall not exempt a Shuttle Bus from any other Parking restrictions or traffic regulations except as authorized by this Section 914, and a Shuttle Bus stopping or parking at any Muni stop, including a Designated Stop, in violation of the terms and conditions set forth in this Subsection (~~f~~h) may be cited for violation of California Vehicle Code Section 22500(i).

(4) The Permittee shall comply with all applicable federal, state, and local laws, including this Code, the California Vehicle Code, and applicable CPUC requirements, including those for registration, insurance, vehicle inspection, and regulation of drivers;

(5) The Permittee shall equip each Shuttle Bus with an on-board device capable of providing real-time location data to the SFMTA in accordance with specifications issued by the Director, and shall maintain a continuous feed of the specified data at all times when the Shuttle Bus is being used to provide Shuttle Service within the City. The Permittee shall begin providing a continuous feed of such data to the SFMTA on the first day that the Permittee begins providing Shuttle Service under the Permit unless the Director establishes an alternate date. ~~Notwithstanding the foregoing requirements stated in this subsection (f)(5), if the Permittee is unable to provide the required data in accordance with specifications issued by the Director, the Permittee shall install an on-board device (OBD) prescribed by the SFMTA in each Shuttle Bus.~~ The SFMTA shall not be responsible for any equipment, or for the failure of any equipment, installed inside any Shuttle Bus for any reason, including for the purpose of complying with this Section 914. If a Shuttle Bus becomes unable to provide the required data for any reason, Permittee shall not operate that Shuttle Bus in Shuttle Service without first notifying SFMTA of the identity of the bus, the route affected, and the time at which Permittee expects the data transmission to be restored. To facilitate SFMTA's monitoring of Shuttle Bus operations, the Director may issue regulations limiting the duration that a Shuttle Bus may operate in Shuttle Service without being able to provide the required data.

(6) The Permittee shall provide the following data regarding its Shuttle Buses, updated each month: average daily Stop Events per Designated Stop for all Shuttle Buses, monthly vehicle miles traveled by Shuttle Buses in commuter shuttle service in San

Francisco (including any deadheading), average daily boardings in commuter shuttle service in San Francisco, average daily occupancy for each Shuttle Bus upon exiting San Francisco (if applicable), average daily occupancy for each Shuttle Bus upon arrival at destination, and average number of daily Shuttle Buses in operation.

(~~6~~7) The Permittee shall, in a timely manner and as otherwise required by law, pay all traffic and parking citations issued to its Shuttle Buses in the course of providing Shuttle Service, as well as all permit fees and penalties for permit violations as set forth in subsections (~~h~~j) and (~~j~~l) below, subject to the Permittee's right under applicable law to contest such citations or penalties.

(~~7~~8) Where the Director determines that the continued use of a particular Shuttle Bus listed on a Shuttle Provider's permit application would constitute a risk to public safety, the Director shall notify the Shuttle Provider in writing, and said Shuttle Bus shall immediately be ineligible to use any Designated Stops unless and until the Shuttle Provider has proven to the satisfaction of the Director that the Shuttle Bus no longer constitutes a risk to public safety.

(9) Permitted Shuttle Buses that exceed 35 feet in length travelling in San Francisco may travel only on the major and minor arterial street network for the City of San Francisco, as determined by the California Department of Transportation.

(10) Permittee shall certify that all of its operators who drive permitted Shuttle Buses in San Francisco have viewed the SFMTA's Large Vehicle Urban Driving Safety video, which will be made available to all permit applicants.

(11) Any Shuttle Service Provider providing Shuttle Service that is free to the public and provided by Shuttle Buses that display the words "Free to the Public" clearly legible on the loading side of the Shuttle Bus in letters at least four inches tall, shall be exempt from otherwise applicable permit fees for Stop Events made by such Shuttle Buses.

(12) All Shuttle Buses not already approved for use under the SFMTA's commuter shuttle pilot program as of January 31, 2016 must be either model year 2012 or newer, or be equipped with a power source that complies with emissions standards applicable to the 2012 class of vehicle. As of January 1, 2020, all Shuttle Buses used by Permittees for Shuttle Service must be model year 2012 or newer. After January 1, 2020, all Shuttle Buses used by Permittees for Shuttle Service must be no more than eight model years old.

(~~g~~i) **Duration of Shuttle Permits and Shuttle Placards.** Shuttle Permits and Shuttle Placards ~~initially~~ issued under this Section 914 shall expire one year from the effective date of the ordinance establishing the commuter shuttle permit program on a permanent basis, and annually thereafter~~six months from the date of commencement of the pilot program designated by the Director pursuant to subsection (c)(1)~~, unless a shorter term is requested by the Permittee, the Permit is revoked, or the Director for good cause finds a shorter term is warranted. ~~Permits issued or renewed on or after that six months' date shall expire 18 months from the date of program commencement, unless a shorter term is requested by the Permittee, the Permit is revoked or the Director for good cause finds a shorter term is required.~~

(~~h~~j) **Fees.**

(1) Unless exempted under subsection (h)(11), Shuttle Service Providers shall pay a Designated Stop use and permit fee as set forth in Section 902. The fee is intended to cover the costs incurred by ~~to~~ SFMTA as a result of permit program implementation, administration, enforcement, and evaluation. The Designated Stop use fee ~~component~~ shall be determined by multiplying the total number of anticipated daily Stop Events stated in the permit application for each Permittee by the per stop fee set forth ~~below~~ in Section 902. The Director is authorized, in his or her discretion, to impose pro-rated Designated Stop use fees

where a Shuttle Service Provider applies for a permit or permit modification following date of commencement of the ~~pilot~~ program.

(2) Permittees shall be billed for the Designated Stop use and permit fee upon issuance or renewal of the Permit, and on a monthly basis thereafter. The Designated Stop use and permit fee shall be due and payable within 30 days from the date of invoice. Fees remaining unpaid 30 days after the date of invoice shall be subject to a 10% ~~percent~~ penalty plus interest at the rate of ~~one percent~~ 1% per month on the outstanding balance, which shall be added to the fee amount from the date that payment is due.

(3) SFMTA shall reconcile the number of Stop Events for each Shuttle Service Provider against the actual stop data provided to the SFMTA on a semi-annual basis, but reserves the right to conduct such reconciliation on a more frequent basis if necessary. Where the SFMTA determines that a Shuttle Service Provider has used Designated Stops more frequently than authorized under the Provider's Permit, the Provider shall pay the additional Designated Stop use fee due. Where SFMTA determines that the Permittee's use of Designated Stops exceeds the authorized number of daily Stop Events by 10% ~~percent~~ or more, the Provider shall pay the additional Designated Stop use fee due, plus a 10% ~~percent~~ penalty. All such fees shall be due within 30 days from the date of invoice. Fees remaining unpaid after that date shall be subject to interest at the rate of ~~one~~ 1% ~~percent~~ per month on the outstanding balance, which shall be added to the fee amount from the date that payment is due.

(~~i~~k) **Grounds for Suspension or Revocation.**

(1) The Director may suspend or revoke a permit issued under this Section 914 upon written notice of revocation and opportunity for hearing. The Director is authorized to promulgate hearing and review procedures for permit suspension and revocation proceedings. Upon revocation or suspension, the

Shuttle Service Provider shall surrender such Permit and the Shuttle Placards authorized under the Permit in accordance with the instructions in the notice of suspension or revocation.

(2) Where the Director determines that public safety is at risk, or where the Permittee's continued operation as a Shuttle Service Provider would be in violation of the California Public Utilities Code or the California Vehicle Code, the Director is authorized to suspend a permit issued under this Section 914 immediately upon written notice of suspension to the Permittee, provided that the Director shall provide the Permittee with the opportunity for a hearing on the suspension within five business days of the date of notice of suspension.

(3) A permit issued under this Section 914 may be suspended or revoked under this paragraph following the Director's determination after an opportunity for hearing that:

(A) the Permittee has failed to abide by any permit condition;

(B) the Permittee knowingly or intentionally provided false or inaccurate information on a permit application;

(C) one or more of Permittee's Shuttle Buses have, in the course of providing Shuttle Service, repeatedly and egregiously violated parking or traffic laws;

(D) the Permittee's continued operation as a Shuttle Service Provider would constitute a public safety risk; or

(E) the Permittee's continued operation as a Shuttle Service Provider would be in violation of the California Public Utilities Code or the California Vehicle Code.

(~~j~~l) **Administrative Penalties.**

(1) This Section shall govern the imposition, assessment and collection of administrative penalties imposed for violations of permit conditions set forth under Subsection 914(~~f~~h).

(2) The SFMTA Board of Directors finds:

(A) That it is in the best interest of the City, its residents, visitors and those who travel on City streets to provide an administrative penalty mechanism for enforcement of Shuttle Bus permit conditions; and

(B) That the administrative penalty scheme established by this section is intended to compensate the public for the injury or damage caused by Shuttle Buses being operated in violation of the permit conditions set forth under Subsection 914(~~f~~h). The administrative penalties authorized under this section are intended to be reasonable and not disproportionate to the damage or injury to the City and the public caused by the prohibited conduct.

(C) The procedures set forth in this Section are adopted pursuant to Government Code Section 53069.4, which governs the imposition, enforcement, collection, and administrative review of administrative citations and fines by local agencies, and pursuant to the City's home rule power over its municipal affairs.

(3) Any Service Provider that is operating a Shuttle Bus in violation of the permit conditions set forth under Subsection 914(~~f~~h) may be subject to the issuance of a citation and imposition of an administrative penalty under this Subsection 914(~~j~~l).

(4) Administrative penalties may not exceed $250 for each violation. In determining the amount of the penalty, the officer or employee who issued the citation may take any or all of the following factors into consideration:

(A) The duration of the violation;

(B) The frequency, recurrence and number of violations by the same violator;

(C) The seriousness of the violation;

(D) The good faith efforts of the violator to correct the violation;

(E) The economic impact of the fine on the violator;

(F) The injury or damage, if any, suffered by any member of the public;

(G) The impact of the violation on the community;

(H) The amount of City staff time expended investigating or addressing the violation;

(I) The amount of fines imposed by the charging official in similar situations;

(J) Such other factors as justice may require.

(5) The Director of Transportation is authorized to designate officers or employees of the Municipal Transportation Agency to issue citations imposing administrative penalties for violations of the permit conditions set forth in Subsection 914(~~f~~h), hereafter referred to as the "Charging Official."

(6) Administrative Citation. A Charging Official who determines that there has been a violation of the permit conditions set forth in Subsection 914(~~f~~h), may issue an administrative citation to the Shuttle Service Provider permitted under this Section 914. The Charging Official shall either serve the citation personally on the Shuttle Service Provider or serve it by certified U.S. mail sent to the address indicated on the Shuttle Service Provider's permit application.

(7) The citation shall contain the following information: the name of the person or entity cited; the date, time, address or location, and nature of the violation; the date the citation is issued; the name and signature of the Charging Official; the amount of the administrative penalty, acceptable forms of payment of the penalty; and that the penalty is due and payable to the SFMTA within 15 business days from (A) the date of issuance of the citation if served personally,

or (B) the date of receipt of the citation if served by certified U.S. Mail. The citation shall also state that the person or entity cited that it has the right to appeal the citation, as provided in Subsection 914(~~j~~l).

(8) Request for Hearing; Hearing.

(A) A person or entity may appeal the issuance of a citation by filing a written request with the SFMTA Hearing Division within 15 business days from (i) the date of the issuance of a citation that is served personally or (ii) the date of receipt if the citation is served by certified U.S. Mail. The failure of the person or entity cited to appeal the citation shall constitute a failure to exhaust administrative remedies and shall preclude the person or entity cited from obtaining judicial review of the validity of the citation.

(B) At the time that the appeal is filed, the appellant must deposit with the SFMTA Hearing Division the full amount of the penalty required under the citation.

(C) The SFMTA Hearing Division shall take the following actions within 10 days of receiving an appeal: appoint a hearing officer, set a date for the hearing, which date shall be no less than 10 and no more than 60 days from the date that the appeal was filed, and send written notice of the hearing date to the appellant and the Charging Official.

(D) Upon receiving notice that the SFMTA Hearing Division has scheduled a hearing on an appeal, the Charging Official shall, within three City business days, serve the hearing officer with records, materials, photographs, and other evidence supporting the citation. The hearing officer may grant a request to allow later service and may find good cause to continue the hearing because of the delay.

(E) The hearing officer shall conduct all appeal hearings under this Chapter and shall be responsible for deciding all matters relating to the hearing

procedures not otherwise specified in this Section. The Charging Official shall have the burden of proof in the hearing. The hearing officer may continue the hearing at his or her own initiative or at the request of either party, and may request additional information from either party to the proceeding. The hearing need not be conducted according to technical rules of evidence and witnesses. Any relevant evidence is admissible if it is the sort of evidence on which responsible persons are accustomed to rely in the conduct of serious affairs.

(F) The following provisions shall also apply to the appeal procedure:

(i) A citation that complies with the requirements of Section 914(~~j~~l)(7) and any additional evidence submitted by the Charging Official shall be prima facie evidence of the facts contained therein;

(ii) The appellant shall be given the opportunity to present evidence concerning the citation; and

(iii) The hearing officer may accept testimony by declaration under penalty of perjury relating to the citation from any party if he or she determines it appropriate to do so.

(iv) After considering all of the testimony and evidence submitted by the parties, the hearing officer shall issue a written decision upholding, modifying or vacating the citation and shall set forth the reasons for the determination. This shall be a final administrative determination.

(v) If the hearing officer upholds the citation, the hearing officer shall inform the appellant of its right to seek judicial review pursuant to California Government Code Section 53069.4. If the citation is upheld, the City shall retain the amount of the fine that the appellant deposited with the City.

(vi) If the hearing officer vacates the citation, the City shall promptly refund the deposit. If the hearing officer partially vacates the citation,

the City shall promptly refund that amount of the deposit that corresponds to the hearing officer's determination. The refund shall include interest at the average rate earned on the City's portfolio for the period of time that the City held the deposit as determined by the Controller.

(G) Any person aggrieved by the action of the hearing officer taken pursuant to this Chapter may obtain review of the administrative decision by filing a petition for review in accordance with the timelines and provisions set forth in California Government Code Section 53069.4.

(H) If a final order of a court of competent jurisdiction determines that the SFMTA has not properly imposed a fine pursuant to the provisions of this Section, and if the fine has been deposited with the SFMTA as required by Section 914(~~j~~l)(8)(B), the SFMTA shall promptly refund the amount of the deposited fine, consistent with the court's determination, together with interest at the average rate earned on the City's portfolio.

(9) Upon request by a Shuttle Service Provider owing administrative penalties for violation of permit conditions set forth under Subsection 914(~~f~~h), the SFMTA may enter into a payment plan with that Shuttle Service Provider. Any such payment plan shall not extend the time for payment beyond 90 days from the otherwise applicable due date for the most recent penalty encompassed by the payment plan. In no event shall SFMTA establish more than three such payment plans for any individual Shuttle Service Provider ~~during the term of this pilot program~~.

(10) Administrative penalties shall be deposited in the Municipal Transportation Fund and may be expended only by the SFMTA.

Section 2. Effective Date. This ordinance shall become effective 31 days after enactment. Enactment occurs when the San Francisco Municipal Transportation Agency Board of Directors approves this ordinance.

Section 3. Scope of Ordinance. In enacting this ordinance, the San Francisco Municipal Transportation Agency Board of Directors intends to amend only those words, phrases, paragraphs, subsections, sections, articles, numbers, letters, punctuation marks, charts, diagrams, or any other constituent parts of the Transportation Code that are explicitly shown in this ordinance as additions or deletions in accordance with the "Note" that appears under the official title of the ordinance.

APPROVED AS TO FORM:
DENNIS J. HERRERA, City Attorney

By:

DAVID A. GREENBURG
Deputy City Attorney

I certify that the foregoing resolution was adopted by the San Francisco Municipal Transportation Agency Board of Directors at its meeting of November 17, 2015.

Secretary to the Board of Directors
San Francisco Municipal Transportation Agency

Attachment C

Appeal Letter from Coalition for Fair, Legal and Environmental Transit, Service Employees International Union Local 1021, Sue Vaughan, and Robert Planthold

LOZEAU DRURY LLP

T 510 836 4200
F 510 836 4205

410 12th Street, Suite 250
Oakland, Ca 94607

www.lozeaudrury.com
rebecca@lozeaudrury.com

December 17, 2015

Via Hand Delivery and Electronic Mail
President London Breed
c/o Ms. Angela Calvillo, Clerk of the Board
Board of Supervisors of the City and County of San Francisco
1 Dr. Carlton B. Goodlett Place
City Hall, Room 244
San Francisco, CA 94102-4689
Email: Board.of.Supervisors@sfgov.org

Re: Appeal of SFMTA Resolution No. 15-161, CEQA Categorical Exemption Determinations for Commuter Shuttle Permit Program

Dear President Breed and Honorable Members of the Board of Supervisors:

I am writing on behalf of the Coalition for Fair, Legal and Environmental Transit ("Coalition"), Service Employees International Union Local Union 1021 ("SEIU 1021"), Sue Vaughan, and Robert Planthold (collectively, "Appellants") concerning the San Francisco Municipal Transportation Agency ("SFMTA") Commuter Shuttle Permit Program and recent amendments to Transportation Code, Division II, to establish a Commuter Shuttle Permit Program to authorize certain shuttle buses to stop in designated Muni stops and passenger loading zones for the purpose of loading or unloading passengers, and establish permit conditions for such permits ("Shuttle Project").

The Coalition is a non-profit unincorporated association based in the City and County of San Francisco, and comprised of San Francisco residents who are concerned about the failure of the City to conduct CEQA review for the Shuttle Project to analyze and mitigate impacts including displacement, air pollution, pedestrian and bicycle safety, public transportation impacts and other impacts. SEIU 1021 is a non-profit public and private service employees' union with over 6,000 members living in the City and County of San Francisco. SEIU is concerned that its members are being forced out of the City in part as a result of commuter shuttles. SEIU 1021 is also concerned that its members are being exposed to air pollution, pedestrian and bicycle safety risks, and other environmental impacts as a result of the Shuttle Project. Ms. Vaughan and Mr. Planthold are San Francisco Resident concerned with the City's failure to conduct CEQA review and the City's adoption of a program that conflicts with the California Vehicle Code.

LOZEAU DRURY LLP

T 510.836.4200
F 510.836.4205

410 12th Street, Suite 250
Oakland, Ca 94607

www.lozeaudrury.com
rebecca@lozeaudrury.com

December 17, 2015

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Dear President Breed and Honorable Members of the Board of Supervisors:

I am writing on behalf of the Coalition for Fair, Legal and Environmental Transit ("Coalition"), Service Employees International Union Local Union 1021 ("SEIU 1021"), Sue Vaughan, and Robert Planthold (collectively, "Appellants") concerning the San Francisco Municipal Transportation Agency ("SFMTA") Commuter Shuttle Permit Program and recent amendments to Transportation Code, Division II, to establish a Commuter Shuttle Permit Program to authorize certain shuttle buses to stop in designated Muni stops and passenger loading zones for the purpose of loading or unloading passengers, and establish permit conditions for such permits ("Shuttle Project").

The Coalition is a non-profit unincorporated association based in the City and County of San Francisco, and comprised of San Francisco residents who are concerned about the failure of the City to conduct CEQA review for the Shuttle Project to analyze and mitigate impacts including displacement, air pollution, pedestrian and bicycle safety, public transportation impacts and other impacts. SEIU 1021 is a non-profit public and private service employees' union with over 6,000 members living in the City and County of San Francisco. SEIU is concerned that its members are being forced out of the City in part as a result of commuter shuttles. SEIU 1021 is also concerned that its members are being exposed to air pollution, pedestrian and bicycle safety risks, and other environmental impacts as a result of the Shuttle Project. Ms. Vaughan and Mr. Planthold are San Francisco Resident concerned with the City's failure to conduct CEQA review and the City's adoption of a program that conflicts with the California Vehicle Code.

Appellants live within areas of displacement, traffic, air quality, bicycle and pedestrian safety impacts and other impacts of the Shuttle Project, and regularly use public thoroughfares and public transportation in areas that will be impacted by the Shuttle Project.

A. Decision Being Appealed (Admin. Code §§ 31.16(a); (b)(1), (e).

Pursuant to San Francisco Administrative Code ("Admin. Code") Section 31.16, Appellants hereby appeal the November 17, 2015 decision of SFMTA Board of Directors approving Resolution No. 15-161 (the "Approval Action"), including but not limited to:

(1) Approval of amendments to the Transportation Code to authorize a commuter shuttle permit program to allow commuter shuttle service providers to use designated Muni zones and white curb loading zones for passenger loading and unloading;
(2) Adoption of a Commuter Shuttle Program Policy to govern the SFMTA's implementation of the commuter shuttle permit program, improving approval of the designated Muni zones and white curb zones;
(3) Determination that the Shuttle Project is exempt from environmental review pursuant to Title 14 of the California Code of Regulations section 15301 and 15308 as a Class 1 and Class 8 categorical exemption from CEQA; and
(4) Concurrence with the October 22, 2015 San Francisco Planning Department determination that the Project it exempt from environmental review ("CEQA Concurrence").

Pursuant to Admin. Code Section 31.16(b)(1), true and correct copies of Resolution No. 15-161 and the related San Francisco Planning Department's CEQA determination are attached hereto as **Exhibit A**. Pursuant to Admin Code Section 31.16(b)(1), a copy of this Appeal Letter is simultaneously being submitted to the Environmental Review Officer.

B. Grounds for Appeal (Admin. Code § 31.16(b)(1), (e)).

Appellants urge the Board of Supervisors to reverse the Approval Action for the Shuttle Project on the grounds that the Project is not exempt from the requirements of the California Environmental Quality Act, Pub. Res. Code §§ 21000, et seq. ("CEQA"). Specifically, the Shuttle Project is not subject to a categorical exemption under 14 Cal. Code Regs. ("CCR") §§ 15301 or 15308 because the Shuttle Project goes beyond the limited scope of those exemptions. Moreover, even if the exemptions did apply, which they do not, they would be inapplicable in this instance because the Shuttle Project will result in significant environmental impacts due to unusual circumstances. These include impacts on the residents of San Francisco, including Appellants.

In addition, Appellants urge the Board of Supervisors to reverse the Approval Action because the Shuttle Project is preempted by the California Vehicle Code. In direct conflict with section 22500(e) of the California Vehicle Code's prohibition against private buses stopping in public "red-curb" bus stops, the Shuttle Project expressly ***allows*** the same action. The California Supreme Court has held that cities (including charter cities) may not enact ordinances that conflict with the State Vehicle Code, because the Vehicle Code expressly preempts local regulation. *O'Connell v. City of Stockton* (2007) 41 Cal.4th 1061, 1074. Since the Shuttle Project expressly allows private buses to stop in public bus stops, and since this action is expressly prohibited by State law, the City policy is preempted by state law and is unlawful.

C. Additional Appeal Procedures.

Appeal of SFMTA's Approval Action to the Board of Supervisors is authorized under CEQA and the Admin. Code. Pub. Res. Code § 21151(c); Admin. Code § 31.16(b), (e). This Appeal is timely because it is being filed within 30 days of November 17, 2015, the date of SFMTA's Approval Action of the Project. See Admin. Code § 31.16(e)(1), (2)(A), (B); see Resolution No. 15-161, p. 3 ("this is the Approval Action as defined by San Francisco Administrative Code Chapter 31").

Appellants expressly reserve the right to submit additional written and oral comments, and additional evidence in support of this Appeal, to the City and County of San Francisco and its departments ("City") and to the Board of Supervisors up to and including the final hearing on this Appeal and any and all subsequent permitting proceedings or approvals undertaken by the City or any other permitting agency for the Project. PRC § 21177(a); *Bakersfield Citizens for Local Control v. Bakersfield* (2004) 124 Cal. App. 4th 1184, 1199-1203; *see Galante Vineyards v. Monterey Water Dist.* (1997) 60 Cal. App. 4th 1109, 1121; Admin Code §§ 31.16(b)(4), (5), (6).

Thank you for consideration of this Appeal. Please place this Appeal Letter in the Administrative Record for the Shuttle Project, and provide Appellants with timely notice of the hearing date set for this Appeal. Admin. Code § 31.16(b)(4).

Sincerely,

Rebecca L. Davis
Lozeau | Drury LLP

Enclosures

cc. Environmental Review Officer
(pursuant to SF Administrative Code § 31.16(b)(1))

EXHIBIT A

SAN FRANCISCO
MUNICIPAL TRANSPORTATION AGENCY
BOARD OF DIRECTORS

RESOLUTION No. 15-161

WHEREAS, The use of shuttle buses to provide commuter shuttle service for the benefit of employees, students and others is a growing means of sustainable transportation in San Francisco and the greater Bay Area, and has become increasingly common in the past several years; and,

WHEREAS, Commuter shuttles are free under law to drive on most of San Francisco's streets, and the SFMTA cannot ban shuttles from the City; and,

WHEREAS, Shuttle bus service provides alternatives to single-occupant vehicle trips, and is associated with reduced auto ownership and with increased use of transit, walking, and bicycling for non-commute trips; and,

WHEREAS, The increase in shuttle buses on San Francisco's streets has led to an increase in issues related to Muni operations, street safety, and complaints from residents; and,

WHEREAS, As part of an effort to address these issues, in 2014, the SFMTA created a pilot program (the "Pilot") to gather accurate and up-to-date information on commuter shuttle activity and operations and to determine if active regulation of shuttles can reduce traffic conflicts and other issues; and,

WHEREAS, Under the Pilot, the SFMTA created a permit program and established a shuttle zone network of designated Muni zones and white loading zones around the City that would be made available to shuttle service providers participating in the program, based upon input from the service providers, SFMTA transit service planning and engineering staff, and the community; and,

WHEREAS, Over the course of the Pilot, the SFMTA made the substantial changes and updates to the shuttle zone network to respond to issues such as street improvements, Muni service changes, shuttle ridership demand, construction, community concerns, and other operational considerations; and,

WHEREAS, The present Pilot shuttle zone network is the SFMTA's best estimate of an effective shuttle zone network; and,

WHEREAS, The SFMTA undertook an extensive evaluation of the Pilot to determine whether the method of regulation used in the Pilot should be continued beyond the pilot period; and,

WHEREAS, The Pilot Evaluation Report found that: the vast majority of community feedback focused on large shuttles being unwelcome on residential streets; effective and accurate real-time shuttle vehicle data assists the SFMTA in regulating and managing commuter shuttle activity; 47% of shuttle riders said they would drive alone to work if a shuttle were not available; shuttles reduce the amount of vehicle miles traveled on the region's streets by nearly 4.3 million miles each month; an average of 2.7% of shuttle stop-events resulted in blocking Muni access to a zone; shuttles block travel and bike lanes about 35% of the time that they stop to load or unload; and more enforcement staffing at shuttle zones and along shuttle routes would assist in keeping traffic flowing smoothly throughout the shuttle zone network and help speed Muni; and,

WHEREAS, After evaluating the Pilot, SFMTA staff developed a Commuter Shuttle Program Policy to establish an ongoing Commuter Shuttle Program that would continue much of the regulatory approach put in place by the Pilot, with several improvements and enhancements based upon the Pilot Evaluation Report and input from elected officials, community members, the SFMTA's transit and traffic engineering teams, shuttle service providers, employers, and other interested stakeholders; and,

WHEREAS, The proposed Commuter Shuttle Program would require participating shuttle service providers to phase in the use of newer vehicles in order to lower greenhouse gas emissions from the shuttle fleet overall; and,

WHEREAS, The proposed Commuter Shuttle Program would require buses participating in the program that are over 35 feet long to travel on the major and minor arterial street network as defined by the California Department of Transportation; and,

WHEREAS, The proposed Commuter Shuttle Program would allow shuttles that are free and open to the public to use the shuttle zone network without charge as long as those shuttles comply with all other Commuter Shuttle Program requirements; and,

WHEREAS, The proposed Commuter Shuttle Program would require real-time GPS data collection and reporting to help better manage commuter shuttle operations and target enforcement; and,

WHEREAS, The proposed Commuter Shuttle Program would require increased data sharing from participating shuttle service providers, and requires that participating shuttle service providers demonstrate for each vehicle that data feeds are regular and accurate before receiving a permit; and,

WHEREAS, The proposed Commuter Shuttle Program would require participating shuttle service providers to comply with the San Francisco Board of Supervisors' March 2015 Labor Harmony Resolution, including the submission of a Service Disruption Prevention Plan that describes the shuttle service providers' efforts to ensure efficient and consistent service in the event of potential disruptions, including labor disputes; and,

WHEREAS, The permit fee for participation in the proposed Commuter Shuttle Program would be a per-stop fee which will be determined by aggregating the costs to the SFMTA that result from the program and dividing that total cost by the annual number of stop-events that all program participants plan to make; and,

WHEREAS, The Commuter Shuttle Program Policy includes the network of designated Muni zones and passenger loading zones that would be available to participating shuttle service providers; and

WHEREAS, The Commuter Shuttle Program Policy also includes capital improvements at shuttle zones and corridors, with such costs recovered, at least in part, as part of the fee for participation in the program; and,

WHEREAS, The per-stop fee amount for the proposed Commuter Shuttle Program will be calculated once the SFMTA has completed the review and approval process for program participation, and will be brought to the SFMTA Board of Directors at a future date for approval and appropriate amendment of the Transportation Code; and,

WHEREAS, On October 22, 2015, the San Francisco Planning Department determined that the proposed Commuter Shuttle Program and Transportation Code amendments are exempt from environmental review pursuant to Title 14 of the California Code of Regulations Sections 15301 and 15308 as a Class 1 and Class 8 categorical exemption from the California Environmental Quality Act (CEQA), the SFMTA Board of Directors concurs with this determination, the Planning Department's determination is on file with the Secretary to the SFMTA Board of Directors, and this is the Approval Action as defined by San Francisco Administrative Code Chapter 31; now, therefore, be it

RESOLVED, That the San Francisco Municipal Transportation Agency Board of Directors finds that substantial evidence in the record, as set forth in the California Environmental Quality Act findings in Attachment A to this resolution, supports the determination that the proposed Commuter Shuttle Program and Transportation Code amendments are exempt from environmental review pursuant to Title 14 of the California Code of Regulations section 15301 and 15308 as a Class 1 and Class 8 categorical exemption from CEQA, and incorporates said findings by this reference as though fully set forth herein; and, be it further,

RESOLVED, That the San Francisco Municipal Transportation Agency Board of Directors amends the Transportation Code, Division II, to authorize a permit program to allow commuter shuttle service providers to use designated Muni zones and white curb loading zones for passenger loading and unloading; and, be it further

RESOLVED, That the San Francisco Municipal Transportation Agency Board of Directors adopts the Commuter Shuttle Program Policy to govern the SFMTA's implementation of the Commuter Shuttle Program, including the network of designated Muni zones and passenger loading zones that would be available to participating shuttle service providers.

I certify that the foregoing resolution was adopted by the San Francisco Municipal Transportation Agency Board of Directors at its meeting of November 17, 2015.

R. Boomer

Secretary to the Board of Directors
San Francisco Municipal Transportation Agency

RESOLUTION #15-161

[Transportation Code – Establishing Permanent Commuter Shuttle Permit Program]

Resolution amending the Transportation Code, Division II to establish a Commuter Shuttle Permit Program to authorize certain shuttle buses to stop in designated Muni stops and passenger loading zones for the purpose of loading or unloading passengers, and establish permit conditions for such permits.

NOTE: Additions are single-underline Times New Roman; deletions are ~~strike-through Times New Roman~~.

The Municipal Transportation Agency Board of Directors of the City and County of San Francisco enacts the following regulations:

Section 1. Article 900 of Division II of the Transportation Code is hereby amended by revising Section 914, to read as follows:

Sec. 914. COMMUTER **SHUTTLE STOP PERMITS.**

(a) **Definitions**. As used in this Section 914, the following words and phrases shall have the following meanings:

Designated Stop. An SFMTA bus stop or a white zone designated by SFMTA as a stop available for loading and/or unloading of passengers by Shuttle Service Providers that have been issued a Shuttle Permit under this Section 914.

Director. The Director of Transportation or his or her designee.

Shuttle Bus. A motor vehicle designed, used or maintained by or for a charter-party carrier of passengers, a passenger stage corporation, or any highway carrier of passengers required to register with the California Public Utilities Commission that is being operated in Shuttle Service. A Shuttle Bus shall

also include any bus that is owned, or being operated on behalf of, a governmental entity and being operated in Shuttle Service.

Shuttle Permit. A permit issued by the SFMTA that authorizes a Shuttle Service Provider to load and/or unload passengers at specified Designated Stops in one or more Shuttle Buses.

Shuttle Placard. A placard issued by SFMTA that is visible from outside the Shuttle Bus at front and rear locations as specified by the SFMTA and that identifies the Shuttle Permit authorizing the Shuttle Bus to use Designated Stops.

Shuttle Service. Transportation by Shuttle Buses offered for the exclusive or primary use of a discrete group or groups, such as clients, patients, students, paid or unpaid staff, visitors, and/or residents, between an organization or entity's facilities or between the organization or entity's facilities and other locations, on a regularly-scheduled basis.

Shuttle Service Provider. Any Person using Shuttle Buses to provide Shuttle Service within the City.

Stop Event. An instance of stopping by a Shuttle Bus at a Designated Stop for the purpose of loading and/or unloading passengers.

(b) **Findings.**

(1) The use of Shuttle Buses for the purpose of providing Shuttle Service is a growing means of transportation in San Francisco and the greater Bay Area.

(2) Shuttle Service provides significant benefits to the community by replacing single occupant trips with more efficient transportation, contributing to a reduction in parking demand, and supporting the City's goal of ~~having of 50 percent of all~~ increasing trips made by sustainable modes ~~by 2018~~.

(3) Shuttle Service currently operating in San Francisco reduces vehicle miles traveled (VMT) in the City by approximately 4,300,000~~at least 45 million~~ miles

~~annually~~each month~~, and reduces greenhouse gas emissions from trips originating or ending in the City by 11,000 metric tons annually~~.

(4) Unregulated use of Muni stops by Shuttle Service Providers ~~has resulted~~results in unintended adverse impacts, including delaying transit bus service, increasing traffic congestion, diverting bicyclists from bicycle lanes into mixed-flow lanes, and diverting motor vehicle traffic into adjacent travel lanes, and preventing transit buses from being able to access the curb in order to load and unload passengers.

(5) Prior to implementing a commuter shuttle pilot program in August, 2014, the~~The~~ SFMTA ~~'s~~ lacked ~~of~~ complete information about Shuttle Service operations, including routes, frequency of service and stops, which had ~~has~~ been a barrier to resolving and preventing conflicts with Shuttle Service Providers' operations, including adverse impacts on Muni service and increased traffic congestion.

(6) Inconsistent or inaccurate identification of, and lack of contact information for, Shuttle Service Providers ~~has~~ previously made it difficult for the SFMTA to effectively and timely communicate with Shuttle Service Providers to prevent or resolve conflicts and makes enforcement of traffic and parking regulations difficult.

(7) Regulation by the SFMTA of the use of stops ~~use~~ by Shuttle Services to provide safe loading and unloading zones for Shuttle Services, whose cumulative ridership is equivalent to that of a small transit system, is consistent with the City's Transit First policy.

(8) The commuter shuttle pilot program implemented in August 2014~~established under this Section 914 is intended to~~ enabled SFMTA to evaluate whether shared use of Muni stops by Shuttle Buses is consistent with efficient operation of the City's public transit system. An evaluation of the pilot program conducted by SFMTA showed that the pilot program was successful in addressing the

issues described above, and also showed ways that the program could be improved. SFMTA now seeks to establish a program that continues the successful aspects of the pilot program while building upon the lessons learned.

(c) **General Permit Program Requirements.**

(1) The Director is authorized to implement a ~~pilot~~ program for the issuance of Shuttle Permits beginning on a date designated by the Director. ~~The duration of the pilot program shall not exceed 18 months from the date of commencement designated by the Director.~~

(2) The Director may issue a Shuttle Permit for the use of Designated Stops upon receipt of an application from a Shuttle Service Provider on a form prescribed by the SFMTA which application meets the requirements of this Section 914.

(3) The Shuttle Permit shall authorize the Shuttle Service Provider to receive a specified number of Shuttle Placards issued by SFMTA.

(4) The Director is authorized to establish up to 200 Designated Stops for the purposes of this ~~pilot~~ program. The Director may establish additional Designated Stops following a public hearing.

(d) **Shuttle Permit Application Requirements.** Each application for a permit or renewal of a permit shall contain the following information:

(1) The name, business location, telephone number, fax number and email address of the Shuttle Service Provider;

(2) The name, title and contact information of one or more persons representing the Shuttle Service Provider to be notified by SFMTA in the event of a problem or permit violation relating to the Permittee's Shuttle Service;

(3) The total number of Shuttle Buses the Shuttle Service Provider intends to use to deliver Shuttle Service using Designated Stops~~, and the make,~~

~~passenger capacity and license plate number of each of its Shuttle Buses that would be authorized, when bearing a Shuttle Placard, to use one or more Designated Stops;~~

(4) The total number of Shuttle Placards requested;

(5) The number of shuttle routes for which the permit applicant is proposing to provide Shuttle Service, including the frequency of service on each route, the neighborhoods served by each route, the origin and terminus of each route, and the frequency of Shuttle Service on each route. In lieu of a map, the permit applicant may provide a narrative statement describing the routes. The applicant need only identify the route to the extent that it lies within the City. Where the point of origin or termination is outside of the City, the applicant need only provide the county in which the point of origin or termination is located;

(6) A list of the Designated Stops the permit applicant proposes to use on each shuttle route, along with the proposed frequency of use of each Designated Stop per day, resulting in a calculation of the total number of Stop Events per day at Designated Stops; and

(7) If applicable, d~~D~~ocumentation of the Applicant's registration status with the California Public Utilities Commission ("CPUC"), including any Charter Party Carrier ("TCP") authorization or permits, or registration as a private carrier of passengers, and documentation that the Applicant maintains insurance in compliance with the applicable requirements imposed by the CPUC.

(8) The application shall require the applicant to acknowledge that the Permittee, by acceptance of the permit, agrees to indemnify and hold the City and County of San Francisco, its departments, commissions, boards, officers, employees and agents ("Indemnitees") harmless from and against any and all claims, demands, actions or causes of action which may be made against the Indemnitees for the recovery of damages for the injury to or death of any person or persons or for the damage to any property resulting

directly or indirectly from the activity authorized by the permit, including, regardless of the negligence of the Indemnitees.

(9) Applicant shall provide a Service Disruption Prevention Plan which describes Permittee's efforts to maintain consistent and efficient service in the event of potential disruptions.

(A) The Service Disruption Prevention Plan must address, at a minimum:

(i) How bus breakdowns or stalls (mechanical or otherwise) will be remedied quickly so as not to block access to bus zones or impede the free flow of traffic;

(ii) Sufficient bus availability to satisfy ridership demand;

(iii) Sufficient back-up driver staffing in the event that drivers are unable to work due to sickness or other reason;

(iv) Contingency routing plans in the case of construction, special events, parades, celebrations, rallies, protests or other activity that may block access to certain city streets; and

(v) A description of the means by which Applicant has considered the San Francisco Board of Supervisors' March 2015 Labor Harmony Resolution, including steps taken to avoid potential disruptions by addressing the principles and concerns set forth in such Resolution, and any agreements or documents evidencing such steps, as well as information regarding shuttle driver schedules (including any split-shifts), work hours, working conditions, and wages.

(B) The Service Disruption Prevention Plan may, but is not required to, include statements from third parties describing the Applicant's efforts to prevent service disruptions.

(C) The SFMTA will post the Service Disruption Prevention Plan for each Permittee on the SFMTA website.

(D) The Permittee shall provide notice to SFMTA of any labor dispute in which it is involved that has the potential to cause a disruption of service.

(e) **Permit Issuance.** After evaluating an applicant's permit application, the Director shall grant the Permit as requested, or grant the Permit with modifications, or deny the Permit. Where the Permit is granted with modifications or denied, the notice shall explain the basis for the Director's decision. The Director may issue procedures for reviewing the Director's decision upon request of the permit applicant.

(f) **Shuttle Placard Application Requirements.** For each vehicle to be used in the Commuter Shuttle Program, Shuttle Service Providers shall apply for a Shuttle Placard. Each application for a Shuttle Placard or renewal of a Shuttle Placard shall contain the following information for the Shuttle Bus that would be authorized, when bearing the Shuttle Placard, to use Designated Stops:

(1) The manufacturer and vehicle make or model name;

(2) The length, gross vehicle weight rating, and passenger capacity;

(3) The model year, or, in the case of vehicles older than model year 2012 that were not previously authorized for use in Shuttle Service under the pilot program, documentation demonstrating compliance with applicable emissions standards for model year 2012;

(4) The type of fuel or power used; and

(5) The license plate number and vehicle registration information.

(g) **Shuttle Placard Issuance.** After evaluating an applicant's Shuttle Placard application, the Director shall grant the Shuttle Placard as requested, or deny the Shuttle Placard application and state the reason(s) for the denial.

(~~f~~h) **Shuttle Permit Terms and Conditions.** The Director shall establish terms and conditions for Shuttle Permits. In addition to any other requirements imposed by the Director, Permits shall include the following terms:

(1) Any Shuttle Bus being operated in Shuttle Service under the Shuttle Permit shall be listed on the ~~permit~~ Permittee's Shuttle Placard application and shall display a valid SFMTA-issued Shuttle Placard visible from outside the Shuttle Bus at front and rear locations on the Shuttle Bus as specified by the SFMTA, at all times such vehicle is being operated in Shuttle Service in the City. A Shuttle Placard~~s~~ may be used only for the vehicle listed on the application for that Shuttle Placard, and may not be transferred to any other vehicle~~between any Shuttle Buses in the Shuttle Service Provider's fleet that are listed on the Permit~~.

(2) A Shuttle Bus bearing valid Shuttle Placards shall be allowed to stop at any Designated Stop subject to the following conditions:

(A) The Shuttle Bus shall give priority to any transit buses that are approaching or departing a Designated Stop;

(B) The Shuttle Bus shall not stop at any Muni stops other than Designated Stops;

(C) The Shuttle Bus shall use Designated Stops only for active loading or unloading of passengers when in the course of actively providing Shuttle Service, and such loading and unloading shall be conducted as quickly as possible without compromising the safety of passengers, pedestrians, bicyclists or other motorists;

(D) Loading and unloading of passengers shall not take place in, or impede travel in, a lane of traffic or bicycle lane.

(3) A Shuttle Permit and Shuttle Placard shall not exempt a Shuttle Bus from any other Parking restrictions or traffic regulations except as authorized by this Section 914, and a Shuttle Bus stopping or parking at any Muni stop, including a Designated Stop, in violation of the terms and conditions set forth in this Subsection (~~f~~h) may be cited for violation of California Vehicle Code Section 22500(i).

(4) The Permittee shall comply with all applicable federal, state, and local laws, including this Code, the California Vehicle Code, and applicable CPUC requirements, including those for registration, insurance, vehicle inspection, and regulation of drivers;

(5) The Permittee shall equip each Shuttle Bus with an on-board device capable of providing real-time location data to the SFMTA in accordance with specifications issued by the Director, and shall maintain a continuous feed of the specified data at all times when the Shuttle Bus is being used to provide Shuttle Service within the City. The Permittee shall begin providing a continuous feed of such data to the SFMTA on the first day that the Permittee begins providing Shuttle Service under the Permit unless the Director establishes an alternate date. ~~Notwithstanding the foregoing requirements stated in this subsection (f)(5), if the Permittee is unable to provide the required data in accordance with specifications issued by the Director, the Permittee shall install an on-board device (OBD) prescribed by the SFMTA in each Shuttle Bus.~~ The SFMTA shall not be responsible for any equipment, or for the failure of any equipment, installed inside any Shuttle Bus for any reason, including for the purpose of complying with this Section 914. If a Shuttle Bus becomes unable to provide the required data for any reason, Permittee shall not operate that Shuttle Bus in Shuttle Service without first notifying SFMTA of the identity of the bus, the route affected, and the time at which Permittee expects the data transmission to be restored. To facilitate SFMTA's monitoring of Shuttle Bus operations, the Director may issue regulations limiting the duration that a Shuttle Bus may operate in Shuttle Service without being able to provide the required data.

(6) The Permittee shall provide the following data regarding its Shuttle Buses, updated each month: average daily Stop Events per Designated Stop for all Shuttle Buses, monthly vehicle miles traveled by Shuttle Buses in commuter shuttle service in San

Francisco (including any deadheading), average daily boardings in commuter shuttle service in San Francisco, average daily occupancy for each Shuttle Bus upon exiting San Francisco (if applicable), average daily occupancy for each Shuttle Bus upon arrival at destination, and average number of daily Shuttle Buses in operation.

(~~6~~7) The Permittee shall, in a timely manner and as otherwise required by law, pay all traffic and parking citations issued to its Shuttle Buses in the course of providing Shuttle Service, as well as all permit fees and penalties for permit violations as set forth in subsections (~~h~~i) and (~~j~~l) below, subject to the Permittee's right under applicable law to contest such citations or penalties.

(~~7~~8) Where the Director determines that the continued use of a particular Shuttle Bus listed on a Shuttle Provider's permit application would constitute a risk to public safety, the Director shall notify the Shuttle Provider in writing, and said Shuttle Bus shall immediately be ineligible to use any Designated Stops unless and until the Shuttle Provider has proven to the satisfaction of the Director that the Shuttle Bus no longer constitutes a risk to public safety.

(9) Permitted Shuttle Buses that exceed 35 feet in length travelling in San Francisco may travel only on the major and minor arterial street network for the City of San Francisco, as determined by the California Department of Transportation.

(10) Permittee shall certify that all of its operators who drive permitted Shuttle Buses in San Francisco have viewed the SFMTA's Large Vehicle Urban Driving Safety video, which will be made available to all permit applicants.

(11) Any Shuttle Service Provider providing Shuttle Service that is free to the public and provided by Shuttle Buses that display the words "Free to the Public" clearly legible on the loading side of the Shuttle Bus in letters at least four inches tall, shall be exempt from otherwise applicable permit fees for Stop Events made by such Shuttle Buses.

(12) All Shuttle Buses not already approved for use under the SFMTA's commuter shuttle pilot program as of January 31, 2016 must be either model year 2012 or newer, or be equipped with a power source that complies with emissions standards applicable to the 2012 class of vehicle. As of January 1, 2020, all Shuttle Buses used by Permittees for Shuttle Service must be model year 2012 or newer. After January 1, 2020, all Shuttle Buses used by Permittees for Shuttle Service must be no more than eight model years old.

(~~g~~i) **Duration of Shuttle Permits and Shuttle Placards.** Shuttle Permits and Shuttle Placards ~~initially~~ issued under this Section 914 shall expire one year from the effective date of the ordinance establishing the commuter shuttle permit program on a permanent basis, and annually thereafter~~six months from the date of commencement of the pilot program designated by the Director pursuant to subsection (c)(1)~~, unless a shorter term is requested by the Permittee, the Permit is revoked, or the Director for good cause finds a shorter term is warranted. ~~Permits issued or renewed on or after that six months' date shall expire 18 months from the date of program commencement, unless a shorter term is requested by the Permittee, the Permit is revoked or the Director for good cause finds a shorter term is required.~~

(~~h~~j) **Fees.**

(1) Unless exempted under subsection (h)(11), Shuttle Service Providers shall pay a Designated Stop use and permit fee as set forth in Section 902. The fee is intended to cover the costs incurred by ~~to~~ SFMTA as a result of permit program implementation, administration, enforcement, and evaluation. The Designated Stop use fee ~~component~~ shall be determined by multiplying the total number of anticipated daily Stop Events stated in the permit application for each Permittee by the per stop fee set forth ~~below~~ in Section 902. The Director is authorized, in his or her discretion, to impose pro-rated Designated Stop use fees

where a Shuttle Service Provider applies for a permit or permit modification following date of commencement of the ~~pilot~~ program.

(2) Permittees shall be billed for the Designated Stop use and permit fee upon issuance or renewal of the Permit, and on a monthly basis thereafter. The Designated Stop use and permit fee shall be due and payable within 30 days from the date of invoice. Fees remaining unpaid 30 days after the date of invoice shall be subject to a 10% ~~percent~~ penalty plus interest at the rate of ~~one percent~~ 1% per month on the outstanding balance, which shall be added to the fee amount from the date that payment is due.

(3) SFMTA shall reconcile the number of Stop Events for each Shuttle Service Provider against the actual stop data provided to the SFMTA on a semi-annual basis, but reserves the right to conduct such reconciliation on a more frequent basis if necessary. Where the SFMTA determines that a Shuttle Service Provider has used Designated Stops more frequently than authorized under the Provider's Permit, the Provider shall pay the additional Designated Stop use fee due. Where SFMTA determines that the Permittee's use of Designated Stops exceeds the authorized number of daily Stop Events by 10% ~~percent~~ or more, the Provider shall pay the additional Designated Stop use fee due, plus a 10% ~~percent~~ penalty. All such fees shall be due within 30 days from the date of invoice. Fees remaining unpaid after that date shall be subject to interest at the rate of ~~one~~ 1% ~~percent~~ per month on the outstanding balance, which shall be added to the fee amount from the date that payment is due.

(~~i~~k) **Grounds for Suspension or Revocation.**

(1) The Director may suspend or revoke a permit issued under this Section 914 upon written notice of revocation and opportunity for hearing. The Director is authorized to promulgate hearing and review procedures for permit suspension and revocation proceedings. Upon revocation or suspension, the

Shuttle Service Provider shall surrender such Permit and the Shuttle Placards authorized under the Permit in accordance with the instructions in the notice of suspension or revocation.

(2) Where the Director determines that public safety is at risk, or where the Permittee's continued operation as a Shuttle Service Provider would be in violation of the California Public Utilities Code or the California Vehicle Code, the Director is authorized to suspend a permit issued under this Section 914 immediately upon written notice of suspension to the Permittee, provided that the Director shall provide the Permittee with the opportunity for a hearing on the suspension within five business days of the date of notice of suspension.

(3) A permit issued under this Section 914 may be suspended or revoked under this paragraph following the Director's determination after an opportunity for hearing that:

(A) the Permittee has failed to abide by any permit condition;

(B) the Permittee knowingly or intentionally provided false or inaccurate information on a permit application;

(C) one or more of Permittee's Shuttle Buses have, in the course of providing Shuttle Service, repeatedly and egregiously violated parking or traffic laws;

(D) the Permittee's continued operation as a Shuttle Service Provider would constitute a public safety risk; or

(E) the Permittee's continued operation as a Shuttle Service Provider would be in violation of the California Public Utilities Code or the California Vehicle Code.

(~~j~~l) **Administrative Penalties.**

(1) This Section shall govern the imposition, assessment and collection of administrative penalties imposed for violations of permit conditions set forth under Subsection 914(~~f~~h).

(2) The SFMTA Board of Directors finds:

(A) That it is in the best interest of the City, its residents, visitors and those who travel on City streets to provide an administrative penalty mechanism for enforcement of Shuttle Bus permit conditions; and

(B) That the administrative penalty scheme established by this section is intended to compensate the public for the injury or damage caused by Shuttle Buses being operated in violation of the permit conditions set forth under Subsection 914(~~f~~h). The administrative penalties authorized under this section are intended to be reasonable and not disproportionate to the damage or injury to the City and the public caused by the prohibited conduct.

(C) The procedures set forth in this Section are adopted pursuant to Government Code Section 53069.4, which governs the imposition, enforcement, collection, and administrative review of administrative citations and fines by local agencies, and pursuant to the City's home rule power over its municipal affairs.

(3) Any Service Provider that is operating a Shuttle Bus in violation of the permit conditions set forth under Subsection 914(~~f~~h) may be subject to the issuance of a citation and imposition of an administrative penalty under this Subsection 914(~~j~~l).

(4) Administrative penalties may not exceed $250 for each violation. In determining the amount of the penalty, the officer or employee who issued the citation may take any or all of the following factors into consideration:

(A) The duration of the violation;

(B) The frequency, recurrence and number of violations by the same violator;

(C) The seriousness of the violation;

(D) The good faith efforts of the violator to correct the violation;

(E) The economic impact of the fine on the violator;

(F) The injury or damage, if any, suffered by any member of the public;

(G) The impact of the violation on the community;

(H) The amount of City staff time expended investigating or addressing the violation;

(I) The amount of fines imposed by the charging official in similar situations;

(J) Such other factors as justice may require.

(5) The Director of Transportation is authorized to designate officers or employees of the Municipal Transportation Agency to issue citations imposing administrative penalties for violations of the permit conditions set forth in Subsection 914(~~f~~h), hereafter referred to as the "Charging Official."

(6) Administrative Citation. A Charging Official who determines that there has been a violation of the permit conditions set forth in Subsection 914(~~f~~h), may issue an administrative citation to the Shuttle Service Provider permitted under this Section 914. The Charging Official shall either serve the citation personally on the Shuttle Service Provider or serve it by certified U.S. mail sent to the address indicated on the Shuttle Service Provider's permit application.

(7) The citation shall contain the following information: the name of the person or entity cited; the date, time, address or location, and nature of the violation; the date the citation is issued; the name and signature of the Charging Official; the amount of the administrative penalty, acceptable forms of payment of the penalty; and that the penalty is due and payable to the SFMTA within 15 business days from (A) the date of issuance of the citation if served personally,

or (B) the date of receipt of the citation if served by certified U.S. Mail. The citation shall also state that the person or entity cited that it has the right to appeal the citation, as provided in Subsection 914(~~j~~l).

(8) Request for Hearing; Hearing.

(A) A person or entity may appeal the issuance of a citation by filing a written request with the SFMTA Hearing Division within 15 business days from (i) the date of the issuance of a citation that is served personally or (ii) the date of receipt if the citation is served by certified U.S. Mail. The failure of the person or entity cited to appeal the citation shall constitute a failure to exhaust administrative remedies and shall preclude the person or entity cited from obtaining judicial review of the validity of the citation.

(B) At the time that the appeal is filed, the appellant must deposit with the SFMTA Hearing Division the full amount of the penalty required under the citation.

(C) The SFMTA Hearing Division shall take the following actions within 10 days of receiving an appeal: appoint a hearing officer, set a date for the hearing, which date shall be no less than 10 and no more than 60 days from the date that the appeal was filed, and send written notice of the hearing date to the appellant and the Charging Official.

(D) Upon receiving notice that the SFMTA Hearing Division has scheduled a hearing on an appeal, the Charging Official shall, within three City business days, serve the hearing officer with records, materials, photographs, and other evidence supporting the citation. The hearing officer may grant a request to allow later service and may find good cause to continue the hearing because of the delay.

(E) The hearing officer shall conduct all appeal hearings under this Chapter and shall be responsible for deciding all matters relating to the hearing

procedures not otherwise specified in this Section. The Charging Official shall have the burden of proof in the hearing. The hearing officer may continue the hearing at his or her own initiative or at the request of either party, and may request additional information from either party to the proceeding. The hearing need not be conducted according to technical rules of evidence and witnesses. Any relevant evidence is admissible if it is the sort of evidence on which responsible persons are accustomed to rely in the conduct of serious affairs.

(F) The following provisions shall also apply to the appeal procedure:

(i) A citation that complies with the requirements of Section 914(~~j~~1)(7) and any additional evidence submitted by the Charging Official shall be prima facie evidence of the facts contained therein;

(ii) The appellant shall be given the opportunity to present evidence concerning the citation; and

(iii) The hearing officer may accept testimony by declaration under penalty of perjury relating to the citation from any party if he or she determines it appropriate to do so.

(iv) After considering all of the testimony and evidence submitted by the parties, the hearing officer shall issue a written decision upholding, modifying or vacating the citation and shall set forth the reasons for the determination. This shall be a final administrative determination.

(v) If the hearing officer upholds the citation, the hearing officer shall inform the appellant of its right to seek judicial review pursuant to California Government Code Section 53069.4. If the citation is upheld, the City shall retain the amount of the fine that the appellant deposited with the City.

(vi) If the hearing officer vacates the citation, the City shall promptly refund the deposit. If the hearing officer partially vacates the citation,

the City shall promptly refund that amount of the deposit that corresponds to the hearing officer's determination. The refund shall include interest at the average rate earned on the City's portfolio for the period of time that the City held the deposit as determined by the Controller.

(G) Any person aggrieved by the action of the hearing officer taken pursuant to this Chapter may obtain review of the administrative decision by filing a petition for review in accordance with the timelines and provisions set forth in California Government Code Section 53069.4.

(H) If a final order of a court of competent jurisdiction determines that the SFMTA has not properly imposed a fine pursuant to the provisions of this Section, and if the fine has been deposited with the SFMTA as required by Section 914(~~j~~l)(8)(B), the SFMTA shall promptly refund the amount of the deposited fine, consistent with the court's determination, together with interest at the average rate earned on the City's portfolio.

(9) Upon request by a Shuttle Service Provider owing administrative penalties for violation of permit conditions set forth under Subsection 914(~~f~~h), the SFMTA may enter into a payment plan with that Shuttle Service Provider. Any such payment plan shall not extend the time for payment beyond 90 days from the otherwise applicable due date for the most recent penalty encompassed by the payment plan. In no event shall SFMTA establish more than three such payment plans for any individual Shuttle Service Provider~~ during the term of this pilot program~~.

(10) Administrative penalties shall be deposited in the Municipal Transportation Fund and may be expended only by the SFMTA.

Section 2. Effective Date. This ordinance shall become effective 31 days after enactment. Enactment occurs when the San Francisco Municipal Transportation Agency Board of Directors approves this ordinance.

Section 3. Scope of Ordinance. In enacting this ordinance, the San Francisco Municipal Transportation Agency Board of Directors intends to amend only those words, phrases, paragraphs, subsections, sections, articles, numbers, letters, punctuation marks, charts, diagrams, or any other constituent parts of the Transportation Code that are explicitly shown in this ordinance as additions or deletions in accordance with the "Note" that appears under the official title of the ordinance.

APPROVED AS TO FORM:
DENNIS J. HERRERA, City Attorney

By:

DAVID A. GREENBURG
Deputy City Attorney

I certify that the foregoing resolution was adopted by the San Francisco Municipal Transportation Agency Board of Directors at its meeting of November 17, 2015.

R. Boomer

Secretary to the Board of Directors
San Francisco Municipal Transportation Agency

ATTACHMENT A

California Environmental Quality Act Findings

Based upon substantial evidence in the record of this proceeding and pursuant to the California Environmental Quality Act ("CEQA"), California Public Resources Code Sections 21000 et seq.; the Guidelines for Implementation of CEQA, 14 California Code of Regulations Sections 15000 et seq.; and Chapter 31 of the San Francisco Administrative Code, the San Francisco Municipal Transportation Agency Board of Directors makes and adopts the following findings of fact in support of the determination that the proposed Commuter Shuttle Program and Transportation Code amendments (herein after "Commuter Shuttle Program") are exempt from environmental review under the Class 1 and Class 8 categorical exemptions from CEQA:

1. Based on substantial evidence in the record, including the data, information, and analysis identified in these findings, the San Francisco Planning Department determined that the physical improvements proposed as part of the Commuter Shuttle Program is exempt from environmental review under Section 15301 of the CEQA Guidelines (Class 1), which exempts from environmental review minor alterations to existing highways and streets, sidewalks, gutters, bicycle and pedestrian trails, and similar facilities. Based on substantial evidence in the record, the proposed modifications to install minor improvements such as signage, boarding islands, and bus bulbs, are minor modifications of existing roadways, and are therefore exempt from environmental review under CEQA.

2. Based on substantial evidence in the record, including the data, information, and analysis identified in these findings, the San Francisco Planning Department determined that the Commuter Shuttle Program is exempt from environmental review under the Section 15308 of the CEQA Guidelines (Class 8), which exempts from environmental review actions taken by regulatory agencies, as authorized by state or local ordinance, to assure the maintenance, restoration, enhancement, or protection of the environment where the regulatory process involves procedures for protection of the environment. The record demonstrates that, in the absence of regulations governing commuter shuttle operations, those operations can lead to conflicts with Muni and with vehicular, bicycle, and pedestrian traffic and safety. The record also demonstrates that, if commuter shuttle operations were not available within the City, then 47% of shuttle riders would instead drive alone to work or school, leading to increased traffic congestion and air emissions throughout the region. The record further demonstrates that ongoing commuter shuttle operations that are controlled, monitored, and enforced through the Commuter Shuttle Program will enhance the environment. The Commuter Shuttle Program includes features that will enhance and protect the environment, such as fleet turnover requirements, restrictions on stopping outside of major and minor arterials, idling limits, and minor

roadway modifications that will improve vehicular, bicycle, and pedestrian safety, decrease conflicts between commuter shuttles and other transportation modes, and improve regional traffic congestion and air emissions. Accordingly, based on substantial evidence in the record, the Commuter Shuttle Program is an action taken by the San Francisco Municipal Transportation Agency to assure the enhancement and protection of the environment, and does not result in construction activities or a relaxation of standards allowing environmental degradation.

3. Based on substantial evidence in the record, and the specific factual findings above, there is no reasonable possibility that the Commuter Shuttle Program will have a significant adverse effect on the environment due to unusual circumstances. Specifically, the Planning Department and the San Francisco Municipal Transportation Agency Board of Directors have determined that the Commuter Shuttle Program does not have any features distinguishing it from other projects in the Class 1 and Class 8 exemptions under CEQA, and the program will not have any significant environmental effects under CEQA. The physical changes that will occur as part of the program are minor in scale and number and do not involve environmentally sensitive locations. Further, the program does not present unusual circumstances because the San Francisco Municipal Transportation Agency regularly adjusts and adapts its traffic control regulations, and makes minor alterations to existing roadways, such as signage, bulbouts and boarding islands, for purposes of reducing vehicular conflicts, protecting bicyclists and pedestrians, and increasing the efficiency of existing roadway systems.

4. In the absence of a Commuter Shuttle Program, commuter shuttles could and would be expected to operate on non-arterial streets without commercial vehicle weight restrictions; and to load and unload passengers at near-side bus stops, white zones, vacant curb areas, or even in travel lanes on both arterial and non-arterial streets. These practices, which the Commuter Shuttle Program would regulate or prohibit, often result in delays to traffic and Muni service, and affect the safety of Muni patrons by requiring them to enter roadways to board Muni buses, and can affect the safety of both bicyclists and pedestrians. Key components of the Commuter Shuttle Program will reduce substantially the possibility and likelihood of these unregulated practices and effects, and there is substantial evidence in the record before this Board that there will be no significant adverse impacts to public transit or to bicyclist or pedestrian safety.

5. The Commuter Shuttle Program directs commuter shuttle activity of large commuter shuttle buses toward major and minor arterial streets as determined by the California Department of Transportation, and away from non-arterial streets in residential neighborhoods. Based on the data gathered by San Francisco Municipal Transportation Agency staff during the Pilot Program, and analyzed by the San Francisco Planning

Department's Environmental Planning Division, and other information presented to this Board, there is substantial evidence in the record that the relatively minor increase in commuter shuttle activity on arterial streets and at arterial intersections compared to existing traffic will not substantially degrade traffic capacity or operations, and there will be no significant adverse impact on traffic operations on arterial roadways or at intersections.

6. As part of the Commuter Shuttle Program, certain commuter shuttles may utilize designated Muni bus stop zones for shuttle loading and unloading. Based on the data gathered by San Francisco Municipal Transportation Agency staff during the Pilot Program, and analyzed by the San Francisco Planning Department's Environmental Planning Division, and other information presented to this Board, there is no significant impact on Muni operations.

7. Commuter shuttles share roadways in San Francisco with bicycles and pedestrians. The Commuter Shuttle Program will modify certain commuter shuttle stop lengths and locations on an ongoing basis, will add additional enforcement at high-activity locations, including the assignment of more traffic control officers, and will require program participants to certify that drivers have completed driver safety training consistent with the San Francisco Municipal Transportation Agency's Large Vehicle Urban Driving Safety Program. Based on the data gathered by San Francisco Municipal Transportation Agency staff during the Pilot Program, and analyzed by the San Francisco Planning Department's Environmental Planning Division, and other information presented to this Board, there is substantial evidence in the record that there will be no significant adverse impacts to bicycle or pedestrian facilities from the Commuter Shuttle Program.

8. Based on substantial evidence in the record, the Commuter Shuttle Program will not result in significant adverse impacts to commercial loading.

9. At the direction of the San Francisco Planning Department, Ramboll Environ, an air quality expert consultant whose credentials are contained in the record, prepared an Air Quality Technical Report to assess regional criteria air pollutants and potential localized health risk impacts that might be associated with the Commuter Shuttle Program. Ramboll Environ analyzed likely emissions from commuter shuttles, and factored in the Commuter Shuttle Program requirement that all new commuter shuttles entering the Program have model year 2012 or equivalent engines, and that by 2020, all active commuter shuttles be no more than eight years old or equivalent, requiring fleet turnover on a rolling basis. Based on these Program requirements, as well as data gathered by San Francisco Municipal Transportation Agency staff during the Pilot Program, Ramboll Environ determined that emissions of the criteria air pollutants reactive organic gases,

particulate matter, and carbon dioxide would decrease, while nitrogen oxide emissions would increase as a result of use of diesel-powered buses; the nitrogen oxide emissions, however, would be below the thresholds of significance propounded by the Bay Area Air Quality Management District, and accordingly, based on substantial evidence in the record, no significant criteria air pollutant impacts would occur.

10. Ramboll Environ also conducted a localized health risk assessment of toxic air contaminants, taking into account San Francisco's unique Air Pollutant Exposure Zones, where a lower threshold of significance is used than what is propounded by the Bay Area Air Quality Management District. Ramboll Environ modeled four representative local impact zones and determined that increases in lifetime cancer risk and shuttle-generated particulate matter emissions would be below these lower applicable thresholds of significance, and accordingly, based on substantial evidence in the record, no significant localized health risk impacts would occur.

11. The Commuter Shuttle Program could also add noise, both during construction of capital improvements and during operations; however, the Program would not result in environmental degradation. Because construction will be required to comply with the San Francisco Noise Ordinance, as well as the Public Works Code and other Department of Public Works regulations, and because it would be temporary, indirect construction noise impacts will be less than significant. The San Francisco Planning Department considered and relied on the noise analysis contained in the 2014 Transit Effectiveness Project Environmental Impact Report to estimate noise that could be generated by commuter shuttles, and the Planning Department determined that the minor amount of noise generated by commuter shuttles would be considered common and generally acceptable in an urban area, and therefore, based on substantial evidence in the record, the Commuter Shuttle Program will not cause a significant noise impact or environmental degradation.

12. Although some members of the public have asserted that the commuter shuttles contribute to increased housing costs and housing displacement, the Commuter Shuttle Program will not eliminate any housing units. Any physical impacts associated with increased housing costs would be related to the construction of replacement housing for displaced residents, or increased trip lengths and emissions for displaced residents. However, there is no demonstrable evidence of physical displacement of individuals from housing units attributable to commuter shuttles, and if such displacement were to occur as a result of the Commuter Shuttle Program, there is no basis to assess where such individuals would relocate and what their travel behavior would entail. Because there is no demonstrated causative link between shuttle use and housing demand or price, and there is no foreseeable displacement associated with the Program, analysis of any such

impacts would be speculative with regard to their scale and nature. Based on substantial evidence in the record, the Commuter Shuttle Program will not cause any significant adverse impacts related to or caused by housing displacement.

13. The Commuter Shuttle Program will not result in any changes in land use, urban design or long range views, cultural resources, biological resources, greenhouse gas emissions, wind, shadow, utilities and service systems, geology and soils, hydrology or water quality, mineral resources or agricultural and forest resources, and no new hazardous waste will be generated. In addition, Commuter Shuttle Program implementation may reduce already less-than-significant effects on emergency vehicle access by reducing congestion. Based on substantial evidence in the record, the Commuter Shuttle Program will not cause any significant adverse impacts or environmental degradation in these impact areas.

SAN FRANCISCO
PLANNING DEPARTMENT

1650 Mission St.
Suite 400
San Francisco,
CA 94103-2479

Reception:
415.558.6378

Fax:
415.558.6409

Planning
Information:
415.558.6377

Certificate of Determination
Exemption from Environmental Review

Case No.:	2015-007975ENV
Project Title:	SFMTA – Commuter Shuttle Program
Project Sponsor:	San Francisco Municipal Transportation Agency Hank Willson – (415) 701-5041
Staff Contact:	Christopher Espiritu – (415) 575-9022 christopher.espiritu@sfgov.org

PROJECT DESCRIPTION:

The San Francisco Municipal Transportation Agency (SFMTA) proposes to implement a Commuter Shuttle Program (herein referred to as "proposed project or proposed Program") which would regulate commuter shuttle activity on San Francisco streets. The proposed project would continue and expand the guidelines and requirements established for the 18-month, Commuter Shuttle Pilot Program (herein referred to as "Pilot") implemented between August 2014 and January 2016. The program would involve the issuance of permits to eligible commuter shuttle operators for the use of public curb space, including designated passenger loading zones and bus stops. In addition, the proposed project would include capital improvements, such as transit boarding islands and curb extensions (bulb-outs). The proposed project would require approval by the SFMTA Board of Directors.

EXEMPT STATUS:

Categorical Exemption, Class 1 and Class 8 (California Environmental Quality Act [CEQA] Guidelines Section 15301 and 15308). See page 25.

DETERMINATION:

I do hereby certify that the above determination has been made pursuant to State and local requirements.

Sarah B. Jones
Environmental Review Officer

October 22, 2015
Date

cc: Hank Willson, SFMTA, Project Sponsor
Viktoriya Wise, SFMTA

Distribution List
Board of Supervisors, All Districts, (via Clerk of the Board)
Virna Byrd, M.D.F.

BACKGROUND

The number of privately operated shuttles in San Francisco has grown in recent years. Numerous employers, educational institutions, medical facilities, office buildings, and transportation management associations offer shuttle service to their employees, students, and clients. Some development projects are required to provide shuttle services as part of their conditions of approval (and the impacts of their shuttle services are considered within the development project's environmental review), and an employer may comply with San Francisco's Commuter Benefits Ordinance and the Bay Area's Commuter Benefits Program by offering a free commute shuttle to employees. The majority of the commuter shuttles are closed systems that provide service to a specific population and are not open to the general public. Most shuttles are provided for free to employees (or students, tenants, etc.). There are two distinct markets within the shuttle sector: those that operate within San Francisco (intra-city) and those that operate between San Francisco and another county (inter-city regional). Shuttles support local San Francisco and regional goals by decreasing single occupancy vehicle (SOV) trips, vehicle miles traveled (VMT), and private vehicle ownership.

Prior to August 2014 and the implementation of the Pilot Program, San Francisco did not regulate commuter shuttle activity on City streets. Shuttles operated throughout the City on both large arterial streets, such as Van Ness Avenue and Mission Streets, and smaller residential streets. Shuttles loaded and unloaded passengers in a variety of zones, including passenger loading (white) zones, Muni bus stops (red) zones, and other vacant curb space. When curb space was unavailable, shuttles often would load or unload passengers within a travel lane. The lack of rules and guidelines for where and when loading and unloading activities were permitted, and the lack of vacant space in general, resulted in confusion for shuttle operators and neighborhood residents, inconsistent enforcement, and real and perceived conflicts with other transportation modes.

To address these issues, in January 2014, the SFMTA Board of Directors approved an 18-month Pilot to test sharing of designated Muni zones and establish permitted commuter shuttle-only passenger loading (white) zones for use by eligible commuter shuttles that paid a fee and received a permit containing the terms and conditions for use of the shared zones. The Pilot Program began in August 2014, and created a network of shared stops for use by Muni and commuter shuttle buses that applied to participate, and restricted parking for some hours of the day in certain locations to create passenger loading (white) zones exclusively for the use of permitted commuter shuttles.

Program Objectives

Prior to the implementation of the Pilot Program, commuter shuttles travelled on City streets with few constraints beyond legislated commercial vehicle or weight restrictions. The City's regulatory and enforcement capacity involved restrictions on commercial vehicles under San Francisco *Transportation Code*, Section 503, which restricted commercial passenger vehicles (with seating capacity of nine or more persons) from certain streets and areas of the City. In addition, Section 501 of the *Transportation Code* restricted the operation of a vehicle with gross weight in excess of 6,000 pounds on specific streets.

Beyond these restrictions, the SFMTA does not have the authority to prevent commuter shuttles from operating on a majority of non-weight-restricted streets throughout the City.[1]

Commuter shuttles, like most vehicles in San Francisco, generally are free to drive on San Francisco's streets. However, without a network of approved zones, private commuter shuttle operators have imperfect choices to make about where to load and unload passengers, as sufficient unregulated or vacant curb space is mostly unavailable. Commuter shuttles would have few options, including: stopping in the travel lane (adjacent to parked cars), which blocks through traffic and bicycles, presents safety hazards for riders boarding and alighting, and risks a parking citation; or stopping at a Muni stop, which enables safer curbside access, but in the absence of regulations governing shuttle operations can delay Muni and risks a parking citation. The objectives of the proposed Commuter Shuttle Program would include:

- Provide a safe environment for all street users in support of the SFMTA's Vision Zero policy to eliminate all traffic deaths
- Prevent service disruptions, including any related to labor relations issues
- Ensure that commuter shuttles do not adversely affect operations of public transportation in San Francisco
- Consistently and fairly apply and enforce any regulations/policies governing shuttle operations
- Work collaboratively with shuttle sector to refine policies and resolve concerns and conflicts
- Integrate commuter shuttles into the existing multi-modal transportation system
- Establish a program structure that meets current needs and has the potential to evolve as the sector grows and evolves
- Ensure more focused enforcement, ease of administration and on-going oversight

<u>Commuter Shuttle Pilot Program (August 2014 to January 2016)</u>

Prior to the Pilot, SFMTA could only estimate the number of commuter shuttles in operation, the location of stops, hours of shuttle operation, routes and other operational characteristics. The Pilot allowed SFMTA to collect data regarding the movement of, usage of, and reaction to commuter shuttles in San Francisco, and determine whether management of the commuter shuttles through shared stops, permits and payment of a permit fee could reduce conflicts and complaints. SFMTA used the data collected during the Pilot to evaluate the Pilot and design the proposed Commuter Shuttle Program

The Pilot applied to privately operated transportation services that move commuters to, from, and within San Francisco. Services that are arranged by an employer, building, or institution to provide transportation for home-to-work, work-to-home, last-mile to work, or work site to work site were eligible to participate in the Pilot. Exceptions for eligibility were defined during the implementation of the Pilot

[1] San Francisco Transportation Code, Article 500, Sections 501 and 503. Available at: http://library.amlegal.com/nxt/gateway.dll/California/ transportation/divisionii/article500sizeweightloadrestrictions. Accessed October 2015.

and would remain under the Commuter Shuttle Program. Services that replicate Muni routes or are not licensed by the California Public Utilities Commission were not eligible for the program.

Under the Pilot, the SFMTA established specific requirements for shuttle types and providers, and identified providers that were not eligible to participate, including:

- Tour buses, recreational buses, and long-distance interurban buses
- Party buses
- School buses
- On-call point-to-point services (airport shuttles, limousines, other on-demand transportation)
- Private individual-fare transportation (jitneys, ride-share or transportation network companies (TNCs))
- Vanpool vehicles

As of October 2015, 17 commuter shuttle operators have been approved to participate in the Pilot. Most commuter shuttle vehicles in the Pilot were either cutaway buses (buses/shuttles formed by a small- to medium- truck chassis attached to the cabin of a truck or van, also called "mini buses") or motor coaches (also called "over the road" coaches) of either 40 or 45 feet in length designed for transporting passengers on intercity trips. To implement the Pilot Program, the SFMTA designated, and marked with appropriate signage, approximately 100 Muni zones and approximately 20 limited-hours shuttle-only loading zones for participating shuttle providers to load and unload passengers. Commuter shuttle zones are indicated by signs and painted curbs (red curbs at Muni zones, and white curbs at loading zones). The Pilot Program did not include modifications to existing Muni transit routes and did not remove (or relocate) any existing Muni bus stops.

The Pilot did not dictate the routing of individual shuttles, however, all shuttle providers were required to comply with San Francisco's commercial vehicle, weight, and passenger restrictions for designated streets. Additionally, permitted commuter shuttles were encouraged, through outreach by SFMTA staff to the shuttle providers, to select routes that follow arterial streets and avoid residential streets.

Under the Pilot, modifications to the public right-of-way were required for the removal or restriction of a limited number of existing on-street parking spaces in order to extend the length of some Muni and shuttle-only loading zones. The addition of shuttle-only loading zones typically required the use of up to 100 feet of curb space for loading during certain hours. All changes to zone locations or lengths during the Pilot Program were submitted for public review and comment at SFMTA engineering hearings.

The Pilot Program shuttle zone network was established through consultation with shuttle operators, community groups, residents, and SFMTA transit service planning and traffic engineering staff. Attachment A shows a map of the shuttle network under the Pilot and locations of Muni zones and passenger loading (white) zones currently designated as shuttle-only loading zones under the Pilot. At the launch of the Pilot, there were 106 zones (14 passenger loading zones, 92 Muni zones). Over the course of the Pilot, the shuttle network was expanded to 125 zones (21 passenger loading zones and 104 shared Muni zones) with 41 stops that have been removed, added or adjusted due to a variety of reasons,

including: construction projects, network gaps in service, residential opposition, rescinded Muni stops, stop location requests from permit holders, and Muni Forward projects.

Under the Pilot, the most frequently used zones were observed to have as many as 100 shuttle stop-events per day, while some zones saw no stop-events at all. The corridors or locations with the most shuttle traffic in the Pilot include Lombard Street, Van Ness Avenue, Divisadero/Castro Streets, Valencia Street, Union/Powell Streets in North Beach, 24th/25th Streets in the Mission/Noe Valley, 30th Street in Noe Valley, and Townsend/Fourth Street near the Caltrain station.

Based on the data that SFMTA has been able to gather regarding operations of commuter shuttles, staff has learned that approximately 90% of shuttle operations occur during peak hours, 6am-10am and 4pm-8pm, with the remaining 10% occurring over off-peak hours 5am-6am, 10am-4pm, and 8pm-12am.[2]

COMMUTER SHUTTLE PROGRAM PROJECT DESCRIPTION

Based on information collected under the Pilot, the SFMTA proposes to establish the Commuter Shuttle Program subsequent to the conclusion of the 18-month Pilot (February 2016). Similar to the Pilot, the proposed Commuter Shuttle Program would apply to privately operated transportation services that move commuters to, from, and within San Francisco. The Commuter Shuttle Program would, at the outset, utilize the shuttle zone network in place at the conclusion of the Pilot.

The Pilot shuttle zone network is the SFMTA's best estimate of an effective zone network at the time of the Commuter Shuttle Program's launch. As further described below, the shuttle zone network would continue to evolve as necessary to best meet the transportation needs. Under the Program, SFMTA would receive consistent feedback from the community and consider changes to the shuttle network. Any proposed changes to the stops and the overall shuttle network would require public comment and testimony, prior to approval, at an engineering hearing and/or by the SFMTA Board of Directors. Both of these venues are open to the public and include a public comment/testimony component.

The program would be a mechanism by which the SFMTA can regulate the travel routes and stops of commuter shuttles in San Francisco. As part of the Commuter Shuttle Program, the SFMTA would continue to designate, and mark with appropriate signage, select Muni zones and passenger loading zones for commuter shuttle use. Of the 125 combined stops/zones (104 Muni zones and 21 passenger loading zones) that exist today under the Pilot, all 125 stops/zones would remain under the Commuter Shuttle Program.

In contrast with the Pilot, under the Commuter Shuttle Program, permitted shuttle vehicles longer than 35 feet would be required to limit travel to major and minor arterial street network as determined by the California Department of Transportation (Caltrans). This additional requirement was included to address the most frequent comment from members of the public about the Pilot, and it also ensures that large

[2] Information provided by Kathleen Phu, SFMTA, September 2015.

buses use the street network that was best designed to handle large vehicles. Attachment B shows a map of major and minor arterial streets where large shuttle vehicles may operate under the Program. In general, large shuttle vehicles would be required to operate on major and minor arterial street networks and avoid steep and/or narrow streets whenever possible. Permitted shuttles would be required to comply with all relevant street and lane restrictions.

Similar to the Pilot, approximately 90% of shuttle operations are assumed to occur during peak hours 6am-10am and 4pm-8pm, with the remaining 10% occurring over off-peak hours 5am-6am, 10am-4pm, and 8pm-12am.[3]

In addition to the stop locations and routes described above, program regulations would also include the following, in order for a shuttle provider to receive a permit:

1. Permittee vehicles (shuttles) must display a placard issued by SFMTA at specified location on the front and rear of vehicles at all times when operating commuter service in San Francisco.
2. Permittee must comply with operating guidelines:
    a. Muni priority: Muni buses have priority at and approaching or departing Designated Stops.
    b. Yield to Muni: Where Muni or other public transit buses are approaching a Designated Stop and when safe to do so, allow such buses to pass so they may stop at Designated Stops first.
    c. Stay within the network: Permittees shall stop only at Designated Stops or other non-Muni zones, and may not stop at Muni zones outside the network.
    d. Active loading; No staging or idling: Designated Stops may be used only for active loading and unloading; shuttles must load and unload riders as quickly and safely as possible. Staging must take place outside of any Designated Stops, consistent with parking regulations. Unnecessarily idling is not permitted, even while staging.
    e. Move forward: Shuttle drivers shall pull forward in a Designated Stop to leave room for Muni or other shuttles.
    f. Pull in: Shuttle drivers shall pull all the way to, and parallel with, the curb for passenger boarding and alighting; shuttle vehicles shall not block travel or bicycle lanes; loading and unloading shall not take place in a vehicle or bicycle lane, or in a manner that impedes travel in these lanes.
    g. Comply with all applicable traffic laws: Shuttles shall operate in accordance with all applicable state and local traffic laws.
    h. Circulation: Shuttle vehicles longer than 35 feet may travel only on the major and minor arterial street network as determined by the California Department of Transportation, as appears on the map of major and minor arterial streets attached as Attachment B. All shuttle vehicles shall stay on the major and minor arterial street networks and avoid

[3] Information provided by Kathleen Phu, SFMTA, September 2015.

steep and/or narrow streets to the extent possible. Permittees shall comply with all relevant street and lane restrictions.

i. Training: Permittees shall ensure that training for shuttle drivers addresses these operating guidelines.

j. Follow instructions from officials and traffic control devices: Shuttle drivers shall follow instructions from police officers, authorized SFMTA staff (including Parking Control Officers) and traffic control devices in the event of emergencies, construction work, special events, or other unusual traffic conditions.

k. Use of Designated Stops limited to permit-related activity. Shuttle vehicles that display a placard but are not making commuter shuttle-related trips may not use Designated Stops.

3. Permittee must comply with the San Francisco Board of Supervisors' March 2015 Labor Harmony Resolution by submitting a Service Disruption Prevention Plan that describes Permittee's efforts to ensure its efficient operations while avoiding any potential disruptions to SFMTA operations by addressing the principles and concerns set forth in such Resolution. Permittee must ensure its operations do not cause or contribute to any service disruptions. Failure to comply with this provision will result in denial or revocation of permits.
4. Permittee must certify that anyone who drives a shuttle in San Francisco has viewed the SFMTA's Large Vehicle Urban Driving Safety video, which can be accessed at https://youtu.be/_LbC3FQeZqc.
5. Permittee must indemnify SFMTA and the City of San Francisco for injuries or damage resulting from Permittee's use of Designated Stops, including associated bus shelters and other related sidewalk features.
6. Permittee vehicles must display a placard issued by SFMTA at specified location on the front and rear of vehicles at all times when operating commuter service in San Francisco.
7. Provide data feeds per SFMTA specifications, and demonstrate for each vehicle that data feeds are regular and accurate.
8. Pay permit fees. Any stop-events made by shuttle vehicles that are free for use by the public, and display the words "Free to the Public" on the loading side of the vehicle in letters at least four inches tall, are exempt from this permit fee requirement but are subject to all other permit terms.
9. Promptly pay any outstanding traffic citations.
10. Demonstrate compliance with all applicable regulatory requirements imposed by the CPUC, including registration/permitting, insurance, vehicle inspection requirements, and driver training.
11. All shuttle vehicles not already approved for use in the Pilot as of January 31, 2016 must be either model year 2012 or newer, or be equipped with a power source that complies with emissions standards applicable to the 2012 class of vehicle. As of January 1, 2020, all shuttle vehicles used by Permittees in the Commuter Shuttle Program must be model year 2012 or newer. After January 1, 2020, all shuttle vehicles used by Permittees in the Commuter Shuttle Program must be no more than eight model years old. SFMTA ensures compliance with this condition through the

annual permit renewal process, which requires submittal of vehicle registration and, in the case of vehicles older than model year 2012, documentation to show compliance with applicable emissions standards.

Capital Improvements

As part of the proposed Program, SFMTA would continue to designate and install appropriate signage on select Muni zones and passenger loading zones for shared Muni/commuter shuttle use. In addition, as appropriate, the Program would include the installation of several safety improvements to the existing right-of-way that would improve the stop network for both commuter shuttles and users of other modes, including: boarding islands, pedestrian bulbs, and bus bulbs.

These improvements, combined, would expand the sidewalk area for passengers waiting to board either Muni vehicles or commuter shuttles (depending on the location). Also, the addition of these improvements would enhance passenger loading and unloading activities by bringing Muni/shuttle passengers closer to buses, as well as reduce delays and potential conflicts from Muni vehicles and commuter shuttles re-entering the travel lane.

As listed in Table 1 below, SFMTA has identified the following capital improvements at existing stops/zones within the Pilot Program network. The locations listed below were selected by SFMTA, during the Pilot Program data collection, due to the level of activity at each location (number of shuttle stop events, Muni bus activity, and availability pedestrian/bicycle facilities). Further, as part of the Program, implementation and construction of the proposed capital improvements would be funded partially through the permit fees collected from shuttle providers through the Program.

Table 1. Capital Improvement Locations (Preliminary)

Locations	Potential Capital Improvement
8th/Market Muni zone/white zone SW corner	Boarding island
Arguello/Geary Muni zones (NW and SE corner)	Boarding islands
Valencia/25th Muni zone (SW corner)	Boarding island
7th/Market Muni zone (SW corner)	Boarding island (left-hand)
7th/Townsend Muni zone (NE corner)	Boarding island (left-hand)
O'Shaughnessy/Portola Muni zone (SW corner)	TSP
Castro/25th Muni zone (SE corner)	Bus bulb
Divisadero corridor (24 line)	TSP
Divisadero/California Muni zones (SW and NE corner)	Bus bulbs
Lombard/Pierce Muni zones (NW, SE corner)	Bus bulbs
Harrison corridor (8/27 lines)	TSP
Harrison/2nd Muni zone (NW corner)	Bus bulb
Harrison/4th Muni zone (NW corner)	Bus bulb
Harrison/7th Muni zone (NW corner)	Bus bulb
18th Street corridor (33 line)	TSP
Bryant corridor (27/47 lines)	TSP
Bryant/7th Muni zone (SE corner)	Bus bulb
North Point/Mason Muni zone (NW corner)	Bus bulb

Source: SFMTA, 2015

Project Approvals

The proposed project is subject to review by SFMTA staff and approval by the SFMTA Board of Directors. The Approval Action for the proposed project would be approved by the SFMTA Board of Directors, which would approve the Commuter Shuttle Program as well as proposed roadway improvements to be implemented or constructed on the public right-of-way. The Approval Action date establishes the start of the 30-day appeal period for this CEQA exemption determination pursuant to Section 31.04(h) of the San Francisco Administrative Code.

REMARKS:

Program Evaluation - Travel Survey

SFMTA conducted field data collection in June 2014, prior to the start of the Pilot Program to assess existing commuter shuttle activity on City streets, followed by a second field data collection effort in June 2015 to examine the effects of the Pilot Program on the transportation system, including effects on Muni operations and identify conflicts and other potential safety issues caused by commuter shuttle activity.

The 2015 field data collection effort observed commuter shuttle and Muni activity at 20 shuttle stop/zone locations including: 10 stops in the morning commute period (6:45-9:15am) and 10 stops in the evening

commute period (5:30-8:00pm). Field data was collected by SFMTA staff and included observations of stop activities at the selected locations, typically in 2 ½-hour increments.

In addition to data collection activities, SFMTA conducted an extensive evaluation of the Pilot and on October 5, 2015, the Commuter Shuttle Pilot Program Evaluation Report was published. As part of the evaluation, in June 2015, SFMTA distributed a survey to shuttle riders to determine the impact of shuttle availability on their transportation choices. According to survey results, 546 shuttle riders responded to the survey; 418 (77%) were intercity regional shuttle riders, while 128 (23%) rode intracity shuttles. This split of riders accurately represents the overall share of boardings for intercity (76%) and intracity shuttles (24%).

Shuttle riders are widely dispersed among neighborhoods in the City, though the top ten neighborhoods of origin are concentrated in the Mission and the northeastern quadrant of the city. The top ten neighborhoods house 55% of total survey respondents, while the remaining 45% of survey respondents are scattered across 56 other neighborhoods.

As shown in Table 2 below, the Evaluation Report found that 47% of shuttle riders said they would drive alone to work if a shuttle were not available, a finding that has allowed SFMTA to conclude that commuter shuttles do help accomplish local and regional objectives related to VMT reduction. Based on the survey data, availability of commuter shuttles influence the travel behavior for a substantial number of shuttle riders which results in the reduction of drive-alone trips. The survey also indicated that 29% of shuttle riders would use public transit in the absence of commuter shuttles, a finding that can inform SFMTA and regional transit providers' decisions regarding transit service to and from employment centers.

Table 2. Commuter Shuttle – Rider Survey

How would you get to work without the shuttle?	Riders	Percent of total
Drive alone	257	47.2%
Public transit	158	29.0%
Get a job closer to home	75	13.8%
Carpool	28	5.2%
Move closer to work	26	4.8%

Source: SFMTA, 2015

Program Evaluation - Shuttle Ridership

Shuttles participating in the Pilot program had approximately 356,997 boardings per month, or 17,000 on an average weekday. An estimated 270,252 of the monthly shuttle boardings were on intercity regional shuttle trips, and 86,745 were shuttle trips that began and ended in San Francisco. Assuming that most people boarded the shuttle twice in one day, this means that an average of 8,500 people ride a permitted shuttle each day. Further, shuttles load or unload an average of 5.7 people per stop-event among all designated shuttle zones and Muni/shuttle loading zones.

Approach to Analysis

Prior to the implementation of the Pilot, commuter shuttles operated on City streets with limited regulation. The Pilot established a means to collect data and manage commuter shuttle activity beyond citing shuttle buses for infractions. However, the approval of the Pilot program only provided for an 18-month operational period. No further regulation of the commuter shuttles is authorized beyond February 2016.

The California Environmental Quality Act (CEQA) mandates that the potential physical changes to the environment resulting from a project be analyzed, as compared to the baseline ("on the ground") conditions existing at the time of the environmental review. Although the Pilot program is operational at the time that this analysis has occurred, the Pilot would not continue after February 2016 and therefore a comparison of the conditions under the proposed Program to the conditions under the Pilot would not reflect an accurate analysis. Moreover, because the proposed Program is a refined and expanded version of the Pilot, analysis of current conditions (i.e., with the Pilot) as the baseline would understate the impacts of the proposed Program because the physical changes resulting from the proposed Program would be minimal; for example, use of the Pilot as a baseline would not reflect the localized emissions resulting from the designation of permitted shuttle stops. Therefore, for the purposes of this analysis, the pre-Pilot conditions represent the baseline existing conditions to provide the most conservative analysis and because the Pilot is a temporary program with a required end date.

The data collected during the Pilot period has been used to inform the conclusions of this analysis, providing a reliable basis for understanding the impacts of the proposed Commuter Shuttle Program.

Transportation

Prior to the Pilot, shuttle operators did not inform SFMTA of their stop locations. However, because the stop network for the Pilot was created based on shuttle providers' requested stop locations and there was no limit on the number of potential stops, it can be reasonably assumed that the Pilot program stop network is similar to the shuttle stop locations that were in use informally prior to the Pilot. One physical change resulting from the proposed Program would be that, rather than having full choice of stop locations, shuttle activity for larger vehicles would be directed away from non-arterial streets towards arterials. The traffic analysis below considers the impacts of this component of the proposed Program by quantifying potential additional shuttle vehicle activity in those arterial locations where the greatest number of shuttles would be routed away from non-arterial streets.

Table 2 below depicts a worst-case scenario showing the number of buses that would be moved to nearby arterial streets if all commuter shuttle traffic (both large and small vehicles) at four of the busiest non-arterial zones would move to a single nearby zone on an arterial, and not dispersed across several nearby zones. Table 3 shows that the shuttle activity at these four arterial streets currently constitutes 1.1% to 7% of the peak hour vehicle activity at these intersections, this maximum number of relocated commuter

shuttles, when added to existing shuttle activity at these stops, would account for between 1.7% and 9% of the average daily traffic on the streets to which they would be relocated.

Table 3. Stop Events at Designated Zones (with Commuter Shuttle Program)

Existing Non-Arterial Zone		Nearest Arterial Zone Alternative				Combined Totals After Relocation	
Existing Non-Arterial Zone (to be relocated)	Stop Events[a]	Nearest Existing Arterial Zone[b]	Stop Events	Existing Arterial Traffic Counts[c]	Shuttle % of Current Traffic Counts	Total Stop Events (after relocation)	Shuttle % of Total Traffic Counts (after relocation)
Castro/25th NW corner, near-side	20.0	24th/Church SW corner, near-side	9.6	342	6%	29.6	9%
Church/Market NE corner, AM/PM white zone	10.3	Castro/Market NE corner, PM white zone	10.3	311	3%	20.5	6%
30th/Church SW corner, flag stop	12.9	San Jose/Dolores NW corner, AM white zone	6.9	1159	1.1%	19.7	1.7%
Townsend/4th South side, Mid-block	22.7	Harrison/Embarcadero, white zone	8.7	341	7%	31.4	9.5%

Source: SFMTA, 2015

Notes:

a – Estimated commuter shuttle stop events per hour

b – Peak hour traffic counts collected by SFMTA in 2009, 2011, and 2012

c – Identified zone with existing shuttle stop where nearest non-arterial stop would be located.

Implementation of the proposed project may include the relocation of stop events and routes for large vehicles to arterial roadways. As shown in Table 3, the four arterial locations closest to the current non-arterial locations experiencing the highest level of shuttle activity could experience an increase in shuttle stop events due to the relocation of nearby non-arterial stops. However, with the relocation of shuttle stops and the subsequent increase in shuttle activity at each location, peak hour traffic volumes at intersections analyzed would increase by 0.6% to 3%, which would not represent a substantial increase from the addition of shuttle stop events due to the relocation of a non-arterial zone. Peak hour traffic volumes collected for each of the four locations listed above includes all vehicle types (including shuttles). The relocation of stops would not result in a substantial increase in the number of commuter shuttle vehicles (or other vehicles) at the locations analyzed above, with the increases in shuttle activity adding approximately one to three percent more shuttle vehicles than current conditions. Ultimately, commuter shuttles would remain approximately less than 10 percent of the vehicles that travel through

each location shown above during the peak hour. Moreover, as part of the Program, commuter shuttles are required to avoid using non-arterial streets, which would further reduce the number of shuttle vehicles on those streets. The relatively minor increase in shuttle activity, compared to the overall peak hour volumes, would not substantially degrade traffic operations and would not have a significant impact on traffic operations at arterial roadways.

Transit

One of the principal objectives in regulating commuter shuttles is to ensure that commuter shuttle conflicts with Muni were avoided or minimized whenever possible. To that end, the Pilot Program shuttle zone network included stops on lower-frequency Muni lines and exclusive shuttle loading zones near, but not shared with, Muni zones. Commuter shuttle activities, especially in designated shared Muni/Shuttle zones, were observed during the data collection effort in 2015. Table 4 below, compares the number of times that a Muni bus was blocked, at least temporarily, by a commuter shuttle bus from accessing a Muni zone, pre- and during-pilot.

Table 4. Average Number of Shuttle Stop-Events Resulting in Blocked Muni Buses (per hour)

Zone Location	Pre-Pilot Program	During-Pilot Program	Percentage (average per hour)
4th and Townsend	0.8	0	0%
16th and Mission	0	0	0%
16th and Mission/South Van Ness	0.4	0	0%
19th and Taraval/Wawona	0	0	0%
Castro and 24th/25th	0	0	0%
Church and 15th/16th	0	0	0%
Church and Market	0	0	0%
Divisadero and Haight/Oak PM	0	0.4	4%
Divisadero and Geary	1.2	0	0%
Divisadero and Haight AM	0.2	0.8	5%
Fillmore and Jackson	0.4	0.4	9%
Lombard and Pierce	0	0	0%
Van Ness and Market AM	0	0	0%
Valencia and 24th	0.86	1.6	10%
Valencia and 25th	0	0.4	2%
Van Ness and Market PM	0	0.8	5%
Van Ness and Sacramento	1.0	0.4	2%
Van Ness and California	0.8	0	0%
Van Ness and Union PM	0	3.2	18%
Van Ness and Union AM	1.2	0	0%
Program Average	0.3	0.4	3%

Source: SFMTA, 2015

Notes: Locations in **BOLD** include loading zones shared with Muni Buses

During data collection for the Pilot in June 2015, commuter shuttles blocking Muni vehicles were observed across several designated stops/zones. Results show that the occurrences of shuttles blocking Muni vehicles did not substantially increase between pre-Pilot conditions and after implementation of the Pilot Program. As shown in Table 4, twelve stops/zones were observed to not have any Muni buses blocked, compared to 11 stops/zones during the pre-pilot data collection. The average number of Muni buses blocked per hour was less than one Muni vehicle per hour (0.4 Muni vehicles during Pilot, 0.3 Muni vehicles pre-Pilot). Blocked Muni buses as a percentage of shuttles per hour shows that Commuter Shuttles blocking Muni buses occurred infrequently; an average of only 3% of shuttle stop-events blocked Muni access to a zone, and only in two locations did 10% or more shuttle stop-events block Muni.

Across all the field data collection locations during the Pilot, which saw 706 total stop-events, or 24% of the 2,978 stop-events that occur at all zones/stops on a typical day, 19 total Muni buses were temporarily prevented from accessing the Muni zone. As part of the proposed project, SFMTA would provide increased enforcement and monitoring at shuttle zones with a higher number of observed cases where commuter shuttles blocked Muni vehicles. The proposed project includes ongoing evaluation to actively respond to community concerns, identify safety issues, and would have the ability to modify shuttle network stops/zones to maintain consistent Muni operations.

For the purposes of a conservative analysis, SFMTA estimated that, by multiplying the average commuter shuttle dwell time (62.4 seconds) at designated stops/zones by 2,978 total daily stop-events, shuttles add a total of 83 minutes per day of delay into the Muni system. The resulting delay per Muni run (Muni makes over 1,200 runs every weekday) is approximately four seconds. The estimated delay added to existing Muni runs would be disperse throughout the Muni bus routes where shuttles also operate and would not be considered substantial. As shown above, the Commuter Shuttle Program would not substantially add delay to Muni lines operating along the same corridors as shuttles.

Further, the threshold of significance for determining peak period transit demand impacts to the SFMTA lines is defined by an "85 percent" capacity utilization performance standard. As determined by the SFMTA Board and the Planning Department, local transit lines should operate at or below 85 percent capacity utilization. This performance standard more accurately reflects actual operations and the likelihood of "pass-ups" (i.e., vehicles not stopping to pick up more passengers). The 85 percent capacity utilization standard would not be exceeded due to the Commuter Shuttle Program, since shuttles do not add to the capacity of existing Muni lines. Therefore, the proposed project would not result in a significant impact related to transit operations.

Bicycles

Similar to transit observations above, data collected by SFMTA during the Pilot indicated that commuter shuttles were observed to have infrequent operational conflicts with existing bicycle facilities. Though these occurrences were infrequent, commuter shuttles were observed to block the travel lane and/or bicycle lane when shuttles failed to maneuver all the way to the curb when accessing a zone, or when shuttles were denied access to the zone by another shuttle, a Muni vehicle, or another vehicle. During the

Pilot, these issues were addressed by extending shuttle zones, creating shuttle-only zones or directing shuttles to stop at low-frequency Muni zones where there were less likely to conflict with a Muni bus. Because of their infrequency, and the Program's ability to address any potential conflicts through modification of the shuttle stop length or location, the proposed Program would not be expected to result in a significant impact related to bicycles.

In addition, the Program requires commuter shuttles to pull all the way into, and maneuver the shuttle vehicle parallel with, the curb for passenger boarding and unloading. The Program would also prohibit shuttle vehicles from blocking travel or bicycle lanes and that loading and unloading do not take place in a vehicle or bicycle lane, or operate in a manner that impedes travel in these lanes. As appropriate, the SFMTA would create far-side shuttle loading zones to minimize the occurrence of shuttles blocking travel lanes and/or bike lanes, and increase enforcement at certain locations to ensure that shuttle drivers pull shuttle vehicles completely into the zone and out of traffic or bicycle lanes. Further, it is important to note that while the conflict with both travel lanes and bicycle lanes were observed, these incidents were very infrequent: the conflicts were observed at three of six near-side zones, and were not observed at all at any of the far-side or mid-block zones. Given the above, the proposed project would not result in a significant impact related to bicycles.

Pedestrians

Data collected during the Pilot indicated that commuter shuttles presented infrequent operational conflicts with pedestrian facilities. According to SFMTA and described below, pedestrian safety issues identified were related to the size of the commuter shuttle and placement of new shuttle stops/zones in relation to certain crosswalks. Observations conducted during the Pilot noted potential reduction in sight distance and whether commuter shuttles are preventing right-turning drivers from seeing pedestrians who may be crossing in front of a shuttle at a near-side stop. Because of the size of the commuter shuttles, shuttles at near-side stops/zones create a temporary restriction of the view of drivers attempting to make a right turn. Analysis of conditions indicated that the temporary restriction in sight distance is created only if all of the following conditions are met at the same time: (1) the commuter shuttle is stopped at the near side of the intersection, (2) a driver is attempting to turn right around the shuttle, and (3) pedestrians are crossing in front of the shuttle and may not be seen by the car driver. Because this issue only arises in limited circumstances, during data collection activities, SFMTA staff noted that these conditions were met only 16 times across the entire data collection period during the Pilot. While infrequent, these occurrences were one of the primary reasons that the Commuter Shuttle Program, upon implementation, would include identifying shuttle zones that may be moved from the near side of the intersection to the far side of the intersection. Also, as part of the Program, participants would be required to certify that shuttle drivers have completed driver safety training consistent with SFMTA's Large Vehicle Urban Driving Safety Program.

In addition, data collection activities during the Pilot Program observed instances where commuter shuttles blocked crosswalks. SFMTA staff noted that this usually occurs when a commuter shuttle driver misjudges the stop light cycle or attempts to access a zone that is already occupied by another vehicle.

Overall, analysis indicated that commuter shuttles actively blocking pedestrian facilities did not occur often during Pilot Program data collection. Shuttles blocked crosswalks six times out of 706 stop-events observed, or less than one percent of all stop events.

While data collected during the Pilot observed minimal conflicts with pedestrian facilities, the Commuter Shuttle Program would further reduce conflicts through increased enforcement at high-activity locations identified by SFMTA, the extension of the length of shuttle-only zones, and in certain cases as determined by SFMTA staff, the modification of near-side stops to far-side stops. By pursuing modifications to identified shuttle loading zones, such as relocating stops to the far-side of the street, both right-turning vehicles and pedestrians at a given crosswalk would not have an obstructed view of the intersection.

While there were intermittent occurrences of operational conflicts, the proposed project would not create a hazard and intermittent conflicts such as shuttle vehicles blocking Muni vehicles, travel lanes, or bicycle lanes would be reduced through the Commuter Shuttle Program. The proposed project, as mentioned previously, would identify specific locations (based on Pilot data collection) and pursue improvements to better manage the movement of vehicles, transit, bicycles, and pedestrians. The observations during the Pilot indicate that these improvements, as part of the project, would further reduce the conflicts between those modes of transportation and avoid instances where Muni passengers would need to board Muni vehicles on the street.

The proposed project would not include any narrowing of sidewalks or other components that could negatively affect pedestrian circulation within the project area. Based on the above, the proposed project would not result in significant impacts related to pedestrians.

Loading

The project, as proposed, would not eliminate any commercial loading zones or create additional demand for commercial loading activities. Under the Commuter Shuttle Program, use of existing passenger loading (white) zones and designated shared Muni/shuttle stops would not reduce the number of commercial loading (yellow) zones. Any elimination of existing loading zones would be evaluated for its impacts. However, the elimination of a loading zone does not typically result in a significant impact. Therefore, the proposed project would not result in significant commercial loading impacts.

If the Commuter Shuttle Program were not implemented, commuter shuttles would be expected to return to operating on non-arterial streets and other streets without restrictions such as residential streets; loading and unloading passengers at near-side bus stops, white zones or vacant curb areas; or loading and unloading passengers in travel lanes on both arterial and non-arterial streets, which could occasionally result in delays to traffic and Muni service or affect Muni patrons who might need to go out into the street to board, and could affect pedestrians crossing streets in front of commuter shuttles.

Other Environmental Topics

Air Quality

An Air Quality Technical Report (AQTR)[4] was prepared in order to assess the regional criteria air pollutant, and localized health risk impacts of the proposed project. The following summarizes the results of the AQTR, as well as provides some background information regarding threshold of significance.

Criteria Air Pollutants (Regional Analysis)

The Bay Area Air Quality Management District (BAAQMD) is the regional agency with jurisdiction over the nine-county San Francisco Bay Area Air Basin (SFBAAB), which includes San Francisco, Alameda, Contra Costa, Marin, San Mateo, Santa Clara, and Napa Counties and portions of Sonoma and Solano Counties. The BAAQMD is responsible for attaining and maintaining air quality in the SFBAAB within federal and state air quality standards, as established by the federal Clean Air Act (CAA) and the California Clean Air Act (CCAA), respectively.

In accordance with the state and federal Clean Air Acts, air pollutant standards are identified for the following six criteria air pollutants: ozone (O_3), carbon monoxide (CO), particulate matter (PM_{10} and $PM_{2.5}$), nitrogen dioxide (NO_2), sulfur dioxide (SO_2) and lead. These air pollutants are termed criteria air pollutants because they are regulated by developing specific public health- and welfare-based criteria as the basis for setting permissible levels. In general, the SFBAAB experiences low concentrations of most pollutants when compared to federal or state standards. The SFBAAB is designated as either in attainment[5] or unclassified for most criteria pollutants with the exception of ozone, $PM_{2.5}$, and PM_{10}, for which these pollutants are designated as non-attainment for either the state or federal standards.[6] By its very nature, regional air pollution is largely a cumulative impact in that no single project is sufficient in size to, by itself, result in non-attainment of air quality standards. Instead, a project's individual emissions contribute to existing cumulative air quality impacts. If a project's contribution to cumulative air quality impacts is considerable, then the project's impact on air quality would be considered significant.[7] The City is utilizing the significance thresholds developed by BAAQMD to analyze this project's criteria pollutant air quality impacts.

The proposed project would include capital improvements consisting of boarding islands, pedestrian bulbs, and bus bulbs. These capital improvements would require the use of construction equipment.

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4 Ramboll Environ. Final Air Quality Technical Report. SFMTA Commuter Shuttle Program. October 13, 2015.

5 "Attainment" status refers to those regions that are meeting federal and/or state standards for a specified criteria pollutant. "Non-attainment" refers to regions that do not meet federal and/or state standards for a specified criteria pollutant. "Unclassified" refers to regions where there is not enough data to determine the region's attainment status for a specified criteria air pollutant.

6 U.S. EPA. Green Book. Current Nonattainment Counties for All Criteria Pollutants. As of October 01, 2015. Available online: http://www3.epa.gov/airquality/greenbook/ancl.html

7 Bay Area Air Quality Management District (BAAQMD), *California Environmental Quality Act Air Quality Guidelines*, May 2011, page 2-1.

Given the limited use and amount of construction, the proposed project would not have the potential to result in significant construction criteria air pollutant impacts.

For the purposes of environmental review, shuttle growth was assumed to be 41 percent of the Pilot Program and was based available data collected by the SFMTA. Shuttle activities occurred on City streets even before the Pilot was implemented. Based on the number of commuter shuttle permits (placards) issued prior to the implementation of the Pilot and the Commuter Shuttle Program (beginning in 2016), SFMTA estimates that participation in the Program could increase by 41 percent.[8]

Potential commuter shuttle activity could grow as a result of increased demand for shuttle service from local and regional employers and their workers. This potential growth could occur with or without implementation of the proposed project. However, for environmental review purposes, the potential growth in the number of shuttles and stop events is being analyzed as related to the Program. Regional criteria air pollutant emissions may increase from the increase in potential commuter shuttle activity within San Francisco and to and from commuter shuttle destinations in the Bay Area. Therefore, regional criteria air pollutant emissions were estimated based upon the following assumptions: a 41 percent growth in commuter shuttle permits (placards) issued prior to the commencement of the Pilot (2014) and estimated Commuter Shuttle Program implementation (2016); commuter shuttle engine year, including model year 2012 equivalent or newer for all new commuter shuttle vehicles entering the Program and, by 2020, a requirement that all active commuter shuttle vehicle engines are no more than eight years old or equivalent (thus requiring fleet turnover of older vehicles); commuter shuttle data on fuel type, idling time, and trip length; and survey responses from individuals participating as commuter shuttle riders in the Pilot Program regarding their mode of commuter travel or location of home/job if commuter shuttles were not available.

Emissions from the proposed project display net reductions in ROG, PM_{10}, and $PM_{2.5}$emissions of 0.26, 0.05, and 0.05 tons per year, respectively, and net reductions in CO_2 of 1,149 metric tons per year. Emissions from the proposed project display net increases of NO_x by 6.6 tons per year. Increases in NO_x are attributable to the difference in emissions generated from a large diesel-fueled bus engine relative to a gasoline-fueled car. In 2018, NO_x emissions from the average shuttle are approximately 18 times greater per mile than a passenger car. However, the NOx emissions would still be below the thresholds of significance, as shown in Table 5. Therefore, no significant criteria air pollutant impacts would occur.

[8] Memo – Potential Increase in Commuter Shuttle Activity, from Hank Willson (SFMTA) to Melinda Hue (SF Planning Department), dated October 8, 2015.

Table 5. Estimated Criteria Air Pollutant Emissions

	ROG	NO_x	PM_{10}	$PM_{2.5}$	CO_2
Estimated emissions (pounds per day)[1]					
Project Emissions	-1.4	36	-0.3	-0.3	-6,939
Significance Threshold	54	54	82	54	n/a[2]
Estimated emissions (tons per year)[1]					
Project Emissions	-0.26	6.60	-0.05	-0.05	-1,149
Significance Threshold	10	10	15	10	n/a[2]

Source: Ramboll Environ, 2015.

1. Annual CO_2 emissions are in metric tons.
2. The City relies on compliance with the City's Greenhouse Gas Reduction Strategy instead of quantitative thresholds for determining significance.

Health Risks and Hazards (Localized Analysis)

In addition to criteria air pollutants, individual projects may emit toxic air contaminants (TACs). TACs collectively refer to a diverse group of air pollutants that are capable of causing chronic (i.e., of long-duration) and acute (i.e., potentially severe but short-term) adverse effects to human health, including carcinogenic effects. In an effort to identify areas of San Francisco most adversely affected by sources of TACs, San Francisco partnered with the BAAQMD to conduct a citywide health risk assessment based on an inventory and assessment of air pollution and exposures from mobile, stationary, and area sources within San Francisco. Areas with poor air quality, termed the "Air Pollutant Exposure Zone," were identified based on health-protective criteria that consider estimated cancer risk, exposures to fine particulate matter, proximity to freeways, and locations with particularly vulnerable populations.

The above citywide health risk modeling was also used as the basis in approving a series of amendments to the San Francisco Building and Health Codes, generally referred to as the Enhanced Ventilation Required for Urban Infill Sensitive Use Developments or Health Code, Article 38 (Ordinance 224-14, effective December 8, 2014) (Article 38). The purpose of Article 38 is to protect the public health and welfare by establishing an Air Pollutant Exposure Zone and imposing an enhanced ventilation requirement for all urban infill sensitive use development within the Air Pollutant Exposure Zone. The Air Pollutant Exposure Zone was also used as the basis in approving a series of amendments to the San Francisco Environment and Administrative Codes, generally referred to as the Clean Construction Ordinance, or Environment Code Section 25.

The threshold of significance used to evaluate health risks from new sources of TACs associated with the project is based on the potential for the proposed project to substantially affect the extent and severity of the Air Pollutant Exposure Zone at sensitive receptor locations. For projects that could result in sensitive

receptor locations meeting the Air Pollutant Exposure Zone criteria that otherwise would not occur without the project, a proposed project that would emit $PM_{2.5}$ concentration above 0.3 µg/m³ or result in an excess cancer risk greater than 10.0 per million would be considered a significant impact. The 0.3 µg/m³ $PM_{2.5}$ concentration and the excess cancer risk of 10.0 per million persons exposed are the levels below which the BAAQMD considers new sources not to make a considerable contribution to cumulative health risks.[9] For those locations already meeting the Air Pollutant Exposure Zone criteria, a lower significance standard is required to ensure that a proposed project's contribution to existing health risks would not be significant. In these areas a proposed project's $PM_{2.5}$ concentrations above 0.2 µg/m³ or an excess cancer risk greater than 7.0 per million would be considered a significant impact. The proposed project would include stops both within and outside the Air Pollutant Exposure Zone and thus all of the above thresholds of significance apply.

The proposed project would include limited construction activities for capital improvements. Project construction activities would result in short-term emissions of DPM and other TACs. The proposed project is subject to the Clean Construction Ordinance. While emission reductions from limiting idling, educating workers and the public and properly maintaining equipment are difficult to quantify, other measures in the Clean Construction Ordinance, specifically the requirement for equipment with Tier 2 engines and Level 3 Verified Diesel Emission Control Strategy (VDECS) can reduce construction emissions by 89 to 94 percent compared to equipment with engines meeting no emission standards and without a VDECS. Emissions reductions from the combination of Tier 2 equipment with level 3 VDECS is almost equivalent to requiring only equipment with Tier 4 Final engines, which is not yet readily available for engine sizes subject to the Clean Construction Ordinance. Therefore, compliance with the Clean Construction Ordinance would ensure construction emissions impacts on nearby sensitive receptors would not be significant.

Sensitive receptors may be exposed to increased emissions at existing stops as a result of the increased demand for shuttle service from local and regional employers and their workers. In addition, sensitive receptors that are currently not exposed to emissions from commuter shuttle stop events could be exposed in the future if new stops are added as part of the Program. Therefore, a localized health risk assessment was conducted to assess the excess cancer risk and $PM_{2.5}$ concentrations from the Program.

Four local impact zones were modeled to represent the localized health risk effects at any existing stop or proposed stop under the Program. The four local impact zones were chosen based on the following criteria: exhibit high volumes of stop events under the Pilot Program; represent average or above average idling times for idling times for commuter shuttle under the Pilot Program; representative of the geographic diversity within the City for stops (within and outside the Air Pollutant Exposure Zone, differing locations of sensitive receptors); and representative of configuration of stops (e.g., east-west vs. north-south, stops on both sides of the street).

[9] Bay Area Air Quality Management District, *California Environmental Quality Act Guidelines Update, Proposed Air Quality CEQA Thresholds of Significance*, May 3, 2010.

In order to assess potential impacts from locating a new stop anywhere in the City, for a baseline the modeling assumed that no shuttles currently stop at the four local impact zones. This represents a conservative analysis for some locations because with or without the Program the shuttles would be making stops at various locations throughout the City. However, this conservative approach allows for disclosure of air quality effects that occur today at some locations and provides information about health effects that could occur in the future if and/or when a new loading zone is created. In addition, localized health effects were based upon the following assumptions: an increase in the number of stop events that could occur between Pilot and Program conditions (estimated at 29 percent) at locations with a high volume stop events; the same commuter shuttle engine years (2012 or newer) as mentioned above for criteria air pollutants; commuter shuttle fuel type and idling time; and various methodologies consistent with BAAQMD guidance regarding assessing local risks and hazards.

As shown in Table 6, the estimated health risk and $PM_{2.5}$ concentrations from the Program would not exceed significance thresholds both within and outside the Air Pollutant Exposure Zone for residential sensitive receptors. Therefore, no significant localized health risk impacts would occur.

Table 6. Estimated Health Risks and Hazards

Air Pollutant Exposure Zone Location	Local Impact Zone	Lifetime Cancer Risk	Shuttle-Generated Annual $PM_{2.5}$ Concentrations
Outside	Van Ness & Union	5.6	0.02
Outside	Valencia & 24th/25th	4.3	0.01
	Significance Threshold	10.0	0.3
Within	Townsend & 4th	0.9	<0.01
Within	Market & 8th	2.8	<0.01
	Significance Threshold	7.0	0.2

Source: Ramboll Environ, 2015.

Noise

An analysis of the potential noise effects of adding transit service on streets in San Francisco was prepared for the Service Improvements analyzed in the Transit Effectiveness Project EIR (TEP EIR) in Chapter 4, Section 4.3, Noise and Vibration, on pp. 4.3-35 to 4.3-48.[10] The results of that analysis are relevant to the indirect changes in noise that could occur as the commuter shuttle program expands in the future.

The City considers temporary noise from construction performed in compliance with the San Francisco Noise Ordinance, Article 2.4 of the San Francisco Public Works Code/DPW Order No. 176-707, and the SFMTA Blue Book to be less than significant. These regulations require that construction not produce noise from any construction equipment (except impact tools) that would exceed 80 dBA at 100 feet or

[10] San Francisco Planning Department, *Transit Effectiveness Project Final Environmental Impact Report*, certified March 27, 2014, Case No. 2011.0558E (hereinafter "TEP EIR").

generate construction noise between 8:00 p.m. and 7:00 a.m. that exceeds the ambient noise level by 5 dBA at the nearest property line without procuring a Night Noise Permit. Pursuant to § 2907 of the San Francisco Noise Ordinance, impact tools and equipment must be equipped with intake and exhaust mufflers recommended by the manufacturers and approved by the Director of Public Works for maximum noise attenuation, and pavement breakers and jackhammers must be equipped with acoustically attenuating shields or shrouds.[11] Per the Night Noise Permit, the use of construction equipment that generates high level of noise and impact equipment is not allowed after 10:00 p.m.[12]

The Federal Transit Administration (FTA) developed a methodology and significance criteria to evaluate noise impacts from operation of surface transportation modes (i.e. passenger cars, trucks, buses, and rail) in their guidance document: *Transit Noise Impact and Vibration Assessment* (FTA Guidelines).[13] The FTA incremental noise impact criteria are based on US EPA recommended levels and studies of community annoyance from transportation noise. This approach was used in the TEP EIR to evaluate the noise impact from increases in transit vehicle trips on San Francisco streets.

The TEP EIR noise analysis evaluated construction impacts from adding pedestrian bulbs, bus bulbs, and boarding islands similar to those included in the proposed project.[14] The loudest noise levels are typically generated by impact equipment (e.g., hoe ram or jackhammers) that would be required for the demolition of the existing sidewalk and street and from paving equipment during street restoration.

The expected noise level from construction equipment used for the proposed capital improvements would not emit noise in excess of 80 dBA at 100 feet.[15] Therefore, with adherence to the San Francisco Noise Ordinance, including limiting the noise levels from individual pieces of construction equipment (other than impact tools) to 80 dBA at a distance of 100 feet, equipping impact tools with both intake and exhaust muffled, and obtaining a noise permit for night work from DPW, as well as compliance with the Public Works Code and other DPW regulations, indirect temporary construction noise impacts from the program would be less than significant.

The TEP EIR noise analysis studied the daily increase in operational ambient noise from increases in transit vehicle trips on streets with existing low (55 to 59 dBA Ldn), medium (60 to 69 dBA Ldn), and high (70 dBA Ldn and greater) ambient noise levels. The increases in numbers of standard diesel motor coaches ranged from about 115 per day on a street with low ambient noise levels (55 dBA Ldn) to over 500 per day on a street with high ambient noise levels (70 dBA Ldn).[16] The use of standard diesel motor coaches provided a conservative estimate of the noise that could be generated by increases in transit

[11] San Francisco Municipal Code, Police Code, Article 29 – Regulation of Noise. Available online at: http://www.sfdph.org/dph/files/EHSdocs/ehsNoise/NoiseOrd.pdf. Accessed June 3, 2013.

[12] TEP EIR p. 4.3.16.

[13] FTA, *Transit Noise and Vibration Impact Assessment*, May 2006. Available online at: www.fta.dot.gov/documents/FTA_Noise_and_Vibration_Manual.pdf. Accessed March 13, 2013.

[14] Note that implementing transit system priority signal systems would not require any construction activities.

[15] See TEP EIR Table 29, p. 4.3.31.

[16] TEP EIR Table 31, pp. 4.3.38-4.3.39.

vehicles in the analysis.[17] The results of the analysis of operational noise impacts in the TEP EIR show that adding substantial numbers of motor coaches to city streets, including streets that currently experience low ambient noise levels, would not result in significant increases in noise and would cause less-than-significant noise impacts.[18] Similarly, noise generated by the commuter shuttles would be comparable to those of the MUNI system if they were all standard diesel motor coaches.

As shown in Table 3 (Stop Events at Designated Zones [with Commuter Shuttle Program]), the commuter shuttle program could add up to three percent to the total number of shuttle vehicles to major and minor arterial roadways, assumed to have moderate to high ambient noise levels on a typical week day in San Francisco. It should be noted that as part of the program, shuttle motor coaches would be required to follow routes along arterial streets and avoid residential streets, thereby avoiding streets with low ambient noise levels. Therefore, it is reasonable to assume that, as for the TEP Service Improvements, the increase in noise levels during operation of the commuter shuttles would result in similar less-than-significant noise impacts.

Further, an approximate doubling of traffic volumes in the project area would be necessary to produce an increase in ambient noise levels noticeable to most people. As previously described, the proposed project would not cause a doubling in traffic volumes with the implementation of the Commuter Shuttle Program. The project's marginal increase to the existing shuttle activity at arterial roads (up to three percent) would not cause a noticeable increase in the ambient noise level in the project vicinity. The noise generated by commuter shuttles would be considered common and generally acceptable in an urban area, and would not be considered a significant impact.

Other CEQA Topics

Members of the public have expressed concern that commuter shuttles, the Pilot, and/or the proposed Program have caused an increase in housing costs, resulting in displacement. The increase in housing costs in San Francisco is a well-documented issue that is being addressed in a variety of ways. Prices have risen across the City as demand for housing has increased due to a variety of factors, including significant growth in employment opportunities within San Francisco and the Bay Area. As shown in Table 2 on p. 10, the ridership survey indicates that of the estimated 8,500 daily shuttle riders, only five percent (425 shuttle users) would move closer to their jobs were the commuter shuttles unavailable. Therefore, the availability and proximity of commuter shuttles do not appear to be contributing substantially to housing demand or prices in San Francisco.

CEQA Guidelines Section 15064(e) states that "economic and social changes resulting from a project shall not be treated as significant effects on the environment. Economic or social changes may be used, however, to determine that a physical change shall be regarded as a significant effect on the environment. Where a physical change is caused by economic or social effects of a project, the physical change may be

[17] TEP EIR pp. 4.3.36-4.3.37.

[18] EPT EIR Table 32, p. 4.3.46, and pp. 4.3-43 to 4.3-44

regarded as a significant effect in the same manner as any other physical change resulting from the project. Alternatively, economic and social effects of a physical change may be used to determine that the physical change is a significant effect on the environment. If the physical change causes adverse economic or social effects on people, those adverse effects may be used as a factor in determining whether the physical change is significant." The proposed Program would not result in elimination of any housing units. Any physical impacts associated with increased housing costs would be related to the construction of replacement housing for displaced residents, or increased trip lengths and emissions for displaced residents. However, there is no demonstrable evidence of physical displacement of individuals from housing units attributable to commuter shuttles, and if such displacement were to occur as a result of the proposed program, there is no basis to assess where such individuals would relocate and what their travel behavior would entail. Since there is no demonstrated causative link between commuter shuttle use and housing demand or price, and there is no foreseeable displacement associated with the proposed Program, analysis of any such impacts would be speculative with regard to their scale and nature.

The Commuter Shuttle Program would not result in any changes in land use, urban design or long range views, cultural resources, biological resources, greenhouse gas emissions, wind, shadow, utilities and service systems, geology and soils, hydrology or water quality, mineral resources or agricultural and forest resources. No new hazardous waste would be generated by the Commuter Shuttle Program. Implementation of the proposed project, may reduce already less-than-significant effects on emergency vehicle access.

EXEMPT STATUS

The California Environmental Quality Act (CEQA) Guidelines Section 15301, or Class 1, provides for the exemption from environmental review of minor alterations to existing highways and streets, sidewalks, gutters, bicycle and pedestrian trails, and similar facilities. The proposed project would include minor modifications to the existing arterials to install new commuter shuttle stops, as well as the installation of minor improvements such as signage, traffic islands, and bus bulbs. Therefore, the proposed project would be exempt from CEQA under Class 1.

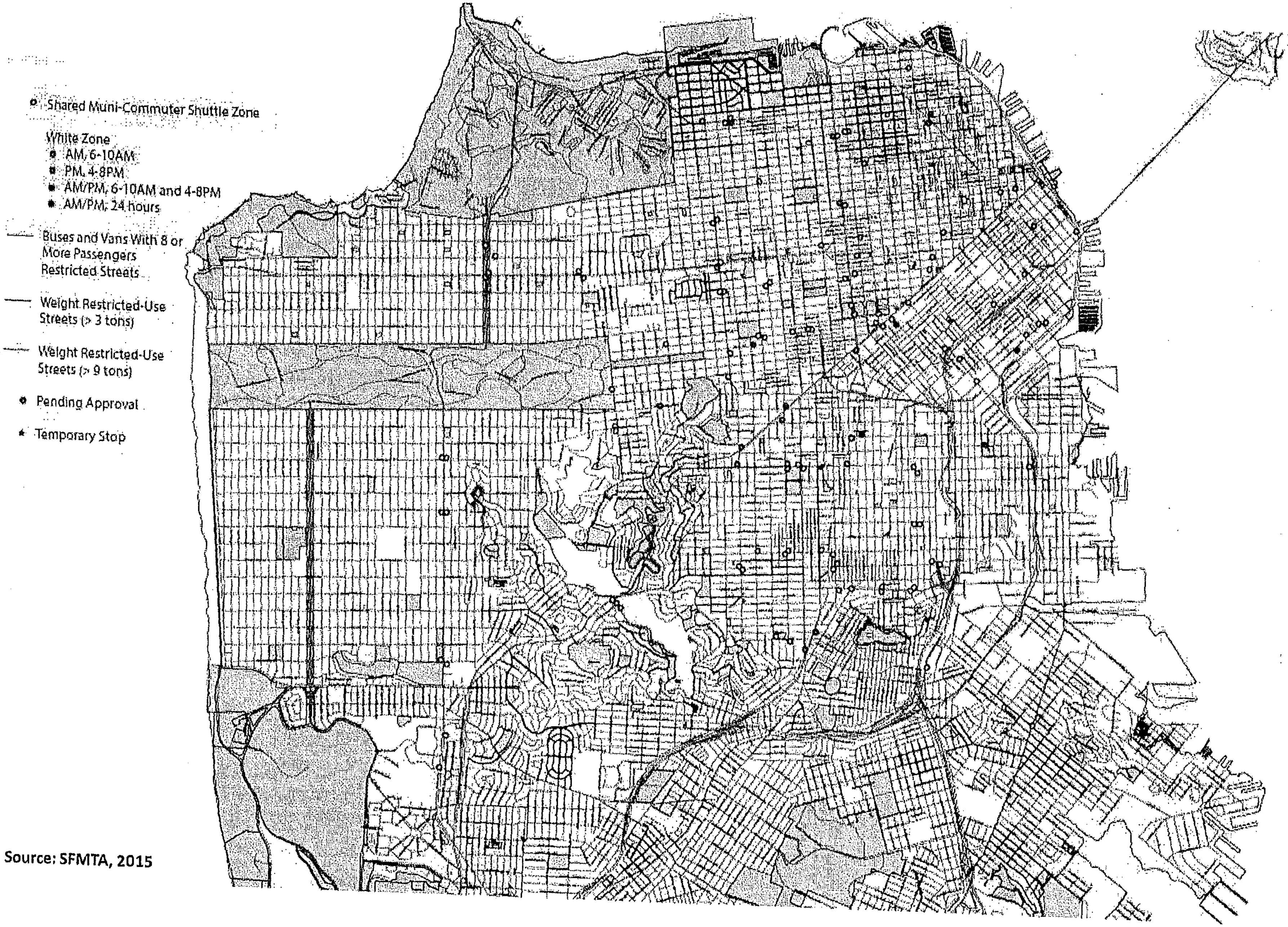
CEQA Guidelines Section 15308, or Class 8, provides for exemption for actions taken by regulatory agencies, as authorized by state or local ordinance, to assure the maintenance, restoration, enhancement, or protection of the environment where the regulatory process involves procedures for protection of the environment. The proposed project would include the implementation of the Commuter Shuttle Program, which issues permits to eligible commuter shuttle providers meeting specific requirements and terms and would allow the use of designated public curb space. The program provides procedures intended to facilitate operation of commuter shuttles, enable vehicle trip reduction, and minimize impacts to users of other transportation modes in San Francisco. As such, it constitutes actions by SFMTA meant to enhance and protect the environment involving regulatory procedures for shuttle activity. Therefore, the proposed project would be exempt from CEQA under Class 8.

CONCLUSION

Guidelines Section 15300.2, subdivision (c), provides that a categorical exemption shall not be used for an activity where there is a reasonable possibility that the activity will have a significant effect on the environment due to unusual circumstances. As illustrated, herein there are no unusual circumstances surrounding the proposed project that would suggest a reasonable possibility of a significant effect. The proposed project would not substantially increase traffic on the existing street system and no significant environmental impact would occur. For the above reasons, the proposed project is appropriately exempt from environmental review.

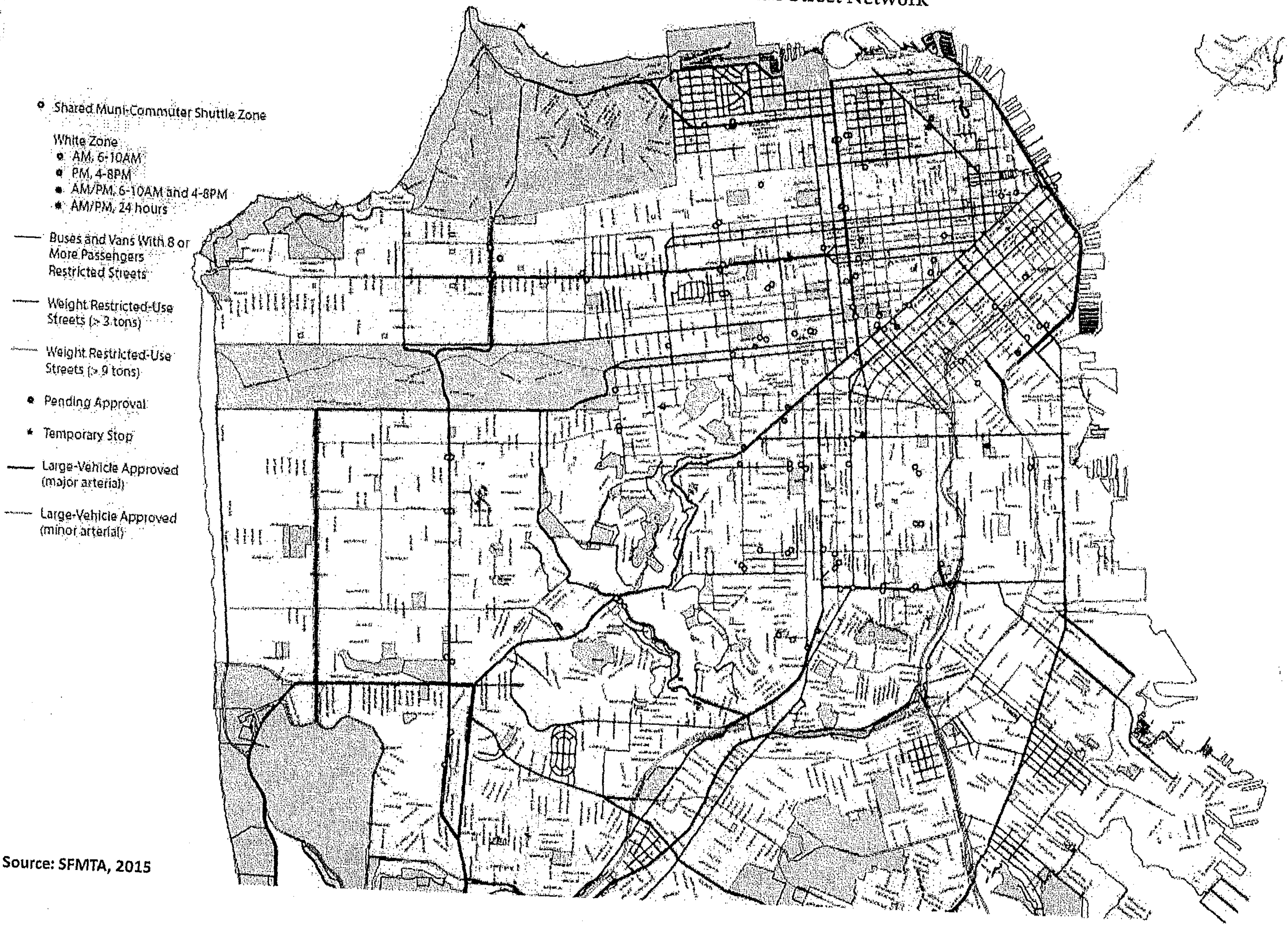
The proposed project satisfies the criteria for exemption under the above-cited classification(s). In addition, none of the CEQA Guidelines Section 15300.2 exceptions to the use of a categorical exemption applies to the proposed project. For the above reasons, the proposed project is appropriately exempt from environmental review.

Attachment A: Pilot Program Shuttle Network



Source: SFMTA, 2015

Attachment B: Proposed Commuter Shuttle Street Network



Source: SFMTA, 2015

LOZEAU DRURY LLP

T 510.836.4200
F 510.836.4205

410 12th Street, Suite 250
Oakland, Ca 94607

www.lozeaudrury.com
rebecca@lozeaudrury.com

January 14, 2016

Via Overnight Delivery and Electronic Mail

President London Breed and
Board of Supervisors of the City and County of San Francisco
c/o Ms. Angela Calvillo, Clerk of the Board
1 Dr. Carlton B. Goodlett Place
City Hall, Room 244
San Francisco, CA 94102-4689
Email: Board.of.Supervisors@sfgov.org
Bos.legislation@sfgov.org

Re: Appeal of SFMTA Resolution No. 15-161, CEQA Categorical Exemption Determinations for Commuter Shuttle Permit Program

Dear President Breed and Honorable Members of the Board of Supervisors:

I am writing on behalf of the Coalition for Fair, Legal and Environmental Transit ("Coalition"), Service Employees International Union Local Union 1021 ("SEIU 1021"), Sue Vaughan, and Robert Planthold (collectively, "Appellants") concerning the San Francisco Municipal Transportation Agency ("SFMTA") Commuter Shuttle Permit Program and recent amendments to Transportation Code, Division II, to establish a Commuter Shuttle Permit Program to authorize certain shuttle buses to stop in designated Muni stops and passenger loading zones for the purpose of loading or unloading passengers, and establish permit conditions for such permits ("Project" or "Shuttle Project").

Appellants urge the Board to require review of the Shuttle Project under the California Environmental Quality Act ("CEQA"). CEQA review would allow the City to analyze the Project's impacts on traffic, pedestrian and bicyclist safety, public transportation, and air quality, and to consider feasible mitigation measures and alternatives. Feasible mitigation measures and alternatives could include, for example, consideration of alternate stop locations that would reduce interference with MUNI, traffic, pedestrians, and bicyclists, more environmentally friendly buses, and other mitigations. Because the City decided to exempt the Shuttle Project entirely from CEQA review, none of this analysis occurred.

In addition, as discussed below, the Shuttle Project conflicts with the California Vehicle Code, which prohibits private shuttle buses from stopping in Muni zones. As a result, the Project is preempted by State law.

For these reasons, Appellants ask the Board of Supervisors to overturn the adoption of the Shuttle Project and the finding that the Project is exempt from CEQA.

I. THE CITY ABUSED ITS DISCRETION BY FINDING THE SHUTTLE PROJECT EXEMPT IS FROM CEQA.

A. Legal Background

CEQA mandates that "the long-term protection of the environment . . . shall be the guiding criterion in public decisions" throughout California. Pub. Res. Code ("PRC") § 21001(d). The foremost principle under CEQA is that it is to be "interpreted in such a manner as to afford the fullest possible protection to the environment within the reasonable scope of the statutory language." *Citizens of Goleta Valley v. Bd. of Sups.* (1990) 52 Cal.3d 553, 563-64. An agency's action violates CEQA if it "thwarts the statutory goals" of "informed decisionmaking" and "informed public participation." *Kings Co. Farm Bur. v. City of Hanford* (1990) 221 Cal.App.3d 692, 712.

To achieve its objectives of environmental protection, CEQA has a three-tiered structure. 14 CCR § 15002(k); *Comm. to Save Hollywoodland v. City of Los Angeles* (2008) 161 Cal.App.4th 1168, 1185-86. First, if a project falls into an exempt category, no further agency evaluation is required. *Id.* Second, if there is a possibility the project will have a significant effect on the environment, the agency must perform a threshold initial study. *Id.*; 14 CCR § 15063(a). If the study indicates that there is no substantial evidence that the project may cause a significant effect on the environment, the agency may issue a negative declaration. *Id.*, 14 CCR §§ 15063(b)(2), 15070. Finally, if the project will have a significant effect on the environment, an environmental impact report ("EIR") is required. *Id.* Here, since the City exempted the Project from CEQA, we are at the first step of the CEQA process, where the standard is extremely low.

1. Categorical Exemptions

CEQA identifies certain classes of projects that are exempt from the provisions of CEQA. These are called categorical exemptions. PRC § 21084(a); 14 CCR §§ 15300, 15354. Categorical exemptions are certain classes of activities that generally do not have a significant effect on the environment. *Id.* Public agencies utilizing such exemptions must support their determination with substantial evidence. PRC § 21168.5.

CEQA exemptions must be narrowly construed, and "[e]xemption categories are not to be expanded beyond the reasonable scope of their statutory language." *Mountain Lion Found. v. Fish & Game Comm'n* (1997) 16 Cal.4th 105, 125; *McQueen v. Bd. of Dirs.* (1988) 202 Cal. App. 3d 1136, 1148. Strict construction is required in order to interpret categorical exemptions in a manner that affords the greatest environmental protection within the reasonable scope of their statutory language. *County of Amador v. El Dorado County Water Agency* (1999) 76 Cal.App.4th 931, 966. "Since a determination that a project falls within a categorical exemption excuses any further compliance with CEQA whatsoever, we must construe the exemptions narrowly in order to afford the fullest possible environmental protection." *Save Our Carmel*

River v. Monterey Peninsula Water Management Dist. (2006) 141 Cal.App.4th 677, 697. Exemptions "should not be so broadly interpreted so to include a class of [projects] that will not normally satisfy the statutory requirements for a categorical exemption, even if the premises on which such [projects] are conducted might otherwise come within [the exemption]." *Azusa Land Reclamation Co. v. Main San Gabriel Basin Watermaster* (1997) 52 Cal.App.4th 1165, 1192-1193.

2. The Significant Effect Exception to Categorical Exemptions

CEQA contains several exceptions to categorical exemptions. 14 CCR § 15300.2. If an exception applies, the exemption cannot be used, and the agency must instead prepare an initial study and CEQA document. *McQueen*, 202 Cal. App. 3d at 1149; *Hollywoodland*, 161 Cal. App. 4th at 1187. "Even if a project falls within the description of one of the exempt classes, it may nonetheless have a significant effect on the environment based on factors such as location, cumulative impact, or unusual circumstances." *Save Our Carmel River v. Monterey Peninsula Water Mgmt. Dist.* (2006) 141 Cal. App. 4th 677, 689. One such exception, referred to as the "significant effect exception" states that "a categorical exemption shall not be used for an activity where there is a reasonable possibility that the activity will have a significant effect on the environment due to unusual circumstances." 14 CCR 15300.2.

The California Supreme Court recently established two ways a party may invoke the unusual circumstances exception in the case *Berkeley Hillside Preservation v. City of Berkeley* (2015) 60 Cal.4th 1086, 1105 ("*Berkeley Hillside*"). First, "a party may establish an unusual circumstance with evidence that the project *will* have a significant environmental effect. That evidence, if convincing, necessarily also establishes 'a reasonable possibility that the activity will have a significant effect on the environment due to unusual circumstances.'" *Berkeley Hillside*, 60 Cal.4th 1086, 1105 (emph. added). Alternatively, "[a] party invoking the exception may establish an unusual circumstance without evidence of an environmental effect, by showing that the project has some feature that distinguishes it from others in the exempt class, such as its size or location. In such a case, to render the exception applicable, the party need only show a reasonable possibility of a significant effect due to that unusual circumstance." *Id.*

B. The Shuttle Project is Beyond the Scope of the Class 8 Exemption.

The City applies two categorical exemptions to the Project. First, the City attempts to exempt the "minor modifications to the existing arterials to install new commuter shuttle stops, as well as the installation of minor improvements such as signage, traffic islands and bus bulbs" from CEQA as a Class 1 "minor alteration" activity.[1] Second, the City attempts to exempt the

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[1] The Class 1 exemption:

> [C]onsists of the operation, repair, maintenance, permitting, leasing, licensing, or minor alteration of existing public or private structures, facilities, mechanical equipment, or topographical features, involving negligible or no expansion of use beyond that existing at the time of the lead agency's determination.

remainder of the Shuttle Project under CEQA's Class 8 categorical exemption for "Actions by Regulatory Agencies for the Protection of the Environment." 14 CCR § 15308. While Appellants do not take issue with application of the Class 1 exemption to a limited portion of the Project such as addition of signs to bus stops, the remainder of the Shuttle Project requires an environmental analysis under CEQA because it goes beyond the scope of the Class 8 exemption, and therefore an environmental analysis must be conducted under CEQA.

The Class 8 exemption "consists of actions taken by regulatory agencies, as authorized by state or local ordinance, to ***assure*** the maintenance, restoration, enhancement, or protection of the environment where the regulatory process involves procedures for protection of the environment. Construction activities and relaxation of standards allowing environmental degradation are not included in this exemption." 14 CCR § 15308 (emph. added). The Class 8 exemption is inapplicable to the Shuttle Project.

When a project may have significant environmental impacts that are both favorable and unfavorable, the project cannot be exempt under Class 8. *Paulek v. Western Riverside County Regional Conservation Authority* (2015) 237 Cal.App.4th 1005, 1030; *Cal. Unions for Reliable Energy v. Mojave Desert Air Quality Mgmt. Dist.* (2009) 178 Cal.App.4th 1225, 1240; *Wildlife Alive v. Chickering* (1976) 18 Cal.3d 190, 206. "[Even a] new regulation that strengthens some environmental requirements may not be entitled to an exemption if the new requirements could result in other potentially significant effects." *Cal. Unions for Reliable Energy v. Mojave Desert Air Quality Mgmt. Dist.* (2009) 178 Cal.App.4th 1225, 1240 (quoting 2 Kostka & Zischke, Practice Under the Cal. Environmental Quality Act, § 20.43, p. 981). As the California Supreme Court explains:

> When the impact may be either adverse or beneficial, it is particularly appropriate to apply CEQA which is carefully conceived for the purpose of increasing the likelihood that the environmental effects will be beneficial rather than adverse.

Wildlife Alive v. Chickering (1976) 18 Cal.3d 190, 206.

The Class 8 exemption is inapplicable to the Shuttle Project for three reasons: 1) the Shuttle Project will not *assure* protection of the environment; 2) the Project has significant adverse environmental impacts that preclude reliance on the Class 8 exemption; and 3) the project relaxes standards set in the State Vehicle Code which will result in environmental degradation including impacts to local air quality, and pedestrian and bicycle safety.

1. The Shuttle Program Fails to Assure Protection of the Environment.

First, the Class 8 exemption is inapplicable because the Shuttle Project does not ***assure*** protection of the environment. In its CEQA Exemption Report, the Planning Department

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14 CCR § 15301.

determined that the Class 8 exemption was applicable because the Shuttle Project "provides procedures ***intended to*** facilitate operation of commuter shuttles, ***enable*** vehicle trip reduction, and ***minimize*** impacts to users or other transportation modes in San Francisco." SFPD, p. 24. The Planning Department further explained that, "[a]s such, [the Shuttle Project] constitutes actions by SFMTA ***meant to*** enhance and protect the environment involving regulatory procedures for shuttle activity." *Id.* As this language makes clear, the Shuttle Project in no way ***assures*** the maintenance, restoration, enhancement, or protection of the environment. As the below discussion makes clear, despite the City's lofty intentions, the Shuttle Project will have environmental impacts.

We know that the Pilot Program had these same goals, but that the Pilot fell far short of meeting them. For example, one of the goals of the Pilot Program was to manage the movement of commuter shuttles by providing shuttle operators with clear guidelines on where and when to stop at curbs. To achieve this goal, the City included various permit conditions, such as requiring shuttles to pull all the way in to shuttle stops, and not double parking. The Shuttle Project has these same permit conditions. During the Pilot Program, between August 2014 and May 2015, SFMTA enforcement officers issued 1200 citations to shuttle buses. Evaluation, p. 26. The most common citation issued was for double-parking and non-permitted use of a Muni zone, both of which were prohibited under the Pilot. *Id.* In October 2014 alone, more than 90 citations were issued for commuter shuttles double-parking in Muni zones. *Id.* at 27. The idea that commuter shuttles will now comply with all permit conditions under the Shuttle Project, when they clearly did not under the Pilot Program, is not supported by evidence. More importantly, the permit conditions alone cannot be said to ***assure*** that commuter shuttles will comply with permit terms.

2. The Shuttle Project Will Have Significant Adverse Environmental Impacts on Pedestrians, Bicycle Safety and Air Quality.

Second, the City may not rely on the Class 8 exemption because, as discussed below, the Shuttle Project will have significant adverse environmental impacts on pedestrian and bicyclist safety and air quality. In finding the Project exempt under Class 8, the City is essentially ignoring all of these significant negative environmental impacts based on the Project's potentially positive impact on reduction of vehicle miles traveled. The City does not get to choose which environmental impact to protect, and then ignore all others. Under the Planning Commission's reasoning, one could exempt any project, regardless of its impacts, as long as it had some environmentally beneficial aspect. CEQA does not allow for this. Despite the Shuttle Project's potential to reduce vehicle miles traveled, the City must conduct CEQA analysis of these Shuttle Project's significant adverse environmental impacts.

3. The Shuttle Project Relaxes Standards Set Forth in the State Vehicle Code, and as a Result, Causes Significant Adverse Impacts to Pedestrians, Bicycle Safety and Public Transit.

As discussed below, the Shuttle Project violates the State Vehicle Code. The Vehicle Code prohibits private vehicles from stopping on red curb zones marked for public buses. The

Shuttle Project expressly allows this violation of state law. As such the Shuttle Project relaxes state standards. As a result, the Shuttle Project causes adverse impacts to pedestrian safety, bicycle safety and public transit.

C. The Class 8 Exemption is Inapplicable Because the Shuttle Project will have Significant Environmental Impacts due to Unusual Circumstances.

Even if the Shuttle Project did fit within the scope of the Class 1 and Class 8 exemptions, which it does not, the exemptions would still be inapplicable because of the significant effect exception. *See* 14 Cal. Code Regs. § 15300.2(c). The Shuttle Project does not present the same general risk of environmental impacts as other projects falling under the Class 1 and Class 8 exemptions, and therefore the exemptions are inapplicable.

1. The Shuttle Project will have a significant environmental impact, thereby establishing an unusual circumstance.

Under *Berkeley Hillside*, evidence that a project *will* have a significant environmental effect "does tend to prove that some circumstance of the project is unusual." *Berkeley Hillside*, 60 Cal.4th at 1105. Here, there is substantial evidence that the Shuttle Project will – and is – having a significant environmental impact, thereby necessarily establishing an unusual circumstance.

i. The Shuttle Project *will have* a significant impact on bicycle safety.

The City has created a list of eight "transportation significance criteria," which act as thresholds of significance to determine if a project's environmental impact is significant under CEQA. The fourth transportation significance criteria states:

> The project would have a significant effect on the environment if it would create potentially hazardous conditions for bicyclists or otherwise substantially interfere with bicycle accessibility to the site and adjoining areas.

San Francisco Planning Department, Transportation Significance Criteria (June 2, 2013).

Traffic Engineer Tom Brohard, P.E., prepared a detailed analysis of the Shuttle Project and concluded that it will have a significant adverse impact because it creates potentially hazardous conditions for bicyclists. Exhibit A, Brohard Comment, p. 4. According to Mr. Brohard, "[s]huttle buses blocking bicycle lanes would cause bicyclists to sharply veer into vehicle travel lanes to avoid the shuttle bus at the stop, creating a potentially hazardous condition." *Id.*

The Exemption Report attempts to couch the impacts of commuter shuttles on bicyclists as "infrequent," yet the Evaluation says that ***on average, shuttles block travel and bike lanes approximately 35% of the time that they stop.*** Evaluation, p. 25. Indeed, during the pilot, at four of the 20 zones studied by SFMTA, ***commuter shuttles blocked travel or bike lanes more***

than 90% of the times they stopped.[2] Evaluation, p. 24. Even more telling, at all four stops where shuttles blocked traffic and bike lanes more than 90% of the time, the frequency of conflicts increased dramatically from pre-pilot to pilot. For example, pre-pilot, commuter shuttles blocked traffic and bike lanes 18% of the time they stopped at 16th & Mission/South Van Ness, but during the pilot, they blocked traffic and bike lanes 94% of the times they stopped. Evaluation, p. 24. These conflicts can hardly be said to be "infrequent."

In addition, "[a]t five of the eight shuttle-only zones, blocked travel and bike lanes as a percentage of shuttle stop-events increased from pre-pilot to during-pilot, sometimes substantially." Evaluation, p. 27.

The Exemption Report concludes, without any supporting evidence, that "[b]ecause of their infrequency, and the Program's ability to address any potential conflicts through modification of the shuttle stop length or location, the proposed Program would not be expected to result in a significant impact related to bicycles." Exemption Report, p. 15. In other words, since the City says the conflicts are infrequent (without any supporting evidence), and since any impacts can be mitigated (which, as discussed below, cannot be considered at the exemption stage of CEQA), there is no significant impact. CEQA does not allow this kind of circular and conclusory analysis.

Since expert evidence, and the City's own reports, establishes that the Shuttle Project will create potentially hazardous conditions for bicyclists, the CEQA exemption is improper. *See, Berkeley Hillside Preservation v. City of Berkeley* (2015) 60 Cal.4th 1086, 1105. CEQA review is required to analyze the Project's bicycle safety impacts and to implement feasible mitigation measures.

ii. The Shuttle Project *will have* a significant impact on pedestrian safety.

The Shuttle Project will also have significant impacts on pedestrian safety. The City's third "transportation significance criteria," states:

> The project would have a significant effect on the environment if it would result in substantial overcrowding on public sidewalks, ***create potentially hazardous conditions for pedestrians***, or otherwise interfere with pedestrian accessibility to the site and adjoining areas.

San Francisco Planning Department, Transportation Significance Criteria (June 2, 2013) (emph. added). Commuter shuttles create potentially hazardous conditions for pedestrians, and therefore CEQA review is required.

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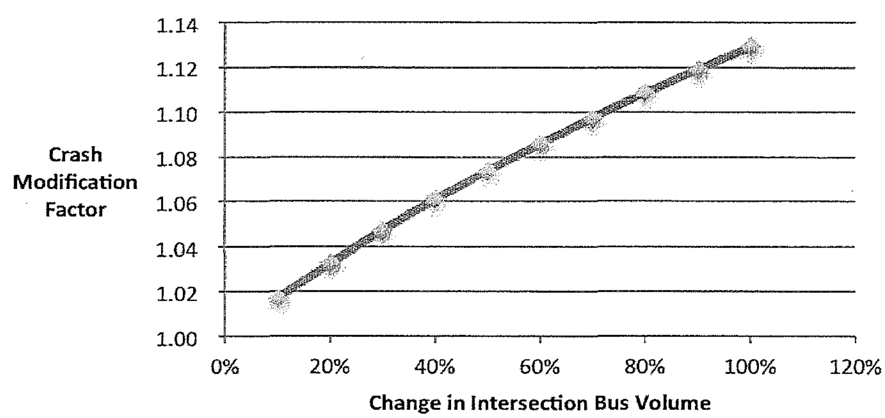
[2] Indeed, the Evaluation states that commuter shuttles blocked travel or bike lanes 105% of the time at Valencia and 24th, explaining that the "zone blocked travel in excess of 100% because two shuttles managed to block both the bike lane and travel lane at the same time." Evaluation, p. 26 fn. 10.

The City has a "Vision Zero SF" goal to reduce to zero the number of traffic-related deaths in San Francisco by 2024.[3] Every year, approximately 30 people lose their lives and more than 200 others are seriously injured while traveling on San Francisco streets.[4] Seventy-one percent of traffic fatalities in 2013 and 2014 were bicyclists and pedestrians.[5] As part of Vision Zero SF, the City identified corridors for targeted safety measures because they encompass 6% of streets, but account for over 60% of serious and fatal injuries. Many of these corridors correspond to those zones used by commuter shuttles. In addition, according to the Vision Zero SF website, large vehicles, such as commuter shuttles, account for four percent of collisions with people walking and bicycling but 17 percent of the fatalities form those collisions.[6]

In 2013 the San Francisco Department of Public Health conducted a detailed study of injuries at signalized intersections in San Francisco.[7] As part of the study, the Department of Public Health created a Pedestrian Injury Model which evaluated the impact of bus volume on intersection level pedestrian injury. The study estimated that an increase in bus volumes of approximately 50% resulted in an increased injury frequency of about 7%. See Figure 1. The effect of bus volumes was independent of traffic volume and the proximity of bus stops.

Figure 1. Pedestrian Injury Collision Frequency as a Function of Bus Volumes at Signalized Intersections in San Francsico (Source: SF Department of Public Health, 2013)



[3] http://visionzerosf.org/about/two-year-action-strategy/
[4] http://visionzerosf.org/about/how-are-we-doing/
[5] Vision Zero San Francisco, Two-Year Action Strategy, Eliminating Traffic Deaths by 2024, p. 5 (Feb. 2015), *available at* http://www.joomag.com/magazine/vision-zero-san-francisco/0685197001423594455?short.
[6] http://visionzerosf.org/vision-zero-in-action/educating-the-public/
[7] San Francisco Dept. of Health. Modeling Vehicle-Pedestrian Injury collisions at Signalized Intersections: A Health Forecasting Approach to Informing Pro-active Pedestrian Safety Improvements, Fall 2013.

The City assumes that under the Shuttle Project, the number of shuttles will increase by 41% from pre-pilot levels, but the Project itself allows for an unlimited increase in the number of shuttles. Based on the City's own study, this increase in bus volume will create potentially hazardous conditions for pedestrians. A CEQA review is required to study and mitigate this significant environmental impact.

According to the Exemption Report, pedestrian safety impacts from commuter shuttles "were one of the primary reasons that the Commuter Shuttle Program, upon implementation, would include identifying shuttle zones that may be moved from the near side of the intersection to the far side of the intersection." Exemption Report, p. 15. But without a CEQA analysis, nothing in the Shuttle Project ***requires*** the City to identify or move any shuttle zones to protect pedestrians. Under CEQA, the City would be required to implement all feasible mitigation measures, such as moving the location of shuttle zones to protect pedestrians.

2. The Shuttle Project presents an unusual circumstance that may result in significant air quality impacts.

When a project has some feature that distinguishes it from others in the exempt class, to render the significant effect exception applicable, one need only show a reasonable possibility of a significant effect due to that unusual circumstance." *Berkeley Hillside*, 60 Cal.4th 1086, 1105 Even if Petitioners had not presented evidence that the Shuttle Project *will* have significant environmental impacts, the unusual circumstances exception would still apply because four characteristics of the Shuttle Project distinguish it from other projects in the exempt class, and these characteristics create environmental risks not generally present for Class 8 projects.

i. The Shuttle Project is unusual compared to other Class 8 projects.

The Shuttle Project is unusual compared to other Class 8 projects for three reasons. First, the Shuttle Project is unusual because it is illegal. The Shuttle Project presents an unusual circumstance because actions taken to assure the maintenance, restoration, enhancement or protection of the environment do not normally authorize activity that is illegal under state law. There are no other Class 8 projects that authorize illegal activity. The court in *Azusa* held that the fact that a project violated state law was an unusual circumstance. *Azusa*, 52 Cal.App.4th at 1208-09 (violation of state water code was unusual circumstance).

Second, the large scale, and ability for unlimited growth allowed under the Shuttle Project are unusual circumstances that differ from other Class 8 projects. The Shuttle Project does not limit the number of commuter shuttles that may apply for and receive permits to operate commuter shuttles in the City, and there is no limit on the number of shuttle stops that the City may approve at Muni zones around the City. Since the Pilot Project began, daily commuter shuttle stop-events have increased nearly 30%. The City predicts that the Shuttle Project will continue to increase in scale, with stop events increasing by an additional 29% and the number of shuttles increasing by an estimated 41%. But the Project puts no limit on its growth, allowing for an unlimited number of additional shuttles, additional stop locations, and additional stop-events per day. Each new commuter shuttle and each new commuter stop creates new risks and health hazards, and increases the Project's environmental impacts.

Finally, the Shuttle Project also presents an unusual circumstance because actions for the protection of the environment do not ordinarily cause impacts to human health,[8] but the Shuttle Project does. The Shuttle Project creates increased hazards for pedestrians and bicyclists, and increases the cancer risk of those people living near shuttle stops.

ii. There is a reasonable possibility that the Shuttle Project will have a significant air quality impact due to unusual circumstances.

The expert analysis conducted by Soil, Water, Air Protection Enterprise ("SWAPE"), attached hereto as Exhibit B, indicates that the City's air quality analysis is flawed, and that the Shuttle Project's diesel engine exhaust will likely have a significant local air quality impact, causing increased cancer rates above the threshold of significance.

According to SWAPE, the air quality assessment fails to adequately evaluate the Project's health risk impacts for a number of reasons. First, the analysis fails to account for the 41% growth in participating shuttles that is anticipated by the City under the Shuttle Project. SWAPE Comment, p. 2. Second, the analysis failed to account for the increased stop-events that will occur because of the requirement that limits permitted shuttles longer than 35 feet to arterial streets. *Id.* at 3. Finally, the analysis is flawed because there is no evidence that supports the City's estimate that the Project growth will be limited to 41%, when the Project allows for unlimited growth in shuttles, stop locations, and stop-events. The diesel emissions from commuter shuttles "will most likely be much higher than anticipated and result in an increased health risk, potentially above the level of significance." *Id.* at 2. This potentially significant impact must be fully evaluated and mitigated under CEQA.

D. The City Improperly Relied on Mitigation Measures in Finding the Shuttle Project Exempt.

In finding the Shuttle Project exempt, the City improperly relied on mitigation measures.[9] The City's conclusion that the Project will not result in adverse impacts is founded on dozens of

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[8] Impacts to human health are significant under CEQA. CEQA § 21083(b)(3) provides that a project has significant impacts if it "will cause substantial adverse effects on human beings, either directly or indirectly."

[9] Under the CEQA Guidelines, "mitigation" includes: "(a) Avoiding the impact altogether by not taking a certain action or parts of an action. [¶] (b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation. [¶] (c) Rectifying the impact by repairing, rehabilitating, or restoring the impacted environment. [¶] (d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action. [¶] (e) Compensating for the impact by replacing or providing substitute resources or environments." CEQA Guidelines, § 15370.

conditions that have been applied to mitigate and reduce the possibility of adverse environmental impacts.

In deciding whether or not a categorical exemption may apply, an agency many not rely on mitigation measures as a basis for determining that a project is categorically exempt or that one of the significant effects exceptions does not apply. *Salmon Protection & Watershed Network v. County of Marin* (2004) 125 Cal.App.4th 1098, 1102 ("*SPAWN*"); *Azusa Land Reclamation Co. v. Main San Gabriel Basin Watermaster* (1997) 52 Cal.App.4th 1165, 1200. If mitigation measures are needed to avoid significant impacts, then at a minimum a mitigated negative declaration must be prepared. An agency must decide whether a project is eligible for a categorical exemption as part of its preliminary review of the project, not in the second phase when mitigation measures are evaluated. *Azusa*, 52 Cal.App.4th at 1198-1200. If a project will have a significant effect on the environment, CEQA review must occur, and only then are mitigation measures relevant. *SPAWN,* 125 Cal.App.4th at 1102; *Berkeley Hillside*, 60 Cal.4th at 1105.

The court in *S.P.A.W.N.* and *Azusa* both held that an agency cannot evade the procedural and informational requirements for a mitigated negative declaration of an EIR by imposing mitigation measures to make a project fit within a categorical exemption. Instead, if there is a reasonable possibility that the project does not fit within the exemption or will have a significant impact without the mitigation measures, an agency cannot rely on a categorical exemption. *S.P.A.W.N.*, 125 Cal.App.4th at 1107; *Azusa*, 52 Cal.App.4th at 1199-1200.

In *S.P.A.W.N*, an agency found that the proposed construction of a home was categorically exempt under CEQA based on an exemption for single-family homes, despite the fact that the home was adjacent to a protected anadromous fish stream of "critical concern." *S.P.A.W.N.*, 125 Cal.App.4th at 1106. In finding the exemption applicable, the agency relied on proposed mitigation measures including drainage features for erosion and sediment control. *Id.* at 1106-07. The court set aside the exemption stating:

> Reliance upon mitigation measures (whether included in the application or later adopted) involves an evaluative process of assessing those mitigation measures and weighing them against potential environmental impacts, and that process must be conducted under established CEQA standards and procedures for EIRs [(environmental impact reports)] or negative declarations.

Id. at 1108. The court further stated:

> [T]here are sound reasons for precluding reliance upon mitigation measures at the preliminary stage of determining eligibility for a categorical exemption. Regulatory guidelines dealing with the environmental review process under CEQA 'contain elaborate standards – as well as significant procedural requirements – for determining whether proposed mitigation will adequately protect the environment and hence make an EIR unnecessary; in sharp contrast, the Guidelines governing preliminary review do not contain any requirements that expressly deal with the evaluation of mitigation measures.'

> [Citation.] An agency should not be permitted to evade standards governing the preparation of a mitigated negative declaration 'by evaluating proposed mitigation measures in connection with the significant effect exception to a categorical exception.' [Citation.]"

Id.

Here, the City has included dozens of mitigation measures as part of the Project, but has done so outside of the CEQA framework for determining if those mitigation measures will adequately protect the environment.

Throughout the entire CEQA exemption analysis, the City relies on numerous mitigation measures, specifically meant to mitigate the environmental impacts of the Shuttle Project, as bases for finding the Project exempt, and for finding that it will not have a significant impact.

For example, the SFMTA supports its Class 8 exemption finding by citing as "features that will enhance and protect the environment" the "fleet turnover requirements, restrictions on stopping outside of major and minor arterial streets, idling limits, and minor roadway modifications that will improve vehicular, bicycle, and pedestrian safety, decrease conflicts between commuter shuttles and other transportation modes, and improve regional traffic congestion and air emissions." SFMTA Resolution 15-161, Attachment A, California Environmental Quality Act Findings, pp. 1-2. Each of these measures fall squarely within the definition of "mitigation" because they are specifically designed to minimize the Shuttle Project's impact on air quality, pedestrian and bicyclist safety, traffic, and public transportation.

In addition, the following are examples of mitigation measures that were improperly included as part of the project, rather than as mitigation measures:

- Requiring vehicles longer than 35 feet to limit travel to major and minor arterial streets.
- Restrictions on the bus model year and emissions requirements.
- Expansion of sidewalk area for passengers waiting to board Muni vehicles or commuter shuttles.
- Safety improvements to the existing right-of way to "improve the stop network for both commuter shuttles and users of other modes including: boarding islands, pedestrian bulbs, and bus bulbs.
- Increased enforcement and monitoring at shuttle zones which higher number of cases where commuter shuttles blocked Muni vehicles.
- Identification of specific locations and pursue improvements to better manage the movement of vehicles, transit, bicycles, and pedestrians.

Exemption Report, pp. 5-6, 8, 16.

By including these unvetted mitigation measures as part of the Shuttle Project, the City has attempted to conduct "an 'end run' around the governing standards." *Azuza*, 52 Cal.App.4th at 1201. This shortcutting of CEQA requirements subverts the purposes of CEQA by omitting material necessary to informed decision making and informed public participation. It precludes both identification of potential environmental consequences arising from the project and also thoughtful analysis of the sufficiency of measures to mitigate those consequences. The City cannot use a notice of exemption for a project which includes mitigation measures to substitute for an EIR or mitigated negative declaration. The City violated CEQA by relying on mitigation measures in finding the Shuttle Project to be exempt.

E. The Illegal Operation of Commuter Shuttles Cannot Form a CEQA Baseline.

It is not proper to include an activity that violates state law in the baseline, yet the City improperly uses the pre-pilot, illegal shuttle operations as the CEQA baseline. Every CEQA document must start from a "baseline" assumption. The CEQA "baseline" is the set of environmental conditions against which to compare a project's anticipated impacts. *Cmtys. for a Better Env't v. So Coast Air Qual. Mgmt. Dist.* (2010) 48 Cal. 4th 310, 321. Section 15125(a) of the CEQA Guidelines states in pertinent part that a lead agency's environmental review under CEQA:

> "...must include a description of the physical environmental conditions in the vicinity of the project, as they exist at the time [environmental analysis] is commenced, from both a local and regional perspective. This environmental setting will normally constitute the baseline physical conditions by which a Lead Agency determines whether an impact is significant."

Using a skewed baseline "mislead(s) the public" and "draws a red herring across the path of public input." *San Joaquin Raptor Rescue Center v. County of Merced* (2007) 149 Cal.App.4th 645, 656; *Woodward Park Homeowners v. City of Fresno* (2007) 150 Cal.App.4th 683, 708-711.

The San Francisco Superior Court has held that illegal operations resulting from a failure to enforce the law cannot form the CEQA baseline. The court found that:

> "When a lead agency issues an EIR, it cannot include activities allowed by the agency's complete non-enforcement into the baseline . . . .
>
> "Neither the Guidelines nor case law allows an EIR to set an illusory no-enforcement baseline that absorbs all ongoing illegal actions and ignores the stricter limitations imposed by a new statutory landscape. Although generally the baseline must include the effects of prior illegal activity, the situation is different when an agency has a concurrent, present responsibility to remedy that prior illegality."

Klamath Riverkeeper v. Cal. Dept. of Fish & Game, San Francisco Superior Court No. CPF-09-509915 (Apr. 20, 2011, Goldsmith, J.)

An agency may not fail to enforce the law, and then use that lack of enforcement to form the CEQA baseline. *Id.* Since the pre-pilot shuttle operations involved illegal "pirate shuttles" which violate state law, the pre-pilot shuttle operations cannot form the CEQA baseline. *League to Save Lake Tahoe v. Tahoe Reg. Planning Agency* (E.D. Cal. 2010) 739 F. Supp. 2d 1260.

II. THE STATE VEHICLE CODE PREEMPTS THE SHUTTLE PROJECT.

As was the case with the commuter shuttle pilot program, the California Vehicle Code preempts the Shuttle Project, rendering it illegal. California Vehicle Code § 22500(e) provides that:

> No person shall stop, park, or leave standing any vehicle whether attended or unattended, except when necessary to avoid conflict with other traffic or in compliance with the directions of a peace officer or official traffic control device, in any of the following places:
>
> . . .
>
> (i) Except as provided under Section 22500.5,[10] alongside curb space authorized for the loading and unloading of passengers of a bus engaged as a common carrier[11] in local transportation when indicated by a sign or red paint on the curb erected or painted by local authorities pursuant to an ordinance.

In direct conflict with the State Vehicle Code's prohibition against private buses stopping in public "red-curb" bus stops, the Shuttle Project expressly ***allows*** the same action.[12] The Shuttle Project provides that a shuttle bus bearing a valid permit placard is allowed to stop at any stop designated under the program, including designated red curbs. Transportation Code Sec. 914(h)(2).

Moreover, California Vehicle Code § 42001.5 imposes a minimum $250.00 fine on any person convicted of violating Vehicle Code § 22500. Vehicle Code § 42001.5(b) provides that the fine cannot be suspended, except that the court can waive anything above $100.00, meaning the minimum fine allowed under state law is $100.00. In contrast, the Shuttle Project allows private shuttle operators to stop in public bus stops if they make a payment of a few dollars, an action that is in direct conflict with California law. Transportation Code Sec. 902.

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[10] Vehicle Code § 22500.5 refers to school buses owned by or operated for a public school district.

[11] Section 211 of the Cal. Public Utilities Code defines "common carriers" as entities that provide transportation to the public for compensation, and the City acknowledges that this does not include the private commuter shuttle buses at issue in this action. AR272.

[12] A statutory exception to this general rule exists, allowing vehicles to stop at each place listed in section 22500 if done "when necessary to avoid conflict with other traffic or in compliance with the direction of a peace officer or official traffic control device."[12] Vehicle Code § 22500. None of these exceptions apply here.

The California Supreme Court has held that cities (including charter cities) may not enact ordinances that conflict with the State Vehicle Code, because the Vehicle Code expressly preempts local regulation. *O'Connell v. City of Stockton* (2007) 41 Cal.4th 1061, 1074. The Supreme Court noted that Vehicle Code section 21 states: "Except as otherwise expressly provided, the provisions of this code are applicable and uniform throughout the State and in all counties and municipalities therein, and no local authority shall enact or enforce any ordinance on the matters covered by this code unless expressly authorized herein." Since the Commuter Shuttle Project expressly allows private buses to stop in public bus stops, and since this action is expressly prohibited by State law, the City policy is preempted by state law and is unlawful.

III. CONCLUSION

Appellants expressly reserve the right to submit additional written and oral comments, and additional evidence in support of this Appeal to the City and Board of Supervisors up to and including at the final hearing on this Appeal and any and all subsequent permitting proceedings or approvals undertaken by the City or any other permitting agency for the Project. Pub. Res. Code § 21177(a); *Bakersfield Citizens for Local Control v. Bakersfield* (2004) 124 Cal.App.4th 1184, 1199-1203.

Thank you for your consideration of this Appeal. Please include this letter in the Administrative Record for the Commuter Shuttle Project.

Sincerely,

Rebecca L. Davis
Richard T. Drury
Lozeau Drury LLP

Enclosures

CC: Environmental Review Officer
(pursuant to SF Administrative Code § 31.16(b)(1))

EXHIBIT A

Tom Brohard and Associates

January 13, 2016

Mr. Richard Drury, Attorney at Law
Lozeau Drury LLP
410 12th Street, Suite 250
Oakland, CA 94607

SUBJECT: Commuter Shuttle Program - Exemption from CEQA Review

Dear Mr. Drury:

I, Tom Brohard, P.E., previously reviewed the San Francisco Municipal Transportation Agency (SFMTA) Board of Directors Resolution No. 14-023 which proposed an 18 month pilot, permit program for private commuter shuttle busses as well as other background materials. My March 29, 2014 letter (enclosed) summarized several traffic issues and concerns regarding the Pilot Program.

As requested, I have reviewed the Permanent Commuter Shuttle Program, the October 2, 2015 Evaluation Report (Evaluation) for the Commuter Shuttle Pilot Program as well as the October 22, 2015 San Francisco Planning Department's "Certificate of Determination - Exemption from Environmental Review". The data collected encompasses only the first 12 of the 18 months in the Pilot Program. During the data collection, several traffic impacts and issues have been identified but they have not been studied or addressed. Further study must be made to identify, analyze, evaluate, and mitigate various traffic issues and impacts before the Commuter Shuttle Program is finalized.

Traffic Issues and Concerns

Based on my review, the SFMTA's Commuter Shuttle Program must be modified to address the following traffic issues and environmental impacts as follows:

1) Data Is Incomplete – The 18 month Pilot Program was approved in August 2014 and was scheduled to run through January 2016. According to Page 5 of the Evaluation, one of the primary objectives of the Pilot Program was to "Gather data regarding shuttle activity in the City." Before the Pilot Program, SFMTA did not understand the scope of the problems and issues associated with commuter shuttles. During the time covered by the Evaluation, changes have been made in the Program such as relocation of a few commuter shuttle bus stops from near-side to far-side as well as from local streets to arterial streets. Most of the collected data covers 12 months from August 2014 through July 2015 rather than the entire 18 months planned for the Pilot Program. Some comparisons in the Evaluation cover different time periods, perhaps to cast the numbers in a better light.

81905 Mountain View Lane, La Quinta, California 92253-7611
Phone (760) 398-8885 Fax (760) 398-8897
Email tbrohard@earthlink.net

The Pilot Program required all shuttle operators to provide real-time data on shuttle stop events and shuttle vehicle movements. Page 34 of the Evaluation notes some operators have failed to provide data regularly and accurately. After more than a year into the Pilot Program, the real-time vehicle data is still not being received completely or accurately from all operators.

2) Evaluation Skews the Data - Pages 6 and 7 of the Evaluation appear to distort the data, draw untimely conclusions or provide meaningless comparisons without further explanation as follows:

   a) "Shuttle dwell times between June 2014 and June 2015 increased from 58 to 62 seconds." With all of the changes and with the rapid increase in the number of shuttles particularly later in 2015, the data collected during the pre-pilot and pilot programs during June likely does not represent today's dwell times. Dwell time comparisons must be made to current data.

   b) The number of shuttle busses has increased dramatically above the 30% shown in the Evaluation. The impact on shuttle dwell times caused by the significant 41% increase in shuttles from September 2014 to October 2015 has not been reported in the Evaluation as it occurred after June 2015. In addition, there is no limit on either the number of commuter shuttles that can participate in the Program or on the number of shuttle stops. For future forecasts and analysis, more shuttles and more stops will create even more congestion and delay in the City. By limiting its analysis of environmental impacts to a 41% increase in shuttles from pre-pilot to the permanent program, the Planning Department has not evaluated the impact of the entire scope of the Project, since the Project allows for unlimited growth. In addition, the Planning Department merely "assumes" the growth in shuttles under the Project will be limited to 41%, without providing any evidence to support this claim.

   c) "Instances of shuttles blocking Muni have decreased by 35% from the pre-pilot to pilot data collection periods." Without further discussion, this percentage and the statement have no real meaning. What is the level of delay caused by the current amount of blocking? Only 12 of the 20 stops observed in June 2015 experienced no blocking – 60% is impressive but does the same percentage relate to all 200 stops in the Program?

   d) "Shuttles block driver's views of pedestrians or block crosswalks less than 2% of the time that they stop." While the percentage is small, it is really meaningless. The Program should have a goal to totally eliminate blocked views of pedestrians and crosswalks by relocating the stops to open up visibility of pedestrians and crosswalks.

e) "Shuttles block travel lanes and bike lanes about 35% of the time that they stop." When shuttles block travel lanes and bicycle lanes, the potential for collisions significantly increases as drivers cannot see each other in order to take evasive action. Shuttles blocking travel lanes also increase delay to motorists. Levels of congestion and levels of service have not been measured or quantified when shuttles block adjacent travel lanes.

f) "Between August 2014 and the end of May 2015, enforcement officers issued an average of 103 citations per month." At that level, ten enforcement personnel assigned to monitor the commuter shuttles in peak hours were writing 10 citations per officer per month, or about one citation every other weekday. Obviously, the officers were not issuing citations as they should. Page 34 of the Evaluation claims there are limited enforcement resources and that they are unable to keep shuttles out of Muni and other no stopping zones. To the contrary, it appears that the number of citations written by the shuttle enforcement team (one every other day) is dismal. The level of enforcement must be increased to reduce double parking and other illegal practices that block traffic lanes, bike lanes, and crosswalks.

3) <u>Traffic, Transit, and Safety Issues Have Not Been Addressed</u> – Page 18 of the Evaluation states "A chief objective of the Pilot Program was to dedicate curb space for loading and unloading of private shuttles in order to minimize commuter shuttles' conflict with Muni and other users of the streets. Delays to Muni, boardings away from the curb, traffic back-ups, blocking bicycle lanes, or blocking crosswalks or pedestrian visibility may occur when multiple vehicles (either more than one shuttle or a shuttle bus and a Muni bus) are competing for limited curb space, or when shuttle drivers do not take care to pull entirely out of the travel lane to load or unload."

While the Evaluation found that commuter shuttles could account for up to 9.5% of the traffic volumes on certain streets, no capacity analyses were conducted and no estimate of delay resulting from increased congestion was calculated. No comprehensive formal study has been conducted on the significant impacts of shuttles on pedestrian and bicycle safety, on Muni passengers with disabilities, on reducing capacity by blocking traffic lanes, and on increased delay and response times for emergency vehicles. Without such a study, it is impossible to support the conclusion that these evaluations are unnecessary and that the Program is exempt from CEQA review because it will not have a significant impact on traffic.

4) <u>Exemption from CEQA Review Cannot Be Supported</u> – The October 22, 2015 Report prepared by the San Francisco Planning Department indicates that the Commuter Shuttle Program is exempt from CEQA review. Traffic impacts are

discussed on Pages 13 through 16. The conclusions reached in the Report together with my comments are reviewed in the following paragraphs:

a) <u>Transportation</u> – Page 13 states "The relatively minor increase in shuttle activity, compared to the overall peak hour volumes, would not substantially degrade traffic operations and would not have a significant impact on traffic operations at arterial roadways." No traffic data or capacity calculations are presented to support this statement. To the contrary as indicated above, shuttle volumes account for 9.5% of the traffic volume on certain streets. If a complete traffic study was conducted, this may be shown to be a significant impact under CEQA. The statement that traffic operations would not be significantly impacted cannot be supported by the data presented because no study was conducted, and the conclusion that there will be no significant impact is fatally flawed.

b) <u>Transit</u> – Page 14 presents limited data from the first 12 months of the Pilot Program and concludes "...the proposed project would not result in a significant impact related to transit operations." The data presented does not include the last 6 months of the Pilot Program when conditions have changed dramatically from August 2014 including a 41% increase in shuttle volumes. The statement that transit operations would not be significantly impacted cannot be supported by the data presented and the conclusion is fatally flawed.

c) <u>Bicycles</u> – Page 15 presents generalities and concludes that potential conflicts have been addressed. The Evaluation indicated that bicycle lanes were blocked 35% of the time by shuttle busses. While a few stops have been relocated or lengthened, the statement that bicycles would not be significantly impacted cannot be supported by the data presented and the conclusion is fatally flawed.

Furthermore, the City's Transportation Significance Criteria state that "The project would have a significant effect on the environment if it would create potentially hazardous conditions for bicyclists or otherwise substantially interfere with bicycle accessibility to the site and adjoining areas." Shuttle busses blocking bicycle lanes would cause bicyclists to sharply veer into vehicle travel lanes to avoid the shuttle bus at the stop, creating a potentially hazardous condition, a significant impact as defined by the City's own Transportation Significance Criteria.

d) <u>Pedestrians</u> – Page 15 downplays the conflicts that occur between shuttle busses and pedestrians, and attempts to dismiss blocking of crosswalks as very infrequent. The Report suggests that additional stops could be relocated or lengthened but there is no program to do this. The statement that pedestrians would not be significantly impacted cannot be supported by the data presented and the conclusion is fatally flawed.

e) Loading – Page 16 states that commercial loading zones (yellow curb) would not be eliminated as part of the Program. The Report fails to indicate that California Vehicle Code (CVC) Section 21458 a) allows stopping in commercial loading zones for the purpose of loading or unloading passengers or freight. The statement that commercial loading zones would not be significantly impacted cannot be supported without any data presented (since the CVC allows passenger loading in commercial loading zones) and the conclusion is fatally flawed.

f) Conclusion – Page 25 states that "The proposed project would not substantially increase traffic on the existing street system and no significant environmental impacts would occur." As pointed out throughout this letter, there are numerous instances where there will be significant impacts. SFMTA has not properly studied, evaluated, or analyzed the Proposed Project in regard to potentially significant impacts to traffic, transit, bicycles, pedestrians, and loading.

In summary, further study must be undertaken to properly identify the traffic impacts of the SFMTA's Commuter Shuttle Program. As discussed in this letter, there is at least a "fair argument" that this Program will have adverse environmental impacts that have not been properly disclosed, analyzed, or mitigated. Each of these significant impacts must be addressed by proposing feasible and effective mitigation measures. If you have questions regarding these comments, please call me at your convenience.

Respectfully submitted,

Tom Brohard and Associates

Tom Brohard

Tom Brohard, PE
Principal

REGISTERED PROFESSIONAL ENGINEER
TOM BROHARD
C24577
CIVIL
STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER
TOM BROHARD
TR724
TRAFFIC
STATE OF CALIFORNIA

Enclosure
March 29, 2014 Letter

Tom Brohard and Associates

March 29, 2014

Mr. Richard Drury, Attorney at Law
Lozeau Drury LLP
410 12th Street, Suite 250
Oakland, CA 94607

SUBJECT: San Francisco Municipal Transportation Agency (SFMTA) Commuter Shuttle Policy and Pilot Program – Traffic Issues and Concerns

Dear Mr. Drury:

Tom Brohard, P.E., has reviewed the San Francisco Municipal Transportation Agency (SFMTA) Board of Directors Resolution No. 14-023 which proposes an 18 month pilot, permit program allowing private shuttle busses to use up to 200 Muni bus stops to pick up and discharge over 35,000 passengers each day. I have also reviewed other background material including the San Francisco County Transportation Authority's June 28, 2011 Strategic Analysis Report entitled "The Role of Shuttle Services in San Francisco's Transportation System" and the July 19, 2013 presentation to SFMTA entitled "Private Commuter Shuttle Policy Draft Proposal".

Further study must be undertaken to properly identify the traffic impacts of the SFMTA's Commuter Shuttle Policy and Pilot Program. Until the issues and concerns raised in this letter are addressed, there is at least a "fair argument" that the Commuter Shuttle Policy and Pilot Program proposed by SFMTA in the City of San Francisco may have adverse and significant environmental impacts that have not been properly disclosed, analyzed, and mitigated.

Education and Experience

Since receiving a Bachelor of Science in Engineering from Duke University in Durham, North Carolina in 1969, I have gained over 40 years of professional engineering experience. I am licensed as a Professional Civil Engineer both in California and Hawaii and as a Professional Traffic Engineer in California. I formed Tom Brohard and Associates in 2000 and now serve as the City Traffic Engineer for the City of Indio and as Consulting Transportation Engineer for the Cities of Big Bear Lake and San Fernando. I have extensive experience in traffic engineering and transportation planning. During my career in both the public and private sectors, I have reviewed many environmental documents and traffic studies, with only a few of these shown on the enclosed resume.

81905 Mountain View Lane, La Quinta, California 92253-7611
Phone (760) 398-8885 Fax (760) 398-8897
Email tbrohard@earthlink.net

Traffic Issues

Based on my review, there is at least a "fair argument" that the SFMTA's Commuter Shuttle Policy and Pilot Program (Program) in the City of San Francisco will have significant traffic and other environmental impacts as follows:

1) Program Will Likely Increase the Number of Shuttles - With the single exception of school busses identified in CVC Section 22500.5, CVC Section 22500 states that "No person shall stop, park, or leave standing any vehicle whether attended or unattended, except when necessary to avoid conflict with other traffic or in compliance with the directions of a peace officer or official traffic control device, in any of the following places...(i) alongside curb space authorized for the loading and unloading of passengers of a bus engaged as a common carrier in local transportation when indicated by a sign or red paint on the curb erected or painted by local authorities pursuant to an ordinance."

   CVC Section 42001.5 imposes a minimum $250 fine on a person "convicted" of violating CVC Section 22500. CVC Section 42001.5(b) provides that the fine cannot be suspended, except that the court can waive anything above $100. In other words the minimum fine allowed under state law is $100. This financial penalty is significant and it is likely that it currently deters other law-abiding shuttle operators from using Muni bus stops.

   SFMTA claims that the Commuter Shuttle Policy and Pilot Program will not increase impacts since the shuttles are already operating illegally. However, the program makes legal what has been illegal. It also allows any shuttle operator to apply for a permit to participate. At least some shuttle companies would not want to operate a pirate shuttle program at risk of significant penalties. Since SFMTA's Commuter Shuttle Policy and Pilot Program makes it legal for private shuttles to use public bus stops, more companies with even more private shuttles are likely to participate. This will create significant traffic impacts by increasing congestion at Muni bus stops, an extremely likely consequence that has not be envisioned, evaluated or analyzed by SFMTA.

2) Program May Increase Idle Times At Muni Stops - When shuttle stops at Muni bus stops were illegal, private shuttles often tried to get in and out of the public bus stops as quickly as possible to avoid being cited. According to SFMTA, the average dwell time for a private shuttle is up to 60 seconds whereas the average dwell time for a Muni bus is about 20 seconds. Now that the Program is legal, private shuttles may idle even longer to pick up passengers, particularly without risking being cited. While the Program suggests that private shuttles move forward to the front of the Muni bus stop, this will not occur when shuttles are already actively loading or unloading.

If more shuttles are already loading or unloading passengers when the Muni bus arrives, then the already identified conflicts with Muni busses, general traffic, pedestrians, and cyclists will be compounded by additional double parking and idling. Additional shuttles could also easily exceed the capacity of the Muni bus stop locations, creating additional impacts. Each of these occurrences would increase diesel emissions at the Muni bus stop locations and would also create pedestrian impacts related to blocking public bus access to the stops as well as additional safety issues.

In summary, further study must be undertaken to properly identify the traffic impacts of the SFMTA's Commuter Shuttle Policy and Pilot Program. As discussed in this letter, there is at least a "fair argument" that this will have adverse environmental impacts that have not been properly disclosed, analyzed, or mitigated. Each of these significant impacts must be addressed by proposing feasible and effective mitigation measures. If you have questions regarding these comments, please call me at your convenience.

Respectfully submitted,

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REGISTERED PROFESSIONAL ENGINEER
TOM BROHARD
C24577
CIVIL
STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER
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TR724
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STATE OF CALIFORNIA

Enclosure
Resume

Tom Brohard and Associates

March 29, 2014

Mr. Richard Drury, Attorney at Law
Lozeau Drury LLP
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TR724
TRAFFIC
STATE OF CALIFORNIA

Enclosure
Resume

Tom Brohard, PE

Licenses:	1975 / Professional Engineer / California – Civil, No. 24577 1977 / Professional Engineer / California – Traffic, No. 724 2006 / Professional Engineer / Hawaii – Civil, No. 12321
Education:	1969 / BSE / Civil Engineering / Duke University
Experience:	40+ Years
Memberships:	1977 / Institute of Transportation Engineers – Fellow, Life 1978 / Orange County Traffic Engineers Council - Chair 1982-1983 1981 / American Public Works Association – Life Member

Tom is a recognized expert in the field of traffic engineering and transportation planning. His background also includes responsibility for leading and managing the delivery of various contract services to numerous cities in Southern California.

Tom has extensive experience in providing transportation planning and traffic engineering services to public agencies. Since May 2005, he has served as Consulting City Traffic Engineer for the City of Indio. He also currently provides "on call" Traffic and Transportation Engineer services to the Cities of Big Bear Lake, Mission Viejo, and San Fernando. In addition to conducting traffic engineering investigations for Los Angeles County from 1972 to 1978, he has previously served as City Traffic Engineer in the following communities:

- Bellflower .... 1997 - 1998
- Bell Gardens .... 1982 - 1995
- Huntington Beach .... 1998 - 2004
- Lawndale .... 1973 - 1978
- Los Alamitos .... 1981 - 1982
- Oceanside .... 1981 - 1982
- Paramount .... 1982 - 1988
- Rancho Palos Verdes .... 1973 - 1978
- Rolling Hills .... 1973 - 1978, 1985 - 1993
- Rolling Hills Estates .... 1973 - 1978, 1984 - 1991
- San Marcos 1981
- Santa Ana .... 1978 - 1981
- Westlake Village .... 1983 - 1994

During these assignments, Tom has supervised City staff and directed other consultants including traffic engineers and transportation planners, traffic signal and street lighting personnel, and signing, striping, and marking crews. He has secured over $5 million in grant funding for various improvements. He has managed and directed many traffic and transportation studies and projects. While serving these communities, he has personally conducted investigations of hundreds of citizen requests for various traffic control devices. Tom has also successfully presented numerous engineering reports at City Council, Planning Commission, and Traffic Commission meetings in these and other municipalities.

Tom Brohard and Associates

In his service to the City of Indio since May 2005, Tom has accomplished the following:

- Oversaw preparation and adoption of the Circulation Element Update of the General Plan including development of Year 2035 buildout traffic volumes, revised and simplified arterial roadway cross sections, and reduction in acceptable Level of Service criteria under certain constraints. Reviewed Riverside County's updated traffic model for consistency with the adopted City of Indio Circulation Plan.

- Oversaw preparation of fact sheets/design exceptions to reduce shoulder widths on Jackson Street over I-10 as well as justifications for protected-permissive left turn phasing at I-10 on-ramps, the first such installation in Caltrans District 8 in Riverside County; reviewed plans and provided assistance during construction of a $1.5 million project to install traffic signals and widen three of four ramps at the I-10/Jackson Street Interchange under a Caltrans encroachment permit.

- Oversaw preparation of fact sheets/design exceptions to reduce shoulder widths on Monroe Street over I-10 as well as striping plans to install left turn lanes on Monroe Street at the I-10 Interchange under a Caltrans encroachment permit; reviewed plans to install traffic signals and widen three of four ramps at the I-10/Monroe Street Interchange.

- Reviewed traffic impact analyses for Project Study Reports evaluating different alternatives for buildout improvement of the I-10 Interchanges at Jefferson Street, Monroe Street, Jackson Street and Golf Center Parkway.

- Oversaw preparation of plans, specifications, and contract documents and provided construction assistance for over 40 traffic signal installations and modifications.

- Reviewed and approved over 600 work area traffic control plans as well as signing and striping plans for all City and developer funded roadway improvement projects.

- Oversaw preparation of a City wide traffic safety study of conditions at all schools.

- Prepared over 500 work orders directing City forces to install, modify, and/or remove traffic signs, pavement and curb markings, and roadway striping.

- Oversaw preparation of engineering and traffic surveys to establish enforceable speed limits on over 200 street segments.

- Reviewed and approved traffic impact studies for more than 25 major developments.

- Developed the Golf Cart Transportation Program and administrative procedures; implemented routes forming the initial baseline system.

Since forming Tom Brohard and Associates in 2000, Tom has reviewed many traffic impact reports and environmental documents for various development projects. He has provided expert witness services and also prepared traffic studies for public agencies and private sector clients.

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Tom Brohard, PE

Licenses: 1975 / Professional Engineer / California – Civil, No. 24577
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2006 / Professional Engineer / Hawaii – Civil, No. 12321

Education: 1969 / BSE / Civil Engineering / Duke University

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Memberships: 1977 / Institute of Transportation Engineers – Fellow, Life
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During these assignments, Tom has supervised City staff and directed other consultants including traffic engineers and transportation planners, traffic signal and street lighting personnel, and signing, striping, and marking crews. He has secured over $10 million in grant funding for various improvements. He has managed and directed many traffic and transportation studies and projects. While serving these communities, he has personally conducted investigations of hundreds of citizen requests for various traffic control devices. Tom has also successfully presented numerous engineering reports at City Council, Planning Commission, and Traffic Commission meetings in these and other municipalities.

In his service to the City of Indio since May 2005, Tom has accomplished the following:

- Oversaw preparation and adoption of the 2008 Circulation Element Update of the General Plan including development of Year 2035 buildout traffic volumes, revised and simplified arterial roadway cross sections, and reduction in acceptable Level of Service criteria under certain conditions.
- Oversaw preparation of fact sheets/design exceptions to reduce shoulder widths on Jackson Street and on Monroe Street over I-10 as well as justifications for protected-permissive left turn phasing at I-10 on-ramps, the first such installations in Caltrans District 8 in Riverside County; reviewed plans and provided assistance during construction of both $2 million projects to install traffic signals and widen three of four ramps at these two interchanges under Caltrans encroachment permits.
- Reviewed traffic signal, signing, striping, and work area traffic control plans for the County's $45 million I-10 Interchange Improvement Project at Jefferson Street.
- Reviewed traffic impact analyses for Project Study Reports evaluating different alternatives for buildout improvements of the I-10 Interchanges at Jefferson Street, Monroe Street, Jackson Street and Golf Center Parkway.
- Oversaw preparation of plans, specifications, and contract documents and provided construction assistance for over 50 traffic signal installations and modifications.
- Reviewed and approved over 1,200 work area traffic control plans as well as signing and striping plans for all City and developer funded roadway improvement projects.
- Oversaw preparation of a City wide traffic safety study of conditions at all schools.
- Obtained $47,000 grant from the California Office of Traffic Safety and implemented the City's Traffic Collision Database System. Annually reviews "Top 25" collision locations and provides traffic engineering recommendations to reduce collisions.
- Prepared over 900 work orders directing City forces to install, modify, and/or remove traffic signs, pavement and curb markings, and roadway striping.
- Oversaw preparation of engineering and traffic surveys to establish enforceable speed limits on over 400 street segments.
- Reviewed and approved traffic impact studies for more than 35 major projects and special events including the annual Coachella and Stagecoach Music Festivals.
- Developed and implemented the City's Golf Cart Transportation Program.

Since forming Tom Brohard and Associates in 2000, Tom has reviewed many traffic impact reports and environmental documents for various development projects. He has provided expert witness services and also prepared traffic studies for public agencies and private sector clients.

Tom Brohard and Associates

EXHIBIT B

SWAPE Technical Consultation, Data Analysis and Litigation Support for the Environment

2656 29th Street, Suite 201
Santa Monica, CA 90405

Matt Hagemann, P.G, C.Hg.
(949) 887-9013
mhagemann@swape.com

January 14, 2016

Rebecca Davis
Lozeau | Drury LLP
410 12th Street, Suite 250
Oakland, CA 94607

Subject: Comments on the SFMTA-Commuter Shuttle Program (Case No. 2015-007975ENV)

Dear Ms. Davis,

We have reviewed the October 22, 2015 Certificate of Determination Exemption from Environmental Review ("Certificate of Exemption"), October 2, 2015 Pilot Program Evaluation Report ("Pilot Program Evaluation Report"), and the October 13, 2015 Final Air Quality Technical Report ("FAQTR") for the Commuter Shuttle Program ("Project"). The Project proposes to implement a Commuter Shuttle Program which would permanently continue and expand upon the 18-month Commuter Shuttle Pilot Program that was implemented in San Francisco between August 2014 and January 2016. This would require issuing permits to eligible commuter shuttle operators for the use of public curb space to pick-up and drop-off passengers, as well as include some capital improvements.

Our review concludes that the Project's air quality assessment fails to adequately evaluate the Project's health risk impacts. First, the health risk assessment fails to account for the 41 percent future project growth and fails to address the lack of a limit on the number of shuttles that could be included in the Project. Second, the health risk assessment fails to consider the risk associated with increased emissions from large buses that will be limited to arterial streets and the increased traffic and stop events that will result.

A Draft Environmental Impact Report (DEIR) should be prepared with an updated health risk assessment that addresses these issues.

Air Quality

Failure to Account for Future Project Growth

According to City's Certificate of Exemption, the health risk at four local impact zones were modeled and analyzed to represent the health risk at any stop under the Program (p. 20). These local impact zones were chosen because they exhibited high volumes of stop events, they represented average or above average idling times for the commuter shuttle under the Pilot Program, and because they were representative of the geographic diversity and configuration of stops within the City (Certificate of Exemption, p. 20). Table 6 of the Certificate of Exemption indicates that, of the four local impact zones modeled, the Project's highest estimated cancer risk is 5.6 in one million, located at Van Ness Avenue and Union Street (p. 21). However, this determination fails to take into account the projected growth in number of shuttles as well as the additional permissible growth of the Project in future years and thus greatly underestimates the potential cancer risk.

The following assumptions were made in the localized air analysis to determine the health effects: "an increase in the number of stop events that could occur between Pilot and Program conditions (estimated at 29 percent) at locations with a higher volume stop events; the same commuter shuttle engine years (2012 or newer) as mentioned above for criteria air pollutants; commuter shuttle fuel type and idling time; and various methodologies consistent with BAAQMD guidance regarding assessing local risks and hazards" (Certificate of Exemption, p. 21). However, this does not include the expected 41 percent increase in the number of participating shuttles projected by the City. This is unlike the regional air quality analysis, in which overall criteria air pollutant emissions for the Project were estimated and did include the 41 percent growth in their assumptions, as below.

> "Based on the number of commuter shuttle permits (placards) issued prior to the implementation of the Pilot and the Commuter Shuttle Program (beginning in 2016), SFMTA estimates that participation in the Program could increase by 41 percent" (Certificate of Exemption, p. 18).

This increase in participation in the Program will result in a growth in the number of shuttles within San Francisco and will result in an increase in emissions from the shuttles. By failing to account for the health effects of DPM emissions from 41 percent more shuttles within the City, the health risk is greatly underestimated.

Additionally, the Project does not propose a limit to the number of commuter shuttles that can be incorporated to the program. Without a limitation, the growth in the number of shuttle/buses could potentially grow beyond the 41 percent predicted. According to the Pilot Program Evaluation Report, from June 2014 before the start of the program until July 2015, daily stop events by shuttles increased by 29 percent (p. 6). In addition, between those dates, the number of zones in the network increased by 23 percent, and the shuttle frequency at the zones increased by nearly 80 percent (Pilot Program Evaluation Report, p. 11 and p. 21). Major zones such as Lombard Street, Van Ness Avenue, and Castro Street had shuttle activity double or even triple from prior to the start of the pilot program to during the pilot program (Pilot Program Evaluation Report, p. 21). These statistics clearly show that the program grew at a very fast rate in only approximately one year. As a result, if the program is continued without a limitation on the number of buses, the growth could potentially be much greater than the assumed 41 percent. This scenario would then result in an unknown increase of emissions, much greater than what has been calculated. Because there is a potential for the Project to grow and put an unlimited number of shuttle buses within the City, the increased DPM emissions from the buses will most likely be much higher than anticipated and result in an increased health risk, potentially above the level of significance.

Without taking into account this uncertainty, it is inappropriate to assume that the health risk of the Project is below the level of significance.

Increase in Stops

The Project, unlike the Pilot Program, will limit permitted shuttles longer than 35 feet to travel only on designated major and minor arterial streets (Certificate of Exemption, p. 5). As a result, arterial streets will have increased shuttle activity and will experience an increase in stop events due to the travel limitations of large buses. Table 3 of the Certificate of Exemption shows how this requirement would increase the number of stop events at four arterial locations closest to the current high-activity level non-arterial locations that would need to be located (see table below) (p. 12).

Table 3. Stop Events at Designated Zones (with Commuter Shuttle Program)

Existing Non-Arterial Zone		Nearest Arterial Zone Alternative				Combined Totals After Relocation	
Existing Non-Arterial Zone (to be relocated)	Stop Events[a]	Nearest Existing Arterial Zone[b]	Stop Events	Existing Arterial Traffic Counts[c]	Shuttle % of Current Traffic Counts	Total Stop Events (after relocation)	Shuttle % of Total Traffic Counts (after relocation)
Castro/25th NW corner, near-side	20.0	24th/Church SW corner, near-side	9.6	342	6%	29.6	9%
Church/Marke t NE corner, AM/PM white zone	10.3	Castro/Market NE corner, PM white zone	10.3	311	3%	20.5	6%
30th/Church SW corner, flag stop	12.9	San Jose/Dolores NW corner, AM white zone	6.9	1159	1.1%	19.7	1.7%
Townsend/4th South side, Mid-block	22.7	Harrison/Emb arcadero, white zone	8.7	341	7%	31.4	9.5%

Source: SFMTA, 2015

Notes:

a – Estimated commuter shuttle stop events per hour

b – Peak hour traffic counts collected by SFMTA in 2009, 2011, and 2012

c – Identified zone with existing shuttle stop where nearest non-arterial stop would be located.

This table shows that for the above zones, stop events will increase by between six to ten stops and that the increase in peak hour traffic volumes will be between 0.6 percent and three percent. While this table shows that stop event and traffic volume will increase as a result of the limitation, these values greatly underestimate the true increase in stop events and traffic volumes at arterial streets.

Table 3 only takes into consideration the current stop events occurring at the non-arterial and arterial streets. It does not take into consideration the stop events that would occur as a result of the 41 percent projected increase in the number of shuttles under the Project. As the Project grows and more shuttles are added, they will have to have stop events throughout the City, many of which will be restricted from using non-arterial streets and must make the stops in arterial streets. With the inclusion of extra shuttles and buses and the restrictions that would require many of the buses to use only arterial streets, stop events and traffic volumes would increase to levels much higher than those demonstrated and described in the Certificate of Exemption.

This is further supported by the Certificate of Exemption that states, "Under the Pilot, the most frequently used zones were observed to have as many as 100 shuttle stop events per day..." (p. 5). These locations include Lombard Street, Van Ness Avenue, Divisadero/Castro Streets, Valencia Street, Union/Powell Streets in North Beach, 24th/25th Streets in the Mission/Noe Valley, 30th Street in Noe Valley, and Townsend/Fourth Street near the Caltrain station (p. 5). If any these locations are already experiencing stops as high as 100 per day, restricting all current and future large buses to arterial streets will just increase the number of stops per day to much higher than 100 per day as well as increase traffic and congestions within the streets. Emissions from buses in traffic, in which the buses are continuously running for an extended period of time, combined with emission from the increased number of buses will result in an overall increase in emissions.

However, the health risk assessment conducted did not take into account the increased emissions resulting from limiting large buses to arterial streets and the increased stop events and traffic that will result from them. All of the local impact zones that were analyzed in the health risk assessment appear to be "Large-Vehicle Approved" (major or minor arterial), according to Attachment B of the Certificate of Exemption. As a result, these locations may be impacted by higher levels of traffic and stops because large buses will not be able to make stops in non-arterial streets nearby. Emissions resulting from the above issues were not included in the assumptions for the health risk assessment and as a result, the health risk is greatly underestimated.

As a result of the issues discussed above, the health risk assessment for the proposed Project greatly underestimates the risk posed to nearby sensitive receptors. A draft environmental impact report should be prepared that includes an updated health risk assessment that incorporates the above issues.

Sincerely,

M Hagemann

Matt Hagemann, P.G., C.Hg.

Jessie Jaeger

SWAPE Technical Consultation, Data Analysis and Litigation Support for the Environment

1640 5th St.., Suite 204 Santa
Santa Monica, California 90401
Tel: (949) 887-9013
Email: mhagemann@swape.com

Matthew F. Hagemann, P.G., C.Hg., QSD, QSP

Geologic and Hydrogeologic Characterization
Industrial Stormwater Compliance
Investigation and Remediation Strategies
Litigation Support and Testifying Expert
CEQA Review

Education:

M.S. Degree, Geology, California State University Los Angeles, Los Angeles, CA, 1984.
B.A. Degree, Geology, Humboldt State University, Arcata, CA, 1982.

Professional Certifications:

California Professional Geologist
California Certified Hydrogeologist
Qualified SWPPP Developer and Practitioner

Professional Experience:

Matt has 25 years of experience in environmental policy, assessment and remediation. He spent nine years with the U.S. EPA in the RCRA and Superfund programs and served as EPA's Senior Science Policy Advisor in the Western Regional Office where he identified emerging threats to groundwater from perchlorate and MTBE. While with EPA, Matt also served as a Senior Hydrogeologist in the oversight of the assessment of seven major military facilities undergoing base closure. He led numerous enforcement actions under provisions of the Resource Conservation and Recovery Act (RCRA) while also working with permit holders to improve hydrogeologic characterization and water quality monitoring.

Matt has worked closely with U.S. EPA legal counsel and the technical staff of several states in the application and enforcement of RCRA, Safe Drinking Water Act and Clean Water Act regulations. Matt has trained the technical staff in the States of California, Hawaii, Nevada, Arizona and the Territory of Guam in the conduct of investigations, groundwater fundamentals, and sampling techniques.

Positions Matt has held include:

- Founding Partner, Soil/Water/Air Protection Enterprise (SWAPE) (2003 – present);
- Geology Instructor, Golden West College, 2010 – 2104;
- Senior Environmental Analyst, Komex H2O Science, Inc. (2000 -- 2003);

- Executive Director, Orange Coast Watch (2001 – 2004);
- Senior Science Policy Advisor and Hydrogeologist, U.S. Environmental Protection Agency (1989–1998);
- Hydrogeologist, National Park Service, Water Resources Division (1998 – 2000);
- Adjunct Faculty Member, San Francisco State University, Department of Geosciences (1993 – 1998);
- Instructor, College of Marin, Department of Science (1990 – 1995);
- Geologist, U.S. Forest Service (1986 – 1998); and
- Geologist, Dames & Moore (1984 – 1986).

Senior Regulatory and Litigation Support Analyst:

With SWAPE, Matt's responsibilities have included:

- Lead analyst and testifying expert in the review of over 100 environmental impact reports since 2003 under CEQA that identify significant issues with regard to hazardous waste, water resources, water quality, air quality, Valley Fever, greenhouse gas emissions, and geologic hazards. Make recommendations for additional mitigation measures to lead agencies at the local and county level to include additional characterization of health risks and implementation of protective measures to reduce worker exposure to hazards from toxins and Valley Fever.
- Stormwater analysis, sampling and best management practice evaluation at industrial facilities.
- Manager of a project to provide technical assistance to a community adjacent to a former Naval shipyard under a grant from the U.S. EPA.
- Technical assistance and litigation support for vapor intrusion concerns.
- Lead analyst and testifying expert in the review of environmental issues in license applications for large solar power plants before the California Energy Commission.
- Manager of a project to evaluate numerous formerly used military sites in the western U.S.
- Manager of a comprehensive evaluation of potential sources of perchlorate contamination in Southern California drinking water wells.
- Manager and designated expert for litigation support under provisions of Proposition 65 in the review of releases of gasoline to sources drinking water at major refineries and hundreds of gas stations throughout California.
- Expert witness on two cases involving MTBE litigation.
- Expert witness and litigation support on the impact of air toxins and hazards at a school.
- Expert witness in litigation at a former plywood plant.

With Komex H2O Science Inc., Matt's duties included the following:

- Senior author of a report on the extent of perchlorate contamination that was used in testimony by the former U.S. EPA Administrator and General Counsel.
- Senior researcher in the development of a comprehensive, electronically interactive chronology of MTBE use, research, and regulation.
- Senior researcher in the development of a comprehensive, electronically interactive chronology of perchlorate use, research, and regulation.
- Senior researcher in a study that estimates nationwide costs for MTBE remediation and drinking water treatment, results of which were published in newspapers nationwide and in testimony against provisions of an energy bill that would limit liability for oil companies.
- Research to support litigation to restore drinking water supplies that have been contaminated by MTBE in California and New York.

- Expert witness testimony in a case of oil production-related contamination in Mississippi.
- Lead author for a multi-volume remedial investigation report for an operating school in Los Angeles that met strict regulatory requirements and rigorous deadlines.

- Development of strategic approaches for cleanup of contaminated sites in consultation with clients and regulators.

Executive Director:

As Executive Director with Orange Coast Watch, Matt led efforts to restore water quality at Orange County beaches from multiple sources of contamination including urban runoff and the discharge of wastewater. In reporting to a Board of Directors that included representatives from leading Orange County universities and businesses, Matt prepared issue papers in the areas of treatment and disinfection of wastewater and control of the discharge of grease to sewer systems. Matt actively participated in the development of countywide water quality permits for the control of urban runoff and permits for the discharge of wastewater. Matt worked with other nonprofits to protect and restore water quality, including Surfrider, Natural Resources Defense Council and Orange County CoastKeeper as well as with business institutions including the Orange County Business Council.

Hydrogeology:

As a Senior Hydrogeologist with the U.S. Environmental Protection Agency, Matt led investigations to characterize and cleanup closing military bases, including Mare Island Naval Shipyard, Hunters Point Naval Shipyard, Treasure Island Naval Station, Alameda Naval Station, Moffett Field, Mather Army Airfield, and Sacramento Army Depot. Specific activities were as follows:

- Led efforts to model groundwater flow and contaminant transport, ensured adequacy of monitoring networks, and assessed cleanup alternatives for contaminated sediment, soil, and groundwater.
- Initiated a regional program for evaluation of groundwater sampling practices and laboratory analysis at military bases.
- Identified emerging issues, wrote technical guidance, and assisted in policy and regulation development through work on four national U.S. EPA workgroups, including the Superfund Groundwater Technical Forum and the Federal Facilities Forum.

At the request of the State of Hawaii, Matt developed a methodology to determine the vulnerability of groundwater to contamination on the islands of Maui and Oahu. He used analytical models and a GIS to show zones of vulnerability, and the results were adopted and published by the State of Hawaii and County of Maui.

As a hydrogeologist with the EPA Groundwater Protection Section, Matt worked with provisions of the Safe Drinking Water Act and NEPA to prevent drinking water contamination. Specific activities included the following:

- Received an EPA Bronze Medal for his contribution to the development of national guidance for the protection of drinking water.
- Managed the Sole Source Aquifer Program and protected the drinking water of two communities through designation under the Safe Drinking Water Act. He prepared geologic reports, conducted public hearings, and responded to public comments from residents who were very concerned about the impact of designation.

- Reviewed a number of Environmental Impact Statements for planned major developments, including large hazardous and solid waste disposal facilities, mine reclamation, and water transfer.

Matt served as a hydrogeologist with the RCRA Hazardous Waste program. Duties were as follows:

- Supervised the hydrogeologic investigation of hazardous waste sites to determine compliance with Subtitle C requirements.
- Reviewed and wrote "part B" permits for the disposal of hazardous waste.
- Conducted RCRA Corrective Action investigations of waste sites and led inspections that formed the basis for significant enforcement actions that were developed in close coordination with U.S. EPA legal counsel.
- Wrote contract specifications and supervised contractor's investigations of waste sites.

With the National Park Service, Matt directed service-wide investigations of contaminant sources to prevent degradation of water quality, including the following tasks:

- Applied pertinent laws and regulations including CERCLA, RCRA, NEPA, NRDA, and the Clean Water Act to control military, mining, and landfill contaminants.
- Conducted watershed-scale investigations of contaminants at parks, including Yellowstone and Olympic National Park.
- Identified high-levels of perchlorate in soil adjacent to a national park in New Mexico and advised park superintendent on appropriate response actions under CERCLA.
- Served as a Park Service representative on the Interagency Perchlorate Steering Committee, a national workgroup.
- Developed a program to conduct environmental compliance audits of all National Parks while serving on a national workgroup.
- Co-authored two papers on the potential for water contamination from the operation of personal watercraft and snowmobiles, these papers serving as the basis for the development of nation-wide policy on the use of these vehicles in National Parks.
- Contributed to the Federal Multi-Agency Source Water Agreement under the Clean Water Action Plan.

Policy:

Served senior management as the Senior Science Policy Advisor with the U.S. Environmental Protection Agency, Region 9. Activities included the following:

- Advised the Regional Administrator and senior management on emerging issues such as the potential for the gasoline additive MTBE and ammonium perchlorate to contaminate drinking water supplies.
- Shaped EPA's national response to these threats by serving on workgroups and by contributing to guidance, including the Office of Research and Development publication, Oxygenates in Water: Critical Information and Research Needs.
- Improved the technical training of EPA's scientific and engineering staff.
- Earned an EPA Bronze Medal for representing the region's 300 scientists and engineers in negotiations with the Administrator and senior management to better integrate scientific principles into the policy-making process.
- Established national protocol for the peer review of scientific documents.

Geology:

With the U.S. Forest Service, Matt led investigations to determine hillslope stability of areas proposed for timber harvest in the central Oregon Coast Range. Specific activities were as follows:

- Mapped geology in the field, and used aerial photographic interpretation and mathematical models to determine slope stability.
- Coordinated his research with community members who were concerned with natural resource protection.
- Characterized the geology of an aquifer that serves as the sole source of drinking water for the city of Medford, Oregon.

As a consultant with Dames and Moore, Matt led geologic investigations of two contaminated sites (later listed on the Superfund NPL) in the Portland, Oregon, area and a large hazardous waste site in eastern Oregon. Duties included the following:

- Supervised year-long effort for soil and groundwater sampling.
- Conducted aquifer tests.
- Investigated active faults beneath sites proposed for hazardous waste disposal.

Teaching:

From 1990 to 1998, Matt taught at least one course per semester at the community college and university levels:

- At San Francisco State University, held an adjunct faculty position and taught courses in environmental geology, oceanography (lab and lecture), hydrogeology, and groundwater contamination.
- Served as a committee member for graduate and undergraduate students.
- Taught courses in environmental geology and oceanography at the College of Marin.

Matt taught physical geology (lecture and lab and introductory geology at Golden West College in Huntington Beach, California from 2010 to 2014.

Invited Testimony, Reports, Papers and Presentations:

Hagemann, M.F., 2008. Disclosure of Hazardous Waste Issues under CEQA. Presentation to the Public Environmental Law Conference, Eugene, Oregon.

Hagemann, M.F., 2008. Disclosure of Hazardous Waste Issues under CEQA. Invited presentation to U.S. EPA Region 9, San Francisco, California.

Hagemann, M.F., 2005. Use of Electronic Databases in Environmental Regulation, Policy Making and Public Participation. Brownfields 2005, Denver, Coloradao.

Hagemann, M.F., 2004. Perchlorate Contamination of the Colorado River and Impacts to Drinking Water in Nevada and the Southwestern U.S. Presentation to a meeting of the American Groundwater Trust, Las Vegas, NV (served on conference organizing committee).

Hagemann, M.F., 2004. Invited testimony to a California Senate committee hearing on air toxins at schools in Southern California, Los Angeles.

Brown, A., Farrow, J., Gray, A. and **Hagemann, M.**, 2004. An Estimate of Costs to Address MTBE Releases from Underground Storage Tanks and the Resulting Impact to Drinking Water Wells. Presentation to the Ground Water and Environmental Law Conference, National Groundwater Association.

Hagemann, M.F., 2004. Perchlorate Contamination of the Colorado River and Impacts to Drinking Water in Arizona and the Southwestern U.S. Presentation to a meeting of the American Groundwater Trust, Phoenix, AZ (served on conference organizing committee).

Hagemann, M.F., 2003. Perchlorate Contamination of the Colorado River and Impacts to Drinking Water in the Southwestern U.S. Invited presentation to a special committee meeting of the National Academy of Sciences, Irvine, CA.

Hagemann, M.F., 2003. Perchlorate Contamination of the Colorado River. Invited presentation to a tribal EPA meeting, Pechanga, CA.

Hagemann, M.F., 2003. Perchlorate Contamination of the Colorado River. Invited presentation to a meeting of tribal repesentatives, Parker, AZ.

Hagemann, M.F., 2003. Impact of Perchlorate on the Colorado River and Associated Drinking Water Supplies. Invited presentation to the Inter-Tribal Meeting, Torres Martinez Tribe.

Hagemann, M.F., 2003. The Emergence of Perchlorate as a Widespread Drinking Water Contaminant. Invited presentation to the U.S. EPA Region 9.

Hagemann, M.F., 2003. A Deductive Approach to the Assessment of Perchlorate Contamination. Invited presentation to the California Assembly Natural Resources Committee.

Hagemann, M.F., 2003. Perchlorate: A Cold War Legacy in Drinking Water. Presentation to a meeting of the National Groundwater Association.

Hagemann, M.F., 2002. From Tank to Tap: A Chronology of MTBE in Groundwater. Presentation to a meeting of the National Groundwater Association.

Hagemann, M.F., 2002. A Chronology of MTBE in Groundwater and an Estimate of Costs to Address Impacts to Groundwater. Presentation to the annual meeting of the Society of Environmental Journalists.

Hagemann, M.F., 2002. An Estimate of the Cost to Address MTBE Contamination in Groundwater (and Who Will Pay). Presentation to a meeting of the National Groundwater Association.

Hagemann, M.F., 2002. An Estimate of Costs to Address MTBE Releases from Underground Storage Tanks and the Resulting Impact to Drinking Water Wells. Presentation to a meeting of the U.S. EPA and State Underground Storage Tank Program managers.

Hagemann, M.F., 2001. From Tank to Tap: A Chronology of MTBE in Groundwater. Unpublished report.

Hagemann, M.F., 2001. Estimated Cleanup Cost for MTBE in Groundwater Used as Drinking Water. Unpublished report.

Hagemann, M.F., 2001. Estimated Costs to Address MTBE Releases from Leaking Underground Storage Tanks. Unpublished report.

Hagemann, M.F., and VanMouwerik, M., 1999. Potential Water Quality Concerns Related to Snowmobile Usage. Water Resources Division, National Park Service, Technical Report.

VanMouwerik, M. and **Hagemann, M.F.** 1999, Water Quality Concerns Related to Personal Watercraft Usage. Water Resources Division, National Park Service, Technical Report.

Hagemann, M.F., 1999, Is Dilution the Solution to Pollution in National Parks? The George Wright Society Biannual Meeting, Asheville, North Carolina.

Hagemann, M.F., 1997, The Potential for MTBE to Contaminate Groundwater. U.S. EPA Superfund Groundwater Technical Forum Annual Meeting, Las Vegas, Nevada.

Hagemann, M.F., and Gill, M., 1996, Impediments to Intrinsic Remediation, Moffett Field Naval Air Station, Conference on Intrinsic Remediation of Chlorinated Hydrocarbons, Salt Lake City.

Hagemann, M.F., Fukunaga, G.L., 1996, The Vulnerability of Groundwater to Anthropogenic Contaminants on the Island of Maui, Hawaii. Hawaii Water Works Association Annual Meeting, Maui, October 1996.

Hagemann, M. F., Fukanaga, G. L., 1996, Ranking Groundwater Vulnerability in Central Oahu, Hawaii. Proceedings, Geographic Information Systems in Environmental Resources Management, Air and Waste Management Association Publication VIP-61.

Hagemann, M.F., 1994. Groundwater Characterization and Cleanup at Closing Military Bases in California. Proceedings, California Groundwater Resources Association Meeting.

Hagemann, M.F. and Sabol, M.A., 1993. Role of the U.S. EPA in the High Plains States Groundwater Recharge Demonstration Program. Proceedings, Sixth Biennial Symposium on the Artificial Recharge of Groundwater.

Hagemann, M.F., 1993. U.S. EPA Policy on the Technical Impracticability of the Cleanup of DNAPL-contaminated Groundwater. California Groundwater Resources Association Meeting.

Hagemann, M.F., 1992. Dense Nonaqueous Phase Liquid Contamination of Groundwater: An Ounce of Prevention... Proceedings, Association of Engineering Geologists Annual Meeting, v. 35.

Other Experience:

Selected as subject matter expert for the California Professional Geologist licensing examination, 2009-2011.

JESSIE MARIE JAEGER

SOIL WATER AIR PROTECTION ENTERPRISE
2656 29th Street, Suite 201
Santa Monica, California 90405
Mobile: (530) 867-6202
Office: (310) 452-5555
Fax: (310) 452-5550
Email: jessie@swape.com

SWAPE Technical Consultation, Data Analysis and Litigation Support for the Environment

EDUCATION

UNIVERSITY OF CALIFORNIA, LOS ANGELES **B.S. CONSERVATION BIOLOGY & ENVIRONMENTAL SCIENCES** *JUNE 2014*

PROJECT EXPERIENCE

SOIL WATER AIR PROTECTION ENTERPRISE ***SANTA MONICA, CA***

AIR QUALITY SPECIALIST

SENIOR ANALYST: CEQA ANALYSIS & MODELING

- Calculated roadway, stationary source, and cumulative impacts for risk and hazard analyses at proposed land use projects.
- Quantified criteria air pollutant and greenhouse gas emissions released during construction and operational activities of proposed land use projects using CalEEMod and EMFAC2011 emission factors.
- Utilized AERSCREEN, a screening dispersion model, to determine the ambient air concentrations at sensitive receptor locations.
- Organized presentations containing figures and tables comparing results of particulate matter analyses to CEQA thresholds.
- Prepared reports that discuss results of the health risk analyses conducted for several land use redevelopment projects.

SENIOR ANALYST: GREENHOUSE GAS MODELING AND DETERMINATION OF SIGNIFICANCE

- Quantified greenhouse gas (GHG) emissions of a "business as usual" scenario for proposed land use projects using CalEEMod.
- Determined compliance of proposed projects with AB 32 GHG reduction targets, with measures described in CARB's Scoping Plan for each land use sector, and with GHG significance thresholds recommended by various Air Quality Management Districts in California.
- Produced tables and figures that compare the results of the GHG analyses to applicable CEQA thresholds and reduction targets.

PROJECT MANAGER: OFF-GASSING OF FORMALDEHYDE FROM FLOORING PRODUCTS

- Determined the appropriate standard test methods to effectively measure formaldehyde emissions from flooring products.
- Compiled and analyzed laboratory testing data. Produced tables, charts, and graphs to exhibit emission levels.
- Compared finalized testing data to Proposition 65 No Significant Risk Level (NSRL) and to CARB's Phase 2 Standard.
- Prepared a final analytical report and organized supporting data for use as Expert testimony in environmental litigation.
- Participated in meetings with clients to discuss project strategy and identify solutions to achieve short and long term goals.

PROJECT ANALYST: EXPOSURE ASSESSMENT OF CONTAMINANTS EMITTED BY INCINERATOR

- Reviewed and organized sampling data, and determined the maximum levels of arsenic, dioxin, and lead in soil samples.
- Determined cumulative and hourly particulate deposition of incinerator and modeled particle dispersion locations using GIS and AERMOD.
- Conducted risk assessment using guidance set forth by the Office of Environmental Health Hazard Assessment (OEHHA).
- Utilized LeadSpread8 to evaluate exposure, and the potential adverse health effects from exposure, to lead in the environment.
- Compared final results of assessment to the Environmental Protection Agency's (EPA) Regional Screening Levels (RSLs).

ACCOMPLISHMENTS

- **Recipient**, Bruins Advantage Scholarship, University of California, Los Angeles — ***SEPT 2010 – JUNE 2014***
- **Academic Honoree,** Dean's List, University of California, Los Angeles — ***SEPT 2013 – JUNE 2014***
- **Academic Wellness Director**, UCLA Undergraduate Students Associated Council — ***SEPT 2013 – JUNE 2014***
- **Student Groups Support Committee Member,** UCLA Undergraduate Students Associated Council — ***SEPT 2012 – JUNE 2013***

Intended for:
San Francisco Planning Department
San Francisco, California

Prepared By:
Ramboll Environ US Corporation
San Francisco, California

Date
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Project Number
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FINAL
AIR QUALITY TECHNICAL REPORT
SFMTA COMMUTER SHUTTLE PROGRAM
SAN FRANCISCO, CALIFORNIA

RAMBOLL ENVIRON

CONTENTS

TABLES

FIGURES

APPENDICES

ACRONYMS AND ABBREVIATIONS

APEZ	Air Pollutant Exposure Zone
AQTR	Air Quality Technical Report
ARB	California Air Resources Board
aREL	Acute Reference Exposure Level
ASF	Age Sensitivity Factor
BAAQMD	Bay Area Air Quality Management District
Cal/EPA	California Environmental Protection Agency
CAP	Criteria Air Pollutant
CAPCOA	California Air Pollution Control Officer's Association
CEQA	California Environmental Quality Act
CNG	Compressed natural gas
CO_2	Carbon Dioxide
CPF	Cancer Potency Factor
CRAF	Cancer Risk Adjustment Factor
CRRP	Community Risk Reduction Plan
CY	Calendar Year
DPM	Diesel Particulate Matter
HI	Hazard Index
HQ	Hazard Quotient
HRA	Health Risk Analysis
IARC	International Agency for Research on Cancer
LDA	Light duty automobile
LDT1	Light duty truck 1
LDT2	Light duty truck 2
MAF	Modeling Adjustment Factor
MDV	Medium Duty Vehicles
MEISR	Maximally Exposed Individual Sensitive Receptor
MY	Model Year
NED	National Elevation Dataset
NOx	Mono-nitrogen oxide
OBUS	Other buses

OEHHA	Office of Environmental Health Hazard Assessment
PM_{10}	Fine Particulate Matter up to 10 Micrometer in Diameter
$PM_{2.5}$	Fine Particulate Matter Less than 2.5 Micrometer in Diameter
PMI	Point of Maximum Impact
ROG	Reactive Organic Gas
SAR	Strategic Analysis Report
SBUS	School buses
SFCTA	San Francisco County Transportation Authority
SFMTA	San Francisco Municipal Transportation Agency
SOV	Single-occupant vehicle
TAC	Toxic Air Contaminant
TDM	Transportation demand management
TOG	Total Organic Gases
UBUS	Urban buses
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
VMT	Vehicle miles traveled
WHO	World Health Organization
χ/Q	"chi over q", also known as a Dispersion Factor

List of Units

g	gram
hr	hour
kg	kilogram
kW	kilowatt
L	liter
lb	pound
m^3	cubic meter
µg	microgram
mph	miles per hour
s	second

1. INTRODUCTION

In connection with the environmental review for the proposed Commuter Shuttle Program ("Commuter Shuttle Program") in San Francisco, California ("City"), Ramboll Environ U.S. Corporation (Ramboll Environ) conducted an analysis of criteria air pollutants and ozone precursors, as well as local risk and hazard impacts associated with the demand for the Commuter Shuttle Program. This analysis was performed to support the Project's California Environmental Quality Act (CEQA) documentation and per the request of the San Francisco Planning Department ("SF Planning").

1.1 Project Understanding

1.1.1 Background

Privately operated commuter shuttles, which ferry workers from their neighborhoods to places of work or transportation hubs, have become an increasingly common feature on the streets of San Francisco with an increase in the number and frequency of commuter shuttles in recent years. Before August 2014, San Francisco did not regulate the movement of these shuttles, and commuter shuttles were making stop events at locations throughout the City without any guidelines for where and when loading and unloading was permitted.

1.1.2 Commuter Shuttle Pilot Program

In January 2014, the San Francisco Municipal Transportation Agency (SFMTA) Board approved an 18-month Commuter Shuttle Pilot Program (August 2014 through January 2016)[1] to collect data regarding the provision of loading zones for commuter shuttles at existing Muni stops and at locations where new passenger loading zones could be installed. The SFMTA Commuter Shuttle Pilot Program ("Pilot Program") applies to shuttle services that serve commuters to, from, and within San Francisco. The Pilot Program does not apply to recreational buses, airport shuttles, long-distance interurban buses, or vanpool buses. Participation in the Pilot Program required a permit from the SFMTA.

Data collection from the Pilot Program by the SFMTA includes information about shuttle operations, enforcement, ability to minimize impacts on Muni operations through selective zone sharing, ability to minimize the impacts of large buses on neighborhood streets, and the effectiveness of a placard identification system in addressing concerns and complaints.

In the three months prior to implementation of the Pilot Program, the SFMTA received 593 placard applications (i.e., for 593 shuttles) (SFMTA 2015a). As of July 2015, 17 shuttle providers participate in the Pilot Program. Most shuttle vehicles are either cutaway buses (buses/shuttles formed by a small- to medium- truck chassis attached to the cabin of a truck or van, also called "mini buses") or motor coaches (also called "over the road" coaches) of either 40 or 45 feet in length designed for transporting passengers on intercity trips.

As of July 2015, the SFMTA has designated, and marked with appropriate signage, 125 loading zones for participating shuttle providers to load and unload passengers (104 Muni zones and 21 passenger loading zones). Commuter shuttle loading zones are

[1] SFMTA. Commuter Shuttles Policy and Pilot Program. 2015. Available online: https://www.sfmta.com/projects-planning/projects/commuter-shuttles-policy-and-pilot-program. Accessed July 2015.

indicated by signs and painted curbs (red curbs at Muni zones, and white curbs at loading zones). The Pilot Program has not included modifications to existing Muni transit routes and has not removed (or relocated) any existing Muni bus stops.

As of July 2015, shuttles were estimated to make 2,978 daily stop events at zones in the network, with an average of 24 daily stop events per zone (2,978 stop events /124 zones). The corridors with the most shuttle traffic in the Commuter Shuttle Pilot Program include Van Ness, Divisadero/Castro, Valencia, 8th/Market, and Townsend/Fourth Street near the Caltrain station.

1.1.3 Commuter Shuttle Program

Based on the data from the Pilot Program, SFMTA proposes to implement a Commuter Shuttle Program ("Program)". The Program is a regulatory mechanism by which the SFMTA can organize the travel routes and stops of commuter shuttles through San Francisco.

As part of the Program, the SFMTA would designate, and mark with appropriate signage, select Muni zones and passenger loading zones for commuter shuttle use. The existing Pilot Program network of 104 Muni zones and 21 passenger loading zones will be continued under the Proposed Program. For the purposes of environmental review, a maximum of 200 zones could be made available for use by permitted commuter shuttle providers. Therefore, 75 zones could be added under the Program.

The Program, while regulatory in nature, would involve altering existing commuter shuttle activities within San Francisco through a restricted street network, relocation of existing Pilot Program stops, and inclusion of new Program stops. As such, for environmental review purposes, the proposed Project is defined as the impacts from the change in the commuter shuttle demand due to potential growth in commuter shuttle activity that could occur following implementation of the Program. These shuttle activities encompass:

1. Shuttle activity within designated loading zones (including shuttle arrival, departure, and idling) within San Francisco.
2. Vehicular activity across the region under the Program. This includes shuttle activity from commuter shuttle travel within and outside of San Francisco (shuttle routes vary from 2 miles to 80 miles, one way).

Following implementation of the Program, SFMTA has projected that the potential commuter shuttle demand at an individual stop could increase by a factor of 29% (SFMTA 2015a). This potential growth in shuttle activity demand would include new stop events at existing or non-existing shuttle loading zones. Additionally, SFMTA projected shuttle activity (such as vehicle miles travelled (VMT)) could increase by an additional 19% above what has been observed from the Pre-Pilot period to the Pilot Program. This potential growth in shuttle activity would result in new vehicular traffic from commuter shuttles traveling along roadways to, from, and within San Francisco. The potential demand growth factors are based upon data collected as part of the Pilot Program.

Commuter shuttles are estimated to operate weekdays from 5am-12am. Approximately 90% of shuttle operations are assumed to occur during peak hours 6am-10am and 4pm-8pm, with the remaining 10% occurring over off-peak hours 5am-6am, 10am-4pm, and 8pm-12am.[2]

[2] Memo from SFMTA, September 2015.

2. METHODOLOGY OVERVIEW

The purpose of the air quality analysis was to assess potential criteria pollutant and health impacts that would result from operation of the commuter shuttles. Consistent with CEQA requirements and Planning Department direction, the Air Quality analysis utilized emissions software tools and air dispersion modeling to evaluate the following impacts from commuter shuttle traffic:

1. **Local Impacts:**
   a. Fine particulate matter ($PM_{2.5}$) concentrations on the Maximally Exposed Individual Sensitive Receptor (MEISR);
   b. Cancer risk impacts on the MEISR associated with exposure to toxic air contaminants (TACs); and
   c. Acute noncancer hazard index (HI) on the Point of Maximum Impact (PMI).
2. **Regional Impacts:**
   a. Mass emissions of criteria air pollutant (CAP), including a regional air quality analysis to determine annual CAP emissions associated with the Project (i.e. Program)[3];

2.1 Project Methodology

The local impacts (health risk assessment) and regional (criteria air pollutants) impacts quantified in the air quality analysis are described below. Each analysis will include both an uncontrolled and controlled scenario.

2.1.1 Scenarios

Both the local impacts (health risk assessment) and regional impacts (criteria air pollutants) are analyzed for both uncontrolled and controlled scenarios. An uncontrolled scenario assumes that the fleet would be comprised of the same mix of vehicles as exists in the Pilot Program (business-as-usual). A controlled scenario evaluated measures that could reduce air quality impacts from business-as-usual. The controlled scenario measures were identified in consultation with SF Planning.

Uncontrolled Scenario

The uncontrolled scenario assumes vehicle fleet turnover every eight years,[4] starting with 2024, based on available United States Census data and Transportation Research Board

[3] The regional air quality analysis focuses on the net CAP impact of new shuttles added under the Program, subtracting out the impact of shuttles that were already on the roads prior to Pilot Program implementation. As discussed above, the Program regulates the location of loading zones and travel upon roads in San Francisco for participants, as shuttles would drive on Bay Area roadways whether or not the Program exists.

[4] According to the Federal Transportation Administration (United States Department of Transportation), vans and buses have typical service lives of 4 to 12 years, depending on vehicle type, annual VMT and service category. Based on the breakdown of assumed vehicle classes and VMT per vehicle in the Commuter Shuttle Program, Ramboll Environ assumed an 8 year fleet turnover, which meets minimum fleet turnover requirements for heavy-duty large buses, heavy-duty small buses, and medium-duty small buses under FTA guidance. "Useful Life of Transit Buses and Vans", Report No. FTA VA-26-7229-07.1. April 2007. Available online: http://www.fta.dot.gov/documents/Useful_Life_of_Buses_Final_Report_4-26-07_rv1.pdf

studies examining average vehicle life for motor coaches.[5] The uncontrolled scenario also assumes the vehicles types and relative ages of vehicles in the program will remain the same throughout the Program. The uncontrolled scenario conservatively assumes the vehicles in the Pilot Program will continue in the Program and any growth associated with the Project will follow the same vehicle type, fuel type and model year breakdown of the Pilot Program fleet as shown in **Figure 1** and **Figure 2**.

Controlled Scenario

The controlled scenario represents the Program with incorporated restrictions on vehicle model year and fleet turnover time. The controlled scenario requires newly permitted shuttles registered with the Program to be four years old or newer at the time of registration (e.g., Model Year (MY) 2012 or newer in Calendar Year (CY) 2016).[6] Furthermore, the controlled scenario requires all shuttles (existing and new) in the commuter shuttle fleet to be MY2012 or newer by 2020. This means 40% of the existing fleet (MY2011 or older) will be required to be replaced by 2020, which is within the range of expected life of motor coaches.

2.1.2 Health Risk Assessment (Local Impacts)

To assess local impacts from the Project, Ramboll Environ performed a health risk assessment of emissions from shuttle activity at loading zones on nearby populations. In order to assess potential impacts from the Project at new loading zones anywhere in the City, Ramboll Environ assumed no shuttles at a loading zone for a baseline condition. This represents a conservative analysis for some locations because with or without the Program the shuttles would be making stops at various locations throughout the City. However, this conservative approach allows for disclosure of air quality effects that occur today at some locations and provides information about health effects that could occur in the future if and/or when a new loading zone is created.

SF Planning, in conjunction with the Bay Area Air Quality Management District (BAAQMD), has completed a City-wide Health Risk Assessment (HRA) to evaluate cumulative cancer risks and $PM_{2.5}$ concentrations from existing stationary and mobile sources as part of the development of a Community Risk Reduction Plan (CRRP). For purposes of this report, the database developed for this effort is referred to as the CRRP-HRA. Consistent with the CRRP-HRA, Ramboll Environ evaluated cancer risks, in addition to $PM_{2.5}$ concentrations.

The HRA was conducted consistent with the following guidance:

- Air Toxics Hot Spots Program Risk Assessment Guidelines (California Environmental Protection Agency [Cal/EPA] 2003);
- The San Francisco Community Risk Reduction Plan: Technical Support Documentation, V10 (BAAQMD 2012b);

[5] American Bus Association Foundation. Motorcoach Census 2013. A Study of the Size and Activity of the Motorcoach Industry in the United States and Canada in 2012. Available online: http://www.buses.org/files/Foundation/Census2013.pdf [Accessed September 2015].

[6] Ramboll Environ assumes shuttles with active placards in 2015 will be automatically enrolled in the Commuter Shuttle Program in 2016. Furthermore, shuttles with active placards are not subject to requirements for new vehicle registration since they already exist in the Shuttle Program, but these vehicles are subject to the 2020 fleet turnover requirement.

- BAAQMD Recommended Methods for Screening and Modeling Local Risks and Hazards (BAAQMD 2012a); and
- California Air Pollution Control Officer's Association (CAPCOA) *Health Risk Assessment for Proposed Land Use Projects* (CAPCOA 2009).

The CRRP-HRA database accounts for all known sources of air pollution and therefore, cumulative impacts are incorporated into this analysis.

Study Locations

Ramboll Environ worked with SF Planning and SFMTA to identify four local impact zones each containing two or more loading zones (Townsend/4th; 8th/Market; Van Ness/Union; and Valencia/25th) to model short-term and long-term air quality impacts. The four locations were chosen to be representative of the potential air quality impacts of existing or new commuter loading zones at any location within the City. The four locations were selected based on the following criteria:

- These stop locations exhibit high volumes of stop events under the Pilot Program, thereby potentially resulting in greater impacts than lower-volume stop event locations. At three of the four stop locations (Townsend/4th; 8th/Market; and Van Ness/Union), the stop locations include more than one shuttle loading zone for a total of seven loading zones. Combined, these four stop locations represent 8 of the 11 highest volume stop locations in the system under the Pilot Program.
- These stop locations exhibit average or above average idling times for commuter shuttles under the Pilot Program, which also directly affect air quality. In particular, the 4th and Townsend stop was selected due to its location, stop volume, and increased average shuttle idle time (due to it being a terminal stop for Caltrain transfers) in comparison to all other stops in the Pilot Program.
- These stop locations are representative of the geographic diversity within the City.
    - Through the CRRP-HRA, the City has identified locations in the City with substantial pollutant concentrations, known as the Air Pollutant Exposure Zone (APEZ). Two of the chosen locations (Townsend/4th and 8th/Market) are located within the APEZ, where the City's standards are more restrictive than the two locations outside the Air Pollutant Exposure Zone (Van Ness/Union and Valencia/25th). Furthermore, 8th/Market represents a stop with two overlapping loading zones, which will combine to create more long-term impacts on nearby receptors than those spaced further apart along the street.
    - Two of the chosen locations (Van Ness/Union and Valencia/25th) reflect a north-south street configuration and show higher effects on sensitive receptors (residential and school, respectively) immediately downwind (east) of the street considering the predominant wind direction in San Francisco is west-to-east.
- These shuttle stop locations are representative of potential Program stop configurations. For example, at Van Ness/Union, loading zones under the Pilot Program are located on both sides of the street directly opposite of each other. Therefore, when taking into consideration total stops per day and proximity of loading zones to each other, modeling

these combined sources display increased overall effects on the sensitive use to the east than stops with lower total daily stop count or those spaced further apart along the street.

Growth Assumptions

Through the Program, shuttle activity is projected to grow by 29% compared to existing shuttle activity. However, since the Program would potentially create a new loading zone at a location where shuttle stops do not currently occur, the modelling considered the potential impacts of existing shuttle activity in a new location plus a 29% increase. Section 4.5 described the shuttle activity pattern assumptions for local impacts in more detail.

2.1.3 Criteria Air Pollutant Emissions (Regional Impacts)

To assess CAP emissions from the Project, Ramboll Environ conducted a literature and data review and calculated new emissions associated with the Project.

Literature and Data Review

Prior to calculating a CAP emissions inventory for the Program, Ramboll Environ performed a review of the available literature and data related to commuter shuttle programs.

As a first step, Ramboll Environ conducted a review of available rulemaking, studies, and academic and government publications related to commuter shuttle programs. Generally articles discuss the impacts to net VMT resulting from a variety of employer-sponsored programs.

The BAAQMD Bay Area Commuter Benefits Program requires subject employers to offer qualified employees any of four options: pre-tax transit contribution, employer-based subsidy, employer-provided transit, or an alternative program (BAAQMD 2014a). The staff report supporting the rule listed a state regulation supporting commute reduction programs (Section 65801 of the California Government Code) and quantifies expected emission reductions by assuming a 2% reduction in single-occupancy vehicle commute trips (BAAQMD 2014b). The 2% reduction estimate was based on an analysis performed by ICF International that estimates the Program would increase transit ridership by 7% among employees at worksites covered by the Program in 2015. This would translate to a 2% reduction in the single-occupant vehicle (SOV) commute trips to worksites covered by the Program. No assessment was made for any change in emissions associated with a change from single occupancy vehicles to buses.

A 2014 California Air Resources Board (ARB) report summarized findings from a variety of studies on VMT reduction resulting from employer-sponsored trip reduction programs. Overall, employer-based trip reduction programs were found to potentially reduce total commute VMT for employees at participating work sites by 4% – 6%, while total peak-hour reductions for an entire metropolitan region were closer to 1% (ARB 2014a). Included in the cited studies was a summary of a 2008 study of Genentech programs which had found commuter single-occupancy vehicles were 21% below the standard suburban rates.

The Strategic Analysis Report (SAR) prepared by the San Francisco County Transportation Authority (SFCTA) evaluates the role of shuttle services with San Francisco and discusses impacts and benefits of private shuttle programs (SFCTA 2011). The report provides findings of a passenger survey that found 63% of regional shuttle passengers would otherwise have driven alone – effectively removing 327,000 solo vehicle round trips per year. The reduction in trips was quantified to remove 20 million VMT each year. Large motor coaches were found to emit approximately 20% of the Carbon Dioxide (CO_2) that would have been emitted by autos if shuttles were not in use.

In 2015, Fehr and Peers authored a letter providing background data on transportation demand management (TDM) literature to support development of a tool to model effectiveness of various TDM strategies to reduce single-occupancy vehicles and VMT within San Francisco (Fehr and Peers 2015). The letter was written as part of the TDM Framework for Growth project. The project is an interagency effort between SF Planning and the SFMTA in partnership with the San Francisco Office of Economic and Workforce Development and the San Francisco County Transportation Authority. Cited findings include a VMT reduction of 0.3-13.4% for employers sponsoring vanpools or shuttles, and a survey indicating 27% of shuttle users would have driven alone if intra-city shuttles were not available.

Studies reviewed are in agreement that employer-sponsored commuter shuttles result in net reductions of VMT.

Regional Emissions Calculation

Regional emissions estimation methods are described in Section 3 below.

Growth Assumptions

Shuttle activities were occurring even before the Pilot Program. Following the implementation of the Program, it is projected that shuttle activities would increase approximately 41% from Pre-Pilot shuttle activities (SFMTA 2015a). SFMTA noted the change in regional shuttle activity is more likely to follow the observed change in placard requests than the change in stop events. The regional assessment looks at the air quality change resulting from an increase in shuttle activity following implementation of the Program when shuttle activity would be regulated by SFMTA. As discussed above, literature and data review shows that an increase in shuttle VMT corresponds with a decrease in passenger vehicle VMT. SFMTA provided results from an operator survey quantifying how shuttle operations reduce passenger VMT (SFMTA 2015b). Therefore the regional assessment quantified the net change in CAPs resulting from an increase in shuttle activity and a decrease in passenger vehicle activity associated with the Project. Section 7 of this report describes the shuttle activity assumptions in more detail as they pertain to regional emissions.

2.2 Report Organization

The document is divided into nine sections as follows:

Section 1.0 – Introduction: describes the project understanding as well as purpose and scope of the HRA in the Air Quality Technical Report (AQTR), the objectives and methodology used in this HRA and outlines the report organization.

Section 2.0 – Methodology Overview: summarizes health risk assessment and regional criteria air pollutant analysis methodology.

Section 3.0 – Emissions Estimation describes the methods used to estimate the emissions of CAP, TACs and $PM_{2.5}$ emitted from the Project.

Section 4.0 – Modeled Air Concentrations: discusses the air dispersion modeling and screening, the selection of the dispersion models, the data used in the dispersion models (e.g., terrain, meteorology, source characterization), and the identification of sensitive receptor locations evaluated in the HRA.

Section 5.0 – Risk Characterization Methods: provides an overview of the methodology used to conduct the HRA.

Section 6.0 – Results from Local Impacts Analysis: provides a summary of estimated air quality impacts from the Project at the four modeled stop locations.

Section 7.0 – Results from Regional Impacts Analysis: provides a summary of Project CAP emissions from regional shuttle operations.

Section 8.0 – Uncertainties: identifies and describes the uncertainties associated with the risk estimates and discusses how these uncertainties may affect the risk assessment conclusions.

Section 9.0 – References: includes a list of all references cited in this report.

3. EMISSIONS ESTIMATION

3.1 Local Traffic

Local impacts were calculated from commuter shuttle operation in the vicinity of each study stop location. This zone of impact was defined by the "idling school buses scenario" ARB evaluated in the Diesel Risk Reduction Plan (ARB 2000). Activities that were considered include shuttles entering and leaving the designated loading zone ("running" emissions) and loading or unloading of passengers at the designated stop ("idling" emissions). The Pilot Program demonstrated several vehicle types are registered as commuter shuttles, shown in **Figure 1**. Shuttle types include:

- Motor coaches (typical 40+ passenger inter-city bus, including double decker vehicles)
- Urban buses (low floor 30-40 passenger bus, similar to a Muni bus)
- Mini-buses (20-30 passenger)
- Vans (6-12 passenger)

Records of registered shuttles also indicate a wide distribution of shuttle model years, with the majority (60%) of the vehicle fleet comprised of 2012 or newer model years, as shown in **Figure 2**. A variety of fuels are used in the commuter shuttles, including diesel, biodiesel, gasoline, and compressed natural gas (CNG).[7]

California Air Resources Board's (ARB's) EMission FACtor (EMFAC2014) model was used to quantify commuter shuttle emissions.[8] Ramboll Environ considered emissions from vehicle classes within EMFAC2014 that are mapped to the registered commuter shuttle fleet as disclosed by SFMTA. This list includes medium duty vehicles ("MDV"), urban buses ("UBUS"), motor coaches ("Motor Coach"), and other buses ("OBUS" and "All Other Buses"). These vehicle classes match the vehicle categories utilized in the pilot environmental impacts survey.[9] The methodology is shown in **Table 1**.

Running emissions for each model year and vehicle type were calculated assuming a vehicle speed of 5 miles per hour (mph) while approaching the loading zone. Idling emissions were calculated from the Project Level assessment component of EMFAC2014 (EMFAC2014-PL) for Motor Coaches and diesel-fueled Other Buses. Idling emissions from the other vehicle classes were determined by multiplying the emission factor at 5 miles per hour by 2.5 as provided in ARB guidance (ARB 2014).[10]

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[7] In the local analysis, biodiesel is evaluated as diesel, and CNG is evaluated as gasoline as the EPA Speciate database has not published CNG-specific speciation profiles; furthermore since biodiesel blends were not known in all cases, a diesel speciation profile is conservative for assessing health risks from biodiesel

[8] Per California Air Resources Board, EMFAC2014 is recommended for project assessment. ARB has recently submitted EMFAC2014 to USEPA for its review. USEPA approval is expected by the end of 2015. USEPA will provide a transition period during which either version may be used. Therefore, in anticipation of USEPA approval, use of EMFAC2014 before the end of the year is appropriate. Available online: http://www.arb.ca.gov/emfac/. Accessed July 2015.

[9] Data provided by Hank Willson, SFMTA, July 10, 2015.

[10] See Section 2.2.5 and Scenario 4 in Section 3.4 in EMFAC2014 Vol. II discussing how to calculate idling emissions from vehicles that do not have idling emission factors.

Vehicle model year specific emission factors for diesel total organic gases (TOG), gasoline TOG, particulate matter (PM_{10}, considered representative of diesel particulate matter, or Diesel Particulate Matter (DPM), when emitted from diesel engines), and fine particulate matter ($PM_{2.5}$) were generated for San Francisco County for calendar years 2016, 2024, 2032, and 2040. Different calendar years were evaluated to account for the impact of changes to CARB emission standards on overall fleet emissions over time as emission factors heavily depend on model year. This effect is shown for diesel particulate emissions in **Figure 3**. As shown in **Figure 4**, approximately 50% of the diesel particulate emissions come from approximately 3% of the fleet, approximately 70% of the diesel particulate emissions come from approximately 8% of the fleet, and approximately 90% of the diesel particulate emissions come from approximately 20% of the fleet. Where emission factors for a given model year/vehicle type/fuel type combination did not exist in EMFAC2014, the emission factor for the most recent prior year for the vehicle type/fuel type combination was used.

In the uncontrolled scenario, emission factors for the 2016 calendar year are considered representative of the vehicle fleet in the Pilot Program and are derived from the portion of vehicle types and portion of model years registered by shuttle operators. Emissions in calendar years 2024, 2032, and 2040 are calculated by shifting the model year distribution used in 2016, as shown in **Figure 5a**. In the controlled scenario, emissions in calendar year 2016 are calculated with the current fleet distribution, but assume the growth of 29% is composed of only 2012 or newer model years. Calendar years 2024, 2032, and 2040 assume shuttles are replaced every eight years such that shuttle model years are evenly distributed over the eight years preceding the calendar year, as indicated in **Figure 5b**. The aggregate emission factor was calculated by weighting the fleet emission factor for each calendar year by the portion of years that emission factor is relevant over the 70 year exposure period. As discussed in Section 4, Ramboll Environ also incorporated the Age Sensitivity Factor (ASF) into the 70 year emission rate calculation to ensure cancer risk impacts took into account both changes in emissions and exposure over time.

Maximum hourly and long term emissions were calculated from the number of stop events observed and the expected growth in the number of stop events, as shown in **Table 2**. Daily emissions reflect long-terms emissions resulting from many years of Program operation. Emissions are estimated from the number of stop events and for diesel PM_{10} and gasoline TOG account for the reduction anticipated in future years from cleaner engines. $PM_{2.5}$ is calculated from only calendar year 2016 as that year will result in the greatest annual emissions and expected concentrations.

3.2 Regional Traffic Emission Factors

Ramboll Environ calculated regional CAP emissions from the Commuter Shuttle Program which includes all vehicle travel within San Francisco and to and from Commuter Shuttle Program destinations in the Bay Area. This section describes the derivation of the CAP emission factors used in those emission calculations.

In addition, a variety of fuels are used in the commuter shuttles, including diesel, biodiesel, gasoline, and CNG. Ramboll Environ calculated regional emissions for all shuttle types currently permitted in the Pilot Program.

Regional emissions were calculated from idling and running activities. Running emissions were generated using EMFAC2014 for San Francisco County for the buildout calendar year of 2018. Idling emissions were calculated from the EMFAC2014-PL tool where provided, or were estimated by multiplying the aggregated speed by 2.5 to estimate emissions resulting from an hour of idling. The uncontrolled emissions scenario assumed shuttle vehicles would be from model years 1992 through 2018, with the distribution of vehicles amongst model years based on the distribution of vehicle age in the Pilot Program as reported by SFMTA (**Figure 2**).[11] The controlled emissions scenario assumed vehicles would be from model years 2012 through 2018, with an even distribution of vehicles between model years (i.e., approximately 14.3% of vehicles represented by each model year). For diesel vehicle classes "Motor Coach" and "All Other Buses" there are no calendar year 2018 emission factors in EMFAC2014 for model years prior to 1996. In the absence of 2018 calendar year emission factors, the emission factors for these vehicles were derived based on EMFAC2014 runs for calendar year 2016. Weighted average running exhaust and idling exhaust emission factors were calculated for each vehicle type/fuel type combo based on the model year specific emission factors and the relative fraction of shuttle vehicles for each model year.

Displaced passenger vehicle emission factors for running exhaust were derived based on a weighted average of the emission factors for passenger vehicles for San Francisco County for calendar year 2018 from EMFAC2014. Passenger vehicle fleet mix was based on EMFAC2014 vehicle population for San Francisco for the vehicle classes LDA (light duty automobile), LDT1 (light duty truck 1), and LDT2 (light duty truck 2) which are typically associated with worker commuting.[12] **Figure 6a** shows mono-nitrogen oxide (NOx) emissions by shuttle model year assuming the current fleet distribution (vehicle type, fuel type, and vehicle age) as projected in 2018. **Figure 6b** shows the NOx emissions by shuttle model year assuming the controlled scenario fleet distribution (current vehicle type and fuel type distribution, vehicle model year 2012 or newer) as projected in 2018. As shown in **Figure 6a**, approximately 50% of the NOx emissions come from approximately 10% of the fleet, approximately 70% of the NOx emissions come from approximately 30% of the fleet, and approximately 90% of the NOx emissions come from approximately 70% of the fleet.

The resulting CAP emission factors for shuttle vehicles and displaced passenger vehicles used in the regional emissions analysis are included in **Appendix F**. The methodology used to calculate regional CAP emissions based on these emission factors is presented in **Table 1**.

[11] Regional inventory was calculated for Calendar Year 2018, and thus vehicle model years range from 1992-2018 to match vehicle ages reported in Pilot Program.

[12] Based on CalEEMod® defaults. CalEEMod 2013.2.2. Available online: www.caleemod.com. Accessed August 2015.

4. MODELED AIR CONCENTRATIONS

Consistent with the CRRP-HRA, the air toxics analysis evaluated health risks and $PM_{2.5}$ concentrations imposed by the Project on the surrounding community. For the Project, this includes idling emissions generated by shuttles at an individual stop as well as emissions generated while the shuttles are arriving to and departing from the modeled loading zones. The methodologies used to evaluate emissions for the Project and cumulative HRA are based on the most recent BAAQMD Recommended Methods for Screening and Modeling Local Risks and Hazards (BAAQMD 2012a).

The Scope of Work (**Appendix A**) proposed to complete a screening approach followed by a more detailed, refined approach, as necessary. After consulting with SF Planning, it was determined a refined approach was necessary to more accurately reflect emissions from expected shuttle operation, and therefore only the methodology and results for the refined approach are presented here. **Figures 7 through 10** show the modeled source locations for the four stops evaluated in the refined approach.

4.1 Chemical Selection

Cancer risk and acute hazard analysis in the HRA was based on diesel exhaust, characterized as DPM and speciated TOG concentrations from diesel buses; as well as speciated TOG from gasoline vehicles. In the local analysis, biodiesel is evaluated as diesel, and CNG is evaluated as gasoline.

Diesel exhaust, a complex mixture that includes hundreds of individual constituents (Cal/EPA 1998), is identified by the State of California as a known carcinogen (Cal/EPA 2011). Under California regulatory guidelines, DPM is used as a surrogate measure of carcinogen exposure for the mixture of chemicals that make up diesel exhaust as a whole (Cal/EPA 2011). Cal/EPA and other proponents of using the surrogate approach to quantifying cancer risks associated with the diesel mixture indicate that this method is preferable to use of a component-based approach. A component-based approach involves estimating cancer risks for each of the individual components of a mixture. Critics of the component-based approach believe it will underestimate the risks associated with diesel as a whole mixture because the identity of all chemicals in the mixture may not be known and/or exposure and health effects information for all chemicals identified within the mixture may not be available. Furthermore, Cal/EPA has concluded that "potential cancer risk from inhalation exposure to whole diesel exhaust will exceed the multi-pathway cancer risk from the speciated components (Cal/EPA 2003)." The DPM analyses are based on the surrogate approach, as recommended by Cal/EPA. In the absence of an acute toxicity value for diesel exhaust, speciated TOG is used as a conservative estimate.

4.2 Air Dispersion Modeling

Near-field air dispersion modeling of emissions from the Project was conducted using the United States Environmental Protection Agency's (USEPA's) AERMOD model. For each receptor location, the model generates average air concentrations (or air dispersion factors as unit emissions will be modeled) resulting from source emissions.

Air dispersion models such as AERMOD require a variety of inputs such as source parameters, meteorological parameters, topography information, and receptor parameters.

Stack parameters are presented in **Table 3: Modeling Parameters**. Modeling files are included in **Appendix C**.

Meteorological data: Air dispersion modeling applications require the use of meteorological data that ideally are spatially and temporally representative of conditions in the immediate vicinity of the site under consideration. For this HRA, BAAQMD's Mission Bay meteorological data for year 2008 was used, which aligns with the San Francisco CRRP-HRA Methodology (BAAQMD 2012b). Meteorological data was processed for use in AERMOD with AERMET V15181, which is the most current pre-processor available.

Terrain considerations: AERMAP was used in order to incorporate terrain fluctuations for sources and receptors. Based on the urban area in which the Project site is located, Ramboll Environ used urban dispersion coefficients.

Source parameters: Source location and parameters are necessary to model the dispersion of air emissions from the shuttle buses. Idling emissions were modeled with two point sources with release parameters equal to the school bus (SBUS) scenario evaluated by ARB (ARB 2000) and one area source to represent the arrival and departure of shuttles into and out of the loading zones. Those parameters are provided in **Table 3**.

Modeled sources included shuttles pulling into and out of the loading area as well as idling vehicles based on the approach ARB utilized in the Diesel Risk Reduction Plan (ARB 2000), which is approximately 60 meters long and 6.6 meters wide for a given stop location.

Receptors: A total of four locations were modeled to evaluate impacts from a variety of stop configurations to locations within and outside of the Air Pollutant Exposure Zone (APEZ). In order to evaluate health impacts at each location, a hypothetical receptor grid was created around the modeled point source. A 20 meter by 20 meter receptor grid with minimum one meter receptor spacing was centered on the modeled point source, with a larger 100 meter by 100 meter grid with five meter spacing superimposed upon the inner grid. Receptors were modeled at a height of 1.8 meters above terrain height, a default breathing height for ground-floor receptors, consistent with the CRRP-HRA analysis. As discussed previously, average annual and 1-hour dispersion factors were estimated for each receptor location.

At each location Ramboll Environ also identified the location of sensitive receptors in order to estimate the maximum annual and lifetime impacts from the Program. This refinement only impacted the estimation of chronic exposure and was not used in estimating acute impacts; acute impacts were measured at the modeled PMI with a distance of 1 meter or more from the modeled shuttle zones. Sensitive receptor locations (such as residential areas and schools) were identified with the help of SF Planning.

Temporal Profile: Commuter shuttles are estimated to operate weekdays from 5am to 12am. Approximately 90% of shuttle operations are assumed to occur during peak hours 6am-10am and 4pm-8pm, with the remaining 10% occurring over off-peak hours 5am-6am, 10am-4pm, and 8pm-12am. Since the model operates more accurately with an entire year of meteorological data, the model was set up to assume operation from 5 am to 12 am, 7 days per week.

Modeling Adjustment Factors: Cal/EPA (2003) recommends applying an adjustment factor to the annual average concentration modeled assuming continuous emissions (i.e., 24 hours per day, 7 days per week), when the actual emissions are less than 24 hours per day and exposures are concurrent with traffic activities occurring as part of the Project. The modeling adjustment factors are discussed below.

For estimating the cancer risk, residents were assumed to be exposed to Project emissions 24 hours per day, 7 days per week. This assumption is consistent with the modeled annual average air concentration (24 hours per day, 7 days per week). Thus, the annual average concentration need not be adjusted.

4.3 Emissions Characterization

Emitting activities were modeled to reflect shuttle operation as expected on a weekday. Emissions were modeled using the χ/Q ("chi over q") method, and distributed over weekday hours such that the modeled source has a unit emission rate over a 24-hour period (i.e., 1 gram per second [g/s]), and the model estimates daily dispersion factors (with units of [ug/m3]/[g/s]). However, per the temporal characteristics described above, emission factors were amplified or zeroed by hour of day based on the diurnal profiles of the shuttle fleet (e.g., "on" from 5 am until 12 am and "off" from 12 am until 5 am).

Emissions from shuttle operation over the loading zones were calculated using the weighted emission rate of the reported vehicle types, fuel types and model years for a vehicle speed of five miles per hour.

For annual average ambient air concentrations, the estimated annual average dispersion factors were multiplied by the annual average emission rates. The emission rates vary day-to-day, as shuttle operations principally occur on Monday to Friday only. For simplicity, the model assumes a constant emission rate during the entire year for all days. For 70-year average ambient air concentrations, Ramboll Environ utilized an approach that takes into consideration change in breathing rates over time as well as change in emission rates over time in order to calculate excess lifetime cancer risk at the MEISR.

Commuter shuttle emissions were estimated based upon the model year distribution and vehicle type distribution discussed in Section 2.2 above. Modeled emission rates are provided in **Appendix B**. In evaluating local impacts, Ramboll Environ evaluated CAP emissions associated with idling and loading of commuter shuttles. The methodology used to calculate emissions is presented in **Table 1.** Two similar methodologies are presented below to evaluate cancer risk and acute impacts.

4.4 Modeling Adjustment Factor

Emissions from the Program analysis (i.e., four modeled stop locations) only impact children at the school near the Valencia and $24^{th}/25^{th}$ stop during the 10 hours the school is assumed to operate (see **Section 5.2**). However, as discussed the concentrations modeled during shuttle activity (5am to midnight) each weekday were annualized assuming 24 hours per day and seven days per week in the modeling outputs. Without adjustment, the concentration used in the evaluation of the school child would not adequately represent the concentration to which the school child might be exposed. The modeling adjustment factor therefore adjusts the concentrations to account for this annualized averaging. Furthermore, school children will be present during a portion of the peak hours of 6-10am and 4-8pm; thus for the evaluation of the school child the concentrations were conservatively treated as occurring entirely between 6am and 8pm (14 hours). To facilitate this assessment, a modeling adjustment factor (MAF) of 2.4 was applied to the annual average concentration used in the school child evaluation to account for an emissions schedule of 14 hours per day and five (5) days per week ([24 hours/11 hours]*[7 days/5 days]). These concentrations represent the theoretical maximum average concentrations over the active shuttle period to which the school child receptor might be exposed.

The modeling adjustment factor for the resident is not needed (i.e. the MAF is 1.0) because the residential receptor is assumed to be present continuously, consistent with the averaging assumptions made when calculating annualized concentrations.

4.5 Shuttle Activity Patterns for Annual and Hourly Impacts

Annual Average Concentration: The annual air concentration (for use in the cancer risk assessment and $PM_{2.5}$ concentration) used the actual calculated emission factors in tandem with the actual projected number of shuttle stops per day and an estimated average stop duration (minutes) in evaluating cancer risk from commuter shuttle arrival, loading, and departure at the four modeled stop locations (each with one or more adjacent loading zones).

As discussed with SFMTA, total daily stops were estimated by increasing SFMTA's observed AM and PM peak totals each by 10% to account for additional trips occurring on off-peak hours and 29% to account for potential projected growth throughout the Program, in line with what SFMTA has observed over the Pilot Program. Consistent with data collected during the Pilot Program, Ramboll Environ assumed idling emissions occur for 1 minute for each of the daily stop events at Van Ness, Valencia, and Market Street zones and 4.89 minutes for each of the daily stop events at 4th & Townsend/Caltrain loading zone.[13]

Hourly Maximum Concentration: The estimation of hourly maximum concentration (for evaluation of acute impacts) differed slightly from the annual average concentration methodology. Here, Ramboll Environ assumed half of the total observed peak AM or PM shuttle bus stops will occur in the course of one hour. Furthermore, Ramboll Environ assumes maximum hourly operations during Program will also include the potential 29% growth for Project Buildout. Similar to above, each shuttle idled for one minute (except 4th & Townsend, which incorporated 4.89 minute idling), and arrival and departure emissions for each bus was included. Ramboll Environ calculated the maximum hourly impact by assuming the net emissions occur in each hour of potential shuttle operation (5am – 12am).

[13] Based on data provided by Kathleen Phu, SFMTA, August 2015.

5. RISK CHARACTERIZATION METHODS

The following sections discuss in detail the various components required to conduct the HRA. Estimated cancer risks and noncancer acute HI were calculated according to the current BAAQMD Guidance and using default BAAQMD and California Office of Environmental Health Hazard Assessment (OEHHA) exposure assumptions. In advance of this calculation, Ramboll Environ gained approval from the Planning Department for the appropriate risk assessment parameters.

5.1 Sources Evaluated

As discussed in Section 1.2, Ramboll Environ evaluated cancer risk, acute hazard index, and $PM_{2.5}$ concentrations for Project emissions reflective of Project implementation.

SFMTA provided Project traffic counts (projected shuttle stops/day and minutes/stop) to represent modeling inputs as described above. These data were utilized to calculate health risk impacts at nearby sensitive receptors.

5.2 Exposure Assessment

Potentially Exposed Populations: This evaluation conservatively evaluated offsite 70-year residents, school children, and other sensitive receptor populations.

Residential receptors were evaluated in areas with residential land use. School children were evaluated at one school in the near proximity of the project stop on Valencia. Because residential exposure assumptions are more conservative than those for other sensitive receptor types as residents have the longest exposure duration and highest exposure frequency, a conservative approach of considering all other sensitive receptors as residential receptors was used in this HRA. Ramboll Environ modeled receptors using the approaches outlined in Section 4.2 above.

Exposure Assumptions: Due to the assumed fleet change-out every 8 years until 2040 as discussed previously for the uncontrolled scenario, residents were evaluated separately but continuously as children and adults to align with the emissions changes related to fleet change-out. Because school children are exposed for 9 years, for the uncontrolled scenario it was conservatively assumed that they were exposed to 2016 emissions for the duration of their exposure period. For the controlled scenario, residents were evaluated assuming fleet change-out in 2020 and 2024, then every 8 years until 2040; school children were evaluated assuming fleet change-out in 2020 and 2024.

The exposure parameters that used to estimate excess lifetime cancer risks for potentially exposed resident and school child populations for the operation scenario were obtained using risk assessment guidelines from BAAQMD (2010), unless otherwise noted, and are presented in attached **Table 4**.

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

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

Where:

IF_{inh}	=	Intake Factor for Inhalation (m^3/kg-day)
DBR	=	Daily Breathing Rate (L/kg-day)
ET	=	Exposure Time (hours/24 hours)
EF	=	Exposure Frequency (days/year)
ED	=	Exposure Duration (years)
AT	=	Averaging Time (days)
CF	=	Conversion Factor, 0.001 (m^3/L)

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

5.3 Toxicity Assessment

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

Following CRRP Methodology for cancer risk calculations, Ramboll Environ included cancer potency factors (CPF) for DPM as well as diesel and organic gases from Project shuttles as part of the analysis. Acute reference exposure levels (aRELs) for chemicals in the speciation profiles of diesel and gasoline TOG were used for the calculation of acute HI. Toxicity values are summarized in **Table 5**.

5.4 Cancer Risk Adjustment Factors

The estimated excess lifetime cancer risks for a resident child and school child were adjusted using the age sensitivity factors (ASFs) recommended in the Cal/EPA OEHHA Technical Support Document (Cal/EPA 2009). This approach accounts for an "anticipated special sensitivity to carcinogens" of infants and children. Cancer risk estimates are weighted by a factor of 10 for exposures that occur from the third trimester of pregnancy to two years of age and by a factor of three for exposures that occur from two years through 15 years of age. No weighting factor (i.e., an ASF of one, which is equivalent to no adjustment) is applied to ages 16 to 70 years.

As described in previous sections, emissions were assumed to change with fleet change-out every 8 years until year 2040. As a result, cancer risk adjustment factor (CRAF) values were calculated using the ASF methodology described above to align with the emissions changes associated with fleet change-out. **Table 6** shows the CRAF values used for residents and school children.

5.5 Risk Characterization

Excess lifetime cancer risks are estimated as the upper-bound incremental probability that an individual will develop cancer over a lifetime as a direct result of exposure to potential carcinogens. The estimated risk is expressed as a unitless probability. The cancer risk attributed to a chemical is calculated by multiplying the chemical intake or dose at the human exchange boundaries (e.g., lungs) by the chemical-specific CPF. Residential cancer risks were calculated for each age group that aligned with the fleet change-out time period as described previously. The cancer risks calculated for each age group were then summed to calculate a total cancer risk for the residential receptor. For the school child receptor only one age group was used.

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

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

Where:

$Risk_{inh}$ = Cancer Risk; the incremental probability of an individual developing cancer as a result of inhalation exposure to a particular potential carcinogen (unit-less)

C_i	=	Annual Average Air Concentration for $Chemical_i$ ($\mu g/m^3$)
MAF	=	Modeling Adjustment Factor (unitless)
CF	=	Conversion Factor (mg/µg)
IF_{inh}	=	Intake Factor for Inhalation (m^3/kg-day)
CPF_I	=	Cancer Potency Factor for $Chemical_i$ (mg chemical/kg body weight-day)$^{-1}$
ASF	=	Age Sensitivity Factor (unitless)

5.6 Estimation of Acute Noncancer Hazard Quotient/Index

The potential for exposure to result in adverse acute effects is evaluated by comparing the estimated one-hour maximum air concentration of chemical to the aREL for each chemical evaluated in this analysis. When calculated for a single chemical, the comparison yields a Hazard Quotient (HQ). To evaluate the potential for adverse acute health effects from simultaneous exposure to multiple chemicals, the HQs for all chemicals are summed, yielding a HI. Health risk calculations are provided in **Appendix D**.

$$HQ_i = {C_i}/{aREL_i}$$
$$HI = \sum HQ_i$$

Where:

HQ_i	=	Acute hazard quotient for chemical i
HI	=	Hazard index
C_i	=	One-hour maximum concentration of chemical i (µg/m^3)
$aREL_i$	=	Acute reference exposure level for chemical i (µg/m^3)

6. RESULTS FROM LOCAL IMPACTS ANALYSIS

As discussed in Section 2.1, Ramboll Environ modeled local air quality impacts at four proposed local impact zones within San Francisco. As discussed in Section 1, Ramboll Environ modeled air quality impacts at two high-activity shuttle intersections within the APEZ and two high-activity shuttle intersections outside of the APEZ in San Francisco. Stops modeled were selected based on discussion with SF Planning and SFMTA, while actual modeled stop (i.e. loading zone) locations and estimated shuttle activity were provided by SFMTA. Ramboll Environ estimated excess cancer risk, acute HI, and annual $PM_{2.5}$ concentrations at the maximally exposed receptors for each modeled loading zone for an uncontrolled and a controlled scenario.

6.1 Modeled Results: Uncontrolled

The Uncontrolled Scenario incorporates the Pilot Program Vehicle and Model Year Fleet Mix starting in 2016 as well as an 8-year fleet turnover rate in order to assess changes in fleet and emission factors over time. Ramboll Environ conservatively assumed the Project Vehicle Fleet maintains the same distribution of vehicle and fuel types as well as vehicle age throughout the lifetime of the receptors. **Figure 5a** presents the fleet model year distribution by modeled calendar year for the Uncontrolled Scenario.

Cancer risk results are presented for 70-year resident or school child (student) MEISR based on nearby land uses to each modeled stop location and is a composite of 2016, 2024, 2032 and 2040 fleet assumptions for the resident, while the school child is based on 2016 fleet assumptions as discussed in Section 5.2. Acute HI is presented for the modeled one-hour PMI, and $PM_{2.5}$ results are presented at the MEISR for annual average modeled $PM_{2.5}$ concentrations, both of which reflect the 2016 fleet assumption.

As shown in **Table 7A**, Ramboll Environ calculated risks and hazards at each stop Before (Pre) Pilot Program,[14] during Pilot Program, and from Program growth of 29% to get to the Total Risk or Hazards at each modeled stop. The Total Risks and Hazards are detailed below: at the Van Ness and Union stop, the estimated residential cancer risk at the MEISR is 9.3 in a million; the acute HI[15] is 0.13, and the $PM_{2.5}$ concentration is 0.021 μg/m^3. At the Valencia and 24th/25th stop, the estimated residential cancer risk at the MEISR is 7.1 in a million; the acute HI is 0.10, and the $PM_{2.5}$ concentration is 0.016 μg/m^3. Also at the Valencia and 24th/25th stop, the estimated student cancer risk is 0.89 in a million. At the Townsend and 4th stop, the estimated residential cancer risk at the MEISR is 1.5 in a million; the acute HI is 0.26, and the $PM_{2.5}$ concentration is 0.0033 μg/m^3. At the Market and 8th stop, the estimated

[14] Before Pilot Program risks and hazards are based on stop count data for each modeled location prior to Pilot Program. Results are scaled based on stop counts before Pilot Program (2013), during Pilot Program (existing 2015) and Program (with projected 29% growth) to estimated total risks and hazards.

[15] Acute HI was calculated using theoretical maximum emission rates (shown in Table 7a), speciation profiles for diesel and gasoline exhaust chemical emissions, and acute reference exposure levels for each chemical. The speciation profile used for diesel exhaust is from the USEPA SPECIATE database, source EPA 4674 (http://cfpub.epa.gov/si/speciate/ehpa_speciate_browse_details.cfm?ptype=G&pnumber=4674). Acrolein was removed from the profile due to inconsistencies in the measurement technique and based on discussion with BAAQMD. The gasoline exhaust profile is from BAAQMD (2012a). Acute reference exposure levels are presented in Table 5.

residential cancer risk is 4.6 in a million; the acute HI is 0.14, and the $PM_{2.5}$ concentration is 0.011 µg/m^3.

6.2 Modeled Results: Controlled

The Controlled Scenario incorporates the Pilot Program Vehicle Type and Model Year Fleet Mix starting in 2016 as well as an 8-year fleet turnover rate in order to assess changes in fleet and emission factors over time. For the Controlled Scenario, Ramboll Environ assumed all new vehicles to the Program (due to fleet turnover or Program growth) have a Model Year of 2012 or newer. Furthermore, as discussed in Section 2.1.1, the Controlled Scenario assumes any newly permitted vehicles are always 4 years old or newer at the time of licensing into Program. Thus, the Controlled Scenario incorporates an approach to assess newer vehicles entering the fleet over time in order to demonstrate reduced air quality impacts. **Figure 5b** presents the fleet model year distribution by modeled calendar year for the Controlled Scenario.

Cancer risk results are presented for 70-year resident or schoolchild (student) MEISR based on nearby land uses to each modeled stop location, Acute HI is presented for the modeled one-hour PMI, and $PM_{2.5}$ results are presented at the MEISR for annual average modeled $PM_{2.5}$ concentrations.

As shown in **Table 7B**, at the Van Ness and Union stop, the estimated residential cancer risk 5.6 in a million; the acute HI is 0.12, and the $PM_{2.5}$ concentration is 0.017 µg/m^3. At the Valencia and 24th/25th stop, the estimated residential cancer risk is 4.3 in a million; the acute HI is 0.09, and the $PM_{2.5}$ concentration is 0.013 µg/m^3. Also at the Valencia and 24th/25th stop, the estimated student cancer risk is 0.88 in a million. At the Townsend and 4th stop, the estimated residential cancer risk is 0.87 in a million; the acute HI is 0.16, and the $PM_{2.5}$ concentration is 0.0026 µg/m^3. At the Market and 8th stop, the estimated residential cancer risk is 2.8 in a million; the acute HI is 0.12, and the $PM_{2.5}$ concentration is 0.0083 µg/m^3. Estimated stop count limits for each modeled stop in comparison to recognized thresholds are provided in **Appendix E**.

7. RESULTS FROM REGIONAL IMPACTS ANALYSIS

Annual commuter shuttle VMT data was provided by SFMTA and was updated by Ramboll Environ. In addition, SFMTA also provided VMT data for displaced passenger vehicles. Displaced passenger vehicle VMT are vehicle miles not traveled due to commuter shuttle use and represent the baseline condition. Ramboll Environ reviewed the VMT data provided by SFMTA and confirmed the VMT calculations were correct or otherwise revised to meet our understanding. The methodology used to calculate VMT is summarized below:

- Commuter shuttles: Through the "Pilot environmental impacts survey", SFMTA collected data from each operator including monthly average VMT and vehicle count for each vehicle class (SFMTA 2015b). Ramboll Environ reviewed the VMT calculated by SFMTA and confirmed potential outliers with SFMTA. The reported VMT in the survey is based on data from 479 participating shuttles. As SFMTA had assigned placards to 703 shuttles at the time of the survey, total Pilot VMT was calculated by scaling the survey-estimated VMT upwards to reflect total operations (ratio of 703/479). Full Program VMT was estimated by scaling the calculated Pilot VMT by the growth in placard requests observed in the Pilot program (19%) following SFMTA's recommendation (SFMTA 2015a). Project VMT was calculated as the difference between the Pre-Pilot VMT and VMT resulting from development of the full program. A summary of net Project shuttle VMT data by vehicle type/fuel type combination is presented in **Table 8**. As shown in **Table 8**, there is a net reduction in VMT from the Project.
- Displaced passenger vehicles: The Pilot Program environmental impacts survey also contains operator-provided average monthly boardings and average distance travelled by each commuter (SFMTA 2015b). Ramboll Environ reviewed the VMT data provided for displaced passenger vehicles and updated Baseline VMT based on available data, revisions based on data review. From there, Ramboll Environ scaled the VMT estimated in the survey upwards based on total active placards during the same time period (ratio of 703/479). The displaced passenger VMT, described above and replaced by the Project, was scaled from the data provided in the Pilot program by the observed and anticipated growth in activity (SFMTA 2015a). Project displaced passenger VMT represented the VMT difference between the estimated Pre-Pilot and the full Program operations. The updated VMT were used to calculate regional CAP emissions for the Project. A summary of net Project displaced passenger VMT data is presented in **Table 9**.

For evaluating regional traffic emission impacts, commuter shuttle running exhaust emissions were calculated using the Project VMT data from **Table 8** in conjunction with the emission factors from EMFAC2014 (as outlined in Section 3.2). Idling exhaust emissions were calculated based on Project annual stops (based on 29% growth projection), 1 minute of idling per stop, and 2 idling events per shuttle trip (using actual daily stop counts). Displaced passenger vehicle emissions were estimated based on total displaced passenger vehicle miles from **Table 9** and weighted average emissions factors for passenger vehicles from EMFAC2014 (as outlined in Section 3.2). Displaced passenger vehicle emissions were subtracted from the shuttle vehicle emissions for each CAP to calculate the net change in regional emissions for the Project. The resulting uncontrolled and controlled net Project regional CAP emissions are presented in **Tables 10A** and **10B**, respectively.

As shown in **Table 10A**, the Project is projected to have a net annual VMT decrease of 26,460,663 versus displaced passenger vehicles. Emissions impacts for the Uncontrolled

Scenario show reductions in net Reactive Organic Gas (ROG) and CO_2 emissions of 0.05 and 1,062 tons per year, respectively. PM_{10}, $PM_{2.5}$, and NOx emissions in the Uncontrolled Scenario increase by 0.013, 0.015, and 14.2 tons per year, respectively. Project increases in NOx are attributable to the large difference in emissions generated from a large diesel-fueled bus engine relative to a gasoline-fueled car. In 2018, NOx emissions from the average shuttle (uncontrolled) are approximately 32 times greater per mile than a passenger car (the controlled fleet is approximately 18 times as great as a passenger car).

As shown in **Table 10B**, Project emissions impacts for the Controlled Scenario show reductions in net ROG, PM_{10}, and $PM_{2.5}$ emissions of 0.26, 0.05, and 0.05 tons per year, respectively, as well as 1,149 metric tons per year of CO_2. NOx in the Controlled Scenario increases by 6.6 tons per year.

8. UNCERTAINTIES

In accordance with risk assessment guidance, Ramboll Environ has evaluated the uncertainties associated with the HRA, including emissions estimation, air dispersion modeling, and risk estimation. The following sections summarize the critical uncertainties associated with the emissions estimation, air dispersion modeling, and risk estimation components of the risk assessment, which is universally applicable to these methods and therefore apply to all projects utilizing them.

Estimation of Vehicle Emissions: There are several factors contributing to uncertainty in the estimated emission factors. First, future commuter shuttle vehicle types may not reflect the current distribution. Second, the distribution of commuter shuttle model years may not remain consistent and operators may (if not restricted by the Program) operate shuttles longer than expected, or may replace shuttles more quickly than assumed. Third, calculations of VMT (in the regional assessment) rely on operator-reported estimates of average miles per shuttle and passenger-reported average trip length. Provided trip lengths are approximations, and are only an estimation of future travel distances.

In the estimate of chronic impacts, emissions from calendar years 2016, 2024, 2032 and 2040 are used to reflect future years. In other words, 2016 is considered representative of every year from 2016 to 2023. In reality, if existing buses are replaced, emissions will likely decrease in every year and that is not recognized in this analysis. Additionally, estimates of emissions in future years (2032 and 2040) do not include reductions in emissions that may be realized through new technologies (electric buses) or new regulatory requirements not yet enacted.

Estimation of Exposure Concentrations: In addition to uncertainty associated with emission estimates, there is also uncertainty associated with the estimated exposure concentrations. The limitations of the air dispersion model provide a source of uncertainty in the estimation of exposure concentrations. According to USEPA, errors due to the limitation of the algorithms implemented in the air dispersion model in the highest estimated concentrations of +/- 10% to 40% are typical (USEPA 2005). However, the models are designed to be conservative; thus predicted exposure concentrations are likely to be at or above actual exposure concentrations.

Source Representation: The source parameters used to model emission sources add uncertainty. For all emission sources, Ramboll Environ used source parameters which are either recommended as defaults or expected to produce more conservative results. Discrepancies might exist between the actual emissions characteristics of a source and its representation in the model; exposure concentrations used in this assessment represent approximate exposure concentrations.

Exposure Assumptions: Numerous assumptions must be made in order to estimate human exposure to chemicals. These assumptions include parameters such as breathing rates, exposure frequency and duration, and human activity patterns. While a mean value derived from scientifically defensible studies is the best estimate of central tendency, most of the exposure variables used in this HRA are high-end estimates. For example, it is assumed that residential receptor exposure to Project emissions occurs during the entire Project duration and exposure to the cumulative emissions sources occurs 24 hours per day for 350 days per year, a highly conservative assumption since most residents do not remain in their homes for this period of time. The combination of several high-end estimates used as exposure parameters may substantially overestimate chemical intake. The excess lifetime cancer risks calculated in this assessment are therefore likely to be higher than may be required to be protective of public health.

Guidance was released from OEHHA in March 2015 with new exposure parameters that further break out risk by age group. However, the BAAQMD has not adopted the February 2015 OEHHA guidance. The Planning Department and the San Francisco Public Health Department (DPH) have worked extensively with the BAAQMD to inventory and assess air pollution and exposures from vehicles, stationary, and area sources within San Francisco which form the basis of the development of Air Pollution Exposure Zones and specific air quality protection measures codified in the Clean Construction Ordinance and Article 38. Consequently, the City has aligned itself with the health risk assessment methodology protocols of the BAAQMD and will continue to follow BAAQMD's lead in implementation of the revised OEHHA guidance methodologies. The analysis herein uses methodology currently embraced by the BAAQMD and which is consistent with the existing methods used to compile inventories of existing risks throughout the City and therefore represents a valid conservative estimate of incremental health risk from the project.

Toxicity Assessment: The Cal/EPA CPF for DPM is used to estimate cancer risks associated with exposure to DPM from the project and offsite emissions. However, the CPF derived by Cal/EPA for DPM is highly uncertain in both the estimation of response and dose. In the past, due to inadequate animal test data and epidemiology data on diesel exhaust, the International Agency for Research on Cancer (IARC), a branch of the World Health Organization (WHO), had classified DPM as Probably Carcinogenic to Humans (Group 2); the USEPA had also concluded that the existing data did not provide an adequate basis for quantitative risk assessment (USEPA 2002). However, based on two recent scientific studies (Attfield 2012, Benbrahim-Tallaa 2012, Silverman 2012), IARC recently re-classified DPM as Carcinogenic to Humans to Group 1 (IARC 2012), which means that the agency has determined that there is "sufficient evidence of carcinogenicity" of a substance in humans and represents the strongest weight-of-evidence rating in IARC's carcinogen classification scheme. This determination by the IARC may provide additional impetus for the USEPA to identify a quantitative dose-response relationship between exposure to DPM and cancer.

Furthermore, as noted by ARB (ARB 2011b) in guidance for the California Air Toxics Emission Factor Database, also known as CATEF, measurements of acrolein percentages in diesel exhaust have significant uncertainties due to issues with sampling methods. Therefore, obtaining a correct speciation of TOG including acrolein is difficult.

Risk Calculations: The USEPA notes that the conservative assumptions used in a risk assessment are intended to assure that the estimated risks do not underestimate the actual risks posed by a site and that the estimated risks do not necessarily represent actual risks experienced by populations at or near a site (USEPA 1989).

The estimated risks in this HRA are based primarily on a series of conservative assumptions related to predicted environmental concentrations, exposure, and chemical toxicity. The use of conservative assumptions tends to produce upper-bound estimates of risk. Although it is difficult to quantify the uncertainties associated with all the assumptions made in this risk assessment, the use of conservative assumptions is likely to result in substantial overestimates of exposure, and hence, risk. BAAQMD acknowledges this uncertainty by stating: "the methods used [to estimate risk] are conservative, meaning that the real risks from the source may be lower than the calculations, but it is unlikely that they will be higher" (BAAQMD 2013).

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TABLES

Table 1: Emissions Calculations Methodology
SFMTA Commuter Shuttle Project
San Francisco, California

Type	Source	Methodology and Formula	Reference
Local Impact Zone[1]	Exhaust – Running	$E_R = EF_R(@5MPH)$ * Zone Length * Daily Stop Events	EMFAC2014
	Exhaust - Idling	$E_I = EF_I$ * Loading Time * Daily Stop Events	EMFAC2014
Regional Impacts[2]	Exhaust - Running	$E_R = \Sigma(EF_R * VMT * C)$, where VMT = Trip Length * Daily Trip Number	EMFAC2014
	Exhaust - Idling	$E_I = EF_I$ * Loading Time * Stop Events in San Francisco * 2	EMFAC2014

Notes:

1. Local impact zone emissions are those impacting local receptors. This is composed of emissions from shuttle loading and unloading along with shuttle approach and departure and may include multiple distinct loading zones.

2. Regional emissions evaluated as the sum of running emissions and idling emissions. Running emissions are calculated from the total shuttle VMT; idling emissions are calculated by doubling the number of stop events in San Francisco.

E_R: running exhaust emissions (lb/day).

EF_R: running emission factor (g/mile). From EMFAC2014. EMFAC reports emissions in tons/day and VMT in miles/day.

The emission factor is calculated as the quotient of those outputs.

VMT: vehicle miles traveled, as provided by SFMTA.

C: unit conversion factor.

E_I: vehicle idling emissions (lb/day).

EF_I: vehicle idling emission factor (g/vehicle-hr). From EMFAC2014 Idling Emission Workbook.

This method of calculating the emission factor assumes an average idling time per trip as provided by SFMTA.

Abbreviations:

ARB: California Air Resources Board
CalEEMod: CALifornia Emissions Estimator MODel
EF: Emission Factor
EMFAC: EMission FACtor Model
g: gram
hr: hour
lb: pound
USEPA: United States Environmental Protection Agency
VMT: vehicle miles traveled

References:

ARB. 2015. EMFAC2014. May. Available online at: http://www.arb.ca.gov/msei/categories.htm

Table 2: Shuttle Activity by Stop: Idling/Running
SFMTA Commuter Shuttle Program
San Francisco, California

Zone	Shuttle Stop	Emission Source	Loading Time[1] (min/stop)	Loading Zone Length (m/trip)	Hourly Stops[2] (stops/hr)	Daily Stops[3] (stops/day)
Outside of APEZ	Van Ness & Union SE (PM Peak)	Idling	1		77	169
		Running		60	77	169
	Van Ness & Union SW (AM Peak)	Idling	1		53	116
		Running		60	53	116
	Valencia & 24th SW (AM Peak)	Idling	1		45	99
		Running		60	45	99
	Valencia & 25th NE (PM Peak)	Idling	1		60	132
		Running		60	60	132
	Valencia & 25th SW (AM Peak)	Idling	1		14	31
		Running		60	14	31
APEZ	Townsend & 4th, S (24 hrs)	Idling	4.9		58	129
		Running		60	58	129
	Townsend & 4th, NW (24 hrs)	Idling	1		43	95
		Running		60	43	95
	Market & 8th (24 hrs)	Idling	1		66	146
		Running		60	66	146
	Market & 8th (AM&PM Peak)	Idling	1		25	112
		Running		60	25	112

Abbreviations:

APEZ: Air Pollutant Exposure Zone
hr: hour
m: meter
min: minute

Notes:

1. Loading times for most stops were observed in the pilot program to average around one minute. However, the Townsend & 4th south side location was observed to have a longer average loading time of 4.89 minutes.
2. Hourly stop events assume half of the stops observed during the peak period in the pilot program occur in one hour. For the Market & 8th stop with both AM and PM peak stops, the total number of stops was assumed equally split between morning and afternoon peaks, with half of that amount assumed to occur in one hour. For 24-hour stops (Market & 8th and both stops at Townsend & 4th), the estimated maximum hourly stop count was calculated by removing the off-peak stops (10%) from the recorded 24-hour count and then dividing by two to represent an expected equal distribution of stop events in the morning and evening. Growth of 29% was assumed in all calculations of total hourly stops.

3. Daily stop events are the number of stops observed in the pilot program, plus 10% additional trips to account for off-peak trips not observed in pilot study, and an additional 29% for project growth. 24-hour stops (Market & 8th and both stops at Townsend & 4th) are not scaled by 10%.

Table 3: Modeling Parameters
SFMTA Commuter Shuttle Project
San Francisco, California

Scenario	Period[1]	Source	Source Type[1]	Source Dimension[2] [m]	Number of Sources[3]	Release Height[4] [m]	Exit Temperature[4] [K]	Exit Velocity[4] [m/s]	Exit Diameter[4] [m]
Commuter Shuttles	5am-12am	Idling Commuter Shuttles	Point		2	0.6	366	0.01	0.1
Commuter Shuttles	5am-12am	Approaching and Departing Commuter Shuttles	Area	6.6 x 60	1	0.6			

Abbreviations:

ARB: Air Resources Board
g: gram
K: Kelvin
m: meter
s: second

Notes:

1. Commuter shuttles are estimated to operate weekdays from 5am-12am. Approximately 90% of shuttle operations are assumed to occur during peak hours 6am-10am and 4pm-8pm, with the remaining 10% occurring over off-peak hours 5am-6am, 10am-4pm, and 8pm-12am.

2. Emissions occurring from commuter shuttles approaching and departing from the loading zone will be modeled as an area source following the methodology in ARB's Diesel Risk Reduction Plan.

3. Source number represents how shuttle activity was modeled. The configuration assumes two shuttles (one behind the other) are idling within the loading zone (point sources), with one area source representing emissions resulting from the shuttle approaching and departing from the idling location.

4. Commuter shuttle release parameters are assumed equivalent to the "Idling School Buses Scenario" ARB investigated in preparing the Diesel Risk Reduction Plan.

References:

ARB. 2000. *Diesel Risk Reduction Plan: Appendix VII Risk Characterization Scenarios.*

Table 4: Exposure Parameters
SFMTA Commuter Shuttle Project
San Francisco, California

Exposure Parameter	Units	70-Year Resident		School Child
		Adult	Child	
Daily Breathing Rate (DBR)[1]	[L/kg-day]	302	581	581
Exposure Time (ET)[2]	[hours/24 hours]	24	24	10
Exposure Frequency (EF)[3]	[days/year]	350	350	180
Exposure Duration (ED)[4]	[years]	54	16	9
Averaging Time (AT)	[days]	25550	25550	25550
Intake Factor, Inhalation (IF_{inh})	[m^3/kg-day]	0.22	0.13	0.015

Abbreviations:

Cal/EPA: California Environmental Protection Agency

L: liter

kg: kilogram

m^3: cubic meter

Notes:

1. Daily breathing rates for 70-year resident adult and both resident and school child receptors reflect default breathing rates for resident adult, and child, respectively from Cal/EPA 2003.
2. Exposure time for 70-year resident adult and child reflect default exposure time from Cal/EPA 2003; exposure time for school child conservatively assumes 10 hours of schooling per day.
3. Exposure frequency for 70-year resident adult and child reflect default exposure frequency from Cal/EPA 2003; exposure frequency for school child reflects 2003 OEHHA Guidelines.
4. Exposure durations for 70-year resident adult and child and school child reflect default exposure durations from Cal/EPA 2003.

Calculation:

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

Where:

CF = conversion factor of 0.001 (m3/L)

References:

Cal/EPA. 2003. The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments. Office of Environmental Health Hazard Assessment. August. Available online at: http://oehha.ca.gov/air/hot_spots/hraguidefinal.html. Accessed August 2015.

Table 5: Toxicity Values
SFMTA Commuter Shuttle Project
San Francisco, California

Source	Chemical	Cancer Potency Factor	Acute Reference Exposure Level
		$[mg/kg\text{-}day]^{-1}$	($\mu g/m^3$)
Diesel and Biodiesel Shuttles[1]	Diesel PM	1.1	--
	Acetaldehyde	--	470
	Benzene	--	27
	Formaldehyde	--	55
Gasoline Shuttles	1,3-Butadiene	0.6	660
	Acetaldehyde	0.01	470
	Acrolein	--	2.5
	Benzene	0.1	27
	Ethylbenzene	0.0087	--
	Formaldehyde	0.021	55
	Methanol	--	28,000
	Methyl Ethyl Ketone	--	13,000
	Naphthalene	0.12	0
	Styrene	--	21,000
	Toluene		37,000
	Xylenes	--	22,000

Abbreviations:

$\mu g/m^3$: micrograms per cubic meter
ARB: Air Resources Board
Cal/EPA: California Environmental Protection Agency
mg/kg-day: per milligram per kilogram-day
OEHHA: Office of Environmental Health Hazard Assessment
PM: Particulate Matter

Notes:
1. DPM is used as a surrogate measure of carcinogen exposure for the mixture of chemicals that make up diesel exhaust as a whole. There is currently no acute non-cancer toxicity value available for DPM. Thus, speciated components of diesel TOGs with acute toxicity values were included in the acute non-cancer hazard analysis.

References:

Cal/EPA. 2015. OEHHA/ARB Consolidated Table of Approved Risk Assessment Health Values. May 13.

Table 6: Cancer Risk Adjustment Factors
SFMTA Commuter Shuttle Project
San Francisco, California

Receptor[1]	Emission Year	Cancer Risk Adjustment Factor (CRAF)	
		Uncontrolled	Controlled
Offsite 70-Year Resident[2]	2016	5.0	6.9
	2020	--	3
	2024	3	3
	2032	1.1	1.1
	2040	1	1
School Child[3]	2016	3	

Abbreviations:

BAAQMD: Bay Area Air Quality Management District
CRAF: Cancer Risk Adjustment Factor

Notes:

1. Based on Cal/EPA 2009 and BAAQMD 2010.
2. A 70-year resident is assumed to be exposed from the last trimester of pregnancy through a 70-year lifetime, in accordance with Cal/EPA 2009. Emissions were modeled for 8-year fleet change-out with the last change-out in 2046; as a result, a CRAF was calculated for each of the emission years modeled assuming a continuous lifetime exposure.

The CRAF is calculated as follows for each emission year:
- 2016 (uncontrolled): ((2.25 years * 10) + ([8 years – 2.25 years] * 3)/ 8 years
- 2016 (controlled): ((2.25 years * 10) + ([4 years - 2.25 years] * 3)/ 4 years
- 2020 (controlled): (8 years * 3)/ 8 years
- 2024 (uncontrolled): (8 years * 3)/ 8 years
- 2024 (controlled): (4 years * 3)/ 4 years
- 2032: ((0.25 years * 3) + ([8 years - 0.25 years] * 1)/ 8 years

3. A school child resident is assumed to be between the ages of 5 and 16; therefore, the CRAF is 3 in accordance with Cal/EPA (2009) and BAAQMD (2010) guidance.

References:

BAAQMD. 2010. Air Toxics NSR Program Health Risk Screening Analysis (HRSA) Guidelines. January. Available online at: http://baaqmd.gov/~/media/Files/Engineering/Air%20Toxics%20Programs/hrsa_guidelines.ashx

Cal/EPA. 2009. Technical Support Document for Cancer Potency Factors: Methodologies for Derivation, Listing of Available Values, and Adjustment to Allow for Early Life Stage Exposures. May. Available online at: http://oehha.ca.gov/air/hot_spots/2009/TSDCancerPotency.pdf. Accessed August 2015.

Table 7A: Modeled Results: Uncontrolled
SFMTA Commuter Shuttle Project
San Francisco, California

Zone	Shuttle Stop	Sensitive Receptor	Before Pilot Program Risk or Hazards			Pilot Program Risk or Hazards			Permanent Project Growth Risk or Hazards			Total Risk or Hazards		
			Cancer Risk[1,2] (in a million)	Acute HI[2,3]	$PM_{2.5}$[2] ($\mu g/m^3$)	Cancer Risk[1,2] (in a million)	Acute HI[2,3]	$PM_{2.5}$[2] ($\mu g/m^3$)	Cancer Risk[1,2] (in a million)	Acute HI[2,3]	$PM_{2.5}$[2] ($\mu g/m^3$)	Cancer Risk[1,2] (in a million)	Acute HI[2,3]	$PM_{2.5}$[2] ($\mu g/m^3$)
Outside of APEZ	Van Ness & Union	Resident	5.0	0.07	0.011	2.2	0.03	0.0050	2.1	0.03	0.0047	9.3	0.13	0.021
	Valencia & 24th/25th	Resident	3.0	0.04	0.0069	2.5	0.04	0.0057	1.6	0.02	0.0037	7.1	0.10	0.016
		Student	0.9			0.7			0.5			2.1		
APEZ	Townsend & 4th	Resident	1.1	0.19	0.0024	0.1	0.01	0.0001	0.3	0.06	0.0007	1.5	0.26	0.0033
	Market & 8th	Resident	2.5	0.07	0.0056	1.1	0.03	0.0025	1.0	0.03	0.0024	4.6	0.14	0.011

Abbreviations:

APEZ: Air Pollutant Exposure Zone
HI: hazard index
m: meter
PM - particulate matter
$\mu g/m^3$: micrograms per cubic meter

Notes:

1. Excess lifetime cancer risks are estimated as the upper-bound incremental probability that an individual will develop cancer over a lifetime as a direct result of exposure to potential carcinogens. The estimated risk is expressed as a unitless probability. Cancer risks were calculated based on the modeled annual average air concentrations and the daily stop count presented in Table 2.

2. The location of the maximally impacted sensitive receptor for cancer risk and $PM_{2.5}$ concentration as well as the acute hazard index point of maximum impact are shown below.

Stop Location	Sensitive Receptor	Cancer Risk / PM2.5 UTMx	Cancer Risk / PM2.5 UTMy	Acute HI UTMx	Acute HI UTMy
Van Ness and Union	Resident	550,735	4,183,593	550,701	4,183,586
Valencia & 24th/25th	Resident	551,027	4,178,419	551,026	4,178,438
	Student	551,060	4,178,325	--	
Townsend & 4th	Resident	553,334	4,181,290	553,166	4,181,127
Market & 8th	Resident	551,596	4,181,386	551,570	4,181,379

3. The potential for exposure to result in adverse acute noncancer effects is evaluated by comparing the estimated one-hour maximum air concentration to the noncancer acute REL for each chemical. When calculated for a single chemical, the comparison yields a ratio termed a hazard quotient. To evaluate the potential for adverse acute noncancer health effects from simultaneous exposure to multiple chemicals, the hazard quotients for all chemicals are summed, yielding a hazard index. Acute hazard indices were calculated based on the modeled one-hour maximum diesel and gasoline TOG concentrations, the hourly stop count presented in Table 2, and the acute RELs presented in Table 5.

Table 7B: Modeled Results: Controlled
SFMTA Commuter Shuttle Project
San Francisco, California

Zone	Shuttle Stop	Sensitive Receptor	Total Risk or Hazards		
			Cancer Risk[1,2] (in a million)	Acute HI[2,3]	$PM_{2.5}$[2] ($\mu g/m^3$)
Outside of APEZ	Van Ness & Union	Resident	5.6	0.12	0.017
	Valencia & 24th/25th	Resident	4.3	0.09	0.013
		Student	0.88		
APEZ	Townsend & 4th	Resident	0.87	0.16	0.0026
	Market & 8th	Resident	2.8	0.12	0.0083

Abbreviations:

APEZ: Air Pollutant Exposure Zone
HI: hazard index
m: meter
PM: particulate matter
$\mu g/m^3$: micrograms per cubic meter

Notes:

1. Excess lifetime cancer risks are estimated as the upper-bound incremental probability that an individual will develop cancer over a lifetime as a direct result of exposure to potential carcinogens. The estimated risk is expressed as a unitless probability. Cancer risks were calculated based on the modeled annual average air concentrations.

2. The location of the maximally impacted sensitive receptor for cancer risk and $PM_{2.5}$ concentration as well as the acute hazard index point of maximum impact are shown below.

Stop Location	Sensitive Receptor	Cancer Risk / PM2.5		Acute HI	
		UTMx	UTMy	UTMx	UTMy
Van Ness & Union	Resident	550,735	4,183,593	550,701	4,183,586
Valencia & 24th/25th	Resident	551,027	4,178,419	551,026	4,178,438
	Student	551,060	4,178,325	--	
Townsend & 4th	Resident	553,334	4,181,290	553,166	4,181,127
Market & 8th	Resident	551,596	4,181,386	551,570	4,181,379

3. The potential for exposure to result in adverse acute noncancer effects is evaluated by comparing the estimated one-hour maximum air concentration to the noncancer acute REL for each chemical. When calculated for a single chemical, the comparison yields a ratio termed a hazard quotient. To evaluate the potential for adverse acute noncancer health effects from simultaneous exposure to multiple chemicals, the hazard quotients for all chemicals are summed, yielding a hazard index. Acute hazard indices were calculated based on the modeled one-hour maximum diesel and gasoline TOG concentrations and the acute RELs presented in Table 5.

Table 8: Shuttle VMT Summary
SFMTA Commuter Shuttle Project
San Francisco, California

Shuttle Class	Fuel Type	Shuttle Survey Count of Shuttles[1]	Fraction of Total	Shuttle Survey Monthly Average VMT per Vehicle[1]	Pilot Annual VMT[2]	Pre-Pilot Annual VMT[3]	Program Annual VMT[4]	Project Annual VMT (Program - Pre-Pilot)[5]
Motor Coach	Diesel	120	25.1%	3,490	7,376,031	6,198,346	8,777,477	2,579,132
	Biodiesel	279	58.2%	1,325	6,510,782	5,471,245	7,747,830	2,276,585
Urban Bus	Gas	5	1.0%	1,127	99,242	83,397	118,098	34,701
	Diesel	17	3.5%	4,281	1,281,691	1,077,051	1,525,212	448,161
	Biodiesel	1	0.2%	898	15,815	13,290	18,820	5,530
	CNG	7	1.5%	3,262	402,145	337,937	478,553	140,616
Mini Bus	Gas	17	3.5%	1,537	460,229	386,747	547,672	160,925
	Diesel	10	2.1%	1,234	217,393	182,684	258,698	76,015
	Biodiesel	4	0.8%	1,721	121,256	101,896	144,295	42,399
	CNG	9	1.9%	3,707	587,649	493,823	699,303	205,480
Van	Gas	5	1.0%	3,495	307,800	258,655	366,281	107,626
	Diesel	5	1.0%	2,062	181,577	152,585	216,076	63,491
Total		**479**			**17,561,610**	**14,757,656**	**20,898,316**	**6,140,660**

Notes:

1. Shuttle counts were reported by the shuttle operators. Monthly average VMT per vehicle are a weighted average of the operator-reported VMT for the vehicle type and the count of shuttles in use by that operator.

2. SFMTA provided Ramboll Environ with VMT data from a 2015 operator survey covering 479 shuttles. However, SFMTA assigned placards to 703 total shuttles at the time of the survey. Therefore, in order to estimate total shuttle and passenger car VMT in the Pilot Program, Ramboll Environ scaled up VMT derived from the operator survey by 703/479.

3. SFMTA observed 19% growth in the number of shuttle placards from the Pre-Pilot period to the Pilot program. Following SFMTA's correlation of placard quantity to net shuttle activity, Pre-Pilot VMT is estimated by subtracting the observed 19% growth in placards.

4. Program annual VMT assumes an additional 19% growth in shuttle VMT over the Pilot Program, paralleling SFMTA's estimated growth in placard requests.

5. Project annual VMT reflects the VMT difference between the Pre-Pilot period and the estimated total Program. The growth in VMT parallels SFMTA's estimated 41% growth in placard records for the Program relative to Pre-Pilot operations.

Table 9: Displaced Passenger VMT Summary
SFMTA Commuter Shuttle Program
San Francisco, California

Operator	Regional Vehicle Trips (Intercity)							Vehicle Trip Within San Francisco Only (Intracity)							Annual VMT Displaced (VMT/yr)				
	Shuttle Survey Monthly Average Boardings	Vehicle Trip Length[1] (VMT/trip): Passenger Driving Alone	Vehicle Trip Length[1] (VMT/trip): Public Transit	Vehicle Trip Length[1] (VMT/trip): Job Closer to Home	Vehicle Trip Length[1] (VMT/trip): Carpool to Work	Vehicle Trip Length[1] (VMT/trip): Move Closer to Work	Shuttle Survey Annual VMT Displaced[2] (VMT/yr)	Shuttle Survey Monthly Average Boardings	Vehicle Trip Length[3] (VMT/trip): Passenger Driving Alone[4]	Vehicle Trip Length[3] (VMT/trip): Public Transit	Vehicle Trip Length[3] (VMT/trip): Job Closer to Home	Vehicle Trip Length[3] (VMT/trip): Carpool to Work	Vehicle Trip Length[3] (VMT/trip): Move Closer to Work	Shuttle Survey Annual VMT Displaced[2] (VMT/yr)	Shuttle Survey[5]	Pilot[6]	Pre-Pilot[7]	Program[8]	Project (Program - Pre-Pilot)[9]
Operator 1	33,306	24	0	2.5	8	12.4	5,018,671	18,774	2.5	0	2.5	1	1.3	366,844	5,385,515	7,904,002	6,642,018	9,405,762	2,763,744
Operator 2	2,096	60	0	2.5	20	12.4	762,111	0	0	0	2.5	0	0	0	762,111	1,118,505	939,920	1,331,021	391,101
Operator 3	16,300	60	0	2.5	20	12.4	5,926,719	0	0	0	2.5	0	0	0	5,926,719	8,698,295	7,309,492	10,350,972	3,041,480
Operator 4	53,680	30	0	2.5	10	12.4	10,187,992	13,992	2.5	0	2.5	1	1.3	273,404	10,461,395	15,353,572	12,902,161	18,270,750	5,368,589
Operator 5	43,176	32	0	2.5	11	12.4	8,688,807	0	0	0	2.5	0	0	0	8,688,807	12,752,049	10,716,008	15,174,938	4,458,931
Operator 6	0	0	0	2.5	0	12.4	0	30,721	1.8	0	2.5	1	0.9	467,819	467,819	686,591	576,967	817,043	240,076
Operator 7	0	0	0	2.5	0	12.4	0	2,184	2.5	0	2.5	1	1.3	42,675	42,675	62,632	52,632	74,532	21,900
Operator 8	16,481	69	0	2.5	23	12.4	6,815,048	0	0	0	2.5	0	0	0	6,815,048	10,002,043	8,405,079	11,902,432	3,497,353
Operator 9	0	0	0	2.5	0	12.4	0	10,180	2.0	0	2.5	1	1.0	167,563	167,563	245,922	206,657	292,647	85,990
Operator 10	45,625	35	0	2.5	12	12.4	9,891,610	1,750	2.5	0	2.5	1	1.3	34,195	9,925,805	14,567,517	12,241,611	17,335,345	5,093,734
Operator 11	10,199	33	0	2.5	11	12.4	2,103,368	1,626	2.5	0	2.5	1	1.3	31,772	2,135,140	3,133,619	2,633,294	3,729,007	1,095,713
Operator 12	1,237	82	0	2.5	27	12.4	609,577	598	2.5	0	2.5	1	1.3	11,685	621,262	911,789	766,209	1,085,029	318,820
Operator 13	0	0	0	2.5	0	12.4	0	6,200	2.5	0	2.5	1	1.3	121,148	121,148	177,802	149,413	211,584	62,171
Operator 14	0	0	0	2.5	0	12.4	0	720	2.5	0	2.5	1	1.3	14,069	14,069	20,648	17,351	24,571	7,220
Operator 15	43,813	40	0	2.5	13	12.4	10,785,113	0	0	0	2.5	0	0	0	10,785,113	15,828,673	13,301,406	18,836,121	5,534,715
Operator 16	2,080	50	0	2.5	17	12.4	634,155	0	0	0	2.5	0	0	0	634,155	930,712	782,111	1,107,548	325,436
Operator 17	2,260	41	0	2.5	14	12.4	573,579	0	0	0	2.5	0	0	0	573,579	841,808	707,402	1,001,751	294,350
TOTAL	**270,253**						**61,996,750**	**86,745**						**1,531,174**	**63,527,924**	**93,236,180**	**78,349,731**	**110,951,054**	**32,601,323**

Notes:

1. Intercity vehicle trip lengths based on the following assumptions:
   - Passenger driving alone -- Actual intercity shuttle one-way trip lengths
   - Public transit -- Zero miles (conservative assumption of zero-emitting public transit)
   - Job closer to home -- 2.5 miles (intra-city commute data from SFMTA)
   - Carpool to work -- One third of actual intercity shuttle one-way trip lengths
   - Move closer to work -- 12.4 miles (San Francisco County average worker commute length from CalEEMod Appendix D, Table 4.2)
2. Assumed total annual passenger VMT that would occur by auto if bus service not available. The calculated VMT was based on the vehicle trip lengths in this table and the following results of 2012 ridership survey: 47.2% passenger driving alone, 29.0% public transit, 13.8% job closer to home, 5.2% carpool to work, and 4.8% move closer to work. The formula below was utilized to calculate the annual VMT displaced for each shuttle operator:

   VMT = 0.472A + 0.29B + 0.138C + 0.052D + 0.048E

   Whe A = Vehicle trip length for passenger driving alone
   B = Vehicle trip length for public transit (equal to zero)
   C = Vehicle trip length for taking job closer to home
   D = Vehicle trip length for carpooling
   E = Vehicle trip length for moving closer to work
3. Intracity vehicle trip lengths based on the following assumptions:
   - Passenger driving alone -- Actual intracity shuttle one-way trip lengths
   - Public transit -- Zero miles (conservative assumption of zero-emitting public transit)
   - Job closer to home -- 2.5 miles (intracity commute data from SFMTA)
   - Carpool to work -- One third of actual intracity shuttle one-way trip lengths
   - Move closer to work -- 1.25 miles (half the intracity commute length from SFMTA data)
4. For trips entirely within San Francisco, only a few operators provided an estimated average displaced passenger trip. For those where no estimate was provided, a trip length of 2.5 miles was assumed as derived from the 2012 rider survey.
5. Sum of intercity and intra-city annual VMT.
6. SFMTA provided Ramboll Environ with VMT data from a 2015 operator survey covering 479 shuttles. However, SFMTA assigned placards to 703 total shuttles at the time of the survey. Therefore, in order to estimate total shuttle and passenger car VMT in the Pilot Program, Ramboll Environ scaled up VMT derived from the operator survey by 703/479.
7. Pre-Pilot annual displaced VMT calculated as 19% below the Pilot Program estimated annual displaced VMT. This estimate parallels the 19% placard request increase SFMTA obeserved from the Pre-Pilot period to the During Pilot period.
8. Program annual displaced VMT assumes an additional 19% growth in shuttle activity over the Pilot Program, paralleling SFMTA's estimated growth in placard requests.
9. Project annual displaced VMT reflects the VMT difference between the Pre-Pilot period and the estimated total Program. The growth in VMT parallels SFMTA's estimated 41% growth in placard records for the Program relative to the Pre-Pilot period.

RAMBOLL ENVIRON

Table 10A: Regional Emissions Summary: Uncontrolled Project
SFMTA Commuter Shuttle Program
San Francisco, California

Vehicle Type	Project Annual VMT[1]	Project Uncontrolled Annual Emissions[2]				
		ROG (tons)	NO_x (tons)	CO_2 (metric tons)	PM_{10} (tons)	$PM_{2.5}$ (tons)
Commuter Shuttles	6,140,660	0.63	17.0	10,226	0.09	0.09
Displaced Passenger Vehicles	32,601,323	0.68	2.9	11,288	0.08	0.07
Net Change	-26,460,663	-0.05	14.2	-1,062	0.013	0.015

Notes:

1. Project annual displaced VMT reflects the VMT difference between the Pre-Pilot period and the estimated total Program. The growth in VMT parallels SFMTA's estimated 41% growth in placard records for the Program relative to the Pre-Pilot period. Table 8 provides VMT calculations.

2. Shuttle emissions include running and idling emissions, assuming 1 minute idling at each daily stop event. Project number of stop events is based on growth compared to Pre-Pilot stop events (i.e, Program minus Pre-Pilot). Ramboll Environ calculated Program stop events utilizing 29% growth factor provided by SFMTA. Passenger displaced emissions include only running emissions. Emissions are based on uncontrolled emission factors for model year 1992 to 2018 shuttle vehicles.

Table 10B: Regional Emissions Summary: Controlled Project
SFMTA Commuter Shuttle Program
San Francisco, California

Vehicle Type	Project Annual VMT[1]	Project Controlled Annual Emissions[2,3]				
		ROG (tons)	NO_x (tons)	CO_2 (metric tons)	PM_{10} (tons)	$PM_{2.5}$ (tons)
Commuter Shuttles	6,140,660	0.42	9.5	10,139	0.03	0.03
Displaced Passenger Vehicles	32,601,323	0.68	2.9	11,288	0.08	0.07
Net Change	-26,460,663	-0.26	6.6	-1,149	-0.05	-0.05

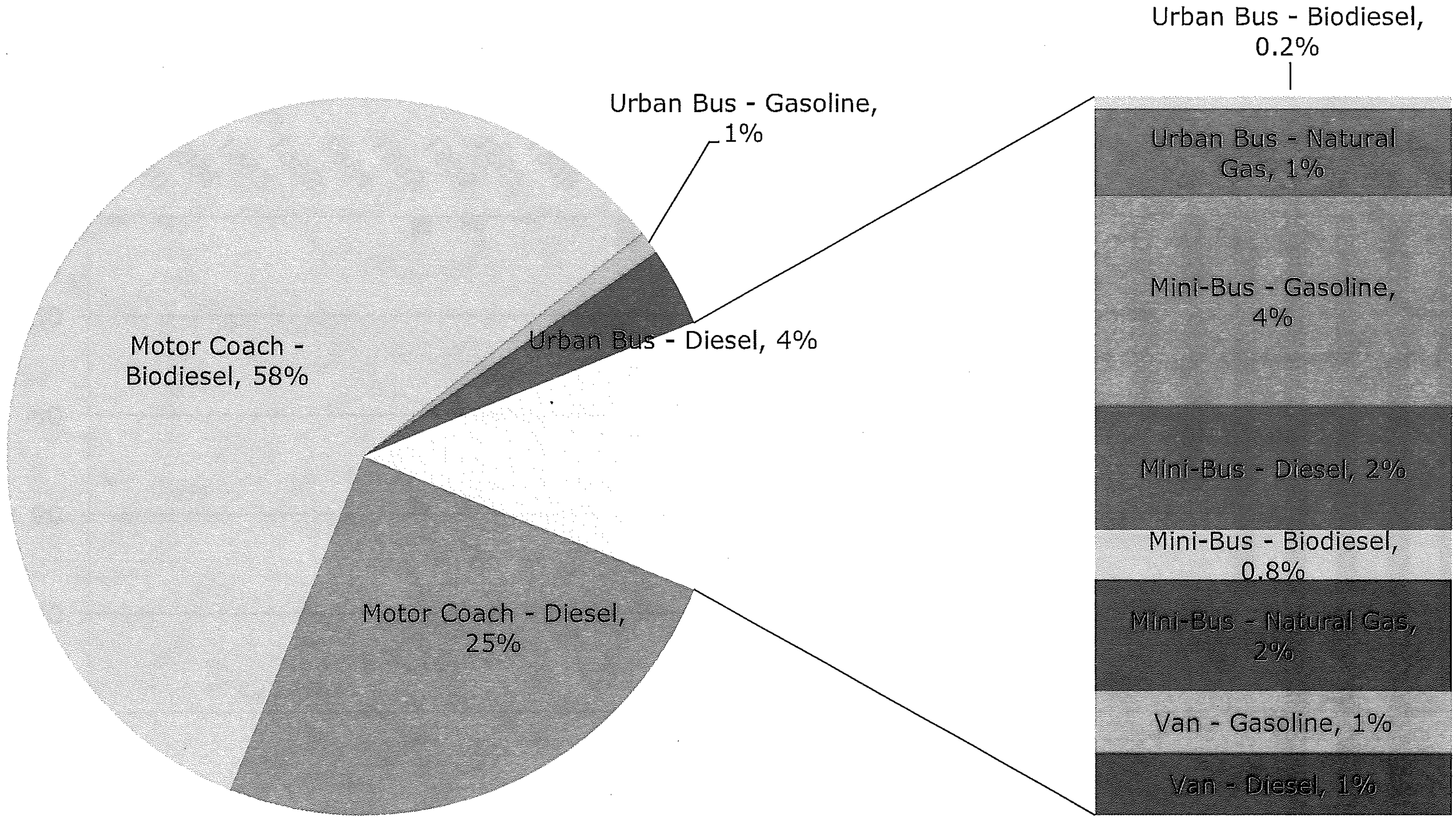
Notes:

1. Project annual displaced VMT reflects the VMT difference between the Pre-Pilot period and the estimated total Program. The growth in VMT parallels SFMTA's estimated 41% growth in placard records for the Program relative to the Pre-Pilot period. Table 8 provides VMT calculations.

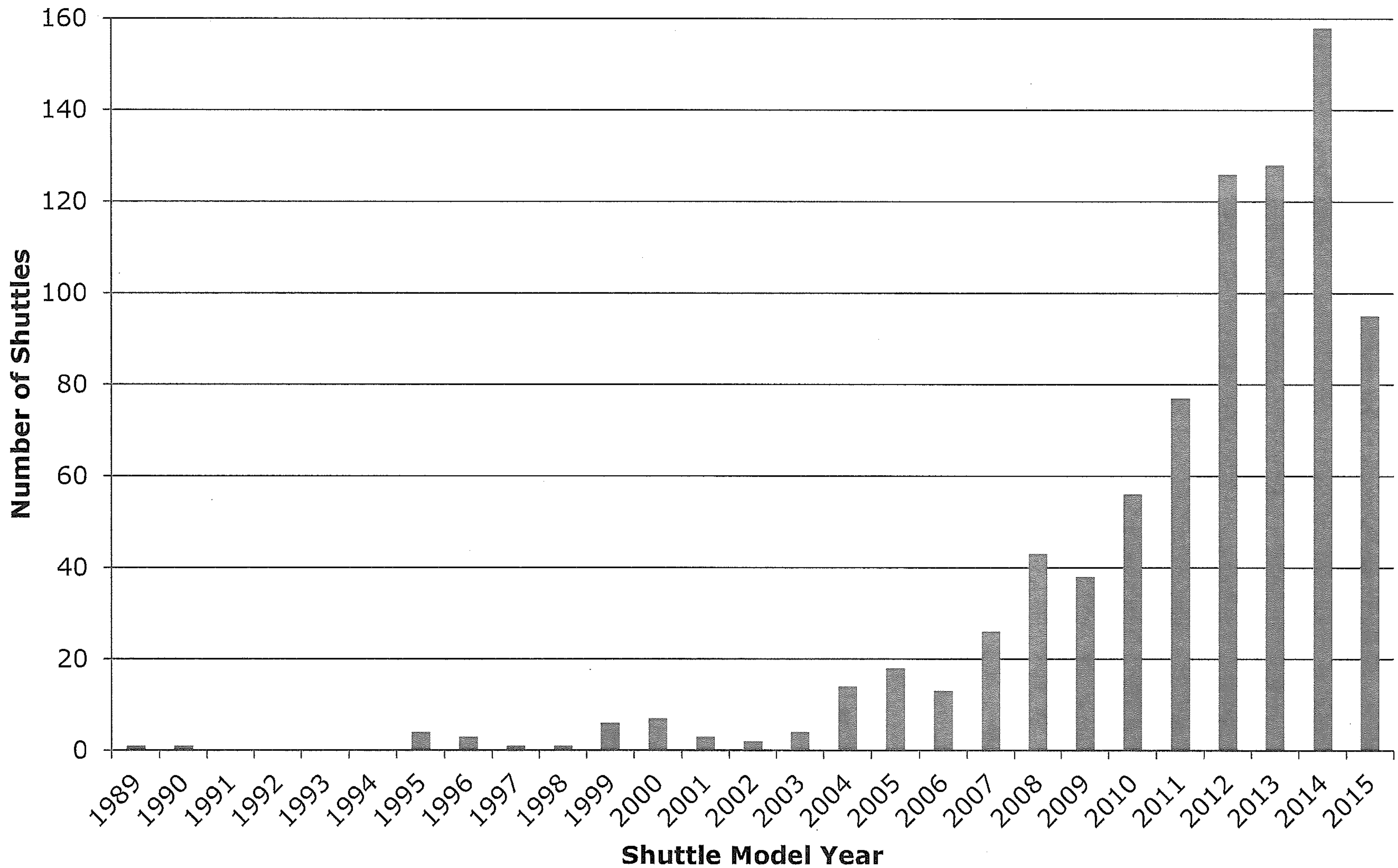
2. Shuttle emissions include running and idling emissions, assuming 1 minute idling at each daily stop event. Project number of stop events is based on growth compared to Pre-Pilot stop events (i.e, Program minus Pre-Pilot). Ramboll Environ calculated Program stop events utilizing 29% growth factor provided by SFMTA. Passenger displaced emissions include only running emissions. Emissions are based on controlled emission factors for model year 2012 to 2018 shuttle vehicles.

3. Emissions presented here reflect only the reductions of the Project increment (Program minus Pre-Pilot). Howver, as part of the Project, control would be applied to all vehicles in the Program and would reduce emissions resulting from activities not in the Project (e.g., Pre-Pilot). Appendix F contains emission estimates for the uncontrolled Pre-Pilot increment and the controlled Pre-Pilot increment. Subtracting the controlled from the uncontrolled emission estimates for the Pre-Pilot increment yields the following reductions: ROG = 0.5 tons, NOx = 18 tons, CO_2 =209 metric tons, PM_{10} = 0.2 tons, and $PM_{2.5}$ = 0.1 tons.

FIGURES



RAMBOLL ENVIRON	Pilot Program Fleet Distribution by Vehicle Type	Figure 1
DRAFTED BY: / DATE: 10/12/2015		PROJECT: 03-38009A



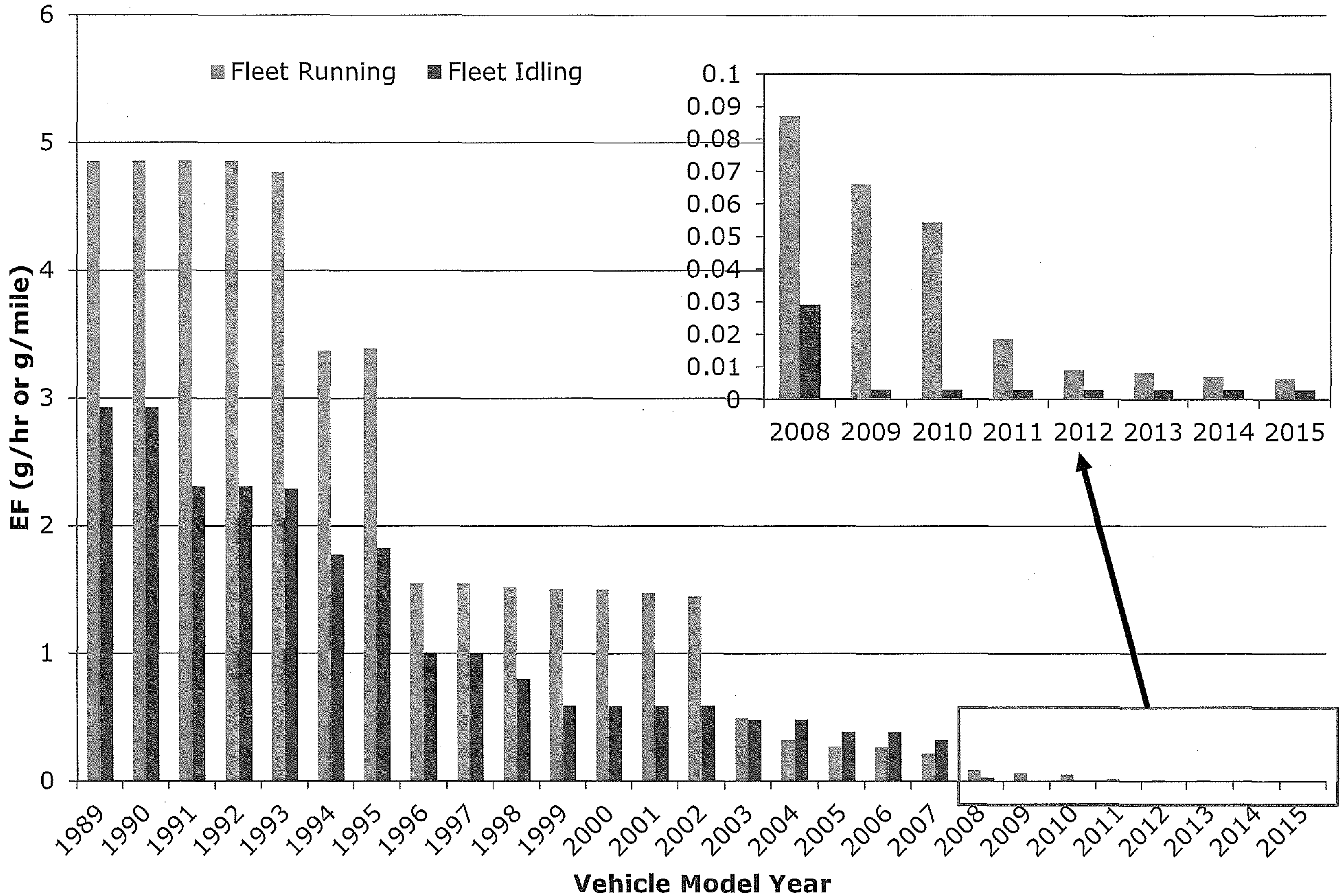
RAMBOLL ENVIRON

Pilot Program Fleet Distribution by Model Year

Figure 2

DRAFTED BY:	DATE: 10/12/2015

PROJECT: 03-38009A



RAMBOLL ENVIRON

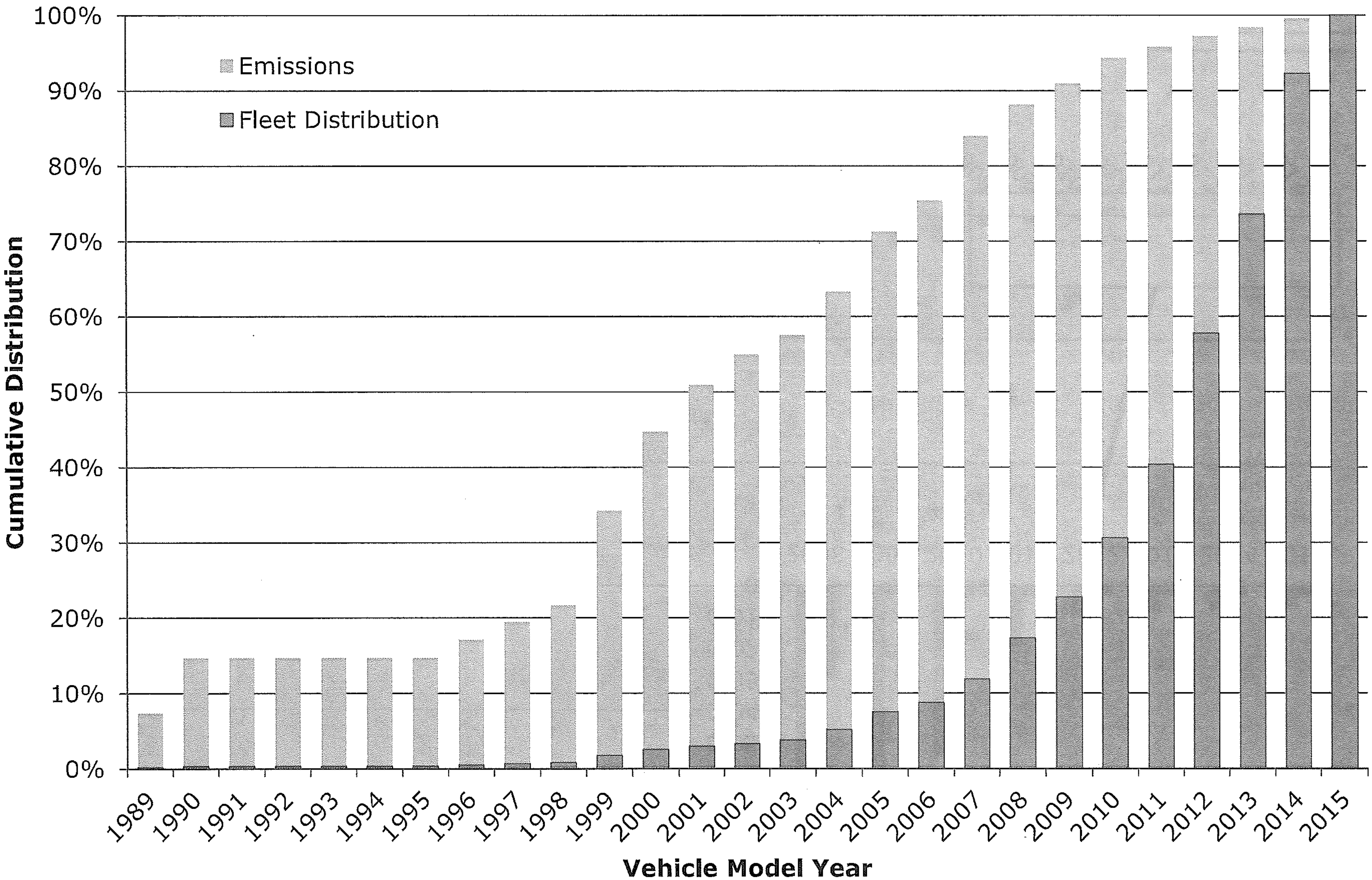
PM10 Emission Factors by Model Year (CY2016)

Figure 3

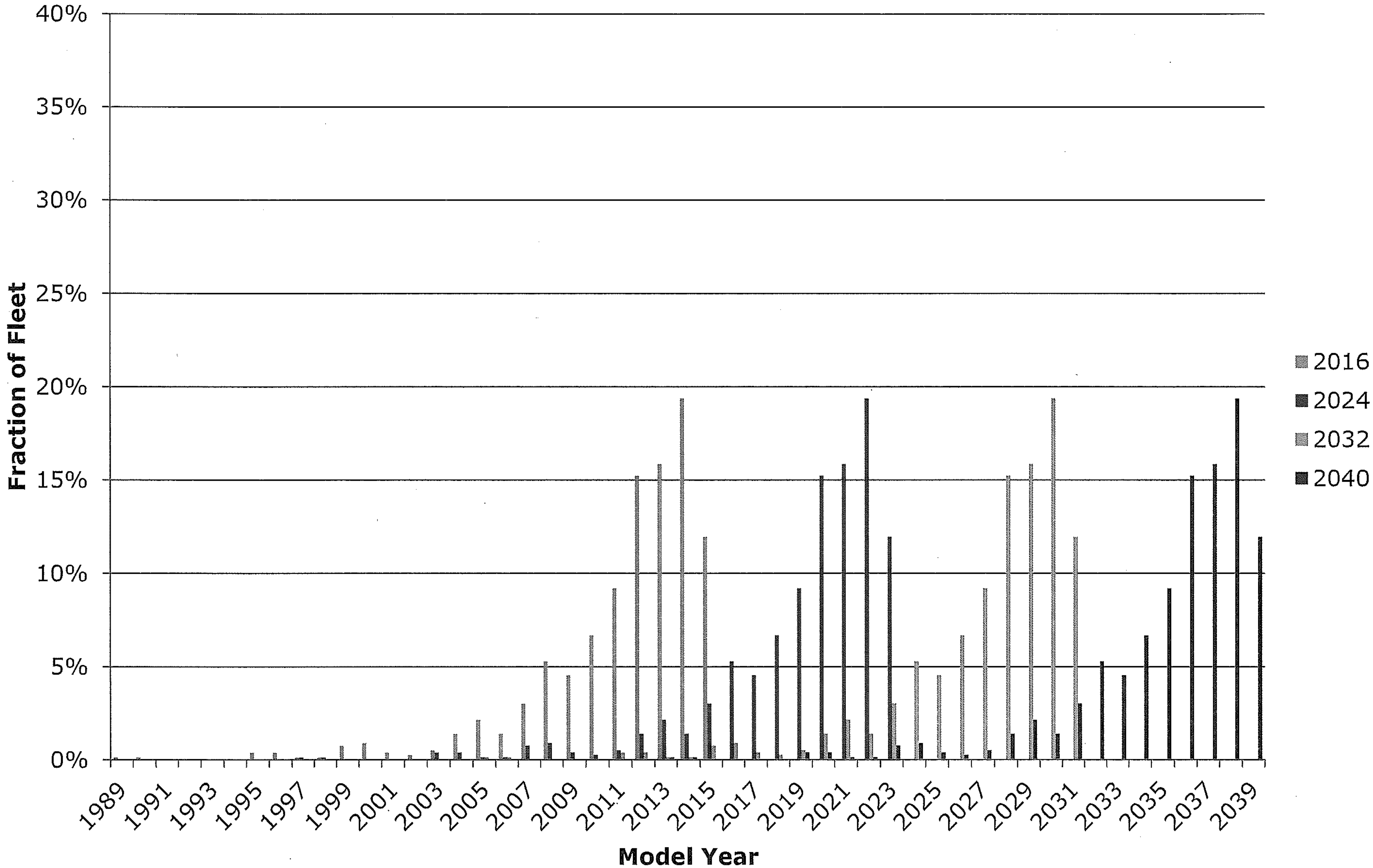
DRAFTED BY:

DATE: 10/12/2015

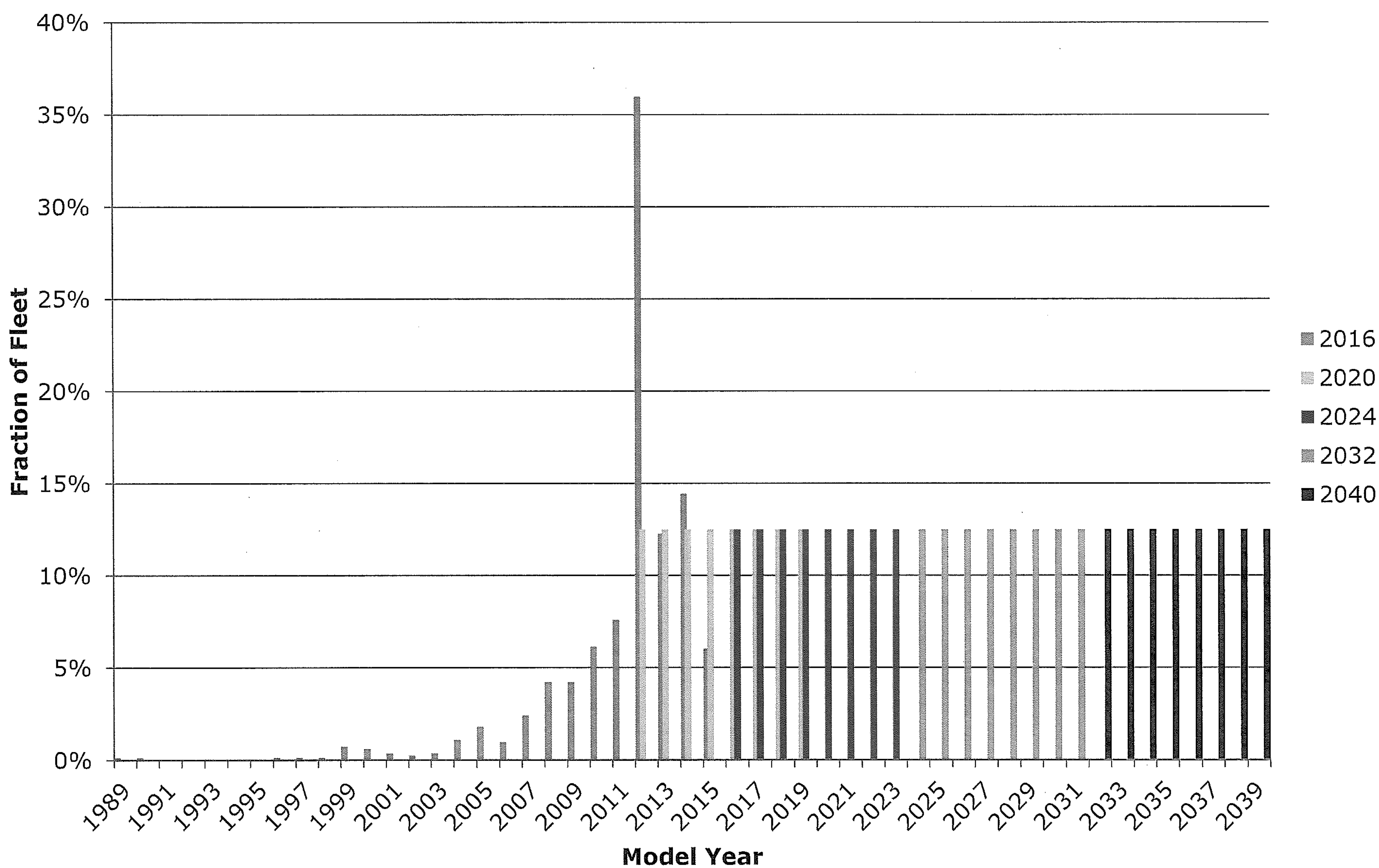
PROJECT: 03-38009A



RAMBOLL ENVIRON	PM10 Emissions by Vehicle Model Year (CY 2016)	Figure 4
DRAFTED BY: / DATE: 10/12/2015		PROJECT: 03-38009A



RAMBOLL ENVIRON	Fleet Distribution by Modeled Calendar Year (Uncontrolled Scenario)	Figure 5A
DRAFTED BY: / DATE: 10/12/2015		PROJECT: 03-38009A

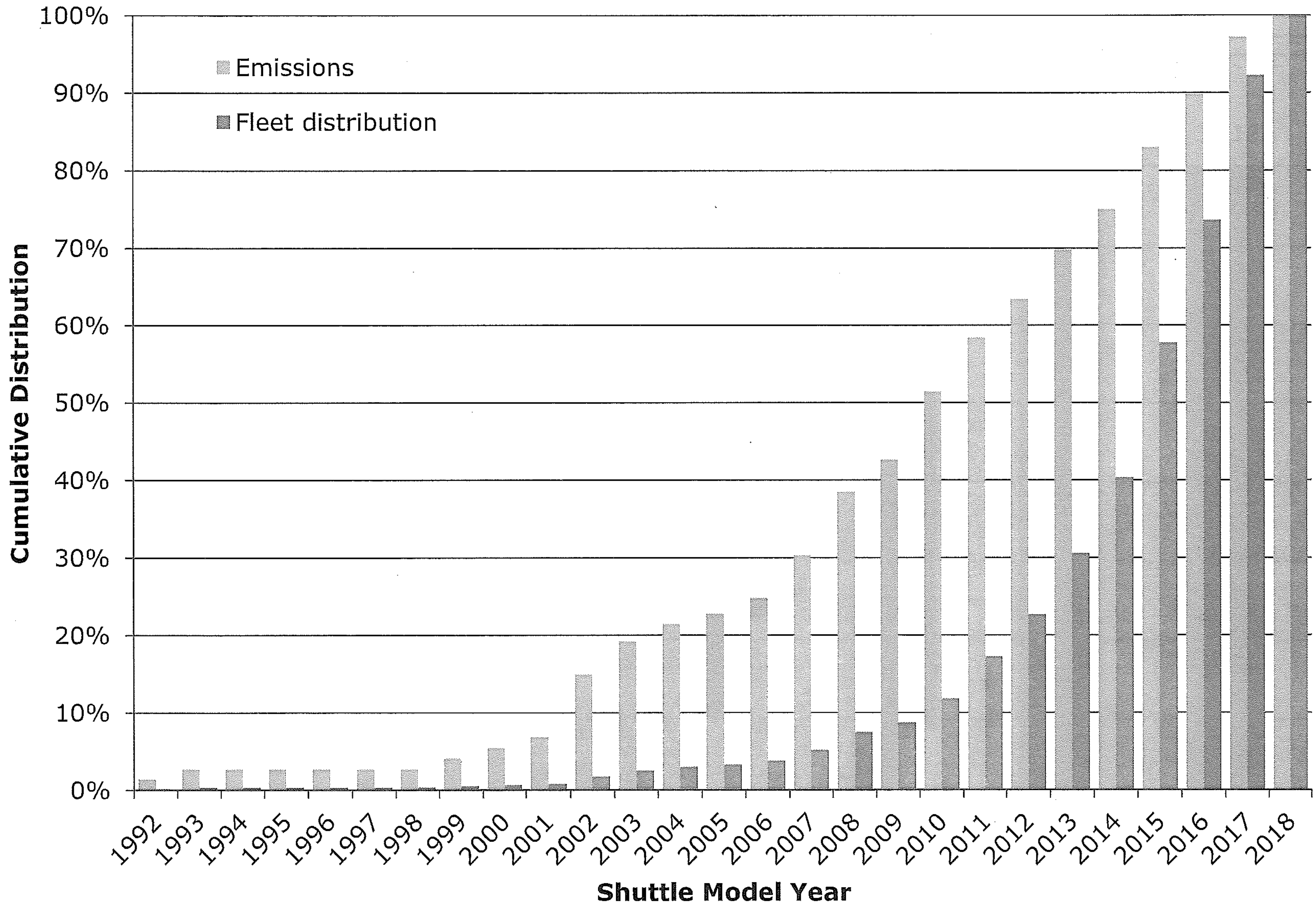


RAMBOLL ENVIRON

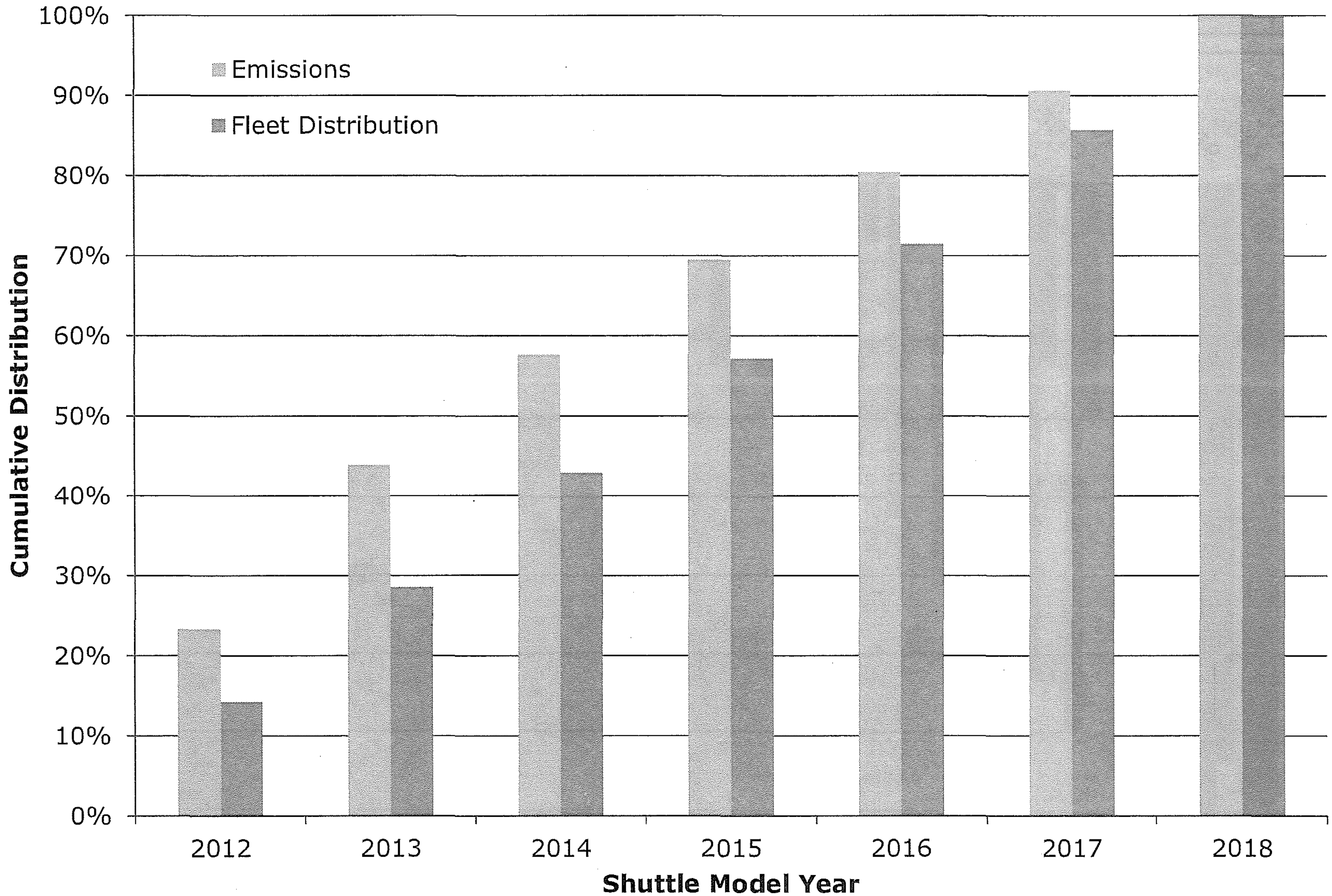
Fleet Distribution by Modeled Calendar Year (Controlled Scenario)

Figure 5B

DRAFTED BY: | DATE: 10/12/2015 | PROJECT: 03-38009A



RAMBOLL ENVIRON	Commuter Shuttle Regional NOx Emissions by Vehicle Model Year (Uncontrolled Scenario)	Figure 6A
DRAFTED BY: / DATE: 10/12/2015		PROJECT: 03-38009A



RAMBOLL ENVIRON

Commuter Shuttle Regional NOx Emissions by Vehicle Model Year (Controlled Scenario)

Figure 6B

DRAFTED BY: | DATE: 10/12/2015 | PROJECT: 03-38009A

RAMBOLL ENVIRON

SFMTA Commuter Shuttle Program
Modeled Source Locations
Van Ness Avenue and Union Street
San Francisco, CA

FIGURE 7

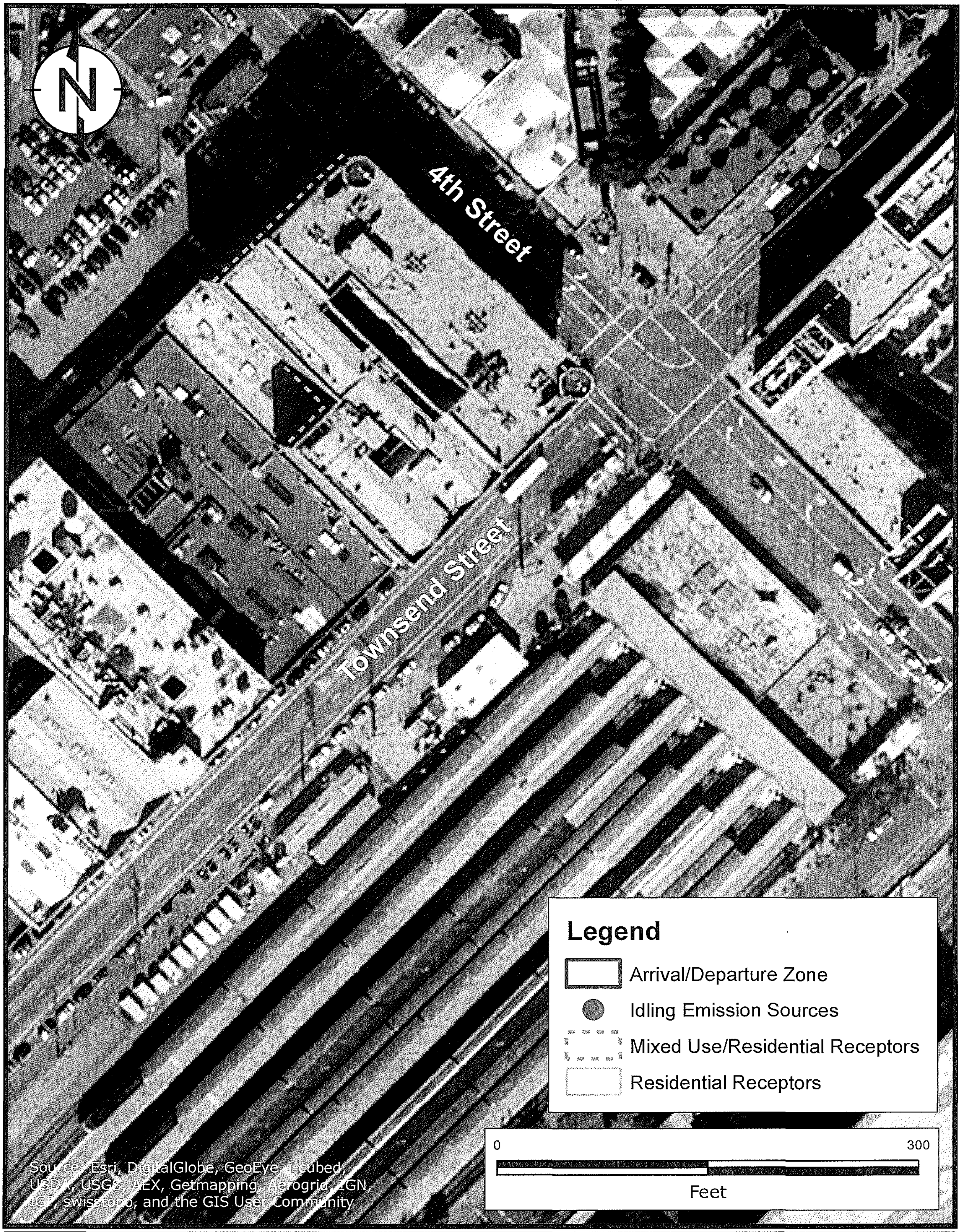
DRAFTED BY: DCW | DATE: 9/9/2015 | PROJECT: 03-38009A

RAMBOLL ENVIRON

SFMTA Commuter Shuttle Program
Modeled Source Locations
Valencia Street and 25th Street
San Francisco, CA

FIGURE
8

DRAFTED BY: DCW | DATE: 9/9/2015 | PROJECT: 03-38009A



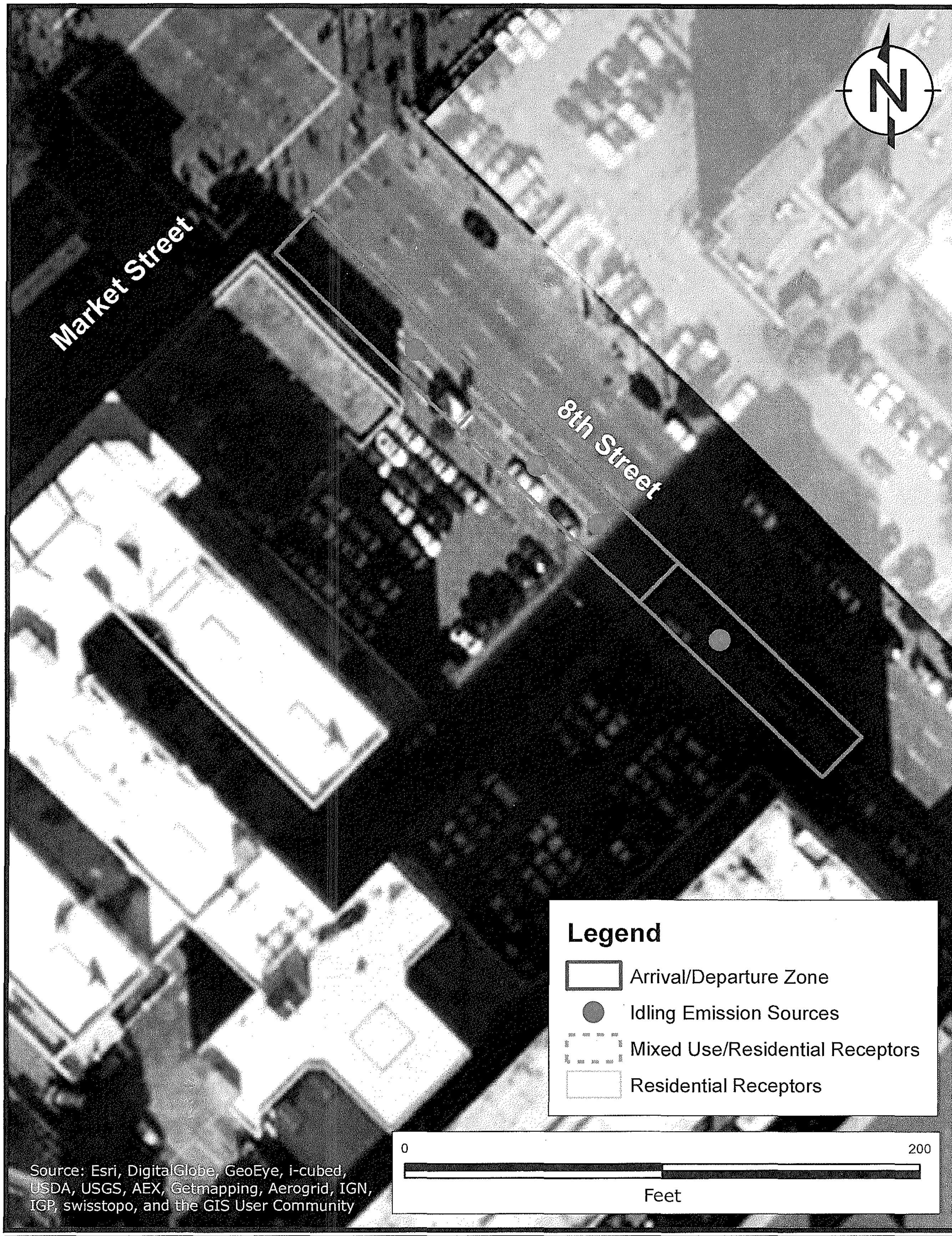
RAMBOLL ENVIRON

DRAFTED BY: DCW | DATE: 9/9/2015

SFMTA Commuter Shuttle Program
Modeled Source Locations
Townsend Street and 4th Street
San Francisco, CA

FIGURE 9

PROJECT: 03-38009A



RAMBOLL ENVIRON

DRAFTED BY: DCW | DATE: 9/9/2015

SFMTA Commuter Shuttle Program
Modeled Source Locations
8th Street and Market Street
San Francisco, CA

FIGURE **10**

PROJECT: 03-38009A

APPENDIX A
FINAL SCOPE OF WORK METHODOLOGY DOCUMENT

Prepared for:
San Francisco Planning Department
San Francisco, California

Prepared By:
Ramboll Environ US Corporation
San Francisco, California

Date
August 2015

Project Number
03-38009A

AIR QUALITY TECHNICAL REPORT METHODOLOGY

SFMTA COMMUTER SHUTTLE PROGRAM
SAN FRANCISCO, CALIFORNIA

RAMBOLL ENVIRON

CONTENTS

TABLES

ACRONYMS AND ABBREVIATIONS

AQTR	Air Quality Technical Report
ARB	California Air Resources Board
aREL	Acute Reference Exposure Level
ASF	Age Sensitivity Factor
BAAQMD	Bay Area Air Quality Management District
Cal/EPA	California Environmental Protection Agency
CAP	Criteria Air Pollutant
CAPCOA	California Air Pollution Control Officer's Association
CEQA	California Environmental Quality Act
CPF	Cancer Potency Factor
CRAF	Cancer Risk Adjustment Factor
DPM	Diesel Particulate Matter
EP	Environmental Planning
HI	Hazard Index
HQ	Hazard Quotient
HRA	Health Risk Analysis
IARC	International Agency for Research on Cancer
MEISR	Maximally Exposed Individual Sensitive Receptor
NED	National Elevation Dataset
OBUS	Other buses
OEHHA	Office of Environmental Health Hazard Assessment
$PM_{2.5}$	Fine Particulate Matter Less than 2.5 Micrometer in Diameter
REL	Reference Exposure Level
SBUS	School buses
SFCTA	San Francisco County Transportation Authority
SFMTA	San Francisco Municipal Transportation Agency
SOMA	South of Market Street
TAC	Toxic Air Contaminant
TOG	Total Organic Gases
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey

WHO	World Health Organization
χ/Q	"chi over q", also known as a Dispersion Factor

List of Units

g	gram
hr	hour
kg	kilogram
kW	kilowatt
L	liter
lb	pound
m^3	cubic meter
µg	microgram
mph	miles per hour
s	second
sf	square feet

1. INTRODUCTION

In connection with the environmental review for the proposed Commuter Shuttle Program ("Commuter Shuttle Program" or "Project") in San Francisco, California, Ramboll Environ U.S. Corporation (Ramboll Environ) will conduct an analysis of criteria air pollutants and ozone precursors, as well as local risk and hazard impacts associated with the proposed project. This analysis will be performed to support the Project's California Environmental Quality Action (CEQA) documentation and per the request of the San Francisco Planning Department's Environmental Planning Division.

1.1 Project Understanding

In January 2014, the SFMTA Board approved an 18-month Commuter Shuttle Pilot Program to collect data regarding the provision of loading zones for commuter shuttles at existing Muni stops and at locations where new passenger loading zones could be installed. In August 2014, the SFMTA implemented the Pilot Program, and data collected from the Pilot Program has included information about shuttle operations, enforcement, ability to minimize impacts on Muni operations through selective zone sharing, ability to minimize the impacts of large buses on neighborhood streets, and the effectiveness of a placard identification system in addressing concerns and complaints.

Based on the data from the Pilot Program, SFMTA proposes to implement a permanent Commuter Shuttle Program. As part of the Commuter Shuttle Program, the SFMTA would permanently designate, and mark with appropriate signage, select Muni zones and passenger loading zones for commuter shuttle use. For the purposes of environmental review, a maximum of 150 Muni zones and up to 40 passenger loading zones could be designated as commuter shuttle zones, which would be available for use by permitted commuter shuttle providers. Added shuttle loading zones typically require the use of up to 100 feet of curb space for passenger loading during certain hours. The Commuter Shuttle Program would not determine the routing of the individual shuttles. The data from the Commuter Shuttle Pilot Program indicates that approximately 205 vehicles run approximately 118 routes through the city each weekday. The corridors with the most shuttle traffic in the Commuter Shuttle Pilot Program include Lombard, Van Ness, Divisadero/Castro, Valencia, Powell (North Beach), 30th Street, and Townsend/Fourth Street near the Caltrain station.

1.2 Methodology Overview

Consistent with CEQA requirements and Planning Department direction, the Air Quality analysis will evaluate the following impacts from Project traffic:

1. Mass emissions of criteria air pollutant (CAP);
2. Fine particulate matter ($PM_{2.5}$) concentrations on sensitive offsite populations; and
3. Cancer risk impacts on the Maximally Exposed Individual Sensitive Receptor (MEISR).
4. Acute noncancer hazard index (HI) on the Maximally Exposed Individual Sensitive Receptor (MEISR)

Ramboll Environ will present draft screening-level results for preliminary review. The goal of this preliminary review would be to assess results and determine if additional refined modeling is necessary. If refined modeling is required, Ramboll Environ will present results of refined modeling prior to the submittal of the draft Report.

1.2.1 Project Methodology

There will be traffic-related operational emissions associated with the Project. The City of San Francisco, in conjunction with the Bay Area Air Quality Management District (BAAQMD), has recently completed a City-wide Health Risk Assessment (HRA) to evaluate cumulative cancer risks and $PM_{2.5}$ concentrations from existing stationary and mobile sources as part of the development of a Community Risk Reduction Plan (CRRP). For purposes of this report, the database developed for this effort is referred to as the CRRP-HRA. Using the CRRP-HRA, the City identified locations in the City with substantial pollutant concentrations, known as the Air Pollutant Exposure Zone. Consistent with the CRRP-HRA, Ramboll Environ will evaluate cancer risks and $PM_{2.5}$ concentrations.

To meet these objectives, the HRA will be conducted consistent with the following guidance:

- Air Toxics Hot Spots Program Risk Assessment Guidelines (California Environmental Protection Agency [Cal/EPA] 2015);
- The San Francisco Community Risk Reduction Plan: Technical Support Documentation, V10 (BAAQMD 2012b);
- BAAQMD Recommended Methods for Screening and Modeling Local Risks and Hazards (BAAQMD 2012a); and
- California Air Pollution Control Officer's Association (CAPCOA) *Health Risk Assessment for Proposed Land Use Projects* (CAPCOA 2009).

The CRRP-HRA database accounts for all known sources of air pollution and therefore, cumulative impacts are incorporated into this analysis.

1.3 Report Organization

The document is divided into six sections as follows:

Section 1.0 – Introduction: describes the purpose and scope of the HRA in the Air Quality Technical Report (AQTR), the objectives and methodology used in this HRA and outlines the report organization.

Section 2.0 – Criteria Air Pollutant Analysis: describes the methods used to estimate the emissions of $PM_{2.5}$ emitted from the Project.

Section 3.0 – Modeled Air Concentrations: discusses the air dispersion modeling and screening, the selection of the dispersion models, the data used in the dispersion models (e.g., terrain, meteorology, source characterization), and the identification of sensitive receptor locations evaluated in the HRA.

Section 4.0 – Risk Characterization Methods: provides an overview of the methodology for conducting both the screening-level and refined HRA.

Section 5.0 – Uncertainties: identifies and describes the uncertainties associated with the risk estimates and discusses how these uncertainties may affect the risk assessment conclusions.

Section 6.0 – References: includes a list of all references cited in this report.

2. CRITERIA AIR POLLUTANT ANALYSIS

2.1 Literature and Data Review

As a first step, Ramboll Environ will conduct a review of available rulemaking, studies, and academic and government publications related to commuter shuttle programs. At a minimum, Ramboll Environ proposes to review and summarize findings of the following documents in order to document the regional air quality benefits or impacts of the proposed Project:

- Impacts of Employer-Based Trip Reduction Programs and Vanpools on Passenger Vehicle Use and Greenhouse Gas Emissions: Technical Background Document (California Air Resources Board [CARB], September 2014)
- Regulation 14 Mobile Source Emissions Reduction Measures, Rule 1: Bay Area Commuter Benefits Program (BAAQMD 2014).
- Strategic Analysis Report: The Role of Shuttle Services in San Francisco's Transportation System - Final SAR 08/09-2 (San Francisco County Transportation Authority [SFCTA], June 2011)

As a result of the literature review, Ramboll Environ proposes to include a qualitative discussion of regional air quality impacts from the proposed Commuter Shuttle Project in the AQTR.

As part of the data review, Ramboll Environ will review the vehicle miles traveled (VMT) calculations provided by SFMTA for the commuter shuttles and passenger vehicles displaced in an effort to make a semi-quantitative judgment about the impact of the Program on VMT. Ramboll Environ will perform a quantitative analysis of VMT and resulting CAP emissions from the Program vs. the Baseline (pre-Program) as part of the refined option described in Section 2.2 below. During the data review, Ramboll Environ will review available methodologies for calculated displaced passenger VMT in order to set up the refined approach. In addition to reviewing the Pilot Program data ridership survey and reports listed above, Ramboll Environ will review the 2015 TDM document listed below:

- TDM Framework for Growth. Summary of Findings – Literature Review (Final). March 30, 2015 (Fehr & Peers 2015).

Based on information provided by SFMTA, Ramboll Environ assumes the Commuter Shuttle Program will follow similar policies to those outlined in the Pilot Program.[1]

2.2 Regional Traffic (if necessary)

If requested, Ramboll Environ will calculate regional CAP emissions from the Commuter Shuttle Project which includes all vehicle travel within San Francisco and to and from Commuter Shuttle destinations in the Bay Area.

[1] SFMTA. Commuter Shuttles Policy and Pilot Program. 2015. Available online: https://www.sfmta.com/projects-planning/projects/commuter-shuttles-policy-and-pilot-program. Accessed July 2015.

California Air Resources Board's (ARB's) EMission FACtor (EMFAC2011) model will be used to determine commuter shuttle emissions for shuttle movement.[2] Ramboll Environ will consider emissions from vehicle classes within EMFAC2011 that are mapped to commuter shuttles as disclosed by SFMTA. This list includes medium duty trucks ("MDV"), school buses ("SBUS"), urban buses ("UBUS"), motor coaches ("Motor Coach"), and other buses ("OBUS" and "All Other Buses"). Note these vehicle classes match the vehicle categories utilized in the pilot environmental impacts survey.[3]

Annual commuter shuttle vehicle miles traveled (VMT) data was provided by SFMTA and will be updated by Ramboll Environ as part of this Task. In addition, SFMTA also provided VMT data for displaced passenger vehicles. Displaced passenger vehicle VMT are vehicle miles not traveled due to commuter shuttle use and represent the baseline condition. This methodology to calculate VMT is summarized below:

- Commuter shuttles: Through the Pilot environmental impacts survey, SFMTA collected data from each operator including monthly average VMT and vehicle count for each vehicle class. Per the data review discussed in Section 2.1 above, Ramboll Environ will review the VMT calculated by SFMTA and bring any potential outliers to SFMTA for confirmation. Once Program VMT assumptions are finalized, Ramboll Environ will calculate VMT for the Project based on reported Pilot data, updated assumptions as applicable, and projected growth.
- Displaced passenger vehicles: The Pilot environmental impacts survey also contains operator-provided average monthly boardings and average distance travelled by each commuter. As discussed in Section 2.1 above, Ramboll Environ will review the VMT data provided for displaced passenger vehicles and update Baseline VMT based on available data and proper assumptions. If the refined analysis is required, the updated VMT will be used to calculate regional CAP emissions for the Project.

Commuter shuttle trips are conducted by a variety of vehicle types. These include:

- Motor coaches (typical 40+ passenger inter-city bus, including double decker vehicles)
- Urban buses (low floor 30-40 passenger bus, similar to a Muni bus)
- School buses
- Mini-buses (20-30 passenger)
- Vans (6-12 passenger)

In addition, a variety of fuels is expected to be used in the commuter shuttles, including diesel, biodiesel, gasoline, and Compressed Natural Gas (CNG). Since diesel, biodiesel, and

[2] Per California Air Resources Board, the EMFAC2014 is available. However ARB lists the following guidance on their webpage: "Note: Both EMFAC2011 and EMFAC2014 versions of the Web Database are available now. Unless otherwise approved by the project-specific approving agency, the EPA approved EMFAC version should be used for analyses. EMFAC2011 is the currently approved version of EMFAC." Available online: http://www.arb.ca.gov/emfac/. Accessed July 2015.

[3] Data provided by Hank Willson, SFMTA, July 10, 2015.

gasoline covered 97% of reported fuel use in the Pilot Program, Ramboll Environ proposes to restrict emissions inventory and HRA analysis to these three fuel types.

For evaluating regional traffic emission impacts, Ramboll Environ proposes to calculate commuter shuttle emissions using the VMT data as provided by SFMTA along with emission factors from ARB's EMission FACtor (EMFAC2011) model. The emission factors for running exhaust emissions of criteria pollutants will be generated for the operational year of 2016 with the current version of the EMFAC2011 released on September 30, 2011.[4] This version reflects the emissions benefits of ARB's recent rulemakings including on-road diesel fleet rules, Pavley Clean Car Standards, and the Low Carbon Fuel Standard (LCFS). The model also includes updated information on California's car and truck fleets and travel activity. Emissions reported by the model will be converted to units of grams of pollutant emitted per vehicle mile traveled (VMT) using the daily VMT. Ramboll Environ will calculate Project emissions using the percentage of VMT by vehicle and fuel type as provided by SFMTA. Ramboll Environ will also include the idling emissions calculated within the region as later described in the local impact discussion below.

Displaced passenger vehicle emissions will be estimated based on total displaced passenger vehicle miles and weighted average emissions factors for passenger vehicles. Passenger vehicle fleet mix will be based on EMFAC2011 vehicle population for San Francisco for the vehicle classes LDA (light duty automobile), LDT1 (light duty truck 1), and LDT2 (light duty truck 2) which are typically associated with worker commuting.[5]

The methodology used to calculate emissions is presented in **Table 1**.

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[4] Note that EMFAC2014 has been released but the release notes state that Both EMFAC2011 and EMFAC2014 versions of the Web Database are available now. The most recent approved version is EMFAC2011. ARB has recently submitted EMFAC2014 to USEPA for its review. USEPA approval is expected by the end of 2015.

[5] Based on CalEEMod® defaults. CalEEMod 2013.2.2. Available online: www.caleemod.com. Accessed August 2015.

3. MODELED AIR CONCENTRATIONS

Consistent with the CRRP-HRA, the air toxics analysis will evaluate health risks and $PM_{2.5}$ concentrations imposed by the Project on the surrounding community. For the Project, this includes idling emissions generated by shuttles at an individual stop as well as emissions generated while the shuttles are arriving to and departing from the modeled shuttle stops. The methodologies used to evaluate emissions for the Project and cumulative HRA will be based on the most recent BAAQMD Recommended Methods for Screening and Modeling Local Risks and Hazards (BAAQMD 2012a).

3.1 Chemical Selection

The screening cancer risk and acute hazard analysis in the HRA will be based on diesel exhaust, characterized as DPM or speciated total organic gases (TOG), concentrations from diesel buses; the refined approach will additionally consider three possible fuel types for shuttles involved in the program (diesel, biodiesel, and gasoline).[6] Diesel exhaust, a complex mixture that includes hundreds of individual constituents (Cal/EPA 1998), is identified by the State of California as a known carcinogen (Cal/EPA 2011). Under California regulatory guidelines, DPM is used as a surrogate measure of carcinogen exposure for the mixture of chemicals that make up diesel exhaust as a whole (Cal/EPA 2011). Cal/EPA and other proponents of using the surrogate approach to quantifying cancer risks associated with the diesel mixture indicate that this method is preferable to use of a component-based approach. A component-based approach involves estimating cancer risks for each of the individual components of a mixture. Critics of the component-based approach believe it will underestimate the risks associated with diesel as a whole mixture because the identity of all chemicals in the mixture may not be known and/or exposure and health effects information for all chemicals identified within the mixture may not be available. Furthermore, Cal/EPA has concluded that "potential cancer risk from inhalation exposure to whole diesel exhaust will exceed the multi-pathway cancer risk from the speciated components (Cal/EPA 2003)." The DPM analyses will be based on the surrogate approach, as recommended by Cal/EPA. In the absence of an acute toxicity value for diesel exhaust, speciated TOG will be used as a conservative.

3.2 Screening Approach

For evaluating local impacts, Ramboll Environ proposes to evaluate CAP emissions associated with idling and loading of commuter shuttles. The methodology used to calculate emissions is presented in **Table 1** . Two similar methodologies are presented below to evaluate cancer risk and acute impacts.

To estimate the emission factor for both acute and cancer impacts, Ramboll Environ proposes to assume all shuttles are in the vehicle class that has the greatest idling emission factor for $PM_{2.5}$ (a conservative estimate of Diesel Particulate Matter equates to PM_{10} emissions): diesel-fueled buses. A component of EMFAC2011 is a database containing idling emission rates; this database contains emission factors for Other Buses ("OBUS") within the

[6] Shuttle types that may be evaluated include motor coaches, urban buses, school buses, mini buses, and vans that run on diesel, biodiesel, gasoline, or CNG fuel. Since CNG fuel amounted for only 3% of fuel use in the Pilot Program, the Air Quality analysis will focus on diesel, biodiesel, and gasoline fuel types.

San Francisco Air Basin. For calendar year 2015, the aggregate $PM_{2.5}$ emission factor is 0.246 g/vehicle/hr.[7]

The screening approach will also include emissions generated by shuttles pulling into and out of the loading area based on the approach ARB utilized in the Diesel Risk Reduction Plan (ARB 2000), which is approximately 60 meters long and 6.6 meters wide for a given stop location. Emissions from shuttle operation over this zone will be calculated using the most conservative emission rate of the eligible vehicle types provided by EMFAC2011 for a vehicle speed of five miles per hour, similar to the ARB approach.

Screening Cancer Risk:

To perform a screening-level cancer risk assessment, Ramboll Environ will use the maximum emission factors in tandem with the maximum number of shuttle stops per day and an estimated average stop duration (minutes) in order to evaluate cancer risk from commuter shuttle arrival, loading, and departure at a hypothetical loading zone.

Data provided by SFMTA indicates a maximum number of shuttle stops at the Van Ness Ave and Union St intersections of 307 stops per day (172 stops on SE corner and 135 stops on SW corner respectively).[8] As discussed with SFMTA, total stops will be estimated by increasing SFMTA's observed AM and PM peak totals each by 10% to account for additional trips occurring on off-peak hours and 29% to account for projected growth throughout the Program, in line with what SFMTA has observed over the Pilot Program. Thus, for the stops at Van Ness Ave and Union St., 436 total stops are estimated for the daily maximum, split between two parallel loading zones (northbound and southbound) on the SE (244 stops) and SW (192 stops) corners of the intersection. For the screening-level approach, as discussed with SFMTA and the Planning Department, Ramboll Environ will assume idling emissions occur for 1 minute for each of the 440 daily stop events.[9]

Screening Acute Impacts: The proposed approach for determining acute impacts differs slightly from the cancer risk methodology. Here, Ramboll Environ will assume 120 shuttle bus stops in the course of one hour, which accounts for up to two shuttles in the loading zone at a time throughout the hour. Similar to above, each shuttle will idle for one minute, and arrival and departure emissions for each bus will be included. Effectively, this assumes two shuttle buses are continually loading or unloading. Ramboll Environ proposes to calculate the maximum hourly impact by assuming the net emissions occur in each hour of potential shuttle operation (5am – 12am).

Both screening-level assessments presented above will provide a conservative estimate of impacts from shuttle bus idling at a hypothetical loading zone. Near-field air dispersion modeling of emissions from the Project will be conducted using the United States

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7 Data from California Air Resources Board. EMFAC2011. Available online: http://www.arb.ca.gov/msei/modeling.htm. Accessed July 2015.

8 Data from Hank Willson, SFMTA. July 10, 2015. Includes stop count on SE and SW corners of intersection.

9 Based on observed Pilot Program data as confirmed by SFMTA.

Environmental Protection Agency's (USEPA's) AERMOD model.[10] For each receptor location, the model generates average air concentrations (or air dispersion factors as unit emissions will be modeled) resulting from source emissions.

Air dispersion models such as AERMOD require a variety of inputs such as source parameters, meteorological parameters, topography information, and receptor parameters. For the screening-level assessment, Ramboll Environ will use one set of stack parameters that are designed to produce conservative (i.e. overestimates of) air concentrations. Stack parameters are presented in **Table 2**.

Meteorological data: Air dispersion modeling applications require the use of meteorological data that ideally are spatially and temporally representative of conditions in the immediate vicinity of the site under consideration. For this HRA, BAAQMD's Mission Bay meteorological data for year 2008 will be used, which aligns with the San Francisco CRRP-HRA Methodology (BAAQMD 2012b). Meteorological data will be processed for use in AERMOD with AERMET V15181, which is the most current pre-processor available.[11]

Terrain considerations: For the screening-level assessment no terrain considerations will be included. Based on the urban area in which the Project site is located, Ramboll Environ will use urban dispersion coefficients.

Emission rates: Emitting activities will be modeled to reflect shuttle operation as anticipated over a weekday.[12] Emissions will be modeled using the χ/Q ("chi over q") method, and distributed over weekday hours such that the modeled source has a unit emission rate over a 24-hour period (i.e., 1 gram per second [g/s]), and the model estimates daily dispersion factors (with units of [ug/m^3]/[g/s]).

For annual average ambient air concentrations, the estimated annual average dispersion factors will be multiplied by the annual average emission rates. The emission rates will vary day-to-day, as shuttle operations occur on Monday to Friday only.[13] For simplicity, the model will assume a constant emission rate during the entire year for weekdays only.[14]

As discussed above, the screening-level acute impact assessment will assume the maximum scenario of 120 shuttle arrivals, departures, and loading events are possible within each hour of shuttle operation (6am – 12am).

Source parameters: Source location and parameters are necessary to model the dispersion of air emissions from the shuttle buses. For the screening assessment, emissions will be

[10] On November 9, 2005, the USEPA promulgated final revisions to the federal Guideline on Air Quality Models, in which they recommended that AERMOD be used for dispersion modeling evaluations of criteria air pollutant and toxic air pollutant emissions from typical industrial facilities.

[11] The latest revision to the AERMOD modeling system (v15181) was released on July 28, 2015. Available online: http://www.epa.gov/ttn/scram/. Accessed July 2015.

[12] Hours of operation fluctuate based on peak commuter shuttle activity. As discussed with SFMTA and the Planning Department on August 12, 2015, Ramboll Environ will utilize data from SFMTA to estimate commuter shuttle activity during peak hours (6am – 10am and 4pm – 8pm). In addition, Ramboll Environ will model off-peak operations between 10am – 4pm and 8pm – 12am assuming 10% of peak hour traffic.

[13] Refined assumption based on information from Juliet Wilson, SFMTA, July 28, 2015.

[14] Based on Pilot data collection summary report provided by Juliet Wilson, SFMTA on July 28, 2015.

modeled as a single point source with release parameters equal to the "idling school buses scenario" ARB evaluated in the Diesel Risk Reduction Plan (ARB 2000). Those parameters are provided in **Table 2: Modeling Parameters**.

Receptors: In order to evaluate health impacts, the screening-level assessment will create a hypothetical receptor grid around the modeled point source. A 20 meter by 20 meter receptor grid with minimum one meter receptor spacing will be centered on the modeled point source, with a larger 100 meter by 100 meter grid with five meter spacing superimposed upon the inner grid. Receptors will be modeled at a height of 1.8 meters above terrain height, a default breathing height for ground-floor receptors, consistent with the CRRP-HRA analysis. As discussed previously, average annual dispersion factors will be estimated for each receptor location.[15]

Modeling Adjustment Factors: Cal/EPA (2003) recommends applying an adjustment factor to the annual average concentration modeled assuming continuous emissions (i.e., 24 hours per day, 7 days per week), when the actual emissions are less than 24 hours per day and exposures are concurrent with traffic activities occurring as part of the Project. The modeling adjustment factors are discussed below.

For estimating the cancer risk, residents are assumed to be exposed to Project emissions 24 hours per day, 7 days per week. This assumption is consistent with the modeled annual average air concentration (24 hours per day, 7 days per week). Thus, the annual average concentration need not be adjusted.

3.3 Refined Approach (if necessary)

If the screening level dispersion factors result in risks above a desired threshold, Ramboll Environ can undertake more detailed refinements of the dispersion factors.

Refined commuter shuttle emissions will be based on the expected variety of vehicle types and fuel combinations (including diesel, gasoline, and biodiesel fuel types) as provided by SFMTA.[16] Furthermore, the refined emissions will be based on actual average shuttle dwell times for each proposed stop (ranging from 0 to 5 minutes/stop). The refined approach will include an air quality analysis of actual expected shuttle emissions at four loading zones in San Francisco (two within and two outside the Air Pollutant Exposure Zone), with data provided by SFMTA.

There are multiple approaches here; a hierarchy of suggested approaches is listed below:

1. *Sensitive Receptors:* For this refinement, Ramboll Environ will review the trends of the modeled concentrations in the screening assessment versus locations with the greatest number of commuter shuttle stops. After reviewing screening results, actual stop locations, and sensitive receptor locations with EP, we will identify which stops have may

[15] Note, for the screening level assessment, relative receptor locations will be used as an actual stop location will not be defined for this scenario.

[16] Note EMFAC2011 idling emissions database only provides emissions for OBUS and SBUS. For other vehicle types, Ramboll Environ proposes to utilize emission factors associated with 5MPH vehicle speed (e.g. LDV vehicles). Ramboll Environ proposes to assume B20 Biodiesel for all biodiesel blends unless more refined data is available from SFMTA prior to Air Quality Analysis.

showcase highest downwind concentrations near actual sensitive receptor locations (i.e., residential buildings) in the vicinity of a shuttle stop. After determining shuttle stops with highest impacts at a sensitive receptor, Ramboll Environ will suggest stops (4 total) for refined modeling, including stops both inside of and outside of the Air Pollutant Exposure Zone (APEZ). If available, Ramboll Environ will take into account recommendations from SFMTA and the Planning Department when selecting appropriate shuttle stops for refined modeling.

2. *Site-Specific Dispersion Factors:* In this more detailed refinement; Ramboll Environ will create a new model for each of the top four commuter shuttle stops identified in the first refinement above. We will place receptors on the perimeter of the residential buildings and calculate receptor base elevations derived from National Elevation Dataset (NED) terrain data. A receptor height of 1.8m will be used for receptors on building perimeters. If an actual air intake can be identified, receptors will be placed on that location and corresponding height instead of at the building perimeter. Ramboll Environ will also align the modeled impact zone with the actual expected shuttle transit area. In line with CRRP-HRA methodology, Ramboll Environ proposes to exclude building downwash from our analysis.

4. RISK CHARACTERIZATION METHODS

The following sections discuss in detail the various components required to conduct the HRA. Estimated unmitigated cancer risks and noncancer acute HI will be calculated according to the current BAAQMD Guidance and using default BAAQMD and California Office of Environmental Health Hazard Assessment (OEHHA) exposure assumptions. In advance of this calculation, Ramboll Environ will gain approval from the Planning Department for the appropriate risk assessment parameters as OEHHA has released new values but the BAAQMD has yet to adopt them. The details below pertain to the methodology currently endorsed by BAAQMD.

4.1 Sources Evaluated

As discussed in Section 1.2, Ramboll Environ will evaluate cancer risk and $PM_{2.5}$ concentrations for Project emissions in 2016 (reflective of Project implementation).

SFMTA will provide Project traffic counts (shuttle stops/day and minutes/stop) to represent modeling inputs as described above. These data will be utilized to calculate health risk impacts at nearby sensitive receptors.

4.2 Exposure Assessment

Potentially Exposed Populations: This evaluation will conservatively evaluate offsite 70-year residents and sensitive receptor populations, which are expected to have the highest impacts from the Project.

As the residential exposure assumptions are more conservative than those for other sensitive receptor types as the residents have the longest exposure duration and highest exposure frequency, a conservative approach of considering all sensitive receptors as residential receptors will be used in this HRA. We will model receptors using the approaches outlined in Section 3 above. If requested, modeled concentrations can be compared to CRRP-HRA results at nearby locations for additional cost.

Exposure Assumptions: The exposure parameters that will be used to estimate excess lifetime cancer risks for all potentially exposed populations for the operation scenario were obtained using risk assessment guidelines from BAAQMD (2010), unless otherwise noted, and are presented in the attached Error! Reference source not found..

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

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

Where:

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

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

4.3 Toxicity Assessment

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

Following CRRP Methodology for cancer risk calculations, Ramboll Environ will include toxicity for DPM in the screening analysis and additionally include diesel and organic gases from Project shuttles as part of the refined analysis as necessary.

Carcinogenic toxicity values are summarized in **Table 4.**

4.4 Age-Specific Sensitivity Factors

The estimated excess lifetime cancer risks for a resident child will be adjusted using the age sensitivity factors (ASFs) recommended in the Cal/EPA OEHHA Technical Support Document (Cal/EPA 2009). This approach accounts for an "anticipated special sensitivity to carcinogens" of infants and children. Cancer risk estimates are weighted by a factor of 10 for exposures that occur from the third trimester of pregnancy to two years of age and by a factor of three for exposures that occur from two years through 15 years of age. No weighting factor (i.e., an ASF of one, which is equivalent to no adjustment) is applied to ages 16 to 70 years. Table 5: shows the CRAF values that will be used (based on the ASF assumptions listed above) for residents in the operation scenario.

4.5 Risk Characterization

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

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

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

Where:

$Risk_{inh}$ = Cancer Risk; the incremental probability of an individual developing cancer as a result of inhalation exposure to a particular potential carcinogen (unit-less)

C_i	=	Annual Average Air Concentration for $Chemical_i$ (µg/m^3)
CF	=	Conversion Factor (mg/µg)
IF_{inh}	=	Intake Factor for Inhalation (m^3/kg-day)
CPF_I	=	Cancer Potency Factor for $Chemical_i$ (mg chemical/kg body weight-day)$^{-1}$
ASF	=	Age Sensitivity Factor (unitless)

4.6 Estimation of Acute Noncancer Hazard Quotient/Index

The potential for exposure to result in adverse acute effects is evaluated by comparing the estimated one-hour maximum air concentration of chemical to the acute reference exposure level (aREL) for each chemical evaluated in this analysis. When calculated for a single chemical, the comparison yields an HQ. To evaluate the potential for adverse acute health effects from simultaneous exposure to multiple chemicals, the HQs for all chemicals are summed, yielding a HI.

$$HQ_i = C_i / aREL_i$$

$$HI = \sum HQ_i$$

Where:

HQ_i	=	Acute hazard quotient for chemical i
HI	=	Hazard index
C_i	=	One-hour maximum concentration of chemical i (µg/m^3)
$aREL_i$	=	Acute reference exposure level for chemical i (µg/m^3)

Acute RELs are summarized in **Table 4.**

5. UNCERTAINTIES

In accordance with risk assessment guidance, Ramboll Environ has evaluated the uncertainties associated with the HRA, including emissions estimation, air dispersion modeling, and risk estimation. The following sections summarize the critical uncertainties associated with the emissions estimation, air dispersion modeling, and risk estimation components of the risk assessment, which is universally applicable to these methods and therefore apply to all projects utilizing them.

Estimation of Exposure Concentrations: In addition to uncertainty associated with emission estimates, there is also uncertainty associated with the estimated exposure concentrations. The limitations of the air dispersion model provide a source of uncertainty in the estimation of exposure concentrations. According to USEPA, errors due to the limitation of the algorithms implemented in the air dispersion model in the highest estimated concentrations of +/- 10 percent to 40 percent are typical (USEPA 2005). However, the models are designed to be conservative; thus predicted exposure concentrations are likely to be at or above actual exposure concentrations.

Source Representation: The source parameters used to model emission sources add uncertainty. For all emission sources, Ramboll Environ will use source parameters which are either recommended as defaults or expected to produce more conservative results. Discrepancies might exist between the actual emissions characteristics of a source and its representation in the model; exposure concentrations used in this assessment represent approximate exposure concentrations.

Exposure Assumptions: Numerous assumptions must be made in order to estimate human exposure to chemicals. These assumptions include parameters such as breathing rates, exposure frequency and duration, and human activity patterns. While a mean value derived from scientifically defensible studies is the best estimate of central tendency, most of the exposure variables used in this HRA are high-end estimates. For example, it is assumed that residential receptor exposure to Project emissions occurs during the entire Project duration and exposure to the cumulative emissions sources occurs 24 hours per day for 350 days per year, a highly conservative assumption since most residents do not remain in their homes for this period of time. The combination of several high-end estimates used as exposure parameters may substantially overestimate chemical intake. The excess lifetime cancer risks calculated in this assessment are therefore likely to be higher than may be required to be protective of public health.

Toxicity Assessment: The Cal/EPA CPF for DPM is used to estimate cancer risks associated with exposure to DPM from the project and offsite emissions. However, the CPF derived by Cal/EPA for DPM is highly uncertain in both the estimation of response and dose. In the past, due to inadequate animal test data and epidemiology data on diesel exhaust, the International Agency for Research on Cancer (IARC), a branch of the World Health Organization (WHO), had classified DPM as Probably Carcinogenic to Humans (Group 2); the USEPA had also concluded that the existing data did not provide an adequate basis for quantitative risk assessment (USEPA 2002). However, based on two recent scientific studies (Attfield 2012, Benbrahim-Tallaa 2012, Silverman 2012), IARC recently re-classified DPM as Carcinogenic to Humans to Group 1 (IARC 2012), which means that the agency has determined that there is "sufficient evidence of carcinogenicity" of a substance in humans and represents the strongest weight-of-evidence rating in IARC's carcinogen classification scheme. This determination by the IARC may provide additional impetus for the USEPA to identify a quantitative dose-response relationship between exposure to DPM and cancer.

Furthermore, as noted by ARB (ARB 2011b) in guidance for the California Air Toxics Emission Factor Database, also known as CATEF, measurements of acrolein percentages in diesel exhaust have significant uncertainties due to issues with sampling methods. Therefore, obtaining a correct speciation of TOG including acrolein is difficult. Until recently, BAAQMD recommended adding acrolein to a USEPA speciation profile for farm equipment and using this speciation profile for diesel-fueled off-road equipment exhaust. However, on November 21, 2011, BAAQMD recommended using the unadjusted USEPA speciation profile for farm equipment that does not contain acrolein. The exclusion of acrolein in speciation profiles is an area of uncertainty. The speciation profile used in the HRA is obtained from its original source (USEPA) without acrolein adjustments.

Risk Calculations: The USEPA notes that the conservative assumptions used in a risk assessment are intended to assure that the estimated risks do not underestimate the actual risks posed by a site and that the estimated risks do not necessarily represent actual risks experienced by populations at or near a site (USEPA 1989).

The estimated risks in this HRA will be based primarily on a series of conservative assumptions related to predicted environmental concentrations, exposure, and chemical toxicity. The use of conservative assumptions tends to produce upper-bound estimates of risk. Although it is difficult to quantify the uncertainties associated with all the assumptions made in this risk assessment, the use of conservative assumptions is likely to result in substantial overestimates of exposure, and hence, risk. BAAQMD acknowledges this uncertainty by stating: "the methods used [to estimate risk] are conservative, meaning that the real risks from the source may be lower than the calculations, but it is unlikely that they will be higher" (BAAQMD 2013).

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TABLES

**Table 1: Emissions Calculations Methodology
SFMTA Commuter Shuttle Project
San Francisco, California**

Type	Source	Methodology and Formula	Reference
Local Impact Zone[1]	Exhaust – Running	$E_R = EF_R(@5MPH) * Zone\ Length * Daily\ Trip\ Number$	EMFAC2011
	Exhaust - Idling	$E_I = EF_I * Total\ Loading\ Time * Daily\ Trip\ Number$	EMFAC2011
Regional Impacts[2]	Exhaust - Running	$E_R = \Sigma(EF_R * VMT * C)$, where VMT = Trip Length * Daily Trip Number	EMFAC2011
	Exhaust - Idling	As calculated in the Local Impact Zone	EMFAC2011

Notes:

1. Local impact zone emissions are those impacting local receptors. This is composed of emissions from shuttle loading and unloading along with shuttle approach and departure.
2. Regional impacts evaluated as running emissions over the commuter shuttle zone along with idling emissions calculated in the local impact zone.

E_R: running exhaust emissions (lb/day).

EF_R: running emission factor (g/mile). From EMFAC2011. EMFAC reports emissions in tons/day and VMT in miles/day. The emission factor is calculated as the quotient of those outputs.

VMT: vehicle miles traveled, as provided by SFMTA

C: unit conversion factor.

E_I: vehicle idling emissions (lb/day).

EF_I: vehicle idling emission factor (g/vehicle-hr). From EMFAC2011 Idling Emission Workbook. This method of calculating the emission factor assumes an average idling time per trip as provided by SFMTA.

Abbreviations:

ARB: California Air Resources Board
CalEEMod: CALifornia Emissions Estimator MODel
EF: Emission Factor
EMFAC: EMission FACtor Model
g: gram
hr: hour
lb: pound
USEPA: United States Environmental Protection Agency
VMT: vehicle miles traveled

References:

ARB. 2011b. EMFAC2011. September

Table 2: Modeling Parameters
SFMTA Commuter Shuttle Project
San Francisco, California

Scenario	Period[1]	Source	Source Type[1]	Source Dimension[2]	Number of Sources	Release Height[3]	Exit Temperature[3]	Exit Velocity[3]	Exit Diameter[3]
				[m]		[m]	[K]	[m/s]	[m]
Commuter Shuttles	5am-12am	Idling Commuter Shuttles	Point		1	0.6	366	0.01	0.1
Commuter Shuttles	5am-12am	Approaching and Departing Commuter Shuttles	Area	6.6 x 60	2	0.6			

Notes:

1. Commuter shuttles are estimated to operate weekdays from 6am-12am. Approximately 90% of shuttle operations are assumed to occur during peak hours 6am-10am and 4pm-8pm, with the remaining 10% occurring over off-peak hours 10am-4pm, 8pm-12am, and 5am-6am.

2. Emissions occurring from commuter shuttles approaching and departing from the loading zone will be modeled as an area source following the methodology in ARB's Diesel Risk Reduction Plan.

3. Commuter shuttle release parameters are assumed equivalent to the "Idling School Buses Scenario" ARB investigated in preparing the Diesel Risk Reduction Plan.

Abbreviations:

ARB: Air Resources Board
g: gram
K: Kelvin
m: meter
s: second

Sources:

ARB. 2000. *Diesel Risk Reduction Plan: Appendix VII Risk Characterization Scenarios.*

Table 3: Exposure Parameters
SFMTA Commuter Shuttle Project
San Francisco, California

Exposure Parameter	Units	70-Year Resident
Daily Breathing Rate (DBR)[1]	[L/kg-day]	302
Exposure Time (ET)	[hours/day]	24
Exposure Frequency (EF)[2]	[days/year]	350
Exposure Duration (ED)[3]	[years]	70
Averaging Time (AT)	[days]	25550
Intake Factor, Inhalation (IF_{inh})	[m^3/kg-day]	0.29

Notes:

[1] Daily breathing rates for resident receptors by age group reflect default breathing rates from Cal/EPA 2003.
[2] Exposure frequencies for residents reflect default exposure frequencies from Cal/EPA 2003.
[3] Exposure durations for residents reflect default exposure durations from Cal/EPA 2003.

Calculation:

Resident:
IF_{inh} = DBR * FAH * EF * ED * CF / AT
CF = 0.001 (m^3/L)

Abbreviations:

Cal/EPA = California Environmental Protection Agency
L = liter
kg = kilogram
m^3 = cubic meter

Reference:

Cal/EPA. 2003. The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments. Office of Environmental Health Hazard Assessment. August. Available online at: http://oehha.ca.gov/air/hot_spots/hraguidefinal.html. Accessed August 2015.

Table 4: Toxicity Values
SFMTA Commuter Shuttle Project
San Francisco, California

Source	Chemical	Cancer Potency Factor[1]	Acute Reference Exposure Level
		[mg/kg-day]$^{-1}$	(µg/m3)
Diesel and Biodiesel Shuttles	Diesel PM	1.1	--
	Acetaldehyde		470
	Acrolein		2.5
	Benzene		27
	Formaldehyde		55
Gasoline Shuttles	1,3-Butadiene	0.6	660
	Acetaldehyde	0.01	470
	Benzene	0.1	27
	Ethylbenzene	0.0087	--
	Formaldehyde	0.021	55
	Naphthalene	0.12	00

Note:

[1] Values presented in this table reflect proposed fuel types that will be used in the screening and refined analyses. Additional chemicals may be added if other fuel types are evaluated.

Abbreviations:

µg/m^3: micrograms per cubic meter
ARB: Air Resources Board
Cal/EPA: California Environmental Protection Agency
mg/kg-day: per milligram per kilogram-day
OEHHA: Office of Environmental Health Hazard Assessment
PM: Particulate Matter

Reference:

Cal/EPA. 2015. OEHHA/ARB Consolidated Table of Approved Risk Assessment Health Values. May 13.

Table 5: Cancer Risk Adjustment Factors
SFMTA Commuter Shuttle Project
San Francisco, California

Receptor[1,2,3]	Cancer Risk Adjustment Factor (CRAF)
Offsite 70-Year Resident	1.7

Notes:

[1] Based on Cal/EPA 2009 and BAAQMD 2010.
[2] A resident is assumed to represent exposure from 3rd trimester through age 70 years, in accordance with Cal/EPA 2009.
[3] A 70-year resident is assumed to be exposed from the last trimester of pregnancy through a 70-year lifetime. The CRAF is calculated as: ((2.25 years * 10) + ([16 years - 2.25 years] * 3) + ([70-16] * 1)) / 70 years

Abbreviations:

BAAQMD: Bay Area Air Quality Management District
CRAF: Cancer Risk Adjustment Factor

References:

BAAQMD. 2010. Air Toxics NSR Program Health Risk Screening Analysis (HRSA) Guidelines. January. Available online at: http://baaqmd.gov/~/media/Files/Engineering/Air%20Toxics%20Programs/hrsa_guidelines.ashx

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APPENDIX B
LOCAL IMPACTS EMISSIONS CALCULATIONS

Table B1: PM10 Emission Factors - 2016 Calendar Year
SFMTA Commuter Shuttle Project
San Francisco, California

Model Year	Uncontrolled Fleet	Controlled Fleet	Running Exhaust (g/mile)[1]								Idling Exhaust (g/hr)[2]							
			Motor Coach		Urban Bus		Mini-Bus		Van		Motor Coach		Urban Bus		Mini-Bus		Van	
			Diesel	Biodiesel	Diesel	Biodiesel	Diesel	Biodiesel	Diesel	Biodiesel	Diesel	Biodiesel	Diesel	Biodiesel	Diesel	Biodiesel	Diesel	Biodiesel
1989	0.2%	0.1%	5.627	5.627	1.541	1.541	3.588	3.588	0.879	0.879	3.200	3.200	3.854	3.854	3.327	3.327	2.196	2.196
1990	0.2%	0.1%	5.627	5.627	1.541	1.541	3.588	3.588	0.879	0.879	3.200	3.200	3.854	3.854	3.327	3.327	2.196	2.196
1991	0	0	5.553	5.553	2.347	2.347	4.723	4.723	0.879	0.879	2.393	2.393	5.868	5.868	2.361	2.361	2.196	2.196
1992	0	0	5.553	5.553	2.347	2.347	4.723	4.723	0.879	0.879	2.393	2.393	5.868	5.868	2.361	2.361	2.196	2.196
1993	0	0	5.453	5.453	2.347	2.347	4.723	4.723	0.216	0.216	2.393	2.393	5.868	5.868	2.361	2.361	0.540	0.540
1994	0	0	3.833	3.833	2.347	2.347	2.981	2.981	0.216	0.216	1.798	1.798	5.868	5.868	1.684	1.684	0.540	0.540
1995	0	0	3.833	3.833	2.860	2.860	2.981	2.981	0.216	0.216	1.798	1.798	7.151	7.151	1.684	1.684	0.540	0.540
1996	0.2%	0.1%	1.657	1.657	3.433	3.433	1.288	1.288	0.216	0.216	0.779	0.779	8.584	8.584	0.730	0.730	0.540	0.540
1997	0.2%	0.1%	1.657	1.657	3.433	3.433	1.282	1.282	0.216	0.216	0.779	0.779	8.584	8.584	0.730	0.730	0.540	0.540
1998	0.2%	0.1%	1.619	1.619	3.433	3.433	1.195	1.195	0.216	0.216	0.551	0.551	8.584	8.584	0.473	0.473	0.540	0.540
1999	0.9%	0.7%	1.702	1.702	1.174	1.174	1.219	1.219	0.216	0.216	0.551	0.551	2.934	2.934	0.473	0.473	0.540	0.540
2000	0.8%	0.6%	1.701	1.701	1.174	1.174	1.195	1.195	0.216	0.216	0.551	0.551	2.934	2.934	0.473	0.473	0.540	0.540
2001	0.5%	0.4%	1.672	1.672	1.174	1.174	1.168	1.168	0.216	0.216	0.551	0.551	2.934	2.934	0.473	0.473	0.540	0.540
2002	0.3%	0.2%	1.639	1.639	1.174	1.174	1.140	1.140	0.216	0.216	0.551	0.551	2.934	2.934	0.473	0.473	0.540	0.540
2003	0.5%	0.4%	0.539	0.539	1.174	1.174	0.232	0.232	0.216	0.216	0.426	0.426	2.934	2.934	0.386	0.386	0.540	0.540
2004	1.4%	1.1%	0.322	0.322	1.174	1.174	0.225	0.225	0.216	0.216	0.426	0.426	2.934	2.934	0.386	0.386	0.540	0.540
2005	2.3%	1.8%	0.313	0.313	0.119	0.119	0.219	0.219	0.216	0.216	0.426	0.426	0.297	0.297	0.386	0.386	0.540	0.540
2006	1.2%	1.0%	0.304	0.304	0.119	0.119	0.211	0.211	0.216	0.216	0.426	0.426	0.297	0.297	0.386	0.386	0.540	0.540
2007	3.1%	2.4%	0.252	0.252	0.015	0.015	0.175	0.175	0.011	0.011	0.373	0.373	0.038	0.038	0.337	0.337	0.027	0.027
2008	5.4%	4.2%	0.102	0.102	0.015	0.015	0.062	0.062	0.010	0.010	0.032	0.032	0.038	0.038	0.029	0.029	0.026	0.026
2009	5.4%	4.2%	0.077	0.077	0.015	0.015	0.046	0.046	0.010	0.010	0.001	0.001	0.038	0.038	0.001	0.001	0.025	0.025
2010	7.9%	6.1%	0.063	0.063	0.015	0.015	0.038	0.038	0.009	0.009	0.001	0.001	0.038	0.038	0.001	0.001	0.024	0.024
2011	9.8%	7.6%	0.021	0.021	0.015	0.015	0.013	0.013	0.009	0.009	0.001	0.001	0.038	0.038	0.001	0.001	0.022	0.022
2012	17.4%	36.0%	0.010	0.010	0.015	0.015	0.006	0.006	0.008	0.008	0.001	0.001	0.038	0.038	0.001	0.001	0.021	0.021
2013	15.8%	12.3%	0.009	0.009	0.015	0.015	0.005	0.005	0.008	0.008	0.001	0.001	0.038	0.038	0.001	0.001	0.020	0.020
2014	18.6%	14.4%	0.007	0.007	0.015	0.015	0.005	0.005	0.007	0.007	0.001	0.001	0.038	0.038	0.001	0.001	0.018	0.018
2015	7.8%	6.0%	0.007	0.007	0.015	0.015	0.004	0.004	0.007	0.007	0.001	0.001	0.038	0.038	0.001	0.001	0.017	0.017
Uncontrolled Type EF[3]			0.115	0.115	0.090	0.090	0.077	0.077	0.029	0.029	0.065	0.065	0.224	0.224	0.059	0.059	0.071	0.071
Controlled Type EF[3]			0.091	0.091	0.073	0.073	0.061	0.061	0.024	0.024	0.050	0.050	0.182	0.182	0.046	0.046	0.060	0.060
Fleet Distribution			25.1%	58.2%	3.5%	0.2%	2.1%	0.8%	1.0%	0	25.1%	58.2%	3.5%	0.2%	2.1%	0.8%	1.0%	0
Uncontrolled Fleet EF[4]			**0.102**								**0.065**							
Controlled Fleet EF[4]			**0.081**								**0.051**							

Notes:

1. Running emission factors are pulled from EMFAC2014 for San Francisco County at a speed of 5 mph. If a given model year was not provided, the closest preceding year with an emission factor was used.
   Vehicle types are paired with EMFAC2014 vehicle classes as follows: Motor Coach = Motor Coach, Urban Bus = UBUS, Diesel Mini-Bus = All Other Buses, Gasoline Mini-Bus = OBUS, Van = MDV
   Biodiesel emission factors are considered equivalent to diesel. CNG is considered equivalent to gasoline, except for CNG Urban Buses, where EMFAC2014 provides emission factors.
2. Idling emission factors are either as provided in EMFAC2014 for San Francisco County, or calculated as the running 5mph emission rate multiplied by 2.5 per ARB guidance.
3. Uncontrolled and Controlled Type emission factors are calculated by weighting the fleet distribution by model year.
4. Uncontrolled and Controlled Fleet emission factors are calculated by weighting the type emission factor by the distribution of vehicle types in the fleet.

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Table B2: Diesel TOG Emission Factors - 2016 Calendar Year
SFMTA Commuter Shuttle Project
San Francisco, California

Model Year	Uncontrolled Fleet	Controlled Fleet	Running Exhaust (g/mile)[1]								Idling Exhaust (g/hr)[2]							
			Motor Coach		Urban Bus		Mini-Bus		Van		Motor Coach		Urban Bus		Mini-Bus		Van	
			Diesel	Biodiesel	Diesel	Biodiesel	Diesel	Biodiesel	Diesel	Biodiesel	Diesel	Biodiesel	Diesel	Biodiesel	Diesel	Biodiesel	Diesel	Biodiesel
1989	0.2%	0.1%	22.7	22.7	6.6	6.6	17.4	17.4	1.5	1.5	21.4	21.4	16.5	16.5	11.4	11.4	3.9	3.9
1990	0.2%	0.1%	22.7	22.7	6.6	6.6	17.4	17.4	1.5	1.5	21.4	21.4	16.5	16.5	11.4	11.4	3.9	3.9
1991	0	0	24.1	24.1	9.0	9.0	13.4	13.4	1.5	1.5	17.1	17.1	22.5	22.5	7.9	7.9	3.9	3.9
1992	0	0	24.1	24.1	9.0	9.0	13.4	13.4	1.5	1.5	17.1	17.1	22.5	22.5	7.9	7.9	3.9	3.9
1993	0	0	23.8	23.8	9.0	9.0	13.4	13.4	0.4	0.4	17.1	17.1	22.5	22.5	7.9	7.9	1.0	1.0
1994	0	0	24.4	24.4	9.0	9.0	14.2	14.2	0.4	0.4	13.7	13.7	22.5	22.5	5.4	5.4	1.0	1.0
1995	0	0	24.4	24.4	8.9	8.9	14.2	14.2	0.4	0.4	13.7	13.7	22.2	22.2	5.4	5.4	1.0	1.0
1996	0.2%	0.1%	10.6	10.6	8.8	8.8	6.1	6.1	0.4	0.4	5.9	5.9	22.1	22.1	2.4	2.4	1.0	1.0
1997	0.2%	0.1%	10.6	10.6	8.8	8.8	6.1	6.1	0.4	0.4	5.9	5.9	22.1	22.1	2.4	2.4	1.0	1.0
1998	0.2%	0.1%	10.6	10.6	8.8	8.8	5.9	5.9	0.4	0.4	4.5	4.5	22.1	22.1	1.5	1.5	1.0	1.0
1999	0.9%	0.7%	10.8	10.8	8.8	8.8	5.9	5.9	0.4	0.4	4.5	4.5	22.1	22.1	1.5	1.5	1.0	1.0
2000	0.8%	0.6%	10.8	10.8	8.8	8.8	5.8	5.8	0.4	0.4	4.5	4.5	22.1	22.1	1.5	1.5	1.0	1.0
2001	0.5%	0.4%	10.6	10.6	8.8	8.8	5.6	5.6	0.4	0.4	4.5	4.5	22.1	22.1	1.5	1.5	1.0	1.0
2002	0.3%	0.2%	10.3	10.3	8.8	8.8	5.4	5.4	0.4	0.4	4.5	4.5	22.1	22.1	1.5	1.5	1.0	1.0
2003	0.5%	0.4%	6.0	6.0	8.8	8.8	3.0	3.0	0.4	0.4	3.7	3.7	22.1	22.1	1.2	1.2	1.0	1.0
2004	1.4%	1.1%	5.5	5.5	8.8	8.8	2.9	2.9	0.4	0.4	3.7	3.7	22.1	22.1	1.2	1.2	1.0	1.0
2005	2.3%	1.8%	5.3	5.3	0.4	0.4	2.8	2.8	0.4	0.4	3.7	3.7	0.9	0.9	1.2	1.2	1.0	1.0
2006	1.2%	1.0%	5.1	5.1	0.4	0.4	2.6	2.6	0.4	0.4	3.7	3.7	0.9	0.9	1.2	1.2	1.0	1.0
2007	3.1%	2.4%	3.5	3.5	0.1	0.1	1.8	1.8	0.3	0.3	3.2	3.2	0.3	0.3	1.0	1.0	0.7	0.7
2008	5.4%	4.2%	2.5	2.5	0.1	0.1	1.1	1.1	0.3	0.3	2.8	2.8	0.3	0.3	0.9	0.9	0.6	0.6
2009	5.4%	4.2%	2.2	2.2	0.1	0.1	1.0	1.0	0.3	0.3	2.7	2.7	0.3	0.3	0.8	0.8	0.7	0.7
2010	7.9%	6.1%	1.9	1.9	0.1	0.1	0.9	0.9	0.3	0.3	2.4	2.4	0.3	0.3	0.7	0.7	0.6	0.6
2011	9.8%	7.6%	0.9	0.9	0.1	0.1	0.4	0.4	0.2	0.2	1.0	1.0	0.3	0.3	0.3	0.3	0.6	0.6
2012	17.4%	36.0%	0.6	0.6	0.1	0.1	0.3	0.3	0.2	0.2	0.6	0.6	0.3	0.3	0.2	0.2	0.6	0.6
2013	15.8%	12.3%	0.6	0.6	0.1	0.1	0.3	0.3	0.2	0.2	0.6	0.6	0.3	0.3	0.2	0.2	0.5	0.5
2014	18.6%	14.4%	0.5	0.5	0.1	0.1	0.2	0.2	0.2	0.2	0.6	0.6	0.3	0.3	0.2	0.2	0.5	0.5
2015	7.8%	6.0%	0.4	0.4	0.1	0.1	0.2	0.2	0.2	0.2	0.6	0.6	0.3	0.3	0.2	0.2	0.5	0.5
Uncontrolled Type EF[3]			1.6	1.6	0.6	0.6	0.8	0.8	0.2	0.2	1.4	1.4	1.5	1.5	0.5	0.5	0.6	0.6
Controlled Type EF[3]			1.4	1.4	0.5	0.5	0.7	0.7	0.2	0.2	1.2	1.2	1.2	1.2	0.4	0.4	0.6	0.6
Fleet Distribution			25.1%	58.2%	3.5%	0.2%	2.1%	0.8%	1.0%	0	25.1%	58.2%	3.5%	0.2%	2.1%	0.8%	1.0%	0
Uncontrolled Fleet EF[4]			1.38								1.26							
Controlled Fleet EF[4]			1.19								1.09							

Notes:

1. Running emission factors are pulled from EMFAC2014 for San Francisco County at a speed of 5 mph. If a given model year was not provided, the closest preceding year with an emission factor was used.
   Vehicle types are paired with EMFAC2014 vehicle classes as follows: Motor Coach = Motor Coach, Urban Bus = UBUS, Diesel Mini-Bus = All Other Buses, Gasoline Mini-Bus = OBUS, Van = MDV
   Biodiesel emission factors are considered equivalent to diesel. CNG is considered equivalent to gasoline, except for CNG Urban Buses, where EMFAC2014 provides emission factors.
2. Idling emission factors are either as provided in EMFAC2014 for San Francisco County, or calculated as the running 5mph emission rate multiplied by 2.5 per ARB guidance.
3. Uncontrolled and Controlled Type emission factors are calculated by weighting the fleet distribution by model year.
4. Uncontrolled and Controlled Fleet emission factors are calculated by weighting the type emission factor by the distribution of vehicle types in the fleet.

Table B3: PM2.5 Emission Factors - 2016 Calendar Year
SFMTA Commuter Shuttle Project
San Francisco, California

Model Year	Uncontrolled Fleet	Controlled Fleet	Running Exhaust (g/mile)[1]													
			Motor Coach		Urban Bus				Mini-Bus				Van			
			Diesel	Biodiesel	Diesel	Biodiesel	Gasoline	CNG	Diesel	Biodiesel	Gasoline	CNG	Diesel	Biodiesel	Gasoline	CNG
1989	0.2%	0.1%	5.383	5.383	1.475	1.475	0.035	0.051	3.433	3.433	0.062	0.062	0.841	0.841	0.094	0.094
1990	0.2%	0.1%	5.383	5.383	1.475	1.475	0.035	0.051	3.433	3.433	0.062	0.062	0.841	0.841	0.100	0.100
1991	0	0	5.312	5.312	2.246	2.246	0.035	0.051	4.519	4.519	0.035	0.035	0.841	0.841	0.055	0.055
1992	0	0	5.312	5.312	2.246	2.246	0.035	0.051	4.519	4.519	0.035	0.035	0.841	0.841	0.057	0.057
1993	0	0	5.218	5.218	2.246	2.246	0.035	0.051	4.519	4.519	0.035	0.035	0.207	0.207	0.060	0.060
1994	0	0	3.668	3.668	2.246	2.246	0.010	0.051	2.852	2.852	0.035	0.035	0.207	0.207	0.061	0.061
1995	0	0	3.668	3.668	2.737	2.737	0.010	0.051	2.852	2.852	0.035	0.035	0.207	0.207	0.061	0.061
1996	0.2%	0.1%	1.585	1.585	3.285	3.285	0.010	0.082	1.233	1.233	0.035	0.035	0.207	0.207	0.017	0.017
1997	0.2%	0.1%	1.585	1.585	3.285	3.285	0.010	0.082	1.226	1.226	0.035	0.035	0.207	0.207	0.017	0.017
1998	0.2%	0.1%	1.549	1.549	3.285	3.285	0.010	0.082	1.143	1.143	0.010	0.010	0.207	0.207	0.018	0.018
1999	0.9%	0.7%	1.628	1.628	1.123	1.123	0.010	0.082	1.167	1.167	0.010	0.010	0.207	0.207	0.018	0.018
2000	0.8%	0.6%	1.628	1.628	1.123	1.123	0.010	0.082	1.143	1.143	0.010	0.010	0.207	0.207	0.019	0.019
2001	0.5%	0.4%	1.600	1.600	1.123	1.123	0.010	0.082	1.118	1.118	0.010	0.010	0.207	0.207	0.019	0.019
2002	0.3%	0.2%	1.568	1.568	1.123	1.123	0.010	0.082	1.090	1.090	0.010	0.010	0.207	0.207	0.019	0.019
2003	0.5%	0.4%	0.515	0.515	1.123	1.123	0.010	0.082	0.222	0.222	0.010	0.010	0.207	0.207	0.019	0.019
2004	1.4%	1.1%	0.308	0.308	1.123	1.123	0.010	0.082	0.216	0.216	0.001	0.001	0.207	0.207	0.001	0.001
2005	2.3%	1.8%	0.300	0.300	0.114	0.114	0.010	0.028	0.209	0.209	0.001	0.001	0.207	0.207	0.001	0.001
2006	1.2%	1.0%	0.291	0.291	0.114	0.114	0.010	0.028	0.202	0.202	0.001	0.001	0.207	0.207	0.001	0.001
2007	3.1%	2.4%	0.241	0.241	0.014	0.014	0.010	0.028	0.167	0.167	0.001	0.001	0.010	0.010	0.001	0.001
2008	5.4%	4.2%	0.097	0.097	0.014	0.014	0.001	0.028	0.059	0.059	0.001	0.001	0.010	0.010	0.001	0.001
2009	5.4%	4.2%	0.074	0.074	0.014	0.014	0.001	0.002	0.044	0.044	0.001	0.001	0.010	0.010	0.002	0.002
2010	7.9%	6.1%	0.060	0.060	0.014	0.014	0.001	0.002	0.036	0.036	0.001	0.001	0.009	0.009	0.002	0.002
2011	9.8%	7.6%	0.020	0.020	0.014	0.014	0.001	0.002	0.012	0.012	0.001	0.001	0.009	0.009	0.003	0.003
2012	17.4%	36.0%	0.009	0.009	0.014	0.014	0.002	0.002	0.006	0.006	0.002	0.002	0.008	0.008	0.004	0.004
2013	15.8%	12.3%	0.009	0.009	0.014	0.014	0.003	0.002	0.005	0.005	0.003	0.003	0.008	0.008	0.006	0.006
2014	18.6%	14.4%	0.007	0.007	0.014	0.014	0.004	0.002	0.004	0.004	0.004	0.004	0.007	0.007	0.008	0.008
2015	7.8%	6.0%	0.006	0.006	0.014	0.014	0.005	0.002	0.004	0.004	0.005	0.005	0.006	0.006	0.011	0.011
Unconrolled Type EF[3]			0.110	0.110	0.086	0.086	0.004	0.009	0.074	0.074	0.003	0.003	0.027	0.027	0.006	0.006
Controlled Type EF[3]			0.087	0.087	0.070	0.070	0.003	0.007	0.058	0.058	0.003	0.003	0.023	0.023	0.005	0.005
Fleet Distribution			25.1%	58.2%	3.5%	0.2%	1.0%	1.5%	2.1%	0.8%	3.5%	1.9%	1.0%	0	1.0%	0
Uncontrolled Fleet EF[4]			**0.098**													
Controlled Fleet EF[4]			**0.078**													

Model Year	Idling Exhaust (g/hr)[2]															
	Motor Coach		Urban Bus				Mini-Bus				Van					
	Diesel	Biodiesel	Diesel	Biodiesel	Gasoline	CNG	Diesel	Biodiesel	Gasoline	CNG	Diesel	Biodiesel	Gasoline	CNG		
1989	3.062	3.062	3.687	3.687	0.087	0.128	3.183	3.183	0.156	0.156	2.101	2.101	0.236	0.236		
1990	3.062	3.062	3.687	3.687	0.087	0.128	3.183	3.183	0.156	0.156	2.101	2.101	0.250	0.250		
1991	2.290	2.290	5.615	5.615	0.087	0.128	2.259	2.259	0.087	0.087	2.101	2.101	0.138	0.138		
1992	2.290	2.290	5.615	5.615	0.087	0.128	2.259	2.259	0.087	0.087	2.101	2.101	0.143	0.143		
1993	2.290	2.290	5.615	5.615	0.087	0.128	2.259	2.259	0.087	0.087	0.517	0.517	0.150	0.150		
1994	1.721	1.721	5.615	5.615	0.025	0.128	1.612	1.612	0.087	0.087	0.517	0.517	0.153	0.153		
1995	1.721	1.721	6.842	6.842	0.025	0.128	1.612	1.612	0.087	0.087	0.517	0.517	0.153	0.153		
1996	0.746	0.746	8.212	8.212	0.025	0.206	0.698	0.698	0.087	0.087	0.517	0.517	0.044	0.044		
1997	0.746	0.746	8.212	8.212	0.025	0.206	0.698	0.698	0.087	0.087	0.517	0.517	0.044	0.044		
1998	0.527	0.527	8.212	8.212	0.025	0.206	0.452	0.452	0.025	0.025	0.517	0.517	0.045	0.045		
1999	0.527	0.527	2.807	2.807	0.025	0.206	0.452	0.452	0.025	0.025	0.517	0.517	0.046	0.046		
2000	0.527	0.527	2.807	2.807	0.025	0.206	0.452	0.452	0.025	0.025	0.517	0.517	0.047	0.047		
2001	0.527	0.527	2.807	2.807	0.025	0.206	0.452	0.452	0.025	0.025	0.517	0.517	0.049	0.049		
2002	0.527	0.527	2.807	2.807	0.025	0.206	0.452	0.452	0.025	0.025	0.517	0.517	0.049	0.049		
2003	0.408	0.408	2.807	2.807	0.025	0.206	0.369	0.369	0.025	0.025	0.517	0.517	0.049	0.049		
2004	0.408	0.408	2.807	2.807	0.025	0.206	0.369	0.369	0.002	0.002	0.517	0.517	0.003	0.003		
2005	0.408	0.408	0.284	0.284	0.025	0.071	0.369	0.369	0.002	0.002	0.517	0.517	0.003	0.003		
2006	0.408	0.408	0.284	0.284	0.025	0.071	0.369	0.369	0.002	0.002	0.517	0.517	0.003	0.003		
2007	0.356	0.356	0.036	0.036	0.025	0.071	0.323	0.323	0.002	0.002	0.026	0.026	0.003	0.003		
2008	0.030	0.030	0.036	0.036	0.002	0.071	0.027	0.027	0.002	0.002	0.025	0.025	0.004	0.004		
2009	0.001	0.001	0.036	0.036	0.002	0.004	0.001	0.001	0.002	0.002	0.024	0.024	0.004	0.004		
2010	0.001	0.001	0.036	0.036	0.003	0.004	0.001	0.001	0.003	0.003	0.023	0.023	0.005	0.005		
2011	0.001	0.001	0.036	0.036	0.004	0.004	0.001	0.001	0.004	0.004	0.021	0.021	0.007	0.007		
2012	0.001	0.001	0.036	0.036	0.005	0.004	0.001	0.001	0.005	0.005	0.020	0.020	0.010	0.010		
2013	0.001	0.001	0.036	0.036	0.008	0.004	0.001	0.001	0.008	0.008	0.019	0.019	0.015	0.015		
2014	0.001	0.001	0.036	0.036	0.011	0.004	0.001	0.001	0.011	0.011	0.018	0.018	0.021	0.021		
2015	0.001	0.001	0.036	0.036	0.014	0.004	0.001	0.001	0.014	0.014	0.016	0.016	0.026	0.026		
Unconrolled Type EF[3]	0.062	0.062	0.215	0.215	0.009	0.022	0.057	0.057	0.008	0.008	0.068	0.068	0.014	0.014		
Controlled Type EF[3]	0.048	0.048	0.175	0.175	0.008	0.018	0.044	0.044	0.007	0.007	0.057	0.057	0.013	0.013		
Fleet Distribution	25.1%	58.2%	3.5%	0.2%	1.0%	1.5%	2.1%	0.8%	3.5%	1.9%	1.0%	0	1.0%	0		
Uncontrolled Fleet EF[4]	**0.063**															
Controlled Fleet EF[4]	**0.049**															

Notes:

1. Running emission factors are pulled from EMFAC2014 for San Francisco County at a speed of 5 mph. If a given model year was not provided, the closest preceding year with an emission factor was used.
   Vehicle types are paired with EMFAC2014 vehicle classes as follows: Motor Coach = Motor Coach, Urban Bus = UBUS, Diesel Mini-Bus = All Other Buses, Gasoline Mini-Bus = OBUS, Van = MDV
   Biodiesel emission factors are considered equivalent to diesel. CNG is considered equivalent to gasoline, except for CNG Urban Buses, where EMFAC2014 provides emission factors.
2. Idling emission factors are either as provided in EMFAC2014 for San Francisco County, or calculated as the running 5mph emission rate multiplied by 2.5 per ARB guidance.
3. Uncontrolled and Controlled Type emission factors are calculated by weighting the fleet distribution by model year.
4. Uncontrolled and Controlled Fleet emission factors are calculated by weighting the type emission factor by the distribution of vehicle types in the fleet.

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Table B4: Gasoline TOG Emission Factors - 2016 Calendar Year
SFMTA Commuter Shuttle Project
San Francisco, California

Model Year	Uncontrolled Fleet	Controlled Fleet	Running Exhaust (g/mile)[1]						Idling Exhaust (g/hr)[2]					
			Urban Bus		Mini-Bus		Van		Urban Bus		Mini-Bus		Van	
			Gasoline	CNG	Gasoline	CNG	Gasoline	CNG	Gasoline	CNG	Gasoline	CNG	Gasoline	CNG
1989	0.2%	0.1%	14.50	35.1	4.11	4.1	2.57	2.57	36.3	87.8	19.4	10.27	6.43	6.43
1990	0.2%	0.1%	14.36	35.1	4.22	4.2	2.56	2.56	35.9	87.8	19.4	10.55	6.40	6.40
1991	0	0	14.36	35.1	4.44	4.4	2.55	2.55	35.9	87.8	19.7	11.09	6.38	6.38
1992	0	0	13.78	35.1	4.44	4.4	2.57	2.57	34.4	87.8	19.7	11.09	6.43	6.43
1993	0	0	13.78	35.1	4.44	4.4	2.61	2.61	34.4	87.8	19.7	11.09	6.52	6.52
1994	0	0	14.47	35.1	4.49	4.5	2.62	2.62	36.2	87.8	19.7	11.22	6.54	6.54
1995	0	0	14.47	35.1	4.29	4.3	2.16	2.16	36.2	87.8	19.7	10.72	5.39	5.39
1996	0.2%	0.1%	14.47	48.6	4.31	4.3	1.39	1.39	36.2	121.6	19.7	10.78	3.46	3.46
1997	0.2%	0.1%	14.33	48.6	4.07	4.1	1.37	1.37	35.8	121.6	19.7	10.17	3.43	3.43
1998	0.2%	0.1%	14.33	48.6	4.72	4.7	1.22	1.22	35.8	121.6	22.9	11.81	3.05	3.05
1999	0.9%	0.7%	0.29	48.6	4.59	4.6	1.09	1.09	0.7	121.6	22.9	11.47	2.73	2.73
2000	0.8%	0.6%	0.30	48.6	4.47	4.5	0.96	0.96	0.7	121.6	22.9	11.19	2.41	2.41
2001	0.5%	0.4%	0.27	48.6	4.50	4.5	0.84	0.84	0.7	121.6	22.9	11.25	2.11	2.11
2002	0.3%	0.2%	0.28	48.6	4.33	4.3	0.82	0.82	0.7	121.6	22.9	10.82	2.06	2.06
2003	0.5%	0.4%	0.28	48.6	4.18	4.2	0.76	0.76	0.7	121.6	22.9	10.46	1.90	1.90
2004	1.4%	1.1%	0.28	48.6	0.13	0.1	0.22	0.22	0.7	121.6	22.9	0.34	0.55	0.55
2005	2.3%	1.8%	0.28	70.6	0.08	0.1	0.21	0.21	0.7	176.4	22.9	0.21	0.51	0.51
2006	1.2%	1.0%	0.28	70.6	0.08	0.1	0.18	0.18	0.7	176.4	22.9	0.21	0.45	0.45
2007	3.1%	2.4%	0.28	70.6	0.08	0.1	0.16	0.16	0.7	176.4	22.9	0.21	0.41	0.41
2008	5.4%	4.2%	0.11	70.6	0.08	0.1	0.15	0.15	0.3	176.4	22.9	0.21	0.37	0.37
2009	5.4%	4.2%	0.11	8.7	0.08	0.1	0.14	0.14	0.3	21.8	22.9	0.21	0.34	0.34
2010	7.9%	6.1%	0.11	8.7	0.08	0.1	0.13	0.13	0.3	21.8	22.9	0.21	0.31	0.31
2011	9.8%	7.6%	0.11	8.7	0.08	0.1	0.12	0.12	0.3	21.8	22.9	0.21	0.29	0.29
2012	17.4%	36.0%	0.11	8.7	0.08	0.1	0.10	0.10	0.3	21.8	22.9	0.21	0.26	0.26
2013	15.8%	12.3%	0.11	8.7	0.08	0.1	0.10	0.10	0.3	21.8	22.9	0.21	0.24	0.24
2014	18.6%	14.4%	0.11	8.7	0.11	0.1	0.09	0.09	0.3	21.8	29.3	0.26	0.23	0.23
2015	7.8%	6.0%	0.11	8.7	0.11	0.1	0.08	0.08	0.3	21.8	29.3	0.26	0.19	0.19
Uncontrolled Type EF[3]			0.24	18.2	0.25	0.3	0.15	0.15	0.6	45.5	24.6	0.63	0.38	0.38
Controlled Type EF[3]			0.21	16.1	0.21	0.2	0.14	0.14	0.5	40.2	24.2	0.53	0.35	0.35
Fleet Distribution			1.0%	1.5%	3.5%	1.9%	1.0%	0	1.0%	1.5%	3.5%	1.9%	1.0%	0
Uncontrolled Fleet EF[4]			**0.28**						**1.56**					
Controlled Fleet EF[4]			**0.25**						**1.46**					

Notes:

1. Running emission factors are pulled from EMFAC2014 for San Francisco County at a speed of 5 mph. If a given model year was not provided, the closest preceding year with an emission factor was used.

   Vehicle types are paired with EMFAC2014 vehicle classes as follows: Motor Coach = Motor Coach, Urban Bus = UBUS, Diesel Mini-Bus = All Other Buses, Gasoline Mini-Bus = OBUS, Van = MDV

   Biodiesel emission factors are considered equivalent to diesel. CNG is considered equivalent to gasoline, except for CNG Urban Buses, where EMFAC2014 provides emission factors.

2. Idling emission factors are either as provided in EMFAC2014 for San Francisco County, or calculated as the running 5mph emission rate multiplied by 2.5 per ARB guidance.
3. Uncontrolled and Controlled Type emission factors are calculated by weighting the fleet distribution by model year.
4. Uncontrolled and Controlled Fleet emission factors are calculated by weighting the type emission factor by the distribution of vehicle types in the fleet.

Table B5: PM10 Emission Factors - 2020 Calendar Year
SFMTA Commuter Shuttle Project
San Francisco, California

Model Year	Controlled Fleet	Running Exhaust (g/mile)[1]								Idling Exhaust (g/hr)[2]							
		Motor Coach		Urban Bus		Mini-Bus		Van		Motor Coach		Urban Bus		Mini-Bus		Van	
		Diesel	Biodiesel	Diesel	Biodiesel	Diesel	Biodiesel	Diesel	Biodiesel	Diesel	Biodiesel	Diesel	Biodiesel	Diesel	Biodiesel	Diesel	Biodiesel
2012	12.5%	0.013	0.013	0.015	0.015	0.008	0.008	0.010	0.010	0.001	0.001	0.038	0.038	0.001	0.001	0.026	0.026
2013	12.5%	0.012	0.012	0.015	0.015	0.007	0.007	0.010	0.010	0.001	0.001	0.038	0.038	0.001	0.001	0.025	0.025
2014	12.5%	0.010	0.010	0.015	0.015	0.006	0.006	0.009	0.009	0.001	0.001	0.038	0.038	0.001	0.001	0.024	0.024
2015	12.5%	0.009	0.009	0.015	0.015	0.005	0.005	0.009	0.009	0.001	0.001	0.038	0.038	0.001	0.001	0.022	0.022
2016	12.5%	0.008	0.008	0.015	0.015	0.005	0.005	0.008	0.008	0.001	0.001	0.038	0.038	0.001	0.001	0.021	0.021
2017	12.5%	0.008	0.008	0.015	0.015	0.005	0.005	0.008	0.008	0.001	0.001	0.038	0.038	0.001	0.001	0.020	0.020
2018	12.5%	0.007	0.007	0.015	0.015	0.004	0.004	0.007	0.007	0.001	0.001	0.038	0.038	0.001	0.001	0.018	0.018
2019	12.5%	0.007	0.007	0.015	0.015	0.004	0.004	0.007	0.007	0.001	0.001	0.038	0.038	0.001	0.001	0.017	0.017
Controlled Type EF		0.009	0.009	0.015	0.015	0.006	0.006	0.009	0.009	0.001	0.001	0.038	0.038	0.001	0.001	0.022	0.022
Fleet Distribution		25.1%	58.2%	3.5%	0.2%	2.1%	0.8%	1.0%	0	25.1%	58.2%	3.5%	0.2%	2.1%	0.8%	1.0%	0
Controlled Fleet EF[4]		**0.009**								**0.003**							

Notes:

1. Running emission factors are pulled from EMFAC2014 for San Francisco County at a speed of 5 mph. If a given model year was not provided, the closest preceding year with an emission factor was used.

   Vehicle types are paired with EMFAC2014 vehicle classes as follows: Motor Coach = Motor Coach, Urban Bus = UBUS, Diesel Mini-Bus = All Other Buses, Gasoline Mini-Bus = OBUS, Van = MDV

   Biodiesel emission factors are considered equivalent to diesel. CNG is considered equivalent to gasoline, except for CNG Urban Buses, where EMFAC2014 provides emission factors.
2. Idling emission factors are either as provided in EMFAC2014 for San Francisco County, or calculated as the running 5mph emission rate multiplied by 2.5 per ARB guidance.
3. Uncontrolled and Controlled Type emission factors are calculated by weighting the fleet distribution by model year.
4. Uncontrolled and Controlled Fleet emission factors are calculated by weighting the type emission factor by the distribution of vehicle types in the fleet.

Table B6: Diesel TOG Emission Factors - 2020 Calendar Year
SFMTA Commuter Shuttle Project
San Francisco, California

Model Year	Controlled Fleet	Running Exhaust (g/mile)[1]								Idling Exhaust (g/hr)[2]							
		Motor Coach		Urban Bus		Mini-Bus		Van		Motor Coach		Urban Bus		Mini-Bus		Van	
		Diesel	Biodiesel	Diesel	Biodiesel	Diesel	Biodiesel	Diesel	Biodiesel	Diesel	Biodiesel	Diesel	Biodiesel	Diesel	Biodiesel	Diesel	Biodiesel
2012	12.5%	0.77	0.77	0.14	0.14	0.35	0.35	0.27	0.27	0.58	0.58	0.34	0.34	0.18	0.18	0.68	0.68
2013	12.5%	0.72	0.72	0.14	0.14	0.33	0.33	0.26	0.26	0.58	0.58	0.34	0.34	0.18	0.18	0.66	0.66
2014	12.5%	0.60	0.60	0.14	0.14	0.28	0.28	0.25	0.25	0.58	0.58	0.34	0.34	0.18	0.18	0.63	0.63
2015	12.5%	0.55	0.55	0.14	0.14	0.26	0.26	0.24	0.24	0.58	0.58	0.34	0.34	0.18	0.18	0.61	0.61
2016	12.5%	0.52	0.52	0.14	0.14	0.26	0.26	0.23	0.23	0.58	0.58	0.34	0.34	0.18	0.18	0.58	0.58
2017	12.5%	0.50	0.50	0.14	0.14	0.26	0.26	0.22	0.22	0.58	0.58	0.34	0.34	0.18	0.18	0.55	0.55
2018	12.5%	0.47	0.47	0.14	0.14	0.22	0.22	0.21	0.21	0.58	0.58	0.34	0.34	0.18	0.18	0.52	0.52
2019	12.5%	0.45	0.45	0.14	0.14	0.21	0.21	0.20	0.20	0.58	0.58	0.34	0.34	0.18	0.18	0.49	0.49
Controlled Type EF		0.57	0.57	0.14	0.14	0.27	0.27	0.24	0.24	0.58	0.58	0.34	0.34	0.18	0.18	0.59	0.59
Fleet Distribution		25.1%	58.2%	3.5%	0.2%	2.1%	0.8%	1.0%	0	25.1%	58.2%	3.5%	0.2%	2.1%	0.8%	1.0%	0
Controlled Fleet EF[4]		**0.49**								**0.51**							

Notes:

1. Running emission factors are pulled from EMFAC2014 for San Francisco County at a speed of 5 mph. If a given model year was not provided, the closest preceding year with an emission factor was used.

   Vehicle types are paired with EMFAC2014 vehicle classes as follows: Motor Coach = Motor Coach, Urban Bus = UBUS, Diesel Mini-Bus = All Other Buses, Gasoline Mini-Bus = OBUS, Van = MDV

   Biodiesel emission factors are considered equivalent to diesel. CNG is considered equivalent to gasoline, except for CNG Urban Buses, where EMFAC2014 provides emission factors.
2. Idling emission factors are either as provided in EMFAC2014 for San Francisco County, or calculated as the running 5mph emission rate multiplied by 2.5 per ARB guidance.
3. Uncontrolled and Controlled Type emission factors are calculated by weighting the fleet distribution by model year.
4. Uncontrolled and Controlled Fleet emission factors are calculated by weighting the type emission factor by the distribution of vehicle types in the fleet.

Table B7: PM2.5 Emission Factors - 2020 Calendar Year
SFMTA Commuter Shuttle Project
San Francisco, California

Model Year	Controlled Fleet	Running Exhaust (g/mile)[1]													
		Motor Coach		Urban Bus				Mini-Bus				Van			
		Diesel	Biodiesel	Diesel	Biodiesel	Gasoline	CNG	Diesel	Biodiesel	Gasoline	CNG	Diesel	Biodiesel	Gasoline	CNG
2012	12.5%	0.013	0.013	0.014	0.014	0.002	0.002	0.007	0.007	0.002	0.002	0.010	0.010	0.004	0.004
2013	12.5%	0.012	0.012	0.014	0.014	0.003	0.002	0.007	0.007	0.003	0.003	0.010	0.010	0.006	0.006
2014	12.5%	0.009	0.009	0.014	0.014	0.004	0.002	0.006	0.006	0.004	0.004	0.009	0.009	0.008	0.008
2015	12.5%	0.009	0.009	0.014	0.014	0.005	0.002	0.005	0.005	0.005	0.005	0.009	0.009	0.011	0.011
2016	12.5%	0.008	0.008	0.014	0.014	0.006	0.002	0.005	0.005	0.006	0.006	0.008	0.008	0.012	0.012
2017	12.5%	0.007	0.007	0.014	0.014	0.007	0.002	0.005	0.005	0.007	0.007	0.008	0.008	0.013	0.013
2018	12.5%	0.007	0.007	0.014	0.014	0.007	0.002	0.004	0.004	0.007	0.007	0.007	0.007	0.014	0.014
2019	12.5%	0.006	0.006	0.014	0.014	0.007	0.002	0.004	0.004	0.007	0.007	0.006	0.006	0.014	0.014
Controlled Type EF		0.009	0.009	0.014	0.014	0.005	0.002	0.005	0.005	0.005	0.005	0.008	0.008	0.010	0.010
Fleet Distribution		25.1%	58.2%	3.5%	0.2%	1.0%	1.5%	2.1%	0.8%	3.5%	1.9%	1.0%	0	1.0%	0
Controlled Fleet EF[4]		**0.009**													

Model Year	Controlled Fleet	Idling Exhaust (g/hr)[2]													
		Motor Coach		Urban Bus				Mini-Bus				Van			
		Diesel	Biodiesel	Diesel	Biodiesel	Gasoline	CNG	Diesel	Biodiesel	Gasoline	CNG	Diesel	Biodiesel	Gasoline	CNG
2012	12.5%	0.001	0.001	0.036	0.036	0.005	0.004	0.001	0.001	0.005	0.005	0.025	0.025	0.010	0.010
2013	12.5%	0.001	0.001	0.036	0.036	0.008	0.004	0.001	0.001	0.008	0.008	0.024	0.024	0.015	0.015
2014	12.5%	0.001	0.001	0.036	0.036	0.011	0.004	0.001	0.001	0.011	0.011	0.023	0.023	0.021	0.021
2015	12.5%	0.001	0.001	0.036	0.036	0.014	0.004	0.001	0.001	0.014	0.014	0.021	0.021	0.026	0.026
2016	12.5%	0.001	0.001	0.036	0.036	0.016	0.004	0.001	0.001	0.016	0.016	0.020	0.020	0.030	0.030
2017	12.5%	0.001	0.001	0.036	0.036	0.017	0.004	0.001	0.001	0.017	0.017	0.019	0.019	0.033	0.033
2018	12.5%	0.001	0.001	0.036	0.036	0.017	0.004	0.001	0.001	0.017	0.017	0.018	0.018	0.034	0.034
2019	12.5%	0.001	0.001	0.036	0.036	0.018	0.004	0.001	0.001	0.018	0.018	0.016	0.016	0.034	0.034
Controlled Type EF		0.001	0.001	0.036	0.036	0.013	0.004	0.001	0.001	0.013	0.013	0.021	0.021	0.025	0.025
Fleet Distribution		25.1%	58.2%	3.5%	0.2%	1.0%	1.5%	2.1%	0.8%	3.5%	1.9%	1.0%	0	1.0%	0
Controlled Fleet EF[4]		**0.004**													

Notes:

1. Running emission factors are pulled from EMFAC2014 for San Francisco County at a speed of 5 mph. If a given model year was not provided, the closest preceding year with an emission factor was used.
   Vehicle types are paired with EMFAC2014 vehicle classes as follows: Motor Coach = Motor Coach, Urban Bus = UBUS, Diesel Mini-Bus = All Other Buses, Gasoline Mini-Bus = OBUS, Van = MDV
   Biodiesel emission factors are considered equivalent to diesel. CNG is considered equivalent to gasoline, except for CNG Urban Buses, where EMFAC2014 provides emission factors.
2. Idling emission factors are either as provided in EMFAC2014 for San Francisco County, or calculated as the running 5mph emission rate multiplied by 2.5 per ARB guidance.
3. Uncontrolled and Controlled Type emission factors are calculated by weighting the fleet distribution by model year.
4. Uncontrolled and Controlled Fleet emission factors are calculated by weighting the type emission factor by the distribution of vehicle types in the fleet.

RAMBOLL ENVIRON

Table B8: Gasoline TOG Emission Factors - 2020 Calendar Year
SFMTA Commuter Shuttle Project
San Francisco, California

Model Year	Controlled Fleet	Running Exhaust (g/mile)[1]						Idling Exhaust (g/hr)[2]					
		Urban Bus		Mini-Bus		Van		Urban Bus		Mini-Bus		Van	
		Gasoline	CNG	Gasoline	CNG	Gasoline	CNG	Gasoline	CNG	Gasoline	CNG	Gasoline	CNG
2012	12.5%	0.11	8.7	0.08	0.08	0.14	0.14	0.26	21.8	22.2	0.20	0.34	0.34
2013	12.5%	0.11	8.7	0.08	0.08	0.13	0.13	0.26	21.8	22.2	0.20	0.33	0.33
2014	12.5%	0.11	8.7	0.08	0.08	0.13	0.13	0.26	21.8	22.2	0.20	0.31	0.31
2015	12.5%	0.11	8.7	0.08	0.08	0.11	0.11	0.26	21.8	22.2	0.20	0.27	0.27
2016	12.5%	0.11	8.7	0.08	0.08	0.09	0.09	0.26	21.8	22.2	0.20	0.23	0.23
2017	12.5%	0.11	8.7	0.08	0.08	0.08	0.08	0.26	21.8	22.2	0.20	0.19	0.19
2018	12.5%	0.11	8.7	0.11	0.11	0.07	0.07	0.26	21.8	29.3	0.26	0.18	0.18
2019	12.5%	0.11	8.7	0.11	0.11	0.06	0.06	0.26	21.8	29.3	0.26	0.16	0.16
Controlled Type EF		0.11	8.7	0.09	0.09	0.10	0.10	0.26	21.8	24.0	0.22	0.25	0.25
Fleet Distribution		1.0%	1.5%	3.5%	1.9%	1.0%	0	1.0%	1.5%	3.5%	1.9%	1.0%	0
Controlled Fleet EF[4]		**0.13**						**1.18**					

Notes:

1. Running emission factors are pulled from EMFAC2014 for San Francisco County at a speed of 5 mph. If a given model year was not provided, the closest preceding year with an emission factor was used.

   Vehicle types are paired with EMFAC2014 vehicle classes as follows: Motor Coach = Motor Coach, Urban Bus = UBUS, Diesel Mini-Bus = All Other Buses, Gasoline Mini-Bus = OBUS, Van = MDV

   Biodiesel emission factors are considered equivalent to diesel. CNG is considered equivalent to gasoline, except for CNG Urban Buses, where EMFAC2014 provides emission factors.

2. Idling emission factors are either as provided in EMFAC2014 for San Francisco County, or calculated as the running 5mph emission rate multiplied by 2.5 per ARB guidance.
3. Uncontrolled and Controlled Type emission factors are calculated by weighting the fleet distribution by model year.
4. Uncontrolled and Controlled Fleet emission factors are calculated by weighting the type emission factor by the distribution of vehicle types in the fleet.

Table B9: PM10 Emission Factors - 2024 Calendar Year
SFMTA Commuter Shuttle Project
San Francisco, California

Model Year	Uncontrolled Fleet	Controlled Fleet	Running Exhaust (g/mile)[1]								Idling Exhaust (g/hr)[2]							
			Motor Coach		Urban Bus		Mini-Bus		Van		Motor Coach		Urban Bus		Mini-Bus		Van	
			Diesel	Biodiesel	Diesel	Biodiesel	Diesel	Biodiesel	Diesel	Biodiesel	Diesel	Biodiesel	Diesel	Biodiesel	Diesel	Biodiesel	Diesel	Biodiesel
1997	0.2%	0	1.657	1.657	3.433	3.433	1.282	1.282	0.216	0.216	0.779	0.7793	8.584	8.584	0.7299	0.7299	0.540	0.540
1998	0.2%	0	1.619	1.619	3.433	3.433	1.195	1.195	0.216	0.216	0.551	0.5509	8.584	8.584	0.4729	0.4729	0.540	0.540
1999	0	0	1.702	1.702	1.174	1.174	1.219	1.219	0.216	0.216	0.551	0.5509	2.934	2.934	0.4729	0.4729	0.540	0.540
2000	0	0	1.701	1.701	1.174	1.174	1.195	1.195	0.216	0.216	0.551	0.5509	2.934	2.934	0.4729	0.4729	0.540	0.540
2001	0	0	1.672	1.672	1.174	1.174	1.168	1.168	0.216	0.216	0.551	0.5509	2.934	2.934	0.4729	0.4729	0.540	0.540
2002	0	0	1.639	1.639	1.174	1.174	1.140	1.140	0.216	0.216	0.551	0.5509	2.934	2.934	0.4729	0.4729	0.540	0.540
2003	0	0	0.539	0.539	1.174	1.174	0.232	0.232	0.216	0.216	0.426	0.4262	2.934	2.934	0.3859	0.3859	0.540	0.540
2004	0.2%	0	0.322	0.322	1.174	1.174	0.225	0.225	0.216	0.216	0.426	0.4262	2.934	2.934	0.3859	0.3859	0.540	0.540
2005	0.2%	0	0.313	0.313	0.119	0.119	0.219	0.219	0.216	0.216	0.426	0.4262	0.297	0.297	0.3859	0.3859	0.540	0.540
2006	0.2%	0	0.304	0.304	0.119	0.119	0.211	0.211	0.216	0.216	0.426	0.4262	0.297	0.297	0.3859	0.3859	0.540	0.540
2007	0.9%	0	0.252	0.252	0.015	0.015	0.175	0.175	0.013	0.013	0.373	0.3726	0.038	0.038	0.3374	0.3374	0.033	0.033
2008	0.8%	0	0.102	0.102	0.015	0.015	0.062	0.062	0.013	0.013	0.032	0.0317	0.038	0.038	0.0287	0.0287	0.033	0.033
2009	0.5%	0	0.077	0.077	0.015	0.015	0.046	0.046	0.013	0.013	0.001	0.0015	0.038	0.038	0.0014	0.0014	0.032	0.032
2010	0.3%	0	0.063	0.063	0.015	0.015	0.038	0.038	0.013	0.013	0.001	0.0015	0.038	0.038	0.0014	0.0014	0.031	0.031
2011	0.5%	0	0.021	0.021	0.015	0.015	0.013	0.013	0.012	0.012	0.001	0.0015	0.038	0.038	0.0014	0.0014	0.031	0.031
2012	1.4%	0	0.016	0.016	0.015	0.015	0.009	0.009	0.012	0.012	0.001	0.0015	0.038	0.038	0.0014	0.0014	0.030	0.030
2013	2.3%	0	0.015	0.015	0.015	0.015	0.009	0.009	0.012	0.012	0.001	0.0015	0.038	0.038	0.0014	0.0014	0.029	0.029
2014	1.2%	0	0.012	0.012	0.015	0.015	0.007	0.007	0.011	0.011	0.001	0.0015	0.038	0.038	0.0014	0.0014	0.028	0.028
2015	3.1%	0	0.011	0.011	0.015	0.015	0.007	0.007	0.011	0.011	0.001	0.0015	0.038	0.038	0.0014	0.0014	0.027	0.027
2016	5.4%	12.5%	0.011	0.011	0.015	0.015	0.007	0.007	0.010	0.010	0.001	0.0015	0.038	0.038	0.0014	0.0014	0.026	0.026
2017	5.4%	12.5%	0.010	0.010	0.015	0.015	0.007	0.007	0.010	0.010	0.001	0.0015	0.038	0.038	0.0014	0.0014	0.025	0.025
2018	7.9%	12.5%	0.009	0.009	0.015	0.015	0.006	0.006	0.009	0.009	0.001	0.0015	0.038	0.038	0.0014	0.0014	0.024	0.024
2019	9.8%	12.5%	0.009	0.009	0.015	0.015	0.005	0.005	0.009	0.009	0.001	0.0015	0.038	0.038	0.0014	0.0014	0.022	0.022
2020	17.4%	12.5%	0.008	0.008	0.015	0.015	0.005	0.005	0.008	0.008	0.001	0.0015	0.038	0.038	0.0014	0.0014	0.021	0.021
2021	15.8%	12.5%	0.008	0.008	0.015	0.015	0.005	0.005	0.001	0.001	0.001	0.0015	0.038	0.038	0.0014	0.0014	0.003	0.003
2022	18.6%	12.5%	0.007	0.007	0.015	0.015	0.004	0.004	0.001	0.001	0.001	0.0015	0.038	0.038	0.0014	0.0014	0.003	0.003
2023	7.8%	12.5%	0.007	0.007	0.015	0.015	0.004	0.004	0.001	0.001	0.001	0.0015	0.038	0.038	0.0014	0.0014	0.003	0.003
Uncontrolled Type EF[3]			0.019	0.019	0.028	0.028	0.012	0.012	0.008	0.008	0.009	0.0092	0.069	0.069	0.0084	0.0084	0.019	0.019
Controlled Type EF[3]			0.009	0.009	0.015	0.015	0.005	0.005	0.006	0.006	0.001	0.0015	0.038	0.038	0.0014	0.0014	0.016	0.016
Fleet Distribution			25.1%	58.2%	3.5%	0.2%	2.1%	0.8%	1.0%	0	25.1%	58.2%	3.5%	0.2%	2.1%	0.8%	1.0%	0
Uncontrolled Fleet EF[4]			**0.017**								**0.011**							
Controlled Fleet EF[4]			**0.008**								**0.003**							

Notes:

1. Running emission factors are pulled from EMFAC2014 for San Francisco County at a speed of 5 mph. If a given model year was not provided, the closest preceding year with an emission factor was used.
   Vehicle types are paired with EMFAC2014 vehicle classes as follows: Motor Coach = Motor Coach, Urban Bus = UBUS, Diesel Mini-Bus = All Other Buses, Gasoline Mini-Bus = OBUS, Van = MDV
   Biodiesel emission factors are considered equivalent to diesel. CNG is considered equivalent to gasoline, except for CNG Urban Buses, where EMFAC2014 provides emission factors.
2. Idling emission factors are either as provided in EMFAC2014 for San Francisco County, or calculated as the running 5mph emission rate multiplied by 2.5 per ARB guidance.
3. Uncontrolled and Controlled Type emission factors are calculated by weighting the fleet distribution by model year.
4. Uncontrolled and Controlled Fleet emission factors are calculated by weighting the type emission factor by the distribution of vehicle types in the fleet.

Table B10: Diesel TOG Emission Factors - 2024 Calendar Year
SFMTA Commuter Shuttle Project
San Francisco, California

Model Year	Uncontrolled Fleet	Controlled Fleet	Running Exhaust (g/mile)[1]								Idling Exhaust (g/hr)[2]							
			Motor Coach		Urban Bus		Mini-Bus		Van		Motor Coach		Urban Bus		Mini-Bus		Van	
			Diesel	Biodiesel	Diesel	Biodiesel	Diesel	Biodiesel	Diesel	Biodiesel	Diesel	Biodiesel	Diesel	Biodiesel	Diesel	Biodiesel	Diesel	Biodiesel
1997	0.2%	0	10.58	10.58	8.83	8.83	6.11	6.11	0.40	0.40	5.92	5.92	22.07	22.07	2.36	2.36	1.00	1.00
1998	0.2%	0	10.55	10.55	8.83	8.83	5.95	5.95	0.40	0.40	4.52	4.52	22.07	22.07	1.47	1.47	1.00	1.00
1999	0	0	10.84	10.84	8.83	8.83	5.93	5.93	0.40	0.40	4.52	4.52	22.07	22.07	1.47	1.47	1.00	1.00
2000	0	0	10.84	10.84	8.83	8.83	5.77	5.77	0.40	0.40	4.52	4.52	22.07	22.07	1.47	1.47	1.00	1.00
2001	0	0	10.58	10.58	8.83	8.83	5.60	5.60	0.40	0.40	4.52	4.52	22.07	22.07	1.47	1.47	1.00	1.00
2002	0	0	10.30	10.30	8.83	8.83	5.41	5.41	0.40	0.40	4.52	4.52	22.07	22.07	1.47	1.47	1.00	1.00
2003	0	0	5.99	5.99	8.83	8.83	3.00	3.00	0.40	0.40	3.70	3.70	22.07	22.07	1.18	1.18	1.00	1.00
2004	0.2%	0	5.54	5.54	8.83	8.83	2.88	2.88	0.40	0.40	3.70	3.70	22.07	22.07	1.18	1.18	1.00	1.00
2005	0.2%	0	5.33	5.33	0.36	0.36	2.76	2.76	0.40	0.40	3.70	3.70	0.91	0.91	1.18	1.18	1.00	1.00
2006	0.2%	0	5.08	5.08	0.36	0.36	2.64	2.64	0.40	0.40	3.70	3.70	0.91	0.91	1.18	1.18	1.00	1.00
2007	0.9%	0	3.55	3.55	0.14	0.14	1.80	1.80	0.33	0.33	3.19	3.19	0.34	0.34	1.02	1.02	0.82	0.82
2008	0.8%	0	2.46	2.46	0.14	0.14	1.12	1.12	0.32	0.32	2.82	2.82	0.34	0.34	0.90	0.90	0.80	0.80
2009	0.5%	0	2.19	2.19	0.14	0.14	1.01	1.01	0.32	0.32	2.66	2.66	0.34	0.34	0.85	0.85	0.81	0.81
2010	0.3%	0	1.87	1.87	0.14	0.14	0.86	0.86	0.32	0.32	2.35	2.35	0.34	0.34	0.75	0.75	0.79	0.79
2011	0.5%	0	0.89	0.89	0.14	0.14	0.41	0.41	0.31	0.31	0.97	0.97	0.34	0.34	0.31	0.31	0.78	0.78
2012	1.4%	0	0.90	0.90	0.14	0.14	0.40	0.40	0.30	0.30	0.58	0.58	0.34	0.34	0.18	0.18	0.76	0.76
2013	2.3%	0	0.85	0.85	0.14	0.14	0.38	0.38	0.30	0.30	0.58	0.58	0.34	0.34	0.18	0.18	0.74	0.74
2014	1.2%	0	0.70	0.70	0.14	0.14	0.32	0.32	0.29	0.29	0.58	0.58	0.34	0.34	0.18	0.18	0.72	0.72
2015	3.1%	0	0.65	0.65	0.14	0.14	0.30	0.30	0.28	0.28	0.58	0.58	0.34	0.34	0.18	0.18	0.70	0.70
2016	5.4%	12.5%	0.63	0.63	0.14	0.14	0.30	0.30	0.27	0.27	0.58	0.58	0.34	0.34	0.18	0.18	0.68	0.68
2017	5.4%	12.5%	0.60	0.60	0.14	0.14	0.30	0.30	0.26	0.26	0.58	0.58	0.34	0.34	0.18	0.18	0.66	0.66
2018	7.9%	12.5%	0.58	0.58	0.14	0.14	0.27	0.27	0.25	0.25	0.58	0.58	0.34	0.34	0.18	0.18	0.63	0.63
2019	9.8%	12.5%	0.55	0.55	0.14	0.14	0.26	0.26	0.24	0.24	0.58	0.58	0.34	0.34	0.18	0.18	0.61	0.61
2020	17.4%	12.5%	0.52	0.52	0.14	0.14	0.25	0.25	0.23	0.23	0.58	0.58	0.34	0.34	0.18	0.18	0.58	0.58
2021	15.8%	12.5%	0.50	0.50	0.14	0.14	0.24	0.24	0.08	0.08	0.58	0.58	0.34	0.34	0.18	0.18	0.19	0.19
2022	18.6%	12.5%	0.47	0.47	0.14	0.14	0.22	0.22	0.07	0.07	0.58	0.58	0.34	0.34	0.18	0.18	0.17	0.17
2023	7.8%	12.5%	0.45	0.45	0.14	0.14	0.21	0.21	0.06	0.06	0.58	0.58	0.34	0.34	0.18	0.18	0.15	0.15
Uncontrolled Type EF[3]			0.65	0.65	0.18	0.18	0.31	0.31	0.18	0.18	0.67	0.67	0.45	0.45	0.21	0.21	0.45	0.45
Controlled Type EF[3]			0.54	0.54	0.14	0.14	0.25	0.25	0.18	0.18	0.58	0.58	0.34	0.34	0.18	0.18	0.46	0.46
Fleet Distribution			25.1%	58.2%	3.5%	0.2%	2.1%	0.8%	1.0%	0	25.1%	58.2%	3.5%	0.2%	2.1%	0.8%	1.0%	0
Uncontrolled Fleet EF[4]			**0.56**								**0.58**							
Controlled Fleet EF[4]			**0.46**								**0.51**							

Notes:

1. Running emission factors are pulled from EMFAC2014 for San Francisco County at a speed of 5 mph. If a given model year was not provided, the closest preceding year with an emission factor was used.
   Vehicle types are paired with EMFAC2014 vehicle classes as follows: Motor Coach = Motor Coach, Urban Bus = UBUS, Diesel Mini-Bus = All Other Buses, Gasoline Mini-Bus = OBUS, Van = MDV
   Biodiesel emission factors are considered equivalent to diesel. CNG is considered equivalent to gasoline, except for CNG Urban Buses, where EMFAC2014 provides emission factors.
2. Idling emission factors are either as provided in EMFAC2014 for San Francisco County, or calculated as the running 5mph emission rate multiplied by 2.5 per ARB guidance.
3. Uncontrolled and Controlled Type emission factors are calculated by weighting the fleet distribution by model year.
4. Uncontrolled and Controlled Fleet emission factors are calculated by weighting the type emission factor by the distribution of vehicle types in the fleet.

Table B11: PM2.5 Emission Factors - 2024 Calendar Year
SFMTA Commuter Shuttle Project
San Francisco, California

Model Year	Uncontrolled Fleet	Controlled Fleet	Running Exhaust (g/mile)[1]													
			Motor Coach		Urban Bus				Mini-Bus				Van			
			Diesel	Biodiesel	Diesel	Biodiesel	Gasoline	CNG	Diesel	Biodiesel	Gasoline	CNG	Diesel	Biodiesel	Gasoline	CNG
1997	0.2%	0	1.585	1.585	3.285	3.285	0.010	0.082	1.226	1.226	0.035	0.035	0.207	0.207	0.017	0.017
1998	0.2%	0	1.549	1.549	3.285	3.285	0.010	0.082	1.143	1.143	0.010	0.010	0.207	0.207	0.018	0.018
1999	0	0	1.628	1.628	1.123	1.123	0.010	0.082	1.167	1.167	0.010	0.010	0.207	0.207	0.018	0.018
2000	0	0	1.628	1.628	1.123	1.123	0.010	0.082	1.143	1.143	0.010	0.010	0.207	0.207	0.019	0.019
2001	0	0	1.600	1.600	1.123	1.123	0.010	0.082	1.118	1.118	0.010	0.010	0.207	0.207	0.019	0.019
2002	0	0	1.568	1.568	1.123	1.123	0.010	0.082	1.090	1.090	0.010	0.010	0.207	0.207	0.019	0.019
2003	0	0	0.515	0.515	1.123	1.123	0.010	0.082	0.222	0.222	0.010	0.010	0.207	0.207	0.019	0.019
2004	0.2%	0	0.308	0.308	1.123	1.123	0.010	0.082	0.216	0.216	0.001	0.001	0.207	0.207	0.001	0.001
2005	0.2%	0	0.300	0.300	0.114	0.114	0.010	0.028	0.209	0.209	0.001	0.001	0.207	0.207	0.001	0.001
2006	0.2%	0	0.291	0.291	0.114	0.114	0.010	0.028	0.202	0.202	0.001	0.001	0.207	0.207	0.001	0.001
2007	0.9%	0	0.241	0.241	0.014	0.014	0.010	0.028	0.167	0.167	0.001	0.001	0.013	0.013	0.001	0.001
2008	0.8%	0	0.097	0.097	0.014	0.014	0.001	0.028	0.059	0.059	0.001	0.001	0.012	0.012	0.001	0.001
2009	0.5%	0	0.074	0.074	0.014	0.014	0.001	0.002	0.044	0.044	0.001	0.001	0.012	0.012	0.002	0.002
2010	0.3%	0	0.060	0.060	0.014	0.014	0.001	0.002	0.036	0.036	0.001	0.001	0.012	0.012	0.002	0.002
2011	0.5%	0	0.020	0.020	0.014	0.014	0.001	0.002	0.012	0.012	0.001	0.001	0.012	0.012	0.003	0.003
2012	1.4%	0	0.015	0.015	0.014	0.014	0.002	0.002	0.009	0.009	0.002	0.002	0.011	0.011	0.004	0.004
2013	2.3%	0	0.014	0.014	0.014	0.014	0.003	0.002	0.008	0.008	0.003	0.003	0.011	0.011	0.006	0.006
2014	1.2%	0	0.012	0.012	0.014	0.014	0.004	0.002	0.007	0.007	0.004	0.004	0.011	0.011	0.008	0.008
2015	3.1%	0	0.011	0.011	0.014	0.014	0.005	0.002	0.006	0.006	0.005	0.005	0.010	0.010	0.011	0.011
2016	5.4%	12.5%	0.010	0.010	0.014	0.014	0.006	0.002	0.006	0.006	0.006	0.006	0.010	0.010	0.012	0.012
2017	5.4%	12.5%	0.010	0.010	0.014	0.014	0.007	0.002	0.006	0.006	0.007	0.007	0.010	0.010	0.013	0.013
2018	7.9%	12.5%	0.009	0.009	0.014	0.014	0.007	0.002	0.005	0.005	0.007	0.007	0.009	0.009	0.014	0.014
2019	9.8%	12.5%	0.009	0.009	0.014	0.014	0.007	0.002	0.005	0.005	0.007	0.007	0.009	0.009	0.014	0.014
2020	17.4%	12.5%	0.008	0.008	0.014	0.014	0.007	0.002	0.005	0.005	0.007	0.007	0.008	0.008	0.012	0.012
2021	15.8%	12.5%	0.007	0.007	0.014	0.014	0.007	0.002	0.005	0.005	0.007	0.007	0.001	0.001	0.011	0.011
2022	18.6%	12.5%	0.007	0.007	0.014	0.014	0.007	0.002	0.004	0.004	0.007	0.007	0.001	0.001	0.011	0.011
2023	7.8%	12.5%	0.006	0.006	0.014	0.014	0.007	0.002	0.004	0.004	0.007	0.007	0.001	0.001	0.011	0.011
Uncontrolled Type EF[3]			0.018	0.018	0.027	0.027	0.007	0.002	0.012	0.012	0.007	0.007	0.007	0.007	0.011	0.011
Controlled Type EF[3]			0.008	0.008	0.014	0.014	0.007	0.002	0.005	0.005	0.007	0.007	0.006	0.006	0.012	0.012
Fleet Distribution			25.1%	58.2%	3.5%	0.2%	1.0%	1.5%	2.1%	0.8%	3.5%	1.9%	1.0%	0	1.0%	0
Uncontrolled Fleet EF[4]			**0.017**													
Controlled Fleet EF[4]			**0.008**													

Model Year	Idling Exhaust (g/hr)[2]													
	Motor Coach		Urban Bus				Mini-Bus				Van			
	Diesel	Biodiesel	Diesel	Biodiesel	Gasoline	CNG	Diesel	Biodiesel	Gasoline	CNG	Diesel	Biodiesel	Gasoline	CNG
1997	0.746	0.746	8.212	8.212	0.025	0.206	0.698	0.698	0.087	0.087	0.517	0.517	0.044	0.044
1998	0.527	0.527	8.212	8.212	0.025	0.206	0.452	0.452	0.025	0.025	0.517	0.517	0.045	0.045
1999	0.527	0.527	2.807	2.807	0.025	0.206	0.452	0.452	0.025	0.025	0.517	0.517	0.046	0.046
2000	0.527	0.527	2.807	2.807	0.025	0.206	0.452	0.452	0.025	0.025	0.517	0.517	0.047	0.047
2001	0.527	0.527	2.807	2.807	0.025	0.206	0.452	0.452	0.025	0.025	0.517	0.517	0.049	0.049
2002	0.527	0.527	2.807	2.807	0.025	0.206	0.452	0.452	0.025	0.025	0.517	0.517	0.049	0.049
2003	0.408	0.408	2.807	2.807	0.025	0.206	0.369	0.369	0.025	0.025	0.517	0.517	0.049	0.049
2004	0.408	0.408	2.807	2.807	0.025	0.206	0.369	0.369	0.002	0.002	0.517	0.517	0.003	0.003
2005	0.408	0.408	0.284	0.284	0.025	0.071	0.369	0.369	0.002	0.002	0.517	0.517	0.003	0.003
2006	0.408	0.408	0.284	0.284	0.025	0.071	0.369	0.369	0.002	0.002	0.517	0.517	0.003	0.003
2007	0.356	0.356	0.036	0.036	0.025	0.071	0.323	0.323	0.002	0.002	0.032	0.032	0.003	0.003
2008	0.030	0.030	0.036	0.036	0.002	0.071	0.027	0.027	0.002	0.002	0.031	0.031	0.004	0.004
2009	0.001	0.001	0.036	0.036	0.002	0.004	0.001	0.001	0.002	0.002	0.031	0.031	0.004	0.004
2010	0.001	0.001	0.036	0.036	0.003	0.004	0.001	0.001	0.003	0.003	0.030	0.030	0.005	0.005
2011	0.001	0.001	0.036	0.036	0.004	0.004	0.001	0.001	0.004	0.004	0.029	0.029	0.007	0.007
2012	0.001	0.001	0.036	0.036	0.005	0.004	0.001	0.001	0.005	0.005	0.028	0.028	0.010	0.010
2013	0.001	0.001	0.036	0.036	0.008	0.004	0.001	0.001	0.008	0.008	0.028	0.028	0.015	0.015
2014	0.001	0.001	0.036	0.036	0.011	0.004	0.001	0.001	0.011	0.011	0.027	0.027	0.021	0.021
2015	0.001	0.001	0.036	0.036	0.014	0.004	0.001	0.001	0.014	0.014	0.026	0.026	0.026	0.026
2016	0.001	0.001	0.036	0.036	0.016	0.004	0.001	0.001	0.016	0.016	0.025	0.025	0.030	0.030
2017	0.001	0.001	0.036	0.036	0.017	0.004	0.001	0.001	0.017	0.017	0.024	0.024	0.033	0.033
2018	0.001	0.001	0.036	0.036	0.017	0.004	0.001	0.001	0.017	0.017	0.023	0.023	0.034	0.034
2019	0.001	0.001	0.036	0.036	0.018	0.004	0.001	0.001	0.018	0.018	0.021	0.021	0.034	0.034
2020	0.001	0.001	0.036	0.036	0.018	0.004	0.001	0.001	0.018	0.018	0.020	0.020	0.030	0.030
2021	0.001	0.001	0.036	0.036	0.018	0.004	0.001	0.001	0.018	0.018	0.003	0.003	0.027	0.027
2022	0.001	0.001	0.036	0.036	0.018	0.004	0.001	0.001	0.018	0.018	0.003	0.003	0.027	0.027
2023	0.001	0.001	0.036	0.036	0.018	0.004	0.001	0.001	0.018	0.018	0.003	0.003	0.027	0.027
Uncontrolled Type EF[3]	0.009	0.009	0.066	0.066	0.017	0.006	0.008	0.008	0.017	0.017	0.018	0.018	0.028	0.028
Controlled Type EF[3]	0.001	0.001	0.036	0.036	0.017	0.004	0.001	0.001	0.017	0.017	0.015	0.015	0.030	0.030
Fleet Distribution	25.1%	58.2%	3.5%	0.2%	1.0%	1.5%	2.1%	0.8%	3.5%	1.9%	1.0%	0	1.0%	0
Uncontrolled Fleet EF[4]	**0.012**													
Controlled Fleet EF[4]	**0.004**													

Notes:

1. Running emission factors are pulled from EMFAC2014 for San Francisco County at a speed of 5 mph. If a given model year was not provided, the closest preceding year with an emission factor was used.
   Vehicle types are paired with EMFAC2014 vehicle classes as follows: Motor Coach = Motor Coach, Urban Bus = UBUS, Diesel Mini-Bus = All Other Buses, Gasoline Mini-Bus = OBUS, Van = MDV
   Biodiesel emission factors are considered equivalent to diesel. CNG is considered equivalent to gasoline, except for CNG Urban Buses, where EMFAC2014 provides emission factors.
2. Idling emission factors are either as provided in EMFAC2014 for San Francisco County, or calculated as the running 5mph emission rate multiplied by 2.5 per ARB guidance.
3. Uncontrolled and Controlled Type emission factors are calculated by weighting the fleet distribution by model year.
4. Uncontrolled and Controlled Fleet emission factors are calculated by weighting the type emission factor by the distribution of vehicle types in the fleet.

RAMBOLL ENVIRON

Table B12: Gasoline TOG Emission Factors - 2024 Calendar Year
SFMTA Commuter Shuttle Project
San Francisco, California

Model Year	Uncontrolled Fleet	Controlled Fleet	Running Exhaust (g/mile)[1]						Idling Exhaust (g/hr)[2]					
			Urban Bus		Mini-Bus		Van		Urban Bus		Mini-Bus		Van	
			Gasoline	CNG	Gasoline	CNG	Gasoline	CNG	Gasoline	CNG	Gasoline	CNG	Gasoline	CNG
1997	0.2%	0	17.60	48.6	3.92	3.92	1.39	1.39	44.01	121.6	18.0	9.81	3.47	3.47
1998	0.2%	0	17.60	48.6	4.78	4.78	1.26	1.26	44.01	121.6	20.9	11.95	3.14	3.14
1999	0	0	0.33	48.6	4.67	4.67	1.14	1.14	0.83	121.6	20.9	11.69	2.84	2.84
2000	0	0	0.33	48.6	4.67	4.67	1.02	1.02	0.82	121.6	20.9	11.69	2.55	2.55
2001	0	0	0.32	48.6	4.67	4.67	0.90	0.90	0.80	121.6	20.9	11.69	2.26	2.26
2002	0	0	0.31	48.6	4.73	4.73	0.89	0.89	0.77	121.6	20.9	11.82	2.23	2.23
2003	0	0	0.31	48.6	4.52	4.52	0.83	0.83	0.77	121.6	20.9	11.30	2.09	2.09
2004	0.2%	0	0.31	48.6	0.14	0.14	0.24	0.24	0.77	121.6	20.9	0.34	0.60	0.60
2005	0.2%	0	0.31	70.6	0.08	0.08	0.23	0.23	0.77	176.4	20.9	0.19	0.57	0.57
2006	0.2%	0	0.31	70.6	0.08	0.08	0.21	0.21	0.77	176.4	20.9	0.19	0.52	0.52
2007	0.9%	0	0.31	70.6	0.08	0.08	0.19	0.19	0.77	176.4	20.9	0.19	0.47	0.47
2008	0.8%	0	0.11	70.6	0.08	0.08	0.17	0.17	0.26	176.4	20.9	0.19	0.44	0.44
2009	0.5%	0	0.11	8.7	0.08	0.08	0.16	0.16	0.26	21.8	20.9	0.19	0.41	0.41
2010	0.3%	0	0.11	8.7	0.08	0.08	0.16	0.16	0.26	21.8	20.9	0.19	0.39	0.39
2011	0.5%	0	0.11	8.7	0.08	0.08	0.15	0.15	0.26	21.8	20.9	0.19	0.38	0.38
2012	1.4%	0	0.11	8.7	0.08	0.08	0.15	0.15	0.26	21.8	20.9	0.19	0.37	0.37
2013	2.3%	0	0.11	8.7	0.08	0.08	0.15	0.15	0.26	21.8	20.9	0.19	0.37	0.37
2014	1.2%	0	0.11	8.7	0.08	0.08	0.14	0.14	0.26	21.8	20.9	0.19	0.36	0.36
2015	3.1%	0	0.11	8.7	0.08	0.08	0.13	0.13	0.26	21.8	20.9	0.19	0.32	0.32
2016	5.4%	12.5%	0.11	8.7	0.08	0.08	0.12	0.12	0.26	21.8	20.9	0.19	0.30	0.30
2017	5.4%	12.5%	0.11	8.7	0.08	0.08	0.10	0.10	0.26	21.8	20.9	0.19	0.26	0.26
2018	7.9%	12.5%	0.11	8.7	0.08	0.08	0.10	0.10	0.26	21.8	20.9	0.19	0.25	0.25
2019	9.8%	12.5%	0.11	8.7	0.08	0.08	0.09	0.09	0.26	21.8	20.9	0.19	0.22	0.22
2020	17.4%	12.5%	0.11	8.7	0.08	0.08	0.07	0.07	0.26	21.8	20.9	0.19	0.19	0.19
2021	15.8%	12.5%	0.11	8.7	0.08	0.08	0.06	0.06	0.26	21.8	20.9	0.19	0.16	0.16
2022	18.6%	12.5%	0.11	8.7	0.11	0.11	0.06	0.06	0.26	21.8	29.3	0.26	0.14	0.14
2023	7.8%	12.5%	0.11	8.7	0.11	0.11	0.04	0.04	0.26	21.8	29.3	0.26	0.11	0.11
Uncontrolled Type EF[3]			0.16	10.2	0.10	0.10	0.09	0.09	0.41	25.4	23.1	0.24	0.22	0.22
Controlled Type EF[3]			0.11	8.7	0.08	0.08	0.08	0.08	0.26	21.8	23.0	0.21	0.20	0.20
Fleet Distribution			1.0%	1.5%	3.5%	1.9%	1.0%	0	1.0%	1.5%	3.5%	1.9%	1.0%	0
Uncontrolled Fleet EF[4]			**0.16**						**1.20**					
Controlled Fleet EF[4]			**0.13**						**1.14**					

Notes:

1. Running emission factors are pulled from EMFAC2014 for San Francisco County at a speed of 5 mph. If a given model year was not provided, the closest preceding year with an emission factor was used.

   Vehicle types are paired with EMFAC2014 vehicle classes as follows: Motor Coach = Motor Coach, Urban Bus = UBUS, Diesel Mini-Bus = All Other Buses, Gasoline Mini-Bus = OBUS, Van = MDV

   Biodiesel emission factors are considered equivalent to diesel. CNG is considered equivalent to gasoline, except for CNG Urban Buses, where EMFAC2014 provides emission factors.

2. Idling emission factors are either as provided in EMFAC2014 for San Francisco County, or calculated as the running 5mph emission rate multiplied by 2.5 per ARB guidance.
3. Uncontrolled and Controlled Type emission factors are calculated by weighting the fleet distribution by model year.
4. Uncontrolled and Controlled Fleet emission factors are calculated by weighting the type emission factor by the distribution of vehicle types in the fleet.

Table B13: PM10 Emission Factors - 2032 Calendar Year
SFMTA Commuter Shuttle Project
San Francisco, California

Model Year	Uncontrolled Fleet	Controlled Fleet	Running Exhaust (g/mile)[1]								Idling Exhaust (g/hr)[2]							
			Motor Coach		Urban Bus		Mini-Bus		Van		Motor Coach		Urban Bus		Mini-Bus		Van	
			Diesel	Biodiesel	Diesel	Biodiesel	Diesel	Biodiesel	Diesel	Biodiesel	Diesel	Biodiesel	Diesel	Biodiesel	Diesel	Biodiesel	Diesel	Biodiesel
2005	0.2%	0	0.313	0.313	0.119	0.119	0.219	0.219	0.216	0.216	0.426	0.426	0.297	0.297	0.386	0.386	0.540	0.540
2006	0.2%	0	0.304	0.304	0.119	0.119	0.211	0.211	0.216	0.216	0.426	0.426	0.297	0.297	0.386	0.386	0.540	0.540
2007	0	0	0.252	0.252	0.015	0.015	0.175	0.175	0.014	0.014	0.373	0.373	0.038	0.038	0.337	0.337	0.035	0.035
2008	0	0	0.102	0.102	0.015	0.015	0.062	0.062	0.014	0.014	0.032	0.032	0.038	0.038	0.029	0.029	0.035	0.035
2009	0	0	0.077	0.077	0.015	0.015	0.046	0.046	0.014	0.014	0.001	0.001	0.038	0.038	0.001	0.001	0.035	0.035
2010	0	0	0.063	0.063	0.015	0.015	0.038	0.038	0.014	0.014	0.001	0.001	0.038	0.038	0.001	0.001	0.035	0.035
2011	0	0	0.021	0.021	0.015	0.015	0.013	0.013	0.014	0.014	0.001	0.001	0.038	0.038	0.001	0.001	0.035	0.035
2012	0.2%	0	0.018	0.018	0.015	0.015	0.011	0.011	0.014	0.014	0.001	0.001	0.038	0.038	0.001	0.001	0.034	0.034
2013	0.2%	0	0.017	0.017	0.015	0.015	0.011	0.011	0.014	0.014	0.001	0.001	0.038	0.038	0.001	0.001	0.034	0.034
2014	0.2%	0	0.014	0.014	0.015	0.015	0.009	0.009	0.013	0.013	0.001	0.001	0.038	0.038	0.001	0.001	0.034	0.034
2015	0.9%	0	0.013	0.013	0.015	0.015	0.008	0.008	0.013	0.013	0.001	0.001	0.038	0.038	0.001	0.001	0.033	0.033
2016	0.8%	0	0.013	0.013	0.015	0.015	0.008	0.008	0.013	0.013	0.001	0.001	0.038	0.038	0.001	0.001	0.033	0.033
2017	0.5%	0	0.013	0.013	0.015	0.015	0.008	0.008	0.013	0.013	0.001	0.001	0.038	0.038	0.001	0.001	0.032	0.032
2018	0.3%	0	0.013	0.013	0.015	0.015	0.008	0.008	0.013	0.013	0.001	0.001	0.038	0.038	0.001	0.001	0.031	0.031
2019	0.5%	0	0.013	0.013	0.015	0.015	0.007	0.007	0.012	0.012	0.001	0.001	0.038	0.038	0.001	0.001	0.031	0.031
2020	1.4%	0	0.012	0.012	0.015	0.015	0.007	0.007	0.012	0.012	0.001	0.001	0.038	0.038	0.001	0.001	0.030	0.030
2021	2.3%	0	0.012	0.012	0.015	0.015	0.007	0.007	0.002	0.002	0.001	0.001	0.038	0.038	0.001	0.001	0.005	0.005
2022	1.2%	0	0.012	0.012	0.015	0.015	0.007	0.007	0.002	0.002	0.001	0.001	0.038	0.038	0.001	0.001	0.005	0.005
2023	3.1%	0	0.011	0.011	0.015	0.015	0.007	0.007	0.002	0.002	0.001	0.001	0.038	0.038	0.001	0.001	0.005	0.005
2024	5.4%	12.5%	0.011	0.011	0.015	0.015	0.007	0.007	0.002	0.002	0.001	0.001	0.038	0.038	0.001	0.001	0.004	0.004
2025	5.4%	12.5%	0.011	0.011	0.015	0.015	0.006	0.006	0.002	0.002	0.001	0.001	0.038	0.038	0.001	0.001	0.004	0.004
2026	7.9%	12.5%	0.009	0.009	0.015	0.015	0.006	0.006	0.002	0.002	0.001	0.001	0.038	0.038	0.001	0.001	0.004	0.004
2027	9.8%	12.5%	0.009	0.009	0.015	0.015	0.005	0.005	0.001	0.001	0.001	0.001	0.038	0.038	0.001	0.001	0.004	0.004
2028	17.4%	12.5%	0.008	0.008	0.015	0.015	0.005	0.005	0.001	0.001	0.001	0.001	0.038	0.038	0.001	0.001	0.004	0.004
2029	15.8%	12.5%	0.008	0.008	0.015	0.015	0.005	0.005	0.001	0.001	0.001	0.001	0.038	0.038	0.001	0.001	0.003	0.003
2030	18.6%	12.5%	0.007	0.007	0.015	0.015	0.004	0.004	0.001	0.001	0.001	0.001	0.038	0.038	0.001	0.001	0.003	0.003
2031	7.8%	12.5%	0.007	0.007	0.015	0.015	0.004	0.004	0.001	0.001	0.001	0.001	0.038	0.038	0.001	0.001	0.003	0.003
Uncontrolled Type EF[3]			0.010	0.010	0.015	0.015	0.006	0.006	0.003	0.003	0.003	0.003	0.038	0.038	0.003	0.003	0.007	0.007
Controlled Type EF[3]			0.009	0.009	0.015	0.015	0.005	0.005	0.001	0.001	0.001	0.001	0.038	0.038	0.001	0.001	0.004	0.004
Fleet Distribution			25.1%	58.2%	3.5%	0.2%	2.1%	0.8%	1.0%	0	25.1%	58.2%	3.5%	0.2%	2.1%	0.8%	1.0%	0
Uncontrolled Fleet EF[4]			**0.009**								**0.004**							
Controlled Fleet EF[4]			**0.008**								**0.003**							

Notes:

1. Running emission factors are pulled from EMFAC2014 for San Francisco County at a speed of 5 mph. If a given model year was not provided, the closest preceding year with an emission factor was used.
   Vehicle types are paired with EMFAC2014 vehicle classes as follows: Motor Coach = Motor Coach, Urban Bus = UBUS, Diesel Mini-Bus = All Other Buses, Gasoline Mini-Bus = OBUS, Van = MDV
   Biodiesel emission factors are considered equivalent to diesel. CNG is considered equivalent to gasoline, except for CNG Urban Buses, where EMFAC2014 provides emission factors.
2. Idling emission factors are either as provided in EMFAC2014 for San Francisco County, or calculated as the running 5mph emission rate multiplied by 2.5 per ARB guidance.
3. Uncontrolled and Controlled Type emission factors are calculated by weighting the fleet distribution by model year.
4. Uncontrolled and Controlled Fleet emission factors are calculated by weighting the type emission factor by the distribution of vehicle types in the fleet.

Table B14: Diesel TOG Emission Factors - 2032 Calendar Year
SFMTA Commuter Shuttle Project
San Francisco, California

Model Year	Uncontrolled Fleet	Controlled Fleet	Running Exhaust (g/mile)[1]								Idling Exhaust (g/hr)[2]							
			Motor Coach		Urban Bus		Mini-Bus		Van		Motor Coach		Urban Bus		Mini-Bus		Van	
			Diesel	Biodiesel	Diesel	Biodiesel	Diesel	Biodiesel	Diesel	Biodiesel	Diesel	Biodiesel	Diesel	Biodiesel	Diesel	Biodiesel	Diesel	Biodiesel
2005	0.2%	0	5.33	5.33	0.36	0.36	2.76	2.76	0.40	0.40	3.70	3.70	0.91	0.91	1.18	1.18	1.00	1.00
2006	0.2%	0	5.08	5.08	0.36	0.36	2.64	2.64	0.40	0.40	3.70	3.70	0.91	0.91	1.18	1.18	1.00	1.00
2007	0	0	3.55	3.55	0.14	0.14	1.80	1.80	0.35	0.35	3.19	3.19	0.34	0.34	1.02	1.02	0.87	0.87
2008	0	0	2.46	2.46	0.14	0.14	1.12	1.12	0.35	0.35	2.82	2.82	0.34	0.34	0.90	0.90	0.87	0.87
2009	0	0	2.19	2.19	0.14	0.14	1.01	1.01	0.35	0.35	2.66	2.66	0.34	0.34	0.85	0.85	0.87	0.87
2010	0	0	1.87	1.87	0.14	0.14	0.86	0.86	0.35	0.35	2.35	2.35	0.34	0.34	0.75	0.75	0.87	0.87
2011	0	0	0.89	0.89	0.14	0.14	0.41	0.41	0.35	0.35	0.97	0.97	0.34	0.34	0.31	0.31	0.86	0.86
2012	0.2%	0	0.98	0.98	0.14	0.14	0.47	0.47	0.34	0.34	0.58	0.58	0.34	0.34	0.18	0.18	0.86	0.86
2013	0.2%	0	0.96	0.96	0.14	0.14	0.45	0.45	0.34	0.34	0.58	0.58	0.34	0.34	0.18	0.18	0.85	0.85
2014	0.2%	0	0.80	0.80	0.14	0.14	0.38	0.38	0.34	0.34	0.58	0.58	0.34	0.34	0.18	0.18	0.84	0.84
2015	0.9%	0	0.76	0.76	0.14	0.14	0.35	0.35	0.33	0.33	0.58	0.58	0.34	0.34	0.18	0.18	0.83	0.83
2016	0.8%	0	0.76	0.76	0.14	0.14	0.35	0.35	0.33	0.33	0.58	0.58	0.34	0.34	0.18	0.18	0.82	0.82
2017	0.5%	0	0.74	0.74	0.14	0.14	0.35	0.35	0.32	0.32	0.58	0.58	0.34	0.34	0.18	0.18	0.81	0.81
2018	0.3%	0	0.73	0.73	0.14	0.14	0.33	0.33	0.32	0.32	0.58	0.58	0.34	0.34	0.18	0.18	0.79	0.79
2019	0.5%	0	0.72	0.72	0.14	0.14	0.33	0.33	0.31	0.31	0.58	0.58	0.34	0.34	0.18	0.18	0.78	0.78
2020	1.4%	0	0.70	0.70	0.14	0.14	0.32	0.32	0.30	0.30	0.58	0.58	0.34	0.34	0.18	0.18	0.76	0.76
2021	2.3%	0	0.69	0.69	0.14	0.14	0.31	0.31	0.12	0.12	0.58	0.58	0.34	0.34	0.18	0.18	0.30	0.30
2022	1.2%	0	0.67	0.67	0.14	0.14	0.30	0.30	0.11	0.11	0.58	0.58	0.34	0.34	0.18	0.18	0.29	0.29
2023	3.1%	0	0.65	0.65	0.14	0.14	0.30	0.30	0.11	0.11	0.58	0.58	0.34	0.34	0.18	0.18	0.27	0.27
2024	5.4%	12.5%	0.65	0.65	0.14	0.14	0.30	0.30	0.10	0.10	0.58	0.58	0.34	0.34	0.18	0.18	0.26	0.26
2025	5.4%	12.5%	0.65	0.65	0.14	0.14	0.28	0.28	0.10	0.10	0.58	0.58	0.34	0.34	0.18	0.18	0.25	0.25
2026	7.9%	12.5%	0.58	0.58	0.14	0.14	0.27	0.27	0.09	0.09	0.58	0.58	0.34	0.34	0.18	0.18	0.23	0.23
2027	9.8%	12.5%	0.55	0.55	0.14	0.14	0.26	0.26	0.09	0.09	0.58	0.58	0.34	0.34	0.18	0.18	0.22	0.22
2028	17.4%	12.5%	0.52	0.52	0.14	0.14	0.25	0.25	0.08	0.08	0.58	0.58	0.34	0.34	0.18	0.18	0.20	0.20
2029	15.8%	12.5%	0.50	0.50	0.14	0.14	0.24	0.24	0.08	0.08	0.58	0.58	0.34	0.34	0.18	0.18	0.19	0.19
2030	18.6%	12.5%	0.47	0.47	0.14	0.14	0.22	0.22	0.07	0.07	0.58	0.58	0.34	0.34	0.18	0.18	0.17	0.17
2031	7.8%	12.5%	0.45	0.45	0.14	0.14	0.21	0.21	0.06	0.06	0.58	0.58	0.34	0.34	0.18	0.18	0.15	0.15
Uncontrolled Type EF[3]			0.56	0.56	0.14	0.14	0.26	0.26	0.09	0.09	0.59	0.59	0.35	0.35	0.19	0.19	0.24	0.24
Controlled Type EF[3]			0.55	0.55	0.14	0.14	0.25	0.25	0.08	0.08	0.58	0.58	0.34	0.34	0.18	0.18	0.21	0.21
Fleet Distribution			25.1%	58.2%	3.5%	0.2%	2.1%	0.8%	1.0%	0	25.1%	58.2%	3.5%	0.2%	2.1%	0.8%	1.0%	0
Uncontrolled Fleet EF[4]			**0.48**								**0.51**							
Controlled Fleet EF[4]			**0.47**								**0.50**							

Notes:

1. Running emission factors are pulled from EMFAC2014 for San Francisco County at a speed of 5 mph. If a given model year was not provided, the closest preceding year with an emission factor was used.
   Vehicle types are paired with EMFAC2014 vehicle classes as follows: Motor Coach = Motor Coach, Urban Bus = UBUS, Diesel Mini-Bus = All Other Buses, Gasoline Mini-Bus = OBUS, Van = MDV
   Biodiesel emission factors are considered equivalent to diesel. CNG is considered equivalent to gasoline, except for CNG Urban Buses, where EMFAC2014 provides emission factors.
2. Idling emission factors are either as provided in EMFAC2014 for San Francisco County, or calculated as the running 5mph emission rate multiplied by 2.5 per ARB guidance.
3. Uncontrolled and Controlled Type emission factors are calculated by weighting the fleet distribution by model year.
4. Uncontrolled and Controlled Fleet emission factors are calculated by weighting the type emission factor by the distribution of vehicle types in the fleet.

Table B15: PM2.5 Emission Factors - 2032 Calendar Year
SFMTA Commuter Shuttle Project
San Francisco, California

Model Year	Uncontrolled Fleet	Controlled Fleet	Running Exhaust (g/mile)[1]													
			Motor Coach		Urban Bus				Mini-Bus				Van			
			Diesel	Biodiesel	Diesel	Biodiesel	Gasoline	CNG	Diesel	Biodiesel	Gasoline	CNG	Diesel	Biodiesel	Gasoline	CNG
2005	0.2%	0	0.300	0.300	0.114	0.114	0.010	0.028	0.209	0.209	0.001	0.001	0.207	0.207	0.001	0.001
2006	0.2%	0	0.291	0.291	0.114	0.114	0.010	0.028	0.202	0.202	0.001	0.001	0.207	0.207	0.001	0.001
2007	0	0	0.241	0.241	0.014	0.014	0.010	0.028	0.167	0.167	0.001	0.001	0.013	0.013	0.001	0.001
2008	0	0	0.097	0.097	0.014	0.014	0.001	0.028	0.059	0.059	0.001	0.001	0.013	0.013	0.001	0.001
2009	0	0	0.074	0.074	0.014	0.014	0.001	0.002	0.044	0.044	0.001	0.001	0.013	0.013	0.002	0.002
2010	0	0	0.060	0.060	0.014	0.014	0.001	0.002	0.036	0.036	0.001	0.001	0.013	0.013	0.002	0.002
2011	0	0	0.020	0.020	0.014	0.014	0.001	0.002	0.012	0.012	0.001	0.001	0.013	0.013	0.003	0.003
2012	0.2%	0	0.017	0.017	0.014	0.014	0.002	0.002	0.010	0.010	0.002	0.002	0.013	0.013	0.004	0.004
2013	0.2%	0	0.016	0.016	0.014	0.014	0.003	0.002	0.010	0.010	0.003	0.003	0.013	0.013	0.006	0.006
2014	0.2%	0	0.014	0.014	0.014	0.014	0.004	0.002	0.008	0.008	0.004	0.004	0.013	0.013	0.008	0.008
2015	0.9%	0	0.013	0.013	0.014	0.014	0.005	0.002	0.008	0.008	0.005	0.005	0.013	0.013	0.011	0.011
2016	0.8%	0	0.013	0.013	0.014	0.014	0.006	0.002	0.008	0.008	0.006	0.006	0.012	0.012	0.012	0.012
2017	0.5%	0	0.013	0.013	0.014	0.014	0.007	0.002	0.008	0.008	0.007	0.007	0.012	0.012	0.013	0.013
2018	0.3%	0	0.012	0.012	0.014	0.014	0.007	0.002	0.007	0.007	0.007	0.007	0.012	0.012	0.014	0.014
2019	0.5%	0	0.012	0.012	0.014	0.014	0.007	0.002	0.007	0.007	0.007	0.007	0.012	0.012	0.014	0.014
2020	1.4%	0	0.012	0.012	0.014	0.014	0.007	0.002	0.007	0.007	0.007	0.007	0.011	0.011	0.012	0.012
2021	2.3%	0	0.011	0.011	0.014	0.014	0.007	0.002	0.007	0.007	0.007	0.007	0.002	0.002	0.011	0.011
2022	1.2%	0	0.011	0.011	0.014	0.014	0.007	0.002	0.006	0.006	0.007	0.007	0.002	0.002	0.011	0.011
2023	3.1%	0	0.011	0.011	0.014	0.014	0.007	0.002	0.006	0.006	0.007	0.007	0.002	0.002	0.011	0.011
2024	5.4%	12.5%	0.011	0.011	0.014	0.014	0.007	0.002	0.006	0.006	0.007	0.007	0.002	0.002	0.011	0.011
2025	5.4%	12.5%	0.011	0.011	0.014	0.014	0.007	0.002	0.006	0.006	0.007	0.007	0.002	0.002	0.011	0.011
2026	7.9%	12.5%	0.009	0.009	0.014	0.014	0.007	0.002	0.005	0.005	0.007	0.007	0.002	0.002	0.009	0.009
2027	9.8%	12.5%	0.009	0.009	0.014	0.014	0.007	0.002	0.005	0.005	0.007	0.007	0.001	0.001	0.006	0.006
2028	17.4%	12.5%	0.008	0.008	0.014	0.014	0.007	0.002	0.005	0.005	0.007	0.007	0.001	0.001	0.004	0.004
2029	15.8%	12.5%	0.007	0.007	0.014	0.014	0.007	0.002	0.005	0.005	0.007	0.007	0.001	0.001	0.004	0.004
2030	18.6%	12.5%	0.007	0.007	0.014	0.014	0.007	0.002	0.004	0.004	0.007	0.007	0.001	0.001	0.004	0.004
2031	7.8%	12.5%	0.006	0.006	0.014	0.014	0.007	0.002	0.004	0.004	0.007	0.007	0.001	0.001	0.004	0.004
Uncontrolled Type EF[3]			0.009	0.009	0.015	0.015	0.007	0.002	0.006	0.006	0.007	0.007	0.003	0.003	0.006	0.006
Controlled Type EF[3]			0.008	0.008	0.014	0.014	0.007	0.002	0.005	0.005	0.007	0.007	0.001	0.001	0.007	0.007
Fleet Distribution			25.1%	58.2%	3.5%	0.2%	1.0%	1.5%	2.1%	0.8%	3.5%	1.9%	1.0%	0	1.0%	0
Uncontrolled Fleet EF[4]			0.0091													
Controlled Fleet EF[4]			0.0083													

Model Year	Idling Exhaust (g/hr)[2]															
	Motor Coach		Urban Bus				Mini-Bus				Van					
	Diesel	Biodiesel	Diesel	Biodiesel	Gasoline	CNG	Diesel	Biodiesel	Gasoline	CNG	Diesel	Biodiesel	Gasoline	CNG		
2005	0.408	0.408	0.284	0.284	0.025	0.071	0.3693	0.3693	0.002	0.002	0.517	0.517	0.003	0.003		
2006	0.408	0.408	0.284	0.284	0.025	0.071	0.3693	0.3693	0.002	0.002	0.517	0.517	0.003	0.003		
2007	0.356	0.356	0.036	0.036	0.025	0.071	0.3228	0.3228	0.002	0.002	0.034	0.034	0.003	0.003		
2008	0.030	0.030	0.036	0.036	0.002	0.071	0.0275	0.0275	0.002	0.002	0.034	0.034	0.004	0.004		
2009	0.001	0.001	0.036	0.036	0.002	0.004	0.0013	0.0013	0.002	0.002	0.034	0.034	0.004	0.004		
2010	0.001	0.001	0.036	0.036	0.003	0.004	0.0013	0.0013	0.003	0.003	0.033	0.033	0.005	0.005		
2011	0.001	0.001	0.036	0.036	0.004	0.004	0.0013	0.0013	0.004	0.004	0.033	0.033	0.007	0.007		
2012	0.001	0.001	0.036	0.036	0.005	0.004	0.0013	0.0013	0.005	0.005	0.033	0.033	0.010	0.010		
2013	0.001	0.001	0.036	0.036	0.008	0.004	0.0013	0.0013	0.008	0.008	0.033	0.033	0.015	0.015		
2014	0.001	0.001	0.036	0.036	0.011	0.004	0.0013	0.0013	0.011	0.011	0.032	0.032	0.021	0.021		
2015	0.001	0.001	0.036	0.036	0.014	0.004	0.0013	0.0013	0.014	0.014	0.032	0.032	0.026	0.026		
2016	0.001	0.001	0.036	0.036	0.016	0.004	0.0013	0.0013	0.016	0.016	0.031	0.031	0.030	0.030		
2017	0.001	0.001	0.036	0.036	0.017	0.004	0.0013	0.0013	0.017	0.017	0.031	0.031	0.033	0.033		
2018	0.001	0.001	0.036	0.036	0.017	0.004	0.0013	0.0013	0.017	0.017	0.030	0.030	0.034	0.034		
2019	0.001	0.001	0.036	0.036	0.018	0.004	0.0013	0.0013	0.018	0.018	0.029	0.029	0.034	0.034		
2020	0.001	0.001	0.036	0.036	0.018	0.004	0.0013	0.0013	0.018	0.018	0.028	0.028	0.030	0.030		
2021	0.001	0.001	0.036	0.036	0.018	0.004	0.0013	0.0013	0.018	0.018	0.005	0.005	0.027	0.027		
2022	0.001	0.001	0.036	0.036	0.018	0.004	0.0013	0.0013	0.018	0.018	0.004	0.004	0.027	0.027		
2023	0.001	0.001	0.036	0.036	0.018	0.004	0.0013	0.0013	0.018	0.018	0.004	0.004	0.027	0.027		
2024	0.001	0.001	0.036	0.036	0.018	0.004	0.0013	0.0013	0.018	0.018	0.004	0.004	0.027	0.027		
2025	0.001	0.001	0.036	0.036	0.018	0.004	0.0013	0.0013	0.018	0.018	0.004	0.004	0.027	0.027		
2026	0.001	0.001	0.036	0.036	0.018	0.004	0.0013	0.0013	0.018	0.018	0.004	0.004	0.022	0.022		
2027	0.001	0.001	0.036	0.036	0.018	0.004	0.0013	0.0013	0.018	0.018	0.004	0.004	0.016	0.016		
2028	0.001	0.001	0.036	0.036	0.018	0.004	0.0013	0.0013	0.018	0.018	0.003	0.003	0.010	0.010		
2029	0.001	0.001	0.036	0.036	0.018	0.004	0.0013	0.0013	0.018	0.018	0.003	0.003	0.010	0.010		
2030	0.001	0.001	0.036	0.036	0.018	0.004	0.0013	0.0013	0.018	0.018	0.003	0.003	0.010	0.010		
2031	0.001	0.001	0.036	0.036	0.018	0.004	0.0013	0.0013	0.018	0.018	0.003	0.003	0.010	0.010		
Uncontrolled Type EF[3]	0.003	0.003	0.037	0.037	0.018	0.004	0.0024	0.0024	0.018	0.018	0.006	0.006	0.015	0.015		
Controlled Type EF[3]	0.001	0.001	0.036	0.036	0.018	0.004	0.0013	0.0013	0.018	0.018	0.003	0.003	0.016	0.016		
Fleet Distribution	25.1%	58.2%	3.5%	0.2%	1.0%	1.5%	2.1%	0.8%	3.5%	1.9%	1.0%	0	1.0%	0		
Uncontrolled Fleet EF[4]	0.0051															
Controlled Fleet EF[4]	0.0040															

Notes:

1. Running emission factors are pulled from EMFAC2014 for San Francisco County at a speed of 5 mph. If a given model year was not provided, the closest preceding year with an emission factor was used.
   Vehicle types are paired with EMFAC2014 vehicle classes as follows: Motor Coach = Motor Coach, Urban Bus = UBUS, Diesel Mini-Bus = All Other Buses, Gasoline Mini-Bus = OBUS, Van = MDV
   Biodiesel emission factors are considered equivalent to diesel. CNG is considered equivalent to gasoline, except for CNG Urban Buses, where EMFAC2014 provides emission factors.
2. Idling emission factors are either as provided in EMFAC2014 for San Francisco County, or calculated as the running 5mph emission rate multiplied by 2.5 per ARB guidance.
3. Uncontrolled and Controlled Type emission factors are calculated by weighting the fleet distribution by model year.
4. Uncontrolled and Controlled Fleet emission factors are calculated by weighting the type emission factor by the distribution of vehicle types in the fleet.

RAMBOLL ENVIRON

Table B16: Gasoline TOG Emission Factors - 2032 Calendar Year
SFMTA Commuter Shuttle Project
San Francisco, California

Model Year	Uncontrolled Fleet	Controlled Fleet	Running Exhaust (g/mile)[1]						Idling Exhaust (g/hr)[2]					
			Urban Bus		Mini-Bus		Van		Urban Bus		Mini-Bus		Van	
			Gasoline	CNG	Gasoline	CNG	Gasoline	CNG	Gasoline	CNG	Gasoline	CNG	Gasoline	CNG
2005	0.2%	0	0.34	70.6	0.08	0.08	0.24	0.24	0.85	176.4	21.0	0.19	0.59	0.59
2006	0.2%	0	0.34	70.6	0.08	0.08	0.21	0.21	0.85	176.4	21.0	0.19	0.54	0.54
2007	0	0	0.34	70.6	0.08	0.08	0.20	0.20	0.85	176.4	21.0	0.19	0.49	0.49
2008	0	0	0.11	70.6	0.08	0.08	0.19	0.19	0.26	176.4	21.0	0.19	0.46	0.46
2009	0	0	0.11	8.7	0.08	0.08	0.18	0.18	0.26	21.8	21.0	0.19	0.44	0.44
2010	0	0	0.11	8.7	0.08	0.08	0.17	0.17	0.26	21.8	21.0	0.19	0.42	0.42
2011	0	0	0.11	8.7	0.08	0.08	0.17	0.17	0.26	21.8	21.0	0.19	0.42	0.42
2012	0.2%	0	0.11	8.7	0.08	0.08	0.17	0.17	0.26	21.8	21.0	0.19	0.42	0.42
2013	0.2%	0	0.11	8.7	0.08	0.08	0.16	0.16	0.26	21.8	21.0	0.19	0.41	0.41
2014	0.2%	0	0.11	8.7	0.08	0.08	0.16	0.16	0.26	21.8	21.0	0.19	0.41	0.41
2015	0.9%	0	0.11	8.7	0.08	0.08	0.15	0.15	0.26	21.8	21.0	0.19	0.37	0.37
2016	0.8%	0	0.11	8.7	0.08	0.08	0.14	0.14	0.26	21.8	21.0	0.19	0.36	0.36
2017	0.5%	0	0.11	8.7	0.08	0.08	0.13	0.13	0.26	21.8	21.0	0.19	0.31	0.31
2018	0.3%	0	0.11	8.7	0.08	0.08	0.12	0.12	0.26	21.8	21.0	0.19	0.31	0.31
2019	0.5%	0	0.11	8.7	0.08	0.08	0.11	0.11	0.26	21.8	21.0	0.19	0.29	0.29
2020	1.4%	0	0.11	8.7	0.08	0.08	0.11	0.11	0.26	21.8	21.0	0.19	0.27	0.27
2021	2.3%	0	0.11	8.7	0.08	0.08	0.10	0.10	0.26	21.8	21.0	0.19	0.24	0.24
2022	1.2%	0	0.11	8.7	0.08	0.08	0.09	0.09	0.26	21.8	21.0	0.19	0.22	0.22
2023	3.1%	0	0.11	8.7	0.08	0.08	0.07	0.07	0.26	21.8	21.0	0.19	0.18	0.18
2024	5.4%	12.5%	0.11	8.7	0.08	0.08	0.06	0.06	0.26	21.8	21.0	0.19	0.14	0.14
2025	5.4%	12.5%	0.11	8.7	0.08	0.08	0.05	0.05	0.26	21.8	21.0	0.19	0.12	0.12
2026	7.9%	12.5%	0.11	8.7	0.08	0.08	0.05	0.05	0.26	21.8	21.0	0.19	0.11	0.11
2027	9.8%	12.5%	0.11	8.7	0.08	0.08	0.04	0.04	0.26	21.8	21.0	0.19	0.11	0.11
2028	17.4%	12.5%	0.11	8.7	0.08	0.08	0.04	0.04	0.26	21.8	21.0	0.19	0.09	0.09
2029	15.8%	12.5%	0.11	8.7	0.08	0.08	0.04	0.04	0.26	21.8	21.0	0.19	0.09	0.09
2030	18.6%	12.5%	0.11	8.7	0.11	0.11	0.03	0.03	0.26	21.8	29.3	0.26	0.08	0.08
2031	7.8%	12.5%	0.11	8.7	0.11	0.11	0.03	0.03	0.26	21.8	29.3	0.26	0.08	0.08
Uncontrolled Type EF[3]			0.11	8.9	0.08	0.08	0.05	0.05	0.27	22.3	23.2	0.21	0.12	0.12
Controlled Type EF[3]			0.11	8.7	0.08	0.08	0.04	0.04	0.26	21.8	23.1	0.21	0.10	0.10
Fleet Distribution			1.0%	1.5%	3.5%	1.9%	1.0%	0	1.0%	1.5%	3.5%	1.9%	1.0%	0
Uncontrolled Fleet EF[4]			**0.14**						**1.16**					
Controlled Fleet EF[4]			**0.13**						**1.15**					

Notes:

1. Running emission factors are pulled from EMFAC2014 for San Francisco County at a speed of 5 mph. If a given model year was not provided, the closest preceding year with an emission factor was used.

   Vehicle types are paired with EMFAC2014 vehicle classes as follows: Motor Coach = Motor Coach, Urban Bus = UBUS, Diesel Mini-Bus = All Other Buses, Gasoline Mini-Bus = OBUS, Van = MDV

   Biodiesel emission factors are considered equivalent to diesel. CNG is considered equivalent to gasoline, except for CNG Urban Buses, where EMFAC2014 provides emission factors.

2. Idling emission factors are either as provided in EMFAC2014 for San Francisco County, or calculated as the running 5mph emission rate multiplied by 2.5 per ARB guidance.
3. Uncontrolled and Controlled Type emission factors are calculated by weighting the fleet distribution by model year.
4. Uncontrolled and Controlled Fleet emission factors are calculated by weighting the type emission factor by the distribution of vehicle types in the fleet.

Table B17: PM10 Emission Factors - 2040 Calendar Year
SFMTA Commuter Shuttle Project
San Francisco, California

Model Year	Uncontrolled Fleet	Controlled Fleet	Running Exhaust (g/mile)[1]								Idling Exhaust (g/hr)[2]							
			Motor Coach		Urban Bus		Mini-Bus		Van		Motor Coach		Urban Bus		Mini-Bus		Van	
			Diesel	Biodiesel	Diesel	Biodiesel	Diesel	Biodiesel	Diesel	Biodiesel	Diesel	Biodiesel	Diesel	Biodiesel	Diesel	Biodiesel	Diesel	Biodiesel
2013	0.2%	0	0.017	0.017	0.015	0.015	0.011	0.011	0.0141	0.0141	0.001	0.001	0.038	0.038	0.0014	0.0014	0.035	0.035
2014	0.2%	0	0.014	0.014	0.015	0.015	0.009	0.009	0.0141	0.0141	0.001	0.001	0.038	0.038	0.0014	0.0014	0.035	0.035
2015	0	0	0.013	0.013	0.015	0.015	0.008	0.008	0.0141	0.0141	0.001	0.001	0.038	0.038	0.0014	0.0014	0.035	0.035
2016	0	0	0.013	0.013	0.015	0.015	0.008	0.008	0.0141	0.0141	0.001	0.001	0.038	0.038	0.0014	0.0014	0.035	0.035
2017	0	0	0.013	0.013	0.015	0.015	0.008	0.008	0.0140	0.0140	0.001	0.001	0.038	0.038	0.0014	0.0014	0.035	0.035
2018	0	0	0.013	0.013	0.015	0.015	0.008	0.008	0.0140	0.0140	0.001	0.001	0.038	0.038	0.0014	0.0014	0.035	0.035
2019	0	0	0.013	0.013	0.015	0.015	0.008	0.008	0.0139	0.0139	0.001	0.001	0.038	0.038	0.0014	0.0014	0.035	0.035
2020	0.2%	0	0.013	0.013	0.015	0.015	0.008	0.008	0.0138	0.0138	0.001	0.001	0.038	0.038	0.0014	0.0014	0.034	0.034
2021	0.2%	0	0.013	0.013	0.015	0.015	0.008	0.008	0.0023	0.0023	0.001	0.001	0.038	0.038	0.0014	0.0014	0.006	0.006
2022	0.2%	0	0.013	0.013	0.015	0.015	0.008	0.008	0.0022	0.0022	0.001	0.001	0.038	0.038	0.0014	0.0014	0.006	0.006
2023	0.9%	0	0.013	0.013	0.015	0.015	0.008	0.008	0.0022	0.0022	0.001	0.001	0.038	0.038	0.0014	0.0014	0.006	0.006
2024	0.8%	0	0.013	0.013	0.015	0.015	0.008	0.008	0.0022	0.0022	0.001	0.001	0.038	0.038	0.0014	0.0014	0.005	0.005
2025	0.5%	0	0.013	0.013	0.015	0.015	0.008	0.008	0.0021	0.0021	0.001	0.001	0.038	0.038	0.0014	0.0014	0.005	0.005
2026	0.3%	0	0.013	0.013	0.015	0.015	0.008	0.008	0.0021	0.0021	0.001	0.001	0.038	0.038	0.0014	0.0014	0.005	0.005
2027	0.5%	0	0.013	0.013	0.015	0.015	0.007	0.007	0.0020	0.0020	0.001	0.001	0.038	0.038	0.0014	0.0014	0.005	0.005
2028	1.4%	0	0.012	0.012	0.015	0.015	0.007	0.007	0.0020	0.0020	0.001	0.001	0.038	0.038	0.0014	0.0014	0.005	0.005
2029	2.3%	0	0.012	0.012	0.015	0.015	0.007	0.007	0.0019	0.0019	0.001	0.001	0.038	0.038	0.0014	0.0014	0.005	0.005
2030	1.2%	0	0.012	0.012	0.015	0.015	0.007	0.007	0.0019	0.0019	0.001	0.001	0.038	0.038	0.0014	0.0014	0.005	0.005
2031	3.1%	0	0.011	0.011	0.015	0.015	0.007	0.007	0.0018	0.0018	0.001	0.001	0.038	0.038	0.0014	0.0014	0.005	0.005
2032	5.4%	12.5%	0.011	0.011	0.015	0.015	0.006	0.006	0.0017	0.0017	0.001	0.001	0.038	0.038	0.0014	0.0014	0.004	0.004
2033	5.4%	12.5%	0.010	0.010	0.015	0.015	0.006	0.006	0.0017	0.0017	0.001	0.001	0.038	0.038	0.0014	0.0014	0.004	0.004
2034	7.9%	12.5%	0.009	0.009	0.015	0.015	0.006	0.006	0.0016	0.0016	0.001	0.001	0.038	0.038	0.0014	0.0014	0.004	0.004
2035	9.8%	12.5%	0.009	0.009	0.015	0.015	0.005	0.005	0.0015	0.0015	0.001	0.001	0.038	0.038	0.0014	0.0014	0.004	0.004
2036	17.4%	12.5%	0.008	0.008	0.015	0.015	0.005	0.005	0.0014	0.0014	0.001	0.001	0.038	0.038	0.0014	0.0014	0.004	0.004
2037	15.8%	12.5%	0.008	0.008	0.015	0.015	0.005	0.005	0.0013	0.0013	0.001	0.001	0.038	0.038	0.0014	0.0014	0.003	0.003
2038	18.6%	12.5%	0.007	0.007	0.015	0.015	0.004	0.004	0.0012	0.0012	0.001	0.001	0.038	0.038	0.0014	0.0014	0.003	0.003
2039	7.8%	12.5%	0.007	0.007	0.015	0.015	0.004	0.004	0.0011	0.0011	0.001	0.001	0.038	0.038	0.0014	0.0014	0.003	0.003
Uncontrolled Type EF[3]			0.009	0.009	0.015	0.015	0.005	0.005	0.0015	0.0015	0.001	0.001	0.038	0.038	0.0014	0.0014	0.004	0.004
Controlled Type EF[3]			0.009	0.009	0.015	0.015	0.005	0.005	0.0014	0.0014	0.001	0.001	0.038	0.038	0.0014	0.0014	0.004	0.004
Fleet Distribution			25.1%	58.2%	3.5%	0.2%	2.1%	0.8%	1.0%	0	25.1%	58.2%	3.5%	0.2%	2.1%	0.8%	1.0%	0
Uncontrolled Fleet EF[4]			**0.0080**								**0.0027**							
Controlled Fleet EF[4]			**0.0079**								**0.0027**							

Notes:

1. Running emission factors are pulled from EMFAC2014 for San Francisco County at a speed of 5 mph. If a given model year was not provided, the closest preceding year with an emission factor was used.
   Vehicle types are paired with EMFAC2014 vehicle classes as follows: Motor Coach = Motor Coach, Urban Bus = UBUS, Diesel Mini-Bus = All Other Buses, Gasoline Mini-Bus = OBUS, Van = MDV
   Biodiesel emission factors are considered equivalent to diesel. CNG is considered equivalent to gasoline, except for CNG Urban Buses, where EMFAC2014 provides emission factors.
2. Idling emission factors are either as provided in EMFAC2014 for San Francisco County, or calculated as the running 5mph emission rate multiplied by 2.5 per ARB guidance.
3. Uncontrolled and Controlled Type emission factors are calculated by weighting the fleet distribution by model year.
4. Uncontrolled and Controlled Fleet emission factors are calculated by weighting the type emission factor by the distribution of vehicle types in the fleet.

Table B18: Diesel TOG Emission Factors - 2040 Calendar Year
SFMTA Commuter Shuttle Project
San Francisco, California

Model Year	Uncontrolled Fleet	Controlled Fleet	Running Exhaust (g/mile)[1]								Idling Exhaust (g/hr)[2]							
			Motor Coach		Urban Bus		Mini-Bus		Van		Motor Coach		Urban Bus		Mini-Bus		Van	
			Diesel	Biodiesel	Diesel	Biodiesel	Diesel	Biodiesel	Diesel	Biodiesel	Diesel	Biodiesel	Diesel	Biodiesel	Diesel	Biodiesel	Diesel	Biodiesel
2013	0.2%	0	0.96	0.96	0.14	0.14	0.45	0.45	0.35	0.35	0.58	0.58	0.34	0.34	0.18	0.18	0.87	0.87
2014	0.2%	0	0.80	0.80	0.14	0.14	0.38	0.38	0.35	0.35	0.58	0.58	0.34	0.34	0.18	0.18	0.87	0.87
2015	0	0	0.76	0.76	0.14	0.14	0.36	0.36	0.35	0.35	0.58	0.58	0.34	0.34	0.18	0.18	0.87	0.87
2016	0	0	0.76	0.76	0.14	0.14	0.36	0.36	0.35	0.35	0.58	0.58	0.34	0.34	0.18	0.18	0.87	0.87
2017	0	0	0.76	0.76	0.14	0.14	0.36	0.36	0.35	0.35	0.58	0.58	0.34	0.34	0.18	0.18	0.87	0.87
2018	0	0	0.76	0.76	0.14	0.14	0.36	0.36	0.35	0.35	0.58	0.58	0.34	0.34	0.18	0.18	0.87	0.87
2019	0	0	0.76	0.76	0.14	0.14	0.36	0.36	0.35	0.35	0.58	0.58	0.34	0.34	0.18	0.18	0.86	0.86
2020	0.2%	0	0.76	0.76	0.14	0.14	0.36	0.36	0.34	0.34	0.58	0.58	0.34	0.34	0.18	0.18	0.86	0.86
2021	0.2%	0	0.76	0.76	0.14	0.14	0.36	0.36	0.14	0.14	0.58	0.58	0.34	0.34	0.18	0.18	0.36	0.36
2022	0.2%	0	0.76	0.76	0.14	0.14	0.36	0.36	0.14	0.14	0.58	0.58	0.34	0.34	0.18	0.18	0.35	0.35
2023	0.9%	0	0.76	0.76	0.14	0.14	0.35	0.35	0.14	0.14	0.58	0.58	0.34	0.34	0.18	0.18	0.35	0.35
2024	0.8%	0	0.76	0.76	0.14	0.14	0.35	0.35	0.14	0.14	0.58	0.58	0.34	0.34	0.18	0.18	0.34	0.34
2025	0.5%	0	0.76	0.76	0.14	0.14	0.34	0.34	0.13	0.13	0.58	0.58	0.34	0.34	0.18	0.18	0.33	0.33
2026	0.3%	0	0.73	0.73	0.14	0.14	0.33	0.33	0.13	0.13	0.58	0.58	0.34	0.34	0.18	0.18	0.33	0.33
2027	0.5%	0	0.72	0.72	0.14	0.14	0.33	0.33	0.13	0.13	0.58	0.58	0.34	0.34	0.18	0.18	0.32	0.32
2028	1.4%	0	0.70	0.70	0.14	0.14	0.32	0.32	0.12	0.12	0.58	0.58	0.34	0.34	0.18	0.18	0.31	0.31
2029	2.3%	0	0.69	0.69	0.14	0.14	0.31	0.31	0.12	0.12	0.58	0.58	0.34	0.34	0.18	0.18	0.30	0.30
2030	1.2%	0	0.67	0.67	0.14	0.14	0.30	0.30	0.11	0.11	0.58	0.58	0.34	0.34	0.18	0.18	0.29	0.29
2031	3.1%	0	0.65	0.65	0.14	0.14	0.30	0.30	0.11	0.11	0.58	0.58	0.34	0.34	0.18	0.18	0.27	0.27
2032	5.4%	12.5%	0.63	0.63	0.14	0.14	0.29	0.29	0.10	0.10	0.58	0.58	0.34	0.34	0.18	0.18	0.26	0.26
2033	5.4%	12.5%	0.60	0.60	0.14	0.14	0.28	0.28	0.10	0.10	0.58	0.58	0.34	0.34	0.18	0.18	0.25	0.25
2034	7.9%	12.5%	0.58	0.58	0.14	0.14	0.27	0.27	0.09	0.09	0.58	0.58	0.34	0.34	0.18	0.18	0.23	0.23
2035	9.8%	12.5%	0.55	0.55	0.14	0.14	0.26	0.26	0.09	0.09	0.58	0.58	0.34	0.34	0.18	0.18	0.22	0.22
2036	17.4%	12.5%	0.52	0.52	0.14	0.14	0.25	0.25	0.08	0.08	0.58	0.58	0.34	0.34	0.18	0.18	0.20	0.20
2037	15.8%	12.5%	0.50	0.50	0.14	0.14	0.24	0.24	0.08	0.08	0.58	0.58	0.34	0.34	0.18	0.18	0.19	0.19
2038	18.6%	12.5%	0.47	0.47	0.14	0.14	0.22	0.22	0.07	0.07	0.58	0.58	0.34	0.34	0.18	0.18	0.17	0.17
2039	7.8%	12.5%	0.45	0.45	0.14	0.14	0.21	0.21	0.06	0.06	0.58	0.58	0.34	0.34	0.18	0.18	0.15	0.15
Uncontrolled Type EF[3]			0.54	0.54	0.14	0.14	0.25	0.25	0.09	0.09	0.58	0.58	0.34	0.34	0.18	0.18	0.22	0.22
Controlled Type EF[3]			0.54	0.54	0.14	0.14	0.25	0.25	0.08	0.08	0.58	0.58	0.34	0.34	0.18	0.18	0.21	0.21
Fleet Distribution			25.1%	58.2%	3.5%	0.2%	2.1%	0.8%	1.0%	0	25.1%	58.2%	3.5%	0.2%	2.1%	0.8%	1.0%	0
Uncontrolled Fleet EF[4]			**0.46**								**0.50**							
Controlled Fleet EF[4]			**0.46**								**0.50**							

Notes:

1. Running emission factors are pulled from EMFAC2014 for San Francisco County at a speed of 5 mph. If a given model year was not provided, the closest preceding year with an emission factor was used.
   Vehicle types are paired with EMFAC2014 vehicle classes as follows: Motor Coach = Motor Coach, Urban Bus = UBUS, Diesel Mini-Bus = All Other Buses, Gasoline Mini-Bus = OBUS, Van = MDV
   Biodiesel emission factors are considered equivalent to diesel. CNG is considered equivalent to gasoline, except for CNG Urban Buses, where EMFAC2014 provides emission factors.
2. Idling emission factors are either as provided in EMFAC2014 for San Francisco County, or calculated as the running 5mph emission rate multiplied by 2.5 per ARB guidance.
3. Uncontrolled and Controlled Type emission factors are calculated by weighting the fleet distribution by model year.
4. Uncontrolled and Controlled Fleet emission factors are calculated by weighting the type emission factor by the distribution of vehicle types in the fleet.

Table B19: PM2.5 Emission Factors - 2040 Calendar Year
SFMTA Commuter Shuttle Project
San Francisco, California

Model Year	Uncontrolled Fleet	Controlled Fleet	Running Exhaust (g/mile)[1]													
			Motor Coach		Urban Bus				Mini-Bus				Van			
			Diesel	Biodiesel	Diesel	Biodiesel	Gasoline	CNG	Diesel	Biodiesel	Gasoline	CNG	Diesel	Biodiesel	Gasoline	CNG
2013	0.2%	0	0.016	0.016	0.014	0.014	0.003	0.002	0.010	0.010	0.003	0.003	0.013	0.013	0.006	0.006
2014	0.2%	0	0.014	0.014	0.014	0.014	0.004	0.002	0.008	0.008	0.004	0.004	0.013	0.013	0.008	0.008
2015	0	0	0.013	0.013	0.014	0.014	0.005	0.002	0.008	0.008	0.005	0.005	0.013	0.013	0.011	0.011
2016	0	0	0.013	0.013	0.014	0.014	0.006	0.002	0.008	0.008	0.006	0.006	0.013	0.013	0.012	0.012
2017	0	0	0.013	0.013	0.014	0.014	0.007	0.002	0.008	0.008	0.007	0.007	0.013	0.013	0.013	0.013
2018	0	0	0.013	0.013	0.014	0.014	0.007	0.002	0.008	0.008	0.007	0.007	0.013	0.013	0.014	0.014
2019	0	0	0.013	0.013	0.014	0.014	0.007	0.002	0.008	0.008	0.007	0.007	0.013	0.013	0.014	0.014
2020	0.2%	0	0.013	0.013	0.014	0.014	0.007	0.002	0.008	0.008	0.007	0.007	0.013	0.013	0.012	0.012
2021	0.2%	0	0.013	0.013	0.014	0.014	0.007	0.002	0.008	0.008	0.007	0.007	0.002	0.002	0.011	0.011
2022	0.2%	0	0.013	0.013	0.014	0.014	0.007	0.002	0.008	0.008	0.007	0.007	0.002	0.002	0.011	0.011
2023	0.9%	0	0.013	0.013	0.014	0.014	0.007	0.002	0.008	0.008	0.007	0.007	0.002	0.002	0.011	0.011
2024	0.8%	0	0.013	0.013	0.014	0.014	0.007	0.002	0.008	0.008	0.007	0.007	0.002	0.002	0.011	0.011
2025	0.5%	0	0.013	0.013	0.014	0.014	0.007	0.002	0.007	0.007	0.007	0.007	0.002	0.002	0.011	0.011
2026	0.3%	0	0.012	0.012	0.014	0.014	0.007	0.002	0.007	0.007	0.007	0.007	0.002	0.002	0.009	0.009
2027	0.5%	0	0.012	0.012	0.014	0.014	0.007	0.002	0.007	0.007	0.007	0.007	0.002	0.002	0.006	0.006
2028	1.4%	0	0.012	0.012	0.014	0.014	0.007	0.002	0.007	0.007	0.007	0.007	0.002	0.002	0.004	0.004
2029	2.3%	0	0.011	0.011	0.014	0.014	0.007	0.002	0.007	0.007	0.007	0.007	0.002	0.002	0.004	0.004
2030	1.2%	0	0.011	0.011	0.014	0.014	0.007	0.002	0.006	0.006	0.007	0.007	0.002	0.002	0.004	0.004
2031	3.1%	0	0.011	0.011	0.014	0.014	0.007	0.002	0.006	0.006	0.007	0.007	0.002	0.002	0.004	0.004
2032	5.4%	12.5%	0.010	0.010	0.014	0.014	0.007	0.002	0.006	0.006	0.007	0.007	0.002	0.002	0.004	0.004
2033	5.4%	12.5%	0.010	0.010	0.014	0.014	0.007	0.002	0.006	0.006	0.007	0.007	0.002	0.002	0.004	0.004
2034	7.9%	12.5%	0.009	0.009	0.014	0.014	0.007	0.002	0.005	0.005	0.007	0.007	0.002	0.002	0.004	0.004
2035	9.8%	12.5%	0.009	0.009	0.014	0.014	0.007	0.002	0.005	0.005	0.007	0.007	0.001	0.001	0.004	0.004
2036	17.4%	12.5%	0.008	0.008	0.014	0.014	0.007	0.002	0.005	0.005	0.007	0.007	0.001	0.001	0.004	0.004
2037	15.8%	12.5%	0.007	0.007	0.014	0.014	0.007	0.002	0.005	0.005	0.007	0.007	0.001	0.001	0.004	0.004
2038	18.6%	12.5%	0.007	0.007	0.014	0.014	0.007	0.002	0.004	0.004	0.007	0.007	0.001	0.001	0.004	0.004
2039	7.8%	12.5%	0.006	0.006	0.014	0.014	0.007	0.002	0.004	0.004	0.007	0.007	0.001	0.001	0.004	0.004
Uncontrolled Type EF[3]			0.008	0.008	0.014	0.014	0.007	0.002	0.005	0.005	0.007	0.007	0.001	0.001	0.004	0.004
Controlled Type EF[3]			0.008	0.008	0.014	0.014	0.007	0.002	0.005	0.005	0.007	0.007	0.001	0.001	0.004	0.004
Fleet Distribution			25.1%	58.2%	3.5%	0.2%	1.0%	1.5%	2.1%	0.8%	3.5%	1.9%	1.0%	0	1.0%	0
Uncontrolled Fleet EF[4]			**0.0082**													
Controlled Fleet EF[4]			**0.0081**													

Model Year	Idling Exhaust (g/hr)[2]													
	Motor Coach		Urban Bus				Mini-Bus				Van			
	Diesel	Biodiesel	Diesel	Biodiesel	Gasoline	CNG	Diesel	Biodiesel	Gasoline	CNG	Diesel	Biodiesel	Gasoline	CNG
2013	0.001	0.001	0.036	0.036	0.008	0.004	0.001	0.001	0.008	0.008	0.034	0.034	0.015	0.015
2014	0.001	0.001	0.036	0.036	0.011	0.004	0.001	0.001	0.011	0.011	0.034	0.034	0.021	0.021
2015	0.001	0.001	0.036	0.036	0.014	0.004	0.001	0.001	0.014	0.014	0.034	0.034	0.026	0.026
2016	0.001	0.001	0.036	0.036	0.016	0.004	0.001	0.001	0.016	0.016	0.034	0.034	0.030	0.030
2017	0.001	0.001	0.036	0.036	0.017	0.004	0.001	0.001	0.017	0.017	0.034	0.034	0.033	0.033
2018	0.001	0.001	0.036	0.036	0.017	0.004	0.001	0.001	0.017	0.017	0.033	0.033	0.034	0.034
2019	0.001	0.001	0.036	0.036	0.018	0.004	0.001	0.001	0.018	0.018	0.033	0.033	0.034	0.034
2020	0.001	0.001	0.036	0.036	0.018	0.004	0.001	0.001	0.018	0.018	0.033	0.033	0.030	0.030
2021	0.001	0.001	0.036	0.036	0.018	0.004	0.001	0.001	0.018	0.018	0.005	0.005	0.027	0.027
2022	0.001	0.001	0.036	0.036	0.018	0.004	0.001	0.001	0.018	0.018	0.005	0.005	0.027	0.027
2023	0.001	0.001	0.036	0.036	0.018	0.004	0.001	0.001	0.018	0.018	0.005	0.005	0.027	0.027
2024	0.001	0.001	0.036	0.036	0.018	0.004	0.001	0.001	0.018	0.018	0.005	0.005	0.027	0.027
2025	0.001	0.001	0.036	0.036	0.018	0.004	0.001	0.001	0.018	0.018	0.005	0.005	0.027	0.027
2026	0.001	0.001	0.036	0.036	0.018	0.004	0.001	0.001	0.018	0.018	0.005	0.005	0.022	0.022
2027	0.001	0.001	0.036	0.036	0.018	0.004	0.001	0.001	0.018	0.018	0.005	0.005	0.016	0.016
2028	0.001	0.001	0.036	0.036	0.018	0.004	0.001	0.001	0.018	0.018	0.005	0.005	0.010	0.010
2029	0.001	0.001	0.036	0.036	0.018	0.004	0.001	0.001	0.018	0.018	0.005	0.005	0.010	0.010
2030	0.001	0.001	0.036	0.036	0.018	0.004	0.001	0.001	0.018	0.018	0.004	0.004	0.010	0.010
2031	0.001	0.001	0.036	0.036	0.018	0.004	0.001	0.001	0.018	0.018	0.004	0.004	0.010	0.010
2032	0.001	0.001	0.036	0.036	0.018	0.004	0.001	0.001	0.018	0.018	0.004	0.004	0.010	0.010
2033	0.001	0.001	0.036	0.036	0.018	0.004	0.001	0.001	0.018	0.018	0.004	0.004	0.010	0.010
2034	0.001	0.001	0.036	0.036	0.018	0.004	0.001	0.001	0.018	0.018	0.004	0.004	0.010	0.010
2035	0.001	0.001	0.036	0.036	0.018	0.004	0.001	0.001	0.018	0.018	0.004	0.004	0.010	0.010
2036	0.001	0.001	0.036	0.036	0.018	0.004	0.001	0.001	0.018	0.018	0.003	0.003	0.010	0.010
2037	0.001	0.001	0.036	0.036	0.018	0.004	0.001	0.001	0.018	0.018	0.003	0.003	0.010	0.010
2038	0.001	0.001	0.036	0.036	0.018	0.004	0.001	0.001	0.018	0.018	0.003	0.003	0.010	0.010
2039	0.001	0.001	0.036	0.036	0.018	0.004	0.001	0.001	0.018	0.018	0.003	0.003	0.010	0.010
Uncontrolled Type EF[3]	0.001	0.001	0.036	0.036	0.018	0.004	0.001	0.001	0.018	0.018	0.004	0.004	0.011	0.011
Controlled Type EF[3]	0.001	0.001	0.036	0.036	0.018	0.004	0.001	0.001	0.018	0.018	0.003	0.003	0.010	0.010
Fleet Distribution	25.1%	58.2%	3.5%	0.2%	1.0%	1.5%	2.1%	0.8%	3.5%	1.9%	1.0%	0	1.0%	0
Uncontrolled Fleet EF[4]	**0.0039**													
Controlled Fleet EF[4]	**0.0039**													

Notes:

1. Running emission factors are pulled from EMFAC2014 for San Francisco County at a speed of 5 mph. If a given model year was not provided, the closest preceding year with an emission factor was used.
   Vehicle types are paired with EMFAC2014 vehicle classes as follows: Motor Coach = Motor Coach, Urban Bus = UBUS, Diesel Mini-Bus = All Other Buses, Gasoline Mini-Bus = OBUS, Van = MDV
   Biodiesel emission factors are considered equivalent to diesel. CNG is considered equivalent to gasoline, except for CNG Urban Buses, where EMFAC2014 provides emission factors.
2. Idling emission factors are either as provided in EMFAC2014 for San Francisco County, or calculated as the running 5mph emission rate multiplied by 2.5 per ARB guidance.
3. Uncontrolled and Controlled Type emission factors are calculated by weighting the fleet distribution by model year.
4. Uncontrolled and Controlled Fleet emission factors are calculated by weighting the type emission factor by the distribution of vehicle types in the fleet.

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Table B20: Gasoline TOG Emission Factors - 2040 Calendar Year
SFMTA Commuter Shuttle Project
San Francisco, California

Model Year	Uncontrolled Fleet	Controlled Fleet	Running Exhaust (g/mile)[1]						Idling Exhaust (g/hr)[2]					
			Urban Bus		Mini-Bus		Van		Urban Bus		Mini-Bus		Van	
			Gasoline	CNG	Gasoline	CNG	Gasoline	CNG	Gasoline	CNG	Gasoline	CNG	Gasoline	CNG
2013	0.2%	0	0.11	8.7	0.08	0.08	0.17	0.17	0.26	21.8	21.7	0.20	0.42	0.42
2014	0.2%	0	0.11	8.7	0.08	0.08	0.17	0.17	0.26	21.8	21.7	0.20	0.42	0.42
2015	0	0	0.11	8.7	0.08	0.08	0.16	0.16	0.26	21.8	21.7	0.20	0.39	0.39
2016	0	0	0.11	8.7	0.08	0.08	0.15	0.15	0.26	21.8	21.7	0.20	0.38	0.38
2017	0	0	0.11	8.7	0.08	0.08	0.13	0.13	0.26	21.8	21.7	0.20	0.34	0.34
2018	0	0	0.11	8.7	0.08	0.08	0.13	0.13	0.26	21.8	21.7	0.20	0.33	0.33
2019	0	0	0.11	8.7	0.08	0.08	0.13	0.13	0.26	21.8	21.7	0.20	0.31	0.31
2020	0.2%	0	0.11	8.7	0.08	0.08	0.12	0.12	0.26	21.8	21.7	0.20	0.30	0.30
2021	0.2%	0	0.11	8.7	0.08	0.08	0.11	0.11	0.26	21.8	21.7	0.20	0.27	0.27
2022	0.2%	0	0.11	8.7	0.08	0.08	0.10	0.10	0.26	21.8	21.7	0.20	0.25	0.25
2023	0.9%	0	0.11	8.7	0.08	0.08	0.08	0.08	0.26	21.8	21.7	0.20	0.20	0.20
2024	0.8%	0	0.11	8.7	0.08	0.08	0.07	0.07	0.26	21.8	21.7	0.20	0.17	0.17
2025	0.5%	0	0.11	8.7	0.08	0.08	0.06	0.06	0.26	21.8	21.7	0.20	0.14	0.14
2026	0.3%	0	0.11	8.7	0.08	0.08	0.06	0.06	0.26	21.8	21.7	0.20	0.14	0.14
2027	0.5%	0	0.11	8.7	0.08	0.08	0.06	0.06	0.26	21.8	21.7	0.20	0.14	0.14
2028	1.4%	0	0.11	8.7	0.08	0.08	0.05	0.05	0.26	21.8	21.7	0.20	0.14	0.14
2029	2.3%	0	0.11	8.7	0.08	0.08	0.05	0.05	0.26	21.8	21.7	0.20	0.13	0.13
2030	1.2%	0	0.11	8.7	0.08	0.08	0.05	0.05	0.26	21.8	21.7	0.20	0.13	0.13
2031	3.1%	0	0.11	8.7	0.08	0.08	0.05	0.05	0.26	21.8	21.7	0.20	0.13	0.13
2032	5.4%	12.5%	0.11	8.7	0.08	0.08	0.05	0.05	0.26	21.8	21.7	0.20	0.12	0.12
2033	5.4%	12.5%	0.11	8.7	0.08	0.08	0.05	0.05	0.26	21.8	21.7	0.20	0.12	0.12
2034	7.9%	12.5%	0.11	8.7	0.08	0.08	0.05	0.05	0.26	21.8	21.7	0.20	0.11	0.11
2035	9.8%	12.5%	0.11	8.7	0.08	0.08	0.04	0.04	0.26	21.8	21.7	0.20	0.11	0.11
2036	17.4%	12.5%	0.11	8.7	0.08	0.08	0.04	0.04	0.26	21.8	21.7	0.20	0.09	0.09
2037	15.8%	12.5%	0.11	8.7	0.08	0.08	0.04	0.04	0.26	21.8	21.7	0.20	0.09	0.09
2038	18.6%	12.5%	0.11	8.7	0.11	0.11	0.03	0.03	0.26	21.8	29.3	0.26	0.08	0.08
2039	7.8%	12.5%	0.11	8.7	0.11	0.11	0.03	0.03	0.26	21.8	29.3	0.26	0.08	0.08
Uncontrolled Type EF[3]			0.11	8.7	0.09	0.09	0.04	0.04	0.26	21.8	23.7	0.21	0.10	0.10
Controlled Type EF[3]			0.11	8.7	0.08	0.08	0.04	0.04	0.26	21.8	23.6	0.21	0.10	0.10
Fleet Distribution			1.0%	1.5%	3.5%	1.9%	1.0%	0	1.0%	1.5%	3.5%	1.9%	1.0%	0
Uncontrolled Fleet EF[4]			**0.13**						**1.17**					
Controlled Fleet EF[4]			**0.13**						**1.16**					

Notes:

1. Running emission factors are pulled from EMFAC2014 for San Francisco County at a speed of 5 mph. If a given model year was not provided, the closest preceding year with an emission factor was used.

   Vehicle types are paired with EMFAC2014 vehicle classes as follows: Motor Coach = Motor Coach, Urban Bus = UBUS, Diesel Mini-Bus = All Other Buses, Gasoline Mini-Bus = OBUS, Van = MDV

   Biodiesel emission factors are considered equivalent to diesel. CNG is considered equivalent to gasoline, except for CNG Urban Buses, where EMFAC2014 provides emission factors.

2. Idling emission factors are either as provided in EMFAC2014 for San Francisco County, or calculated as the running 5mph emission rate multiplied by 2.5 per ARB guidance.
3. Uncontrolled and Controlled Type emission factors are calculated by weighting the fleet distribution by model year.
4. Uncontrolled and Controlled Fleet emission factors are calculated by weighting the type emission factor by the distribution of vehicle types in the fleet.

Table B21: Short-Term Uncontrolled Emission Rates
SFMTA Commuter Shuttle Project
San Francisco, California

Zone	Shuttle Stop	Emission Source	Loading Time[1] (min/vehicle)	Loading Zone Length (m/trip)	Reported Stops	Maximum Stops in One Hour[2] (stops/hr)	Modeled Emission Rates[3] (g/s)	
							Gasoline TOG	Diesel TOG
Outside of APEZ	Van Ness & Union SE (PM Peak)	Idling	1.0		119	77	5.5E-04	4.5E-04
		Running		60	119	77	2.3E-04	1.1E-03
	Van Ness & Union SW (AM Peak)	Idling	1.0		82	53	3.8E-04	3.1E-04
		Running		60	82	53	1.6E-04	7.5E-04
	Valencia & 24th SW (AM Peak)	Idling	1.0		70	45	3.3E-04	2.6E-04
		Running		60	70	45	1.3E-04	6.4E-04
	Valencia & 25th NE (PM Peak)	Idling	1.0		93	60	4.3E-04	3.5E-04
		Running		60	93	60	1.8E-04	8.6E-04
	Valencia & 25th SW (AM Peak)	Idling	1.0		22	14	1.0E-04	8.3E-05
		Running		60	22	14	4.2E-05	2.0E-04
APEZ	Townsend & 4th, S (24 hrs)	Idling	4.9		100	58	2.0E-03	1.7E-03
		Running		60	100	58	1.7E-04	8.3E-04
	Townsend & 4th, NW (24 hrs)	Idling	1.0		74	43	3.1E-04	2.5E-04
		Running		60	74	43	1.3E-04	6.1E-04
	Market & 8th (24 hrs)	Idling	1.0		113	66	4.7E-04	3.8E-04
		Running		60	113	66	1.9E-04	9.4E-04
	Market & 8th (AM&PM Peak)	Idling	1.0		79	25	1.8E-04	1.5E-04
		Running		60	79	25	7.5E-05	3.6E-04

Notes:

[1] Loading times for most stops were observed in the pilot program to average around one minute. However, the Townsend & 4th south side location was observed to have a longer average loading time of 4.89 minutes.

[2] Hourly stop events are calculated assuming half of the stops observed during the peak period in the pilot program occur in one hour. For the stop with both AM and PM peak stops, the total number of stops was assumed equally split between morning and afternoon peaks, with half of the peak amount assumed to occur in one hour. For 24-hour stops, the estimated maximum hourly stop count was calculated by removing the off peak stops (10%) from the recorded 24-hour count, then divided by two to represent an expected equal distribution of stop events in the morning and evening. Half of the peak amount was assumed to occur in one hour. Growth of 29% was assumed in all calculations of maximum hourly stops.

[3] Modeled emission rates calculated based on hourly emission rates. Hourly emissions are calculated from the number of stop events and fleet aggregate emission factors. Emission factors are representative of the vehicle fleet in the pilot program and are derived from the vehicle types and model years registered by shuttle operators. Maximum hourly emissions are calculated from the emission factors in EMFAC2014 for calendar year 2016 in San Francisco County.

Table B22: Long-Term Uncontrolled Emission Rates
SFMTA Commuter Shuttle Project
San Francisco, California

Zone	Shuttle Stop	Emission Source	Loading Time[1] (min/vehicle)	Loading Zone Length (m/trip)	Reported Stops	Number of Shuttles[2] (stops/day)	Modeled Emission Rates[3] (g/s)								
							$PM_{2.5}$	Diesel PM_{10}				Gasoline TOG			
								CY 2016	CY 2024	CY 2032	CY 2040	CY 2016	CY 2024	CY 2032	CY 2040
Outside of APEZ	Van Ness & Union SE (PM Peak)	Idling	1.0		119	169	1.5E-06	1.5E-06	2.5E-07	9.1E-08	6.4E-08	3.6E-05	2.8E-05	2.7E-05	2.7E-05
		Running		60	119	169	5.1E-06	5.3E-06	8.9E-07	4.6E-07	4.2E-07	1.5E-05	8.1E-06	7.1E-06	7.0E-06
	Van Ness & Union SW (AM Peak)	Idling	1.0		82	116	1.0E-06	1.0E-06	1.7E-07	6.3E-08	4.4E-08	2.5E-05	1.9E-05	1.9E-05	1.9E-05
		Running		60	82	116	3.5E-06	3.6E-06	6.1E-07	3.2E-07	2.9E-07	1.0E-05	5.6E-06	4.9E-06	4.8E-06
	Valencia & 24th SW (AM Peak)	Idling	1.0		70	99	8.6E-07	8.9E-07	1.5E-07	5.4E-08	3.7E-08	2.1E-05	1.6E-05	1.6E-05	1.6E-05
		Running		60	70	99	3.0E-06	3.1E-06	5.2E-07	2.7E-07	2.5E-07	8.7E-06	4.8E-06	4.2E-06	4.1E-06
	Valencia & 25th NE (PM Peak)	Idling	1.0		93	132	1.1E-06	1.2E-06	2.0E-07	7.1E-08	5.0E-08	2.8E-05	2.2E-05	2.1E-05	2.1E-05
		Running		60	93	132	4.0E-06	4.1E-06	6.9E-07	3.6E-07	3.3E-07	1.2E-05	6.4E-06	5.5E-06	5.4E-06
	Valencia & 25th SW (AM Peak)	Idling	1.0		22	31	2.7E-07	2.8E-07	4.6E-08	1.7E-08	1.2E-08	6.7E-06	5.2E-06	5.0E-06	5.0E-06
		Running		60	22	31	9.4E-07	9.8E-07	1.6E-07	8.6E-08	7.7E-08	2.7E-06	1.5E-06	1.3E-06	1.3E-06
APEZ	Townsend & 4th, S (24 hrs)	Idling	4.9		100	129	5.5E-06	5.6E-06	9.3E-07	3.4E-07	2.4E-07	1.4E-04	1.0E-04	1.0E-04	1.0E-04
		Running		60	100	129	3.9E-06	4.0E-06	6.8E-07	3.5E-07	3.2E-07	1.1E-05	6.2E-06	5.4E-06	5.3E-06
	Townsend & 4th, NW (24 hrs)	Idling	1.0		74	95	8.3E-07	8.5E-07	1.4E-07	5.2E-08	3.6E-08	2.1E-05	1.6E-05	1.5E-05	1.5E-05
		Running		60	74	95	2.9E-06	3.0E-06	5.0E-07	2.6E-07	2.4E-07	8.4E-06	4.6E-06	4.0E-06	3.9E-06
	Market & 8th (24 hrs)	Idling	1.0		113	146	1.3E-06	1.3E-06	2.2E-07	7.9E-08	5.5E-08	3.1E-05	2.4E-05	2.3E-05	2.3E-05
		Running		60	113	146	4.4E-06	4.6E-06	7.7E-07	4.0E-07	3.6E-07	1.3E-05	7.0E-06	6.1E-06	6.0E-06
	Market & 8th (AM&PM Peak)	Idling	1.0		79	112	9.7E-07	1.0E-06	1.7E-07	6.1E-08	4.2E-08	2.4E-05	1.9E-05	1.8E-05	1.8E-05
		Running		60	79	112	3.4E-06	3.5E-06	5.9E-07	3.1E-07	2.8E-07	9.8E-06	5.4E-06	4.7E-06	4.6E-06

Notes:

[1] Loading times for most stops were observed in the pilot program to average around one minute. However, the Townsend & 4th south side location was observed to have a longer average loading time of 4.89 minutes.

[2] Daily stop events are calculated from the number of stops observed in the pilot program, plus 10% additional trips to account for off-peak trips not observed in pilot study, and an additional 29% for project growth. 24-hour stops are not scaled by 10%.

[3] Modeled emission rates calculated based on daily emission rates. Daily emissions are calculated from the number of stop events and use fleet-aggregate emission factors. Emission factors are representative of the vehicle fleet in the pilot program and are derived from the vehicle types and model years registered by shuttle operators. For evaluating chronic, long-term health impacts from diesel PM_{10} and gasoline TOG, emissions are calculated from emission factors in EMFAC2014 for calendar years 2016, 2024, 2032, and 2040 in San Francisco County. In the uncontrolled analysis emissions in each calendar year are calculated by shifting the shuttle model year distribution as observed in 2016. A factor of 5/7 was applied to the daily emission rates to account for the fact that while the shuttles will only operate 5 days per week, modeling was conducted for all days of the year. Idling emissions presented here represent the total from both modeled idling locations.

Table B23: Short-Term Controlled Emission Rates
SFMTA Commuter Shuttle Project
San Francisco, California

Zone	Shuttle Stop	Emission Source	Loading Time[1] (min/vehicle)	Loading Zone Length (m/trip)	Reported Stops	Maximum Stops in One Hour[2] (stops/hr)	Modeled Emission Rates[3] (g/s)	
							Gasoline TOG	Diesel TOG
Outside of APEZ	Van Ness & Union SE (PM Peak)	Idling	1		119	77	5.2E-04	3.9E-04
		Running		60	119	77	2.0E-04	9.4E-04
	Van Ness & Union SW (AM Peak)	Idling	1		82	53	3.6E-04	2.7E-04
		Running		60	82	53	1.4E-04	6.5E-04
	Valencia & 24th SW (AM Peak)	Idling	1		70	45	3.1E-04	2.3E-04
		Running		60	70	45	1.2E-04	5.5E-04
	Valencia & 25th NE (PM Peak)	Idling	1		93	60	4.1E-04	3.0E-04
		Running		60	93	60	1.6E-04	7.4E-04
	Valencia & 25th SW (AM Peak)	Idling	1		22	14	9.6E-05	7.2E-05
		Running		60	22	14	3.7E-05	1.7E-04
APEZ	Townsend & 4th, S (24 hrs)	Idling	3		100	58	1.2E-03	8.8E-04
		Running		60	100	58	1.5E-04	7.1E-04
	Townsend & 4th, NW (24 hrs)	Idling	1		74	43	2.9E-04	2.2E-04
		Running		60	74	43	1.1E-04	5.3E-04
	Market & 8th (24 hrs)	Idling	1		113	66	4.4E-04	3.3E-04
		Running		60	113	66	1.7E-04	8.1E-04
	Market & 8th (AM&PM Peak)	Idling	1		79	25	1.7E-04	1.3E-04
		Running		60	79	25	6.6E-05	3.1E-04

Notes:

[1] Loading times for most stops were observed in the pilot program to average around one minute. In the controlled analysis, stop locations with an average loading time in excess of one minute were limited to a maximum of 3 minutes.

[2] Hourly stop events are calculated assuming half of the stops observed during the peak period in the pilot program occur in one hour. For the stop with both AM and PM peak stops, the total number of stops was assumed equally split between morning and afternoon peaks, with half of the peak amount assumed to occur in one hour. For 24-hour stops, the estimated maximum hourly stop count was calculated by removing the offpeak stops (10%) from the recorded 24-hour count, then divided by two to represent an expected equal distribution of stop events in the morning and evening. Half of the peak total was assumed to occur in one hour. Growth of 29% was assumed in all calculations of maximum hourly stops.

[3] Modeled emission rates calculated based on hourly emission rates. Hourly emissions are calculated from the number of stop events and fleet aggregate emission factors. Emission factors are representative of the vehicle fleet in the pilot program and are derived from the vehicle types and model years registered by shuttle operators. In the controlled analysis, the 29% growth factor was calculated as only 2012 or newer model years. Maximum hourly emissions are calculated from the emission factors in EMFAC2014 for calendar year 2016 in San Francisco County.

Table B24: Long-Term Controlled Emission Rates
SFMTA Commuter Shuttle Project
San Francisco, California

Zone	Shuttle Stop	Emission Source	Loading Time[1] (min/vehicle)	Loading Zone Length (m/trip)	Reported Stops	Number of Shuttles[2] (stops/day)	Modeled Emission Rates (g/s)[3]										
							$PM_{2.5}$	Diesel PM_{10}					Gasoline TOG				
								CY 2016	CY 2020	CY 2024	CY 2032	CY 2040	CY 2016	CY 2020	CY 2024	CY 2032	CY 2040
Outside of APEZ	Van Ness & Union SE (PM Peak)	Idling	1		119	169	1.2E-06	1.2E-06	6.8E-08	6.7E-08	6.4E-08	6.4E-08	3.4E-05	2.7E-05	2.7E-05	2.7E-05	2.7E-05
		Running		60	119	169	4.0E-06	4.2E-06	4.4E-07	4.2E-07	4.2E-07	4.1E-07	1.3E-05	7.0E-06	7.0E-06	6.9E-06	7.0E-06
	Van Ness & Union SW (AM Peak)	Idling	1		82	116	7.9E-07	8.1E-07	4.7E-08	4.6E-08	4.4E-08	4.4E-08	2.3E-05	1.9E-05	1.8E-05	1.8E-05	1.9E-05
		Running		60	82	116	2.8E-06	2.9E-06	3.1E-07	2.9E-07	2.9E-07	2.8E-07	9.0E-06	4.8E-06	4.8E-06	4.8E-06	4.8E-06
	Valencia & 24th SW (AM Peak)	Idling	1		70	99	6.8E-07	7.0E-07	4.0E-08	3.9E-08	3.7E-08	3.7E-08	2.0E-05	1.6E-05	1.6E-05	1.6E-05	1.6E-05
		Running		60	70	99	2.4E-06	2.5E-06	2.6E-07	2.4E-07	2.5E-07	2.4E-07	7.7E-06	4.1E-06	4.1E-06	4.1E-06	4.1E-06
	Valencia & 25th NE (PM Peak)	Idling	1		93	132	9.0E-07	9.2E-07	5.3E-08	5.2E-08	5.0E-08	5.0E-08	2.7E-05	2.1E-05	2.1E-05	2.1E-05	2.1E-05
		Running		60	93	132	3.2E-06	3.3E-06	3.5E-07	3.2E-07	3.3E-07	3.2E-07	1.0E-05	5.5E-06	5.4E-06	5.4E-06	5.4E-06
	Valencia & 25th SW (AM Peak)	Idling	1		22	31	2.1E-07	2.2E-07	1.3E-08	1.2E-08	1.2E-08	1.2E-08	6.3E-06	5.1E-06	4.9E-06	4.9E-06	5.0E-06
		Running		60	22	31	7.5E-07	7.8E-07	8.2E-08	7.7E-08	7.8E-08	7.6E-08	2.4E-06	1.3E-06	1.3E-06	1.3E-06	1.3E-06
APEZ	Townsend & 4th, S (24 hrs)	Idling	3		100	129	2.6E-06	2.7E-06	1.6E-07	1.5E-07	1.5E-07	1.5E-07	7.8E-05	6.3E-05	6.1E-05	6.1E-05	6.2E-05
		Running		60	100	129	3.1E-06	3.2E-06	3.4E-07	3.2E-07	3.2E-07	3.2E-07	9.9E-06	5.3E-06	5.3E-06	5.3E-06	5.3E-06
	Townsend & 4th, NW (24 hrs)	Idling	1		74	95	6.5E-07	6.7E-07	3.8E-08	3.8E-08	3.6E-08	3.6E-08	1.9E-05	1.6E-05	1.5E-05	1.5E-05	1.5E-05
		Running		60	74	95	2.3E-06	2.4E-06	2.5E-07	2.3E-07	2.4E-07	2.3E-07	7.4E-06	4.0E-06	3.9E-06	3.9E-06	3.9E-06
	Market & 8th (24 hrs)	Idling	1		113	146	9.9E-07	1.0E-06	5.9E-08	5.8E-08	5.5E-08	5.5E-08	2.9E-05	2.4E-05	2.3E-05	2.3E-05	2.3E-05
		Running		60	113	146	3.5E-06	3.6E-06	3.8E-07	3.6E-07	3.6E-07	3.6E-07	1.1E-05	6.0E-06	6.0E-06	6.0E-06	6.0E-06
	Market & 8th (AM&PM Peak)	Idling	1		79	112	7.6E-07	7.9E-07	4.5E-08	4.4E-08	4.2E-08	4.2E-08	2.3E-05	1.8E-05	1.8E-05	1.8E-05	1.8E-05
		Running		60	79	112	2.7E-06	2.8E-06	3.0E-07	2.8E-07	2.8E-07	2.7E-07	8.6E-06	4.6E-06	4.6E-06	4.6E-06	4.6E-06

Notes:

[1] Loading times for most stops were observed in the pilot program to average around one minute. In the controlled analysis, stop locations with an average loading time in excess of one minute were limited to a maximum of 3 minutes.

[2] Daily stop events are calculated from the number of stops observed in the pilot program, plus 10% additional trips to account for off-peak trips not observed in pilot study, and an additional 29% for project growth. 24-hour stops are not scaled by 10%.

[5] Modeled emission rates calculated based on daily emission rates. Daily emissions are calculated from the number of stop events and use fleet-aggregate emission factors. Emission factors are representative of the vehicle fleet in the pilot program and are derived from the vehicle types and model years registered by shuttle operators. For evaluating chronic, long-term health impacts from diesel PM10 and gasoline TOG, emissions are calculated from emission factors in EMFAC2014 for calendar years 2016, 2020, 2024, 2032, and 2040 in San Francisco County. In the controlled analysis, emissions in calendar year 2016 are calculated with the current fleet distribution, but assume the growth of 29% is composed of only 2012 or newer model years. Calendar years 2020, 2024, 2032, and 2040 assume shuttles are replaced every eight years such that shuttle model years are evenly distributed over the eight years preceding the calendar year. A factor of 5/7 was applied to the daily emission rates to account for the fact that while the shuttles will only operate 5 days per week, modeling was conducted for all days of the year. Idling emissions presented here represent the total from both modeled idling locations.

APPENDIX C
LOCAL IMPACTS MODELING FILES

APPENDIX D
LOCAL IMPACTS HEALTH RISK CALCULATIONS

Appendix D
Health Risk Analysis Calculations Database

A Microsoft Access 2007-2010 database was used to perform the ambient air quality (AAQ) health risk assessment (HRA) of potential emissions from shuttles in the Program. The databases [*SFMTA Commuter - Uncontrolled.accdb and SFMTA Commuter - Controlled.accdb*] include the tables supporting the uncontrolled and controlled calculations for the HRA. This Appendix provides a description of the tables in the Microsoft Access 2007-2010 database that were used to perform the HRA calculations. In this HRA, Ramboll Environ estimated cancer risks, acute non-cancer hazard indices, and $PM_{2.5}$ concentrations assuming two population types at specific receptor locations – residential and school child populations. Acute non-cancer hazard indices are calculated in this HRA, in addition to cancer risk and $PM_{2.5}$ concentrations, to ensure short-term impacts are adequately evaluated.

A detailed description of the methodology used in this HRA is presented in Section 5 of the Air Quality Technical Report (AQTR). The remainder of this Appendix describes the structure of the Access 2007-2010 database used to calculate cancer risks and acute non-cancer hazard indices.

1 Database Tables Used in Health Risk Calculations

Each database consists of six input tables. Four tables contain air emissions and modeling information and two tables contain human health risk assessment data/information. **Table D-1** summarizes the relationship between the input tables in the database. **Table D-2** provides definitions of select column names and data entries. All tables used in the database are described below.

1.1 Air Emission and Modeling Tables

The information presented in the following tables is associated with the air dispersion modeling performed to estimate air concentrations based on emissions presented in Sections 3 and 4 of the AQTR.

tblReceptors

This table relates X- and Y- coordinates to potentially exposed populations as shown in Figure D-1. The table contains Universal Transverse Mercator (UTMx and UTMy) coordinates in meters (m), Ramboll Environ arbitrarily-assigned receptor identification numbers for tracking purposes ("Receptor ID" column), and potentially exposed population information ("Sensitive" and "Receptor Type" columns). The potentially exposed populations ("Receptors") considered in this HRA are described in Section 4. For this HRA, risks were quantified for the residents and school children; locations that are marked as "Yes" sensitive are specific receptor locations.

Model	RID	UTMx	UTMy	ELEV	Sensitive	Receptor Type
VN	VN0034	550714	4183530	35.12	No	Resident
VL	VL04154	551062	4178303	27.23	Yes	School

Figure D-1. Example Entries in tblReceptors

tblDispersionFactors

This table lists the annual average and maximum 1-hour (as indicated by "AVE" column) dispersion coefficients (see "CONC" column) calculated for modeled sources (see "Group" column) for each receptor location listed in the "RID" column (see Figure D-2 below for example of this table). The table also contains Universal Transverse Mercator (UTMx and UTMy) coordinates in meters (m). The air dispersion analysis used to derive the dispersion coefficients presented in the table was performed in accordance with U.S. Environmental Protection Agency (USEPA), California Air Resources Board (CARB), and Bay Area Air Quality Management District (BAAQMD) modeling guidelines as described in Section 4. The dispersion coefficients in this table are in units of micrograms per cubic meter over grams per second (($\mu g/m^3$)/(g/s)) and are used in conjunction with emission rates to estimate ambient air concentrations.

RID	Group	UTMx	UTMy	CONC	AVE	Flag	Year
MK0001	AS1_8MKS	551612	4181324	2251.552	1-HR	1.8	2008
MK0002	AS1_8MKS	551603	4181324	2378.04	1-HR	1.8	2008

Figure D-2. Example Entries in tblDispersionFactors

tblEmissions

This table lists annual emission rates (see "Emission (g/s)" column) for all of the sources that were evaluated for this HRA. Example entries are shown in Figure D-3. The "Src_Grp" column identifies the sources from where the emissions are released. Emission rates are in units of grams per second (g/s). The "Pollutant" column identifies the speciation profile that is applicable for each source. The "Time of Day" column specifies that the 1-hour emissions are for the peak time period as discussed in the AQTR. Because the evaluation includes fleet turn-over assumptions, the "Years" column represents the fleet year.

Emission (g/s)	Src_Grp	Pollutant	Fuel	Averaging Period	Time of Day	Years
3.837E-07	AS1_8MKS	DPM	Diesel	ANNUAL		2020
0.0001989	ASX_VNUE	TOG	Gasoline	1-HR	Peak	2016

Figure D-3. Example Entries in tblEmissions

tblSpeciation

This table shows the fraction of emission rate (see "Quantity" column) for each chemical. The speciation profile ("spec_profile") for all emissions evaluated in this HRA are broken out by the chemicals in each emission type ("Chemical"). The "Fuel" and "Type" columns indicate the fuel type and emission type, respectively. The Chemical Abstracts Service (CAS) number is identified in the "CAS" column. The "Notes" column indicates those chemicals used only for acute HI calculations for DPM. Figure D-4 shows example entries in the speciation table.

Chemical	Fuel	Type	spec_profile	CAS	Quantity	Notes	Unit
Diesel PM	Diesel	DPM	425	9901	1		g/s
Benzene_Diesel	Diesel	TOG	4674	71432	0.01045	Acute HI Calcs only	g/s

Figure D-4. Example Entries in tblSpeciation

1.2 Human Health Calculation Database Tables

The information presented in the tables below was used to calculate cancer risks and acute non-cancer HIs in this HRA. The information contained in these tables reflects methodologies described in detail in Section 5 of the AQTR.

tblToxicity

This table contains the chemical-specific toxicity values used to estimate cancer and non-cancer acute HIs. As shown in Figure D-5, the table lists the cancer potency factor (CPF) ("CPF" column) and acute REL ("aREL" column) for the chemicals included in this analysis. Only chemicals with at least one toxicity value are included in this table. The chemical and the Chemical Abstracts Service (CAS) number are identified in the "Chemical" and "CAS" columns. The "Notes" columns indicates which chemicals are used only for the acute analysis of DPM.

The CPF is expressed in units of per milligram per kilogram-day $(mg/kg\text{-}day)^{-1}$. The acute REL is expressed in units of $\mu g/m^3$.

Chemical	CAS	Notes	CPF	aREL
Diesel PM	9901		1.1	5
Benzene_Diesel	71432	Acute HI Calcs only		27

Figure D-5. Entries in Toxicity Table

tblExposure

This table contains exposure parameters, year for fleet turnover assumptions (EMIS_Year), age sensitivity factors (ASFs), modeling adjustment factors (MAFs) and inhalation intake factors (IFinh). Figure D-6 presents the exposure parameters used in the database.

Population	EMIS Year	Receptor Type	IFInh	DBR	ET	EF	ED	CF	ASF	MAF	AT
Resident	2024	Lifetime	0.191	581	24	350	8	0.001	3	1	25550
Resident	2032	Lifetime	0.0351	302	24	350	8	0.001	1.0625	1	25550

Figure D-6. Entries in tblExposure

The equation and assumptions used to calculate the IFinh in the database are as follows:

$$If_{inh} = \frac{DBR \times ET \times EF \times ED \times CF}{AT \times 24} \times MAF \times ASF$$

Where:

IF_{inh} = Intake factor for inhalation (m^3/kg-day)
DBR = Daily breathing rate (L/kg-day)
ET = Exposure time (hours/24)
EF = Exposure frequency (days/year)
ED = Exposure duration (years)
ASF = Age sensitivity factor (unitless)
MAF = Modeling adjustment factor (unitless)
CF = Conversion factor (0.001 m^3/L)
AT = Averaging Time (365 days/year x 70 years, or 25,550 days)

In contrast to methods and equations presented in Sections 4 and 5 of the AQTR, ASFs and MAFs are included in the calculation of the inhalation intake factors (IFinh) for use in the analysis database to streamline the calculation of cancer risk. Therefore, the IFinh shown in the AQTR is different from that shown here and used in the database. However, the cancer risks estimated in the AQTR correspond with the estimates calculated from the database.

As discussed in Section 5 of the AQTR, the exposure assumptions used to calculate the inhalation intake factors are consistent with assumptions recommended in the BAAQMD Air Toxics NSR Program Health Risk Screening Analysis (HRSA) Guidelines (BAAQMD 2010).

2 Risk Characterization Calculations

As indicated above, human health risks were estimated using the Access 2007-2010 database. The database was developed to perform large-scale risk calculations for multiple emission sources and receptor locations. The following sections describe the Access 2007-2010 database general setup and queries used to calculate cancer risks.

2.1 Chemical Air Concentration Calculation

To calculate the overall, chemical-specific, air chemical concentrations resulting from all emission sources for each receptor location, emission rates from "tblEmissions" and dispersion coefficients from "tblDispersionFactors" were used at each receptor location using the following formula:

$$C_i = \sum_{source=1}^{\#sources} \left[ER * (\chi / Q) * f\right]_{source}$$

Where:

C_i = Air concentration of chemical i (μg/m^3)
ER = Source-specific emission rate (from tblEmissions) (g/s)
(χ/Q) = Source-specific dispersion factor (from tblDispersionFactors) ((μg/m^3)/(g/s))
f = Fraction of emission rate for chemical i (from tblSpeciation)

Annual average ambient air concentrations can be calculated with this formula by using annual average emission rates and dispersion coefficients as well as fraction for each emission type.

2.2 Cancer Risk and Non-cancer Hazard

The following general equations were used to calculate cancer risk and acute non-cancer hazard quotient (HQ) using information from the Access 2007-2010 tables discussed above:

$$\text{Cancer risk} = [\text{AnnualConc}] \times [\text{CF}] \times [\text{IF}_{inh}] \times [\text{CPF}]$$

$$\text{Acute Hazard Index} = \frac{[\text{AnnualConc}]}{[\text{aREL}]}$$

Where:

AnnualConc = Receptor-specific annual average air concentration (μg/m^3)
CF = Conversion factor (0.001 mg/μg)
IF_{inh} = Intake factor for inhalation (m^3/kg-day)
CPF = Cancer potency factor (mg/kg-day)$^{-1}$ from "tblToxicity"
aREL = Acute reference exposure level (μg/m^3) from "tblToxicity"

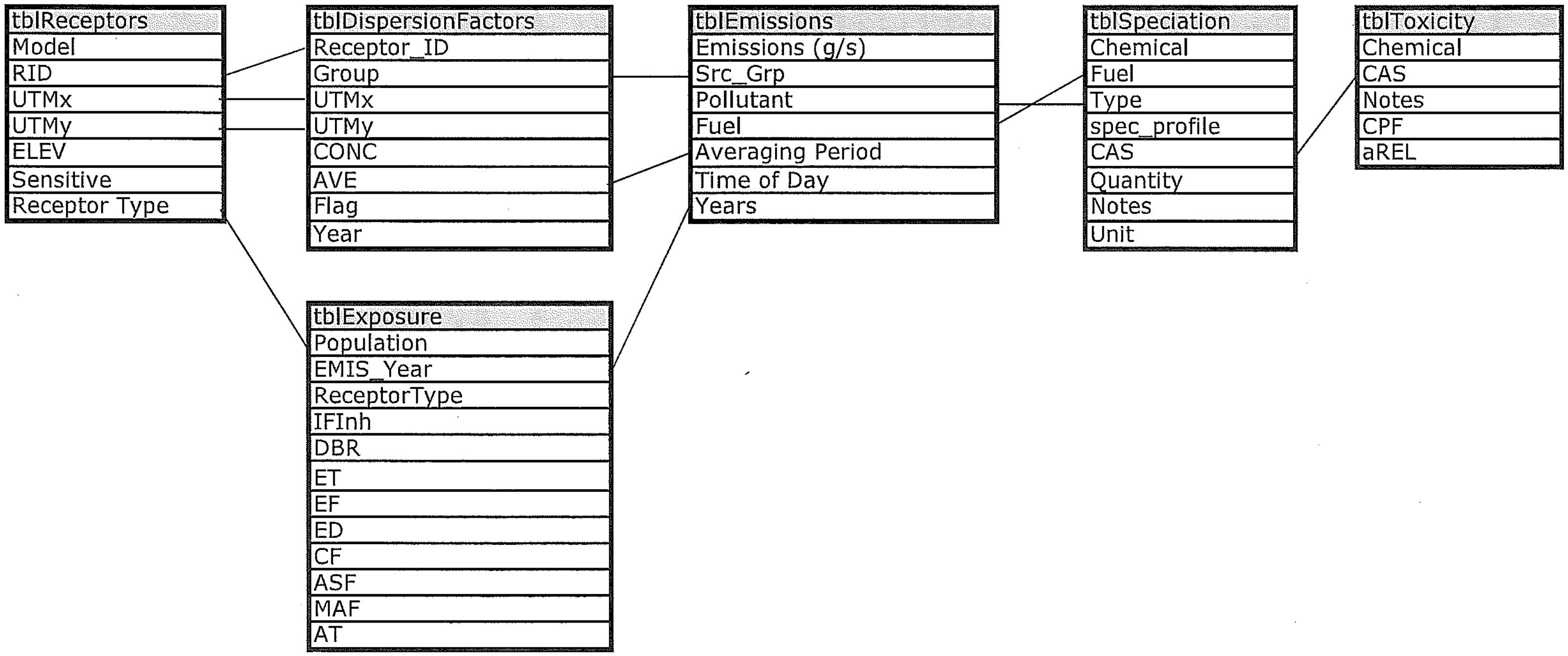
3 References

Bay Area Air Quality Management District (BAAQMD). 2010. BAAQMD Air Toxics NSR Program Health Risk Screening Analysis (HRSA) Guidelines. January.

Cal/EPA. 2003. *Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments.* Office of Environmental Health Hazard Assessment. August. Available online at: http://oehha.ca.gov/air/hot_spots/hraguidefinal.html.

Cal/EPA. 2015. Consolidated Table of OEHHA/ARB Approved Risk Assessment Health Values. May.

Table D-1: Database Tables Used in Health Risk Databases[1]
SFMTA Commuter Shuttle Program
San Francisco, California



Notes:
1. Refer to Table D-2 for definitions & table elements.

Acronyms
Cal/EPA = California Environmental Protection Agency
OEHHA = Office of Environmental Health Hazard Assessment

References

California Environmental Protection Agency (Cal/EPA). 2000. Air Toxics Hot Spots Program Risk Assessment Guidelines: Part IV Technical Support Document for Exposure Assessment and Stochastic Analysis. Office of Environmental Health Hazard Assessment. September.

California Environmental Protection Agency (Cal/EPA). 2003. The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments. Office of Environmental Health Hazard Assessment. August.

Table D-2: Select Table Entry Definitions
SFMTA Commuter Shuttle Program
San Francisco, California

Table Name	Column Name/Data Entry	Definition
tblReceptors	**Model**	Indicates modeled source location
	Receptor ID	Ramboll Environ-assigned receptor ID
	UTMx	X-coordinate (m)
	UTMy	Y-coordinate (m)
	Sensitive	Identifies population-type of receptor (sensitive)
	Receptor_Type	Identifies potentially exposed population type
tblDispersionFactors	**Group**	Ramboll Environ-assigned source group ID
	CONC	Annual average or maximum 1-hour dispersion factor
	AVE	Indicates averaging period (annual average or maximum 1-hour)
tblEmissions	**Emissions (g/s)**	Annual average emission rate
	Src_Grp	Ramboll Environ-assigned source group ID
	Pollutant	Type of chemical pollutant
	Fuel	Type of fuel for source
	Averaging Period	Indicates averaging period (annual average or maximum 1-hour)
	Years	Indicates fleet year
tblSpeciation	**Chemical**	Chemical
	Fuel	Type of fuel for source
	Type	Type of chemical pollutant
	spec_profile	Speciation profile source
	CAS	Chemical Abstract Service registry number
	Quantity	Fraction of emissions attributable to specified chemical.
tblToxicity	**CPF**	Cancer potency factor $(mg/kg\text{-}day)^{-1}$
	aREL	Acute reference exposure level ($\mu g/m^3$)
tblExposure	**IFInh**	Intake factor for specified population (m^3/kg-day)
	ReceptorType	Type of receptor
	DBR	Daily Breathing Rate (L/kg-day)
	ET	Exposure Time (hrs/24 hrs)
	EF	Exposure Frequency (days/year)
	ED	Exposure Duration (years)
	CF	Conversion Factor (0.001 mg/ug)
	CRAF	Cancer Risk Adjustment Factor (unitless)
	MAF	Modeling Adjustment Factor (unitless)
	AT	Averaging Time (days)

Acronyms:
ARB = Air Resource Board
BAAQMD = Bay Area Air Quality Management District
Cal/EPA = California Environmental Protection Agency
HRSA = Health Risk Screening Analysis
OEHHA = Office of Environmental Health Hazard Assessment

References:

Bay Area Air Quality Management District (BAAQMD). 2010. BAAQMD Air Toxics NSR Program Health Risk Screening Analysis (HRSA) Guidelines. January.

California Environmental Protection Agency (Cal/EPA). 2000. Air Toxics Hot Spots Program Risk Assessment Guidelines: Part IV Technical Support Document for Exposure Assessment and Stochastic Analysis. Office of Environmental Health Hazard Assessment. September.

California Environmental Protection Agency (Cal/EPA). 2003. The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments. Office of Environmental Health Hazard Assessment. August.

California Environmental Protection Agency (Cal/EPA). 2015. Consolidated Table of OEHHA/ARB Approved Risk Assessment Health Values. May 13.

APPENDIX E
ESTIMATED STOP COUNT LIMITS (CONTROLLED/UNCONTROLLED)

Appendix E
Maximum Allowable Shuttle Activity by Stop: Idling/Running (Controlled)
SFMTA Commuter Shuttle Program

Shuttle Stop	Program Stops in One Hour[2] (stops/hr)	Maximum Stops in One Hour Outside an APEZ[3] (stops/hr)	Maximum Stops in One Hour Within APEZ[3] (stops/hr)	Daily Stops[2] (stops/day)	Maximum Daily Stops Outside of APEZ[4,6] (stops/day)	Maximum Daily Stops Within APEZ[5,6] (stops/day)
Van Ness & Union SE (PM Peak)	77	302	211	169	302	211
Van Ness & Union SW (AM Peak)	53	208	146	116	208	146
Valencia & 24th SW (AM Peak)	45	230	161	99	230	161
Valencia & 25th NE (PM Peak)	60	306	214	132	306	214
Valencia & 25th SW (AM Peak)	14	72	51	31	72	51
Townsend & 4th, S (24 hrs)	58	371	371	129	1490	1043
Townsend & 4th, NW (24 hrs)	43	274	274	95	1103	772
Market & 8th (24 hrs)	66	523	366	146	523	366
Market & 8th (AM&PM Peak)	25	208	208	112	402	282

Abbreviations:

hr - hour

m - meter

min - minute

[1] Loading times for most stops were observed in the pilot program to average around one minute. In the controlled analysis, stop locations with an average loading time in excess of one minute were limited to a maximum of 3 minutes.

[2] Values from AQTR Table 2.

[3] Maximum stops are calculated by determining the highest number of stops that could occur within one hour without exceeding the acute threshold. In the instance this is higher than maximum daily stops, the number is set to be equal to the maximum daily stops.

[4] Maximum stops are calculated by determining the highest number of stops that could occur without exceeding the threshold outside of an APEZ.

[5] Maximum stops are calculated by determining the highest number of stops that could occur without exceeding the threshold within an APEZ.

[6] Values are shown for both "outside of" and "within" APEZ in order to use these values for similarly sitituated shuttle stop zones that may be located throughout San Francisco.

APPENDIX F
REGIONAL IMPACTS INPUTS & EMISSIONS CALCULATIONS

Table F1: Uncontrolled ROG Emission Factors
SFMTA Commuter Shuttle Project
San Francisco, California

Model Year	% of Vehicles	Running Exhaust (g/mile)													
		Motor Coach		UBUS				All Other Buses				MDV			
		DSL	Biodiesel	DSL	Biodiesel	GAS	CNG	DSL	Biodiesel	GAS	CNG	DSL	Biodiesel	GAS	CNG
1992	0.2%	2.317625	2.317625	1.69452	1.69452	3.08416	3.08416	1.41621	1.41621	0.533288	0.533288	0.379108	0.379108	0.393535	0.393535
1993	0.2%	2.247204	2.247204	1.69452	1.69452	3.08416	3.08416	1.41621	1.41621	0.533288	0.533288	0.098726	0.098726	0.38171	0.38171
1994	0	2.22559	2.22559	1.69452	1.69452	3.428383	3.428383	1.499383	1.499383	0.563068	0.563068	0.098726	0.098726	0.377736	0.377736
1995	0	2.22559	2.22559	1.673703	1.673703	3.428383	3.428383	1.499383	1.499383	0.544331	0.544331	0.098726	0.098726	0.311086	0.311086
1996	0	0.332267	0.332267	1.647756	1.647756	3.428383	3.428383	0.224094	0.224094	0.557284	0.557284	0.098726	0.098726	0.206601	0.206601
1997	0	0.332267	0.332267	1.647756	1.647756	3.167363	3.167363	0.222467	0.222467	0.532882	0.532882	0.098726	0.098726	0.206514	0.206514
1998	0	0.331558	0.331558	1.647756	1.647756	3.167363	3.167363	0.212079	0.212079	0.617133	0.617133	0.098726	0.098726	0.180088	0.180088
1999	0.2%	0.361361	0.361361	1.652693	1.652693	0.0655	0.0655	0.224243	0.224243	0.582081	0.582081	0.098726	0.098726	0.156351	0.156351
2000	0.2%	0.361361	0.361361	1.653171	1.653171	0.064526	0.064526	0.22265	0.22265	0.586664	0.586664	0.098726	0.098726	0.133178	0.133178
2001	0.2%	0.361361	0.361361	1.655219	1.655219	0.062176	0.062176	0.217207	0.217207	0.570103	0.570103	0.098726	0.098726	0.111772	0.111772
2002	0.9%	0.361301	0.361301	1.650774	1.650774	0.064258	0.064258	0.211371	0.211371	0.555801	0.555801	0.098726	0.098726	0.109429	0.109429
2003	0.8%	0.234136	0.234136	1.650774	1.650774	0.064258	0.064258	0.136067	0.136067	0.559125	0.559125	0.098726	0.098726	0.101805	0.101805
2004	0.5%	0.229386	0.229386	1.650774	1.650774	0.064258	0.064258	0.131895	0.131895	0.017412	0.017412	0.098726	0.098726	0.029309	0.029309
2005	0.3%	0.222786	0.222786	0.774067	0.774067	0.064258	0.064258	0.127428	0.127428	0.010217	0.010217	0.098726	0.098726	0.027631	0.027631
2006	0.5%	0.21503	0.21503	0.121496	0.121496	0.064258	0.064258	0.122655	0.122655	0.010217	0.010217	0.098726	0.098726	0.024594	0.024594
2007	1.4%	0.1552	0.1552	0.023002	0.023002	0.064258	0.064258	0.086918	0.086918	0.010217	0.010217	0.022958	0.022958	0.022073	0.022073
2008	2.3%	0.362116	0.362116	0.023002	0.023002	0.022628	0.022628	0.187767	0.187767	0.010217	0.010217	0.022248	0.022248	0.020343	0.020343
2009	1.2%	0.330816	0.330816	0.023008	0.023008	0.022628	0.022628	0.171156	0.171156	0.010217	0.010217	0.022514	0.022514	0.018885	0.018885
2010	3.1%	0.285006	0.285006	0.02301	0.02301	0.022628	0.022628	0.148288	0.148288	0.010217	0.010217	0.021807	0.021807	0.017533	0.017533
2011	5.4%	0.136745	0.136745	0.023002	0.023002	0.022628	0.022628	0.071822	0.071822	0.010217	0.010217	0.021057	0.021057	0.016959	0.016959
2012	5.4%	0.094089	0.094089	0.023002	0.023002	0.022628	0.022628	0.049822	0.049822	0.010217	0.010217	0.020264	0.020264	0.016242	0.016242
2013	7.9%	0.087136	0.087136	0.023052	0.023052	0.022628	0.022628	0.046475	0.046475	0.010217	0.010217	0.019428	0.019428	0.015151	0.015151
2014	9.8%	0.073522	0.073522	0.023052	0.023052	0.022628	0.022628	0.03953	0.03953	0.010217	0.010217	0.01855	0.01855	0.013323	0.013323
2015	17.4%	0.068032	0.068032	0.023052	0.023052	0.022628	0.022628	0.036719	0.036719	0.010217	0.010217	0.017628	0.017628	0.011513	0.011513
2016	15.8%	0.064578	0.064578	0.023052	0.023052	0.022628	0.022628	0.036719	0.036719	0.013298	0.013298	0.016664	0.016664	0.010558	0.010558
2017	18.6%	0.061123	0.061123	0.023052	0.023052	0.022628	0.022628	0.036719	0.036719	0.013298	0.013298	0.015657	0.015657	0.008728	0.008728
2018	7.8%	0.057669	0.057669	0.023052	0.023052	0.022628	0.022628	0.031275	0.031275	0.013298	0.013298	0.014607	0.014607	0.008157	0.008157
Type EF		0.104847	0.104847	0.074006	0.074006	0.034139	0.034139	0.057986	0.057986	0.025174	0.025174	0.021266	0.021266	0.015777	0.015777
% of Total		25.1%	58.2%	3.5%	0.2%	1.0%	1.5%	2.1%	0.8%	3.5%	1.9%	1.0%	0	1.0%	0

Table F1: Uncontrolled ROG Emission Factors
SFMTA Commuter Shuttle Project
San Francisco, California

Model Year	% of Vehicles	Idling Exhaust (g/hr)													
		Motor Coach		UBUS				All Other Buses				MDV			
		DSL	Biodiesel	DSL	Biodiesel	GAS	CNG	DSL	Biodiesel	GAS	CNG	DSL	Biodiesel	GAS	CNG
1992	0.2%	14.99966	14.99966	19.77451	19.77451	24.98751	24.98751	6.899912	6.899912	7.36365	7.36365	3.389517	3.389517	4.440442	4.440442
1993	0.2%	14.99966	14.99966	19.77451	19.77451	24.98751	24.98751	6.899912	6.899912	7.36365	7.36365	0.882687	0.882687	4.499812	4.499812
1994	0	12.00499	12.00499	19.77451	19.77451	27.77636	27.77636	4.782278	4.782278	7.774855	7.774855	0.882687	0.882687	4.51913	4.51913
1995	0	12.00499	12.00499	19.53158	19.53158	27.77636	27.77636	4.782278	4.782278	7.516134	7.516134	0.882687	0.882687	3.721669	3.721669
1996	0	1.800748	1.800748	19.22879	19.22879	27.77636	27.77636	0.717342	0.717342	7.694991	7.694991	0.882687	0.882687	2.400933	2.400933
1997	0	1.800748	1.800748	19.22879	19.22879	25.66161	25.66161	0.717342	0.717342	7.358047	7.358047	0.882687	0.882687	2.399817	2.399817
1998	0	1.373375	1.373375	19.22879	19.22879	25.66161	25.66161	0.447741	0.447741	8.521387	8.521387	0.882687	0.882687	2.146855	2.146855
1999	0.2%	1.373375	1.373375	19.2864	19.2864	0.530672	0.530672	0.447741	0.447741	8.03739	8.03739	0.882687	0.882687	1.920958	1.920958
2000	0.2%	1.373375	1.373375	19.29199	19.29199	0.52278	0.52278	0.447741	0.447741	8.10067	8.10067	0.882687	0.882687	1.698882	1.698882
2001	0.2%	1.373375	1.373375	19.31588	19.31588	0.503747	0.503747	0.447741	0.447741	7.871992	7.871992	0.882687	0.882687	1.491961	1.491961
2002	0.9%	1.373375	1.373375	19.26401	19.26401	0.520611	0.520611	0.447741	0.447741	7.674518	7.674518	0.882687	0.882687	1.460689	1.460689
2003	0.8%	1.126213	1.126213	19.26401	19.26401	0.520611	0.520611	0.358391	0.358391	7.720411	7.720411	0.882687	0.882687	1.35893	1.35893
2004	0.5%	1.126213	1.126213	19.26401	19.26401	0.520611	0.520611	0.358391	0.358391	0.240428	0.240428	0.882687	0.882687	0.391226	0.391226
2005	0.3%	1.126213	1.126213	8.595433	8.595433	0.520611	0.520611	0.358391	0.358391	0.141083	0.141083	0.882687	0.882687	0.368834	0.368834
2006	0.5%	1.126213	1.126213	1.349117	1.349117	0.520611	0.520611	0.358391	0.358391	0.141083	0.141083	0.882687	0.882687	0.328284	0.328284
2007	1.4%	0.970117	0.970117	0.303017	0.303017	0.520611	0.520611	0.308717	0.308717	0.141083	0.141083	0.629117	0.629117	0.294633	0.294633
2008	2.3%	2.477325	2.477325	0.303017	0.303017	0.183329	0.183329	0.788351	0.788351	0.141083	0.141083	0.609655	0.609655	0.271539	0.271539
2009	1.2%	2.333946	2.333946	0.303093	0.303093	0.183329	0.183329	0.742724	0.742724	0.141083	0.141083	0.616956	0.616956	0.252082	0.252082
2010	3.1%	2.067196	2.067196	0.303123	0.303123	0.183329	0.183329	0.657837	0.657837	0.141083	0.141083	0.597578	0.597578	0.234038	0.234038
2011	5.4%	0.84786	0.84786	0.303017	0.303017	0.183329	0.183329	0.269812	0.269812	0.141083	0.141083	0.577025	0.577025	0.226365	0.226365
2012	5.4%	0.508512	0.508512	0.303017	0.303017	0.183329	0.183329	0.161822	0.161822	0.141083	0.141083	0.555298	0.555298	0.216801	0.216801
2013	7.9%	0.508512	0.508512	0.303679	0.303679	0.183329	0.183329	0.161822	0.161822	0.141083	0.141083	0.532396	0.532396	0.202238	0.202238
2014	9.8%	0.508512	0.508512	0.303679	0.303679	0.183329	0.183329	0.161822	0.161822	0.141083	0.141083	0.508318	0.508318	0.177836	0.177836
2015	17.4%	0.508512	0.508512	0.303679	0.303679	0.183329	0.183329	0.161822	0.161822	0.141083	0.141083	0.483068	0.483068	0.153672	0.153672
2016	15.8%	0.508512	0.508512	0.303679	0.303679	0.183329	0.183329	0.161822	0.161822	0.183625	0.183625	0.456643	0.456643	0.140925	0.140925
2017	18.6%	0.508512	0.508512	0.303679	0.303679	0.183329	0.183329	0.161822	0.161822	0.183625	0.183625	0.429043	0.429043	0.116495	0.116495
2018	7.8%	0.508512	0.508512	0.303679	0.303679	0.183329	0.183329	0.161822	0.161822	0.183625	0.183625	0.400268	0.400268	0.108874	0.108874
Type EF		0.719905	0.719905	0.895312	0.895312	0.276589	0.276589	0.235847	0.235847	0.347602	0.347602	0.50679	0.50679	0.208023	0.208023
% of Total		25.1%	58.2%	3.5%	0.2%	1.0%	1.5%	2.1%	0.8%	3.5%	1.9%	1.0%	0	1.0%	0

RAMBOLL ENVIRON

Table F2: Uncontrolled TOG Emission Factors
SFMTA Commuter Shuttle Project
San Francisco, California

Model Year	% of Vehicles	Running Exhaust (g/mile)													
		Motor Coach		UBUS				All Other Buses				MDV			
		DSL	Biodiesel	DSL	Biodiesel	GAS	CNG	DSL	Biodiesel	GAS	CNG	DSL	Biodiesel	GAS	CNG
1992	0.2%	2.63844	2.63844	1.929098	1.929098	4.500399	4.500399	1.612248	1.612248	0.81676	0.81676	0.431589	0.431589	0.574245	0.574245
1993	0.2%	2.558271	2.558271	1.929098	1.929098	4.500399	4.500399	1.612248	1.612248	0.81676	0.81676	0.112393	0.112393	0.55699	0.55699
1994	0	2.533665	2.533665	1.929098	1.929098	5.002689	5.002689	1.706934	1.706934	0.821627	0.821627	0.112393	0.112393	0.551191	0.551191
1995	0	2.533665	2.533665	1.905399	1.905399	5.002689	5.002689	1.706934	1.706934	0.794286	0.794286	0.112393	0.112393	0.453936	0.453936
1996	0	0.37826	0.37826	2.788283	2.788283	5.002689	5.002689	0.255114	0.255114	0.813187	0.813187	0.112393	0.112393	0.301471	0.301471
1997	0	0.37826	0.37826	2.788283	2.788283	4.621809	4.621809	0.253262	0.253262	0.77758	0.77758	0.112393	0.112393	0.301345	0.301345
1998	0	0.377454	0.377454	2.788283	2.788283	4.621809	4.621809	0.241436	0.241436	0.900519	0.900519	0.112393	0.112393	0.262784	0.262784
1999	0.2%	0.411382	0.411382	2.460833	2.460833	0.095577	0.095577	0.255283	0.255283	0.849371	0.849371	0.112393	0.112393	0.228147	0.228147
2000	0.2%	0.411382	0.411382	2.429074	2.429074	0.094156	0.094156	0.25347	0.25347	0.856059	0.856059	0.112393	0.112393	0.194332	0.194332
2001	0.2%	0.411382	0.411382	2.293261	2.293261	0.090728	0.090728	0.247273	0.247273	0.831893	0.831893	0.112393	0.112393	0.163097	0.163097
2002	0.9%	0.411314	0.411314	2.588097	2.588097	0.093765	0.093765	0.24063	0.24063	0.811024	0.811024	0.112393	0.112393	0.159678	0.159678
2003	0.8%	0.266546	0.266546	2.588097	2.588097	0.093765	0.093765	0.154902	0.154902	0.815874	0.815874	0.112393	0.112393	0.148554	0.148554
2004	0.5%	0.261138	0.261138	2.588097	2.588097	0.093765	0.093765	0.150152	0.150152	0.025408	0.025408	0.112393	0.112393	0.042768	0.042768
2005	0.3%	0.253625	0.253625	4.982474	4.982474	0.093765	0.093765	0.145067	0.145067	0.014909	0.014909	0.112393	0.112393	0.04032	0.04032
2006	0.5%	0.244795	0.244795	0.429419	0.429419	0.093765	0.093765	0.139633	0.139633	0.014909	0.014909	0.112393	0.112393	0.035887	0.035887
2007	1.4%	0.176683	0.176683	0.026186	0.026186	0.093765	0.093765	0.098949	0.098949	0.014909	0.014909	0.026136	0.026136	0.032208	0.032208
2008	2.3%	0.412241	0.412241	0.026186	0.026186	0.033019	0.033019	0.213758	0.213758	0.014909	0.014909	0.025328	0.025328	0.029684	0.029684
2009	1.2%	0.376609	0.376609	0.080195	0.080195	0.033019	0.033019	0.194848	0.194848	0.014909	0.014909	0.025631	0.025631	0.027557	0.027557
2010	3.1%	0.324458	0.324458	0.101384	0.101384	0.033019	0.033019	0.168815	0.168815	0.014909	0.014909	0.024826	0.024826	0.025584	0.025584
2011	5.4%	0.155674	0.155674	0.026186	0.026186	0.033019	0.033019	0.081764	0.081764	0.014909	0.014909	0.023972	0.023972	0.024746	0.024746
2012	5.4%	0.107114	0.107114	0.026186	0.026186	0.033019	0.033019	0.056719	0.056719	0.014909	0.014909	0.023069	0.023069	0.023701	0.023701
2013	7.9%	0.099198	0.099198	0.49506	0.49506	0.033019	0.033019	0.052908	0.052908	0.014909	0.014909	0.022118	0.022118	0.022109	0.022109
2014	9.8%	0.0837	0.0837	0.49506	0.49506	0.033019	0.033019	0.045001	0.045001	0.014909	0.014909	0.021118	0.021118	0.019441	0.019441
2015	17.4%	0.077449	0.077449	0.49506	0.49506	0.033019	0.033019	0.041801	0.041801	0.014909	0.014909	0.020069	0.020069	0.0168	0.0168
2016	15.8%	0.073517	0.073517	0.49506	0.49506	0.033019	0.033019	0.041801	0.041801	0.019405	0.019405	0.018971	0.018971	0.015406	0.015406
2017	18.6%	0.069584	0.069584	0.49506	0.49506	0.033019	0.033019	0.041801	0.041801	0.019405	0.019405	0.017824	0.017824	0.012736	0.012736
2018	7.8%	0.065652	0.065652	0.49506	0.49506	0.033019	0.033019	0.035604	0.035604	0.019405	0.019405	0.016629	0.016629	0.011903	0.011903
Type EF		0.11936	0.11936	0.481675	0.481675	0.049815	0.049815	0.066013	0.066013	0.036854	0.036854	0.02421	0.02421	0.023022	0.023022
% of Total		25.1%	58.2%	3.5%	0.2%	1.0%	1.5%	2.1%	0.8%	3.5%	1.9%	1.0%	0	1.0%	0

RAMBOLL ENVIRON

Table F2: Uncontrolled TOG Emission Factors
SFMTA Commuter Shuttle Project
San Francisco, California

Model Year	% of Vehicles	Idling Exhaust (g/hr)													
		Motor Coach		UBUS				All Other Buses				MDV			
		Diesel	Biodiesel	DSL	Biodiesel	GAS	CNG	DSL	Biodiesel	GAS	CNG	DSL	Biodiesel	GAS	CNG
1992	0.2%	17.07597	17.07597	22.51197	22.51197	36.46172	36.46172	7.855025	7.855025	10.74502	10.74502	3.85874	3.85874	6.479482	6.479482
1993	0.2%	17.07597	17.07597	22.51197	22.51197	36.46172	36.46172	7.855025	7.855025	10.74502	10.74502	1.00488	1.00488	6.566115	6.566115
1994	0	13.66677	13.66677	22.51197	22.51197	40.53121	40.53121	5.44426	5.44426	11.34505	11.34505	1.00488	1.00488	6.594304	6.594304
1995	0	13.66677	13.66677	22.23541	22.23541	40.53121	40.53121	5.44426	5.44426	10.96753	10.96753	1.00488	1.00488	5.430651	5.430651
1996	0	2.050015	2.050015	32.53839	32.53839	40.53121	40.53121	0.816639	0.816639	11.22851	11.22851	1.00488	1.00488	3.503436	3.503436
1997	0	2.050015	2.050015	32.53839	32.53839	37.44536	37.44536	0.816639	0.816639	10.73685	10.73685	1.00488	1.00488	3.501807	3.501807
1998	0	1.563483	1.563483	32.53839	32.53839	37.44536	37.44536	0.509719	0.509719	12.43439	12.43439	1.00488	1.00488	3.132686	3.132686
1999	0.2%	1.563483	1.563483	28.71714	28.71714	0.774356	0.774356	0.509719	0.509719	11.72814	11.72814	1.00488	1.00488	2.803058	2.803058
2000	0.2%	1.563483	1.563483	28.34653	28.34653	0.762839	0.762839	0.509719	0.509719	11.82048	11.82048	1.00488	1.00488	2.479005	2.479005
2001	0.2%	1.563483	1.563483	26.76164	26.76164	0.735066	0.735066	0.509719	0.509719	11.48679	11.48679	1.00488	1.00488	2.177066	2.177066
2002	0.9%	1.563483	1.563483	30.20227	30.20227	0.759674	0.759674	0.509719	0.509719	11.19864	11.19864	1.00488	1.00488	2.131434	2.131434
2003	0.8%	1.282108	1.282108	30.20227	30.20227	0.759674	0.759674	0.408001	0.408001	11.26561	11.26561	1.00488	1.00488	1.982948	1.982948
2004	0.5%	1.282108	1.282108	30.20227	30.20227	0.759674	0.759674	0.408001	0.408001	0.350832	0.350832	1.00488	1.00488	0.570876	0.570876
2005	0.3%	1.282108	1.282108	55.32666	55.32666	0.759674	0.759674	0.408001	0.408001	0.205867	0.205867	1.00488	1.00488	0.538201	0.538201
2006	0.5%	1.282108	1.282108	4.768374	4.768374	0.759674	0.759674	0.408001	0.408001	0.205867	0.205867	1.00488	1.00488	0.479031	0.479031
2007	1.4%	1.104404	1.104404	0.344965	0.344965	0.759674	0.759674	0.351451	0.351451	0.205867	0.205867	0.716208	0.716208	0.429928	0.429928
2008	2.3%	2.820246	2.820246	0.344965	0.344965	0.267513	0.267513	0.897478	0.897478	0.205867	0.205867	0.694052	0.694052	0.396229	0.396229
2009	1.2%	2.65702	2.65702	1.056464	1.056464	0.267513	0.267513	0.845535	0.845535	0.205867	0.205867	0.702364	0.702364	0.367838	0.367838
2010	3.1%	2.353345	2.353345	1.335591	1.335591	0.267513	0.267513	0.748898	0.748898	0.205867	0.205867	0.680303	0.680303	0.341508	0.341508
2011	5.4%	0.965224	0.965224	0.344965	0.344965	0.267513	0.267513	0.30716	0.30716	0.205867	0.205867	0.656905	0.656905	0.330311	0.330311
2012	5.4%	0.578902	0.578902	0.344965	0.344965	0.267513	0.267513	0.184222	0.184222	0.205867	0.205867	0.632169	0.632169	0.316356	0.316356
2013	7.9%	0.578902	0.578902	6.521733	6.521733	0.267513	0.267513	0.184222	0.184222	0.205867	0.205867	0.606098	0.606098	0.295105	0.295105
2014	9.8%	0.578902	0.578902	6.521733	6.521733	0.267513	0.267513	0.184222	0.184222	0.205867	0.205867	0.578687	0.578687	0.259498	0.259498
2015	17.4%	0.578902	0.578902	6.521733	6.521733	0.267513	0.267513	0.184222	0.184222	0.205867	0.205867	0.549941	0.549941	0.224238	0.224238
2016	15.8%	0.578902	0.578902	6.521733	6.521733	0.267513	0.267513	0.184222	0.184222	0.267945	0.267945	0.519857	0.519857	0.205637	0.205637
2017	18.6%	0.578902	0.578902	6.521733	6.521733	0.267513	0.267513	0.184222	0.184222	0.267945	0.267945	0.488437	0.488437	0.16999	0.16999
2018	7.8%	0.578902	0.578902	6.521733	6.521733	0.267513	0.267513	0.184222	0.184222	0.267945	0.267945	0.455679	0.455679	0.158869	0.158869
Type EF		0.819557	0.819557	6.198839	6.198839	0.403598	0.403598	0.268494	0.268494	0.507221	0.507221	0.576947	0.576947	0.303546	0.303546
% of Total		25.1%	58.2%	3.5%	0.2%	1.0%	1.5%	2.1%	0.8%	3.5%	1.9%	1.0%	0	1.0%	0

Table F3: Uncontrolled CO Emission Factors
SFMTA Commuter Shuttle Project
San Francisco, California

Model Year	% of Vehicles	Running Exhaust (g/mile)													
		Motor Coach		UBUS				All Other Buses				MDV			
		DSL	Biodiesel	DSL	Biodiesel	GAS	CNG	DSL	Biodiesel	GAS	CNG	DSL	Biodiesel	GAS	CNG
1992	0.2%	5.974617	5.974617	8.851089	8.851089	55.20337	55.20337	3.256018	3.256018	14.02631	14.02631	2.278454	2.278454	8.666141	8.666141
1993	0.2%	6.171565	6.171565	8.851089	8.851089	55.20337	55.20337	3.256018	3.256018	14.02631	14.02631	1.043567	1.043567	8.249118	8.249118
1994	0	6.751174	6.751174	8.851089	8.851089	59.35228	59.35228	3.447241	3.447241	14.13231	14.13231	1.043567	1.043567	8.101581	8.101581
1995	0	6.751174	6.751174	5.918008	5.918008	59.35228	59.35228	3.447241	3.447241	13.65789	13.65789	1.043567	1.043567	6.159426	6.159426
1996	0	1.017072	1.017072	6.482908	6.482908	59.35228	59.35228	0.519098	0.519098	13.9859	13.9859	1.043567	1.043567	5.701666	5.701666
1997	0	1.017072	1.017072	6.482908	6.482908	54.8215	54.8215	0.52312	0.52312	13.36796	13.36796	1.043567	1.043567	5.687732	5.687732
1998	0	1.014905	1.014905	6.482908	6.482908	54.8215	54.8215	0.545639	0.545639	15.00106	15.00106	1.043567	1.043567	5.270835	5.270835
1999	0.2%	0.931555	0.931555	5.813145	5.813145	1.173783	1.173783	0.515558	0.515558	14.14334	14.14334	1.043567	1.043567	4.854726	4.854726
2000	0.2%	0.931555	0.931555	5.748186	5.748186	1.152335	1.152335	0.511896	0.511896	14.25544	14.25544	1.043567	1.043567	4.435835	4.435835
2001	0.2%	0.931555	0.931555	5.470396	5.470396	1.10061	1.10061	0.499382	0.499382	13.85022	13.85022	1.043567	1.043567	4.080087	4.080087
2002	0.9%	0.931401	0.931401	6.073449	6.073449	1.146437	1.146437	0.485964	0.485964	13.50027	13.50027	1.043567	1.043567	4.109458	4.109458
2003	0.8%	0.653211	0.653211	6.073449	6.073449	1.146437	1.146437	0.370273	0.370273	13.58159	13.58159	1.043567	1.043567	4.446158	4.446158
2004	0.5%	0.747399	0.747399	6.073449	6.073449	1.146437	1.146437	0.358868	0.358868	0.369638	0.369638	1.043567	1.043567	1.337748	1.337748
2005	0.3%	0.725787	0.725787	11.57248	11.57248	1.146437	1.146437	0.34666	0.34666	0.227058	0.227058	1.043567	1.043567	1.29819	1.29819
2006	0.5%	0.700038	0.700038	3.634708	3.634708	1.146437	1.146437	0.333612	0.333612	0.222367	0.222367	1.043567	1.043567	1.238314	1.238314
2007	1.4%	0.468764	0.468764	2.037382	2.037382	1.146437	1.146437	0.219535	0.219535	0.220558	0.220558	0.530865	0.530865	1.090649	1.090649
2008	2.3%	1.002177	1.002177	2.037382	2.037382	0.45579	0.45579	0.460337	0.460337	0.203671	0.203671	0.51269	0.51269	0.963647	0.963647
2009	1.2%	0.907426	0.907426	2.224068	2.224068	0.45579	0.45579	0.418508	0.418508	0.189924	0.189924	0.445133	0.445133	0.861844	0.861844
2010	3.1%	0.830402	0.830402	2.297307	2.297307	0.420873	0.420873	0.385146	0.385146	0.185931	0.185931	0.425928	0.425928	0.774232	0.774232
2011	5.4%	0.631675	0.631675	2.037382	2.037382	0.399192	0.399192	0.295752	0.295752	0.182754	0.182754	0.40556	0.40556	0.744685	0.744685
2012	5.4%	0.555576	0.555576	2.037382	2.037382	0.380431	0.380431	0.262247	0.262247	0.179016	0.179016	0.384026	0.384026	0.706291	0.706291
2013	7.9%	0.514519	0.514519	3.65807	3.65807	0.359966	0.359966	0.244628	0.244628	0.175108	0.175108	0.36133	0.36133	0.649317	0.649317
2014	9.8%	0.434132	0.434132	3.65807	3.65807	0.34644	0.34644	0.208071	0.208071	0.170941	0.170941	0.33747	0.33747	0.565449	0.565449
2015	17.4%	0.401712	0.401712	3.65807	3.65807	0.316192	0.316192	0.193275	0.193275	0.166316	0.166316	0.312445	0.312445	0.496173	0.496173
2016	15.8%	0.381316	0.381316	3.65807	3.65807	0.29981	0.29981	0.193275	0.193275	0.193639	0.193639	0.286257	0.286257	0.460822	0.460822
2017	18.6%	0.36092	0.36092	3.65807	3.65807	0.274501	0.274501	0.193275	0.193275	0.187962	0.187962	0.258905	0.258905	0.43145	0.43145
2018	7.8%	0.340523	0.340523	3.65807	3.65807	0.251683	0.251683	0.16462	0.16462	0.181719	0.181719	0.230389	0.230389	0.40682	0.40682
Type EF		0.484589	0.484589	3.463949	3.463949	0.533887	0.533887	0.238211	0.238211	0.518791	0.518791	0.349274	0.349274	0.665156	0.665156
% of Total		25.1%	58.2%	3.5%	0.2%	1.0%	1.5%	2.1%	0.8%	3.5%	1.9%	1.0%	0	1.0%	0

Table F3: Uncontrolled CO Emission Factors
SFMTA Commuter Shuttle Project
San Francisco, California

Model Year	% of Vehicles	Idling Exhaust (g/hr)													
		Motor Coach		UBUS				All Other Buses				MDV			
		Diesel	Biodiesel	DSL	Biodiesel	GAS	CNG	DSL	Biodiesel	GAS	CNG	DSL	Biodiesel	GAS	CNG
1992	0.2%	54.19453	54.19453	46.8128	46.8128	185.0265	185.0265	48.62281	48.62281	58.75783	58.75783	16.164	16.164	40.50422	40.50422
1993	0.2%	54.19453	54.19453	46.8128	46.8128	185.0265	185.0265	48.62281	48.62281	58.75783	58.75783	7.403357	7.403357	37.49709	37.49709
1994	0	49.8874	49.8874	46.8128	46.8128	198.9325	198.9325	39.61263	39.61263	62.07004	62.07004	7.403357	7.403357	36.45929	36.45929
1995	0	49.8874	49.8874	31.29993	31.29993	198.9325	198.9325	39.61263	39.61263	59.98632	59.98632	7.403357	7.403357	27.72276	27.72276
1996	0	7.48311	7.48311	34.28765	34.28765	198.9325	198.9325	5.941894	5.941894	61.42697	61.42697	7.403357	7.403357	25.6861	25.6861
1997	0	7.48311	7.48311	34.28765	34.28765	183.7466	183.7466	5.941894	5.941894	58.71294	58.71294	7.403357	7.403357	25.62725	25.62725
1998	0	6.763529	6.763529	34.28765	34.28765	183.7466	183.7466	4.565495	4.565495	65.88562	65.88562	7.403357	7.403357	23.30863	23.30863
1999	0.2%	6.763529	6.763529	30.74532	30.74532	3.934197	3.934197	4.565495	4.565495	62.11846	62.11846	7.403357	7.403357	21.03534	21.03534
2000	0.2%	6.763529	6.763529	30.40176	30.40176	3.862309	3.862309	4.565495	4.565495	62.61083	62.61083	7.403357	7.403357	18.75855	18.75855
2001	0.2%	6.763529	6.763529	28.93255	28.93255	3.688941	3.688941	4.565495	4.565495	60.83108	60.83108	7.403357	7.403357	16.7819	16.7819
2002	0.9%	6.763529	6.763529	32.12205	32.12205	3.842541	3.842541	4.565495	4.565495	59.29406	59.29406	7.403357	7.403357	16.9027	16.9027
2003	0.8%	6.284525	6.284525	32.12205	32.12205	3.842541	3.842541	4.04471	4.04471	59.65124	59.65124	7.403357	7.403357	18.28759	18.28759
2004	0.5%	6.284525	6.284525	32.12205	32.12205	3.842541	3.842541	4.04471	4.04471	1.623476	1.623476	7.403357	7.403357	5.502323	5.502323
2005	0.3%	6.284525	6.284525	89.15126	89.15126	3.842541	3.842541	4.04471	4.04471	0.997255	0.997255	7.403357	7.403357	5.339614	5.339614
2006	0.5%	6.284525	6.284525	28.0008	28.0008	3.842541	3.842541	4.04471	4.04471	0.976651	0.976651	7.403357	7.403357	5.093338	5.093338
2007	1.4%	5.280419	5.280419	26.83968	26.83968	3.842541	3.842541	3.398469	3.398469	0.968703	0.968703	14.54733	14.54733	4.485974	4.485974
2008	2.3%	10.25045	10.25045	26.83968	26.83968	1.527682	1.527682	6.597172	6.597172	0.894538	0.894538	14.04928	14.04928	3.963597	3.963597
2009	1.2%	9.348513	9.348513	29.29901	29.29901	1.527682	1.527682	6.016688	6.016688	0.834158	0.834158	12.19801	12.19801	3.544869	3.544869
2010	3.1%	8.257122	8.257122	30.26383	30.26383	1.41065	1.41065	5.31427	5.31427	0.816622	0.816622	11.67175	11.67175	3.184512	3.184512
2011	5.4%	3.268286	3.268286	26.83968	26.83968	1.337981	1.337981	2.103464	2.103464	0.802668	0.802668	11.11359	11.11359	3.062906	3.062906
2012	5.4%	1.879864	1.879864	26.83968	26.83968	1.275102	1.275102	1.209877	1.209877	0.78625	0.78625	10.52351	10.52351	2.904916	2.904916
2013	7.9%	1.879864	1.879864	48.19	48.19	1.206507	1.206507	1.209877	1.209877	0.769088	0.769088	9.90156	9.90156	2.670522	2.670522
2014	9.8%	1.879864	1.879864	48.19	48.19	1.161173	1.161173	1.209877	1.209877	0.750783	0.750783	9.247708	9.247708	2.325528	2.325528
2015	17.4%	1.879864	1.879864	48.19	48.19	1.059789	1.059789	1.209877	1.209877	0.730469	0.730469	8.561961	8.561961	2.040565	2.040565
2016	15.8%	1.879864	1.879864	48.19	48.19	1.004881	1.004881	1.209877	1.209877	0.850475	0.850475	7.84432	7.84432	1.895133	1.895133
2017	18.6%	1.879864	1.879864	48.19	48.19	0.920051	0.920051	1.209877	1.209877	0.825543	0.825543	7.094804	7.094804	1.774296	1.774296
2018	7.8%	1.879864	1.879864	48.19	48.19	0.843571	0.843571	1.209877	1.209877	0.798123	0.798123	6.313364	6.313364	1.672966	1.672966
Type EF		2.808274	2.808274	43.87723	43.87723	1.789444	1.789444	1.853051	1.853051	2.269722	2.269722	8.742413	8.742413	2.751186	2.751186
% of Total		25.1%	58.2%	3.5%	0.2%	1.0%	1.5%	2.1%	0.8%	3.5%	1.9%	1.0%	0	1.0%	0

RAMBOLL ENVIRON

Table F4: Uncontrolled NOx Emission Factors
SFMTA Commuter Shuttle Project
San Francisco, California

Model Year	% of Vehicles	Running Exhaust (g/mile)													
		Motor Coach		UBUS				All Other Buses				MDV			
		DSL	Biodiesel	DSL	Biodiesel	GAS	CNG	DSL	Biodiesel	GAS	CNG	DSL	Biodiesel	GAS	CNG
1992	0.2%	24.64895	24.64895	25.86677	25.86677	14.13365	14.13365	15.04836	15.04836	3.969635	3.969635	1.220817	1.220817	2.104455	2.104455
1993	0.2%	23.02933	23.02933	25.86677	25.86677	14.13365	14.13365	15.04836	15.04836	3.969635	3.969635	1.607748	1.607748	2.074043	2.074043
1994	0	20.66986	20.66986	25.86677	25.86677	14.73363	14.73363	15.26809	15.26809	3.951341	3.951341	1.607748	1.607748	2.063072	2.063072
1995	0	20.66986	20.66986	30.27566	30.27566	14.73363	14.73363	15.26809	15.26809	3.848751	3.848751	1.607748	1.607748	1.773532	1.773532
1996	0	20.43639	20.43639	37.64332	37.64332	14.73363	14.73363	15.13003	15.13003	3.919677	3.919677	1.607748	1.607748	1.271408	1.271408
1997	0	20.43639	20.43639	37.64332	37.64332	13.69592	13.69592	14.85392	14.85392	3.786057	3.786057	1.607748	1.607748	1.270812	1.270812
1998	0	20.60816	20.60816	37.64332	37.64332	13.69592	13.69592	13.37497	13.37497	3.928556	3.928556	1.607748	1.607748	1.071622	1.071622
1999	0.2%	25.08143	25.08143	20.63244	20.63244	1.174453	1.174453	15.4737	15.4737	3.743084	3.743084	1.607748	1.607748	0.886315	0.886315
2000	0.2%	25.08143	25.08143	20.63583	20.63583	1.150433	1.150433	15.44515	15.44515	3.767327	3.767327	1.607748	1.607748	0.702879	0.702879
2001	0.2%	25.08143	25.08143	20.65036	20.65036	1.0925	1.0925	15.3476	15.3476	3.679698	3.679698	1.607748	1.607748	0.533425	0.533425
2002	0.9%	25.08049	25.08049	20.61882	20.61882	1.14383	1.14383	15.24301	15.24301	3.604019	3.604019	1.607748	1.607748	0.532789	0.532789
2003	0.8%	14.7413	14.7413	20.61882	20.61882	1.14383	1.14383	8.253534	8.253534	3.621604	3.621604	1.607748	1.607748	0.531919	0.531919
2004	0.5%	12.97317	12.97317	20.61882	20.61882	1.14383	1.14383	8.166645	8.166645	0.306595	0.306595	1.607748	1.607748	0.118825	0.118825
2005	0.3%	12.85621	12.85621	6.778823	6.778823	1.14383	1.14383	8.073635	8.073635	0.16802	0.16802	1.607748	1.607748	0.106352	0.106352
2006	0.5%	12.73227	12.73227	3.923099	3.923099	1.14383	1.14383	7.974226	7.974226	0.16235	0.16235	1.607748	1.607748	0.080113	0.080113
2007	1.4%	11.93325	11.93325	1.898511	1.898511	1.14383	1.14383	7.341696	7.341696	0.160164	0.160164	0.040642	0.040642	0.075337	0.075337
2008	2.3%	10.62085	10.62085	1.898511	1.898511	0.406421	0.406421	6.143732	6.143732	0.118965	0.118965	0.04005	0.04005	0.074567	0.074567
2009	1.2%	10.25788	10.25788	1.852092	1.852092	0.406421	0.406421	5.932539	5.932539	0.083625	0.083625	0.03927	0.03927	0.073455	0.073455
2010	3.1%	8.660264	8.660264	1.833882	1.833882	0.361725	0.361725	5.059461	5.059461	0.082418	0.082418	0.038653	0.038653	0.07231	0.07231
2011	5.4%	3.786512	3.786512	1.898511	1.898511	0.333972	0.333972	2.316634	2.316634	0.081459	0.081459	0.037998	0.037998	0.07081	0.07081
2012	5.4%	2.637069	2.637069	1.898511	1.898511	0.309958	0.309958	1.655394	1.655394	0.080329	0.080329	0.037306	0.037306	0.068586	0.068586
2013	7.9%	2.328743	2.328743	1.495532	1.495532	0.283761	0.283761	1.482595	1.482595	0.079149	0.079149	0.036576	0.036576	0.064888	0.064888
2014	9.8%	1.499868	1.499868	1.495532	1.495532	0.266447	0.266447	1.005563	1.005563	0.077889	0.077889	0.03581	0.03581	0.058305	0.058305
2015	17.4%	1.256925	1.256925	1.495532	1.495532	0.227728	0.227728	0.857008	0.857008	0.076492	0.076492	0.035005	0.035005	0.051091	0.051091
2016	15.8%	1.157807	1.157807	1.495532	1.495532	0.206758	0.206758	0.857008	0.857008	0.102978	0.102978	0.034164	0.034164	0.046272	0.046272
2017	18.6%	1.058689	1.058689	1.495532	1.495532	0.174361	0.174361	0.857008	0.857008	0.101016	0.101016	0.033284	0.033284	0.038091	0.038091
2018	7.8%	0.959572	0.959572	1.495532	1.495532	0.145152	0.145152	0.658935	0.658935	0.098857	0.098857	0.032368	0.032368	0.035059	0.035059
Type EF		2.863194	2.863194	2.177596	2.177596	0.324325	0.324325	1.828744	1.828744	0.181505	0.181505	0.093211	0.093211	0.070535	0.070535
% of Total		25.1%	58.2%	3.5%	0.2%	1.0%	1.5%	2.1%	0.8%	3.5%	1.9%	1.0%	0	1.0%	0

Table F4: Uncontrolled NOx Emission Factors
SFMTA Commuter Shuttle Project
San Francisco, California

Model Year	% of Vehicles	Idling Exhaust (g/hr)													
		Motor Coach		UBUS				All Other Buses				MDV			
		Diesel	Biodiesel	DSL	Biodiesel	GAS	CNG	DSL	Biodiesel	GAS	CNG	DSL	Biodiesel	GAS	CNG
1992	0.2%	100.3962	100.3962	145.6488	145.6488	51.35095	51.35095	92.09139	92.09139	16.58509	16.58509	2.27617	2.27617	10.09372	10.09372
1993	0.2%	100.3962	100.3962	145.6488	145.6488	51.35095	51.35095	92.09139	92.09139	16.58509	16.58509	2.997589	2.997589	9.696809	9.696809
1994	0	109.1235	109.1235	145.6488	145.6488	53.53079	53.53079	105.1359	105.1359	17.29905	17.29905	2.997589	2.997589	9.560746	9.560746
1995	0	109.1235	109.1235	170.4741	170.4741	53.53079	53.53079	105.1359	105.1359	16.84991	16.84991	2.997589	2.997589	8.218853	8.218853
1996	0	109.1235	109.1235	211.9594	211.9594	53.53079	53.53079	105.1359	105.1359	17.16042	17.16042	2.997589	2.997589	6.222454	6.222454
1997	0	109.1235	109.1235	211.9594	211.9594	49.76055	49.76055	105.1359	105.1359	16.57543	16.57543	2.997589	2.997589	6.219366	6.219366
1998	0	117.4327	117.4327	211.9594	211.9594	49.76055	49.76055	127.0977	127.0977	17.1993	17.1993	2.997589	2.997589	5.162395	5.162395
1999	0.2%	117.4327	117.4327	116.1757	116.1757	4.26707	4.26707	127.0977	127.0977	16.3873	16.3873	2.997589	2.997589	4.178736	4.178736
2000	0.2%	117.4327	117.4327	116.1948	116.1948	4.1798	4.1798	127.0977	127.0977	16.49343	16.49343	2.997589	2.997589	3.205983	3.205983
2001	0.2%	117.4327	117.4327	116.2766	116.2766	3.969315	3.969315	127.0977	127.0977	16.10979	16.10979	2.997589	2.997589	2.306834	2.306834
2002	0.9%	117.4327	117.4327	116.099	116.099	4.155808	4.155808	127.0977	127.0977	15.77846	15.77846	2.997589	2.997589	2.304082	2.304082
2003	0.8%	121.7613	121.7613	116.099	116.099	4.155808	4.155808	138.4003	138.4003	15.85545	15.85545	2.997589	2.997589	2.300321	2.300321
2004	0.5%	121.7613	121.7613	116.099	116.099	4.155808	4.155808	138.4003	138.4003	1.342278	1.342278	2.997589	2.997589	0.513869	0.513869
2005	0.3%	121.7613	121.7613	33.06346	33.06346	4.155808	4.155808	138.4003	138.4003	0.735594	0.735594	2.997589	2.997589	0.459928	0.459928
2006	0.5%	121.7613	121.7613	19.13477	19.13477	4.155808	4.155808	138.4003	138.4003	0.710774	0.710774	2.997589	2.997589	0.346452	0.346452
2007	1.4%	125.1354	125.1354	12.23476	12.23476	4.155808	4.155808	142.2354	142.2354	0.7012	0.7012	0.416811	0.416811	0.325802	0.325802
2008	2.3%	93.60593	93.60593	12.23476	12.23476	1.476623	1.476623	106.3974	106.3974	0.520831	0.520831	0.410743	0.410743	0.322471	0.322471
2009	1.2%	46.55468	46.55468	11.93562	11.93562	1.476623	1.476623	52.91648	52.91648	0.36611	0.36611	0.402743	0.402743	0.317661	0.317661
2010	3.1%	39.95563	39.95563	11.81826	11.81826	1.314233	1.314233	45.41566	45.41566	0.360829	0.360829	0.396413	0.396413	0.312707	0.312707
2011	5.4%	21.5209	21.5209	12.23476	12.23476	1.213401	1.213401	24.46178	24.46178	0.356628	0.356628	0.389699	0.389699	0.306221	0.306221
2012	5.4%	15.50986	15.50986	12.23476	12.23476	1.126151	1.126151	17.62931	17.62931	0.351681	0.351681	0.382601	0.382601	0.296597	0.296597
2013	7.9%	15.50986	15.50986	9.637801	9.637801	1.030971	1.030971	17.62931	17.62931	0.346515	0.346515	0.37512	0.37512	0.280604	0.280604
2014	9.8%	15.50986	15.50986	9.637801	9.637801	0.968067	0.968067	17.62931	17.62931	0.341	0.341	0.367254	0.367254	0.252133	0.252133
2015	17.4%	15.50986	15.50986	9.637801	9.637801	0.82739	0.82739	17.62931	17.62931	0.334883	0.334883	0.359005	0.359005	0.220935	0.220935
2016	15.8%	15.50986	15.50986	9.637801	9.637801	0.751202	0.751202	17.62931	17.62931	0.45084	0.45084	0.350373	0.350373	0.200097	0.200097
2017	18.6%	15.50986	15.50986	9.637801	9.637801	0.633495	0.633495	17.62931	17.62931	0.442248	0.442248	0.341357	0.341357	0.164717	0.164717
2018	7.8%	15.50986	15.50986	9.637801	9.637801	0.527373	0.527373	17.62931	17.62931	0.4328	0.4328	0.331957	0.331957	0.151604	0.151604
Type EF		24.16526	24.16526	13.46336	13.46336	1.178351	1.178351	27.3099	27.3099	0.792168	0.792168	0.458213	0.458213	0.308491	0.308491
% of Total		25.1%	58.2%	3.5%	0.2%	1.0%	1.5%	2.1%	0.8%	3.5%	1.9%	1.0%	0	1.0%	0

Table F5: Uncontrolled CO2 Emission Factors
SFMTA Commuter Shuttle Project
San Francisco, California

Model Year	% of Vehicles	Running Exhaust (g/mile)													
		Motor Coach		UBUS				All Other Buses				MDV			
		DSL	Biodiesel	DSL	Biodiesel	GAS	CNG	DSL	Biodiesel	GAS	CNG	DSL	Biodiesel	GAS	CNG
1992	0.2%	1833.91	1833.91	2599.097	2599.097	1743.906	1743.906	1216.088	1216.088	1310.448	1310.448	638.0325	638.0325	681.5523	681.5523
1993	0.2%	1824.158	1824.158	2599.097	2599.097	1743.906	1743.906	1216.088	1216.088	1310.448	1310.448	638.0325	638.0325	583	583
1994	0	1733.877	1733.877	2599.097	2599.097	1743.906	1743.906	1165.695	1165.695	1310.448	1310.448	638.0325	638.0325	583.0243	583.0243
1995	0	1733.877	1733.877	2415.429	2415.429	1743.906	1743.906	1165.695	1165.695	1310.448	1310.448	638.0325	638.0325	583.0611	583.0611
1996	0	1767.192	1767.192	2281.041	2281.041	1743.906	1743.906	1188.016	1188.016	1310.448	1310.448	638.0325	638.0325	578.1561	578.1561
1997	0	1767.192	1767.192	2281.041	2281.041	1743.906	1743.906	1186.031	1186.031	1310.448	1310.448	638.0325	638.0325	578.1816	578.1816
1998	0	1808.273	1808.273	2281.041	2281.041	1743.906	1743.906	1201.414	1201.414	1310.448	1310.448	638.0325	638.0325	579.5575	579.5575
1999	0.2%	1834.756	1834.756	2292.385	2292.385	1743.906	1743.906	1216.649	1216.649	1310.448	1310.448	638.0325	638.0325	580.8191	580.8191
2000	0.2%	1834.756	1834.756	2293.485	2293.485	1743.906	1743.906	1216.649	1216.649	1310.448	1310.448	638.0325	638.0325	651.9101	651.9101
2001	0.2%	1834.756	1834.756	2298.19	2298.19	1743.906	1743.906	1216.649	1216.649	1310.448	1310.448	638.0325	638.0325	653.2036	653.2036
2002	0.9%	1834.756	1834.756	2287.976	2287.976	1743.906	1743.906	1216.649	1216.649	1310.448	1310.448	638.0325	638.0325	653.2036	653.2036
2003	0.8%	1817.157	1817.157	2287.976	2287.976	1743.906	1743.906	1204.979	1204.979	1310.448	1310.448	638.0325	638.0325	653.2036	653.2036
2004	0.5%	1817.157	1817.157	2287.976	2287.976	1743.906	1743.906	1204.979	1204.979	1310.448	1310.448	638.0325	638.0325	653.164	653.164
2005	0.3%	1817.157	1817.157	2220.494	2220.494	1743.906	1743.906	1204.979	1204.979	1310.448	1310.448	638.0325	638.0325	653.164	653.164
2006	0.5%	1816.695	1816.695	2305.613	2305.613	1743.906	1743.906	1204.979	1204.979	1310.448	1310.448	638.0325	638.0325	653.164	653.164
2007	1.4%	1836.057	1836.057	2312.116	2312.116	1743.906	1743.906	1218.387	1218.387	1310.448	1310.448	636.7037	636.7037	653.164	653.164
2008	2.3%	1852.703	1852.703	2312.116	2312.116	1743.906	1743.906	1232.284	1232.284	1310.448	1310.448	636.7037	636.7037	653.164	653.164
2009	1.2%	1854.432	1854.432	2299.856	2299.856	1743.906	1743.906	1233.548	1233.548	1310.448	1310.448	636.7037	636.7037	653.164	653.164
2010	3.1%	1839.813	1839.813	2295.047	2295.047	1743.906	1743.906	1240.632	1240.632	1310.448	1310.448	636.7037	636.7037	653.164	653.164
2011	5.4%	1763.827	1763.827	2312.116	2312.116	1743.906	1743.906	1271.827	1271.827	1310.448	1310.448	636.7037	636.7037	653.1872	653.1872
2012	5.4%	1740.004	1740.004	2312.116	2312.116	1743.906	1743.906	1280.117	1280.117	1310.448	1310.448	546.6648	546.6648	560.8373	560.8373
2013	7.9%	1740.004	1740.004	2205.688	2205.688	1743.906	1743.906	1276.638	1276.638	1310.448	1310.448	530.5864	530.5864	544.3615	544.3615
2014	9.8%	1670.349	1670.349	2117.391	2117.391	1674.094	1674.094	1201.904	1201.904	1257.988	1257.988	516.1159	516.1159	529.5341	529.5341
2015	17.4%	1670.349	1670.349	2117.391	2117.391	1674.094	1674.094	1196.078	1196.078	1257.988	1257.988	491.9983	491.9983	504.8075	504.8075
2016	15.8%	1670.349	1670.349	2117.391	2117.391	1674.094	1674.094	1196.078	1196.078	1257.988	1257.988	469.4886	469.4886	481.7289	481.7289
2017	18.6%	1606.105	1606.105	2035.953	2035.953	1609.706	1609.706	1196.078	1196.078	1209.604	1209.604	466.2729	466.2729	478.4464	478.4464
2018	7.8%	1606.105	1606.105	2035.953	2035.953	1609.706	1609.706	1150.075	1150.075	1209.604	1209.604	450.1946	450.1946	461.9647	461.9647
Type EF		1687.637	1687.637	2146.32	2146.32	1678.453	1678.453	1211.674	1211.674	1261.263	1261.263	513.7711	513.7711	526.9039	526.9039
% of Total		25.1%	58.2%	3.5%	0.2%	1.0%	1.5%	2.1%	0.8%	3.5%	1.9%	1.0%	0	1.0%	0

Table F5: Uncontrolled CO2 Emission Factors
SFMTA Commuter Shuttle Project
San Francisco, California

Model Year	% of Vehicles	Idling Exhaust (g/hr)															
		Motor Coach		UBUS				All Other Buses				MDV			
		Diesel	Biodiesel	DSL	Biodiesel	GAS	CNG	DSL	Biodiesel	GAS	CNG	DSL	Biodiesel	GAS	CNG
1992	0.2%	6572.745	6572.745	10419	10419	9900.862	9900.862	6054.448	6054.448	9900.862	9900.862	3452.605	3452.605	4928.16	4928.16
1993	0.2%	6572.745	6572.745	10419	10419	9900.862	9900.862	6054.448	6054.448	9900.862	9900.862	3452.605	3452.605	4215.483	4215.483
1994	0	6718.885	6718.885	10419	10419	9900.862	9900.862	6461.859	6461.859	9900.862	9900.862	3452.605	3452.605	4215.592	4215.592
1995	0	6718.885	6718.885	9682.733	9682.733	9900.862	9900.862	6461.859	6461.859	9900.862	9900.862	3452.605	3452.605	4215.756	4215.756
1996	0	6853.263	6853.263	9144.012	9144.012	9900.862	9900.862	6591.096	6591.096	9900.862	9900.862	3452.605	3452.605	4180.069	4180.069
1997	0	6853.263	6853.263	9144.012	9144.012	9900.862	9900.862	6591.096	6591.096	9900.862	9900.862	3452.605	3452.605	4180.183	4180.183
1998	0	7037.445	7037.445	9144.012	9144.012	9900.862	9900.862	7264.756	7264.756	9900.862	9900.862	3452.605	3452.605	4190.042	4190.042
1999	0.2%	7037.445	7037.445	9189.484	9189.484	9900.862	9900.862	7264.756	7264.756	9900.862	9900.862	3452.605	3452.605	4199.146	4199.146
2000	0.2%	7037.445	7037.445	9193.894	9193.894	9900.862	9900.862	7264.756	7264.756	9900.862	9900.862	3452.605	3452.605	4713.094	4713.094
2001	0.2%	7037.445	7037.445	9212.754	9212.754	9900.862	9900.862	7264.756	7264.756	9900.862	9900.862	3452.605	3452.605	4722.429	4722.429
2002	0.9%	7037.445	7037.445	9171.811	9171.811	9900.862	9900.862	7264.756	7264.756	9900.862	9900.862	3452.605	3452.605	4722.429	4722.429
2003	0.8%	7160.876	7160.876	9171.811	9171.811	9900.862	9900.862	7605.46	7605.46	9900.862	9900.862	3452.605	3452.605	4722.429	4722.429
2004	0.5%	7160.876	7160.876	9171.811	9171.811	9900.862	9900.862	7605.46	7605.46	9900.862	9900.862	3452.605	3452.605	4722.252	4722.252
2005	0.3%	7160.876	7160.876	8901.297	8901.297	9900.862	9900.862	7605.46	7605.46	9900.862	9900.862	3452.605	3452.605	4722.252	4722.252
2006	0.5%	7160.876	7160.876	9242.511	9242.511	9900.862	9900.862	7605.46	7605.46	9900.862	9900.862	3452.605	3452.605	4722.252	4722.252
2007	1.4%	7497.536	7497.536	9268.58	9268.58	9900.862	9900.862	7963.021	7963.021	9900.862	9900.862	3445.414	3445.414	4722.252	4722.252
2008	2.3%	7566.437	7566.437	9268.58	9268.58	9900.862	9900.862	8036.2	8036.2	9900.862	9900.862	3445.414	3445.414	4722.252	4722.252
2009	1.2%	7581.998	7581.998	9219.436	9219.436	9900.862	9900.862	8052.727	8052.727	9900.862	9900.862	3445.414	3445.414	4722.252	4722.252
2010	3.1%	7427.067	7427.067	9200.156	9200.156	9900.862	9900.862	7888.178	7888.178	9900.862	9900.862	3445.414	3445.414	4722.252	4722.252
2011	5.4%	6718.87	6718.87	9268.58	9268.58	9900.862	9900.862	7136.012	7136.012	9900.862	9900.862	3445.414	3445.414	4722.356	4722.356
2012	5.4%	6521.775	6521.775	9268.58	9268.58	9900.862	9900.862	6926.68	6926.68	9900.862	9900.862	2958.184	2958.184	4054.637	4054.637
2013	7.9%	6521.775	6521.775	8841.943	8841.943	9900.862	9900.862	6926.68	6926.68	9900.862	9900.862	2871.179	2871.179	3935.47	3935.47
2014	9.8%	6260.698	6260.698	8487.986	8487.986	9504.515	9504.515	6649.394	6649.394	9504.515	9504.515	2792.874	2792.874	3828.223	3828.223
2015	17.4%	6260.698	6260.698	8487.986	8487.986	9504.515	9504.515	6649.394	6649.394	9504.515	9504.515	2662.366	2662.366	3649.415	3649.415
2016	15.8%	6260.698	6260.698	8487.986	8487.986	9504.515	9504.515	6649.394	6649.394	9504.515	9504.515	2540.558	2540.558	3482.524	3482.524
2017	18.6%	6019.902	6019.902	8161.525	8161.525	9138.957	9138.957	6649.394	6649.394	9138.957	9138.957	2523.157	2523.157	3458.748	3458.748
2018	7.8%	6019.902	6019.902	8161.525	8161.525	9138.957	9138.957	6393.648	6393.648	9138.957	9138.957	2436.152	2436.152	3339.554	3339.554
Type EF		6387.229	6387.229	8603.952	8603.952	9529.259	9529.259	6825.629	6825.629	9529.259	9529.259	2780.186	2780.186	3809.195	3809.195
% of Total		25.1%	58.2%	3.5%	0.2%	1.0%	1.5%	2.1%	0.8%	3.5%	1.9%	1.0%	0	1.0%	0

Table F6: Uncontrolled PM10 Emission Factors
SFMTA Commuter Shuttle Project
San Francisco, California

Model Year	% of Vehicles	Running Exhaust (g/mile)													
		Motor Coach		UBUS				All Other Buses				MDV			
		DSL	Biodiesel	DSL	Biodiesel	GAS	CNG	DSL	Biodiesel	GAS	CNG	DSL	Biodiesel	GAS	CNG
1992	0.2%	0.970005	0.970005	0.758614	0.758614	0.011703	0.011703	0.884538	0.884538	0.006868	0.006868	0.245646	0.245646	0.013361	0.013361
1993	0.2%	0.98507	0.98507	0.758614	0.758614	0.011703	0.011703	0.884538	0.884538	0.006868	0.006868	0.060443	0.060443	0.013482	0.013482
1994	0	0.729927	0.729927	0.758614	0.758614	0.003344	0.003344	0.558144	0.558144	0.006868	0.006868	0.060443	0.060443	0.013523	0.013523
1995	0	0.729927	0.729927	0.92445	0.92445	0.003344	0.003344	0.558144	0.558144	0.006868	0.006868	0.060443	0.060443	0.013523	0.013523
1996	0	0.109723	0.109723	0.99583	0.99583	0.003344	0.003344	0.083839	0.083839	0.006868	0.006868	0.060443	0.060443	0.003864	0.003864
1997	0	0.109723	0.109723	0.99583	0.99583	0.003344	0.003344	0.084075	0.084075	0.006868	0.006868	0.060443	0.060443	0.003864	0.003864
1998	0	0.107238	0.107238	0.99583	0.99583	0.003344	0.003344	0.082693	0.082693	0.001962	0.001962	0.060443	0.060443	0.003886	0.003886
1999	0.2%	0.1029	0.1029	0.355833	0.355833	0.003344	0.003344	0.080985	0.080985	0.001962	0.001962	0.060443	0.060443	0.003907	0.003907
2000	0.2%	0.1029	0.1029	0.357142	0.357142	0.003344	0.003344	0.080546	0.080546	0.001962	0.001962	0.060443	0.060443	0.003928	0.003928
2001	0.2%	0.1029	0.1029	0.362739	0.362739	0.003344	0.003344	0.079048	0.079048	0.001962	0.001962	0.060443	0.060443	0.003947	0.003947
2002	0.9%	0.102888	0.102888	0.350588	0.350588	0.003344	0.003344	0.077441	0.077441	0.001962	0.001962	0.060443	0.060443	0.003947	0.003947
2003	0.8%	0.102903	0.102903	0.350588	0.350588	0.003344	0.003344	0.082959	0.082959	0.001962	0.001962	0.060443	0.060443	0.003947	0.003947
2004	0.5%	0.118097	0.118097	0.350588	0.350588	0.003344	0.003344	0.081035	0.081035	0.000131	0.000131	0.060443	0.060443	0.000263	0.000263
2005	0.3%	0.115615	0.115615	0.064437	0.064437	0.003344	0.003344	0.078975	0.078975	0.000131	0.000131	0.060443	0.060443	0.000263	0.000263
2006	0.5%	0.112663	0.112663	0.082613	0.082613	0.003344	0.003344	0.076773	0.076773	0.000131	0.000131	0.060443	0.060443	0.000263	0.000263
2007	1.4%	0.081727	0.081727	0.010365	0.010365	0.003344	0.003344	0.055759	0.055759	0.000131	0.000131	0.005999	0.005999	0.000263	0.000263
2008	2.3%	0.057537	0.057537	0.010365	0.010365	0.000254	0.000254	0.035965	0.035965	0.000149	0.000149	0.005807	0.005807	0.0003	0.0003
2009	1.2%	0.043645	0.043645	0.010058	0.010058	0.000254	0.000254	0.026341	0.026341	0.000167	0.000167	0.005602	0.005602	0.000337	0.000337
2010	3.1%	0.036219	0.036219	0.009937	0.009937	0.000348	0.000348	0.021997	0.021997	0.000204	0.000204	0.005383	0.005383	0.000411	0.000411
2011	5.4%	0.01224	0.01224	0.010365	0.010365	0.000473	0.000473	0.007516	0.007516	0.000277	0.000277	0.005152	0.005152	0.000558	0.000558
2012	5.4%	0.005785	0.005785	0.010365	0.010365	0.000691	0.000691	0.003586	0.003586	0.000406	0.000406	0.004907	0.004907	0.000816	0.000816
2013	7.9%	0.005273	0.005273	0.007698	0.007698	0.001034	0.001034	0.003296	0.003296	0.000607	0.000607	0.004648	0.004648	0.001221	0.001221
2014	9.8%	0.004324	0.004324	0.007698	0.007698	0.00144	0.00144	0.002728	0.002728	0.000845	0.000845	0.004377	0.004377	0.0017	0.0017
2015	17.4%	0.003908	0.003908	0.007698	0.007698	0.001815	0.001815	0.002477	0.002477	0.001065	0.001065	0.004092	0.004092	0.002142	0.002142
2016	15.8%	0.003626	0.003626	0.007698	0.007698	0.002095	0.002095	0.002477	0.002477	0.00123	0.00123	0.003794	0.003794	0.002474	0.002474
2017	18.6%	0.003343	0.003343	0.007698	0.007698	0.002251	0.002251	0.002477	0.002477	0.001321	0.001321	0.003483	0.003483	0.002658	0.002658
2018	7.8%	0.003061	0.003061	0.007698	0.007698	0.002345	0.002345	0.001953	0.001953	0.001376	0.001376	0.003158	0.003158	0.002768	0.002768
Type EF		0.014791	0.014791	0.020132	0.020132	0.001752	0.001752	0.010661	0.010661	0.00098	0.00098	0.006546	0.006546	0.00197	0.00197
% of Total		25.1%	58.2%	3.5%	0.2%	1.0%	1.5%	2.1%	0.8%	3.5%	1.9%	1.0%	0	1.0%	0

Table F6: Uncontrolled PM10 Emission Factors
SFMTA Commuter Shuttle Project
San Francisco, California

Model Year	% of Vehicles	Idling Exhaust (g/hr)													
		Motor Coach		UBUS				All Other Buses				MDV			
		Diesel	Biodiesel	DSL	Biodiesel	GAS	CNG	DSL	Biodiesel	GAS	CNG	DSL	Biodiesel	GAS	CNG
1992	0.2%	2.39319	2.39319	5.868379	5.868379	0.094814	0.094814	2.360687	2.360687	0.094814	0.094814	2.196266	2.196266	0.155767	0.155767
1993	0.2%	2.39319	2.39319	5.868379	5.868379	0.094814	0.094814	2.360687	2.360687	0.094814	0.094814	0.540406	0.540406	0.163577	0.163577
1994	0	1.798389	1.798389	5.868379	5.868379	0.02709	0.02709	1.684396	1.684396	0.094814	0.094814	0.540406	0.540406	0.166181	0.166181
1995	0	1.798389	1.798389	7.151232	7.151232	0.02709	0.02709	1.684396	1.684396	0.094814	0.094814	0.540406	0.540406	0.166181	0.166181
1996	0	0.269758	0.269758	7.703404	7.703404	0.02709	0.02709	0.252659	0.252659	0.094814	0.094814	0.540406	0.540406	0.04748	0.04748
1997	0	0.269758	0.269758	7.703404	7.703404	0.02709	0.02709	0.252659	0.252659	0.094814	0.094814	0.540406	0.540406	0.04748	0.04748
1998	0	0.190695	0.190695	7.703404	7.703404	0.02709	0.02709	0.163702	0.163702	0.02709	0.02709	0.540406	0.540406	0.04893	0.04893
1999	0.2%	0.190695	0.190695	2.752603	2.752603	0.02709	0.02709	0.163702	0.163702	0.02709	0.02709	0.540406	0.540406	0.050284	0.050284
2000	0.2%	0.190695	0.190695	2.762728	2.762728	0.02709	0.02709	0.163702	0.163702	0.02709	0.02709	0.540406	0.540406	0.051619	0.051619
2001	0.2%	0.190695	0.190695	2.806026	2.806026	0.02709	0.02709	0.163702	0.163702	0.02709	0.02709	0.540406	0.540406	0.052859	0.052859
2002	0.9%	0.190695	0.190695	2.71203	2.71203	0.02709	0.02709	0.163702	0.163702	0.02709	0.02709	0.540406	0.540406	0.052859	0.052859
2003	0.8%	0.147547	0.147547	2.71203	2.71203	0.02709	0.02709	0.133597	0.133597	0.02709	0.02709	0.540406	0.540406	0.052859	0.052859
2004	0.5%	0.147547	0.147547	2.71203	2.71203	0.02709	0.02709	0.133597	0.133597	0.001806	0.001806	0.540406	0.540406	0.003524	0.003524
2005	0.3%	0.147547	0.147547	0.22805	0.22805	0.02709	0.02709	0.133597	0.133597	0.001806	0.001806	0.540406	0.540406	0.003524	0.003524
2006	0.5%	0.147547	0.147547	0.292377	0.292377	0.02709	0.02709	0.133597	0.133597	0.001806	0.001806	0.540406	0.540406	0.003524	0.003524
2007	1.4%	0.128973	0.128973	0.037565	0.037565	0.02709	0.02709	0.11678	0.11678	0.001806	0.001806	0.028926	0.028926	0.003524	0.003524
2008	2.3%	0.031742	0.031742	0.037565	0.037565	0.002059	0.002059	0.028741	0.028741	0.002059	0.002059	0.028	0.028	0.004017	0.004017
2009	1.2%	0.001497	0.001497	0.036452	0.036452	0.002059	0.002059	0.001356	0.001356	0.002312	0.002312	0.02701	0.02701	0.004511	0.004511
2010	3.1%	0.001497	0.001497	0.036015	0.036015	0.002817	0.002817	0.001356	0.001356	0.002817	0.002817	0.025956	0.025956	0.005497	0.005497
2011	5.4%	0.001497	0.001497	0.037565	0.037565	0.003829	0.003829	0.001356	0.001356	0.003829	0.003829	0.024838	0.024838	0.007471	0.007471
2012	5.4%	0.001497	0.001497	0.037565	0.037565	0.005599	0.005599	0.001356	0.001356	0.005599	0.005599	0.023657	0.023657	0.010924	0.010924
2013	7.9%	0.001497	0.001497	0.027898	0.027898	0.00838	0.00838	0.001356	0.001356	0.00838	0.00838	0.022411	0.022411	0.016351	0.016351
2014	9.8%	0.001497	0.001497	0.027898	0.027898	0.011667	0.011667	0.001356	0.001356	0.011667	0.011667	0.021102	0.021102	0.022765	0.022765
2015	17.4%	0.001497	0.001497	0.027898	0.027898	0.014701	0.014701	0.001356	0.001356	0.014701	0.014701	0.019729	0.019729	0.028685	0.028685
2016	15.8%	0.001497	0.001497	0.027898	0.027898	0.016976	0.016976	0.001356	0.001356	0.016976	0.016976	0.018292	0.018292	0.033125	0.033125
2017	18.6%	0.001497	0.001497	0.027898	0.027898	0.01824	0.01824	0.001356	0.001356	0.01824	0.01824	0.016791	0.016791	0.035592	0.035592
2018	7.8%	0.001497	0.001497	0.027898	0.027898	0.018999	0.018999	0.001356	0.001356	0.018999	0.018999	0.015226	0.015226	0.037072	0.037072
Type EF		0.017003	0.017003	0.120802	0.120802	0.014196	0.014196	0.015872	0.015872	0.013532	0.013532	0.042022	0.042022	0.026319	0.026319
% of Total		25.1%	58.2%	3.5%	0.2%	1.0%	1.5%	2.1%	0.8%	3.5%	1.9%	1.0%	0	1.0%	0

RAMBOLL ENVIRON

Table F7: Uncontrolled PM2.5 Emission Factors
SFMTA Commuter Shuttle Project
San Francisco, California

Model Year	% of Vehicles	Running Exhaust (g/mile)															
		Motor Coach		UBUS				All Other Buses				MDV					
		DSL	Biodiesel	DSL	Biodiesel	GAS	CNG	DSL	Biodiesel	GAS	CNG	DSL	Biodiesel	GAS	CNG		
1992	0.2%	0.928043	0.928043	0.725797	0.725797	0.010761	0.010761	0.846273	0.846273	0.006315	0.006315	0.23502	0.23502	0.012285	0.012285		
1993	0.2%	0.942456	0.942456	0.725797	0.725797	0.010761	0.010761	0.846273	0.846273	0.006315	0.006315	0.057828	0.057828	0.012397	0.012397		
1994	0	0.698351	0.698351	0.725797	0.725797	0.003074	0.003074	0.533999	0.533999	0.006315	0.006315	0.057828	0.057828	0.012434	0.012434		
1995	0	0.698351	0.698351	0.884459	0.884459	0.003074	0.003074	0.533999	0.533999	0.006315	0.006315	0.057828	0.057828	0.012434	0.012434		
1996	0	0.104976	0.104976	0.952751	0.952751	0.003074	0.003074	0.080212	0.080212	0.006315	0.006315	0.057828	0.057828	0.003552	0.003552		
1997	0	0.104976	0.104976	0.952751	0.952751	0.003074	0.003074	0.080438	0.080438	0.006315	0.006315	0.057828	0.057828	0.003552	0.003552		
1998	0	0.102599	0.102599	0.952751	0.952751	0.003074	0.003074	0.079116	0.079116	0.001804	0.001804	0.057828	0.057828	0.003573	0.003573		
1999	0.2%	0.098449	0.098449	0.34044	0.34044	0.003074	0.003074	0.077482	0.077482	0.001804	0.001804	0.057828	0.057828	0.003592	0.003592		
2000	0.2%	0.098449	0.098449	0.341692	0.341692	0.003074	0.003074	0.077062	0.077062	0.001804	0.001804	0.057828	0.057828	0.003612	0.003612		
2001	0.2%	0.098449	0.098449	0.347047	0.347047	0.003074	0.003074	0.075628	0.075628	0.001804	0.001804	0.057828	0.057828	0.003629	0.003629		
2002	0.9%	0.098437	0.098437	0.335422	0.335422	0.003074	0.003074	0.074091	0.074091	0.001804	0.001804	0.057828	0.057828	0.003629	0.003629		
2003	0.8%	0.098451	0.098451	0.335422	0.335422	0.003074	0.003074	0.07937	0.07937	0.001804	0.001804	0.057828	0.057828	0.003629	0.003629		
2004	0.5%	0.112989	0.112989	0.335422	0.335422	0.003074	0.003074	0.077529	0.077529	0.00012	0.00012	0.057828	0.057828	0.000242	0.000242		
2005	0.3%	0.110614	0.110614	0.06165	0.06165	0.003074	0.003074	0.075558	0.075558	0.00012	0.00012	0.057828	0.057828	0.000242	0.000242		
2006	0.5%	0.107789	0.107789	0.07904	0.07904	0.003074	0.003074	0.073452	0.073452	0.00012	0.00012	0.057828	0.057828	0.000242	0.000242		
2007	1.4%	0.078191	0.078191	0.009916	0.009916	0.003074	0.003074	0.053347	0.053347	0.00012	0.00012	0.00574	0.00574	0.000242	0.000242		
2008	2.3%	0.055048	0.055048	0.009916	0.009916	0.000234	0.000234	0.034409	0.034409	0.000137	0.000137	0.005556	0.005556	0.000276	0.000276		
2009	1.2%	0.041757	0.041757	0.009622	0.009622	0.000234	0.000234	0.025202	0.025202	0.000154	0.000154	0.00536	0.00536	0.00031	0.00031		
2010	3.1%	0.034652	0.034652	0.009507	0.009507	0.00032	0.00032	0.021045	0.021045	0.000188	0.000188	0.005151	0.005151	0.000377	0.000377		
2011	5.4%	0.011711	0.011711	0.009916	0.009916	0.000435	0.000435	0.007191	0.007191	0.000255	0.000255	0.004929	0.004929	0.000513	0.000513		
2012	5.4%	0.005535	0.005535	0.009916	0.009916	0.000635	0.000635	0.003431	0.003431	0.000373	0.000373	0.004694	0.004694	0.00075	0.00075		
2013	7.9%	0.005045	0.005045	0.007365	0.007365	0.000951	0.000951	0.003154	0.003154	0.000558	0.000558	0.004447	0.004447	0.001123	0.001123		
2014	9.8%	0.004137	0.004137	0.007365	0.007365	0.001324	0.001324	0.00261	0.00261	0.000777	0.000777	0.004187	0.004187	0.001563	0.001563		
2015	17.4%	0.003739	0.003739	0.007365	0.007365	0.001668	0.001668	0.00237	0.00237	0.000979	0.000979	0.003915	0.003915	0.001969	0.001969		
2016	15.8%	0.003469	0.003469	0.007365	0.007365	0.001927	0.001927	0.00237	0.00237	0.001131	0.001131	0.00363	0.00363	0.002274	0.002274		
2017	18.6%	0.003199	0.003199	0.007365	0.007365	0.00207	0.00207	0.00237	0.00237	0.001215	0.001215	0.003332	0.003332	0.002444	0.002444		
2018	7.8%	0.002928	0.002928	0.007365	0.007365	0.002156	0.002156	0.001868	0.001868	0.001265	0.001265	0.003021	0.003021	0.002545	0.002545		
Type EF		0.014151	0.014151	0.019261	0.019261	0.001611	0.001611	0.0102	0.0102	0.000901	0.000901	0.006262	0.006262	0.001812	0.001812		
% of Total		25.1%	58.2%	3.5%	0.2%	1.0%	1.5%	2.1%	0.8%	3.5%	1.9%	1.0%	0	1.0%	0		

RAMBOLL ENVIRON

Table F7: Uncontrolled PM2.5 Emission Factors
SFMTA Commuter Shuttle Project
San Francisco, California

Model Year	% of Vehicles	Idling Exhaust (g/hr)													
		Motor Coach		UBUS				All Other Buses				MDV			
		Diesel	Biodiesel	DSL	Biodiesel	GAS	CNG	DSL	Biodiesel	GAS	CNG	DSL	Biodiesel	GAS	CNG
1992	0.2%	2.289662	2.289662	5.614515	5.614515	0.087178	0.087178	2.258565	2.258565	0.087178	0.087178	2.101257	2.101257	0.143222	0.143222
1993	0.2%	2.289662	2.289662	5.614515	5.614515	0.087178	0.087178	2.258565	2.258565	0.087178	0.087178	0.517029	0.517029	0.150403	0.150403
1994	0	1.720591	1.720591	5.614515	5.614515	0.024908	0.024908	1.61153	1.61153	0.087178	0.087178	0.517029	0.517029	0.152797	0.152797
1995	0	1.720591	1.720591	6.841872	6.841872	0.024908	0.024908	1.61153	1.61153	0.087178	0.087178	0.517029	0.517029	0.152797	0.152797
1996	0	0.258089	0.258089	7.370158	7.370158	0.024908	0.024908	0.241729	0.241729	0.087178	0.087178	0.517029	0.517029	0.043656	0.043656
1997	0	0.258089	0.258089	7.370158	7.370158	0.024908	0.024908	0.241729	0.241729	0.087178	0.087178	0.517029	0.517029	0.043656	0.043656
1998	0	0.182445	0.182445	7.370158	7.370158	0.024908	0.024908	0.156621	0.156621	0.024908	0.024908	0.517029	0.517029	0.044989	0.044989
1999	0.2%	0.182445	0.182445	2.633527	2.633527	0.024908	0.024908	0.156621	0.156621	0.024908	0.024908	0.517029	0.517029	0.046234	0.046234
2000	0.2%	0.182445	0.182445	2.643214	2.643214	0.024908	0.024908	0.156621	0.156621	0.024908	0.024908	0.517029	0.517029	0.047462	0.047462
2001	0.2%	0.182445	0.182445	2.684639	2.684639	0.024908	0.024908	0.156621	0.156621	0.024908	0.024908	0.517029	0.517029	0.048602	0.048602
2002	0.9%	0.182445	0.182445	2.594709	2.594709	0.024908	0.024908	0.156621	0.156621	0.024908	0.024908	0.517029	0.517029	0.048602	0.048602
2003	0.8%	0.141164	0.141164	2.594709	2.594709	0.024908	0.024908	0.127818	0.127818	0.024908	0.024908	0.517029	0.517029	0.048602	0.048602
2004	0.5%	0.141164	0.141164	2.594709	2.594709	0.024908	0.024908	0.127818	0.127818	0.001661	0.001661	0.517029	0.517029	0.00324	0.00324
2005	0.3%	0.141164	0.141164	0.218185	0.218185	0.024908	0.024908	0.127818	0.127818	0.001661	0.001661	0.517029	0.517029	0.00324	0.00324
2006	0.5%	0.141164	0.141164	0.279729	0.279729	0.024908	0.024908	0.127818	0.127818	0.001661	0.001661	0.517029	0.517029	0.00324	0.00324
2007	1.4%	0.123394	0.123394	0.03594	0.03594	0.024908	0.024908	0.111728	0.111728	0.001661	0.001661	0.027675	0.027675	0.00324	0.00324
2008	2.3%	0.030369	0.030369	0.03594	0.03594	0.001893	0.001893	0.027497	0.027497	0.001893	0.001893	0.026789	0.026789	0.003694	0.003694
2009	1.2%	0.001432	0.001432	0.034875	0.034875	0.001893	0.001893	0.001297	0.001297	0.002125	0.002125	0.025842	0.025842	0.004147	0.004147
2010	3.1%	0.001432	0.001432	0.034457	0.034457	0.00259	0.00259	0.001297	0.001297	0.00259	0.00259	0.024833	0.024833	0.005055	0.005055
2011	5.4%	0.001432	0.001432	0.03594	0.03594	0.00352	0.00352	0.001297	0.001297	0.00352	0.00352	0.023764	0.023764	0.006869	0.006869
2012	5.4%	0.001432	0.001432	0.03594	0.03594	0.005148	0.005148	0.001297	0.001297	0.005148	0.005148	0.022633	0.022633	0.010044	0.010044
2013	7.9%	0.001432	0.001432	0.026691	0.026691	0.007705	0.007705	0.001297	0.001297	0.007705	0.007705	0.021442	0.021442	0.015034	0.015034
2014	9.8%	0.001432	0.001432	0.026691	0.026691	0.010727	0.010727	0.001297	0.001297	0.010727	0.010727	0.020189	0.020189	0.020931	0.020931
2015	17.4%	0.001432	0.001432	0.026691	0.026691	0.013517	0.013517	0.001297	0.001297	0.013517	0.013517	0.018875	0.018875	0.026375	0.026375
2016	15.8%	0.001432	0.001432	0.026691	0.026691	0.015609	0.015609	0.001297	0.001297	0.015609	0.015609	0.0175	0.0175	0.030457	0.030457
2017	18.6%	0.001432	0.001432	0.026691	0.026691	0.016771	0.016771	0.001297	0.001297	0.016771	0.016771	0.016064	0.016064	0.032725	0.032725
2018	7.8%	0.001432	0.001432	0.026691	0.026691	0.017469	0.017469	0.001297	0.001297	0.017469	0.017469	0.014567	0.014567	0.034086	0.034086
Type EF		0.016267	0.016267	0.115576	0.115576	0.013053	0.013053	0.015185	0.015185	0.012442	0.012442	0.040205	0.040205	0.0242	0.0242
% of Total		25.1%	58.2%	3.5%	0.2%	1.0%	1.5%	2.1%	0.8%	3.5%	1.9%	1.0%	0	1.0%	0

RAMBOLL ENVIRON

Table F8: Uncontrolled SOx Emission Factors
SFMTA Commuter Shuttle Project
San Francisco, California

Model Year	% of Vehicles	Running Exhaust (g/mile)													
		Motor Coach		UBUS				All Other Buses				MDV			
		DSL	Biodiesel	DSL	Biodiesel	GAS	CNG	DSL	Biodiesel	GAS	CNG	DSL	Biodiesel	GAS	CNG
1992	0.2%	0.017496	0.017496	0.024813	0.024813	0.018405	0.018405	0.011602	0.011602	0.013313	0.013313	0.006091	0.006091	0.006956	0.006956
1993	0.2%	0.017403	0.017403	0.024813	0.024813	0.018405	0.018405	0.011602	0.011602	0.013313	0.013313	0.006091	0.006091	0.005965	0.005965
1994	0	0.016542	0.016542	0.024813	0.024813	0.018485	0.018485	0.011121	0.011121	0.013326	0.013326	0.006091	0.006091	0.005963	0.005963
1995	0	0.016542	0.016542	0.023059	0.023059	0.018485	0.018485	0.011121	0.011121	0.013318	0.013318	0.006091	0.006091	0.00593	0.00593
1996	0	0.01686	0.01686	0.019751	0.019751	0.018485	0.018485	0.011334	0.011334	0.013324	0.013324	0.006091	0.006091	0.005869	0.005869
1997	0	0.01686	0.01686	0.019751	0.019751	0.018402	0.018402	0.011315	0.011315	0.013313	0.013313	0.006091	0.006091	0.005869	0.005869
1998	0	0.017252	0.017252	0.019751	0.019751	0.018402	0.018402	0.011462	0.011462	0.013342	0.013342	0.006091	0.006091	0.005875	0.005875
1999	0.2%	0.017504	0.017504	0.020599	0.020599	0.017428	0.017428	0.011607	0.011607	0.013327	0.013327	0.006091	0.006091	0.00588	0.00588
2000	0.2%	0.017504	0.017504	0.020681	0.020681	0.017428	0.017428	0.011607	0.011607	0.013329	0.013329	0.006091	0.006091	0.006582	0.006582
2001	0.2%	0.017504	0.017504	0.021032	0.021032	0.017427	0.017427	0.011607	0.011607	0.013322	0.013322	0.006091	0.006091	0.006589	0.006589
2002	0.9%	0.017504	0.017504	0.020269	0.020269	0.017428	0.017428	0.011607	0.011607	0.013316	0.013316	0.006091	0.006091	0.006589	0.006589
2003	0.8%	0.017337	0.017337	0.020269	0.020269	0.017428	0.017428	0.011496	0.011496	0.013317	0.013317	0.006091	0.006091	0.006594	0.006594
2004	0.5%	0.017337	0.017337	0.020269	0.020269	0.017428	0.017428	0.011496	0.011496	0.013087	0.013087	0.006091	0.006091	0.006542	0.006542
2005	0.3%	0.017337	0.017337	0.015227	0.015227	0.017428	0.017428	0.011496	0.011496	0.013085	0.013085	0.006091	0.006091	0.006541	0.006541
2006	0.5%	0.017332	0.017332	0.021587	0.021587	0.017428	0.017428	0.011496	0.011496	0.013085	0.013085	0.006091	0.006091	0.00654	0.00654
2007	1.4%	0.017517	0.017517	0.022073	0.022073	0.017428	0.017428	0.011624	0.011624	0.013084	0.013084	0.006078	0.006078	0.006538	0.006538
2008	2.3%	0.017676	0.017676	0.022073	0.022073	0.017415	0.017415	0.011757	0.011757	0.013084	0.013084	0.006078	0.006078	0.006536	0.006536
2009	1.2%	0.017692	0.017692	0.021341	0.021341	0.017415	0.017415	0.011769	0.011769	0.013084	0.013084	0.006078	0.006078	0.006534	0.006534
2010	3.1%	0.017553	0.017553	0.021054	0.021054	0.017415	0.017415	0.011836	0.011836	0.013084	0.013084	0.006078	0.006078	0.006533	0.006533
2011	5.4%	0.016828	0.016828	0.022073	0.022073	0.017414	0.017414	0.012134	0.012134	0.013084	0.013084	0.006078	0.006078	0.006532	0.006532
2012	5.4%	0.0166	0.0166	0.022073	0.022073	0.017414	0.017414	0.012213	0.012213	0.013084	0.013084	0.005219	0.005219	0.00561	0.00561
2013	7.9%	0.0166	0.0166	0.015721	0.015721	0.017414	0.017414	0.01218	0.01218	0.013084	0.013084	0.005065	0.005065	0.005445	0.005445
2014	9.8%	0.015936	0.015936	0.015091	0.015091	0.016717	0.016717	0.011467	0.011467	0.01256	0.01256	0.004927	0.004927	0.005295	0.005295
2015	17.4%	0.015936	0.015936	0.015091	0.015091	0.016716	0.016716	0.011411	0.011411	0.01256	0.01256	0.004697	0.004697	0.005047	0.005047
2016	15.8%	0.015936	0.015936	0.015091	0.015091	0.016716	0.016716	0.011411	0.011411	0.012561	0.012561	0.004482	0.004482	0.004816	0.004816
2017	18.6%	0.015323	0.015323	0.014511	0.014511	0.016073	0.016073	0.011411	0.011411	0.012077	0.012077	0.004451	0.004451	0.004783	0.004783
2018	7.8%	0.015323	0.015323	0.014511	0.014511	0.016073	0.016073	0.010972	0.010972	0.012077	0.012077	0.004298	0.004298	0.004618	0.004618
Type EF		0.016101	0.016101	0.01647	0.01647	0.016764	0.016764	0.01156	0.01156	0.012599	0.012599	0.004905	0.004905	0.005271	0.005271
% of Total		25.1%	58.2%	3.5%	0.2%	1.0%	1.5%	2.1%	0.8%	3.5%	1.9%	1.0%	0	1.0%	0

RAMBOLL ENVIRON

Table F8: Uncontrolled SOx Emission Factors
SFMTA Commuter Shuttle Project
San Francisco, California

Model Year	% of Vehicles	Idling Exhaust (g/hr)															
		Motor Coach		Urban Bus				Mini-Bus				Van			
		Diesel	Biodiesel	Diesel	Biodiesel	Gasoline	CNG	Diesel	Biodiesel	Gasoline	CNG	Diesel	Biodiesel	Gasoline	CNG
1992	0.2%	0.062707	0.062707	0.062031	0.062031	0.046012	0.046012	0.057762	0.057762	0.033283	0.033283	0.015228	0.015228	0.01739	0.01739
1993	0.2%	0.062707	0.062707	0.062031	0.062031	0.046012	0.046012	0.057762	0.057762	0.033283	0.033283	0.015228	0.015228	0.014913	0.014913
1994	0	0.064101	0.064101	0.062031	0.062031	0.046211	0.046211	0.061649	0.061649	0.033316	0.033316	0.015228	0.015228	0.014907	0.014907
1995	0	0.064101	0.064101	0.057648	0.057648	0.046211	0.046211	0.061649	0.061649	0.033295	0.033295	0.015228	0.015228	0.014825	0.014825
1996	0	0.065383	0.065383	0.049378	0.049378	0.046211	0.046211	0.062882	0.062882	0.033309	0.033309	0.015228	0.015228	0.014673	0.014673
1997	0	0.065383	0.065383	0.049378	0.049378	0.046006	0.046006	0.062882	0.062882	0.033283	0.033283	0.015228	0.015228	0.014673	0.014673
1998	0	0.067141	0.067141	0.049378	0.049378	0.046006	0.046006	0.069309	0.069309	0.033356	0.033356	0.015228	0.015228	0.014688	0.014688
1999	0.2%	0.067141	0.067141	0.051497	0.051497	0.043571	0.043571	0.069309	0.069309	0.033318	0.033318	0.015228	0.015228	0.014701	0.014701
2000	0.2%	0.067141	0.067141	0.051702	0.051702	0.04357	0.04357	0.069309	0.069309	0.033323	0.033323	0.015228	0.015228	0.016456	0.016456
2001	0.2%	0.067141	0.067141	0.052581	0.052581	0.043568	0.043568	0.069309	0.069309	0.033305	0.033305	0.015228	0.015228	0.016472	0.016472
2002	0.9%	0.067141	0.067141	0.050673	0.050673	0.04357	0.04357	0.069309	0.069309	0.03329	0.03329	0.015228	0.015228	0.016473	0.016473
2003	0.8%	0.068318	0.068318	0.050673	0.050673	0.04357	0.04357	0.07256	0.07256	0.033294	0.033294	0.015228	0.015228	0.016486	0.016486
2004	0.5%	0.068318	0.068318	0.050673	0.050673	0.04357	0.04357	0.07256	0.07256	0.032718	0.032718	0.015228	0.015228	0.016355	0.016355
2005	0.3%	0.068318	0.068318	0.038069	0.038069	0.04357	0.04357	0.07256	0.07256	0.032711	0.032711	0.015228	0.015228	0.016353	0.016353
2006	0.5%	0.068318	0.068318	0.053968	0.053968	0.04357	0.04357	0.07256	0.07256	0.032711	0.032711	0.015228	0.015228	0.016351	0.016351
2007	1.4%	0.07153	0.07153	0.055182	0.055182	0.04357	0.04357	0.075971	0.075971	0.032711	0.032711	0.015196	0.015196	0.016344	0.016344
2008	2.3%	0.072187	0.072187	0.055182	0.055182	0.043538	0.043538	0.076669	0.076669	0.032711	0.032711	0.015196	0.015196	0.016339	0.016339
2009	1.2%	0.072336	0.072336	0.053353	0.053353	0.043538	0.043538	0.076827	0.076827	0.03271	0.03271	0.015196	0.015196	0.016335	0.016335
2010	3.1%	0.070858	0.070858	0.052635	0.052635	0.043537	0.043537	0.075257	0.075257	0.03271	0.03271	0.015196	0.015196	0.016332	0.016332
2011	5.4%	0.064101	0.064101	0.055182	0.055182	0.043536	0.043536	0.068081	0.068081	0.03271	0.03271	0.015196	0.015196	0.016331	0.016331
2012	5.4%	0.062221	0.062221	0.055182	0.055182	0.043535	0.043535	0.066084	0.066084	0.03271	0.03271	0.013047	0.013047	0.014025	0.014025
2013	7.9%	0.062221	0.062221	0.039302	0.039302	0.043535	0.043535	0.066084	0.066084	0.032709	0.032709	0.012663	0.012663	0.013611	0.013611
2014	9.8%	0.05973	0.05973	0.037729	0.037729	0.041792	0.041792	0.063438	0.063438	0.0314	0.0314	0.012318	0.012318	0.013238	0.013238
2015	17.4%	0.05973	0.05973	0.037729	0.037729	0.041791	0.041791	0.063438	0.063438	0.0314	0.0314	0.011742	0.011742	0.012618	0.012618
2016	15.8%	0.05973	0.05973	0.037729	0.037729	0.04179	0.04179	0.063438	0.063438	0.031401	0.031401	0.011205	0.011205	0.01204	0.01204
2017	18.6%	0.057433	0.057433	0.036278	0.036278	0.040182	0.040182	0.063438	0.063438	0.030194	0.030194	0.011128	0.011128	0.011957	0.011957
2018	7.8%	0.057433	0.057433	0.036278	0.036278	0.040182	0.040182	0.060998	0.060998	0.030193	0.030193	0.010745	0.010745	0.011545	0.011545
Type EF		0.060937	0.060937	0.041174	0.041174	0.041909	0.041909	0.06512	0.06512	0.031497	0.031497	0.012262	0.012262	0.013176	0.013176
% of Total		25.1%	58.2%	3.5%	0.2%	1.0%	1.5%	2.1%	0.8%	3.5%	1.9%	1.0%	0	1.0%	0

RAMBOLL ENVIRON

Table F9: Controlled ROG Emission Factors
SFMTA Commuter Shuttle Project
San Francisco, California

Model Year	% of Vehicles	Running Exhaust (g/mile)													
		Motor Coach		UBUS				All Other Buses				MDV			
		DSL	Biodiesel	DSL	Biodiesel	GAS	CNG	DSL	Biodiesel	GAS	CNG	DSL	Biodiesel	GAS	CNG
2012	14.3%	0.094089	0.094089	0.023002	0.023002	0.022628	0.022628	0.049822	0.049822	0.010217	0.010217	0.020264	0.020264	0.016242	0.016242
2013	14.3%	0.087136	0.087136	0.023052	0.023052	0.022628	0.022628	0.046475	0.046475	0.010217	0.010217	0.019428	0.019428	0.015151	0.015151
2014	14.3%	0.073522	0.073522	0.023052	0.023052	0.022628	0.022628	0.03953	0.03953	0.010217	0.010217	0.01855	0.01855	0.013323	0.013323
2015	14.3%	0.068032	0.068032	0.023052	0.023052	0.022628	0.022628	0.036719	0.036719	0.010217	0.010217	0.017628	0.017628	0.011513	0.011513
2016	14.3%	0.064578	0.064578	0.023052	0.023052	0.022628	0.022628	0.036719	0.036719	0.013298	0.013298	0.016664	0.016664	0.010558	0.010558
2017	14.3%	0.061123	0.061123	0.023052	0.023052	0.022628	0.022628	0.036719	0.036719	0.013298	0.013298	0.015657	0.015657	0.008728	0.008728
2018	14.3%	0.057669	0.057669	0.023052	0.023052	0.022628	0.022628	0.031275	0.031275	0.013298	0.013298	0.014607	0.014607	0.008157	0.008157
Type EF		0.072307	0.072307	0.023045	0.023045	0.022628	0.022628	0.039608	0.039608	0.011538	0.011538	0.017543	0.017543	0.011953	0.011953
% of Total		25.1%	58.2%	3.5%	0.2%	1.0%	1.5%	2.1%	0.8%	3.5%	1.9%	1.0%	0	1.0%	0

Table F9: Controlled ROG Emission Factors
SFMTA Commuter Shuttle Project
San Francisco, California

Model Year	% of Vehicles	Idling Exhaust (g/hr)													
		Motor Coach		UBUS				All Other Buses				MDV			
		Diesel	Biodiesel	DSL	Biodiesel	GAS	CNG	DSL	Biodiesel	GAS	CNG	DSL	Biodiesel	GAS	CNG
2012	14.3%	0.508512	0.508512	0.303017	0.303017	0.183329	0.183329	0.161822	0.161822	0.141083	0.141083	0.555298	0.555298	0.216801	0.216801
2013	14.3%	0.508512	0.508512	0.303679	0.303679	0.183329	0.183329	0.161822	0.161822	0.141083	0.141083	0.532396	0.532396	0.202238	0.202238
2014	14.3%	0.508512	0.508512	0.303679	0.303679	0.183329	0.183329	0.161822	0.161822	0.141083	0.141083	0.508318	0.508318	0.177836	0.177836
2015	14.3%	0.508512	0.508512	0.303679	0.303679	0.183329	0.183329	0.161822	0.161822	0.141083	0.141083	0.483068	0.483068	0.153672	0.153672
2016	14.3%	0.508512	0.508512	0.303679	0.303679	0.183329	0.183329	0.161822	0.161822	0.183625	0.183625	0.456643	0.456643	0.140925	0.140925
2017	14.3%	0.508512	0.508512	0.303679	0.303679	0.183329	0.183329	0.161822	0.161822	0.183625	0.183625	0.429043	0.429043	0.116495	0.116495
2018	14.3%	0.508512	0.508512	0.303679	0.303679	0.183329	0.183329	0.161822	0.161822	0.183625	0.183625	0.400268	0.400268	0.108874	0.108874
Type EF		0.508512	0.508512	0.303585	0.303585	0.183329	0.183329	0.161822	0.161822	0.159315	0.159315	0.480719	0.480719	0.159549	0.159549
% of Total		25.1%	58.2%	3.5%	0.2%	1.0%	1.5%	2.1%	0.8%	3.5%	1.9%	1.0%	0	1.0%	0

Table F10: Controlled TOG Emission Factors
SFMTA Commuter Shuttle Project
San Francisco, California

Model Year	% of Vehicles	Running Exhaust (g/mile)													
		Motor Coach		UBUS				All Other Buses				MDV			
		DSL	Biodiesel	DSL	Biodiesel	GAS	CNG	DSL	Biodiesel	GAS	CNG	DSL	Biodiesel	GAS	CNG
2012	14.3%	0.107114	0.107114	0.026186	0.026186	0.033019	0.033019	0.056719	0.056719	0.014909	0.014909	0.023069	0.023069	0.023701	0.023701
2013	14.3%	0.099198	0.099198	0.49506	0.49506	0.033019	0.033019	0.052908	0.052908	0.014909	0.014909	0.022118	0.022118	0.022109	0.022109
2014	14.3%	0.0837	0.0837	0.49506	0.49506	0.033019	0.033019	0.045001	0.045001	0.014909	0.014909	0.021118	0.021118	0.019441	0.019441
2015	14.3%	0.077449	0.077449	0.49506	0.49506	0.033019	0.033019	0.041801	0.041801	0.014909	0.014909	0.020069	0.020069	0.0168	0.0168
2016	14.3%	0.073517	0.073517	0.49506	0.49506	0.033019	0.033019	0.041801	0.041801	0.019405	0.019405	0.018971	0.018971	0.015406	0.015406
2017	14.3%	0.069584	0.069584	0.49506	0.49506	0.033019	0.033019	0.041801	0.041801	0.019405	0.019405	0.017824	0.017824	0.012736	0.012736
2018	14.3%	0.065652	0.065652	0.49506	0.49506	0.033019	0.033019	0.035604	0.035604	0.019405	0.019405	0.016629	0.016629	0.011903	0.011903
Type EF		0.082316	0.082316	0.428078	0.428078	0.033019	0.033019	0.045091	0.045091	0.016836	0.016836	0.019971	0.019971	0.017442	0.017442
% of Total		25.1%	58.2%	3.5%	0.2%	1.0%	1.5%	2.1%	0.8%	3.5%	1.9%	1.0%	0	1.0%	0

Table F10: Controlled TOG Emission Factors
SFMTA Commuter Shuttle Project
San Francisco, California

Model Year	% of Vehicles	Idling Exhaust (g/hr)															
		Motor Coach		UBUS				All Other Buses				MDV					
		Diesel	Biodiesel	DSL	Biodiesel	GAS	CNG	DSL	Biodiesel	GAS	CNG	DSL	Biodiesel	GAS	CNG		
2012	14.3%	0.578902	0.578902	0.344965	0.344965	0.267513	0.267513	0.184222	0.184222	0.205867	0.205867	0.632169	0.632169	0.316356	0.316356		
2013	14.3%	0.578902	0.578902	6.521733	6.521733	0.267513	0.267513	0.184222	0.184222	0.205867	0.205867	0.606098	0.606098	0.295105	0.295105		
2014	14.3%	0.578902	0.578902	6.521733	6.521733	0.267513	0.267513	0.184222	0.184222	0.205867	0.205867	0.578687	0.578687	0.259498	0.259498		
2015	14.3%	0.578902	0.578902	6.521733	6.521733	0.267513	0.267513	0.184222	0.184222	0.205867	0.205867	0.549941	0.549941	0.224238	0.224238		
2016	14.3%	0.578902	0.578902	6.521733	6.521733	0.267513	0.267513	0.184222	0.184222	0.267945	0.267945	0.519857	0.519857	0.205637	0.205637		
2017	14.3%	0.578902	0.578902	6.521733	6.521733	0.267513	0.267513	0.184222	0.184222	0.267945	0.267945	0.488437	0.488437	0.16999	0.16999		
2018	14.3%	0.578902	0.578902	6.521733	6.521733	0.267513	0.267513	0.184222	0.184222	0.267945	0.267945	0.455679	0.455679	0.158869	0.158869		
Type EF		0.578902	0.578902	5.639337	5.639337	0.267513	0.267513	0.184222	0.184222	0.232472	0.232472	0.547267	0.547267	0.232813	0.232813		
% of Total		25.1%	58.2%	3.5%	0.2%	1.0%	1.5%	2.1%	0.8%	3.5%	1.9%	1.0%	0	1.0%	0		

Table F11: Controlled CO Emission Factors
SFMTA Commuter Shuttle Project
San Francisco, California

Model Year	% of Vehicles	Running Exhaust (g/mile)													
		Motor Coach		UBUS				All Other Buses				MDV			
		DSL	Biodiesel	DSL	Biodiesel	GAS	CNG	DSL	Biodiesel	GAS	CNG	DSL	Biodiesel	GAS	CNG
2012	14.3%	0.555576	0.555576	2.037382	2.037382	0.380431	0.380431	0.262247	0.262247	0.179016	0.179016	0.384026	0.384026	0.706291	0.706291
2013	14.3%	0.514519	0.514519	3.65807	3.65807	0.359966	0.359966	0.244628	0.244628	0.175108	0.175108	0.36133	0.36133	0.649317	0.649317
2014	14.3%	0.434132	0.434132	3.65807	3.65807	0.34644	0.34644	0.208071	0.208071	0.170941	0.170941	0.33747	0.33747	0.565449	0.565449
2015	14.3%	0.401712	0.401712	3.65807	3.65807	0.316192	0.316192	0.193275	0.193275	0.166316	0.166316	0.312445	0.312445	0.496173	0.496173
2016	14.3%	0.381316	0.381316	3.65807	3.65807	0.29981	0.29981	0.193275	0.193275	0.193639	0.193639	0.286257	0.286257	0.460822	0.460822
2017	14.3%	0.36092	0.36092	3.65807	3.65807	0.274501	0.274501	0.193275	0.193275	0.187962	0.187962	0.258905	0.258905	0.43145	0.43145
2018	14.3%	0.340523	0.340523	3.65807	3.65807	0.251683	0.251683	0.16462	0.16462	0.181719	0.181719	0.230389	0.230389	0.40682	0.40682
Type EF		0.426957	0.426957	3.426543	3.426543	0.318432	0.318432	0.208485	0.208485	0.179243	0.179243	0.310117	0.310117	0.530903	0.530903
% of Total		25.1%	58.2%	3.5%	0.2%	1.0%	1.5%	2.1%	0.8%	3.5%	1.9%	1.0%	0	1.0%	0

Table F11: Controlled CO Emission Factors
SFMTA Commuter Shuttle Project
San Francisco, California

Model Year	% of Vehicles	Idling Exhaust (g/hr)													
		Motor Coach		UBUS				All Other Buses				MDV			
		Diesel	Biodiesel	DSL	Biodiesel	GAS	CNG	DSL	Biodiesel	GAS	CNG	DSL	Biodiesel	GAS	CNG
2012	14.3%	1.879864	1.879864	26.83968	26.83968	1.275102	1.275102	1.209877	1.209877	0.78625	0.78625	10.52351	10.52351	2.904916	2.904916
2013	14.3%	1.879864	1.879864	48.19	48.19	1.206507	1.206507	1.209877	1.209877	0.769088	0.769088	9.90156	9.90156	2.670522	2.670522
2014	14.3%	1.879864	1.879864	48.19	48.19	1.161173	1.161173	1.209877	1.209877	0.750783	0.750783	9.247708	9.247708	2.325528	2.325528
2015	14.3%	1.879864	1.879864	48.19	48.19	1.059789	1.059789	1.209877	1.209877	0.730469	0.730469	8.561961	8.561961	2.040565	2.040565
2016	14.3%	1.879864	1.879864	48.19	48.19	1.004881	1.004881	1.209877	1.209877	0.850475	0.850475	7.84432	7.84432	1.895133	1.895133
2017	14.3%	1.879864	1.879864	48.19	48.19	0.920051	0.920051	1.209877	1.209877	0.825543	0.825543	7.094804	7.094804	1.774296	1.774296
2018	14.3%	1.879864	1.879864	48.19	48.19	0.843571	0.843571	1.209877	1.209877	0.798123	0.798123	6.313364	6.313364	1.672966	1.672966
Type EF		1.879864	1.879864	45.13996	45.13996	1.067296	1.067296	1.209877	1.209877	0.787247	0.787247	8.498175	8.498175	2.183418	2.183418
% of Total		25.1%	58.2%	3.5%	0.2%	1.0%	1.5%	2.1%	0.8%	3.5%	1.9%	1.0%	0	1.0%	0

Table F12: Controlled NOx Emission Factors
SFMTA Commuter Shuttle Project
San Francisco, California

Model Year	% of Vehicles	Running Exhaust (g/mile)													
		Motor Coach		UBUS				All Other Buses				MDV			
		DSL	Biodiesel	DSL	Biodiesel	GAS	CNG	DSL	Biodiesel	GAS	CNG	DSL	Biodiesel	GAS	CNG
2012	14.3%	2.637069	2.637069	1.898511	1.898511	0.309958	0.309958	1.655394	1.655394	0.080329	0.080329	0.037306	0.037306	0.068586	0.068586
2013	14.3%	2.328743	2.328743	1.495532	1.495532	0.283761	0.283761	1.482595	1.482595	0.079149	0.079149	0.036576	0.036576	0.064888	0.064888
2014	14.3%	1.499868	1.499868	1.495532	1.495532	0.266447	0.266447	1.005563	1.005563	0.077889	0.077889	0.03581	0.03581	0.058305	0.058305
2015	14.3%	1.256925	1.256925	1.495532	1.495532	0.227728	0.227728	0.857008	0.857008	0.076492	0.076492	0.035005	0.035005	0.051091	0.051091
2016	14.3%	1.157807	1.157807	1.495532	1.495532	0.206758	0.206758	0.857008	0.857008	0.102978	0.102978	0.034164	0.034164	0.046272	0.046272
2017	14.3%	1.058689	1.058689	1.495532	1.495532	0.174361	0.174361	0.857008	0.857008	0.101016	0.101016	0.033284	0.033284	0.038091	0.038091
2018	14.3%	0.959572	0.959572	1.495532	1.495532	0.145152	0.145152	0.658935	0.658935	0.098857	0.098857	0.032368	0.032368	0.035059	0.035059
Type EF		1.556953	1.556953	1.553101	1.553101	0.230595	0.230595	1.053359	1.053359	0.088101	0.088101	0.03493	0.03493	0.051756	0.051756
% of Total		25.1%	58.2%	3.5%	0.2%	1.0%	1.5%	2.1%	0.8%	3.5%	1.9%	1.0%	0	1.0%	0

Table F12: Controlled NOx Emission Factors
SFMTA Commuter Shuttle Project
San Francisco, California

Model Year	% of Vehicles	Idling Exhaust (g/hr)													
		Motor Coach		UBUS				All Other Buses				MDV			
		Diesel	Biodiesel	DSL	Biodiesel	GAS	CNG	DSL	Biodiesel	GAS	CNG	DSL	Biodiesel	GAS	CNG
2012	14.3%	15.50986	15.50986	12.23476	12.23476	1.126151	1.126151	17.62931	17.62931	0.351681	0.351681	0.382601	0.382601	0.296597	0.296597
2013	14.3%	15.50986	15.50986	9.637801	9.637801	1.030971	1.030971	17.62931	17.62931	0.346515	0.346515	0.37512	0.37512	0.280604	0.280604
2014	14.3%	15.50986	15.50986	9.637801	9.637801	0.968067	0.968067	17.62931	17.62931	0.341	0.341	0.367254	0.367254	0.252133	0.252133
2015	14.3%	15.50986	15.50986	9.637801	9.637801	0.82739	0.82739	17.62931	17.62931	0.334883	0.334883	0.359005	0.359005	0.220935	0.220935
2016	14.3%	15.50986	15.50986	9.637801	9.637801	0.751202	0.751202	17.62931	17.62931	0.45084	0.45084	0.350373	0.350373	0.200097	0.200097
2017	14.3%	15.50986	15.50986	9.637801	9.637801	0.633495	0.633495	17.62931	17.62931	0.442248	0.442248	0.341357	0.341357	0.164717	0.164717
2018	14.3%	15.50986	15.50986	9.637801	9.637801	0.527373	0.527373	17.62931	17.62931	0.4328	0.4328	0.331957	0.331957	0.151604	0.151604
Type EF		15.50986	15.50986	10.0088	10.0088	0.837807	0.837807	17.62931	17.62931	0.385709	0.385709	0.358238	0.358238	0.223813	0.223813
% of Total		25.1%	58.2%	3.5%	0.2%	1.0%	1.5%	2.1%	0.8%	3.5%	1.9%	1.0%	0	1.0%	0

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Table F13: Controlled CO2 Emission Factors
SFMTA Commuter Shuttle Project
San Francisco, California

Model Year	% of Vehicles	Running Exhaust (g/mile)													
		Motor Coach		UBUS				All Other Buses				MDV			
		DSL	Biodiesel	DSL	Biodiesel	GAS	CNG	DSL	Biodiesel	GAS	CNG	DSL	Biodiesel	GAS	CNG
2012	14.3%	1740.004	1740.004	2312.116	2312.116	1743.906	1743.906	1280.117	1280.117	1310.448	1310.448	546.6648	546.6648	560.8373	560.8373
2013	14.3%	1740.004	1740.004	2205.688	2205.688	1743.906	1743.906	1276.638	1276.638	1310.448	1310.448	530.5864	530.5864	544.3615	544.3615
2014	14.3%	1670.349	1670.349	2117.391	2117.391	1674.094	1674.094	1201.904	1201.904	1257.988	1257.988	516.1159	516.1159	529.5341	529.5341
2015	14.3%	1670.349	1670.349	2117.391	2117.391	1674.094	1674.094	1196.078	1196.078	1257.988	1257.988	491.9983	491.9983	504.8075	504.8075
2016	14.3%	1670.349	1670.349	2117.391	2117.391	1674.094	1674.094	1196.078	1196.078	1257.988	1257.988	469.4886	469.4886	481.7289	481.7289
2017	14.3%	1606.105	1606.105	2035.953	2035.953	1609.706	1609.706	1196.078	1196.078	1209.604	1209.604	466.2729	466.2729	478.4464	478.4464
2018	14.3%	1606.105	1606.105	2035.953	2035.953	1609.706	1609.706	1150.075	1150.075	1209.604	1209.604	450.1946	450.1946	461.9647	461.9647
Type EF		1671.895	1671.895	2134.555	2134.555	1675.644	1675.644	1213.853	1213.853	1259.153	1259.153	495.9031	495.9031	508.8115	508.8115
% of Total		25.1%	58.2%	3.5%	0.2%	1.0%	1.5%	2.1%	0.8%	3.5%	1.9%	1.0%	0	1.0%	0

Table F13: Controlled CO2 Emission Factors
SFMTA Commuter Shuttle Project
San Francisco, California

Model Year	% of Vehicles	Idling Exhaust (g/hr)															
		Motor Coach		UBUS				All Other Buses				MDV					
		Diesel	Biodiesel	DSL	Biodiesel	GAS	CNG	DSL	Biodiesel	GAS	CNG	DSL	Biodiesel	GAS	CNG		
2012	14.3%	6521.775	6521.775	9268.58	9268.58	9900.862	9900.862	6926.68	6926.68	9900.862	9900.862	2958.184	2958.184	4054.637	4054.637		
2013	14.3%	6521.775	6521.775	8841.943	8841.943	9900.862	9900.862	6926.68	6926.68	9900.862	9900.862	2871.179	2871.179	3935.47	3935.47		
2014	14.3%	6260.698	6260.698	8487.986	8487.986	9504.515	9504.515	6649.394	6649.394	9504.515	9504.515	2792.874	2792.874	3828.223	3828.223		
2015	14.3%	6260.698	6260.698	8487.986	8487.986	9504.515	9504.515	6649.394	6649.394	9504.515	9504.515	2662.366	2662.366	3649.415	3649.415		
2016	14.3%	6260.698	6260.698	8487.986	8487.986	9504.515	9504.515	6649.394	6649.394	9504.515	9504.515	2540.558	2540.558	3482.524	3482.524		
2017	14.3%	6019.902	6019.902	8161.525	8161.525	9138.957	9138.957	6649.394	6649.394	9138.957	9138.957	2523.157	2523.157	3458.748	3458.748		
2018	14.3%	6019.902	6019.902	8161.525	8161.525	9138.957	9138.957	6393.648	6393.648	9138.957	9138.957	2436.152	2436.152	3339.554	3339.554		
Type EF		6266.492	6266.492	8556.79	8556.79	9513.312	9513.312	6692.083	6692.083	9513.312	9513.312	2683.496	2683.496	3678.367	3678.367		
% of Total		25.1%	58.2%	3.5%	0.2%	1.0%	1.5%	2.1%	0.8%	3.5%	1.9%	1.0%	0	1.0%	0		

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Table F14: Controlled PM10 Emission Factors
SFMTA Commuter Shuttle Project
San Francisco, California

Model Year	% of Vehicles	Running Exhaust (g/mile)													
		Motor Coach		UBUS				All Other Buses				MDV			
		DSL	Biodiesel	DSL	Biodiesel	GAS	CNG	DSL	Biodiesel	GAS	CNG	DSL	Biodiesel	GAS	CNG
2012	14.3%	0.005785	0.005785	0.010365	0.010365	0.000691	0.000691	0.003586	0.003586	0.000406	0.000406	0.004907	0.004907	0.000816	0.000816
2013	14.3%	0.005273	0.005273	0.007698	0.007698	0.001034	0.001034	0.003296	0.003296	0.000607	0.000607	0.004648	0.004648	0.001221	0.001221
2014	14.3%	0.004324	0.004324	0.007698	0.007698	0.00144	0.00144	0.002728	0.002728	0.000845	0.000845	0.004377	0.004377	0.0017	0.0017
2015	14.3%	0.003908	0.003908	0.007698	0.007698	0.001815	0.001815	0.002477	0.002477	0.001065	0.001065	0.004092	0.004092	0.002142	0.002142
2016	14.3%	0.003626	0.003626	0.007698	0.007698	0.002095	0.002095	0.002477	0.002477	0.00123	0.00123	0.003794	0.003794	0.002474	0.002474
2017	14.3%	0.003626	0.003626	0.007698	0.007698	0.002251	0.002251	0.002477	0.002477	0.001321	0.001321	0.003483	0.003483	0.002658	0.002658
2018	14.3%	0.003061	0.003061	0.007698	0.007698	0.002345	0.002345	0.001953	0.001953	0.001376	0.001376	0.003158	0.003158	0.002768	0.002768
Type EF		0.004229	0.004229	0.008079	0.008079	0.001667	0.001667	0.002714	0.002714	0.000979	0.000979	0.004065	0.004065	0.001968	0.001968
% of Total		25.1%	58.2%	3.5%	0.2%	1.0%	1.5%	2.1%	0.8%	3.5%	1.9%	1.0%	0	1.0%	0

Table F14: Controlled PM10 Emission Factors
SFMTA Commuter Shuttle Project
San Francisco, California

Model Year	% of Vehicles	Idling Exhaust (g/hr)													
		Motor Coach		UBUS				All Other Buses				MDV			
		Diesel	Biodiesel	DSL	Biodiesel	GAS	CNG	DSL	Biodiesel	GAS	CNG	DSL	Biodiesel	GAS	CNG
2012	14.3%	0.001497	0.001497	0.037565	0.037565	0.005599	0.005599	0.001356	0.001356	0.005599	0.005599	0.023657	0.023657	0.010924	0.010924
2013	14.3%	0.001497	0.001497	0.027898	0.027898	0.00838	0.00838	0.001356	0.001356	0.00838	0.00838	0.022411	0.022411	0.016351	0.016351
2014	14.3%	0.001497	0.001497	0.027898	0.027898	0.011667	0.011667	0.001356	0.001356	0.011667	0.011667	0.021102	0.021102	0.022765	0.022765
2015	14.3%	0.001497	0.001497	0.027898	0.027898	0.014701	0.014701	0.001356	0.001356	0.014701	0.014701	0.019729	0.019729	0.028685	0.028685
2016	14.3%	0.001497	0.001497	0.027898	0.027898	0.016976	0.016976	0.001356	0.001356	0.016976	0.016976	0.018292	0.018292	0.033125	0.033125
2017	14.3%	0.001497	0.001497	0.027898	0.027898	0.01824	0.01824	0.001356	0.001356	0.01824	0.01824	0.016791	0.016791	0.035592	0.035592
2018	14.3%	0.001497	0.001497	0.027898	0.027898	0.018999	0.018999	0.001356	0.001356	0.018999	0.018999	0.015226	0.015226	0.037072	0.037072
Type EF		0.001497	0.001497	0.029279	0.029279	0.013509	0.013509	0.001356	0.001356	0.013509	0.013509	0.019601	0.019601	0.026359	0.026359
% of Total		25.1%	58.2%	3.5%	0.2%	1.0%	1.5%	2.1%	0.8%	3.5%	1.9%	1.0%	0	1.0%	0

Table F15: Controlled PM2.5 Emission Factors
SFMTA Commuter Shuttle Project
San Francisco, California

Model Year	% of Vehicles	Running Exhaust (g/mile)													
		Motor Coach		UBUS				All Other Buses				MDV			
		DSL	Biodiesel	DSL	Biodiesel	GAS	CNG	DSL	Biodiesel	GAS	CNG	DSL	Biodiesel	GAS	CNG
2012	14.3%	0.005535	0.005535	0.009916	0.009916	0.000635	0.000635	0.003431	0.003431	0.000373	0.000373	0.004694	0.004694	0.00075	0.00075
2013	14.3%	0.005045	0.005045	0.007365	0.007365	0.000951	0.000951	0.003154	0.003154	0.000558	0.000558	0.004447	0.004447	0.001123	0.001123
2014	14.3%	0.004137	0.004137	0.007365	0.007365	0.001324	0.001324	0.00261	0.00261	0.000777	0.000777	0.004187	0.004187	0.001563	0.001563
2015	14.3%	0.003739	0.003739	0.007365	0.007365	0.001668	0.001668	0.00237	0.00237	0.000979	0.000979	0.003915	0.003915	0.001969	0.001969
2016	14.3%	0.003469	0.003469	0.007365	0.007365	0.001927	0.001927	0.00237	0.00237	0.001131	0.001131	0.00363	0.00363	0.002274	0.002274
2017	14.3%	0.003199	0.003199	0.007365	0.007365	0.00207	0.00207	0.00237	0.00237	0.001215	0.001215	0.003332	0.003332	0.002444	0.002444
2018	14.3%	0.002928	0.002928	0.007365	0.007365	0.002156	0.002156	0.001868	0.001868	0.001265	0.001265	0.003021	0.003021	0.002545	0.002545
Type EF		0.004007	0.004007	0.007729	0.007729	0.001533	0.001533	0.002596	0.002596	0.0009	0.0009	0.00389	0.00389	0.00181	0.00181
% of Total		25.1%	58.2%	3.5%	0.2%	1.0%	1.5%	2.1%	0.8%	3.5%	1.9%	1.0%	0	1.0%	0

Table F15: Controlled PM2.5 Emission Factors
SFMTA Commuter Shuttle Project
San Francisco, California

Model Year	% of Vehicles	Idling Exhaust (g/hr)													
		Motor Coach		UBUS				All Other Buses				MDV			
		Diesel	Biodiesel	DSL	Biodiesel	GAS	CNG	DSL	Biodiesel	GAS	CNG	DSL	Biodiesel	GAS	CNG
2012	14.3%	0.001432	0.001432	0.03594	0.03594	0.005148	0.005148	0.001297	0.001297	0.005148	0.005148	0.022633	0.022633	0.010044	0.010044
2013	14.3%	0.001432	0.001432	0.026691	0.026691	0.007705	0.007705	0.001297	0.001297	0.007705	0.007705	0.021442	0.021442	0.015034	0.015034
2014	14.3%	0.001432	0.001432	0.026691	0.026691	0.010727	0.010727	0.001297	0.001297	0.010727	0.010727	0.020189	0.020189	0.020931	0.020931
2015	14.3%	0.001432	0.001432	0.026691	0.026691	0.013517	0.013517	0.001297	0.001297	0.013517	0.013517	0.018875	0.018875	0.026375	0.026375
2016	14.3%	0.001432	0.001432	0.026691	0.026691	0.015609	0.015609	0.001297	0.001297	0.015609	0.015609	0.0175	0.0175	0.030457	0.030457
2017	14.3%	0.001432	0.001432	0.026691	0.026691	0.016771	0.016771	0.001297	0.001297	0.016771	0.016771	0.016064	0.016064	0.032725	0.032725
2018	14.3%	0.001432	0.001432	0.026691	0.026691	0.017469	0.017469	0.001297	0.001297	0.017469	0.017469	0.014567	0.014567	0.034086	0.034086
Type EF		0.001432	0.001432	0.028013	0.028013	0.012421	0.012421	0.001297	0.001297	0.012421	0.012421	0.018753	0.018753	0.024236	0.024236
% of Total		25.1%	58.2%	3.5%	0.2%	1.0%	1.5%	2.1%	0.8%	3.5%	1.9%	1.0%	0	1.0%	0

Table F16: Controlled SOx Emission Factors
SFMTA Commuter Shuttle Project
San Francisco, California

Model Year	% of Vehicles	Running Exhaust (g/mile)															
		Motor Coach		UBUS				All Other Buses				MDV			
		DSL	Biodiesel	DSL	Biodiesel	GAS	CNG	DSL	Biodiesel	GAS	CNG	DSL	Biodiesel	GAS	CNG
2012	14.3%	0.0166	0.0166	0.022073	0.022073	0.017414	0.017414	0.012213	0.012213	0.013084	0.013084	0.005219	0.005219	0.00561	0.00561
2013	14.3%	0.0166	0.0166	0.015721	0.015721	0.017414	0.017414	0.01218	0.01218	0.013084	0.013084	0.005065	0.005065	0.005445	0.005445
2014	14.3%	0.015936	0.015936	0.015091	0.015091	0.016717	0.016717	0.011467	0.011467	0.01256	0.01256	0.004927	0.004927	0.005295	0.005295
2015	14.3%	0.015936	0.015936	0.015091	0.015091	0.016716	0.016716	0.011411	0.011411	0.01256	0.01256	0.004697	0.004697	0.005047	0.005047
2016	14.3%	0.015936	0.015936	0.015091	0.015091	0.016716	0.016716	0.011411	0.011411	0.012561	0.012561	0.004482	0.004482	0.004816	0.004816
2017	14.3%	0.015323	0.015323	0.014511	0.014511	0.016073	0.016073	0.011411	0.011411	0.012077	0.012077	0.004451	0.004451	0.004783	0.004783
2018	14.3%	0.015323	0.015323	0.014511	0.014511	0.016073	0.016073	0.010972	0.010972	0.012077	0.012077	0.004298	0.004298	0.004618	0.004618
Type EF		0.015951	0.015951	0.016013	0.016013	0.016732	0.016732	0.011581	0.011581	0.012572	0.012572	0.004734	0.004734	0.005088	0.005088
% of Total		25.1%	58.2%	3.5%	0.2%	1.0%	1.5%	2.1%	0.8%	3.5%	1.9%	1.0%	0	1.0%	0

Table F16: Controlled SOx Emission Factors
SFMTA Commuter Shuttle Project
San Francisco, California

Model Year	% of Vehicles	Idling Exhaust (g/hr)															
		Motor Coach		Urban Bus				Mini-Bus				Van			
		Diesel	Biodiesel	Diesel	Biodiesel	Gasoline	CNG	Diesel	Biodiesel	Gasoline	CNG	Diesel	Biodiesel	Gasoline	CNG
2012	14.3%	0.062221	0.062221	0.055182	0.055182	0.043535	0.043535	0.066084	0.066084	0.03271	0.03271	0.013047	0.013047	0.014025	0.014025
2013	14.3%	0.062221	0.062221	0.039302	0.039302	0.043535	0.043535	0.066084	0.066084	0.032709	0.032709	0.012663	0.012663	0.013611	0.013611
2014	14.3%	0.05973	0.05973	0.037729	0.037729	0.041792	0.041792	0.063438	0.063438	0.0314	0.0314	0.012318	0.012318	0.013238	0.013238
2015	14.3%	0.05973	0.05973	0.037729	0.037729	0.041791	0.041791	0.063438	0.063438	0.0314	0.0314	0.011742	0.011742	0.012618	0.012618
2016	14.3%	0.05973	0.05973	0.037729	0.037729	0.04179	0.04179	0.063438	0.063438	0.031401	0.031401	0.011205	0.011205	0.01204	0.01204
2017	14.3%	0.057433	0.057433	0.036278	0.036278	0.040182	0.040182	0.063438	0.063438	0.030194	0.030194	0.011128	0.011128	0.011957	0.011957
2018	14.3%	0.057433	0.057433	0.036278	0.036278	0.040182	0.040182	0.060998	0.060998	0.030193	0.030193	0.010745	0.010745	0.011545	0.011545
Type EF		0.059785	0.059785	0.040032	0.040032	0.04183	0.04183	0.063846	0.063846	0.03143	0.03143	0.011835	0.011835	0.012719	0.012719
% of Total		25.1%	58.2%	3.5%	0.2%	1.0%	1.5%	2.1%	0.8%	3.5%	1.9%	1.0%	0	1.0%	0

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Table F17: Regional Emissions Summary (Uncontrolled Project)
SFMTA Commuter Shuttle Project
San Francisco, California

Shuttle Class	Fuel Type	EMFAC Class	Project Annual VMT[1]	Project Emissions[2]								
				Running Exhaust ROG (tpy)	Idling Exhaust ROG (tpy)	Total ROG (tpy)	Running Exhaust TOG (tpy)	Idling Exhaust TOG (tpy)	Total TOG (tpy)	Running Exhaust CO (tpy)	Idling Exhaust CO (tpy)	Total CO (tpy)
Motor Coach	Diesel	Motor Coach	2,579,132	0.30	2.0E-03	0.30	0.34	2.3E-03	0.34	1.4	7.9E-03	1.39
	Biodiesel	Motor Coach	2,276,585	0.26	4.7E-03	0.27	0.30	5.4E-03	0.30	1.2	1.8E-02	1.2
Urban Bus	Gas	UBUS	34,701	1.3E-03	3.3E-05	1.3E-03	1.9E-03	4.8E-05	2.0E-03	2.0E-02	2.1E-04	2.1E-02
	Diesel	UBUS	448,161	3.7E-02	3.6E-04	3.7E-02	0.24	2.5E-03	0.24	1.7	1.8E-02	1.7
	Biodiesel	UBUS	5,530	4.5E-04	2.1E-05	4.7E-04	2.9E-03	1.5E-04	3.1E-03	2.1E-02	1.0E-03	2.2E-02
	CNG	UBUS	140,616	5.3E-03	4.6E-05	5.3E-03	7.7E-03	6.7E-05	7.8E-03	8.3E-02	3.0E-04	8.3E-02
Mini Bus	Gas	OBUS	160,925	4.5E-03	1.4E-04	4.6E-03	6.5E-03	2.0E-04	6.7E-03	9.2E-02	9.1E-04	9.3E-02
	Diesel	All Other Buses	76,015	4.9E-03	5.6E-05	4.9E-03	5.5E-03	6.3E-05	5.6E-03	2.0E-02	4.4E-04	2.0E-02
	Biodiesel	All Other Buses	42,399	2.7E-03	2.2E-05	2.7E-03	3.1E-03	2.5E-05	3.1E-03	1.1E-02	1.7E-04	1.1E-02
	CNG	OBUS	205,480	5.7E-03	7.4E-05	5.8E-03	8.3E-03	1.1E-04	8.5E-03	0.12	4.8E-04	0.12
Van	Gas	MDV	107,626	1.9E-03	2.5E-05	1.9E-03	2.7E-03	3.6E-05	2.8E-03	7.9E-02	3.2E-04	7.9E-02
	Diesel	MDV	63,491	1.5E-03	6.0E-05	1.5E-03	1.7E-03	6.8E-05	1.8E-03	2.4E-02	1.0E-03	2.5E-02
Shuttle Subtotal			**6,140,660**			**0.63**			**0.93**			**4.8**
Passengers Displaced Values			**32,601,323**	**0.68**		**0.68**	**0.98**		**0.98**	**29.10**		**29.1**
Net Change			**-26,460,663**			**-5.0E-02**			**-5.5E-02**			**-24.3**

Notes:

1. Project annual VMT reflects the incremental VMT over Pre-Pilot operations associated with 19% growth compared to Pilot annual VMT. Pre-Pilot annual VMT assumed to be 19% less than Pilot annual VMT. See AQTR Table 8 for VMT calculation details.
2. Shuttle emissions include running and idling emissions, assuming 1 minute idling at each daily stop event. Project number of stop events is based on growth compared to Pre-Pilot stop events (i.e, Program minus Pre-Pilot). Ramboll Environ calculated Program stop events utilizing 29% growth factor provided by SFMTA. Passenger displaced emissions include only running emissions. Emissions are based on uncontrolled emission factors for model year 1992 to 2018 shuttle vehicles.

Table F17: Regional Emissions Summary (Uncontrolled Project)
SFMTA Commuter Shuttle Project
San Francisco, California

Shuttle Class	Fuel Type	EMFAC Class	Project Emissions[2] Running Exhaust NO_x (tpy)	Idling Exhaust NO_x (tpy)	Total NO_x (tpy)	Running Exhaust CO_2 (MT/yr)	Idling Exhaust CO_2 (MT/yr)	Total CO_2 (MT/yr)	Running Exhaust PM_{10} (tpy)	Idling Exhaust PM_{10} (tpy)	Total PM_{10} (tpy)	Running Exhaust $PM_{2.5}$ (tpy)	Idling Exhaust $PM_{2.5}$ (tpy)	Total $PM_{2.5}$ (tpy)	Running Exhaust SO_x (tpy)	Idling Exhaust SO_x (tpy)	Total SO_x (tpy)
Motor Coach	Diesel	Motor Coach	8.1	6.8E-02	8.2	4,353	16.4	4,369	4.2E-02	4.8E-05	4.2E-02	4.0E-02	4.6E-05	4.0E-02	4.6E-02	1.7E-04	4.6E-02
	Biodiesel	Motor Coach	7.2	0.16	7.3	3,842	38.1	3,880	3.7E-02	1.1E-04	3.7E-02	3.6E-02	1.1E-04	3.6E-02	4.0E-02	4.0E-04	4.1E-02
Urban Bus	Gas	UBUS	1.2E-02	1.4E-04	1.3E-02	58.2	1.0	59.3	6.7E-05	1.7E-06	6.9E-05	6.2E-05	1.5E-06	6.3E-05	6.4E-04	4.9E-06	6.5E-04
	Diesel	UBUS	1.1	5.4E-03	1.1	961.9	3.1	965.0	9.9E-03	4.8E-05	1.0E-02	9.5E-03	4.6E-05	9.6E-03	8.1E-03	1.6E-05	8.2E-03
	Biodiesel	UBUS	1.3E-02	3.2E-04	1.4E-02	11.9	0.18	12.1	1.2E-04	2.8E-06	1.3E-04	1.2E-04	2.7E-06	1.2E-04	1.0E-04	9.7E-07	1.0E-04
	CNG	UBUS	5.0E-02	1.9E-04	5.0E-02	236.0	1.4	237.4	2.7E-04	2.3E-06	2.7E-04	2.5E-04	2.2E-06	2.5E-04	2.6E-03	6.9E-06	2.6E-03
Mini Bus	Gas	OBUS	3.2E-02	3.2E-04	3.3E-02	203.0	3.5	206.4	1.7E-04	5.4E-06	1.8E-04	1.6E-04	5.0E-06	1.6E-04	2.2E-03	1.3E-05	2.2E-03
	Diesel	All Other Buses	0.15	6.4E-03	0.16	92.1	1.5	93.6	8.9E-04	3.7E-06	9.0E-04	8.5E-04	3.6E-06	8.6E-04	9.7E-04	1.5E-05	9.8E-04
	Biodiesel	All Other Buses	8.5E-02	2.6E-03	8.8E-02	51.4	0.58	52.0	5.0E-04	1.5E-06	5.0E-04	4.8E-04	1.4E-06	4.8E-04	5.4E-04	6.1E-06	5.5E-04
	CNG	OBUS	4.1E-02	1.7E-04	4.1E-02	259.2	1.8	261.0	2.2E-04	2.9E-06	2.2E-04	2.0E-04	2.6E-06	2.1E-04	2.9E-03	6.7E-06	2.9E-03
Van	Gas	MDV	8.4E-03	3.6E-05	8.4E-03	56.7	0.41	57.1	2.3E-04	3.1E-06	2.4E-04	2.1E-04	2.9E-06	2.2E-04	6.3E-04	1.6E-06	6.3E-04
	Diesel	MDV	6.5E-03	5.4E-05	6.6E-03	32.6	0.30	32.9	4.6E-04	5.0E-06	4.6E-04	4.4E-04	4.7E-06	4.4E-04	3.4E-04	1.4E-06	3.4E-04
Shuttle Subtotal					**17.0**			**10,226**			**9.2E-02**			**8.8E-02**			**0.11**
Passengers Displaced Values			**2.9**		**2.9**	**11,288**		**11,288**	**7.9E-02**		**7.9E-02**	**7.3E-02**		**7.3E-02**	**0.12**		**0.12**
Net Change					**14.2**			**-1,062**			**1.3E-02**			**1.5E-02**			**-1.9E-02**

Notes:

1. Project annual VMT reflects the incremental VMT over Pre-Pilot operations associated with 19% growth compared to Pilot annual VMT. Pre-Pilot annual VMT assumed to be 19% less than Pilot annual VMT. See AQTR Table 8 for VMT calculation details.
2. Shuttle emissions include running and idling emissions, assuming 1 minute idling at each daily stop event. Project number of stop events is based on growth compared to Pre-Pilot stop events (i.e, Program minus Pre-Pilot). Ramboll Environ calculated Program stop events utilizing 29% growth factor provided by SFMTA. Passenger displaced emissions include only running emissions. Emissions are based on uncontrolled emission factors for model year 1992 to 2018 shuttle vehicles.

Table F18: Regional Emissions Summary (Controlled Project)
SFMTA Commuter Shuttle Project
San Francisco, California

Shuttle Class	Fuel Type	EMFAC Class	Project Annual VMT[1]	Project Emissions[2]								
				Running Exhaust ROG (tpy)	Idling Exhaust ROG (tpy)	Total ROG (tpy)	Running Exhaust TOG (tpy)	Idling Exhaust TOG (tpy)	Total TOG (tpy)	Running Exhaust CO (tpy)	Idling Exhaust CO (tpy)	Total CO (tpy)
Motor Coach	Diesel	Motor Coach	2,579,132	0.21	1.4E-03	0.21	0.23	1.6E-03	0.24	1.21	5.3E-03	1.2
	Biodiesel	Motor Coach	2,276,585	0.18	3.3E-03	0.18	0.21	3.8E-03	0.21	1.1	1.2E-02	1.1
Urban Bus	Gas	UBUS	34,701	8.7E-04	2.2E-05	8.9E-04	1.3E-03	3.2E-05	1.3E-03	1.2E-02	1.3E-04	1.2E-02
	Diesel	UBUS	448,161	1.1E-02	1.2E-04	1.2E-02	0.21	2.3E-03	0.21	1.7	1.8E-02	1.7
	Biodiesel	UBUS	5,530	1.4E-04	7.2E-06	1.5E-04	2.6E-03	1.3E-04	2.7E-03	2.1E-02	1.1E-03	2.2E-02
	CNG	UBUS	140,616	3.5E-03	3.0E-05	3.5E-03	5.1E-03	4.4E-05	5.2E-03	4.9E-02	1.8E-04	5.0E-02
Mini Bus	Gas	OBUS	160,925	2.0E-03	6.4E-05	2.1E-03	3.0E-03	9.3E-05	3.1E-03	3.2E-02	3.2E-04	3.2E-02
	Diesel	All Other Buses	76,015	3.3E-03	3.8E-05	3.4E-03	3.8E-03	4.3E-05	3.8E-03	1.7E-02	2.9E-04	1.8E-02
	Biodiesel	All Other Buses	42,399	1.9E-03	1.5E-05	1.9E-03	2.1E-03	1.7E-05	2.1E-03	9.7E-03	1.1E-04	9.9E-03
	CNG	OBUS	205,480	2.6E-03	3.4E-05	2.6E-03	3.8E-03	4.9E-05	3.9E-03	4.1E-02	1.7E-04	4.1E-02
Van	Gas	MDV	107,626	1.4E-03	1.9E-05	1.4E-03	2.1E-03	2.7E-05	2.1E-03	6.3E-02	2.6E-04	6.3E-02
	Diesel	MDV	63,491	1.2E-03	5.7E-05	1.3E-03	1.4E-03	6.4E-05	1.5E-03	2.2E-02	1.0E-03	2.3E-02
Shuttle Subtotal			**6,140,660**			**0.42**			**0.69**			**4.3**
Passengers Displaced Values			**32,601,323**	**0.68**		**0.68**	**0.98**		**0.98**	**29.1**		**29.1**
Net Change			**-26,460,663**			**-0.26**			**-0.30**			**-24.8**

Notes:

1. Project annual VMT reflects the incremental VMT over Pre-Pilot operations associated with 19% growth compared to Pilot annual VMT. Pre-Pilot annual VMT assumed to be 19% less than Pilot annual VMT. See AQTR Table 8 for VMT calculation details.

2. Shuttle emissions include running and idling emissions, assuming 1 minute idling at each daily stop event. Project number of stop events is based on growth compared to Pre-Pilot stop events (i.e, Program minus Pre-Pilot). Ramboll Environ calculated Program stop events utilizing 29% growth factor provided by SFMTA. Passenger displaced emissions include only running emissions. Emissions are based on controlled emission factors for model year 2012 to 2018 shuttle vehicles.

Table F18: Regional Emissions Summary (Controlled Project)
SFMTA Commuter Shuttle Project
San Francisco, California

Shuttle Class	Fuel Type	EMFAC Class	Project Emissions[2] Running Exhaust NO_x (tpy)	Idling Exhaust NO_x (tpy)	Total NO_x (tpy)	Running Exhaust CO_2 (MT/yr)	Idling Exhaust CO_2 (MT/yr)	Total CO_2 (MT/yr)	Running Exhaust PM_{10} (tpy)	Idling Exhaust PM_{10} (tpy)	Total PM_{10} (tpy)	Running Exhaust $PM_{2.5}$ (tpy)	Idling Exhaust $PM_{2.5}$ (tpy)	Total $PM_{2.5}$ (tpy)	Running Exhaust SO_x (tpy)	Idling Exhaust SO_x (tpy)	Total SO_x (tpy)
Motor Coach	Diesel	Motor Coach	4.4	4.4E-02	4.5	4,312	16.1	4,328	1.2E-02	4.2E-06	1.2E-02	1.1E-02	4.1E-06	1.1E-02	4.5E-02	1.7E-04	4.6E-02
	Biodiesel	Motor Coach	3.9	0.10	4.0	3,806	37.4	3,844	1.1E-02	9.8E-06	1.1E-02	1.0E-02	9.4E-06	1.0E-02	4.0E-02	3.9E-04	4.0E-02
Urban Bus	Gas	UBUS	8.8E-03	9.9E-05	8.9E-03	58.1	1.0	59.2	6.4E-05	1.6E-06	6.5E-05	5.9E-05	1.5E-06	6.0E-05	6.4E-04	4.9E-06	6.4E-04
	Diesel	UBUS	0.77	4.0E-03	0.77	956.6	3.1	959.7	4.0E-03	1.2E-05	4.0E-03	3.8E-03	1.1E-05	3.8E-03	7.9E-03	1.6E-05	7.9E-03
	Biodiesel	UBUS	9.5E-03	2.4E-04	9.7E-03	11.8	0.18	12.0	4.9E-05	6.9E-07	5.0E-05	4.7E-05	6.6E-07	4.8E-05	9.8E-05	9.4E-07	9.9E-05
	CNG	UBUS	3.6E-02	1.4E-04	3.6E-02	235.6	1.4	237.0	2.6E-04	2.2E-06	2.6E-04	2.4E-04	2.0E-06	2.4E-04	2.6E-03	6.9E-06	2.6E-03
Mini Bus	Gas	OBUS	1.6E-02	1.5E-04	1.6E-02	202.6	3.5	206.1	1.7E-04	5.4E-06	1.8E-04	1.6E-04	5.0E-06	1.6E-04	2.2E-03	1.3E-05	2.2E-03
	Diesel	All Other Buses	8.8E-02	4.2E-03	9.2E-02	92.3	1.4	93.7	2.3E-04	3.2E-07	2.3E-04	2.2E-04	3.1E-07	2.2E-04	9.7E-04	1.5E-05	9.9E-04
	Biodiesel	All Other Buses	4.9E-02	1.7E-03	5.1E-02	51.5	0.57	52.0	1.3E-04	1.3E-07	1.3E-04	1.2E-04	1.2E-07	1.2E-04	5.4E-04	6.0E-06	5.5E-04
	CNG	OBUS	2.0E-02	8.2E-05	2.0E-02	258.7	1.8	260.6	2.2E-04	2.9E-06	2.2E-04	2.0E-04	2.6E-06	2.1E-04	2.8E-03	6.7E-06	2.9E-03
Van	Gas	MDV	6.1E-03	2.6E-05	6.2E-03	54.8	0.39	55.2	2.3E-04	3.1E-06	2.4E-04	2.1E-04	2.9E-06	2.2E-04	6.0E-04	1.5E-06	6.1E-04
	Diesel	MDV	2.4E-03	4.2E-05	2.5E-03	31.5	0.29	31.8	2.8E-04	2.3E-06	2.9E-04	2.7E-04	2.2E-06	2.7E-04	3.3E-04	1.4E-06	3.3E-04
Shuttle Subtotal					**9.5**			**10,139**			**2.8E-02**			**2.7E-02**			**0.10**
Passengers Displaced Values			**2.9**		**2.9**	**11,288**		**11,288**	**7.9E-02**		**7.9E-02**	**7.3E-02**		**7.3E-02**	**0.12**		**0.12**
Net Change					**6.6**			**-1,149**			**-5.1E-02**			**-4.6E-02**			**-2.0E-02**

Notes:

1. Project annual VMT reflects the incremental VMT over Pre-Pilot operations associated with 19% growth compared to Pilot annual VMT. Pre-Pilot annual VMT assumed to be 19% less than Pilot annual VMT. See AQTR Table 8 for VMT calculation details.

2. Shuttle emissions include running and idling emissions, assuming 1 minute idling at each daily stop event. Project number of stop events is based on growth compared to Pre-Pilot stop events (i.e, Program minus Pre-Pilot). Ramboll Environ calculated Program stop events utilizing 29% growth factor provided by SFMTA. Passenger displaced emissions include only running emissions. Emissions are based on controlled emission factors for model year 2012 to 2018 shuttle vehicles.

Table F19: Regional Emissions Summary (Uncontrolled Pre-Pilot)
SFMTA Commuter Shuttle Project
San Francisco, California

Shuttle Class	Fuel Type	EMFAC Class	Pre-Pilot Annual VMT[1]	Pre-Pilot Emissions[2]								
				Running Exhaust ROG (tpy)	Idling Exhaust ROG (tpy)	Total ROG (tpy)	Running Exhaust TOG (tpy)	Idling Exhaust TOG (tpy)	Total TOG (tpy)	Running Exhaust CO (tpy)	Idling Exhaust CO (tpy)	Total CO (tpy)
Motor Coach	Diesel	Motor Coach	6,198,346	0.72	4.6E-03	0.72	0.82	5.2E-03	0.82	3.31	1.8E-02	3.33
	Biodiesel	Motor Coach	5,471,245	0.63	1.1E-02	0.64	0.72	1.2E-02	0.73	2.9	4.2E-02	3.0
Urban Bus	Gas	UBUS	83,397	3.1E-03	7.3E-05	3.2E-03	4.6E-03	1.1E-04	4.7E-03	4.9E-02	4.7E-04	5.0E-02
	Diesel	UBUS	1,077,051	8.8E-02	8.1E-04	8.9E-02	0.57	5.6E-03	0.58	4.1	4.0E-02	4.2
	Biodiesel	UBUS	13,290	1.1E-03	4.7E-05	1.1E-03	7.1E-03	3.3E-04	7.4E-03	5.1E-02	2.3E-03	5.3E-02
	CNG	UBUS	337,937	1.3E-02	1.0E-04	1.3E-02	1.9E-02	1.5E-04	1.9E-02	0.20	6.6E-04	0.20
Mini Bus	Gas	OBUS	386,747	1.1E-02	3.1E-04	1.1E-02	1.6E-02	4.6E-04	1.6E-02	0.22	2.0E-03	0.22
	Diesel	All Other Buses	182,684	1.2E-02	1.3E-04	1.2E-02	1.3E-02	1.4E-04	1.3E-02	4.8E-02	9.8E-04	4.9E-02
	Biodiesel	All Other Buses	101,896	6.5E-03	5.0E-05	6.6E-03	7.4E-03	5.7E-05	7.5E-03	2.7E-02	3.9E-04	2.7E-02
	CNG	OBUS	493,823	1.4E-02	1.7E-04	1.4E-02	2.0E-02	2.4E-04	2.0E-02	0.28	1.1E-03	0.28
Van	Gas	MDV	258,655	4.5E-03	5.5E-05	4.6E-03	6.6E-03	8.1E-05	6.6E-03	0.19	7.3E-04	0.19
	Diesel	MDV	152,585	3.6E-03	1.3E-04	3.7E-03	4.1E-03	1.5E-04	4.2E-03	5.9E-02	2.3E-03	6.1E-02
Shuttle Subtotal			**14,757,656**			**1.5**			**2.2**			**11.6**
Passengers Displaced Values			**78,349,731**	**1.6**		**1.6**	**2.4**		**2.4**	**69.9**		**69.9**
Net Change			**-63,592,076**			**-0.12**			**-0.13**			**-58.4**

Notes:

1. Pre-Pilot annual VMT assumed to be 19% less than Pilot annual VMT. See AQTR Table 8 for VMT calculation details.
2. Shuttle emissions include running and idling emissions, assuming 1 minute idling at each daily stop event. Pre-Pilot number of stop events is based on data provided by SFMTA. Passenger displaced emissions include only running emissions. Emissions are based on uncontrolled emission factors for model year 1992 to 2018 shuttle

Table F19: Regional Emissions Summary (Uncontrolled Pre-Pilot)
SFMTA Commuter Shuttle Project
San Francisco, California

			Pre-Pilot Emissions[2]														
Shuttle Class	**Fuel Type**	**EMFAC Class**	**Running Exhaust NO_x (tpy)**	**Idling Exhaust NO_x (tpy)**	**Total NO_x (tpy)**	**Running Exhaust CO_2 (MT/yr)**	**Idling Exhaust CO_2 (MT/yr)**	**Total CO_2 (MT/yr)**	**Running Exhaust PM_{10} (tpy)**	**Idling Exhaust PM_{10} (tpy)**	**Total PM_{10} (tpy)**	**Running Exhaust $PM_{2.5}$ (tpy)**	**Idling Exhaust $PM_{2.5}$ (tpy)**	**Total $PM_{2.5}$ (tpy)**	**Running Exhaust SO_x (tpy)**	**Idling Exhaust SO_x (tpy)**	**Total SO_x (tpy)**
Motor Coach	Diesel	Motor Coach	19.6	0.15	19.7	10,461	36.9	10,497	1.0E-01	1.1E-04	1.0E-01	9.7E-02	1.0E-04	9.7E-02	1.1E-01	3.9E-04	1.1E-01
	Biodiesel	Motor Coach	17.3	0.36	17.6	9,233	85.8	9,319	8.9E-02	2.5E-04	8.9E-02	8.5E-02	2.4E-04	8.6E-02	9.7E-02	9.0E-04	9.8E-02
Urban Bus	Gas	UBUS	3.0E-02	3.1E-04	3.0E-02	140.0	2.3	142.3	1.6E-04	3.8E-06	1.6E-04	1.5E-04	3.5E-06	1.5E-04	1.5E-03	1.1E-05	1.6E-03
	Diesel	UBUS	2.6	1.2E-02	2.6	2,311.7	7.0	2,319	2.4E-02	1.1E-04	2.4E-02	2.3E-02	1.0E-04	2.3E-02	2.0E-02	3.7E-05	2.0E-02
	Biodiesel	UBUS	3.2E-02	7.1E-04	3.3E-02	28.5	0.41	28.9	2.9E-04	6.4E-06	3.0E-04	2.8E-04	6.1E-06	2.9E-04	2.4E-04	2.2E-06	2.4E-04
	CNG	UBUS	0.12	4.4E-04	0.12	567.2	3.2	570.4	6.5E-04	5.3E-06	6.6E-04	6.0E-04	4.8E-06	6.1E-04	6.2E-03	1.6E-05	6.3E-03
Mini Bus	Gas	OBUS	7.7E-02	7.1E-04	7.8E-02	487.8	7.8	495.6	4.2E-04	1.2E-05	4.3E-04	3.8E-04	1.1E-05	4.0E-04	5.4E-03	2.8E-05	5.4E-03
	Diesel	All Other Buses	0.37	1.4E-02	0.38	221.4	3.3	224.6	2.1E-03	8.4E-06	2.2E-03	2.1E-03	8.1E-06	2.1E-03	2.3E-03	3.5E-05	2.4E-03
	Biodiesel	All Other Buses	0.21	5.8E-03	0.21	123.5	1.31	124.8	1.2E-03	3.4E-06	1.2E-03	1.1E-03	3.2E-06	1.1E-03	1.3E-03	1.4E-05	1.3E-03
	CNG	OBUS	9.9E-02	3.8E-04	9.9E-02	622.8	4.1	627.0	5.3E-04	6.5E-06	5.4E-04	4.9E-04	5.9E-06	5.0E-04	6.9E-03	1.5E-05	6.9E-03
Van	Gas	MDV	2.0E-02	8.2E-05	2.0E-02	136.3	0.92	137.2	5.6E-04	7.0E-06	5.7E-04	5.2E-04	6.4E-06	5.2E-04	1.5E-03	3.5E-06	1.5E-03
	Diesel	MDV	1.6E-02	1.2E-04	1.6E-02	78.4	0.67	79.1	1.1E-03	1.1E-05	1.1E-03	1.1E-03	1.1E-05	1.1E-03	8.2E-04	3.3E-06	8.3E-04
Shuttle Subtotal					**40.9**			**24,565**			**0.22**			**0.21**			**0.25**
Passengers Displaced Values			**6.9**		**6.9**	**27,128**		**27,128**	**0.19**		**0.19**	**0.18**		**0.18**	**0.30**		**0.30**
Net Change					**34.0**			**-2,563**			**3.1E-02**			**3.6E-02**			**-4.5E-02**

Notes:
1. Pre-Pilot annual VMT assumed to be 19% less than Pilot annual VMT. See AQTR Table 8 for VMT calculation details.
2. Shuttle emissions include running and idling emissions, assuming 1 minute idling at each daily stop event. Pre-Pilot number of stop events is based on data provided by SFMTA. Passenger displaced emissions include only running emissions. Emissions are based on uncontrolled emission factors for model year 1992 to 2018 shuttle vehicles.

Table F20: Regional Emissions Summary (Controlled Pre-Pilot)
SFMTA Commuter Shuttle Project
San Francisco, California

Shuttle Class	Fuel Type	EMFAC Class	Pre-Pilot Annual VMT[1]	Pre-Pilot Emissions[2]								
				Running Exhaust ROG (tpy)	Idling Exhaust ROG (tpy)	Total ROG (tpy)	Running Exhaust TOG (tpy)	Idling Exhaust TOG (tpy)	Total TOG (tpy)	Running Exhaust CO (tpy)	Idling Exhaust CO (tpy)	Total CO (tpy)
Motor Coach	Diesel	Motor Coach	6,198,346	0.49	3.2E-03	0.50	0.56	3.7E-03	0.57	2.92	1.2E-02	2.9
	Biodiesel	Motor Coach	5,471,245	0.44	7.5E-03	0.44	0.50	8.6E-03	0.51	2.6	2.8E-02	2.6
Urban Bus	Gas	UBUS	83,397	2.1E-03	4.9E-05	2.1E-03	3.0E-03	7.1E-05	3.1E-03	2.9E-02	2.8E-04	3.0E-02
	Diesel	UBUS	1,077,051	2.7E-02	2.7E-04	2.8E-02	0.51	5.1E-03	0.51	4.1	4.1E-02	4.1
	Biodiesel	UBUS	13,290	3.4E-04	1.6E-05	3.5E-04	6.3E-03	3.0E-04	6.6E-03	5.0E-02	2.4E-03	5.3E-02
	CNG	UBUS	337,937	8.4E-03	6.8E-05	8.5E-03	1.2E-02	9.9E-05	1.2E-02	0.12	4.0E-04	0.12
Mini Bus	Gas	OBUS	386,747	4.9E-03	1.4E-04	5.1E-03	7.2E-03	2.1E-04	7.4E-03	7.6E-02	7.1E-04	7.7E-02
	Diesel	All Other Buses	182,684	8.0E-03	8.6E-05	8.1E-03	9.1E-03	9.8E-05	9.2E-03	4.2E-02	6.4E-04	4.3E-02
	Biodiesel	All Other Buses	101,896	4.4E-03	3.4E-05	4.5E-03	5.1E-03	3.9E-05	5.1E-03	2.3E-02	2.6E-04	2.4E-02
	CNG	OBUS	493,823	6.3E-03	7.6E-05	6.4E-03	9.2E-03	1.1E-04	9.3E-03	9.8E-02	3.8E-04	0.10
Van	Gas	MDV	258,655	3.4E-03	4.2E-05	3.5E-03	5.0E-03	6.2E-05	5.0E-03	0.15	5.8E-04	0.15
	Diesel	MDV	152,585	3.0E-03	1.3E-04	3.1E-03	3.4E-03	1.5E-04	3.5E-03	5.2E-02	2.3E-03	5.4E-02
Shuttle Subtotal			**14,757,656**			**1.0**			**1.6**			**10.3**
Passengers Displaced Values			**78,349,731**	**1.6**		**1.6**	**2.4**		**2.4**	**69.9**		**69.9**
Net Change			**-63,592,076**			**-0.63**			**-0.72**			**-59.6**

Notes:

1. Pre-Pilot annual VMT assumed to be 19% less than Pilot annual VMT. See AQTR Table 8 for VMT calculation details.
2. Shuttle emissions include running and idling emissions, assuming 1 minute idling at each daily stop event. Pre-Pilot number of stop events is based on data provided by SFMTA. Passenger displaced emissions include only running emissions. Emissions are based on controlled emission factors for model year 2012 to 2018 shuttle

Table F20: Regional Emissions Summary (Controlled Pre-Pilot)
SFMTA Commuter Shuttle Project
San Francisco, California

Shuttle Class	Fuel Type	EMFAC Class	Pre-Pilot Emissions[2]																	
			Running Exhaust NO_x (tpy)	Idling Exhaust NO_x (tpy)	Total NO_x (tpy)	Running Exhaust CO_2 (MT/yr)	Idling Exhaust CO_2 (MT/yr)	Total CO_2 (MT/yr)	Running Exhaust PM_{10} (tpy)	Idling Exhaust PM_{10} (tpy)	Total PM_{10} (tpy)	Running Exhaust $PM_{2.5}$ (tpy)	Idling Exhaust $PM_{2.5}$ (tpy)	Total $PM_{2.5}$ (tpy)	Running Exhaust SO_x (tpy)	Idling Exhaust SO_x (tpy)	Total SO_x (tpy)
Motor Coach	Diesel	Motor Coach	10.6	9.9E-02	10.7	10,363	36.2	10,399	2.9E-02	9.5E-06	2.9E-02	2.7E-02	9.1E-06	2.7E-02	0.11	3.8E-04	0.11
	Biodiesel	Motor Coach	9.4	0.23	9.6	9,147	84.1	9,231	2.6E-02	2.2E-05	2.6E-02	2.4E-02	2.1E-05	2.4E-02	9.6E-02	8.8E-04	9.7E-02
Urban Bus	Gas	UBUS	2.1E-02	2.2E-04	2.1E-02	139.7	2.3	142.0	1.5E-04	3.6E-06	1.6E-04	1.4E-04	3.3E-06	1.4E-04	1.5E-03	1.1E-05	1.5E-03
	Diesel	UBUS	1.8	9.0E-03	1.9	2,299	7.0	2,306	9.6E-03	2.6E-05	9.6E-03	9.2E-03	2.5E-05	9.2E-03	1.9E-02	3.6E-05	1.9E-02
	Biodiesel	UBUS	2.3E-02	5.3E-04	2.3E-02	28.4	0.41	28.8	1.2E-04	1.6E-06	1.2E-04	1.1E-04	1.5E-06	1.1E-04	2.3E-04	2.1E-06	2.4E-04
	CNG	UBUS	8.6E-02	3.1E-04	8.6E-02	566.3	3.2	569.5	6.2E-04	5E-06	6.3E-04	5.7E-04	4.6E-06	5.8E-04	6.2E-03	1.6E-05	6.2E-03
Mini Bus	Gas	OBUS	3.8E-02	3.5E-04	3.8E-02	487.0	7.8	494.8	4.2E-04	1.2E-05	4.3E-04	3.8E-04	1.1E-05	3.9E-04	5.4E-03	2.8E-05	5.4E-03
	Diesel	All Other Buses	0.21	9.4E-03	0.22	221.8	3.2	225.0	5.5E-04	7.2E-07	5.5E-04	5.2E-04	6.9E-07	5.2E-04	2.3E-03	3.4E-05	2.4E-03
	Biodiesel	All Other Buses	0.12	3.7E-03	0.12	123.7	1.3	125.0	3.0E-04	2.9E-07	3.1E-04	2.9E-04	2.8E-07	2.9E-04	1.3E-03	1.4E-05	1.3E-03
	CNG	OBUS	4.8E-02	1.8E-04	4.8E-02	621.8	4.1	625.9	5.3E-04	6.4E-06	5.4E-04	4.9E-04	5.9E-06	5.0E-04	6.8E-03	1.5E-05	6.9E-03
Van	Gas	MDV	1.5E-02	5.9E-05	1.5E-02	131.6	0.89	132.5	5.6E-04	7.0E-06	5.7E-04	5.2E-04	6.4E-06	5.2E-04	1.5E-03	3.4E-06	1.5E-03
	Diesel	MDV	5.9E-03	9.5E-05	6.0E-03	75.7	0.65	76.3	6.8E-04	5.2E-06	6.9E-04	6.5E-04	5.0E-06	6.6E-04	8.0E-04	3.1E-06	8.0E-04
Shuttle Subtotal					**22.8**			**24,356**			**6.8E-02**			**6.5E-02**			**0.25**
Passengers Displaced Values			**6.9**		**6.9**	**27,128**		**27,128**	**0.19**		**0.19**	**0.18**		**0.18**	**0.30**		**0.30**
Net Change					**15.9**			**-2,772**			**-0.12**			**-0.11**			**-4.8E-02**

Notes:
1. Pre-Pilot annual VMT assumed to be 19% less than Pilot annual VMT. See AQTR Table 8 for VMT calculation details.
2. Shuttle emissions include running and idling emissions, assuming 1 minute idling at each daily stop event. Pre-Pilot number of stop events is based on data provided by SFMTA. Passenger displaced emissions include only running emissions. Emissions are based on controlled emission factors for model year 2012 to 2018 shuttle vehicles.

RAMBOLL ENVIRON

Carroll, John (BOS)

From:	Wise, Viktoriya A <Viktoriya.A.Wise@sfmta.com>
Sent:	Tuesday, January 19, 2016 1:48 PM
To:	Carroll, John (BOS)
Cc:	Willson, Hank (MTA); Paine, Carli (MTA); Maguire, Tom; Auyoung, Dillon; Jones, Sarah (CPC)
Subject:	FW: Hearing Notice - CEQA Exemption Determination Appeal - Proposed Commuter Shuttle Permit Program - Appeal Hearing on January 26, 2016
Attachments:	SFMTA 16-0119 BOS overview re Appeal of CEQA Determination-Commuter Shuttle Program final.docx.pdf
Categories:	151269

John,

Attached please find SFMTA's correspondence in connection with the CEQA appeal of the Commuter Shuttle Program scheduled for 1/26/16.

Thank you.

Viktoriya Wise, AICP
Chief of Staff, Sustainable Streets Division
SFMTA | Municipal Transportation Agency
1 South Van Ness, 7th Floor
San Francisco, CA 94103
(415) 701-4691 Office
Email Viktoriya.A.Wise@sfmta.com
www.sfmta.com

From: BOS Legislation, (BOS) [mailto:bos.legislation@sfgov.org]
Sent: Tuesday, January 12, 2016 9:40 AM
To: Rebecca Davis (rebecca@lozeaudrury.com); Wise, Viktoriya A; Willson, Hank; Espiritu, Christopher; Rahaim, John; Jones, Sarah B; Starr, Aaron; Rodgers, AnMarie; Sanchez, Scott; Ionin, Jonas; Givner, Jon; Warren, Elaine; Zane Gresham (zgresham@mofo.com); Miles Imwalle (mlmwalle@mofo.com); David Gold (dgold@mofo.com); Dan Gershwin (DGershwin@mofo.com); Adrian Covert (acovert@bayareacouncil.org); Richard Drury (richard@lozeaudrury.com); Theresa Rettinghouse (theresa@lozeaudrury.com); Sue Vaughan (susan.e.vaughan@sonic.net); Wise, Viktoriya A; Willson, Hank; Espiritu, Christopher; Rahaim, John; Jones, Sarah B; Starr, Aaron; Rodgers, AnMarie; Sanchez, Scott; Ionin, Jonas; Givner, Jon; Warren, Elaine; BOS-Supervisors; bos-legislative_aides
Cc: Calvillo, Angela; Miller, Alisa; Carroll, John; BOS Legislation
Subject: Hearing Notice - CEQA Exemption Determination Appeal - Proposed Commuter Shuttle Permit Program - Appeal Hearing on January 26, 2016

Good morning,

The Office of the Clerk of the Board has scheduled an appeal hearing for Special Order on **January 26, 2016, at 3:00 p.m.,** to hear an appeal of the determination of exemption from environmental review under the California Environmental Quality Act for the proposed Commuter Shuttle Permit Program, filed by Rebecca L. Davis, on behalf of the Coalition for Fair, Legal and Environmental Transit, Sue Vaughan, and Robert Planthold.

Please find the following link to the hearing notice for the matter

January 26, 2016 - Board of Supervisors - Appeal Hearing - Proposed Commuter Shuttle Permit Program

I invite you to review the entire matter on our Legislative Research Center by following the links below.

Board of Supervisors File No. 151269

Thank you,

John Carroll
Legislative Clerk
Board of Supervisors
San Francisco City Hall, Room 244
San Francisco, CA 94102
(415)554-4445 - Direct | (415)554-5163 - Fax
john.carroll@sfgov.org | bos.legislation@sfgov.org

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January 19, 2016

Angela Calvillo
Clerk of the San Francisco Board of Supervisors
1 Dr. Carlton B. Goodlett Place, Room 244
San Francisco, CA 94102

Subject: Appeal of CEQA Determination – SFMTA Commuter Shuttle Program

Dear Ms. Calvillo:

This communication provides the Board of Supervisors with an overview of the Commuter Shuttle Program in connection with the appeal of the Planning Department's determination that the Program is exempt under California Environmental Quality Act (CEQA). The SFMTA supports the CEQA determination issued by the Planning Department, which will be providing the Board with a separate memorandum directly responding to the issues raised by the Appellant.

INTRODUCTION

Privately operated commuter shuttles, which transport workers from their neighborhoods to places of work or transportation hubs, have become increasingly common on the streets of San Francisco. Commuter shuttles provide a commute choice to thousands of employees, students, and other residents of the city, and provide alternatives to drive-alone trips. Shuttles are associated with reduced auto ownership and the increased use of transit, walking, and bicycling for non-commute trips.

Numerous employers, educational institutions, medical facilities, office buildings, and transportation management associations offer shuttle service to their employees, students, and clients. Some buildings are required to provide shuttle service as part of their entitlement conditions of approval, and an employer may comply with San Francisco's Commuter Benefits Ordinance by offering a free commuter shuttle to employees. The majority of the commuter shuttles are closed systems that provide service to a specific population and are not open to the general public. Most shuttles are provided at no cost to riders, such as employees, students, or tenants.

Buses taking commuters to Silicon Valley originated as an attempt (or a requirement) to improve air quality by reducing the number of cars travelling to and entering corporate campuses. Commuter shuttles serving Silicon Valley companies are not confined to San Francisco: buses run through the entire Bay Area, with routes connecting the North Bay, East Bay, the Peninsula, and the South Bay. Commuter shuttles have operated for decades in San Francisco, but their use has significantly increased over the past several years. Commuter shuttles are allowed to drive on city

1 South Van Ness Avenue 7th Floor, San Francisco, CA 94103 415.701.4500 www.sfmta.com

streets (subject to specified street restrictions), and the SFMTA cannot ban shuttles from operating in the city.

Before August 2014, San Francisco did not regulate commuter shuttles. Shuttles operated throughout the city on both large arterial streets, such as Van Ness Avenue and Mission Street, and smaller residential streets. Shuttles loaded and unloaded passengers in a variety of locations, including white loading zones, red Muni zones, and other vacant curb space. When curb space was unavailable, shuttles loaded or unloaded passengers in the street, often blocking traffic, transit and bicyclists, and increasing potential dangers to passengers, motorists, pedestrians and bicyclists. The lack of rules for loading and unloading resulted in confusion for shuttle operators and neighborhood residents, challenges for enforcement, and real and perceived conflicts with other transportation modes.

COMMUTER SHUTTLE PILOT PROGRAM AND EVALUATION

Pilot Program Description

To address these emerging issues, in January 2014, the SFMTA Board of Directors approved, and in August 2014 the SFMTA implemented, an 18-month Pilot to gather accurate and up-to-date information on commuter shuttle activity and operations and to determine if active regulation of shuttles could reduce traffic conflicts and other issues.[1] Specifically, the objectives of the Pilot Program included:

- Create clear and enforceable locations and guidelines for shuttle loading and unloading;
- Reduce conflicts with Muni and other vehicles;
- Improve safety in shuttle interactions with other users;
- Reduce drive-alone trips, vehicle miles traveled, and greenhouse gas emissions;
- Provide a positive relationship between city agencies and private sector transportation providers;
- Increase acceptance of commuter shuttles by community members; and,
- Gather data regarding shuttle activity in the city.

The regulatory framework included creating a shuttle zone network to test the sharing of designated Muni zones with eligible commuter shuttles that have been issued a permit authorizing use of the shuttle zone network, as well as to gather data on commuter shuttle operations. The shuttle zone network included shared Muni stops for use by participating commuter shuttle buses, along with passenger loading (white) zones exclusively for the use of permitted commuter shuttles during peak commute hours. To create the shuttle zone network, the SFMTA invited shuttle service providers

[1] The January 2014 SFMTA Board Resolution No. 14-023 and staff report are available on-line: https://www.sfmta.com/sites/default/files/agendaitems/1-21-14%20Item%2014%20Private%20Commuter%20Shuttle%20policy%20resolution.pdf and https://www.sfmta.com/sites/default/files/agendaitems/1-21-14%20Item%2014%20Private%20Commuter%20Shuttle%20policy.pdf, respectively.

to propose stops to be included in the network, and SFMTA transit service planning and engineering staff evaluated the requested stops in light of community input and Muni operations. Shuttle service providers initially requested more than 240 zones; the Pilot created a shuttle zone network of a total of 101 designated Muni zones and white permitted commuter shuttle zones around the city. Over the course of the Pilot, the SFMTA made changes and updates to the shuttle zone network to respond to issues such as community concerns, street improvements, Muni service changes, shuttle ridership demand, construction, and other operational considerations. As a result, the Pilot Program shuttle zone network ultimately had 125 zones across the City (104 shared Muni zones and 21 white zones).

Under the Pilot, shuttle service providers (or 'permittees') wishing to use the designated zones were required to obtain a permit from SFMTA. The permit contained conditions for shuttle operation, including:

- Giving priority and yielding to Muni;
- Staying within the shuttle zone network;
- Using zones for active loading, with no unnecessary idling;
- Pulling forward to leave room for Muni and other shuttles;
- Pulling all the way to the curb;
- Complying with all traffic laws;
- Training for shuttle drivers; and
- Using the shuttle zone network only for permit-related activity.

The permit also required participating shuttle service providers to provide SFMTA with substantial data about their activity and operations. Permittees vehicles participating in the program were required to display SFMTA-issued placards.

In addition, the Pilot established a per-stop permit fee tied to the cost recovery of administering the Pilot Program. Currently the fee is $3.67 for each stop event at a designated stop. Stops outside of San Francisco, are not counted. Since the start of the Pilot in August 2014 through January 2016, the SFMTA has billed shuttle service providers a little over $3,802,000 in fees.

Pilot Program Evaluation

Over the course of the Pilot, the SFMTA undertook an extensive evaluation of the program to determine whether the program should be continued beyond the Pilot period and if so, how it could be improved. In October 2015, the SFMTA published the Commuter Shuttle Pilot Program Evaluation Report.[2] The Pilot Program evaluation focused on shuttle activity, a survey of rider travel behavior, and field data collection at a representative sample of shuttle zones. The *Pilot Program Evaluation Report* found that: regulating the shuttles helped reduce conflicts with Muni

[2] The Commuter Shuttle Pilot Program Evaluation Report is available on-line at: https://www.sfmta.com/sites/default/files/projects/2015/Evaluation%20Report%20-%20Oct%205%202015.pdf

and other users; more enforcement is needed; and shuttles provide significant environmental and transportation benefits. The key findings that informed the Commuter Shuttle Program are:

- 47 percent of shuttle riders said they would drive alone to work if a shuttle were not available;
- Shuttles remove nearly 4.3 million vehicle miles traveled from the region's streets each month;
- An average of 2.7 percent of shuttle stop-events resulted in blocking Muni access to a zone;
- Shuttles block travel and bike lanes about 35 percent of the time that they stop;
- More enforcement staffing, and a focus on enforcement both at shuttle zones and along shuttle routes, would assist in keeping traffic flowing smoothly throughout the shuttle zone network;
- The vast majority of community feedback focused on large shuttles being unwelcome on the streets, especially residential streets;
- The Pilot Program allowed for the collection of unprecedented data about shuttle activity; and
- Real-time shuttle vehicle data would greatly assist the SFMTA in regulating and managing commuter shuttle activity.

The SFMTA determined that overall, the Pilot Program successfully regulated commuter shuttles in San Francisco. Thus, the SFMTA embarked on developing the Commuter Shuttle Program that would be in effect after the Pilot is set to expire on January 31, 2016. The Commuter Shuttle Program, described in detail below, was informed by the community feedback and the findings of the *Pilot Program Evaluation Report*. Going forward, the Commuter Shuttle Program is expected to continue to evolve to respond to address on-going information collection and emerging issues.

COMMUTER SHUTTLE PROGRAM

Overview

On November 17, 2015, the SFMTA Board of Directors approved the Commuter Shuttle Program.[3] The Commuter Shuttle Program builds on the regulatory scheme developed for the Pilot. The Program is informed by the following guiding principles:

1. Provide a safe environment for all street users in support of the SFMTA's Vision Zero policy to eliminate all traffic deaths;
2. Prevent service disruptions, including any related to labor relations issues;
3. Ensure that commuter shuttles do not adversely affect operations of public transportation in San Francisco;

[3] The SFMTA Board Staff Report, Resolution and Commuter Shuttle Policy document are available on-line: https://www.sfmta.com/sites/default/files/agendaitems/2015/11-17-15%20Item%2011%20Commuter%20Shuttle%20Program.pdf

4. Consistently and fairly apply and enforce any regulations/policies governing shuttle operations;
5. Work collaboratively with shuttle sector to refine policies and resolve concerns and conflicts;
6. Integrate commuter shuttles into the existing multi-modal transportation system;
7. Establish a program structure that meets current needs and has the potential to evolve as the sector grows and evolves; and
8. Ensure more focused enforcement, ease of administration and on-going oversight.

Based on the above principles and input received from City officials and the public, the Commuter Shuttle Program includes the following provisions.

- Creation of a shuttle zone network that caps the total number of shared Muni and shuttle-only zones at 200 across the city.
    - The existing shuttle zone network from the Pilot, which is the product of thorough vetting by internal agency stakeholders and input from community members, will be used at the outset of the Commuter Shuttle Program.
    - The Commuter Shuttle Program allows for changes to the network to address new program requirements, shifting demand, community concerns, and other operational issues that arise. Changes to the shuttle zone network will be subject to the SFMTA's public review and hearing process. The Commuter Shuttle Program also includes new rules about bus size that affect the siting of zones (see below).
- Shuttle operators apply for a permit to use the shuttle zone network, and pay a permit fee determined by the number of stop events. The permit fee is adjusted on a regular basis.
- Shuttle operators are responsible for ensuring that their operators comply with agreed-upon operating guidelines, including displaying a placard that identifies them as a permitted user.
- SFMTA Parking Control Officers (PCOs) enforce parking and stopping at zones in the network, and along shuttle routes, in order to:
    - Reduce safety hazards;
    - Keep zones safe for pedestrians and other users;
    - Ensure that Muni buses get priority at shared zones;
    - Limit the use of such stops only to Muni and participating shuttle operators;
    - Prevent parking and stopping violations by shuttle operators;
    - Keep shuttles and other traffic along shuttle routes and near shuttle network zones moving smoothly; and
    - Prevent unnecessary idling or layovers by shuttle operators.
- Shuttle operators must share data on operations with the SFMTA, following specifications established by the SFMTA.

How the Commuter Shuttle Program Improves Upon the Pilot

The Program has taken lessons from the Pilot by adding several new features, which were in direct response to the most common community concerns, information gleaned from the pilot data collection and analysis, and policy direction from City officials. The Commuter Shuttle Program builds upon the Pilot in the following specific ways:

- Requires buses over 35 feet long to travel on the major and minor arterial street network as defined by the California Department of Transportation (during the transition to the Commuter Shuttle Program, SFMTA staff will work with participating shuttle operators to either relocate stop-events currently made outside of the arterial street network, or accommodate those stop-events using smaller vehicles);[4]
- Requires participating shuttle operators to phase in the use of newer vehicles, and requires that new participating vehicles be no older than eight years old, which ensures lower greenhouse gas and other emissions from the shuttle fleet overall;
- Increases enforcement resources devoted to shuttle zones and corridors, and recovers the costs as part of the fee for participation in the program;
- Increases capital improvements at shuttle zones and on corridors, with such costs recovered as part of the fee for participation in the program;
- Improves real-time GPS data collection and reporting to help better manage commuter shuttle operations and target enforcement;
- Requires increased data sharing from participating shuttle operators, and requires that participating shuttle operators demonstrate for each vehicle that data feeds are regular and accurate before receiving a permit;
- Permits shuttles that are free and open to the public to use the shuttle zone network without charge (as long as those shuttles comply with all other Commuter Shuttle Program requirements); and
- Requires participating shuttle operators to comply with the San Francisco Board of Supervisors' March 2015 Labor Harmony Resolution, including the submission of a Service Disruption Prevention Plan that describes the shuttle operators' efforts to ensure efficient and consistent service in the event of potential disruptions, including labor disputes in advance of permit issuance.

In addition to the above new requirements, there are numerous permit conditions that will continue to be in effect to ensure that the Program achieves the guiding principles described above. These permit conditions include but are not limited to requiring that the commuter shuttle buses give priority to transit vehicles at the designated stops, loading/unloading be conducted as expeditiously as possible and not take place in travel or bicycle lanes, there is no unnecessary idling, etc.[5]

The conditions of the permit will be monitored and enforced through ongoing and increased collection of data, increased enforcement, and dedicated SFMTA program administration staff.

---

[4] A map of the Caltrans arterial street network is available on-line:
https://www.sfmta.com/sites/default/files/projects/2015/Caltrans%20Arterial%20Street%20Network.pdf

[5] A complete list of permit conditions can be found in the Transportation Code amendments, available on-line beginning on page 11:
https://www.sfmta.com/sites/default/files/agendaitems/2015/11-17-15%20Item%2011%20Commuter%20Shuttle%20Program.pdf

How SFMTA Will Enforce the Program

The success of the Commuter Shuttle Program rests in large part on how well permittees follow the rules and the ability of the SFMTA to take action when they do not. To that end, the Director of Transportation is authorized to suspend or revoke a permit if providers: knowingly or intentionally provide false or inaccurate information in the permit application; repeatedly and egregiously violate parking or traffic laws; create a public safety risk; violate the California Public Utilities or Vehicle codes; or, fail to abide by permit conditions. The Director of Transportation can also impose administrative penalties for violations of permit conditions. To date, the SFMTA has imposed $12,500 in administrative penalties for violations such as failure to send data feeds or failure to submit documentation of required large vehicle driver safety training.

SFMTA PCOs routinely patrol and observe Commuter Shuttle operations as part of their regular beat assignments. The PCOs issue citations for actions such as: non-permitted shuttles using shared stops, permitted shuttles using non-designated Muni stops and any shuttles (permitted or not) loading/unloading in bicycle or mixed flow lanes. In addition to routine observations and enforcement, PCOs often respond to specific citizen complaints (for example: the unnecessary idling on residential streets).

Fee for Program Participation

Public feedback on the Commuter Shuttle Program has included concerns that the fee paid by providers is too low. The Commuter Shuttle permit fee is a regulatory fee. Accordingly, under Article XIIIC, Sec. 1 of the state constitution (Prop. 26), that fee is limited to recovery of the costs of implementing, administering, and enforcing the program. State law prohibits establishing a permit fee that would generate revenue beyond these costs. The SFMTA developed its proposed annual budget for the Commuter Shuttle Program consistent with these requirements.

The estimated budget includes: SFMTA staff to oversee and manage the day-to-day administration of the program as well as other support staff (e.g., sign workers, painters); 15 PCOs and associated support staff; IT costs (e.g., reporting software, data processing and storage, etc.); lost meter revenue; materials such as placards and signs and sign maintenance; and capital improvements such as bus bulbs and boarding islands. On an annual basis, these costs add up to a little under $5,000,000. The budget is based on FY2016 labor and benefit costs and will be adjusted every two years.[6] Per-stop fees will rise from the current $3.67 to between $5.00 and $6.25 depending on the extent of capital improvements and the total number of stop events. The program will reconcile actual stop-events made by permittees, based on GPS data, with stop-events paid for. permittees will be charged for stop-events made in excess of those paid for, with a penalty assessed for making greater than 10 percent more stop-events than approved.

As part of the FY2017-18 two-year budget process, the SFMTA will be revisiting all of its fees. The two-year budget is currently in the process of being developed and is expected to take effect on July 1, 2016. Since the Commuter Shuttle Program will become effective on February 1, 2016, providers will be required to retroactively pay the difference for the five months between February and July 2016. The Commuter Shuttle Program budget will be updated every two years to reflect the costs of the program; the per-stop-event fee will be adjusted annually.

[6] The budget includes overhead charges.

Consideration of Alternatives

As part of the development of the Commuter Shuttle Program, the SFMTA considered a number of different regulatory approaches. Each is summarized below.

SFMTA considered prohibiting shuttles from all Muni zones and requiring them to use existing white zones, or seek new white zones for operations. This alternative was not pursued because it would require the establishment of a large network of new white zones, many of which would require removal of existing parking, and because the Pilot demonstrated that sharing Muni zones works in most instances (for example, SFMTA's Pilot Evaluation showed that fewer than three percent of shuttle stop-events resulted in blocked Muni buses).

SFMTA also considered allowing shuttles to use all Muni zones, with exception of those Muni zones identified by the SFMTA as particularly unsuitable for sharing. This alternative is very similar to conditions before the Pilot, where shuttles stopped wherever they found space, including in many Muni zones. The problems with this approach include unclear rules and increased instances where shuttles block or impede Muni, which were the motivations for the Pilot and this Commuter Shuttle Program. In addition, allowing commuter shuttles to use all Muni zones could encourage other types of private buses, including tour buses or party buses to use Muni zones for loading and unloading, which would result in increased congestion and delays of Muni service.

SFMTA also considered a hub-and-spoke network in which either (a) smaller feeder shuttles would transport passengers from residential areas to large motor coach shuttles located at designated hubs, or (b) shuttles of all sizes would be restricted to a handful of designated hubs and would have extremely limited access to the city's street network. This hub-and-spoke alternative was not pursued for several reasons. First, there are few off-street locations within the city that could accommodate dozens of buses at the same time, or hundreds of buses over the course of a few hours. Second, dozens of buses attempting to access a small number of hubs at the same time, or hundreds of buses attempting to access a small number of hubs over the course of a few hours, would lead to unacceptable negative impacts on local and citywide traffic. Third, these vast increases in the number of buses accessing a small number of hubs would create unacceptable air quality and quality-of-life concerns near the hubs. Fourth, creating any on-street hubs would require the removal of entire block faces of parking spaces. Fifth, a hub-and-spoke model would force shuttle riders to transfer once or more to get to their destinations, which likely would discourage shuttle ridership and result in an increase in individual car ownership and vehicle miles traveled. Additionally, it is likely that far fewer providers would voluntarily join the program and would instead continue to operate outside the Program, limiting the SFMTA's ability to collect data about their operations or work expeditiously with providers to resolve operational issues as well as those important to residents, businesses and other stakeholders.

Commuter Shuttle Program Benefits

Through its regulatory requirements, the Commuter Shuttle Program delivers benefits to both the city and its residents, as well as to the shuttle sector.

Benefits to the city and its residents of regulating the commuter shuttle sector through this program include:

- Increased safety for all users, including pedestrians, bicyclists, public transit riders, and private vehicle drivers as shuttles operate according to agreed-upon guidelines, including mandatory safety training;
- Reduced conflicts with Muni operations and other vehicles;
- Shifts commuters onto, and keeps commuters using, sustainable transportation modes;
- Ensures quick resolution of conflicts, using identification and shared data;
- Designates point of coordination for resolving conflicts, questions, and issues;
- Provides data to support more effective management of the roadway network for all users; and
- Provides information on shuttle activity, allowing effective communication and planning.

Benefits to the shuttle sector include:

- Ability to propose and coordinate with SFMTA on approved locations for passenger loading/unloading;
- Clarity on which stops are permissible to use and which are not, and a clear framework of enforcement and consequences for violators;
- Signage at approved zones to communicate allowed use to members of the public and enforcement;
- Upgrades of some stops to accommodate shuttle vehicles as added users;
- Ability to address issues and concerns quickly through fast communication with the city;
- Coordination with SFMTA on further improvement of transportation services and conditions; and
- Information about upcoming construction projects, street closures, and planning projects of interest that may affect shuttle services.

Need for Regulation
Well before the SFMTA began regulating commuter shuttles, shuttles were making thousands of stop-events at hundreds of locations around the city. By all accounts, a shuttle ride to the job location has become an integral part of the working conditions of thousands of workers in the Bay Area.

The alternative to the Commuter Shuttle Program is not the elimination of shuttles, but instead a return to the circumstances prior to establishment of the Pilot Program, when shuttles stopped at more than twice as many locations as they do now and SFMTA had limited resources to regulate their movements effectively. Without a network of approved stops, shuttle operators have imperfect choices to make about where to load and unload riders and as a result conflicts with pedestrians, bicyclists, Muni and traffic would increase. The SFMTA has limited enforcement resources to issue citations for parking and stopping violations. Given the importance of the shuttles to the businesses that use them, even significant increases in the number of citations likely would have been accepted by the shuttle operators as a cost of doing business. Additionally, the SFMTA would be forced to address any issues that arise on an ad hoc basis rather than in a systematic way through an established program with dedicated staff.

Furthermore, implementation of the Commuter Shuttle Program allows the city to collect shuttle operations data that not only will help target enforcement but over time will inform improvements to the Program. The Program also addresses some of the key neighborhood concerns such as restricting large buses on non-arterial streets. It also contributes to improved air quality by requiring cleaner bus engines.

Public Outreach

The SFMTA maintains an online project page for the Pilot, and members of the public can sign up for email updates about meetings, project updates, and major project developments. During the Pilot, SFMTA staff received extensive comments from the community via, among other avenues: 311 (the city's customer service center), offices of members of the Board of Supervisors, SFMTA engineering hearings, direct telephone or email contact with SFMTA staff, and communications directly from shuttle service providers.

In preparation for the release of the Commuter Shuttle Program policy, SFMTA staff met with members of the Board of Supervisors and the Mayor's office, as well as shuttle service providers and some of the companies that use those shuttle service providers to transport their employees. SFMTA staff also met with various community members who had expressed interest in or concerns about shuttle activity in their particular neighborhoods. Additionally, the SFMTA made presentations at San Francisco Environment Commission, at the San Francisco Transportation Authority Citizens' Advisory Council, and at the SFMTA Citizens' Advisory Council. Furthermore, as part of the pilot, Muni drivers were able to report shuttle issues to Central Control or via email and as part of the data collection effort, SFMTA staff solicited input from Muni drivers. As the Program moves forward, SFMTA staff administering the Program will regularly seek input from Muni operators. In addition, Muni operators will be sent a survey asking about their experiences driving around commuter shuttles, and will continue to be able to report shuttle issues to Central Control or via email. Finally, the SFMTA held an open house on the proposed Commuter Shuttle Program for the public on November 4, 2015. Members of the public also had an opportunity to share their views on the Program with the SFMTA Board of Directors on November 17, 2015.

As the Commuter Shuttle Program moves forward, it is anticipated that the stop network will evolve to address a variety of issues (e.g., service changes, shuttle ridership demand, construction, community concerns, or other operational considerations). All such changes will include a public hearing process and additional outreach.

PENDING LEGAL ACTION

Opponents of the Pilot Program appealed the City's determination under CEQA to this Board in April 2014. The Board denied the appeal. The appellants later challenged the City's decision in court, focusing on two issues: the adequacy of the City's review of the Pilot Program under CEQA and whether the California Vehicle Code prohibits the City from allowing non-Muni buses to stop in Muni zones. The trial court heard arguments on the merits of the case in November 2015, but has not issued a decision.

CONCLUSION

The Commuter Shuttle Program aims to maximize the benefits provided by commuter shuttles while minimizing their impacts on the City and its residents. Regulating this sector of our transportation system helps to address many of the concerns that have been expressed by citizens. SFMTA anticipates that the Program will be responsive to ongoing concerns from San Francisco residents and evolve in response to those concerns as well as continued information collected from the shuttle providers and the changing dynamics of the transportation sector.

Sincerely,

Edward D. Reiskin
Director of Transportation

Carroll, John (BOS)

From:	BOS Legislation, (BOS)
Sent:	Thursday, January 14, 2016 4:54 PM
To:	Rebecca Davis (rebecca@lozeaudrury.com); Wise, Viktoriya (MTA); Willson, Hank (MTA); Espiritu, Christopher (CPC); Rahaim, John (CPC); Jones, Sarah (CPC); Starr, Aaron (CPC); Rodgers, AnMarie (CPC); Sanchez, Scott (CPC); Ionin, Jonas (CPC); Givner, Jon (CAT); Warren, Elaine (CAT); Zane Gresham (zgresham@mofo.com); Miles Imwalle (mImwalle@mofo.com); David Gold (dgold@mofo.com); Dan Gershwin (DGershwin@mofo.com); Adrian Covert (acovert@bayareacouncil.org); Richard Drury (richard@lozeaudrury.com); Theresa Rettinghouse (theresa@lozeaudrury.com); Sue Vaughan (susan.e.vaughan@sonic.net); Wise, Viktoriya (MTA); Willson, Hank (MTA); Espiritu, Christopher (CPC); Rahaim, John (CPC); Jones, Sarah (CPC); Starr, Aaron (CPC); Rodgers, AnMarie (CPC); Sanchez, Scott (CPC); Ionin, Jonas (CPC); Givner, Jon (CAT); Warren, Elaine (CAT); BOS-Supervisors; BOS-Legislative Aides
Cc:	Calvillo, Angela (BOS); Somera, Alisa (BOS); Carroll, John (BOS); BOS Legislation, (BOS)
Subject:	Supplemental Appeal Letter - CEQA Exemption Determination Appeal - Proposed Commuter Shuttle Permit Program - Appeal Hearing on January 26, 2016
Categories:	151269

Good afternoon,

Please find linked below a supplemental appeal letter received by the Office of the Clerk of the Board from Rebecca L. Davis, appellant, concerning the categorical exemption determination for the proposed Commuter Shuttle Permit Program.

Appellant Letter - January 14, 2016

The appeal hearing for this matter is scheduled for a 3:00 p.m. special order before the Board on January 26, 2016.

I invite you to review the entire matter on our Legislative Research Center by following the link below:

Board of Supervisors File No. 151269

Thank you,

John Carroll
Legislative Clerk
Board of Supervisors
San Francisco City Hall, Room 244
San Francisco, CA 94102
(415)554-4445 - Direct | (415)554-5163 - Fax
john.carroll@sfgov.org | bos.legislation@sfgov.org

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Carroll, John (BOS)

From: Rebecca Davis <rebecca@lozeaudrury.com>
Sent: Thursday, January 14, 2016 10:52 AM
To: Board of Supervisors, (BOS); BOS Legislation, (BOS); Jones, Sarah (CPC)
Subject: CEQA Appeal - Commuter Shuttle Program
Attachments: 2016.01.14 BOS Comment Letter.pdf

Categories: 151269

Dear ms. Calvillo and Ms. Jones:

Pursuant to you December 23, 2015 letter, please find the attached comment letter to be made available to member of the Board of Supervisors prior to the hearing on the appeal of the proposed commuter shuttle permit program. Two hard copies are also being sent to you via overnight mail. Please let me know if you have any questions.

Sincerely,

Rebecca Davis

Rebecca L. Davis

Associate Attorney
Lozeau | Drury LLP
410 12th Street, Suite 250
Oakland, CA 94607
P: 510.836.4200
F: 510.836.4205
rebecca@lozeaudrury.com

LOZEAU DRURY LLP
T 510.836.4200
F 510.836.4205
410 12th Street, Suite 250
Oakland, Ca 94607
www.lozeaudrury.com
rebecca@lozeaudrury.com

January 14, 2016

Via Overnight Delivery and Electronic Mail

President London Breed and
Board of Supervisors of the City and County of San Francisco
c/o Ms. Angela Calvillo, Clerk of the Board
1 Dr. Carlton B. Goodlett Place
City Hall, Room 244
San Francisco, CA 94102-4689
Email: Board.of.Supervisors@sfgov.org
Bos.legislation@sfgov.org

Re: Appeal of SFMTA Resolution No. 15-161, CEQA Categorical Exemption Determinations for Commuter Shuttle Permit Program

Dear President Breed and Honorable Members of the Board of Supervisors:

I am writing on behalf of the Coalition for Fair, Legal and Environmental Transit ("Coalition"), Service Employees International Union Local Union 1021 ("SEIU 1021"), Sue Vaughan, and Robert Planthold (collectively, "Appellants") concerning the San Francisco Municipal Transportation Agency ("SFMTA") Commuter Shuttle Permit Program and recent amendments to Transportation Code, Division II, to establish a Commuter Shuttle Permit Program to authorize certain shuttle buses to stop in designated Muni stops and passenger loading zones for the purpose of loading or unloading passengers, and establish permit conditions for such permits ("Project" or "Shuttle Project").

Appellants urge the Board to require review of the Shuttle Project under the California Environmental Quality Act ("CEQA"). CEQA review would allow the City to analyze the Project's impacts on traffic, pedestrian and bicyclist safety, public transportation, and air quality, and to consider feasible mitigation measures and alternatives. Feasible mitigation measures and alternatives could include, for example, consideration of alternate stop locations that would reduce interference with MUNI, traffic, pedestrians, and bicyclists, more environmentally friendly buses, and other mitigations. Because the City decided to exempt the Shuttle Project entirely from CEQA review, none of this analysis occurred.

In addition, as discussed below, the Shuttle Project conflicts with the California Vehicle Code, which prohibits private shuttle buses from stopping in Muni zones. As a result, the Project is preempted by State law.

For these reasons, Appellants ask the Board of Supervisors to overturn the adoption of the Shuttle Project and the finding that the Project is exempt from CEQA.

I. THE CITY ABUSED ITS DISCRETION BY FINDING THE SHUTTLE PROJECT EXEMPT IS FROM CEQA.

A. Legal Background

CEQA mandates that "the long-term protection of the environment . . . shall be the guiding criterion in public decisions" throughout California. Pub. Res. Code ("PRC") § 21001(d). The foremost principle under CEQA is that it is to be "interpreted in such a manner as to afford the fullest possible protection to the environment within the reasonable scope of the statutory language." *Citizens of Goleta Valley v. Bd. of Sups.* (1990) 52 Cal.3d 553, 563-64. An agency's action violates CEQA if it "thwarts the statutory goals" of "informed decisionmaking" and "informed public participation." *Kings Co. Farm Bur. v. City of Hanford* (1990) 221 Cal.App.3d 692, 712.

To achieve its objectives of environmental protection, CEQA has a three-tiered structure. 14 CCR § 15002(k); *Comm. to Save Hollywoodland v. City of Los Angeles* (2008) 161 Cal.App.4th 1168, 1185-86. First, if a project falls into an exempt category, no further agency evaluation is required. *Id.* Second, if there is a possibility the project will have a significant effect on the environment, the agency must perform a threshold initial study. *Id.*; 14 CCR § 15063(a). If the study indicates that there is no substantial evidence that the project may cause a significant effect on the environment, the agency may issue a negative declaration. *Id.*, 14 CCR §§ 15063(b)(2), 15070. Finally, if the project will have a significant effect on the environment, an environmental impact report ("EIR") is required. *Id.* Here, since the City exempted the Project from CEQA, we are at the first step of the CEQA process, where the standard is extremely low.

1. Categorical Exemptions

CEQA identifies certain classes of projects that are exempt from the provisions of CEQA. These are called categorical exemptions. PRC § 21084(a); 14 CCR §§ 15300, 15354. Categorical exemptions are certain classes of activities that generally do not have a significant effect on the environment. *Id.* Public agencies utilizing such exemptions must support their determination with substantial evidence. PRC § 21168.5.

CEQA exemptions must be narrowly construed, and "[e]xemption categories are not to be expanded beyond the reasonable scope of their statutory language." *Mountain Lion Found. v. Fish & Game Comm'n* (1997) 16 Cal.4th 105, 125; *McQueen v. Bd. of Dirs.* (1988) 202 Cal. App. 3d 1136, 1148. Strict construction is required in order to interpret categorical exemptions in a manner that affords the greatest environmental protection within the reasonable scope of their statutory language. *County of Amador v. El Dorado County Water Agency* (1999) 76 Cal.App.4th 931, 966. "Since a determination that a project falls within a categorical exemption excuses any further compliance with CEQA whatsoever, we must construe the exemptions narrowly in order to afford the fullest possible environmental protection." *Save Our Carmel*

River v. Monterey Peninsula Water Management Dist. (2006) 141 Cal.App.4th 677, 697. Exemptions "should not be so broadly interpreted so to include a class of [projects] that will not normally satisfy the statutory requirements for a categorical exemption, even if the premises on which such [projects] are conducted might otherwise come within [the exemption]." *Azusa Land Reclamation Co. v. Main San Gabriel Basin Watermaster* (1997) 52 Cal.App.4th 1165, 1192-1193.

2. The Significant Effect Exception to Categorical Exemptions

CEQA contains several exceptions to categorical exemptions. 14 CCR § 15300.2. If an exception applies, the exemption cannot be used, and the agency must instead prepare an initial study and CEQA document. *McQueen*, 202 Cal. App. 3d at 1149; *Hollywoodland*, 161 Cal. App. 4th at 1187. "Even if a project falls within the description of one of the exempt classes, it may nonetheless have a significant effect on the environment based on factors such as location, cumulative impact, or unusual circumstances." *Save Our Carmel River v. Monterey Peninsula Water Mgmt. Dist.* (2006) 141 Cal. App. 4th 677, 689. One such exception, referred to as the "significant effect exception" states that "a categorical exemption shall not be used for an activity where there is a reasonable possibility that the activity will have a significant effect on the environment due to unusual circumstances." 14 CCR 15300.2.

The California Supreme Court recently established two ways a party may invoke the unusual circumstances exception in the case *Berkeley Hillside Preservation v. City of Berkeley* (2015) 60 Cal.4th 1086, 1105 ("*Berkeley Hillside*"). First, "a party may establish an unusual circumstance with evidence that the project *will* have a significant environmental effect. That evidence, if convincing, necessarily also establishes 'a reasonable possibility that the activity will have a significant effect on the environment due to unusual circumstances.'" *Berkeley Hillside*, 60 Cal.4th 1086, 1105 (emph. added). Alternatively, "[a] party invoking the exception may establish an unusual circumstance without evidence of an environmental effect, by showing that the project has some feature that distinguishes it from others in the exempt class, such as its size or location. In such a case, to render the exception applicable, the party need only show a reasonable possibility of a significant effect due to that unusual circumstance." *Id.*

B. The Shuttle Project is Beyond the Scope of the Class 8 Exemption.

The City applies two categorical exemptions to the Project. First, the City attempts to exempt the "minor modifications to the existing arterials to install new commuter shuttle stops, as well as the installation of minor improvements such as signage, traffic islands and bus bulbs" from CEQA as a Class 1 "minor alteration" activity.[1] Second, the City attempts to exempt the

[1] The Class 1 exemption:

> [C]onsists of the operation, repair, maintenance, permitting, leasing, licensing, or minor alteration of existing public or private structures, facilities, mechanical equipment, or topographical features, involving negligible or no expansion of use beyond that existing at the time of the lead agency's determination.

remainder of the Shuttle Project under CEQA's Class 8 categorical exemption for "Actions by Regulatory Agencies for the Protection of the Environment." 14 CCR § 15308. While Appellants do not take issue with application of the Class 1 exemption to a limited portion of the Project such as addition of signs to bus stops, the remainder of the Shuttle Project requires an environmental analysis under CEQA because it goes beyond the scope of the Class 8 exemption, and therefore an environmental analysis must be conducted under CEQA.

The Class 8 exemption "consists of actions taken by regulatory agencies, as authorized by state or local ordinance, to ***assure*** the maintenance, restoration, enhancement, or protection of the environment where the regulatory process involves procedures for protection of the environment. Construction activities and relaxation of standards allowing environmental degradation are not included in this exemption." 14 CCR § 15308 (emph. added). The Class 8 exemption is inapplicable to the Shuttle Project.

When a project may have significant environmental impacts that are both favorable and unfavorable, the project cannot be exempt under Class 8. *Paulek v. Western Riverside County Regional Conservation Authority* (2015) 237 Cal.App.4th 1005, 1030; *Cal. Unions for Reliable Energy v. Mojave Desert Air Quality Mgmt. Dist.* (2009) 178 Cal.App.4th 1225, 1240; *Wildlife Alive v. Chickering* (1976) 18 Cal.3d 190, 206. "[Even a] new regulation that strengthens some environmental requirements may not be entitled to an exemption if the new requirements could result in other potentially significant effects." *Cal. Unions for Reliable Energy v. Mojave Desert Air Quality Mgmt. Dist.* (2009) 178 Cal.App.4th 1225, 1240 (quoting 2 Kostka & Zischke, Practice Under the Cal. Environmental Quality Act, § 20.43, p. 981). As the California Supreme Court explains:

> When the impact may be either adverse or beneficial, it is particularly appropriate to apply CEQA which is carefully conceived for the purpose of increasing the likelihood that the environmental effects will be beneficial rather than adverse.

Wildlife Alive v. Chickering (1976) 18 Cal.3d 190, 206.

The Class 8 exemption is inapplicable to the Shuttle Project for three reasons: 1) the Shuttle Project will not *assure* protection of the environment; 2) the Project has significant adverse environmental impacts that preclude reliance on the Class 8 exemption; and 3) the project relaxes standards set in the State Vehicle Code which will result in environmental degradation including impacts to local air quality, and pedestrian and bicycle safety.

1. The Shuttle Program Fails to Assure Protection of the Environment.

First, the Class 8 exemption is inapplicable because the Shuttle Project does not ***assure*** protection of the environment. In its CEQA Exemption Report, the Planning Department

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14 CCR § 15301.

determined that the Class 8 exemption was applicable because the Shuttle Project "provides procedures ***intended to*** facilitate operation of commuter shuttles, ***enable*** vehicle trip reduction, and ***minimize*** impacts to users or other transportation modes in San Francisco." SFPD, p. 24. The Planning Department further explained that, "[a]s such, [the Shuttle Project] constitutes actions by SFMTA ***meant to*** enhance and protect the environment involving regulatory procedures for shuttle activity." *Id.* As this language makes clear, the Shuttle Project in no way ***assures*** the maintenance, restoration, enhancement, or protection of the environment. As the below discussion makes clear, despite the City's lofty intentions, the Shuttle Project will have environmental impacts.

We know that the Pilot Program had these same goals, but that the Pilot fell far short of meeting them. For example, one of the goals of the Pilot Program was to manage the movement of commuter shuttles by providing shuttle operators with clear guidelines on where and when to stop at curbs. To achieve this goal, the City included various permit conditions, such as requiring shuttles to pull all the way in to shuttle stops, and not double parking. The Shuttle Project has these same permit conditions. During the Pilot Program, between August 2014 and May 2015, SFMTA enforcement officers issued 1200 citations to shuttle buses. Evaluation, p. 26. The most common citation issued was for double-parking and non-permitted use of a Muni zone, both of which were prohibited under the Pilot. *Id.* In October 2014 alone, more than 90 citations were issued for commuter shuttles double-parking in Muni zones. *Id.* at 27. The idea that commuter shuttles will now comply with all permit conditions under the Shuttle Project, when they clearly did not under the Pilot Program, is not supported by evidence. More importantly, the permit conditions alone cannot be said to ***assure*** that commuter shuttles will comply with permit terms.

2. The Shuttle Project Will Have Significant Adverse Environmental Impacts on Pedestrians, Bicycle Safety and Air Quality.

Second, the City may not rely on the Class 8 exemption because, as discussed below, the Shuttle Project will have significant adverse environmental impacts on pedestrian and bicyclist safety and air quality. In finding the Project exempt under Class 8, the City is essentially ignoring all of these significant negative environmental impacts based on the Project's potentially positive impact on reduction of vehicle miles traveled. The City does not get to choose which environmental impact to protect, and then ignore all others. Under the Planning Commission's reasoning, one could exempt any project, regardless of its impacts, as long as it had some environmentally beneficial aspect. CEQA does not allow for this. Despite the Shuttle Project's potential to reduce vehicle miles traveled, the City must conduct CEQA analysis of these Shuttle Project's significant adverse environmental impacts.

3. The Shuttle Project Relaxes Standards Set Forth in the State Vehicle Code, and as a Result, Causes Significant Adverse Impacts to Pedestrians, Bicycle Safety and Public Transit.

As discussed below, the Shuttle Project violates the State Vehicle Code. The Vehicle Code prohibits private vehicles from stopping on red curb zones marked for public buses. The

Shuttle Project expressly allows this violation of state law. As such the Shuttle Project relaxes state standards. As a result, the Shuttle Project causes adverse impacts to pedestrian safety, bicycle safety and public transit.

C. The Class 8 Exemption is Inapplicable Because the Shuttle Project will have Significant Environmental Impacts due to Unusual Circumstances.

Even if the Shuttle Project did fit within the scope of the Class 1 and Class 8 exemptions, which it does not, the exemptions would still be inapplicable because of the significant effect exception. *See* 14 Cal. Code Regs. § 15300.2(c). The Shuttle Project does not present the same general risk of environmental impacts as other projects falling under the Class 1 and Class 8 exemptions, and therefore the exemptions are inapplicable.

1. The Shuttle Project will have a significant environmental impact, thereby establishing an unusual circumstance.

Under *Berkeley Hillside*, evidence that a project *will* have a significant environmental effect "does tend to prove that some circumstance of the project is unusual." *Berkeley Hillside*, 60 Cal.4th at 1105. Here, there is substantial evidence that the Shuttle Project will – and is – having a significant environmental impact, thereby necessarily establishing an unusual circumstance.

i. The Shuttle Project *will have* a significant impact on bicycle safety.

The City has created a list of eight "transportation significance criteria," which act as thresholds of significance to determine if a project's environmental impact is significant under CEQA. The fourth transportation significance criteria states:

> The project would have a significant effect on the environment if it would create potentially hazardous conditions for bicyclists or otherwise substantially interfere with bicycle accessibility to the site and adjoining areas.

San Francisco Planning Department, Transportation Significance Criteria (June 2, 2013).

Traffic Engineer Tom Brohard, P.E., prepared a detailed analysis of the Shuttle Project and concluded that it will have a significant adverse impact because it creates potentially hazardous conditions for bicyclists. Exhibit A, Brohard Comment, p. 4. According to Mr. Brohard, "[s]huttle buses blocking bicycle lanes would cause bicyclists to sharply veer into vehicle travel lanes to avoid the shuttle bus at the stop, creating a potentially hazardous condition." *Id.*

The Exemption Report attempts to couch the impacts of commuter shuttles on bicyclists as "infrequent," yet the Evaluation says that ***on average, shuttles block travel and bike lanes approximately 35% of the time that they stop.*** Evaluation, p. 25. Indeed, during the pilot, at four of the 20 zones studied by SFMTA, ***commuter shuttles blocked travel or bike lanes more***

than 90% of the times they stopped.[2] Evaluation, p. 24. Even more telling, at all four stops where shuttles blocked traffic and bike lanes more than 90% of the time, the frequency of conflicts increased dramatically from pre-pilot to pilot. For example, pre-pilot, commuter shuttles blocked traffic and bike lanes 18% of the time they stopped at 16th & Mission/South Van Ness, but during the pilot, they blocked traffic and bike lanes 94% of the times they stopped. Evaluation, p. 24. These conflicts can hardly be said to be "infrequent."

In addition, "[a]t five of the eight shuttle-only zones, blocked travel and bike lanes as a percentage of shuttle stop-events increased from pre-pilot to during-pilot, sometimes substantially." Evaluation, p. 27.

The Exemption Report concludes, without any supporting evidence, that "[b]ecause of their infrequency, and the Program's ability to address any potential conflicts through modification of the shuttle stop length or location, the proposed Program would not be expected to result in a significant impact related to bicycles." Exemption Report, p. 15. In other words, since the City says the conflicts are infrequent (without any supporting evidence), and since any impacts can be mitigated (which, as discussed below, cannot be considered at the exemption stage of CEQA), there is no significant impact. CEQA does not allow this kind of circular and conclusory analysis.

Since expert evidence, and the City's own reports, establishes that the Shuttle Project will create potentially hazardous conditions for bicyclists, the CEQA exemption is improper. *See*, *Berkeley Hillside Preservation v. City of Berkeley* (2015) 60 Cal.4th 1086, 1105. CEQA review is required to analyze the Project's bicycle safety impacts and to implement feasible mitigation measures.

ii. The Shuttle Project *will have* a significant impact on pedestrian safety.

The Shuttle Project will also have significant impacts on pedestrian safety. The City's third "transportation significance criteria," states:

> The project would have a significant effect on the environment if it would result in substantial overcrowding on public sidewalks, ***create potentially hazardous conditions for pedestrians***, or otherwise interfere with pedestrian accessibility to the site and adjoining areas.

San Francisco Planning Department, Transportation Significance Criteria (June 2, 2013) (emph. added). Commuter shuttles create potentially hazardous conditions for pedestrians, and therefore CEQA review is required.

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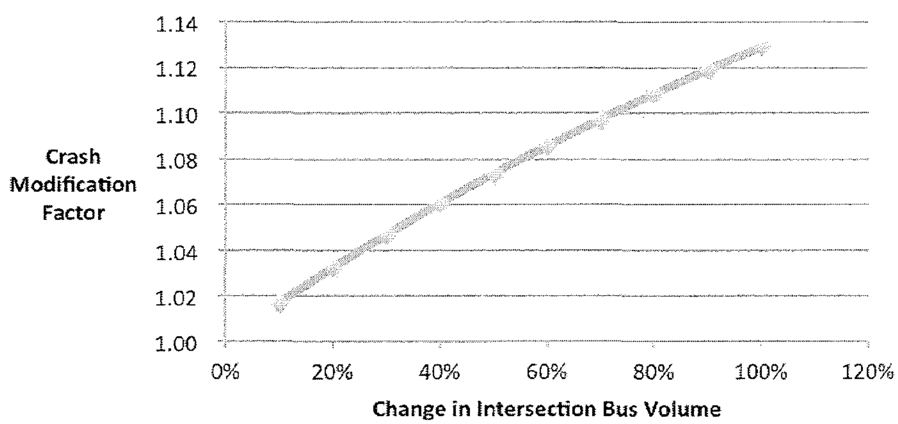
[2] Indeed, the Evaluation states that commuter shuttles blocked travel or bike lanes 105% of the time at Valencia and 24th, explaining that the "zone blocked travel in excess of 100% because two shuttles managed to block both the bike lane and travel lane at the same time." Evaluation, p. 26 fn. 10.

The City has a "Vision Zero SF" goal to reduce to zero the number of traffic-related deaths in San Francisco by 2024.[3] Every year, approximately 30 people lose their lives and more than 200 others are seriously injured while traveling on San Francisco streets.[4] Seventy-one percent of traffic fatalities in 2013 and 2014 were bicyclists and pedestrians.[5] As part of Vision Zero SF, the City identified corridors for targeted safety measures because they encompass 6% of streets, but account for over 60% of serious and fatal injuries. Many of these corridors correspond to those zones used by commuter shuttles. In addition, according to the Vision Zero SF website, large vehicles, such as commuter shuttles, account for four percent of collisions with people walking and bicycling but 17 percent of the fatalities form those collisions.[6]

In 2013 the San Francisco Department of Public Health conducted a detailed study of injuries at signalized intersections in San Francisco.[7] As part of the study, the Department of Public Health created a Pedestrian Injury Model which evaluated the impact of bus volume on intersection level pedestrian injury. The study estimated that an increase in bus volumes of approximately 50% resulted in an increased injury frequency of about 7%. See Figure 1. The effect of bus volumes was independent of traffic volume and the proximity of bus stops.

Figure 1. Pedestrian Injury Collision Frequency as a Function of Bus Volumes at Signalized Intersections in San Francsico (Source: SF Department of Public Health, 2013)



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[3] http://visionzerosf.org/about/two-year-action-strategy/

[4] http://visionzerosf.org/about/how-are-we-doing/

[5] Vision Zero San Francisco, Two-Year Action Strategy, Eliminating Traffic Deaths by 2024, p. 5 (Feb. 2015), *available at* http://www.joomag.com/magazine/vision-zero-san-francisco/0685197001423594455?short.

[6] http://visionzerosf.org/vision-zero-in-action/educating-the-public/

[7] San Francisco Dept. of Health. Modeling Vehicle-Pedestrian Injury collisions at Signalized Intersections: A Health Forecasting Approach to Informing Pro-active Pedestrian Safety Improvements, Fall 2013.

The City assumes that under the Shuttle Project, the number of shuttles will increase by 41% from pre-pilot levels, but the Project itself allows for an unlimited increase in the number of shuttles. Based on the City's own study, this increase in bus volume will create potentially hazardous conditions for pedestrians. A CEQA review is required to study and mitigate this significant environmental impact.

According to the Exemption Report, pedestrian safety impacts from commuter shuttles "were one of the primary reasons that the Commuter Shuttle Program, upon implementation, would include identifying shuttle zones that may be moved from the near side of the intersection to the far side of the intersection." Exemption Report, p. 15. But without a CEQA analysis, nothing in the Shuttle Project ***requires*** the City to identify or move any shuttle zones to protect pedestrians. Under CEQA, the City would be required to implement all feasible mitigation measures, such as moving the location of shuttle zones to protect pedestrians.

2. The Shuttle Project presents an unusual circumstance that may result in significant air quality impacts.

When a project has some feature that distinguishes it from others in the exempt class, to render the significant effect exception applicable, one need only show a reasonable possibility of a significant effect due to that unusual circumstance." *Berkeley Hillside*, 60 Cal.4th 1086, 1105 Even if Petitioners had not presented evidence that the Shuttle Project *will* have significant environmental impacts, the unusual circumstances exception would still apply because four characteristics of the Shuttle Project distinguish it from other projects in the exempt class, and these characteristics create environmental risks not generally present for Class 8 projects.

i. The Shuttle Project is unusual compared to other Class 8 projects.

The Shuttle Project is unusual compared to other Class 8 projects for three reasons. First, the Shuttle Project is unusual because it is illegal. The Shuttle Project presents an unusual circumstance because actions taken to assure the maintenance, restoration, enhancement or protection of the environment do not normally authorize activity that is illegal under state law. There are no other Class 8 projects that authorize illegal activity. The court in *Azusa* held that the fact that a project violated state law was an unusual circumstance. *Azusa*, 52 Cal.App.4th at 1208-09 (violation of state water code was unusual circumstance).

Second, the large scale, and ability for unlimited growth allowed under the Shuttle Project are unusual circumstances that differ from other Class 8 projects. The Shuttle Project does not limit the number of commuter shuttles that may apply for and receive permits to operate commuter shuttles in the City, and there is no limit on the number of shuttle stops that the City may approve at Muni zones around the City. Since the Pilot Project began, daily commuter shuttle stop-events have increased nearly 30%. The City predicts that the Shuttle Project will continue to increase in scale, with stop events increasing by an additional 29% and the number of shuttles increasing by an estimated 41%. But the Project puts no limit on its growth, allowing for an unlimited number of additional shuttles, additional stop locations, and additional stop-events per day. Each new commuter shuttle and each new commuter stop creates new risks and health hazards, and increases the Project's environmental impacts.

Finally, the Shuttle Project also presents an unusual circumstance because actions for the protection of the environment do not ordinarily cause impacts to human health,[8] but the Shuttle Project does. The Shuttle Project creates increased hazards for pedestrians and bicyclists, and increases the cancer risk of those people living near shuttle stops.

ii. There is a reasonable possibility that the Shuttle Project will have a significant air quality impact due to unusual circumstances.

The expert analysis conducted by Soil, Water, Air Protection Enterprise ("SWAPE"), attached hereto as Exhibit B, indicates that the City's air quality analysis is flawed, and that the Shuttle Project's diesel engine exhaust will likely have a significant local air quality impact, causing increased cancer rates above the threshold of significance.

According to SWAPE, the air quality assessment fails to adequately evaluate the Project's health risk impacts for a number of reasons. First, the analysis fails to account for the 41% growth in participating shuttles that is anticipated by the City under the Shuttle Project. SWAPE Comment, p. 2. Second, the analysis failed to account for the increased stop-events that will occur because of the requirement that limits permitted shuttles longer than 35 feet to arterial streets. *Id.* at 3. Finally, the analysis is flawed because there is no evidence that supports the City's estimate that the Project growth will be limited to 41%, when the Project allows for unlimited growth in shuttles, stop locations, and stop-events. The diesel emissions from commuter shuttles "will most likely be much higher than anticipated and result in an increased health risk, potentially above the level of significance." *Id.* at 2. This potentially significant impact must be fully evaluated and mitigated under CEQA.

D. The City Improperly Relied on Mitigation Measures in Finding the Shuttle Project Exempt.

In finding the Shuttle Project exempt, the City improperly relied on mitigation measures.[9] The City's conclusion that the Project will not result in adverse impacts is founded on dozens of

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[8] Impacts to human health are significant under CEQA. CEQA § 21083(b)(3) provides that a project has significant impacts if it "will cause substantial adverse effects on human beings, either directly or indirectly."

[9] Under the CEQA Guidelines, "mitigation" includes: "(a) Avoiding the impact altogether by not taking a certain action or parts of an action. [¶] (b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation. [¶] (c) Rectifying the impact by repairing, rehabilitating, or restoring the impacted environment. [¶] (d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action. [¶] (e) Compensating for the impact by replacing or providing substitute resources or environments." CEQA Guidelines, § 15370.

conditions that have been applied to mitigate and reduce the possibility of adverse environmental impacts.

In deciding whether or not a categorical exemption may apply, an agency many not rely on mitigation measures as a basis for determining that a project is categorically exempt or that one of the significant effects exceptions does not apply. *Salmon Protection & Watershed Network v. County of Marin* (2004) 125 Cal.App.4th 1098, 1102 ("*SPAWN*"); *Azusa Land Reclamation Co. v. Main San Gabriel Basin Watermaster* (1997) 52 Cal.App.4th 1165, 1200. If mitigation measures are needed to avoid significant impacts, then at a minimum a mitigated negative declaration must be prepared. An agency must decide whether a project is eligible for a categorical exemption as part of its preliminary review of the project, not in the second phase when mitigation measures are evaluated. *Azusa*, 52 Cal.App.4th at 1198-1200. If a project will have a significant effect on the environment, CEQA review must occur, and only then are mitigation measures relevant. *SPAWN,* 125 Cal.App.4th at 1102; *Berkeley Hillside*, 60 Cal.4th at 1105.

The court in *S.P.A.W.N.* and *Azusa* both held that an agency cannot evade the procedural and informational requirements for a mitigated negative declaration of an EIR by imposing mitigation measures to make a project fit within a categorical exemption. Instead, if there is a reasonable possibility that the project does not fit within the exemption or will have a significant impact without the mitigation measures, an agency cannot rely on a categorical exemption. *S.P.A.W.N.*, 125 Cal.App.4th at 1107; *Azusa*, 52 Cal.App.4th at 1199-1200.

In *S.P.A.W.N*, an agency found that the proposed construction of a home was categorically exempt under CEQA based on an exemption for single-family homes, despite the fact that the home was adjacent to a protected anadromous fish stream of "critical concern." *S.P.A.W.N.*, 125 Cal.App.4th at 1106. In finding the exemption applicable, the agency relied on proposed mitigation measures including drainage features for erosion and sediment control. *Id.* at 1106-07. The court set aside the exemption stating:

> Reliance upon mitigation measures (whether included in the application or later adopted) involves an evaluative process of assessing those mitigation measures and weighing them against potential environmental impacts, and that process must be conducted under established CEQA standards and procedures for EIRs [(environmental impact reports)] or negative declarations.

Id. at 1108. The court further stated:

> [T]here are sound reasons for precluding reliance upon mitigation measures at the preliminary stage of determining eligibility for a categorical exemption. Regulatory guidelines dealing with the environmental review process under CEQA 'contain elaborate standards – as well as significant procedural requirements – for determining whether proposed mitigation will adequately protect the environment and hence make an EIR unnecessary; in sharp contrast, the Guidelines governing preliminary review do not contain any requirements that expressly deal with the evaluation of mitigation measures.'

> [Citation.] An agency should not be permitted to evade standards governing the preparation of a mitigated negative declaration 'by evaluating proposed mitigation measures in connection with the significant effect exception to a categorical exception.' [Citation.]"

Id.

Here, the City has included dozens of mitigation measures as part of the Project, but has done so outside of the CEQA framework for determining if those mitigation measures will adequately protect the environment.

Throughout the entire CEQA exemption analysis, the City relies on numerous mitigation measures, specifically meant to mitigate the environmental impacts of the Shuttle Project, as bases for finding the Project exempt, and for finding that it will not have a significant impact.

For example, the SFMTA supports its Class 8 exemption finding by citing as "features that will enhance and protect the environment" the "fleet turnover requirements, restrictions on stopping outside of major and minor arterial streets, idling limits, and minor roadway modifications that will improve vehicular, bicycle, and pedestrian safety, decrease conflicts between commuter shuttles and other transportation modes, and improve regional traffic congestion and air emissions." SFMTA Resolution 15-161, Attachment A, California Environmental Quality Act Findings, pp. 1-2. Each of these measures fall squarely within the definition of "mitigation" because they are specifically designed to minimize the Shuttle Project's impact on air quality, pedestrian and bicyclist safety, traffic, and public transportation.

In addition, the following are examples of mitigation measures that were improperly included as part of the project, rather than as mitigation measures:

- Requiring vehicles longer than 35 feet to limit travel to major and minor arterial streets.
- Restrictions on the bus model year and emissions requirements.
- Expansion of sidewalk area for passengers waiting to board Muni vehicles or commuter shuttles.
- Safety improvements to the existing right-of way to "improve the stop network for both commuter shuttles and users of other modes including: boarding islands, pedestrian bulbs, and bus bulbs.
- Increased enforcement and monitoring at shuttle zones which higher number of cases where commuter shuttles blocked Muni vehicles.
- Identification of specific locations and pursue improvements to better manage the movement of vehicles, transit, bicycles, and pedestrians.

Exemption Report, pp. 5-6, 8, 16.

By including these unvetted mitigation measures as part of the Shuttle Project, the City has attempted to conduct "an 'end run' around the governing standards." *Azuza*, 52 Cal.App.4th at 1201. This shortcutting of CEQA requirements subverts the purposes of CEQA by omitting material necessary to informed decision making and informed public participation. It precludes both identification of potential environmental consequences arising from the project and also thoughtful analysis of the sufficiency of measures to mitigate those consequences. The City cannot use a notice of exemption for a project which includes mitigation measures to substitute for an EIR or mitigated negative declaration. The City violated CEQA by relying on mitigation measures in finding the Shuttle Project to be exempt.

E. The Illegal Operation of Commuter Shuttles Cannot Form a CEQA Baseline.

It is not proper to include an activity that violates state law in the baseline, yet the City improperly uses the pre-pilot, illegal shuttle operations as the CEQA baseline. Every CEQA document must start from a "baseline" assumption. The CEQA "baseline" is the set of environmental conditions against which to compare a project's anticipated impacts. *Cmtys. for a Better Env't v. So Coast Air Qual. Mgmt. Dist.* (2010) 48 Cal. 4th 310, 321. Section 15125(a) of the CEQA Guidelines states in pertinent part that a lead agency's environmental review under CEQA:

> "...must include a description of the physical environmental conditions in the vicinity of the project, as they exist at the time [environmental analysis] is commenced, from both a local and regional perspective. This environmental setting will normally constitute the baseline physical conditions by which a Lead Agency determines whether an impact is significant."

Using a skewed baseline "mislead(s) the public" and "draws a red herring across the path of public input." *San Joaquin Raptor Rescue Center v. County of Merced* (2007) 149 Cal.App.4th 645, 656; *Woodward Park Homeowners v. City of Fresno* (2007) 150 Cal.App.4th 683, 708-711.

The San Francisco Superior Court has held that illegal operations resulting from a failure to enforce the law cannot form the CEQA baseline. The court found that:

> "When a lead agency issues an EIR, it cannot include activities allowed by the agency's complete non-enforcement into the baseline . . . .
>
> "Neither the Guidelines nor case law allows an EIR to set an illusory no-enforcement baseline that absorbs all ongoing illegal actions and ignores the stricter limitations imposed by a new statutory landscape. Although generally the baseline must include the effects of prior illegal activity, the situation is different when an agency has a concurrent, present responsibility to remedy that prior illegality."

Klamath Riverkeeper v. Cal. Dept. of Fish & Game, San Francisco Superior Court No. CPF-09-509915 (Apr. 20, 2011, Goldsmith, J.)

An agency may not fail to enforce the law, and then use that lack of enforcement to form the CEQA baseline. *Id.* Since the pre-pilot shuttle operations involved illegal "pirate shuttles" which violate state law, the pre-pilot shuttle operations cannot form the CEQA baseline. *League to Save Lake Tahoe v. Tahoe Reg. Planning Agency* (E.D. Cal. 2010) 739 F. Supp. 2d 1260.

II. THE STATE VEHICLE CODE PREEMPTS THE SHUTTLE PROJECT.

As was the case with the commuter shuttle pilot program, the California Vehicle Code preempts the Shuttle Project, rendering it illegal. California Vehicle Code § 22500(e) provides that:

> No person shall stop, park, or leave standing any vehicle whether attended or unattended, except when necessary to avoid conflict with other traffic or in compliance with the directions of a peace officer or official traffic control device, in any of the following places:
>
> . . .
>
> (i) Except as provided under Section 22500.5,[10] alongside curb space authorized for the loading and unloading of passengers of a bus engaged as a common carrier[11] in local transportation when indicated by a sign or red paint on the curb erected or painted by local authorities pursuant to an ordinance.

In direct conflict with the State Vehicle Code's prohibition against private buses stopping in public "red-curb" bus stops, the Shuttle Project expressly ***allows*** the same action.[12] The Shuttle Project provides that a shuttle bus bearing a valid permit placard is allowed to stop at any stop designated under the program, including designated red curbs. Transportation Code Sec. 914(h)(2).

Moreover, California Vehicle Code § 42001.5 imposes a minimum $250.00 fine on any person convicted of violating Vehicle Code § 22500. Vehicle Code § 42001.5(b) provides that the fine cannot be suspended, except that the court can waive anything above $100.00, meaning the minimum fine allowed under state law is $100.00. In contrast, the Shuttle Project allows private shuttle operators to stop in public bus stops if they make a payment of a few dollars, an action that is in direct conflict with California law. Transportation Code Sec. 902.

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[10] Vehicle Code § 22500.5 refers to school buses owned by or operated for a public school district.

[11] Section 211 of the Cal. Public Utilities Code defines "common carriers" as entities that provide transportation to the public for compensation, and the City acknowledges that this does not include the private commuter shuttle buses at issue in this action. AR272.

[12] A statutory exception to this general rule exists, allowing vehicles to stop at each place listed in section 22500 if done "when necessary to avoid conflict with other traffic or in compliance with the direction of a peace officer or official traffic control device."[12] Vehicle Code § 22500. None of these exceptions apply here.

The California Supreme Court has held that cities (including charter cities) may not enact ordinances that conflict with the State Vehicle Code, because the Vehicle Code expressly preempts local regulation. *O'Connell v. City of Stockton* (2007) 41 Cal.4th 1061, 1074. The Supreme Court noted that Vehicle Code section 21 states: "Except as otherwise expressly provided, the provisions of this code are applicable and uniform throughout the State and in all counties and municipalities therein, and no local authority shall enact or enforce any ordinance on the matters covered by this code unless expressly authorized herein." Since the Commuter Shuttle Project expressly allows private buses to stop in public bus stops, and since this action is expressly prohibited by State law, the City policy is preempted by state law and is unlawful.

III. CONCLUSION

Appellants expressly reserve the right to submit additional written and oral comments, and additional evidence in support of this Appeal to the City and Board of Supervisors up to and including at the final hearing on this Appeal and any and all subsequent permitting proceedings or approvals undertaken by the City or any other permitting agency for the Project. Pub. Res. Code § 21177(a); *Bakersfield Citizens for Local Control v. Bakersfield* (2004) 124 Cal.App.4th 1184, 1199-1203.

Thank you for your consideration of this Appeal. Please include this letter in the Administrative Record for the Commuter Shuttle Project.

Sincerely,

Rebecca L. Davis
Richard T. Drury
Lozeau Drury LLP

Enclosures

CC: Environmental Review Officer
(pursuant to SF Administrative Code § 31.16(b)(1))

EXHIBIT A

Tom Brohard and Associates

January 13, 2016

Mr. Richard Drury, Attorney at Law
Lozeau Drury LLP
410 12th Street, Suite 250
Oakland, CA 94607

SUBJECT: Commuter Shuttle Program - Exemption from CEQA Review

Dear Mr. Drury:

I, Tom Brohard, P.E., previously reviewed the San Francisco Municipal Transportation Agency (SFMTA) Board of Directors Resolution No. 14-023 which proposed an 18 month pilot, permit program for private commuter shuttle busses as well as other background materials. My March 29, 2014 letter (enclosed) summarized several traffic issues and concerns regarding the Pilot Program.

As requested, I have reviewed the Permanent Commuter Shuttle Program, the October 2, 2015 Evaluation Report (Evaluation) for the Commuter Shuttle Pilot Program as well as the October 22, 2015 San Francisco Planning Department's "Certificate of Determination - Exemption from Environmental Review". The data collected encompasses only the first 12 of the 18 months in the Pilot Program. During the data collection, several traffic impacts and issues have been identified but they have not been studied or addressed. Further study must be made to identify, analyze, evaluate, and mitigate various traffic issues and impacts before the Commuter Shuttle Program is finalized.

Traffic Issues and Concerns

Based on my review, the SFMTA's Commuter Shuttle Program must be modified to address the following traffic issues and environmental impacts as follows:

1) Data Is Incomplete – The 18 month Pilot Program was approved in August 2014 and was scheduled to run through January 2016. According to Page 5 of the Evaluation, one of the primary objectives of the Pilot Program was to "Gather data regarding shuttle activity in the City." Before the Pilot Program, SFMTA did not understand the scope of the problems and issues associated with commuter shuttles. During the time covered by the Evaluation, changes have been made in the Program such as relocation of a few commuter shuttle bus stops from near-side to far-side as well as from local streets to arterial streets. Most of the collected data covers 12 months from August 2014 through July 2015 rather than the entire 18 months planned for the Pilot Program. Some comparisons in the Evaluation cover different time periods, perhaps to cast the numbers in a better light.

81905 Mountain View Lane, La Quinta, California 92253-7611
Phone (760) 398-8885 Fax (760) 398-8897
Email tbrohard@earthlink.net

The Pilot Program required all shuttle operators to provide real-time data on shuttle stop events and shuttle vehicle movements. Page 34 of the Evaluation notes some operators have failed to provide data regularly and accurately. After more than a year into the Pilot Program, the real-time vehicle data is still not being received completely or accurately from all operators.

2) Evaluation Skews the Data - Pages 6 and 7 of the Evaluation appear to distort the data, draw untimely conclusions or provide meaningless comparisons without further explanation as follows:

   a) "Shuttle dwell times between June 2014 and June 2015 increased from 58 to 62 seconds." With all of the changes and with the rapid increase in the number of shuttles particularly later in 2015, the data collected during the pre-pilot and pilot programs during June likely does not represent today's dwell times. Dwell time comparisons must be made to current data.

   b) The number of shuttle busses has increased dramatically above the 30% shown in the Evaluation. The impact on shuttle dwell times caused by the significant 41% increase in shuttles from September 2014 to October 2015 has not been reported in the Evaluation as it occurred after June 2015. In addition, there is no limit on either the number of commuter shuttles that can participate in the Program or on the number of shuttle stops. For future forecasts and analysis, more shuttles and more stops will create even more congestion and delay in the City. By limiting its analysis of environmental impacts to a 41% increase in shuttles from pre-pilot to the permanent program, the Planning Department has not evaluated the impact of the entire scope of the Project, since the Project allows for unlimited growth. In addition, the Planning Department merely "assumes" the growth in shuttles under the Project will be limited to 41%, without providing any evidence to support this claim.

   c) "Instances of shuttles blocking Muni have decreased by 35% from the pre-pilot to pilot data collection periods." Without further discussion, this percentage and the statement have no real meaning. What is the level of delay caused by the current amount of blocking? Only 12 of the 20 stops observed in June 2015 experienced no blocking – 60% is impressive but does the same percentage relate to all 200 stops in the Program?

   d) "Shuttles block driver's views of pedestrians or block crosswalks less than 2% of the time that they stop." While the percentage is small, it is really meaningless. The Program should have a goal to totally eliminate blocked views of pedestrians and crosswalks by relocating the stops to open up visibility of pedestrians and crosswalks.

e) "Shuttles block travel lanes and bike lanes about 35% of the time that they stop." When shuttles block travel lanes and bicycle lanes, the potential for collisions significantly increases as drivers cannot see each other in order to take evasive action. Shuttles blocking travel lanes also increase delay to motorists. Levels of congestion and levels of service have not been measured or quantified when shuttles block adjacent travel lanes.

f) "Between August 2014 and the end of May 2015, enforcement officers issued an average of 103 citations per month." At that level, ten enforcement personnel assigned to monitor the commuter shuttles in peak hours were writing 10 citations per officer per month, or about one citation every other weekday. Obviously, the officers were not issuing citations as they should. Page 34 of the Evaluation claims there are limited enforcement resources and that they are unable to keep shuttles out of Muni and other no stopping zones. To the contrary, it appears that the number of citations written by the shuttle enforcement team (one every other day) is dismal. The level of enforcement must be increased to reduce double parking and other illegal practices that block traffic lanes, bike lanes, and crosswalks.

3) <u>Traffic, Transit, and Safety Issues Have Not Been Addressed</u> – Page 18 of the Evaluation states "A chief objective of the Pilot Program was to dedicate curb space for loading and unloading of private shuttles in order to minimize commuter shuttles' conflict with Muni and other users of the streets. Delays to Muni, boardings away from the curb, traffic back-ups, blocking bicycle lanes, or blocking crosswalks or pedestrian visibility may occur when multiple vehicles (either more than one shuttle or a shuttle bus and a Muni bus) are competing for limited curb space, or when shuttle drivers do not take care to pull entirely out of the travel lane to load or unload."

While the Evaluation found that commuter shuttles could account for up to 9.5% of the traffic volumes on certain streets, no capacity analyses were conducted and no estimate of delay resulting from increased congestion was calculated. No comprehensive formal study has been conducted on the significant impacts of shuttles on pedestrian and bicycle safety, on Muni passengers with disabilities, on reducing capacity by blocking traffic lanes, and on increased delay and response times for emergency vehicles. Without such a study, it is impossible to support the conclusion that these evaluations are unnecessary and that the Program is exempt from CEQA review because it will not have a significant impact on traffic.

4) <u>Exemption from CEQA Review Cannot Be Supported</u> – The October 22, 2015 Report prepared by the San Francisco Planning Department indicates that the Commuter Shuttle Program is exempt from CEQA review. Traffic impacts are

discussed on Pages 13 through 16. The conclusions reached in the Report together with my comments are reviewed in the following paragraphs:

a) Transportation – Page 13 states "The relatively minor increase in shuttle activity, compared to the overall peak hour volumes, would not substantially degrade traffic operations and would not have a significant impact on traffic operations at arterial roadways." No traffic data or capacity calculations are presented to support this statement. To the contrary as indicated above, shuttle volumes account for 9.5% of the traffic volume on certain streets. If a complete traffic study was conducted, this may be shown to be a significant impact under CEQA. The statement that traffic operations would not be significantly impacted cannot be supported by the data presented because no study was conducted, and the conclusion that there will be no significant impact is fatally flawed.

b) Transit – Page 14 presents limited data from the first 12 months of the Pilot Program and concludes "...the proposed project would not result in a significant impact related to transit operations." The data presented does not include the last 6 months of the Pilot Program when conditions have changed dramatically from August 2014 including a 41% increase in shuttle volumes. The statement that transit operations would not be significantly impacted cannot be supported by the data presented and the conclusion is fatally flawed.

c) Bicycles – Page 15 presents generalities and concludes that potential conflicts have been addressed. The Evaluation indicated that bicycle lanes were blocked 35% of the time by shuttle busses. While a few stops have been relocated or lengthened, the statement that bicycles would not be significantly impacted cannot be supported by the data presented and the conclusion is fatally flawed.

   Furthermore, the City's Transportation Significance Criteria state that "The project would have a significant effect on the environment if it would create potentially hazardous conditions for bicyclists or otherwise substantially interfere with bicycle accessibility to the site and adjoining areas." Shuttle busses blocking bicycle lanes would cause bicyclists to sharply veer into vehicle travel lanes to avoid the shuttle bus at the stop, creating a potentially hazardous condition, a significant impact as defined by the City's own Transportation Significance Criteria.

d) Pedestrians – Page 15 downplays the conflicts that occur between shuttle busses and pedestrians, and attempts to dismiss blocking of crosswalks as very infrequent. The Report suggests that additional stops could be relocated or lengthened but there is no program to do this. The statement that pedestrians would not be significantly impacted cannot be supported by the data presented and the conclusion is fatally flawed.

e) <u>Loading</u> – Page 16 states that commercial loading zones (yellow curb) would not be eliminated as part of the Program. The Report fails to indicate that California Vehicle Code (CVC) Section 21458 a) allows stopping in commercial loading zones for the purpose of loading or unloading passengers or freight. The statement that commercial loading zones would not be significantly impacted cannot be supported without any data presented (since the CVC allows passenger loading in commercial loading zones) and the conclusion is fatally flawed.

f) <u>Conclusion</u> – Page 25 states that "The proposed project would not substantially increase traffic on the existing street system and no significant environmental impacts would occur." As pointed out throughout this letter, there are numerous instances where there will be significant impacts. SFMTA has not properly studied, evaluated, or analyzed the Proposed Project in regard to potentially significant impacts to traffic, transit, bicycles, pedestrians, and loading.

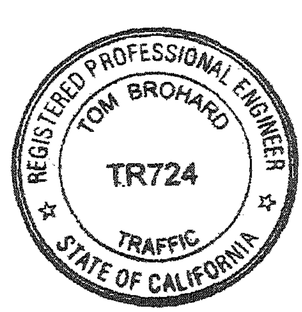
In summary, further study must be undertaken to properly identify the traffic impacts of the SFMTA's Commuter Shuttle Program. As discussed in this letter, there is at least a "fair argument" that this Program will have adverse environmental impacts that have not been properly disclosed, analyzed, or mitigated. Each of these significant impacts must be addressed by proposing feasible and effective mitigation measures. If you have questions regarding these comments, please call me at your convenience.

Respectfully submitted,

Tom Brohard and Associates

Tom Brohard

Tom Brohard, PE
Principal



Enclosure
March 29, 2014 Letter

Tom Brohard and Associates

March 29, 2014

Mr. Richard Drury, Attorney at Law
Lozeau Drury LLP
410 12th Street, Suite 250
Oakland, CA 94607

SUBJECT: San Francisco Municipal Transportation Agency (SFMTA) Commuter Shuttle Policy and Pilot Program – Traffic Issues and Concerns

Dear Mr. Drury:

Tom Brohard, P.E., has reviewed the San Francisco Municipal Transportation Agency (SFMTA) Board of Directors Resolution No. 14-023 which proposes an 18 month pilot, permit program allowing private shuttle busses to use up to 200 Muni bus stops to pick up and discharge over 35,000 passengers each day. I have also reviewed other background material including the San Francisco County Transportation Authority's June 28, 2011 Strategic Analysis Report entitled "The Role of Shuttle Services in San Francisco's Transportation System" and the July 19, 2013 presentation to SFMTA entitled "Private Commuter Shuttle Policy Draft Proposal".

Further study must be undertaken to properly identify the traffic impacts of the SFMTA's Commuter Shuttle Policy and Pilot Program. Until the issues and concerns raised in this letter are addressed, there is at least a "fair argument" that the Commuter Shuttle Policy and Pilot Program proposed by SFMTA in the City of San Francisco may have adverse and significant environmental impacts that have not been properly disclosed, analyzed, and mitigated.

Education and Experience

Since receiving a Bachelor of Science in Engineering from Duke University in Durham, North Carolina in 1969, I have gained over 40 years of professional engineering experience. I am licensed as a Professional Civil Engineer both in California and Hawaii and as a Professional Traffic Engineer in California. I formed Tom Brohard and Associates in 2000 and now serve as the City Traffic Engineer for the City of Indio and as Consulting Transportation Engineer for the Cities of Big Bear Lake and San Fernando. I have extensive experience in traffic engineering and transportation planning. During my career in both the public and private sectors, I have reviewed many environmental documents and traffic studies, with only a few of these shown on the enclosed resume.

81905 Mountain View Lane, La Quinta, California 92253-7611
Phone (760) 398-8885 Fax (760) 398-8897
Email tbrohard@earthlink.net

Traffic Issues

Based on my review, there is at least a "fair argument" that the SFMTA's Commuter Shuttle Policy and Pilot Program (Program) in the City of San Francisco will have significant traffic and other environmental impacts as follows:

1) Program Will Likely Increase the Number of Shuttles - With the single exception of school busses identified in CVC Section 22500.5, CVC Section 22500 states that "No person shall stop, park, or leave standing any vehicle whether attended or unattended, except when necessary to avoid conflict with other traffic or in compliance with the directions of a peace officer or official traffic control device, in any of the following places...(i) alongside curb space authorized for the loading and unloading of passengers of a bus engaged as a common carrier in local transportation when indicated by a sign or red paint on the curb erected or painted by local authorities pursuant to an ordinance."

   CVC Section 42001.5 imposes a minimum $250 fine on a person "convicted" of violating CVC Section 22500. CVC Section 42001.5(b) provides that the fine cannot be suspended, except that the court can waive anything above $100. In other words the minimum fine allowed under state law is $100. This financial penalty is significant and it is likely that it currently deters other law-abiding shuttle operators from using Muni bus stops.

   SFMTA claims that the Commuter Shuttle Policy and Pilot Program will not increase impacts since the shuttles are already operating illegally. However, the program makes legal what has been illegal. It also allows any shuttle operator to apply for a permit to participate. At least some shuttle companies would not want to operate a pirate shuttle program at risk of significant penalties. Since SFMTA's Commuter Shuttle Policy and Pilot Program makes it legal for private shuttles to use public bus stops, more companies with even more private shuttles are likely to participate. This will create significant traffic impacts by increasing congestion at Muni bus stops, an extremely likely consequence that has not be envisioned, evaluated or analyzed by SFMTA.

2) Program May Increase Idle Times At Muni Stops - When shuttle stops at Muni bus stops were illegal, private shuttles often tried to get in and out of the public bus stops as quickly as possible to avoid being cited. According to SFMTA, the average dwell time for a private shuttle is up to 60 seconds whereas the average dwell time for a Muni bus is about 20 seconds. Now that the Program is legal, private shuttles may idle even longer to pick up passengers, particularly without risking being cited. While the Program suggests that private shuttles move forward to the front of the Muni bus stop, this will not occur when shuttles are already actively loading or unloading.

If more shuttles are already loading or unloading passengers when the Muni bus arrives, then the already identified conflicts with Muni busses, general traffic, pedestrians, and cyclists will be compounded by additional double parking and idling. Additional shuttles could also easily exceed the capacity of the Muni bus stop locations, creating additional impacts. Each of these occurrences would increase diesel emissions at the Muni bus stop locations and would also create pedestrian impacts related to blocking public bus access to the stops as well as additional safety issues.

In summary, further study must be undertaken to properly identify the traffic impacts of the SFMTA's Commuter Shuttle Policy and Pilot Program. As discussed in this letter, there is at least a "fair argument" that this will have adverse environmental impacts that have not been properly disclosed, analyzed, or mitigated. Each of these significant impacts must be addressed by proposing feasible and effective mitigation measures. If you have questions regarding these comments, please call me at your convenience.

Respectfully submitted,

Tom Brohard and Associates

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Enclosure
Resume

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Enclosure
Resume

Tom Brohard, PE

Licenses:	1975 / Professional Engineer / California – Civil, No. 24577 1977 / Professional Engineer / California – Traffic, No. 724 2006 / Professional Engineer / Hawaii – Civil, No. 12321
Education:	1969 / BSE / Civil Engineering / Duke University
Experience:	40+ Years
Memberships:	1977 / Institute of Transportation Engineers – Fellow, Life 1978 / Orange County Traffic Engineers Council - Chair 1982-1983 1981 / American Public Works Association – Life Member

Tom is a recognized expert in the field of traffic engineering and transportation planning. His background also includes responsibility for leading and managing the delivery of various contract services to numerous cities in Southern California.

Tom has extensive experience in providing transportation planning and traffic engineering services to public agencies. Since May 2005, he has served as Consulting City Traffic Engineer for the City of Indio. He also currently provides "on call" Traffic and Transportation Engineer services to the Cities of Big Bear Lake, Mission Viejo, and San Fernando. In addition to conducting traffic engineering investigations for Los Angeles County from 1972 to 1978, he has previously served as City Traffic Engineer in the following communities:

- Bellflower .... 1997 - 1998
- Bell Gardens .... 1982 - 1995
- Huntington Beach .... 1998 - 2004
- Lawndale .... 1973 - 1978
- Los Alamitos .... 1981 - 1982
- Oceanside .... 1981 - 1982
- Paramount .... 1982 - 1988
- Rancho Palos Verdes .... 1973 - 1978
- Rolling Hills .... 1973 - 1978, 1985 - 1993
- Rolling Hills Estates .... 1973 - 1978, 1984 - 1991
- San Marcos 1981
- Santa Ana .... 1978 - 1981
- Westlake Village .... 1983 - 1994

During these assignments, Tom has supervised City staff and directed other consultants including traffic engineers and transportation planners, traffic signal and street lighting personnel, and signing, striping, and marking crews. He has secured over $5 million in grant funding for various improvements. He has managed and directed many traffic and transportation studies and projects. While serving these communities, he has personally conducted investigations of hundreds of citizen requests for various traffic control devices. Tom has also successfully presented numerous engineering reports at City Council, Planning Commission, and Traffic Commission meetings in these and other municipalities.

In his service to the City of Indio since May 2005, Tom has accomplished the following:

- Oversaw preparation and adoption of the Circulation Element Update of the General Plan including development of Year 2035 buildout traffic volumes, revised and simplified arterial roadway cross sections, and reduction in acceptable Level of Service criteria under certain constraints. Reviewed Riverside County's updated traffic model for consistency with the adopted City of Indio Circulation Plan.

- Oversaw preparation of fact sheets/design exceptions to reduce shoulder widths on Jackson Street over I-10 as well as justifications for protected-permissive left turn phasing at I-10 on-ramps, the first such installation in Caltrans District 8 in Riverside County; reviewed plans and provided assistance during construction of a $1.5 million project to install traffic signals and widen three of four ramps at the I-10/Jackson Street Interchange under a Caltrans encroachment permit.

- Oversaw preparation of fact sheets/design exceptions to reduce shoulder widths on Monroe Street over I-10 as well as striping plans to install left turn lanes on Monroe Street at the I-10 Interchange under a Caltrans encroachment permit; reviewed plans to install traffic signals and widen three of four ramps at the I-10/Monroe Street Interchange.

- Reviewed traffic impact analyses for Project Study Reports evaluating different alternatives for buildout improvement of the I-10 Interchanges at Jefferson Street, Monroe Street, Jackson Street and Golf Center Parkway.

- Oversaw preparation of plans, specifications, and contract documents and provided construction assistance for over 40 traffic signal installations and modifications.

- Reviewed and approved over 600 work area traffic control plans as well as signing and striping plans for all City and developer funded roadway improvement projects.

- Oversaw preparation of a City wide traffic safety study of conditions at all schools.

- Prepared over 500 work orders directing City forces to install, modify, and/or remove traffic signs, pavement and curb markings, and roadway striping.

- Oversaw preparation of engineering and traffic surveys to establish enforceable speed limits on over 200 street segments.

- Reviewed and approved traffic impact studies for more than 25 major developments.

- Developed the Golf Cart Transportation Program and administrative procedures; implemented routes forming the initial baseline system.

Since forming Tom Brohard and Associates in 2000, Tom has reviewed many traffic impact reports and environmental documents for various development projects. He has provided expert witness services and also prepared traffic studies for public agencies and private sector clients.

Tom Brohard and Associates

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During these assignments, Tom has supervised City staff and directed other consultants including traffic engineers and transportation planners, traffic signal and street lighting personnel, and signing, striping, and marking crews. He has secured over $10 million in grant funding for various improvements. He has managed and directed many traffic and transportation studies and projects. While serving these communities, he has personally conducted investigations of hundreds of citizen requests for various traffic control devices. Tom has also successfully presented numerous engineering reports at City Council, Planning Commission, and Traffic Commission meetings in these and other municipalities.

Tom Brohard and Associates

In his service to the City of Indio since May 2005, Tom has accomplished the following:

- Oversaw preparation and adoption of the 2008 Circulation Element Update of the General Plan including development of Year 2035 buildout traffic volumes, revised and simplified arterial roadway cross sections, and reduction in acceptable Level of Service criteria under certain conditions.

- Oversaw preparation of fact sheets/design exceptions to reduce shoulder widths on Jackson Street and on Monroe Street over I-10 as well as justifications for protected-permissive left turn phasing at I-10 on-ramps, the first such installations in Caltrans District 8 in Riverside County; reviewed plans and provided assistance during construction of both $2 million projects to install traffic signals and widen three of four ramps at these two interchanges under Caltrans encroachment permits.

- Reviewed traffic signal, signing, striping, and work area traffic control plans for the County's $45 million I-10 Interchange Improvement Project at Jefferson Street.

- Reviewed traffic impact analyses for Project Study Reports evaluating different alternatives for buildout improvements of the I-10 Interchanges at Jefferson Street, Monroe Street, Jackson Street and Golf Center Parkway.

- Oversaw preparation of plans, specifications, and contract documents and provided construction assistance for over 50 traffic signal installations and modifications.

- Reviewed and approved over 1,200 work area traffic control plans as well as signing and striping plans for all City and developer funded roadway improvement projects.

- Oversaw preparation of a City wide traffic safety study of conditions at all schools.

- Obtained $47,000 grant from the California Office of Traffic Safety and implemented the City's Traffic Collision Database System. Annually reviews "Top 25" collision locations and provides traffic engineering recommendations to reduce collisions.

- Prepared over 900 work orders directing City forces to install, modify, and/or remove traffic signs, pavement and curb markings, and roadway striping.

- Oversaw preparation of engineering and traffic surveys to establish enforceable speed limits on over 400 street segments.

- Reviewed and approved traffic impact studies for more than 35 major projects and special events including the annual Coachella and Stagecoach Music Festivals.

- Developed and implemented the City's Golf Cart Transportation Program.

Since forming Tom Brohard and Associates in 2000, Tom has reviewed many traffic impact reports and environmental documents for various development projects. He has provided expert witness services and also prepared traffic studies for public agencies and private sector clients.

EXHIBIT B

SWAPE Technical Consultation, Data Analysis and Litigation Support for the Environment

2656 29th Street, Suite 201
Santa Monica, CA 90405

Matt Hagemann, P.G, C.Hg.
(949) 887-9013
mhagemann@swape.com

January 14, 2016

Rebecca Davis
Lozeau | Drury LLP
410 12th Street, Suite 250
Oakland, CA 94607

Subject: Comments on the SFMTA-Commuter Shuttle Program (Case No. 2015-007975ENV)

Dear Ms. Davis,

We have reviewed the October 22, 2015 Certificate of Determination Exemption from Environmental Review ("Certificate of Exemption"), October 2, 2015 Pilot Program Evaluation Report ("Pilot Program Evaluation Report"), and the October 13, 2015 Final Air Quality Technical Report ("FAQTR") for the Commuter Shuttle Program ("Project"). The Project proposes to implement a Commuter Shuttle Program which would permanently continue and expand upon the 18-month Commuter Shuttle Pilot Program that was implemented in San Francisco between August 2014 and January 2016. This would require issuing permits to eligible commuter shuttle operators for the use of public curb space to pick-up and drop-off passengers, as well as include some capital improvements.

Our review concludes that the Project's air quality assessment fails to adequately evaluate the Project's health risk impacts. First, the health risk assessment fails to account for the 41 percent future project growth and fails to address the lack of a limit on the number of shuttles that could be included in the Project. Second, the health risk assessment fails to consider the risk associated with increased emissions from large buses that will be limited to arterial streets and the increased traffic and stop events that will result.

A Draft Environmental Impact Report (DEIR) should be prepared with an updated health risk assessment that addresses these issues.

Air Quality

Failure to Account for Future Project Growth

According to City's Certificate of Exemption, the health risk at four local impact zones were modeled and analyzed to represent the health risk at any stop under the Program (p. 20). These local impact zones were chosen because they exhibited high volumes of stop events, they represented average or above average idling times for the commuter shuttle under the Pilot Program, and because they were representative of the geographic diversity and configuration of stops within the City (Certificate of Exemption, p. 20). Table 6 of the Certificate of Exemption indicates that, of the four local impact zones modeled, the Project's highest estimated cancer risk is 5.6 in one million, located at Van Ness Avenue and Union Street (p. 21). However, this determination fails to take into account the projected growth in number of shuttles as well as the additional permissible growth of the Project in future years and thus greatly underestimates the potential cancer risk.

The following assumptions were made in the localized air analysis to determine the health effects: "an increase in the number of stop events that could occur between Pilot and Program conditions (estimated at 29 percent) at locations with a higher volume stop events; the same commuter shuttle engine years (2012 or newer) as mentioned above for criteria air pollutants; commuter shuttle fuel type and idling time; and various methodologies consistent with BAAQMD guidance regarding assessing local risks and hazards" (Certificate of Exemption, p. 21). However, this does not include the expected 41 percent increase in the number of participating shuttles projected by the City. This is unlike the regional air quality analysis, in which overall criteria air pollutant emissions for the Project were estimated and did include the 41 percent growth in their assumptions, as below.

> "Based on the number of commuter shuttle permits (placards) issued prior to the implementation of the Pilot and the Commuter Shuttle Program (beginning in 2016), SFMTA estimates that participation in the Program could increase by 41 percent" (Certificate of Exemption, p. 18).

This increase in participation in the Program will result in a growth in the number of shuttles within San Francisco and will result in an increase in emissions from the shuttles. By failing to account for the health effects of DPM emissions from 41 percent more shuttles within the City, the health risk is greatly underestimated.

Additionally, the Project does not propose a limit to the number of commuter shuttles that can be incorporated to the program. Without a limitation, the growth in the number of shuttle/buses could potentially grow beyond the 41 percent predicted. According to the Pilot Program Evaluation Report, from June 2014 before the start of the program until July 2015, daily stop events by shuttles increased by 29 percent (p. 6). In addition, between those dates, the number of zones in the network increased by 23 percent, and the shuttle frequency at the zones increased by nearly 80 percent (Pilot Program Evaluation Report, p. 11 and p. 21). Major zones such as Lombard Street, Van Ness Avenue, and Castro Street had shuttle activity double or even triple from prior to the start of the pilot program to during the pilot program (Pilot Program Evaluation Report, p. 21). These statistics clearly show that the program grew at a very fast rate in only approximately one year. As a result, if the program is continued without a limitation on the number of buses, the growth could potentially be much greater than the assumed 41 percent. This scenario would then result in an unknown increase of emissions, much greater than what has been calculated. Because there is a potential for the Project to grow and put an unlimited number of shuttle buses within the City, the increased DPM emissions from the buses will most likely be much higher than anticipated and result in an increased health risk, potentially above the level of significance.

Without taking into account this uncertainty, it is inappropriate to assume that the health risk of the Project is below the level of significance.

Increase in Stops

The Project, unlike the Pilot Program, will limit permitted shuttles longer than 35 feet to travel only on designated major and minor arterial streets (Certificate of Exemption, p. 5). As a result, arterial streets will have increased shuttle activity and will experience an increase in stop events due to the travel limitations of large buses. Table 3 of the Certificate of Exemption shows how this requirement would increase the number of stop events at four arterial locations closest to the current high-activity level non-arterial locations that would need to be located (see table below) (p. 12).

Table 3. Stop Events at Designated Zones (with Commuter Shuttle Program)

Existing Non-Arterial Zone		Nearest Arterial Zone Alternative				Combined Totals After Relocation	
Existing Non-Arterial Zone (to be relocated)	Stop Events[a]	Nearest Existing Arterial Zone[b]	Stop Events	Existing Arterial Traffic Counts[c]	Shuttle % of Current Traffic Counts	Total Stop Events (after relocation)	Shuttle % of Total Traffic Counts (after relocation)
Castro/25th NW corner, near-side	20.0	24th/Church SW corner, near-side	9.6	342	6%	29.6	9%
Church/Market NE corner, AM/PM white zone	10.3	Castro/Market NE corner, PM white zone	10.3	311	3%	20.5	6%
30th/Church SW corner, flag stop	12.9	San Jose/Dolores NW corner, AM white zone	6.9	1159	1.1%	19.7	1.7%
Townsend/4th South side, Mid-block	22.7	Harrison/Embarcadero, white zone	8.7	341	7%	31.4	9.5%

Source: SFMTA, 2015

Notes:

a – Estimated commuter shuttle stop events per hour

b – Peak hour traffic counts collected by SFMTA in 2009, 2011, and 2012

c – Identified zone with existing shuttle stop where nearest non-arterial stop would be located.

This table shows that for the above zones, stop events will increase by between six to ten stops and that the increase in peak hour traffic volumes will be between 0.6 percent and three percent. While this table shows that stop event and traffic volume will increase as a result of the limitation, these values greatly underestimate the true increase in stop events and traffic volumes at arterial streets.

Table 3 only takes into consideration the current stop events occurring at the non-arterial and arterial streets. It does not take into consideration the stop events that would occur as a result of the 41 percent projected increase in the number of shuttles under the Project. As the Project grows and more shuttles are added, they will have to have stop events throughout the City, many of which will be restricted from using non-arterial streets and must make the stops in arterial streets. With the inclusion of extra shuttles and buses and the restrictions that would require many of the buses to use only arterial streets, stop events and traffic volumes would increase to levels much higher than those demonstrated and described in the Certificate of Exemption.

This is further supported by the Certificate of Exemption that states, "Under the Pilot, the most frequently used zones were observed to have as many as 100 shuttle stop events per day..." (p. 5). These locations include Lombard Street, Van Ness Avenue, Divisadero/Castro Streets, Valencia Street, Union/Powell Streets in North Beach, 24th/25th Streets in the Mission/Noe Valley, 30th Street in Noe Valley, and Townsend/Fourth Street near the Caltrain station (p. 5). If any these locations are already experiencing stops as high as 100 per day, restricting all current and future large buses to arterial streets will just increase the number of stops per day to much higher than 100 per day as well as increase traffic and congestions within the streets. Emissions from buses in traffic, in which the buses are continuously running for an extended period of time, combined with emission from the increased number of buses will result in an overall increase in emissions.

However, the health risk assessment conducted did not take into account the increased emissions resulting from limiting large buses to arterial streets and the increased stop events and traffic that will result from them. All of the local impact zones that were analyzed in the health risk assessment appear to be "Large-Vehicle Approved" (major or minor arterial), according to Attachment B of the Certificate of Exemption. As a result, these locations may be impacted by higher levels of traffic and stops because large buses will not be able to make stops in non-arterial streets nearby. Emissions resulting from the above issues were not included in the assumptions for the health risk assessment and as a result, the health risk is greatly underestimated.

As a result of the issues discussed above, the health risk assessment for the proposed Project greatly underestimates the risk posed to nearby sensitive receptors. A draft environmental impact report should be prepared that includes an updated health risk assessment that incorporates the above issues.

Sincerely,

M Hagemann

Matt Hagemann, P.G., C.Hg.

Jessie Jaeger

SWAPE Technical Consultation, Data Analysis and Litigation Support for the Environment

1640 5th St.., Suite 204 Santa
Santa Monica, California 90401
Tel: (949) 887-9013
Email: mhagemann@swape.com

Matthew F. Hagemann, P.G., C.Hg., QSD, QSP

Geologic and Hydrogeologic Characterization
Industrial Stormwater Compliance
Investigation and Remediation Strategies
Litigation Support and Testifying Expert
CEQA Review

Education:

M.S. Degree, Geology, California State University Los Angeles, Los Angeles, CA, 1984.
B.A. Degree, Geology, Humboldt State University, Arcata, CA, 1982.

Professional Certifications:

California Professional Geologist
California Certified Hydrogeologist
Qualified SWPPP Developer and Practitioner

Professional Experience:

Matt has 25 years of experience in environmental policy, assessment and remediation. He spent nine years with the U.S. EPA in the RCRA and Superfund programs and served as EPA's Senior Science Policy Advisor in the Western Regional Office where he identified emerging threats to groundwater from perchlorate and MTBE. While with EPA, Matt also served as a Senior Hydrogeologist in the oversight of the assessment of seven major military facilities undergoing base closure. He led numerous enforcement actions under provisions of the Resource Conservation and Recovery Act (RCRA) while also working with permit holders to improve hydrogeologic characterization and water quality monitoring.

Matt has worked closely with U.S. EPA legal counsel and the technical staff of several states in the application and enforcement of RCRA, Safe Drinking Water Act and Clean Water Act regulations. Matt has trained the technical staff in the States of California, Hawaii, Nevada, Arizona and the Territory of Guam in the conduct of investigations, groundwater fundamentals, and sampling techniques.

Positions Matt has held include:

- Founding Partner, Soil/Water/Air Protection Enterprise (SWAPE) (2003 – present);
- Geology Instructor, Golden West College, 2010 – 2104;
- Senior Environmental Analyst, Komex H2O Science, Inc. (2000 -- 2003);

- Executive Director, Orange Coast Watch (2001 – 2004);
- Senior Science Policy Advisor and Hydrogeologist, U.S. Environmental Protection Agency (1989–1998);
- Hydrogeologist, National Park Service, Water Resources Division (1998 – 2000);
- Adjunct Faculty Member, San Francisco State University, Department of Geosciences (1993 – 1998);
- Instructor, College of Marin, Department of Science (1990 – 1995);
- Geologist, U.S. Forest Service (1986 – 1998); and
- Geologist, Dames & Moore (1984 – 1986).

Senior Regulatory and Litigation Support Analyst:

With SWAPE, Matt's responsibilities have included:

- Lead analyst and testifying expert in the review of over 100 environmental impact reports since 2003 under CEQA that identify significant issues with regard to hazardous waste, water resources, water quality, air quality, Valley Fever, greenhouse gas emissions, and geologic hazards. Make recommendations for additional mitigation measures to lead agencies at the local and county level to include additional characterization of health risks and implementation of protective measures to reduce worker exposure to hazards from toxins and Valley Fever.
- Stormwater analysis, sampling and best management practice evaluation at industrial facilities.
- Manager of a project to provide technical assistance to a community adjacent to a former Naval shipyard under a grant from the U.S. EPA.
- Technical assistance and litigation support for vapor intrusion concerns.
- Lead analyst and testifying expert in the review of environmental issues in license applications for large solar power plants before the California Energy Commission.
- Manager of a project to evaluate numerous formerly used military sites in the western U.S.
- Manager of a comprehensive evaluation of potential sources of perchlorate contamination in Southern California drinking water wells.
- Manager and designated expert for litigation support under provisions of Proposition 65 in the review of releases of gasoline to sources drinking water at major refineries and hundreds of gas stations throughout California.
- Expert witness on two cases involving MTBE litigation.
- Expert witness and litigation support on the impact of air toxins and hazards at a school.
- Expert witness in litigation at a former plywood plant.

With Komex H2O Science Inc., Matt's duties included the following:

- Senior author of a report on the extent of perchlorate contamination that was used in testimony by the former U.S. EPA Administrator and General Counsel.
- Senior researcher in the development of a comprehensive, electronically interactive chronology of MTBE use, research, and regulation.
- Senior researcher in the development of a comprehensive, electronically interactive chronology of perchlorate use, research, and regulation.
- Senior researcher in a study that estimates nationwide costs for MTBE remediation and drinking water treatment, results of which were published in newspapers nationwide and in testimony against provisions of an energy bill that would limit liability for oil companies.
- Research to support litigation to restore drinking water supplies that have been contaminated by MTBE in California and New York.

- Expert witness testimony in a case of oil production-related contamination in Mississippi.
- Lead author for a multi-volume remedial investigation report for an operating school in Los Angeles that met strict regulatory requirements and rigorous deadlines.

- Development of strategic approaches for cleanup of contaminated sites in consultation with clients and regulators.

Executive Director:

As Executive Director with Orange Coast Watch, Matt led efforts to restore water quality at Orange County beaches from multiple sources of contamination including urban runoff and the discharge of wastewater. In reporting to a Board of Directors that included representatives from leading Orange County universities and businesses, Matt prepared issue papers in the areas of treatment and disinfection of wastewater and control of the discharge of grease to sewer systems. Matt actively participated in the development of countywide water quality permits for the control of urban runoff and permits for the discharge of wastewater. Matt worked with other nonprofits to protect and restore water quality, including Surfrider, Natural Resources Defense Council and Orange County CoastKeeper as well as with business institutions including the Orange County Business Council.

Hydrogeology:

As a Senior Hydrogeologist with the U.S. Environmental Protection Agency, Matt led investigations to characterize and cleanup closing military bases, including Mare Island Naval Shipyard, Hunters Point Naval Shipyard, Treasure Island Naval Station, Alameda Naval Station, Moffett Field, Mather Army Airfield, and Sacramento Army Depot. Specific activities were as follows:

- Led efforts to model groundwater flow and contaminant transport, ensured adequacy of monitoring networks, and assessed cleanup alternatives for contaminated sediment, soil, and groundwater.
- Initiated a regional program for evaluation of groundwater sampling practices and laboratory analysis at military bases.
- Identified emerging issues, wrote technical guidance, and assisted in policy and regulation development through work on four national U.S. EPA workgroups, including the Superfund Groundwater Technical Forum and the Federal Facilities Forum.

At the request of the State of Hawaii, Matt developed a methodology to determine the vulnerability of groundwater to contamination on the islands of Maui and Oahu. He used analytical models and a GIS to show zones of vulnerability, and the results were adopted and published by the State of Hawaii and County of Maui.

As a hydrogeologist with the EPA Groundwater Protection Section, Matt worked with provisions of the Safe Drinking Water Act and NEPA to prevent drinking water contamination. Specific activities included the following:

- Received an EPA Bronze Medal for his contribution to the development of national guidance for the protection of drinking water.
- Managed the Sole Source Aquifer Program and protected the drinking water of two communities through designation under the Safe Drinking Water Act. He prepared geologic reports, conducted public hearings, and responded to public comments from residents who were very concerned about the impact of designation.

- Reviewed a number of Environmental Impact Statements for planned major developments, including large hazardous and solid waste disposal facilities, mine reclamation, and water transfer.

Matt served as a hydrogeologist with the RCRA Hazardous Waste program. Duties were as follows:

- Supervised the hydrogeologic investigation of hazardous waste sites to determine compliance with Subtitle C requirements.
- Reviewed and wrote "part B" permits for the disposal of hazardous waste.
- Conducted RCRA Corrective Action investigations of waste sites and led inspections that formed the basis for significant enforcement actions that were developed in close coordination with U.S. EPA legal counsel.
- Wrote contract specifications and supervised contractor's investigations of waste sites.

With the National Park Service, Matt directed service-wide investigations of contaminant sources to prevent degradation of water quality, including the following tasks:

- Applied pertinent laws and regulations including CERCLA, RCRA, NEPA, NRDA, and the Clean Water Act to control military, mining, and landfill contaminants.
- Conducted watershed-scale investigations of contaminants at parks, including Yellowstone and Olympic National Park.
- Identified high-levels of perchlorate in soil adjacent to a national park in New Mexico and advised park superintendent on appropriate response actions under CERCLA.
- Served as a Park Service representative on the Interagency Perchlorate Steering Committee, a national workgroup.
- Developed a program to conduct environmental compliance audits of all National Parks while serving on a national workgroup.
- Co-authored two papers on the potential for water contamination from the operation of personal watercraft and snowmobiles, these papers serving as the basis for the development of nation-wide policy on the use of these vehicles in National Parks.
- Contributed to the Federal Multi-Agency Source Water Agreement under the Clean Water Action Plan.

Policy:

Served senior management as the Senior Science Policy Advisor with the U.S. Environmental Protection Agency, Region 9. Activities included the following:

- Advised the Regional Administrator and senior management on emerging issues such as the potential for the gasoline additive MTBE and ammonium perchlorate to contaminate drinking water supplies.
- Shaped EPA's national response to these threats by serving on workgroups and by contributing to guidance, including the Office of Research and Development publication, Oxygenates in Water: Critical Information and Research Needs.
- Improved the technical training of EPA's scientific and engineering staff.
- Earned an EPA Bronze Medal for representing the region's 300 scientists and engineers in negotiations with the Administrator and senior management to better integrate scientific principles into the policy-making process.
- Established national protocol for the peer review of scientific documents.

Geology:

With the U.S. Forest Service, Matt led investigations to determine hillslope stability of areas proposed for timber harvest in the central Oregon Coast Range. Specific activities were as follows:

- Mapped geology in the field, and used aerial photographic interpretation and mathematical models to determine slope stability.
- Coordinated his research with community members who were concerned with natural resource protection.
- Characterized the geology of an aquifer that serves as the sole source of drinking water for the city of Medford, Oregon.

As a consultant with Dames and Moore, Matt led geologic investigations of two contaminated sites (later listed on the Superfund NPL) in the Portland, Oregon, area and a large hazardous waste site in eastern Oregon. Duties included the following:

- Supervised year-long effort for soil and groundwater sampling.
- Conducted aquifer tests.
- Investigated active faults beneath sites proposed for hazardous waste disposal.

Teaching:

From 1990 to 1998, Matt taught at least one course per semester at the community college and university levels:

- At San Francisco State University, held an adjunct faculty position and taught courses in environmental geology, oceanography (lab and lecture), hydrogeology, and groundwater contamination.
- Served as a committee member for graduate and undergraduate students.
- Taught courses in environmental geology and oceanography at the College of Marin.

Matt taught physical geology (lecture and lab and introductory geology at Golden West College in Huntington Beach, California from 2010 to 2014.

Invited Testimony, Reports, Papers and Presentations:

Hagemann, M.F., 2008. Disclosure of Hazardous Waste Issues under CEQA. Presentation to the Public Environmental Law Conference, Eugene, Oregon.

Hagemann, M.F., 2008. Disclosure of Hazardous Waste Issues under CEQA. Invited presentation to U.S. EPA Region 9, San Francisco, California.

Hagemann, M.F., 2005. Use of Electronic Databases in Environmental Regulation, Policy Making and Public Participation. Brownfields 2005, Denver, Coloradao.

Hagemann, M.F., 2004. Perchlorate Contamination of the Colorado River and Impacts to Drinking Water in Nevada and the Southwestern U.S. Presentation to a meeting of the American Groundwater Trust, Las Vegas, NV (served on conference organizing committee).

Hagemann, M.F., 2004. Invited testimony to a California Senate committee hearing on air toxins at schools in Southern California, Los Angeles.

Brown, A., Farrow, J., Gray, A. and **Hagemann, M.**, 2004. An Estimate of Costs to Address MTBE Releases from Underground Storage Tanks and the Resulting Impact to Drinking Water Wells. Presentation to the Ground Water and Environmental Law Conference, National Groundwater Association.

Hagemann, M.F., 2004. Perchlorate Contamination of the Colorado River and Impacts to Drinking Water in Arizona and the Southwestern U.S. Presentation to a meeting of the American Groundwater Trust, Phoenix, AZ (served on conference organizing committee).

Hagemann, M.F., 2003. Perchlorate Contamination of the Colorado River and Impacts to Drinking Water in the Southwestern U.S. Invited presentation to a special committee meeting of the National Academy of Sciences, Irvine, CA.

Hagemann, M.F., 2003. Perchlorate Contamination of the Colorado River. Invited presentation to a tribal EPA meeting, Pechanga, CA.

Hagemann, M.F., 2003. Perchlorate Contamination of the Colorado River. Invited presentation to a meeting of tribal repesentatives, Parker, AZ.

Hagemann, M.F., 2003. Impact of Perchlorate on the Colorado River and Associated Drinking Water Supplies. Invited presentation to the Inter-Tribal Meeting, Torres Martinez Tribe.

Hagemann, M.F., 2003. The Emergence of Perchlorate as a Widespread Drinking Water Contaminant. Invited presentation to the U.S. EPA Region 9.

Hagemann, M.F., 2003. A Deductive Approach to the Assessment of Perchlorate Contamination. Invited presentation to the California Assembly Natural Resources Committee.

Hagemann, M.F., 2003. Perchlorate: A Cold War Legacy in Drinking Water. Presentation to a meeting of the National Groundwater Association.

Hagemann, M.F., 2002. From Tank to Tap: A Chronology of MTBE in Groundwater. Presentation to a meeting of the National Groundwater Association.

Hagemann, M.F., 2002. A Chronology of MTBE in Groundwater and an Estimate of Costs to Address Impacts to Groundwater. Presentation to the annual meeting of the Society of Environmental Journalists.

Hagemann, M.F., 2002. An Estimate of the Cost to Address MTBE Contamination in Groundwater (and Who Will Pay). Presentation to a meeting of the National Groundwater Association.

Hagemann, M.F., 2002. An Estimate of Costs to Address MTBE Releases from Underground Storage Tanks and the Resulting Impact to Drinking Water Wells. Presentation to a meeting of the U.S. EPA and State Underground Storage Tank Program managers.

Hagemann, M.F., 2001. From Tank to Tap: A Chronology of MTBE in Groundwater. Unpublished report.

Hagemann, M.F., 2001. Estimated Cleanup Cost for MTBE in Groundwater Used as Drinking Water. Unpublished report.

Hagemann, M.F., 2001. Estimated Costs to Address MTBE Releases from Leaking Underground Storage Tanks. Unpublished report.

Hagemann, M.F., and VanMouwerik, M., 1999. Potential Water Quality Concerns Related to Snowmobile Usage. Water Resources Division, National Park Service, Technical Report.

VanMouwerik, M. and **Hagemann, M.F.** 1999, Water Quality Concerns Related to Personal Watercraft Usage. Water Resources Division, National Park Service, Technical Report.

Hagemann, M.F., 1999, Is Dilution the Solution to Pollution in National Parks? The George Wright Society Biannual Meeting, Asheville, North Carolina.

Hagemann, M.F., 1997, The Potential for MTBE to Contaminate Groundwater. U.S. EPA Superfund Groundwater Technical Forum Annual Meeting, Las Vegas, Nevada.

Hagemann, M.F., and Gill, M., 1996, Impediments to Intrinsic Remediation, Moffett Field Naval Air Station, Conference on Intrinsic Remediation of Chlorinated Hydrocarbons, Salt Lake City.

Hagemann, M.F., Fukunaga, G.L., 1996, The Vulnerability of Groundwater to Anthropogenic Contaminants on the Island of Maui, Hawaii. Hawaii Water Works Association Annual Meeting, Maui, October 1996.

Hagemann, M. F., Fukanaga, G. L., 1996, Ranking Groundwater Vulnerability in Central Oahu, Hawaii. Proceedings, Geographic Information Systems in Environmental Resources Management, Air and Waste Management Association Publication VIP-61.

Hagemann, M.F., 1994. Groundwater Characterization and Cleanup at Closing Military Bases in California. Proceedings, California Groundwater Resources Association Meeting.

Hagemann, M.F. and Sabol, M.A., 1993. Role of the U.S. EPA in the High Plains States Groundwater Recharge Demonstration Program. Proceedings, Sixth Biennial Symposium on the Artificial Recharge of Groundwater.

Hagemann, M.F., 1993. U.S. EPA Policy on the Technical Impracticability of the Cleanup of DNAPL-contaminated Groundwater. California Groundwater Resources Association Meeting.

Hagemann, M.F., 1992. Dense Nonaqueous Phase Liquid Contamination of Groundwater: An Ounce of Prevention... Proceedings, Association of Engineering Geologists Annual Meeting, v. 35.

Other Experience:

Selected as subject matter expert for the California Professional Geologist licensing examination, 2009-2011.

JESSIE MARIE JAEGER

SOIL WATER AIR PROTECTION ENTERPRISE
2656 29th Street, Suite 201
Santa Monica, California 90405
Mobile: (530) 867-6202
Office: (310) 452-5555
Fax: (310) 452-5550
Email: jessie@swape.com

SWAPE Technical Consultation, Data Analysis and Litigation Support for the Environment

EDUCATION

UNIVERSITY OF CALIFORNIA, LOS ANGELES **B.S. CONSERVATION BIOLOGY & ENVIRONMENTAL SCIENCES** *JUNE 2014*

PROJECT EXPERIENCE

SOIL WATER AIR PROTECTION ENTERPRISE ***SANTA MONICA, CA***

AIR QUALITY SPECIALIST

SENIOR ANALYST: CEQA ANALYSIS & MODELING

- Calculated roadway, stationary source, and cumulative impacts for risk and hazard analyses at proposed land use projects.
- Quantified criteria air pollutant and greenhouse gas emissions released during construction and operational activities of proposed land use projects using CalEEMod and EMFAC2011 emission factors.
- Utilized AERSCREEN, a screening dispersion model, to determine the ambient air concentrations at sensitive receptor locations.
- Organized presentations containing figures and tables comparing results of particulate matter analyses to CEQA thresholds.
- Prepared reports that discuss results of the health risk analyses conducted for several land use redevelopment projects.

SENIOR ANALYST: GREENHOUSE GAS MODELING AND DETERMINATION OF SIGNIFICANCE

- Quantified greenhouse gas (GHG) emissions of a "business as usual" scenario for proposed land use projects using CalEEMod.
- Determined compliance of proposed projects with AB 32 GHG reduction targets, with measures described in CARB's Scoping Plan for each land use sector, and with GHG significance thresholds recommended by various Air Quality Management Districts in California.
- Produced tables and figures that compare the results of the GHG analyses to applicable CEQA thresholds and reduction targets.

PROJECT MANAGER: OFF-GASSING OF FORMALDEHYDE FROM FLOORING PRODUCTS

- Determined the appropriate standard test methods to effectively measure formaldehyde emissions from flooring products.
- Compiled and analyzed laboratory testing data. Produced tables, charts, and graphs to exhibit emission levels.
- Compared finalized testing data to Proposition 65 No Significant Risk Level (NSRL) and to CARB's Phase 2 Standard.
- Prepared a final analytical report and organized supporting data for use as Expert testimony in environmental litigation.
- Participated in meetings with clients to discuss project strategy and identify solutions to achieve short and long term goals.

PROJECT ANALYST: EXPOSURE ASSESSMENT OF CONTAMINANTS EMITTED BY INCINERATOR

- Reviewed and organized sampling data, and determined the maximum levels of arsenic, dioxin, and lead in soil samples.
- Determined cumulative and hourly particulate deposition of incinerator and modeled particle dispersion locations using GIS and AERMOD.
- Conducted risk assessment using guidance set forth by the Office of Environmental Health Hazard Assessment (OEHHA).
- Utilized LeadSpread8 to evaluate exposure, and the potential adverse health effects from exposure, to lead in the environment.
- Compared final results of assessment to the Environmental Protection Agency's (EPA) Regional Screening Levels (RSLs).

ACCOMPLISHMENTS

- **Recipient**, Bruins Advantage Scholarship, University of California, Los Angeles ***SEPT 2010 – JUNE 2014***
- **Academic Honoree,** Dean's List, University of California, Los Angeles ***SEPT 2013 – JUNE 2014***
- **Academic Wellness Director**, UCLA Undergraduate Students Associated Council ***SEPT 2013 – JUNE 2014***
- **Student Groups Support Committee Member**, UCLA Undergraduate Students Associated Council ***SEPT 2012 – JUNE 2013***

Carroll, John (BOS)

From: SF Docs (LIB)
Sent: Thursday, January 14, 2016 3:02 PM
To: BOS Legislation, (BOS)
Subject: Re: Hearing Notice - CEQA Exemption Determination Appeal - Proposed Commuter Shuttle Permit Program - Appeal Hearing on January 26, 2016

Hi John,

I have posted the hearing notices.

Thank you,

Michael

From: BOS Legislation, (BOS)
Sent: Thursday, January 14, 2016 2:49 PM
To: SF Docs (LIB)
Cc: BOS Legislation, (BOS)
Subject: RE: Hearing Notice - CEQA Exemption Determination Appeal - Proposed Commuter Shuttle Permit Program - Appeal Hearing on January 26, 2016

Good afternoon,

Could you please also post the two below-linked translations of the previous hearing notice for public viewing?

151269 - Chinese

151269 - Spanish

Best to you,

John Carroll
Legislative Clerk
Board of Supervisors
San Francisco City Hall, Room 244
San Francisco, CA 94102
(415)554-4445 - Direct | (415)554-5163 - Fax
john.carroll@sfgov.org | bos.legislation@sfgov.org

Carroll, John (BOS)

From: Panopio, Sandra (ADM)
Sent: Tuesday, January 12, 2016 3:35 PM
To: Carroll, John (BOS)
Cc: Somera, Alisa (BOS); BOS Legislation, (BOS); Nevin, Peggy (BOS)
Subject: RE: Translation Request (Public Notice) - Board File No. 151269
Attachments: Hearing Notice 151269 - CHI.DOC; Hearing Notice 151269 - CHI.PDF; 151269 Public Hearing- Spa.doc

Categories: 151269

Hi John,

Good afternoon! Please find the requested translation attached.
2016年1月26日 - 市參事委員會 - 上訴聽證 - 類別（性）豁免（Categorical Exemption） - 建議「通勤者穿梭交通許可計劃」

Expediente Núm. 151269
26 de enero de 2016 – Junta de Supervisores – Audiencia de Apelación – Exención Categórica – Programa para Permisos de Autobuses Suburbanos Propuesto

Thanks,
Sandra

From: Carroll, John (BOS)
Sent: Monday, January 11, 2016 3:48 PM
To: Panopio, Sandra (ADM); Hooker, Sarah (ADM)
Cc: Somera, Alisa (BOS); BOS Legislation, (BOS); Nevin, Peggy (BOS)
Subject: Translation Request (Public Notice) - Board File No. 151269

Hello Sandra,

Please translate the following public notice into Chinese, Spanish, and Filipino (if available):

Link Language:
January 26, 2016 - Board of Supervisors - Appeal Hearing - Categorical Exemption - Proposed Commuter Shuttle Permit Program

Public Hearing Notice:
Date: Tuesday, January 26, 2016

Time: 3:00 p.m.

Location: Legislative Chamber, City Hall, Room 250
1 Dr. Carlton B. Goodlett, Place, San Francisco, CA 94102

Subject: File No. 151269. Hearing of persons interested in or objecting to the determination of categorical exemption from environmental review under the California Environmental Quality Act issued by the Planning Department on October 22, 2015, and approved by the San Francisco Municipal Transportation Agency on November

17, 2015, for the proposed Commuter Shuttle Permit Program. (Appellant: Rebecca L. Davis, on behalf of the Coalition for Fair, Legal and Environmental Transit, Sue Vaughan, and Robert Planthold) (Filed December 17, 2015).

Angela Calvillo
Clerk of the Board

Dated/Mailed/Posted: January 12, 2016

Pursuant to the protocols, the translations in each language should be received by replying to all to this e-mail within three business days; however, if possible, please reply by 12:00 p.m. on Thursday, January 14, 2016.

Thank you, kindly.

John Carroll
Legislative Clerk
Board of Supervisors
San Francisco City Hall, Room 244
San Francisco, CA 94102
(415)554-4445 - Direct | (415)554-5163 - Fax
john.carroll@sfgov.org | bos.legislation@sfgov.org

BOARD of SUPERVISORS

City Hall
1 Dr. Carlton B. Goodlett Place, Room 244
San Francisco 94102-4689
Tel. No 554-5184
Fax No. 554-5163
TTD/TTY No. 5545227

公聽會通知

三藩市市及縣市參事委員會

日期: 2016 年 1 月 26 日星期二

時間: 下午 3 時

地點: 市政廳，立法會議廳 250 室，1 Dr. Carlton B. Goodlett Place, San Francisco, CA 94102

議題: **檔案號碼 151269。** 聆訊感興趣或反對人士對環境審核的類別（性）豁免（categorical exemption）所作出的決定的意見，依據「加州環境質量法」（California Environmental Quality Act），其由規劃局於2015年10月22日頒佈，並經由三藩市市交通局於2015年11月17日通過建議的「通勤者穿梭交通許可計劃」（Commuter Shuttle Permit Program）。（上訴人：Rebecca L. Davis，代表公平、法律及環境交通聯盟 <Coalition for Fair, Legal and Environmental Transit>，Sue Vaughan和Robert Planthold）（於2015年12月17日已提交）。

Angela Calvillo
市參事委員會書記

日期/郵寄/張貼: **January 12, 2016**

BOARD of SUPERVISORS

City Hall
1 Dr. Carlton B. Goodlett Place, Room 244
San Francisco 94102-4689
Tel. No 554-5184
Fax No. 554-5163
TTD/TTY No. 5545227

NOTIFICACIÓN DE AUDIENCIA PÚBLICA

JUNTA DE SUPERVISORES DE LA CIUDAD Y CONDADO DE SANFRANCISCO

SE NOTIFICA POR LA PRESENTE que el Comité de Uso de Terrenos y Transporte celebrará una audiencia pública para considerar la siguiente propuesta y dicha audiencia pública se celebrará de la siguiente manera, en tal momento que todos los interesados podrán asistir y ser escuchados:

Fecha: **Martes, 26 de enero de 2016**

Hora: **3:00 p.m.**

Lugar: **Cámara Legislativa, Sala 250 del Ayuntamiento**
1 Dr. Carlton B. Goodlett Place, San Francisco, CA

Asunto: **Expediente Núm. 151269.** Audiencia a las personas interesadas en, o que se oponen a la determinación de una categoría exenta a la revisión medioambiental conforme con la Ley de Calidad Medioambiental de California que el Departamento de Planificación emitió el 22 de octubre de 2015, y que la Agencia de Transporte Municipal de San Francisco aprobó el 17 de noviembre de 2015 para el propuesto Programa para Permisos de Autobuses Suburbanos. (Apelante: Rebecca L. Davis, en nombre de la Coalición para el Tránsito Justo, Legal y Medioambiental, Sue Vaughan, y Robert Planthold) (Presentada el 17 de diciembre 2015).

De acuerdo con la Sección 67.7-1 del Código Administrativo, las personas que no puedan acudir a la audiencia sobre este asunto podrán presentar comentarios por escrito antes de la hora de comienzo de la audiencia. Estos comentarios serán parte del registro público oficial sobre este asunto y se pondrán a la atención de la Junta de Supervisores. Los comentarios por escrito deben dirigirse a: Angela Calvillo, Secretaria de la Junta, Ayuntamiento, 1 Dr. Carlton B. Goodlett Place, Sala 244, San Francisco, CA, 94102. La información relativa a este asunto está disponible en la Oficina del Secretaría de la Junta e información de la agenda relativa a este asunto estará disponible para la revisión pública en el viernes 22 de enero de 2016.

Angela Calvillo,
Secretaria de la Junta

FECHADO: 12 de enero de 2016
ANUNCIADO: 12 de enero de 2016
PUBLICADO: 12 de enero de 2016

Carroll, John (BOS)

From: SF Docs (LIB)
Sent: Tuesday, January 12, 2016 10:22 AM
To: BOS Legislation, (BOS)
Subject: Re: Hearing Notice - CEQA Exemption Determination Appeal - Proposed Commuter Shuttle Permit Program - Appeal Hearing on January 26, 2016

Categories: 151269

Hi John,

I have posted the hearing notice.

Thank you,

Michael

From: BOS Legislation, (BOS)
Sent: Tuesday, January 12, 2016 10:09 AM
To: SF Docs (LIB)
Cc: BOS Legislation, (BOS)
Subject: FW: Hearing Notice - CEQA Exemption Determination Appeal - Proposed Commuter Shuttle Permit Program - Appeal Hearing on January 26, 2016

Good morning,

Please post the below-linked hearing notice for public viewing.

Thanks so much. Best to you,

John Carroll
Legislative Clerk
Board of Supervisors
San Francisco City Hall, Room 244
San Francisco, CA 94102
(415)554-4445 - Direct | (415)554-5163 - Fax
john.carroll@sfgov.org | bos.legislation@sfgov.org

Click here to complete a Board of Supervisors Customer Service Satisfaction form.

The Legislative Research Center provides 24-hour access to Board of Supervisors legislation and archived matters since August 1998.

From: BOS Legislation, (BOS)
Sent: Tuesday, January 12, 2016 9:40 AM
To: Rebecca Davis (rebecca@lozeaudrury.com) <rebecca@lozeaudrury.com>; Wise, Viktoriya (MTA) <viktoriya.a.wise@sfmta.com>; Willson, Hank (MTA) <hank.willson@sfmta.com>; Espiritu, Christopher (CPC) <christopher.espiritu@sfgov.org>; Rahaim, John (CPC) <john.rahaim@sfgov.org>; Jones, Sarah (CPC) <sarah.b.jones@sfgov.org>; Starr, Aaron (CPC) <aaron.starr@sfgov.org>; Rodgers, AnMarie (CPC) <anmarie.rodgers@sfgov.org>; Sanchez, Scott (CPC) <scott.sanchez@sfgov.org>; Ionin, Jonas (CPC) <jonas.ionin@sfgov.org>; Givner, Jon (CAT) <jon.givner@sfgov.org>; Warren, Elaine (CAT) <elaine.warren@sfgov.org>; Zane Gresham (zgresham@mofo.com) <zgresham@mofo.com>; Miles Imwalle (mlmwalle@mofo.com) <mlmwalle@mofo.com>; David Gold (dgold@mofo.com) <dgold@mofo.com>; Dan Gershwin (DGershwin@mofo.com) <DGershwin@mofo.com>; Adrian Covert (acovert@bayareacouncil.org) <acovert@bayareacouncil.org>; Richard Drury (richard@lozeaudrury.com) <richard@lozeaudrury.com>; Theresa Rettinghouse (theresa@lozeaudrury.com) <theresa@lozeaudrury.com>; Sue Vaughan (susan.e.vaughan@sonic.net) <susan.e.vaughan@sonic.net>; Wise, Viktoriya (MTA) <viktoriya.a.wise@sfmta.com>; Willson, Hank (MTA) <hank.willson@sfmta.com>; Espiritu, Christopher (CPC) <christopher.espiritu@sfgov.org>; Rahaim, John (CPC) <john.rahaim@sfgov.org>; Jones, Sarah (CPC) <sarah.b.jones@sfgov.org>; Starr, Aaron (CPC) <aaron.starr@sfgov.org>; Rodgers, AnMarie (CPC) <anmarie.rodgers@sfgov.org>; Sanchez, Scott (CPC) <scott.sanchez@sfgov.org>; Ionin, Jonas (CPC) <jonas.ionin@sfgov.org>; Givner, Jon (CAT) <jon.givner@sfgov.org>; Warren, Elaine (CAT) <elaine.warren@sfgov.org>; BOS-Supervisors <bos-supervisors@sfgov.org>; BOS-Legislative Aides <bos-legislative_aides@sfgov.org>
Cc: Calvillo, Angela (BOS) <angela.calvillo@sfgov.org>; Somera, Alisa (BOS) <alisa.somera@sfgov.org>; Carroll, John (BOS) <john.carroll@sfgov.org>; BOS Legislation, (BOS) <bos.legislation@sfgov.org>
Subject: Hearing Notice - CEQA Exemption Determination Appeal - Proposed Commuter Shuttle Permit Program - Appeal Hearing on January 26, 2016

Good morning,

The Office of the Clerk of the Board has scheduled an appeal hearing for Special Order on **January 26, 2016, at 3:00 p.m.,** to hear an appeal of the determination of exemption from environmental review under the California Environmental Quality Act for the proposed Commuter Shuttle Permit Program, filed by Rebecca L. Davis, on behalf of the Coalition for Fair, Legal and Environmental Transit, Sue Vaughan, and Robert Planthold.

Please find the following link to the hearing notice for the matter

January 26, 2016 - Board of Supervisors - Appeal Hearing - Proposed Commuter Shuttle Permit Program

I invite you to review the entire matter on our Legislative Research Center by following the links below.

Board of Supervisors File No. 151269

Thank you,

John Carroll
Legislative Clerk
Board of Supervisors
San Francisco City Hall, Room 244
San Francisco, CA 94102
(415)554-4445 - Direct | (415)554-5163 - Fax
john.carroll@sfgov.org | bos.legislation@sfgov.org

__Disclosures:__ Personal information that is provided in communications to the Board of Supervisors is subject to disclosure under the California Public Records Act and the San Francisco Sunshine Ordinance. Personal information provided will not be redacted. Members of the public are not required to provide personal identifying information when they communicate with the Board of Supervisors and its committees. All written or oral communications that members of the public submit to the Clerk's Office regarding pending legislation or hearings will be made available to all members of the public for inspection and copying. The Clerk's Office does not redact any information from these submissions. This means that personal information—including names, phone numbers, addresses and similar information that a member of the public elects to submit to the Board and its committees—may appear on the Board of Supervisors website or in other public documents that members of the public may inspect or copy.

BOARD of SUPERVISORS

City Hall
1 Dr. Carlton B. Goodlett Place, Room 244
San Francisco 94102-4689
Tel. No. 554-5184
Fax No. 554-5163
TDD/TTY No. 544-5227

PROOF OF MAILING

Legislative File No. 151269

Description of Items: **Hearing of persons interested in or objecting to the determination of categorical exemption from environmental review under the California Environmental Quality Act issued by the Planning Department on October 22, 2015, and approved by the San Francisco Municipal Transportation Agency on November 17, 2015, for the proposed Commuter Shuttle Permit Program. (Appellant: Rebecca L. Davis, on behalf of the Coalition for Fair, Legal and Environmental Transit, Sue Vaughan, and Robert Planthold) (Filed December 17, 2015).**

I, John Carroll, an employee of the City and County of San Francisco, mailed the above described document(s) by depositing the sealed items with the United States Postal Service (USPS) with the postage fully prepaid as follows:

Date: January 12, 2016

Time: 10:00 a.m.

USPS Location: Repro Pick-up Box in the Clerk of the Board's Office (Rm 244)

Mailbox/Mailslot Pick-Up Times (if applicable): N/A

Signature:

Instructions: Upon completion, original must be filed in the above referenced file.

Carroll, John (BOS)

From:	BOS Legislation, (BOS)
Sent:	Tuesday, January 12, 2016 9:40 AM
To:	Rebecca Davis (rebecca@lozeaudrury.com); Wise, Viktoriya (MTA); Willson, Hank (MTA); Espiritu, Christopher (CPC); Rahaim, John (CPC); Jones, Sarah (CPC); Starr, Aaron (CPC); Rodgers, AnMarie (CPC); Sanchez, Scott (CPC); Ionin, Jonas (CPC); Givner, Jon (CAT); Warren, Elaine (CAT); Zane Gresham (zgresham@mofo.com); Miles Imwalle (mlmwalle@mofo.com); David Gold (dgold@mofo.com); Dan Gershwin (DGershwin@mofo.com); Adrian Covert (acovert@bayareacouncil.org); Richard Drury (richard@lozeaudrury.com); Theresa Rettinghouse (theresa@lozeaudrury.com); Sue Vaughan (susan.e.vaughan@sonic.net); Wise, Viktoriya (MTA); Willson, Hank (MTA); Espiritu, Christopher (CPC); Rahaim, John (CPC); Jones, Sarah (CPC); Starr, Aaron (CPC); Rodgers, AnMarie (CPC); Sanchez, Scott (CPC); Ionin, Jonas (CPC); Givner, Jon (CAT); Warren, Elaine (CAT); BOS-Supervisors; BOS-Legislative Aides
Cc:	Calvillo, Angela (BOS); Somera, Alisa (BOS); Carroll, John (BOS); BOS Legislation, (BOS)
Subject:	Hearing Notice - CEQA Exemption Determination Appeal - Proposed Commuter Shuttle Permit Program - Appeal Hearing on January 26, 2016
Categories:	151269

Good morning,

The Office of the Clerk of the Board has scheduled an appeal hearing for Special Order on **January 26, 2016, at 3:00 p.m.,** to hear an appeal of the determination of exemption from environmental review under the California Environmental Quality Act for the proposed Commuter Shuttle Permit Program, filed by Rebecca L. Davis, on behalf of the Coalition for Fair, Legal and Environmental Transit, Sue Vaughan, and Robert Planthold.

Please find the following link to the hearing notice for the matter

January 26, 2016 - Board of Supervisors - Appeal Hearing - Proposed Commuter Shuttle Permit Program

I invite you to review the entire matter on our Legislative Research Center by following the links below.

Board of Supervisors File No. 151269

Thank you,

John Carroll
Legislative Clerk
Board of Supervisors
San Francisco City Hall, Room 244
San Francisco, CA 94102
(415)554-4445 - Direct | (415)554-5163 - Fax
john.carroll@sfgov.org | bos.legislation@sfgov.org

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Carroll, John (BOS)

From: Carroll, John (BOS)
Sent: Monday, January 11, 2016 3:48 PM
To: Panopio, Sandra (ADM); Hooker, Sarah (ADM)
Cc: Somera, Alisa (BOS); BOS Legislation, (BOS); Nevin, Peggy (BOS)
Subject: Translation Request (Public Notice) - Board File No. 151269
Attachments: Hearing Notice 011216.pdf

Categories: 151269

Hello Sandra,

Please translate the following public notice into Chinese, Spanish, and Filipino (if available):

Link Language:
January 26, 2016 - Board of Supervisors - Appeal Hearing - Categorical Exemption - Proposed Commuter Shuttle Permit Program

Public Hearing Notice:
Date: Tuesday, January 26, 2016

Time: 3:00 p.m.

Location: Legislative Chamber, City Hall, Room 250
1 Dr. Carlton B. Goodlett, Place, San Francisco, CA 94102

Subject: File No. 151269. Hearing of persons interested in or objecting to the determination of categorical exemption from environmental review under the California Environmental Quality Act issued by the Planning Department on October 22, 2015, and approved by the San Francisco Municipal Transportation Agency on November 17, 2015, for the proposed Commuter Shuttle Permit Program. (Appellant: Rebecca L. Davis, on behalf of the Coalition for Fair, Legal and Environmental Transit, Sue Vaughan, and Robert Planthold) (Filed December 17, 2015).

Angela Calvillo
Clerk of the Board

Dated/Mailed/Posted: January 12, 2016

Pursuant to the protocols, the translations in each language should be received by replying to all to this e-mail within three business days; however, if possible, please reply by 12:00 p.m. on Thursday, January 14, 2016.

Thank you, kindly.

John Carroll
Legislative Clerk
Board of Supervisors
San Francisco City Hall, Room 244
San Francisco, CA 94102
(415)554-4445 - Direct | (415)554-5163 - Fax
john.carroll@sfgov.org | bos.legislation@sfgov.org

BOARD of SUPERVISORS

City Hall
1 Dr. Carlton B. Goodlett Place, Room 244
San Francisco 94102-4689
Tel. No. 554-5184
Fax No. 554-5163
TDD/TTY No. 554-5227

NOTICE OF PUBLIC HEARING

BOARD OF SUPERVISORS OF THE CITY AND COUNTY OF SAN FRANCISCO

NOTICE IS HEREBY GIVEN THAT the Board of Supervisors of the City and County of San Francisco will hold a public hearing to consider the following appeal and said public hearing will be held as follows, at which time all interested parties may attend and be heard:

Date: **Tuesday, January 26, 2016**

Time: **3:00 p.m.**

Location: **Legislative Chamber, City Hall, Room 250**
1 Dr. Carlton B. Goodlett, Place, San Francisco, CA 94102

Subject: **File No. 151269.** Hearing of persons interested in or objecting to the determination of categorical exemption from environmental review under the California Environmental Quality Act issued by the Planning Department on October 22, 2015, and approved by the San Francisco Municipal Transportation Agency on November 17, 2015, for the proposed Commuter Shuttle Permit Program. (Appellant: Rebecca L. Davis, on behalf of the Coalition for Fair, Legal and Environmental Transit, Sue Vaughan, and Robert Planthold) (Filed December 17, 2015).

In accordance with Administrative Code, Section 67.7-1, persons who are unable to attend the hearing on this matter may submit written comments prior to the time the hearing begins. These comments will be made as part of the official public record in this matter and shall be brought to the attention of the Board of Supervisors. Written comments should be addressed to Angela Calvillo, Clerk of the Board, City Hall, 1 Dr. Carlton B. Goodlett Place, Room 244, San Francisco, CA, 94102. Information relating to this matter is available in the Office of the Clerk of the Board and agenda information relating to this matter will be available for public review on Friday, January 22, 2016.

Angela Calvillo
Clerk of the Board

DATED/MAILED/POSTED: January 12, 2016 3273

BOARD of SUPERVISORS

City Hall
1 Dr. Carlton B. Goodlett Place, Room 244
San Francisco 94102-4689
Tel. No. 554-5184
Fax No. 554-5163
TDD/TTY No. 544-5227

January 5, 2016

File No. 151269
Planning Case No. 2015-007975ENV

Received from the Board of Supervisors Clerk's Office one check, in the amount of Five Hundred Sixty Two Dollars ($562), representing filing fee paid by Rebecca L. Davis for appeal of the Exemption Determination for the proposed Commuter Shuttle Permit Program Appeal.

Planning Department
By:

Tony Young
Print Name

1/6/16
Signature and Date

Carroll, John (BOS)

From: Carroll, John (BOS)
Sent: Tuesday, January 05, 2016 2:04 PM
To: Ko, Yvonne (CPC)
Cc: Espiritu, Christopher (CPC); BOS Legislation, (BOS)
Subject: Commuter Shuttle Permit Program Appeal - Appeal Check Available for Pickup in the Clerk's Office

Categories: 151269

Good afternoon,

I have set aside the appeal check for the Commuter Shuttle Permit Program Appeal; it's available for pickup here in the Clerk's Office weekdays from 8 a.m. through 5 p.m.

Regards,

John Carroll
Legislative Clerk
Board of Supervisors
San Francisco City Hall, Room 244
San Francisco, CA 94102
(415)554-4445 - Direct | (415)554-5163 - Fax
john.carroll@sfgov.org | bos.legislation@sfgov.org

Carroll, John (BOS)

From: Young, Victor
Sent: Wednesday, December 23, 2015 3:15 PM
To: rebecca@lozeaudrury.com
Cc: Carroll, John (BOS); Somera, Alisa (BOS); Wise, Viktoriya (MTA); Sanchez, Scott (CPC); Willson, Hank (MTA); Givner, Jon (CAT); Stacy, Kate (CAT); Pearson, Anne (CAT); Rahaim, John (CPC); Jones, Sarah (CPC); Starr, Aaron (CPC); Rodgers, AnMarie (CPC); Espiritu, Christopher (CPC); Ionin, Jonas (CPC); zgresham@mofo.com; mlmwalle@mofo.com; dgold@mofo.com; Calvillo, Angela (BOS); BOS-Supervisors; BOS-Legislative Aides
Subject: CEQA Appeal - Proposed Commuter Shuttle Permit Program - Appeal Hearing Date January 26, 2016

Categories: 151269

Good afternoon,

The Office of the Clerk of the Board has scheduled an appeal hearing for a Special Order before the Board of Supervisors on **Tuesday, January 26, 2016, at 3:00 p.m.** Please find linked below a letter regarding the appeal of the categorical exemption from environmental review for the Proposed Commuter Shuttle Permit Program.

Clerk of the Board Letter – December 23, 2015

Appeal Letter – December 17, 2015

I invite you to review the entire matter on our Legislative Research Center by following the link below.

Board of Supervisors File No. 151269

Thank you,

Victor Young
Assistant Clerk
Board of Supervisors
1 Dr. Carlton B. Goodlett Place, City Hall., Room 244
San Francisco CA 94102
phone 415-554-7724 | fax 415-554-5163
victor.young@sfgov.org | www.sfbos.org

BOARD of SUPERVISORS

City Hall
1 Dr. Carlton B. Goodlett Place, Room 244
San Francisco 94102-4689
Tel. No. 554-5184
Fax No. 554-5163
TDD/TTY No. 544-5227

December 23, 2015

Rebecca L. Davis
Lozeau Drury LLP
410 12 Street Suite 250
Oakland, CA 94607

Subject: Appeal of California Environmental Quality Act (CEQA) Determination of Exemption from Environmental Review - Proposed Commuter Shuttle Permit Program

Dear Ms. Davis:

The Office of the Clerk of the Board is in receipt of a memorandum dated December 21, 2015, from the Planning Department regarding their determination on the timeliness of your filing of appeal of the California Environmental Quality Act determination of exemption from environmental review for the proposed Commuter Shuttle Permit Program.

The Planning Department has determined that the appeal was filed in a timely manner.

The appeal filing period for the CEQA Exemption Determination closed on Thursday, December 17, 2015. Pursuant to Administrative Code, Section 31.16, and Planning Code, Section 308.1, a hearing date has been scheduled for **Tuesday, January 26, 2016, at 3:00 p.m.**, at the Board of Supervisors meeting to be held in City Hall, 1 Dr. Carlton B. Goodlett Place, Legislative Chamber, Room 250, San Francisco, CA 94102.

Continues on next page

Please provide to the Clerk's Office by noon:

20 days prior to the hearing: names and addresses of interested parties to be notified of the hearing, in spreadsheet format; and

11 days prior to the hearing: any documentation which you may want available to the Board members prior to the hearing.

For the above, the Clerk's office requests one electronic file (sent to bos.legislation@sfgov.org) and two copies of the documentation for distribution.

NOTE: If electronic versions of the documentation are not available, please submit 18 hard copies of the materials to the Clerk's Office for distribution. If you are unable to make the deadlines prescribed above, it is your responsibility to ensure that all parties receive copies of the materials.

If you have any questions, please feel free to contact John Carroll, Legislative Clerk, at (415) 554-4445.

Very truly yours,

Alisa Somera

for Angela Calvillo
Clerk of the Board

c: Viktoriya Wise, Municipal Transportation Agency
Hank Willson, Municipal Transportation Agency
Jon Givner, Deputy City Attorney
Kate Stacy, Deputy City Attorney
Audrey Pearson, Deputy City Attorney
John Rahaim, Planning Director
Scott Sanchez, Zoning Administrator, Planning Department
Sarah Jones, Planning Department
Aaron Starr, Planning Department
AnMarie Rodgers, Planning Department
Christopher Espiritu, Planning Department
Jonas Ionin, Planning Commission Secretary

Carroll, John (BOS)

From: Jones, Sarah (CPC)
Sent: Monday, December 21, 2015 3:03 PM
To: Carroll, John (BOS); Rahaim, John (CPC)
Cc: Givner, Jon (CAT); Stacy, Kate (CAT); Sanchez, Scott (CPC); Rodgers, AnMarie (CPC); Starr, Aaron (CPC); Espiritu, Christopher (CPC); Ionin, Jonas (CPC); Wise, Viktoriya (MTA); Willson, Hank (MTA); BOS-Supervisors; BOS-Legislative Aides; Calvillo, Angela (BOS); BOS Legislation, (BOS); Somera, Alisa (BOS)
Subject: RE: Appeal of CEQA Negative Declaration - Proposed Commuter Shuttle Permit Program - Timeliness Determination Request
Attachments: SFMTA Commuter Shuttle Program - Timeliness Determination.pdf

Categories: 151269

Please see attached determination, indicating that the appeal has been found timely.

Sarah Bernstein Jones
Environmental Review Officer
Director of Environmental Planning

Planning Department | City and County of San Francisco
1650 Mission Street, Suite 400, San Francisco, CA 94103
Direct: 415-575-9034 | Fax: 415-558-6409
Email: sarah.b.jones@sfgov.org
Web: www.sfplanning.org

From: Carroll, John (BOS)
Sent: Friday, December 18, 2015 8:54 AM
To: Rahaim, John (CPC)
Cc: Givner, Jon (CAT); Stacy, Kate (CAT); Sanchez, Scott (CPC); Jones, Sarah (CPC); Rodgers, AnMarie (CPC); Starr, Aaron (CPC); Espiritu, Christopher (CPC); Ionin, Jonas (CPC); Wise, Viktoriya (MTA); Willson, Hank (MTA); BOS-Supervisors; BOS-Legislative Aides; Calvillo, Angela (BOS); BOS Legislation, (BOS); Carroll, John (BOS); Somera, Alisa (BOS)
Subject: Appeal of CEQA Negative Declaration - Proposed Commuter Shuttle Permit Program - Timeliness Determination Request

Dear Director Rahaim,

The Office of the Clerk of the Board is in receipt of an Appeal of the CEQA Certificate of Determination of Categorical Exemption for the proposed Commuter Shuttle Permit Program. The appeal was filed on December 17, 2015, by Rebecca L. Davis, on behalf of The Coalition for Fair, Legal and Environmental Transit, Service Employees International Union Local 1021, Sue Vaughan, and Robert Planthold.

Please review for timely filing determination.

Thank you in advance.

John Carroll
Legislative Clerk
Board of Supervisors
San Francisco City Hall, Room 244
San Francisco, CA 94102
(415)554-4445 - Direct | (415)554-5163 - Fax

john.carroll@sfgov.org | bos.legislation@sfgov.org

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SAN FRANCISCO
PLANNING DEPARTMENT

MEMO

1650 Mission St.
Suite 400
San Francisco,
CA 94103-2479

Reception:
415.558.6378

Fax:
415.558.6409

Planning
Information:
415.558.6377

DATE:	**December 21, 2015**
TO:	**Angela Calvillo, Clerk of the Board of Supervisors**
FROM:	**Sarah B. Jones, Environmental Review Officer**
RE:	**Appeal timeliness determination – SFMTA - Commuter Shuttle Program, Planning Department Case No. 2015-007975E**

An appeal of the categorical exemption for the proposed SFMTA – Commuter Shuttle Program (Planning Department Case No. 2015-007975E) was filed with the Office of the Clerk of the Board on December 17, 2015 by Rebecca L. Davis, on behalf of The Coalition for Fair, Legal and Environmental Transit, Service Employees International Union Local 1021, Sue Vaughan, and Robert Planthold.

Timeline: The Categorical Exemption was issued on October 22, 2015. The exemption identified the Approval Action for the project as the duly noticed hearing by the SFMTA Board of Directors, which occurred on November 17, 2015 (Date of the Approval Action).

Timeliness Determination: Section 31.16(a) and (e) of the San Francisco Administrative Code states that any person or entity may appeal an exemption determination to the Board of Supervisors during the time period beginning with the date of the exemption determination and ending 30 days after the Date of the Approval Action. If the 30th day after the Date of the Approval Action falls on a Saturday, Sunday, or holiday, an appeal may be filed before 5:00pm on the next business day.

The appeal of the exemption determination was filed on December 17, 2015, which is the 30th business day within 30 days after the Date of the Approval Action and is within the time frame specified above. Therefore the appeal is considered timely.

Section 31.16(b)(4) of the San Francisco Administrative Code states that the Clerk of the Board shall schedule the appeal hearing no less than 21 days and no more than 45 days following expiration of the specified time period for filing of the appeal.

Carroll, John (BOS)

From:	Carroll, John (BOS)
Sent:	Friday, December 18, 2015 8:54 AM
To:	Rahaim, John (CPC)
Cc:	Givner, Jon (CAT); Stacy, Kate (CAT); Sanchez, Scott (CPC); Jones, Sarah (CPC); Rodgers, AnMarie (CPC); Starr, Aaron (CPC); Espiritu, Christopher (CPC); Ionin, Jonas (CPC); Wise, Viktoriya (MTA); Willson, Hank (MTA); BOS-Supervisors; BOS-Legislative Aides; Calvillo, Angela (BOS); BOS Legislation, (BOS); Carroll, John (BOS); Somera, Alisa (BOS)
Subject:	Appeal of CEQA Negative Declaration - Proposed Commuter Shuttle Permit Program - Timeliness Determination Request
Attachments:	COB Ltr 121715.pdf; Appeal Ltr 121715.pdf
Categories:	151269

Dear Director Rahaim,

The Office of the Clerk of the Board is in receipt of an Appeal of the CEQA Certificate of Determination of Categorical Exemption for the proposed Commuter Shuttle Permit Program. The appeal was filed on December 17, 2015, by Rebecca L. Davis, on behalf of The Coalition for Fair, Legal and Environmental Transit, Service Employees International Union Local 1021, Sue Vaughan, and Robert Planthold.

Please review for timely filing determination.

Thank you in advance.

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BOARD of SUPERVISORS

City Hall
1 Dr. Carlton B. Goodlett Place, Room 244
San Francisco 94102-4689
Tel. No. 554-5184
Fax No. 554-5163
TDD/TTY No. 544-5227

December 17, 2015

To: John Rahaim
Planning Director

From: Angela Calvillo
Clerk of the Board of Supervisors

Subject: Appeal of California Environmental Quality Act (CEQA) Categorical Exemption Determination - Proposed Commuter Shuttle Permit Program

An appeal of the CEQA Certificate of Determination of Categorical Exemption for the proposed Commuter Shuttle Permit Program, was filed with the Office of the Clerk of the Board on December 17, 2015, by Rebecca L. Davis, on behalf of The Coalition for Fair, Legal and Environmental Transit, Service Employees International Union Local 1021, Sue Vaughan, and Robert Planthold.

Pursuant to Administrative Code, Chapter 31.16, I am forwarding this appeal, with attached documents, to the Planning Department to determine if the appeal has been filed in a timely manner. The Planning Department's determination should be made within three (3) working days of receipt of this request.

If you have any questions, please feel free to contact John Carroll, Legislative Clerk, at (415) 554-4445.

c: Jon Givner, Deputy City Attorney
Kate Stacy, Deputy City Attorney
Scott Sanchez, Zoning Administrator, Planning Department
Sarah Jones, Environmental Review Officer, Planning Department
AnMarie Rodgers, Planning Department
Aaron Starr, Planning Department
Christopher Espititu, Planning Department
Jonas Ionin, Planning Department
Viktoriya Wise, Municipal Transportation Agency
Hank Wilson, Municipal Transportation Agency

Print Form

Introduction Form

By a Member of the Board of Supervisors or the Mayor

Time stamp
or meeting date

I hereby submit the following item for introduction (select only one):

☐ 1. For reference to Committee. (An Ordinance, Resolution, Motion, or Charter Amendment)

☐ 2. Request for next printed agenda Without Reference to Committee.

☒ 3. Request for hearing on a subject matter at Committee.

☐ 4. Request for letter beginning "Supervisor [ ] inquires"

☐ 5. City Attorney request.

☐ 6. Call File No. [ ] from Committee.

☐ 7. Budget Analyst request (attach written motion).

☐ 8. Substitute Legislation File No. [ ]

☐ 9. Reactivate File No. [ ]

☐ 10. Question(s) submitted for Mayoral Appearance before the BOS on [ ]

Please check the appropriate boxes. The proposed legislation should be forwarded to the following:

☐ Small Business Commission ☐ Youth Commission ☐ Ethics Commission

☐ Planning Commission ☐ Building Inspection Commission

Note: For the Imperative Agenda (a resolution not on the printed agenda), use a Imperative Form.

Sponsor(s):

Clerk of the Board

Subject:

Public Hearing - Appeal of Categorical Exemption from Environmental Review - Proposed Commuter Shuttle Permit Program

The text is listed below or attached:

Hearing of persons interested in or objecting to the determination of categorical exemption from environmental review under the California Environmental Quality Act issued by the Planning Department on October 22, 2015, and approved by the San Francisco Municipal Transportation Agency on November 17, 2015, for the proposed Commuter Shuttle Permit Program. (Appellant: Rebecca L. Davis, on behalf of the Coalition for Fair, Legal and Environmental Transit, Sue Vaughan, and Robert Planthold) (Filed December 17, 2015).

Signature of Sponsoring Supervisor: for Alisa Somera

For Clerk's Use Only:

151269