Final 7th Addendum to the
TRANSBAY JOINT POWERS AUTHORITY
TRANSBAY TERMINAL/CALTRAIN DOWNTOWN
EXTENSION/REDEVELOPMENT PROJECT
FINAL ENVIRONMENTAL IMPACT STATEMENT/REPORT

FOR THE PROPOSED

GOLDEN GATE TRANSIT
MID-DAY BUS PARKING FACILITY RELOCATION PROJECT

State Clearinghouse No. 95063004

Prepared for

Golden Gate Bridge
Highway and Transportation District

Prepared by

AECOM

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1.0 INTRODUCTION

1.1 DOCUMENT ORGANIZATION

This Addendum is organized into five sections as follows:

Introduction: This section provides introductory information such as background and purpose, summary findings, the project title, and the lead agency for the proposed project.

Project Description: This section provides a detailed description of the project setting, related projects, and the proposed project, including project characteristics, project objectives, and environmental review requirements.

Addendum Checklist and Environmental Impact Analysis: This section contains the completed Addendum Checklist. Each environmental issue identified in the Addendum Checklist contains an assessment and discussion of impacts associated with each subject area. When the evaluation identifies potentially significant effects, as identified in the Checklist, mitigation measures are provided to reduce such impacts to less-than-significant levels.

References: This section provides data sources used in the review of environmental impacts and the conclusions reached in the Addendum.

List of Preparers: This section provides a list of GGBHTD personnel and other team members who participated in the preparation of the Addendum.

1.2 BACKGROUND AND PURPOSE

In April 2004, the Transbay Terminal/Caltrain Downtown Extension/Redevelopment Project (Transbay Program) Final Environmental Impact Statement/Environmental Impact Report (2004 FEIS/EIR) (SCH #95063004) was certified by the City and County of San Francisco, the Peninsula Corridor Joint Powers Board, and the San Francisco Redevelopment Agency. To date, the Transbay Terminal Joint Powers Authority, as lead agency for the Transbay Terminal portion of the project, has adopted six addenda to the original document. As used herein, "FEIS/EIR" includes all subsequently approved addenda.

This Seventh Addendum is being considered by the Golden Gate Bridge, Highway and Transportation District ("GGBHTD"), which is the lead agency for the development of the Mid-Day Bus Storage lot on the block bounded by Third, Fourth, Stillman and Perry Streets in San Francisco. Subsequent to certification of the 2004 FEIS /EIR, additional planning was initiated related to the details of the Mid-day Bus Parking Facility. This Addendum has been prepared pursuant to Section 15164 of the California Environmental Quality Act (CEQA) Guidelines (Title 14, California Code of Regulations, Section 15000 et seq.), which provides that the lead agency or responsible agency shall prepare an addendum to a previously certified environmental impact report (EIR) if some changes or additions are necessary but none of the changes or additions increase the level of environmental impacts to an extent requiring the preparation of a subsequent EIR (See CEQA Guideline 15162).

The replacement of the Transbay Terminal with the new Transbay Transit Center and the redevelopment of the surrounding area required that Golden Gate Transit relocate its previous San Francisco Mid-day Bus Parking

Facility—located on the block bounded by Main Street, Beale Street, Howard Street, and Folsom Street— to a new site. The proposed project site is located under the elevated portion of Interstate 80 (West Approach of the San Francisco-Oakland Bay Bridge) on the block bounded by Third Street, Fourth Street, Perry Street, and Stillman Street. Since the proposed project site could not be occupied until after the seismic retrofit of the West Approach was completed, Golden Gate Transit's Mid-day Bus Parking Facility was temporarily relocated to the current location at Eighth Street and Harrison Street. The proposed project evaluated herein consists of moving the Golden Gate Transit Mid-day Bus Parking Facility from the temporary location at Eighth Street and Harrison Street to the project site. The use of the proposed project site was examined in the FEIS/EIR, but several changes and refinements to the project are proposed. The purpose of this document is to evaluate the potential impacts associated with the proposed changes and refinements to the bus lot component of the project studied in the FEIS/EIR. This Addendum provides an accurate and objective discussion of environmental effects of the changes to the proposed project and is intended to inform decision makers, agencies, and the public.

1.3 SUMMARY FINDINGS

This Seventh Addendum is focused on the environmental topics that could show a potential change in the level of impact under the revised proposed project, namely air quality, greenhouse gas (GHG) emissions, noise, and transportation and traffic. As a result of the analysis conducted in this Seventh Addendum, it has been determined that all of these potential impacts would be classified as Less Than Significant or No Impact. All potentially significant impacts associated with the bus storage lot were previously evaluated in the FEIS/EIR. The proposed refinements to the bus storage lot are similar to previous design components evaluated in the FEIS/EIR, and no new or substantially more severe significant impacts have been identified or are anticipated to be identified, nor would these elements substantially change the severity or significance of the environmental impacts disclosed in the FEIS/EIR.

Therefore, the modifications described in this Addendum would not require major revisions to the FEIS/EIR due to new or substantially increased significant environmental effects. Furthermore, there have been no substantial changes with respect to the circumstances under which these design refinements would be undertaken that would require major revisions of the FEIS/EIR due to new or substantially increased significant environmental effects; and there has been no discovery of new information of substantial importance that would trigger or require major revisions to the FEIS/EIR due to new or substantially increased significant environmental effects. Therefore, no subsequent or supplemental environmental impact reports are required pursuant to CEQA Guidelines Sections 15162.

1.4 PROJECT INFORMATION

Project Title: Golden Gate Transit Mid-day Bus Parking Facility Relocation

Project Location: Third Street and Perry Street in San Francisco, CA

Lead Agency: GGBHTD

Project Sponsor: GGBHTD

GGBHTD Contact Person: Daniel Ng, PE, Senior Civil Engineer (415) 923-2323

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2.0 PROJECT DESCRIPTION

2.1 PROJECT SETTING

2.1.1 Project Location

The existing Golden Gate Transit Mid-day Bus Parking Facility is currently located at Eighth Street and Harrison Street, at the southeast corner of the block generally bounded by Eighth Street, Ninth Street (specifically, Gordon Street), Folsom Street (specifically, Ringold Street), and Harrison Street.

The proposed Golden Gate Transit Mid-day Bus Parking Facility would be located on the block generally bounded by Third Street, Fourth Street, Perry Street, and Stillman Street.

2.1.2 Description of Project Site and Existing Land Uses

The project site is located on the block bounded by Third Street, Fourth Street, Perry Street, and Stillman Street, underneath the elevated Interstate 80 (I-80) freeway (West Approach of the San Francisco–Oakland Bay Bridge or West Approach). The site is paved and fenced and is currently being used for daily vehicle parking. The project site is illustrated in Figure 2-1.

2.1.3 Description of the Surrounding Area

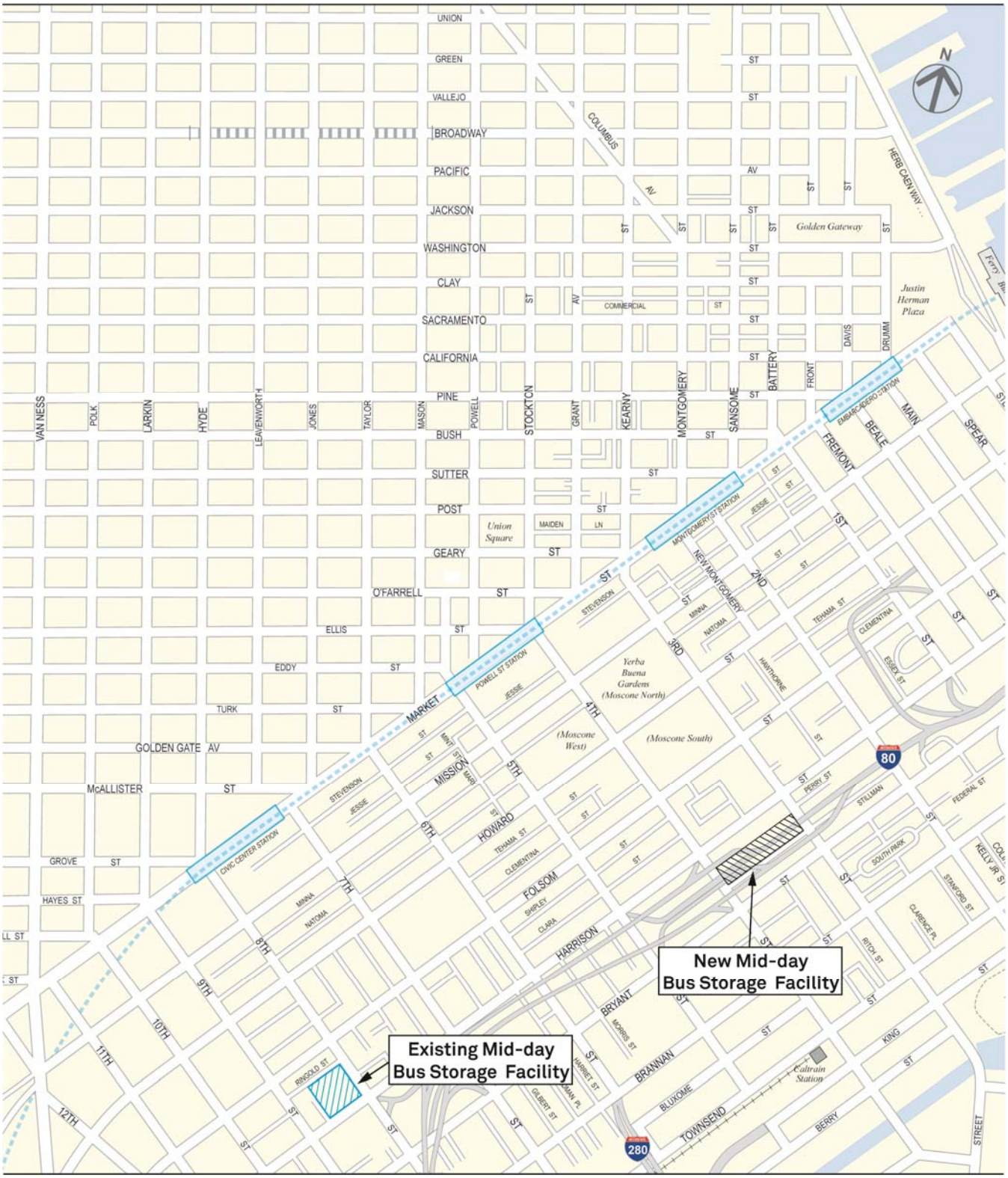
The project site is located within the South of Market (SoMa) area of Downtown San Francisco, and is bounded, in general, by major arterial roadways on all four sides (Third Street, Fourth Street, Harrison Street, and Bryant Street) that serve key roles in carrying traffic into and out of Downtown San Francisco and to and from nearby destination uses such as Caltrain's San Francisco terminal at Fourth Street / King Street, AT&T Park, and the Mission Bay area. An all-access interchange to I-80 is provided in close proximity to the site on the block bounded by Fourth Street, Fifth Street, Harrison Street, and Bryant Street. The southern tunnel portal of the under-construction Central Subway will be located along Fourth Street between Perry Street and Stillman Street.

Land uses in the vicinity of the project site consist primarily of light industrial and residential uses, but also include office and retail uses. The project site is bounded by two one-way streets (one-way westbound Perry Street to the north and one-way eastbound Stillman Street to the south) that provide on-street parking, mid-block circulation for vehicles attempting to access Third Street or Fourth Street (a one-way couplet), and parking / loading facility access for abutting parcels.

2.2 PROJECT OBJECTIVES

GGBHTD owns, maintains, and operates all "Golden Gate Transit" bus services in San Francisco. Existing Golden Gate Transit operations in San Francisco consist of two types of services: "Basic Bus" services operate seven days a week, during both peak and off-peak periods, while "Commute Bus" services operate during weekday peak periods, inbound into Downtown San Francisco in the mornings and outbound from Downtown San Francisco towards Marin and Sonoma Counties in the evenings. Existing Golden Gate Transit service in San Francisco is summarized in Table 2-1.

Figure 2-1: Project Site



Source: AECOM, 2013.

Table 2-1: Golden Gate Transit Service in San Francisco

Routes		Scheduled Daily Trips			
		Weekday[a]		Weekend[b]	
		Inbound	Outbound	Inbound	Outbound
Basic Bus Services					
10	Strawberry – Marin City – Sausalito	13	14	11	11
70	Novato – San Rafael – Marin City	17	21	17	19
80	Santa Rosa – Rohnert Park – Cotati – Petaluma – Novato – San Rafael – Marin City	6	6	19	18
101	Santa Rosa – Rohnert Park – Cotati – Petaluma – Novato – San Rafael	14	17	9	10
101X	Santa Rosa – Rohnert Park – Cotati – Petaluma	2	1		
Subtotal		**52**	**59**	**56**	**58**
Commute Bus Services					
2	Marin Headlands – Marin City (Drake Avenue & Cole Drive) – Sausalito	6	4		
4	East Blithedale & Tower – Mill Valley Depot – Tam Junction – Manzanita Park & Ride	21	22		
8	Tiburon – Belvedere – Strawberry	2	1		
18	College of Marin – Larkspur – Corte Madera	7	7		
24	Manor – Fairfax – San Anselmo – Ross – Kentfield – College of Marin – Greenbrae	15	13		
27	San Anselmo – San Rafael	9	5		
38	Terra Linda – Northgate Mall	4	4		
44	Marinwood – Lucas Valley – San Rafael Transit Center	2	2		
54	San Marin – Novato	12	13		
56	Novato – San Marin – San Marin Drive – Rowland Boulevard Park & Ride	5	6		
58	Novato – Rowland Boulevard Park & Ride – Ignacio – Hamilton	4	3		
72	Santa Rosa – Rohnert Park	8	8		
72X	Santa Rosa – Rohnert Park	3	3		
74	Cotati – West Petaluma	6	5		
76	East Petaluma	5	5		
92	Marin City – Sausalito	8	6		
93	Golden Gate Bridge Toll Plaza	9	3		
97	Larkspur Ferry Terminal	1			
Subtotal		**127**	**110**		

Notes:
[a] Mondays through Fridays, except holidays.
[b] Saturdays, Sundays, and holidays.
Source: GGBHTD, 2012a.

Basic Bus services (Routes 10, 70, 80, 101 and 101X) operate to and from Downtown San Francisco via Van Ness Avenue and Mission Street, with route alignment and stop locations in Downtown San Francisco as illustrated in Figure 2-2. In the inbound direction, all Basic Bus services travel eastbound along Mission Street to the Temporary Transbay Terminal (on the block bounded by Howard Street, Folsom Street, Main Street, and Beale Street) before turning onto westbound Howard Street towards the existing Mid-day Bus Parking Facility (located at Eighth Street and Harrison Street), with the exception of one weekday (i.e., Mondays through Fridays, except holidays) run and one weekend (i.e., Saturdays, Sundays, and holidays) run on Route 70, which continue south on Eighth Street past Mission Street directly to the current Mid-day Bus Parking Facility.

Commute Bus services can be classified into one of two different groups based on their general route to and from Downtown San Francisco:

- Via the Financial District (Routes 2, 4, 8, 18, 24, 27, 38, 44, 54, 56, 58, 72 / 72X, 74, 76, and 97); and,
- Via Civic Center (Routes 92 and 93).

All Financial District Commute Bus services travel along Doyle Drive, Richardson Avenue, Lombard Street, Van Ness Avenue, Beach Street / North Point Street, The Embarcadero, and Battery Street / Sansome Street. The exceptions are Route 97 and the first inbound trip on Route 27, which have the following route alignment east of Lombard Street: southbound Van Ness Avenue and eastbound Broadway Street to Battery Street and the Financial District. All Financial District Commute Bus services terminate at Eighth Street / Folsom Street in the inbound direction and begin at Seventh Street / Folsom Street in the outbound direction. Route alignment and stop locations are illustrated in Figure 2-3.

For Civic Center Commute Bus services, Route 92 travels along Doyle Drive, Park Presidio Boulevard, Geary Boulevard, Webster Street, and Golden Gate Avenue / McAllister Street, while Route 93 travels along Van Ness Avenue similar to the Basic Bus services, but without serving stops along Mission Street east of the Civic Center area. In other words, Route 92 and Route 93 share the same route in the Civic Center area, but Route 92 takes Park Presidio Boulevard, Geary Boulevard, Webster Street, and Golden Gate Avenue / McAllister Street to and from the Golden Gate Bridge, while Route 93 takes Doyle Drive, Richardson Avenue, Lombard Street, and Van Ness Avenue. All Civic Center Commute Bus services terminate at Eighth Street / Folsom Street in the inbound direction and begin at Seventh Street / Market Street in the outbound direction. Route alignment and stop locations are illustrated in Figure 2-4.

Golden Gate Transit's current Mid-day Bus Parking Facility (Division 4) is located on the block generally bounded by Eighth Street, Ninth Street (specifically, Gordon Street), Folsom Street (specifically, Ringold Street), and Harrison Street. The parking facility can accommodate approximately 150 buses, and is currently used by all of Golden Gate Transit's San Francisco services, seven days a week and 24 hours a day, although its primary function is to provide mid-day parking for Commute Bus services, eliminating the need to deadhead to and from Golden Gate Transit's other yards in San Rafael (Division 1), Novato (Division 2), and Santa Rosa (Division 3) after the weekday morning peak period and before the weekday evening peak period.

Figure 2-2: Existing Golden Gate Transit Routes (Basic Bus Services)

Source: AECOM, 2013.

Figure 2-3: Existing Golden Gate Transit Routes (Financial District Commute Bus Services)

Source: AECOM, 2013.

Figure 2-4: Existing Golden Gate Transit Routes (Civic Center Commute Bus Services)

Source: AECOM, 2013.

The replacement of the Transbay Terminal with the new Transbay Transit Center and the redevelopment of the surrounding area required that Golden Gate Transit relocate it's previous San Francisco Mid-day Bus Parking Facility—located on the block bounded by Main Street, Beale Street, Howard Street, and Folsom Street— to a new site. The proposed project site is located under the elevated portion of Interstate 80 (West Approach of the San Francisco-Oakland Bay Bridge) on the block bounded by Third Street, Fourth Street, Perry Street, and Stillman Street. Since the proposed project site could not be occupied until after the seismic retrofit of the West Approach was completed, Golden Gate Transit's Mid-day Bus Parking Facility was temporarily relocated to the current location at Eighth Street and Harrison Street. The proposed project consists of moving the Golden Gate Transit Mid-day Bus Parking Facility from the temporary location at Eighth Street and Harrison Street to the project site.

Likewise, AC Transit, which originally stored its commuter buses on the elevated loop connecting the Transbay Terminal with I-80, would be provided with a separate Mid-day Bus Parking Facility on the opposite side of Third Street from Golden Gate Transit's Mid-day Bus Parking Facility. A dedicated bus ramp would be provided from the new AC Transit facility, connecting into the primary bus approach structure into the Transbay Transit Center, allowing AC Transit buses to directly access their platforms inside the Transbay Transit Center. A separate connecter ramp was proposed in the *2004 FEIS / EIR* to connect this approach structure with the existing I-80 off-ramp touching down midblock at Fremont Street between Howard Street and Folsom Street, allowing Golden Gate Transit buses departing the new parking facility to use the AC Transit ramp to bypass surface streets to access Fremont Street.

The *2004 FEIS / EIR* evaluated mid-day bus parking facilities for Golden Gate Transit and AC Transit underneath the I-80 (West Approach) on the two blocks bounded by Perry Street, Stillman Street, Second Street, and Fourth Street. AC Transit would occupy the block between Second Street and Third Street, while Golden Gate Transit would occupy the block between Third Street and Fourth Street. As part of the proposed project, the bus storage functions currently performed for Golden Gate Transit's Commute Bus services by the current parking facility at Eighth Street / Harrison Street would be relocated to this new parking facility. The *2004 FEIS / EIR* estimated that this new parking facility would have the capacity to accommodate up to 140 buses and restricted use of the facility to weekdays only, between 7:00 AM and 7:00 PM. As a result, the facility would be used to support Commute Bus operations, which would only use the new ramp and ramp connector in the outbound direction (i.e., primarily during the weekday evening peak periods).

In addition to the new Mid-day Bus Parking Facility, the Transbay Transit Center project also involves construction of a new street-level passenger terminal (the "Transbay Transit Center Bus Plaza") for bus services on the block bounded by Minna Street, Natoma Street, Beale Street, and Fremont Street, serving primarily San Francisco Municipal Railway (Muni) and Golden Gate Transit services. This facility would provide a total of four platforms, three to be used by Muni bus services and one reserved for Golden Gate Transit bus services. This fourth platform would be used by Golden Gate Transit's Basic Bus services.

2.3 PROJECT CHARACTERISTICS

2.3.1 Proposed Uses and Service

Since the publication of the *2004 FEIS / EIR*, the following changes to the proposed project have been identified:

- The District has determined that the capacity of the new facility, originally estimated at 140 buses, is actually substantially lower, due to the column reconfiguration implemented as part of the seismic retrofit of the Bay Bridge's west approach, the requirement to construct a sound wall on portions of the south and east sides of the site as shown in the *2004 FEIS / EIR*, and the limited ability to maneuver buses in the parking area and through the ingress and egress points. The anticipated capacity of the new facility is now estimated to be 73 buses, based on conceptual engineering drawings.

- The District has reconfigured the placement of the sound wall without narrowing the public right-of-way on Stillman Street, restricting bus ingress and egress to and from the new parking facility to Perry Street only.

- The District has proposed to have its weekday evening Commute Bus services depart the new parking facility using surface streets instead of the new dedicated ramp structures connecting the AC Transit Mid-day Bus Parking Facility with Fremont Street between Howard Street and Folsom Street. No changes are proposed to inbound Commute Bus services (the planned ramp structures were never designed to allow bus traffic from surface streets to directly enter the Mid-day Bus Parking Facility) or to Basic Bus services (these services would use the Transbay Transit Center Bus Plaza, and were never envisioned to use the planned ramp structures).

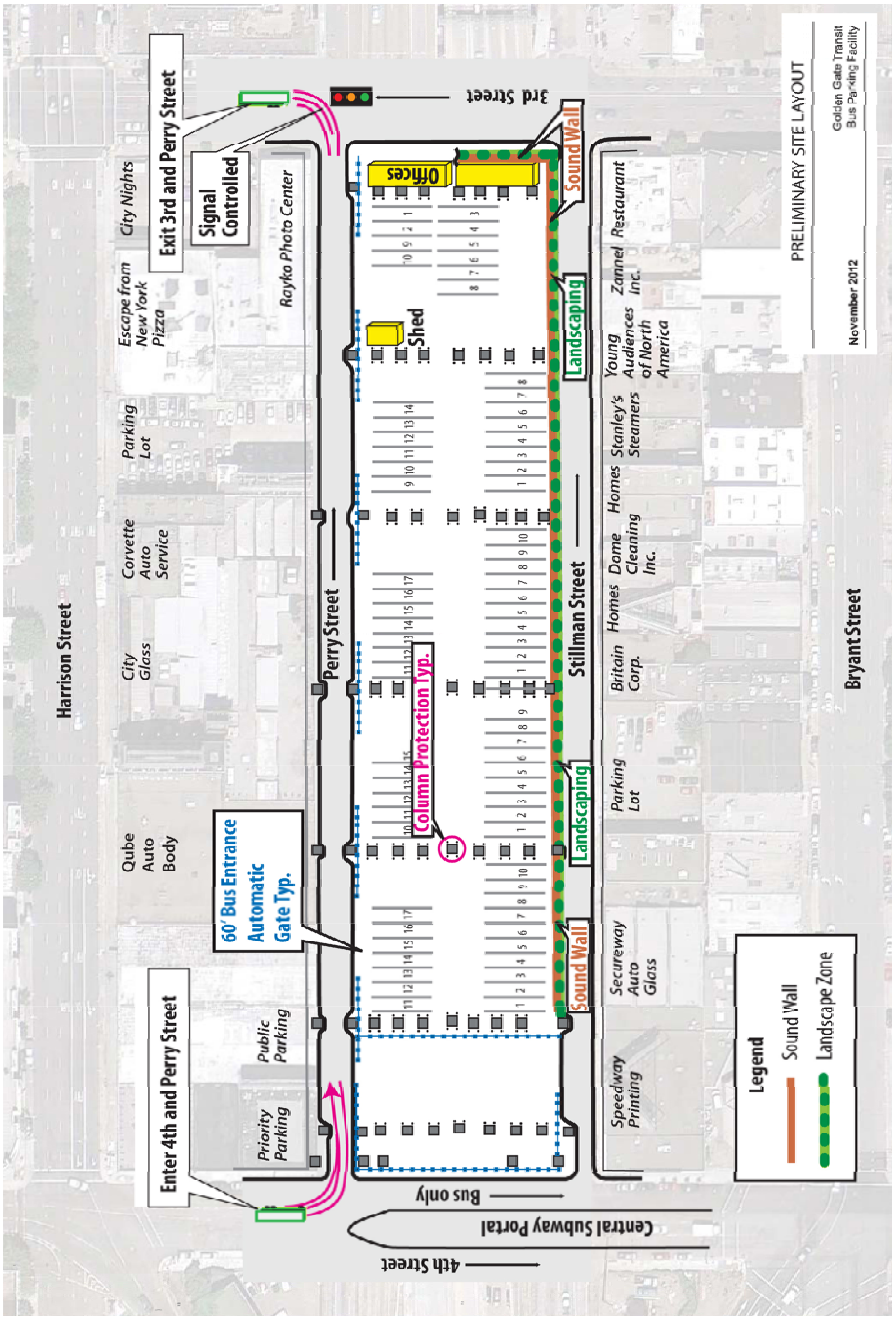
- The District has determined that the location of the signal at Third Street should be located at the intersection of Third Street / Perry Street and will include a midblock pedestrian crossing across Third Street on the south leg of the intersection.

- The District has determined that the removal of all on-street metered parking spaces along the reconfigured eastbound Perry Street is necessary due to curb modifications to enable bus ingress and egress.

The realignment of outbound Commute Bus routes onto surface streets—as opposed to grade-separated ramps—requires an evaluation of the effect of additional bus traffic to intersections not originally analyzed in the *2004 FEIS / EIR*. This proposed realignment of Golden Gate Transit's Commute Bus services onto surface streets is hereafter referred to as the "proposed project".

The project site plan, illustrating the conceptual engineering design for the Mid-day Bus Parking Facility, is illustrated in Figure 2-5.

Figure 2-5: Project Site Plan



Source: URS, 2012.

2.3.2 Proposed Weekday PM Bus Pull-Outs

As described previously, the proposed project involves the realignment of Golden Gate Transit's Commute Bus services departing the new Mid-day Bus Parking Facility during the weekday PM peak period onto surface streets.

Information on weekday PM peak period Commute Bus pull-outs from the existing Mid-day Bus Parking Facility was obtained from GGBHTD, and is summarized in Table 2-2 for 15-minute increments. As shown in Table 2-2, the maximum number of pull-outs during any four consecutive 15-minute periods is 42 trips.

Table 2-2: Weekday PM Peak Period Commute Bus Pull-Outs

Time Period	Pull-Outs	Running Hourly Total
16:01 – 16:15	9	
16:16 – 16:30	12	
16:31 – 16:45	6	
16:46 – 17:00	15	42
17:01 – 17:15	9	42
17:16 – 17:30	11	41
17:31 – 17:45	4	39
17:46 – 18:00	7	31

Source: GGBHTD, 2012b.

2.3.3 Proposed Route Realignment

The relocation of Golden Gate Transit's Mid-day Bus Parking Facility, together with the realignment of Commute Bus services onto surface streets, would necessitate changes to Commute Bus routes and stops through the SOMA area. In particular, route segments along Howard Street and Folsom Street west of Fourth Street would be discontinued, together with the existing Golden Gate Transit stop at Fourth Street / Howard Street. New Commute Bus stops would be established in the inbound direction at Fourth Street / Folsom Street (a far-side stop shared with an existing Muni stop) and Third Street / Harrison Street (a new far-side stop). The changes to bus routes and stops are illustrated in Figures 2-6, 2-7, and 2-8.

2.4 DISCRETIONARY ACTION AND APPROVALS

GGBHTD is the lead agency for this Addendum, which will be used as a decision-making tool to take action on the proposed project. GGBHTD is responsible for approval and implementation of the proposed project.

Other regulatory agencies and local jurisdictions that may require discretionary approvals in order to operate the proposed project include the San Francisco Municipal Transportation Agency (SFMTA).

Figure 2-6: Changes to Golden Gate Transit Routes (Basic Bus Services)

Source: AECOM, 2013.

Figure 2-7: Changes to Golden Gate Transit Routes (Financial District Commute Bus Services)

Source: AECOM, 2013.

Figure 2-8: Changes to Golden Gate Transit Routes (Civic Center Commute Bus Services)

Source: AECOM, 2013.

2.5 CUMULATIVE PROJECTS

Section 15063(b) of the State CEQA Guidelines states that a CEQA analysis must consider the environmental effects of a proposed project individually, as well as cumulative impacts to which the project may contribute. Cumulative impacts are two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts of the proposed project (State CEQA Guidelines Section 15355). Cumulative impacts are analyzed by considering a list of past, present, and probable future projects that may result in direct or cumulative impacts.

The cumulative impacts including past, proposed (i.e., those projects with pending applications), recently approved, under construction, or reasonably foreseeable projects considered in combination with the proposed project are evaluated in this Addendum, and are addressed in Section 3.0, Addendum Checklist and Environmental Impact Analysis.

There are several projects considered in conjunction with the proposed project in the cumulative impact analyses:

- *Transbay Terminal / Caltrain Downtown Extension / Redevelopment Project:* This project involves the demolition of the Transbay Terminal and replacement with a new multi-modal transit hub integrating local, regional, and intercity bus services (Muni, SamTrans, AC Transit, WestCAT, Golden Gate Transit, and Greyhound); Caltrain's Downtown Extension from its current terminus at Fourth Street / King Street; and intercity high-speed rail. In addition, this project also includes a major land use component (the "Transbay Redevelopment Project") in the redevelopment of multiple parcels along the alignment of the elevated loop originally connecting the Transbay Terminal with I-80, used by AC Transit, WestCat, Greyhound, and Muni before the demolition of the terminal building, as well as associated roadway and streetscape changes described under the Transbay Streetscape and Open Space Plan. The new terminal is scheduled to be completed in 2017.

- *Transit Center District Plan and Transit Tower:* This project involves zoning changes (including changes to land use, height, bulk, and density), roadway and streetscape changes (including new transit-only lanes, new traffic signals, lane reductions, two-way conversions, new crosswalks and bulb-outs, new bicycle lanes, changes to on-street parking and loading, and other features), and changes to off-street parking requirements in the immediate vicinity surrounding the Transbay Transit Center. This project also involves construction of the Transit Tower, a mixed-use skyscraper adjacent to the new Transbay Transit Center, as well as zoning changes specifically designed to address proposed developments at the following "opportunity sites":

    - 41 Tehama Street (Block 3736, Lots 074-078A);
    - 181 Fremont Street (Block 3719, Lots 010-011);
    - 50 First Street (Block 3708, Lots 006-007, 009-012, 055);
    - 350 Mission Street (Block 3710, Lot 017);
    - 201 Second Street (Block 3736, Lots 094-098);
    - Parcel F (560 Howard Street) (Block 3721, Lot 015A);
    - Transit Tower (Parcel T) (Block 3720, Lot 001);
    - Golden Gate University (536 Mission Street) (Block 3708, Lot 098);
    - 222 Second Street (Block 3735, Lot 063);
    - Palace Hotel (2 New Montgomery Street) (Block 3707, Lot 052 (southwest corner));

- 524 Howard Street (Block 3721, Lots 013-015);
- 543 Howard Street (Block 3736, Lot 111);
- Parcel M (201 Mission Street) (Block 3718, Lot 027 (northern portion));
- Marine Firemen's Union (240 Second Street) (Block 3735, Lot 055);
- 176 Second Street (Block 3722, Lot 017);
- 661-667 Howard Street (Block 3735, Lots 039-040); and,
- 648-660 Howard Street (Block 3722, Lots 011-012, 014, 023-024, 026).

The San Francisco Planning Commission certified the Final Environmental Impact Report and adopted the Transit Center District Plan in May 2012.

Other relevant projects currently moving through environmental review under CEQA include the following:

- *San Francisco Bicycle Plan*: This project describes a package of citywide bikeway improvements, several of which have already been implemented. Two projects—the Second Street Bicycle Lanes Project (Modified Option 1) and the Howard Street Bicycle Lane Project—are located in the vicinity of the project site and were therefore accounted for in the cumulative analysis.

- *Rincon Hill Streetscape Master Plan*: This project would extend two-way traffic along Folsom Street from Main Street to Fremont Street and along Spear Street from Folsom Street to Harrison Street. Portions of the two-way conversion along Folsom Street have already been partially completed under roadway changes initiated under the Temporary Transbay Terminal, but the two-way conversion along Spear Street has yet to be implemented.

- *Transit Effectiveness Project:* This project would institute a series of substantial changes to Muni's service to streamline operations, including changes to frequencies, service hours, route alignments, and vehicle capacities. Some elements of the project have already been completed independently, but the bulk of the recommended capital investments, such as new overhead lines, have yet to be implemented.

- *Central Subway:* This project would extend Muni's T Third Street light rail line from Fourth Street / King Street into Union Square and Chinatown. Construction is already underway, and the new extension is expected to open for revenue service in 2019.

- *Expanded Water Emergency Transportation Authority (WETA) ferry service on San Francisco Bay:* This project involves an expansion of San Francisco Bay ferry services and would involve new routes connecting San Francisco with points in the South Bay and East Bay. Some routes have recently been implemented, but the bulk of the service expansion has yet to be implemented.

As the cumulative analysis is based primarily on work conducted for the *Transit Center District Plan and Transit Tower Draft Environmental Impact Report* Planning Department Case Number 2007.0558E and 2008.0789E and SCH #2008072073), which used the San Francisco County Transportation Authority (SFCTA) travel demand model to generate cumulative traffic and transit ridership forecasts, any development growth contained in the model is also assumed in the cumulative analysis for the proposed project. This includes general background growth in the City and region, as well as growth attributable to specific projects such as the *Market / Octavia Better Neighborhoods Plan* and *Treasure Island Redevelopment Plan*.

3.0 ADDENDUM CHECKLIST AND ENVIRONMENTAL IMPACT ANALYSIS

The environmental factors checked below (☒) would be potentially affected by this project and were, therefore, analyzed as part of this Addendum on the following pages.

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

EVALUATION OF ENVIRONMENTAL IMPACTS

3.1 AIR QUALITY

Issue	Potentially Significant Impact	Less-Than-Significant Impact with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☒	☐
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors)?	☐	☐	☒	☐
d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐

e) Create objectionable odors affecting a substantial number of people?	☐	☐	☒	☐

Existing Conditions

Criteria Air Pollutant Emissions

The federal and the State governments have established National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS) respectively for six criteria pollutants: ground-level ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter (PM), and lead. Ozone is considered a regional pollutant, since ozone impacts air quality on a regional scale (BAAQMD, 1999). Carbon monoxide tends to accumulate in the air locally, forming CO "hotspots" (BAAQMD, 1999). PM is considered both a localized pollutant and a regional pollutant. Most of the criteria pollutants are directly emitted, but ground-level ozone—also known as smog—is a secondary pollutant produced by the photochemical reaction of sunlight with volatile organic compounds, including non-methane organic gases (NMOG) and oxides of nitrogen (NO_x) that have been released into the atmosphere from the combustion of fossil fuels.

The primary pollutants of concern within the San Francisco Bay Area Air Basin (SFBAAB) are ozone and particulate matter with a diameter of 10 microns or less (PM_{10}), as well as "fine" particulate matter with a diameter of 2.5 microns or less ($PM_{2.5}$). This is because the SFBAAB is currently classified as non-attainment for the California one-hour and eight-hour ozone standards and also the national eight-hour ozone standard. The SFBAAB is also in non-attainment for the California annual arithmetic mean and 24-hour standards for PM_{10} as well as the California annual arithmetic mean and national 24-hour standards for $PM_{2.5}$. Emissions and ambient concentrations of CO have decreased dramatically in the SFBAAB with the introduction of the catalytic converter in 1975. No exceedances of the CAAQS or NAAQS for CO have been recorded at nearby monitoring stations since 1991. SFBAAB is currently designated as an attainment area for the CAAQS and NAAQS for CO; however, elevated localized concentrations of CO still warrant consideration in the environmental review process. Occurrences of localized CO concentrations (hotspots), are often associated with heavy traffic congestion, which most frequently occur at signalized intersections of high-volume roadways (BAAQMD, 2012).

Toxic Air Contaminants

Some air pollutants are identified as toxic air contaminants (TACs) because of their potential to increase the risk of developing cancer or because of their acute or chronic health risks due to long-term exposure. Individual TACs vary greatly in the health risk they present. For TACs that cause cancer, a unit risk factor can be developed to evaluate cancer risk. For non-cancer health risks, a similar factor called a hazard index (HI) is used to evaluate risk. The HI is calculated by summing the hazard quotients for substances that affect the same target organ or organ system (e.g., respiratory system). The hazard quotient is the ratio of potential exposure to the substance and the level at which no adverse health effects are expected. An HI of less than one indicates no adverse health effects are expected because of exposure and an HI greater than 1 indicates adverse health effects are possible.

Regulatory Framework

Clean Air Act

The federal Clean Air Act (CAA), originally enacted in 1963 and amended several times thereafter (including the 1990 amendments), establishes the current framework for air pollution control in the United States. The CAA directs the U.S. Environmental Protection Agency (EPA) to establish ambient air standards for six pollutants: ozone, CO, lead, NO_2, PM, and SO_2. The standards are divided into primary and secondary standards; the former are set to protect human health within an adequate margin of safety and the latter to protect environmental values, such as plant and animal life.

Currently, the primary legislation that governs federal air quality regulations is the Clean Air Act Amendments of 1990 (CAAA). The CAAA delegates primary responsibility for clean air to EPA. EPA develops rules and regulations to preserve and improve air quality, as well as delegating specific responsibilities to state and local agencies.

The CAA requires states to submit a state implementation plan (SIP) for areas in nonattainment for federal standards. The SIP, which is reviewed and approved by EPA, must demonstrate how the federal standards will be achieved. Failing to submit a plan or secure approval could lead to denial of federal funding. In cases where the SIP is submitted by the state but fails to demonstrate achievement of the standards, EPA is directed to prepare a federal implementation plan for that state.

Ozone Attainment Plan

The Bay Area Air Quality Management District (BAAQMD) and California Air Resources Board (CARB) have been working with EPA to develop plans and approaches to address air quality issues in the SFAAB. These efforts have resulted in the 2001 Ozone Attainment Plan, which is the SFBAAB's portion of California's SIP to achieve the national ozone standard. On April 15, 2004, EPA identified areas that did not meet the national eight-hour ozone standard. The Bay Area was designated as a non-attainment area for the 8-hour ozone standard, and was classified as "marginal" based on the five classes of non-attainment areas for ozone, ranging (low to high) from marginal to extreme.

California Ambient Air Quality Standards

CARB and local air districts are tasked with the responsibility for achieving the California Ambient Air Quality Standards (CAAQS), which are more stringent than the national ambient air quality standards, through district-level air quality management plans that will be incorporated into the SIP. In California, EPA has delegated authority to prepare SIPs to CARB, which, in turn, has delegated that authority to individual air districts (for San Francisco, the BAAQMD).

CARB establishes CAAQS, maintains oversight authority in air quality planning, develops programs for reducing emissions from motor vehicles, develops air emission inventories, collects air quality and meteorological data, and approves SIPs.

Responsibilities of air districts include overseeing stationary source emissions, approving permits, maintaining emissions inventories, maintaining air quality stations, overseeing agricultural burning permits, and reviewing air quality-related sections of CEQA environmental review documents .

California Clean Air Act

The California Clean Air Act of 1988 (CCAA) substantially added to the authority and responsibilities of air districts. The CCAA designates air districts as lead air quality planning agencies, requires air districts to prepare air quality plans, and grants air districts authority to implement transportation control measures. The CCAA focuses on attainment of the state ambient air quality standards, which are generally more stringent than the comparable federal standards.

The CCAA requires designation of attainment and non-attainment areas with respect to CAAQS. The CCAA also requires that local and regional air districts expeditiously adopt and prepare an air quality attainment plan if the district violates CAAQS for CO, SO_2, NO_2, or ozone. These clean air plans are specifically designed to attain these standards and must be designed to achieve an annual five (5) percent reduction in district-wide emissions of each nonattainment pollutant or its precursors. Where an air district is unable to achieve a five (5) percent annual reduction, the adoption of "all feasible measures" on an expeditious schedule is acceptable as an alternative strategy (Health and Safety Code Section 40914[b][2]). No locally prepared attainment plans are required for areas that violate the state PM_{10} standards.

The CCAA requires that the State air quality standards be met as expeditiously as practicable but, unlike the federal CAA, does not set precise attainment deadlines. Instead, for areas that will require more time to achieve the standards the CCAA established increasingly stringent requirements. Currently, the SFBAAB is in non-attainment for the California one-hour and eight-hour ozone standards. The SFBAAB is also in non-attainment for the California annual arithmetic mean and 24-hour standards for PM_{10}, as well as the California annual arithmetic mean standard for $PM_{2.5}$.

California Air Resources Board Fleet Rule for Transit Agencies

The Transit Fleet Vehicle and Urban Bus Requirements under the Fleet Rule for Transit Agencies, Title 13 California Code of Regulations, Section 2023 first went into effect in 2000. The Fleet Rule for Transit Agencies is CARB's effort to reduce both criteria pollutant emissions and exposure to TACs from urban buses and transit fleet vehicles. The requirements for urban buses differ from the requirements for transit fleet vehicles. The regulation affects both public transit operators and heavy-duty engine manufacturers. Transit agencies must annually report detailed information on their fleets to CARB and meet increasingly stringent fleet average emission requirements for both PM and NO_x through phase-in years. The reductions in fleet average emissions can be obtained through the use of alternative fuels (e.g. compressed natural gas, propane, ethanol, methanol, gasoline (when used in hybrid electric buses), hydrogen, electricity, fuel cells, or advanced technologies that do not rely on diesel fuel) and / or through the installment of engine retrofits (e.g. diesel particulate filters), engine repowers, or vehicle replacements (CARB, 2013).

Bay Area 2010 Clean Air Plan

BAAQMD adopted the Bay Area *2010 Clean Air Plan* in cooperation with the Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments (ABAG) to set forth a plan to achieve compliance with the state one-hour air quality standard for ozone as expeditiously as practicable. A clean air plan is a comprehensive strategy to reduce air pollution from both stationary sources, such as factories and refineries, and mobile sources, such as cars, trucks, ships, diesel locomotives, and construction equipment. The goal of a clean air plan is to reduce air pollution in order to attain air quality standards and protect public health. The plan outlines strategies to reduce ozone precursors, as well as PM, TACs, and GHG emissions, in order to improve public health and protect the environment and climate.

BAAQMD CEQA Guidelines

The purpose of the BAAQMD *CEQA Air Quality Guidelines* is to assist lead agencies in evaluating air quality impacts of projects and plans proposed in the SFBAAB. Land development plans and projects have the potential to generate harmful air pollutants that degrade air quality and increase local exposure. The *CEQA Air Quality Guidelines* contain instructions on how to evaluate, measure, and mitigate air quality impacts generated from land development, construction, and operation activities, focusing on criteria air pollutant, GHG, TAC, and odor emissions generated from plans or projects.

The BAAQMD *CEQA Air Quality Guidelines* is an advisory document that provides lead agencies, consultants, and project applicants with uniform procedures for addressing air quality in environmental documents. In May 2010, BAAQMD updated its CEQA Guidelines with new quantitative thresholds for construction and operational-related criteria air pollutants and precursors, TACs, and GHGs. However, in March 2012, the Alameda County Superior Court issued a judgment finding that the changes to the BAAQMD *CEQA Air Quality Guidelines* qualify as a project under CEQA and that BAAQMD has not complied with CEQA as part of the adoption process. Therefore, at the time of this writing, BAAQMD is not recommending use of the updated 2010 *CEQA Air Quality Guidelines* thresholds to evaluate air quality impacts. As a result, the thresholds of significance in the BAAQMD's 1999 *CEQA Guidelines* must be relied upon to determine the significance of the proposed project's air quality impacts in the interim.

Impact Discussion

3.1a. Less-Than-Significant Impact. A significant impact may occur if the project is not consistent with the applicable air quality management plan (AQMP) or would in some way represent a substantial hindrance to employing the policies or obtaining the goals of that plan.

The *2010 Clean Air Plan* developed by BAAQMD is a roadmap showing how the region will continue to make progress toward meeting the California one-hour ozone standard as expeditiously as practicable, and how the region will reduce transport of ozone and ozone precursors to neighboring air basins (BAAQMD, 2010).

The proposed project involves the modification of existing bus routes and the relocation and operation of an existing bus lot that would result in a decrease of total criteria air pollutant emissions, including ozone precursors NO_x and reactive organic gases (ROG). This is because the length of the existing Commute Bus and Basic Bus services would actually be reduced and several bus stops would be removed, thus reducing bus engine running

time and idling time, respectively. Therefore, the proposed project would reduce mobile source emissions in the region while continuing to provide public transit services for commuters, which would comply with BAAQMD's core goals to reduce mobile source emissions. By continuing the operation of Commute Bus and Basic Bus services, commuters would still have the option of deferring a single-occupancy vehicle commute and shifting to public transit. These actions would reduce ozone precursor emissions along with other criteria air pollutants associated with vehicle emissions (e.g., carbon monoxide, PM_{10}, $PM_{2.5}$). By complying with BAAQMD's rules and regulations regarding ozone precursor emissions, the proposed project would be compliant with the *2010 Clean Air Plan*.

To address reductions of PM, on November 16, 2005 the BAAQMD adopted the Particulate Matter Implementation Schedule in compliance with Senate Bill (SB) 656, which is meant to reduce public exposure to PM_{10} and fine particulate matter ($PM_{2.5}$), as well as to make progress towards attainment standards. As stated in the above paragraph, the proposed project would result in a reduction of criteria pollutants, including PM emissions, and would thus be compliant with the Particulate Matter Implementation Schedule. Reducing the number of bus routes and the number of transit stops would help reduce regional PM emissions resulting from running emissions and exhaust emissions, respectively. Thus, the proposed project would also contribute to BAAQMD's plans to reduce regional PM emissions.

Considering the information discussed above for ozone precursors and PM emissions, implementation of the proposed project would not conflict with an applicable air quality plan and thus would have a less than significant impact for this criterion. See Section 3.1b for a quantitative comparison of emissions from the baseline and proposed project.

3.1b. Less-Than-Significant Impact. A project may have a significant impact if project-related emissions would exceed federal, State, or regional standards or thresholds, or if project-related emissions would substantially contribute to an existing or projected air quality violation. As described earlier, BAAQMD is not currently recommending use of the updated 2010 *CEQA Air Quality Guidelines* thresholds to evaluate air quality impacts. As a result, the thresholds of significance in the 1999 *CEQA Guidelines* must be relied upon to determine the significance of the proposed project's air quality impacts in the interim.

It is important to note that Golden Gate Transit's existing bus services already generate some level of emissions. As the Proposed Project involves the relocation of the Mid-day Bus Parking Facility and associated reroutes to bus services, the air quality and GHG emissions analysis focuses on the geographical area where the bus routes will change. These route changes would be confined to several streets in the South of Market (SoMa) District of San Francisco, and can be captured by defining an analysis area bounded by Market Street to the north, Stillman Street to the south, Main Street to the east, and Ninth Street to the west. Figures 2-4a – 2-4c provide maps capturing the existing and new routes in this area.

Since the bus routes outside of this area will remain the same, only the existing and future vehicle-miles traveled (VMT) from the bus routes within this zone need to be evaluated to determine if the proposed project's air quality emissions are a significant impact. Table 3-1 provides the existing and proposed VMT for Commute Bus and Basic Bus services, based on the existing Golden Gate Transit service in San Francisco (Table 2-1) and approximate route distances estimated using aerial images of the analysis area. Table 3-2 shows the resulting net change in daily and annual criteria pollutant emissions as a result of the proposed project.

Table 3-1: Route Distances within Analysis Area

Route	Route Distance within Analysis Area (mi)[a]			
	Existing		Proposed	
	Inbound	Outbound	Inbound	Outbound
Basic Bus Services				
Via Mission	3.20	3.35	1.55	1.30
Direct to facility[b]	0.50		1.55	1.30
Commute Bus Services				
Financial District routes	1.70	2.00	1.15	1.05
Civic Center routes	1.20	0.90	1.25	1.30

Notes:
[a] Distances rounded to the nearest 0.05 miles.
[b] Currently, one inbound run on Route 70 each day skips all Mission Street stops and heads directly to the existing Mid-day Bus Parking Facility after crossing Market Street via Eighth Street. With the Proposed Project, this inbound run would be rerouted to serve the Mission Street stops and the new Transbay Transit Center Bus Plaza along the same route as the other Basic Bus services.
Source: AECOM, 2013a.

Table 3-2: Net Change in Criteria Pollutant Emissions

Emissions Source	Net Change in Criteria Pollutant Emissions					
	Absolute Change (lbs / day or tons / year)					Percentage Change
	ROG	CO	NO_x	PM_{10}	$PM_{2.5}$	
Daily Emissions						
Basic Bus Services	(0.39)	(1.43)	(4.62)	(0.10)	(0.09)	(57%)
Commute Bus Services	(0.32)	(1.20)	(3.86)	(0.08)	(0.08)	(37%)
Total	**(1.27)**	**(4.71)**	**(15.19)**	**(0.32)**	**(0.30)**	**(46%)**
Annual Emissions						
Basic Bus Services	(0.07)	(0.26)	(0.84)	(0.02)	(0.04)	(57%)
Commute Bus Services	(0.04)	(0.16)	(0.50)	(0.01)	(0.02)	(37%)
Total	**(0.21)**	**(0.80)**	**(2.57)**	**(0.05)**	**(0.06)**	**(47%)**

Source: AECOM, 2013a.

As shown in Table 3-2, the VMT reductions associated with the project are expected to reduce total daily and annual emissions of criteria pollutants related to bus travel within the SoMa District by approximately 50 percent for each criteria pollutant.

In addition to reduced bus VMT, a total of five bus stops would also be removed due to the bus rerouting for the relocation of the bus storage lot. The removal of these bus stops would further decrease air emissions beyond the values summarized in Table 3-2 by reducing the amount of deceleration, acceleration, and idling activities associated with serving bus stops, activities that typically result in higher emission rates compared with same-speed travel.

3.1c. Less-Than-Significant Impact. A project found to individually have significant air impacts would also be considered to have significant cumulative impacts.

As discussed in Section 3.1b and shown in Table 3-2, project implementation would not result in long-term operational ROG, CO, NO_x, PM_{10}, or $PM_{2.5}$ emissions that would result in or contribute substantially to an air quality violation. Operational emissions from the proposed project would actually be reduced from the baseline operational scenario and would not be considered significant under BAAQMD thresholds, and, therefore, impacts would be less than significant on a project-level basis.

In addition, for any project that does not individually have significant operational air quality impacts, the determination of a significant cumulative impact should be based on an evaluation of the consistency of the project with the local general plan and of the general plan with the regional air quality plan. As noted above under Section 3.1a, the proposed project would be consistent with local air quality planning efforts and would not require an amendment to the existing *San Francisco General Plan*. As such, the project's long-term operational activities and emissions would be considered consistent with local planning efforts and less than significant on a project-level, and thus would not be cumulatively considerable.

3.1d. Less-Than-Significant Impact. A significant impact may occur where a project would generate substantial pollutant concentrations that would adversely affect sensitive receptors.

The most recent air quality analysis for the project—the Supplemental Air Quality Impact Analysis performed for the *2004 FEIS / EIR*—concluded that the relocation would not result in a substantial adverse change in concentrations of CO, NO_x, sulfur oxides (SO_x), or PM_{10} (Terry A. Hayes Associates, 2003). The proposed project would involve the use of diesel transit buses that were already in operation when the last air quality impact analysis was performed. Since the Supplemental Air Quality Impact Analysis was performed, however, CARB's Fleet Rule for Transit Agencies has imposed more stringent PM and NO_x standards for transit and urban bus fleets, including the buses operated by GGBHTD (CARB, 2013). As a result of these lowered fleet averages for PM and NO_x, the expected pollutant concentrations associated with the proposed project are expected to be reduced further beyond what was reported in the Supplemental Air Quality Impact Analysis for the *2004 FEIS / EIR*.

The overall changes to the bus routes proposed by the project would be minor and would actually reduce the total bus VMT within the SoMa District. For each individual route, the total distance would be equal or less to the current distance, and the new routes would generally be realigned only a few blocks away from their current routes. Nevertheless, an evaluation of the new routes was performed to determine if sensitive receptors (e.g. residential areas, parks, schools or senior centers, etc.) are located along those new routes.

The re-route for Basic Bus services reduces a substantial amount of its route from the SOMA District, as illustrated in Figure 2-6. There is only a small addition to the route where buses would turn right from southbound Beale Street to serve the new Transbay Transit Center Bus Plaza and then make a right onto northbound Fremont Street, where the buses would rejoin the existing route. No nearby sensitive receptors were found along the added route segment.

Likewise, routes for Financial District and Civic Center Commute Bus services would also shrink substantially. For Financial District Commute Bus services, there is only a small addition to the route where buses would turn left onto southbound Fourth Street and then travel approximately two and one-half blocks to make a left onto Perry Street and into the new Mid-day Bus Parking Facility, as illustrated in Figure 2-7. The buses would then exit onto northbound Third Street, traveling approximately one and one-half blocks before turning right onto eastbound Folsom Street to rejoin the existing route alignment. An existing day care center was identified at the corner of Fourth Street and Folsom Street, but subsequent research indicates that this center was established in 1970. The center is situated only one-and-a-half blocks from the existing route for Golden Gate Transit buses, but no indication of health risk was mentioned in the original addendum to the *2004 FEIS / EIR*.

The Civic Center Commute Bus services are the only services expected to see an expansion in geographical scope, as indicated in Figure 2-8. The new route segments proposed for these services are already part of existing routes for both Basic Bus and Financial District Commute Bus services. Because of this route overlap, there would be no new exposure of TAC or $PM_{2.5}$ emissions to receptors.

These observations of reductions in total bus VMT and overlapping route segments between the existing and proposed routes show that the proposed project will either maintain or reduce the pollutant concentration exposure for sensitive receptors, indicating a less-than-significant impact for local community risk and hazard impacts.

Although the updated significance thresholds in the 2010 BAAQMD *CEQA Air Quality Guidelines* cannot be directly used in determinations regarding the significance of an individual project's air quality impacts, the CO screening methodology provides a conservative indication of whether the implementation of the proposed project would result in CO emissions that exceed the significance thresholds.

According to the 2010 *CEQA Air Quality Guidelines*, the proposed project would result in a less-than-significant impact to localized CO concentrations if the following screening criteria are met:

1. The proposed project is consistent with an applicable congestion management program established by the county congestion management agency for designated roads or highways, regional transportation plan, and local congestion management agency plans.

2. The project traffic would not increase traffic volumes at affected intersections to more than 44,000 vehicles per hour.

3. The project traffic would not increase traffic volumes at affected intersections to more than 24,000 vehicles per hour where vertical and/or horizontal mixing is substantially limited (e.g., tunnel, parking garage, bridge underpass, natural or urban street canyon, below-grade roadway).

For Screening Criteria 1, the proposed project is consistent with the *2011 Congestion Management Program* established by the San Francisco County Transportation Authority (SFCTA, 2011). For Screening Criteria 2 and Screening Criteria 3, Existing plus Project Conditions traffic volumes at the three affected intersections would remain well below the indicated volume thresholds in the BAAQMD CO screening methodology. Thus, the proposed project would not result in operational conditions that could generate an exceedance of the CO CAAQS or NAAQS. More information on the traffic study can be found in Section 3.4.

3.1e. Less-Than-Significant Impact. A significant impact could occur if construction or operation of the proposed project would generate objectionable odors that would adversely affect sensitive receptors.

The occurrence and severity of odor impacts depends on numerous factors, including the nature, frequency, and intensity of the source; wind speed and direction; and the presence of sensitive receptors. Although offensive odors rarely cause any physical harm, they can be unpleasant and a nuisance, leading to citizen complaints.

The proposed project would involve the use of diesel transit buses that were already in operation when the most recent air quality impact analysis was performed (for the *2004 FEIS / EIR*). The continued operation of these buses would not result in an increase in generation of any odors because total emissions and operational time from the proposed project would decrease from baseline conditions. In addition, there is an overlap in the existing and proposed routes through the SoMa District, such that buses would not travel and generate potential odors in new areas that would result in exposure to new receptors. Thus, project implementation would not create objectionable odors affecting a substantial number of people and the project would have a less-than-significant impact related to odor generation.

3.2 GREENHOUSE GAS EMISSIONS

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

Existing Conditions

Greenhouse Gas Emissions and Climate Change

Activities such as fossil-fuel combustion, deforestation, and other human activity and changes in land use result in the accumulation of greenhouse gas (GHG) emissions—carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), ozone (O_3), and certain human-made hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs)—in Earth's atmosphere. An increase in atmospheric GHGs alters Earth's radiation budget and, therefore, results in an increase in Earth's average surface temperature, a phenomenon commonly referred to as global warming.

The International Panel on Climate Change (IPCC) states that recently recorded increases in Earth's average surface temperature are the result of increased concentrations of GHGs in the atmosphere (IPCC, 2007). The IPCC's best estimates are that the average global temperature increase between 2000 and 2100 could range from 0.6 degrees Celsius (°C), assuming no increase in GHG emissions above 2000 levels, to 4.0°C, assuming a substantial increase in GHG emissions (IPCC, 2007). Global warming is expected, in turn, to affect weather patterns, average sea level, ocean acidification, chemical reaction rates, and precipitation rates, among other things, in a manner commonly referred to as climate change. Climate change is a global problem, and GHGs are global pollutants, unlike criteria air pollutants (such as ozone precursors) and toxic air contaminants (TACs), which are pollutants of regional and local concern.

Regulatory Framework

Massachusetts v. EPA

Twelve U.S. states and cities (including California), in conjunction with several environmental organizations, sued to force the U.S. Environmental Protection Agency (EPA) to regulate GHGs as a pollutant pursuant to the Clean Air Act (CAA) in *Massachusetts v. Environmental Protection Agency et al.* (U.S. Supreme Court No. 05-1120. Argued November 29, 2006—Decided April 2, 2007). The Supreme Court ruled that the plaintiffs had standing to sue, that GHGs fit within the CAA's definition of a pollutant, and that EPA's reasons for not regulating GHGs were insufficiently grounded in the CAA. Despite the Supreme Court ruling, there are no promulgated federal regulations to date limiting GHG emissions.

SB 97 (Chapter 185, Statutes of 2007)

Senate Bill 97 requires that the California Office of Planning and Research (OPR) prepare guidelines to submit to the California Resources Agency regarding feasible mitigation of GHG emissions or the effects of GHG emissions as required by the California Environmental Quality Act (CEQA). The Resources Agency is required to certify and adopt these revisions to the State CEQA Guidelines by January 1, 2010. The Guidelines will apply retroactively to any incomplete environmental impact report, negative declaration, mitigated negative declaration, or other related document.

Assembly Bill 32 (Chapter 488, Statutes of 2006)

The California Global Warming Solutions Act of 2006, widely known as Assembly Bill (AB) 32, requires the California Air Resources Board (CARB) to develop and enforce regulations for the reporting and verification of statewide GHG emissions. CARB is directed to set a GHG emission limit, based on 1990 levels, to be achieved by 2020. The bill sets a timeline for adopting a scoping plan for achieving GHG reductions in a technologically and economically feasible manner.

The heart of the bill is the requirement that statewide GHG emissions must be reduced to 1990 levels by the year 2020. California needs to reduce GHG emissions by approximately 25 percent below business-as-usual predictions of year 2020 GHG emissions to achieve this goal. The bill requires CARB to adopt rules and regulations in an open public process to achieve the maximum technologically feasible and cost-effective GHG reductions.

CARB proposed "Early Action Measures" in three groups, and together these measures will make a substantial contribution to the overall 2020 statewide GHG emissions reduction goal of approximately 174 million metric tons of carbon dioxide equivalent gases. These measures are summarized as follows:

- *Group 1*: Three new GHG-only regulations are proposed to meet the narrow legal definition of "discrete early action GHG reduction measures": a low-carbon fuel standard, reduction of refrigerant losses from motor vehicle air conditioning system maintenance, and increased CH_4 capture from landfills. These regulations are expected to take effect by January 1, 2010.

- *Group 2:* CARB is initiating work on 23 other GHG emission-reducing measures between 2007 and 2009, with rulemaking to occur as soon as possible, where applicable. These GHG measures relate to the following sectors: agriculture, commercial, education, energy efficiency, fire suppression, forestry, oil and gas, and transportation.

- *Group 3:* CARB is initiating work on ten conventional air pollution controls aimed at criteria and toxic air pollutants, but with concurrent climate co-benefits through reductions in CO_2 or non-Kyoto pollutants (i.e., diesel particulate matter, other light-absorbing compounds, and / or ozone precursors) that contribute to global warming.

Some proposed measures will require new legislation to implement, some will require subsidies, some are already developed, and some will require additional effort to evaluate and quantify. It should be noted that none of the measures from Group 1 would apply to the proposed project. Applicable early action measures that are ultimately adopted from Group 2 and Group 3 may become effective during implementation of the proposed project and the proposed project may be subject to these requirements, depending on their timing.

Bay Area Air Quality Management District Climate Protection Program

The Bay Area Air Quality Management District (BAAQMD) established a climate protection program to reduce pollutants that contribute to global climate change and affect air quality in the San Francisco Bay Area Air Basin (SFBAAB). The climate protection program includes measures that promote energy efficiency, reduce vehicle miles traveled, and develop alternative sources of energy, all of which assist in reducing emissions of GHGs and in reducing air pollutants that affect the health of residents. BAAQMD also seeks to support current climate protection programs in the region and to stimulate additional efforts through public education and outreach, technical assistance to local governments and other interested parties, and promotion of collaborative efforts among stakeholders.

City and County of San Francisco's Greenhouse Gas Reduction Strategy

The City and County of San Francisco (City) has a history of environmental protection policies and programs aimed at improving the quality of life for residents and reducing impacts on the environment. The following plans, policies, and legislation demonstrate San Francisco's continued commitment to environmental protection. They include measures relevant that would decrease the amount of GHG emitted into the atmosphere and thus decrease San Francisco's overall contribution to climate change. These programs are collectively referred to as San Francisco's GHG Reduction Strategy.

- *Transit First Policy:* In 1973, the City instituted the Transit First Policy, which added Article 8A, Section 8A.115 to the City Charter with the goal of reducing San Francisco's reliance on freeways and meeting transportation needs by emphasizing mass transportation. The Transit First Policy gives priority to public transit investments; adopts street capacity and parking policies to discourage increased automobile traffic; and encourages the use of transit, bicycling, and walking instead of single-occupant vehicles.

- *San Francisco Climate Action Plan:* In February 2002, the San Francisco Board of Supervisors passed the Greenhouse Gas Emissions Reduction Resolution (Number 158-02) that set a goal for the City to reduce GHG emissions to 20 percent below 1990 levels by the year 2012 (SFDE, 2004). In September 2004, the San Francisco Department of the Environment (SFDE) and San Francisco Public Utilities Commission published the *Climate Action Plan for San Francisco: Local Actions to Reduce Greenhouse Gas Emissions*. This climate action plan provides the context of climate change in San Francisco and examines strategies to meet the 20 percent GHG emissions reduction target. Although the Board of Supervisors has not formally committed the City to perform the actions addressed in the plan, and many of the actions require further development and commitment of resources, the plan serves as a blueprint for GHG emissions reductions, and several actions have been implemented or are now in progress.

- *San Francisco Municipal Transportation Agency's Zero Emissions 2020 Plan:* The Zero Emissions 2020 Plan focuses on the purchase of cleaner-emissions transit buses, including hybrid diesel-electric buses. Under this plan, hybrid buses will replace the oldest diesel buses, some dating back to 1988. The hybrid buses emit 95 percent less particulate matter (soot) than the buses they replace, produce 40 percent less NO_x, and reduce GHGs by 30 percent.

- *Greenhouse Gas Reduction Ordinance:* In May 2008, the City adopted an ordinance amending the San Francisco Environment Code to establish GHG emissions targets and departmental action plans, to authorize the SFDE to coordinate efforts to meet these targets, and to make environmental findings. The ordinance establishes the following GHG emissions reduction limits for San Francisco and the target dates by which to achieve them:

    - Determine 1990 City GHG emissions by 2008, the baseline level with reference to which target reductions are set;
    - Reduce GHG emissions by 25 percent below 1990 levels by 2017;
    - Reduce GHG emissions by 40 percent below 1990 levels by 2025; and,
    - Reduce GHG emissions by 80 percent below 1990 levels by 2050.

    The ordinance also specifies requirements for City departments to prepare climate action plans that assess GHG emissions associated with their activities and activities regulated by them, report the results of those assessments to the SFDE, and prepare recommendations to reduce emissions. In particular, the San Francisco Planning Department is required to (1) update and amend the City's applicable General Plan elements to include the emissions reduction limits set forth in this ordinance and policies to achieve those targets; (2) consider a project's impact on the City's GHG emissions reduction limits specified in this ordinance as part of its review under CEQA; and (3) work with other City departments to enhance the Transit First Policy to encourage a shift to sustainable modes of transportation, thereby reducing emissions and helping to achieve the targets set forth by the ordinance.

Impact Discussion

3.7a-b. Less-Than-Significant Impact. A significant impact would occur if the proposed project's GHG emissions would result in a substantial contribution to global climate change.

Operational GHG emissions are typically generated by both mobile sources and area sources associated with operation of a particular project. Area-source GHG emissions include natural gas combustion for space and water heating, lighting, maintenance of landscaping and grounds, waste disposal, and other sources. The two potential area-source GHG emissions that would be generated by the proposed project would be the maintenance of landscaping (i.e., water consumption) and electricity consumption associated with the new facility.

The new Mid-day Bus Parking Facility would include a building that would require electricity for lighting. Similar to the reduced parking capacity, the new building would also be smaller than the building at the existing facility. Thus, it is anticipated that electricity-related GHG emissions for lighting would decrease with implementation of the proposed project.

Although mobile-source GHG emissions would be generated by project-related bus trips, the total number of Golden Gate Transit bus trips and vehicle-miles traveled (VMT) would be reduced compared to existing conditions. The project would, therefore, result in a net decrease in mobile-source GHG emissions.

As a result, the proposed project would result in a net decrease in operational GHG emissions compared with Existing Conditions. Table 3-3 summarizes the estimated net change in operational emissions associated with bus routes and operation of the building facilities. Details on the baseline and project scenario determinations as well as the calculation methodologies are contained within the Air Quality / Greenhouse Gas Emissions Technical Study Memorandum found in Appendix A (see Appendix A) (AECOM, 2013a).

Table 3-3: Net Change in GHG Emissions

Emissions Source	Net Change in GHG emissions (carbon dioxide equivalent, CO_2e)	
	Absolute Change (metric tons / year)	**Percentage Change**
Basic Bus Services	(158.05)	(57%)
Commute Bus Services	(93.96)	(37%)
Modular Office	(51.93)	(89%)
Parking Lot	(4.38)	(14%)
Total	**(308.32)**	**(49%)**

Source: AECOM, 2013a.

As shown in Table 3-3, the proposed project would result in a net decrease in GHG emissions from mobile and area sources, as well as overall project-related GHG emissions. Therefore, although a quantitative GHG threshold has not been established by BAAQMD, CARB, or another applicable regulatory agency, it is reasonable to conclude that, because the proposed project would result in an individual (i.e., on an emission source basis) and overall net decrease in GHG emissions, it would not generate a significant amount of GHG emissions that would represent a substantial contribution to climate change.

As one component of the Transbay Transit Center, the proposed project is also part of a regional effort to reduce mobile source emissions consistent with the regional climate action plan and the statewide AB 32 Scoping Plan's GHG reduction goals. Specifically, the project and other elements of the Transbay Transit Center would improve public transit, consistent with the transportation component of San Francisco's *Climate Action Plan* (i.e., Part A. Public Transit). The transportation component of the *Climate Action Plan* calls for expanding and improving local and regional transit service and interconnections, increasing the user-friendliness of public transit, and other actions to encourage use of public transit and reduce vehicle emissions in the region, which are also the goals of the future Transbay Transit Center. Therefore, the proposed project can also be considered consistent with the transportation component of the *Climate Action Plan*. As a result, the project would have a less-than-significant impact on greenhouse gas emissions.

3.3 NOISE

Issue	Potentially Significant Impact	Less-Than-Significant Impact with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
Would the project result in:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☒	☐
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☐	☒
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☐	☒
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

Existing Conditions

Acoustics Background and Terminology

Sound is mechanical energy transmitted by pressure waves in a compressible medium such as air. Noise can be defined as unwanted sound. Sound is characterized by various parameters that include the rate of oscillation of sound waves (frequency), the speed of propagation, and the pressure level or energy content (amplitude). In particular, the sound pressure level is the most common descriptor used to characterize the loudness of an ambient sound level. The decibel (dB) scale is used to quantify sound intensity. Because sound pressure can vary enormously within the range of human hearing, the logarithmic decibel scale is used to keep sound intensity numbers at a convenient and manageable level.

The human ear is not equally sensitive to all frequencies in the entire spectrum, so noise measurements are weighted more heavily for frequencies to which humans are sensitive in a process called "A-weighting." Since humans are less sensitive to low frequency sound than to high frequency sound, A-weighted sound levels de-emphasize low frequency sound energy to better represent how humans hear.

Different types of measurements are used to characterize the time-varying nature of sound. These measurements include the equivalent sound level (L_{eq}), the minimum and maximum sound levels (L_{min} and L_{max}), percentile-exceeded sound levels (L_n), the day-night sound level (L_{dn}), and the community noise equivalent level (CNEL). Below are brief definitions of terminology used in this section:

Sound. A vibratory disturbance created by a vibrating object, which, when transmitted by pressure waves through a medium such as air, is capable of being detected by a receiving mechanism, such as the human ear or a microphone.

Noise. Sound that is loud, unpleasant, unexpected, or otherwise undesirable.

Ambient Noise. The composite of noise from all sources near and far in a given environment exclusive of particular noise sources to be measured.

Decibel (dB). A unitless measure of sound on a logarithmic scale, which indicates the squared ratio of sound pressure amplitude to a reference sound pressure amplitude. The reference pressure is 20 micropascals.

A-Weighted Decibel (dBA). An overall frequency-weighted sound level in decibels which approximates the frequency response of the human ear.

Equivalent Sound Level (L_{eq}). The average of sound energy occurring over a specified period. In effect, L_{eq} is the steady-state sound level that in a stated period would contain the same acoustical energy as the time-varying sound that actually occurs during the same period.

Day-Night Sound Level (L_{dn}). The energy average of the A-weighted sound levels occurring during a 24-hour period, with 10 dB added to the A-weighted sound levels occurring during the period from 10:00 PM to 7:00 AM (nighttime).

Community Noise Equivalent Level (CNEL). The energy average of the A-weighted sound levels occurring during a 24-hour period with 5 dB added to the A-weighted sound levels occurring during the period from 7:00 PM to 10:00 PM and 10 dB added to the A-weighted sound levels occurring during the period from 10:00 PM to 7:00 AM.

L_{dn} and CNEL values rarely differ by more than 1 dB. As a matter of practice, L_{dn} and CNEL values are considered to be equivalent and are treated as such in this assessment. In general, human sound perception is such that a change in sound level of 3 dB is just noticeable, a change of 5 dB is clearly noticeable, and a change of 10 dB is perceived as doubling or halving sound level.

For a point source of sound such as a stationary compressor, sound generally attenuates at a rate of 6 dB per doubling of distance. For a line source of sound such as free flowing traffic on a freeway, sound generally attenuates at a rate of 3 dB per doubling of distance. Atmospheric conditions including wind, temperature gradients, and humidity can change how sound propagates over distance and can affect the level of sound received at a given location. The degree to which the ground surface absorbs acoustical energy also affects sound propagation. Sound that travels over an acoustically absorptive surface such as grass attenuates at a greater rate than sound that travel over a hard surface such as pavement. The increased attenuation of an absorptive surface is typically in the range of 1 to 2 dB per doubling of distance. Barriers such as building and topography that block the line of site between a source and receiver also increase the attenuation of sound over distance.

Auditory and non-auditory effects can result from excessive or chronic exposure to elevated noise levels. Auditory effects of noise on people can include temporary or permanent hearing loss. Non-auditory effects of exposure to elevated noise levels include sleep disturbance, speech interference, and physiological effects, such as annoyance. Land use compatibility standards for noise are typically based on research related to these auditory effects.

Ambient Noise and Noise-Sensitivity of Land Uses

Noise-sensitive land uses are those locations where noise can interfere with primary activities. These uses include places where people sleep, such as residences and hospitals. Other noise-sensitive uses include schools, libraries, places of worship, and areas of recreation during hours of normal human use. Vibration-sensitive uses are similar to noise-sensitive uses, but are in large part limited to residential uses, historical structures, and vibration–sensitive technical facilities (i.e., biomedical research).

The proposed project is located in downtown San Francisco, an urban environment consisting primarily of residential, commercial, and mixed-use developments. Noise-sensitive land uses in the project vicinity are primarily residential, with the closest residences located within 50 feet of proposed bus routes and within 100 feet of the proposed Mid-day Bus Parking Facility.

Existing (ambient) noise levels in the vicinity of the closest residential receivers to the project bus parking facility were measured to be in the range of 70-79 dB hourly L_{eq} (81 dB L_{dn}). This noise exposure was dominated by local traffic on Third Street and the elevated I-80 (West Approach) freeway. Measured noise exposure near building setbacks along roadway segments in the project vicinity ranged from 64-71 dB L_{eq}, with maximum levels as high as 88 dB (L_{max}). In terms of the day-night average noise level (L_{dn}), existing traffic noise levels at typical building

setbacks and exterior receiver locations in the project vicinity were modeled to be in the range of approximately 60-75 dB.

Regulatory Framework

Federal Transit Administration (FTA)

The Federal Transit Administration (FTA) has developed a methodology and significance criteria to evaluate noise impacts from surface transportation modes (i.e., passenger cars, trucks, buses, and rail), detailed in *Transit Noise and Vibration Impact Assessment* ("*FTA Guidelines*") (May 2006). The incremental noise level increase criteria included within the *FTA Guidelines* are based on studies of annoyance in communities affected by transportation noise, prepared by the U.S. Environmental Protection Agency (EPA). These criteria are summarized in Table 3-4.

Table 3-4: FTA Impact Criteria for Noise-Sensitive Uses

Existing Day-Night Noise Level (L_{dn}) (dBA)	Allowable Noise Level Increase (dB)	
	Residences and Buildings Where People Normally Sleep[a]	Institutional Land Uses with Primarily Daytime and Evening Uses[b]
45	8	12
50	5	9
55	3	6
60	2	5
65	1	3
70	1	3
75	0	1
80	0	0

Notes:
[a] This category includes residences, hospitals, and hotels where a nighttime sensitivity to noise is assumed to be of utmost importance.
[b] This category includes schools, libraries, theaters, and churches where it is important to avoid interference with activities such as speech, meditation, and concentration on reading material.
Source: FTA, 2006.

The scientific rationale for the choice of these criteria is explained in the *FTA Guidelines*. Starting from the EPA's definition of minimal noise impact as a 5 dB change from an established protective ambient level, the FTA extended the EPA's incremental impact criteria to higher baseline ambient levels. As baseline ambient levels increase, the allowable noise level increase is reduced to limit community annoyance. For example, in residential areas with a baseline ambient noise level of 50 dBA L_{dn}, a 5 dB increase in noise levels would be acceptable, while at 70 dBA L_{dn}, only a 1 dB increase would be allowed.

The FTA has also developed guidelines for assessing the significance of ground-borne vibration produced by transportation sources and construction activity. Vibration impact criteria are summarized in Table 3-5.

Table 3-5: FTA Impact Criteria for Ground-borne Vibration (General Assessment)

Land Use Category	Impact Levels (VdB, relative to 1 µin / sec)		
	Frequent Events[a]	Occasional Events[b]	Infrequent Events[c]
Category 1 Buildings where vibration would interfere with interior operations[d]	65	65	65
Category 2 Residences and buildings where people normally sleep	72	75	80
Category 3 Institutional land uses with primarily daytime uses	75	78	83

Notes:
[a] Defined as more than 70 vibration events of the same source per day.
[b] Defined as between 30 and 70 vibration events of the same source per day.
[c] Defined as fewer than 30 vibration events of the same source per day.
[d] This criterion limit is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes.
Source: FTA, 2006.

These vibration criteria are related to ground-borne vibration levels that are expected to result in human annoyance, and are based on root mean square (RMS) velocity levels expressed in VdB. FTA experience with community response to ground-borne vibration indicates that when there are only a few train or bus events per day, higher vibration levels are needed to evoke the same community response that would be expected from more frequent events generating a similar level of vibration. The FTA criteria take this phenomenon into account by distinguishing between projects with "frequent" and "infrequent" events, where frequent is defined as more than 70 events per day.

To address the potential for structural damage to fragile buildings, Section 12.2.2 of the *FTA Guidelines* also recommends vibration impact thresholds of 0.2 in / sec peak particle velocity (PPV) (approximately 100 VdB) for fragile buildings and 0.12 in / sec PPV (approximately 95 VdB) for extremely fragile buildings. In this case, the FTA's general assessment criteria listed in Table 3-5 are more restrictive, and will therefore be used to assess proposed project impacts in this report.

Title 24

Title 24, Part 6, Division T25, Chapter 1, Subchapter 1, Article 4, Sections T25–28 of the California Code of Regulations establish building standards applicable to all dwellings throughout the state. The Code provides acoustical regulations requiring both exterior-to-interior sound insulation and sound and impact isolation between adjacent spaces of various occupied units. Title 24 regulations state that interior noise levels generated by exterior noise sources shall not exceed 45 dB L_{dn}, with windows closed, in any habitable room for general residential uses. Generally, the inclusion of noise-insulating windows and sound isolation materials in the project design are means of demonstrating compliance with this interior noise level standard.

San Francisco General Plan

The *San Francisco General Plan* provides long-term guidance and policies for maintaining and improving the quality of life and the man-made and natural resources of the community. In particular, the Environmental Protection Element of the *San Francisco General Plan* is concerned primarily with avoiding or mitigating the adverse effects of transportation noise, and contains the following objectives and policies relevant to this analysis:

Objective 11: Promote land uses that are compatible with various transportation noise levels.

Policy 11.1 Discourage new uses in areas in which the noise level exceeds the noise compatibility guidelines for that use.

Policy 11.3 Locate new noise-generating development so that the noise impact is reduced.

The "Land Use Compatibility Chart for Community Noise" included in Policy 11.1 establishes the compatibility of different land use types within a range of ambient noise levels.

For residential uses:

- Noise exposure is considered "satisfactory, with no special noise insulation requirements" where the L_{dn} is 60 dBA or less.
- "New construction or development should be undertaken only after a detailed analysis of noise reduction requirements is made and needed noise insulation features included in the design" where the L_{dn} is between 60 dBA and 70 dBA.
- "New construction or development should generally be discouraged" where the L_{dn} is above 65 dBA.

For other noise-sensitive uses (i.e., schools, libraries, churches, hospitals, nursing homes):

- Noise exposure is considered "satisfactory, with no special noise insulation requirements" where the L_{dn} is 65 dBA or less.
- "New construction or development should be undertaken only after a detailed analysis of noise reduction requirements is made and needed noise insulation features included in the design" where the L_{dn} is between 62 dBA and 70 dBA.

"New construction or development should generally not be undertaken" where the L_{dn} is above 65 dBA.

San Francisco Noise Ordinance

The *San Francisco Noise Ordinance* (Article 29, *San Francisco Police Code*, Section 2900) specifically recognizes that adverse effects on a community can arise from noise sources such as transportation, construction, mechanical equipment, entertainment, and human and animal behavior. In particular, the *San Francisco Noise Ordinance* makes the following declaration:

> It shall be the policy of San Francisco to maintain noise levels in areas with existing healthful and acceptable levels of noise and to reduce noise levels, through all practicable means, in those areas of San Francisco where noise levels are above acceptable levels as defined by the World Health Organization's *Guidelines on Community Noise*.

Section 2909 of the *San Francisco Noise Ordinance* limits noise from a fixed source (e.g., an idling bus in the proposed Mid-day Bus Parking Facility) from causing the noise level measured inside any sleeping or living room

in any dwelling unit located on residential property to 45 dBA between the hours of 10:00 PM to 7:00 AM or 55 dBA between the hours of 7:00 AM to 10:00 PM with windows open except where building ventilation is achieved through mechanical systems that allow windows to remain closed. It is assumed that these noise level limits are represented by the hourly L_{eq} descriptor (hourly average level).

Impact Discussion

3.3a. Less-Than-Significant Impact. A significant impact may occur if project-related noise levels exceed the applicable standards of the City of San Francisco or other agencies.

Measured exterior noise exposure at a residential receiver location in the vicinity of the proposed new Mid-day Bus Parking Facility, on the southeast corner of Third Street and Stillman Street, was approximately 81 dBA L_{dn}. This noise exposure was dominated by local traffic on Third Street and the elevated I-80 freeway. Modeled traffic noise exposure under the existing (ambient) condition ranged from 60.2 dBA L_{dn} to 75.3 dBA L_{dn} for affected receivers in the project vicinity, with most levels exceeding 65 dBA L_{dn}. Therefore, for most noise-sensitive uses in the project vicinity, existing noise exposure currently exceeds the City's applicable 60 dBA L_{dn} or 65 dBA L_{dn} "satisfactory" land use compatibility limits.

Modeled existing plus project traffic noise levels also ranged from approximately 60.2 dBA L_{dn} to 75.3 dBA L_{dn}, with no more than a 0.2 dB increase in traffic noise level due to the project at affected roadways / receivers. The addition of the project itself would not be expected to cause noise exposure in excess of the City's noise compatibility standards. Therefore, this impact is considered less than significant.

More detailed information regarding acoustical measurements, modeling, analysis, and impact assessment are contained within the Noise / Vibration Technical Study Memorandum found in Appendix B (see Appendix B) (AECOM, 2013b).

3.3b. Less-Than-Significant Impact. A significant impact may occur if the project would produce excessive ground-borne vibration levels at acoustically sensitive uses.

The proposed project would not include sources of substantial ground-borne vibration. The passing of a project-related bus on local streets would not be expected to produce vibration levels in excess of 65 VdB at a distance of 50 feet, and, thus, would likely be imperceptible to most receivers. Since residential receivers in the vicinity of the project bus routes would generally be more than 50 feet from passing project buses, the vibration produced by these operations would not likely be perceptible. Additionally, project-related daily operations at the Mid-day Bus Parking Facility would not be expected to introduce substantial sources of ground-borne vibration. Therefore, this impact is considered less than significant.

3.3c. Less-Than-Significant Impact. A significant impact may occur if the project would permanently increase noise exposure relative to the ambient noise condition.

As presented in Impact 3.3a above, the proposed project is not expected to increase traffic noise exposure by more than 0.2 dB (L_{dn}) relative to the existing traffic noise condition. This is not a significant increase based on the applied FTA impact threshold (see Table 3-4 above). Project-related noise produced by bus operations within the Mid-day Bus Parking Facility would be shielded from neighboring residences by the 12-foot high sound wall

(proposed as part of the previously approved 2004 FEIS / EIR) that would be constructed along Stillman Street and part of Third Street. Resulting noise exposure is expected to be well below ambient levels and is not expected to produce a significant increase in noise levels relative to the existing condition. Therefore, this impact is considered less than significant.

3.3d. No Impact. A significant impact may occur if the project would temporary or periodically increase noise exposure relative to the ambient noise condition.

The proposed project would not include any new construction or any other temporary source of noise that was not addressed in the original FEIS / EIR. Thus, implementation of the proposed project would not result in significant, temporary increases in noise exposure relative to the ambient condition. There would be no impact. Permanent increases in noise exposure from the proposed project are discussed under Impact 3.3c above.

3.3e & f. No Impact. A significant impact may occur if the people residing or working in the project area would be exposed to excessive aircraft noise levels.

The proposed project is not located within an area covered by an airport land use plan or within two miles of a public airport, public use airport, or private airport. Noise exposure in the project area is dominated by local traffic operations. Thus, implementation of the proposed project would not result in airport noise impacts on people residing or working within the project area. There would be no impact.

3.4 TRANSPORTATION AND TRAFFIC

Issue	Potentially Significant Impact	Less-Than-Significant Impact with Mitigation Incorporated	Less-Than-Significant Impact	No Impact
Would the project:				
a) Cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?	☐	☐	☒	☐
b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?	☐	☐	☒	☐
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☐	☒
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e. g. farm equipment)?	☐	☐	☐	☒

e) Result in inadequate emergency access?	☐	☐	☒	☐
f) Conflict with adopted policies supporting alternative transportation (e.g., bus turnouts, bicycle racks)?	☐	☐	☐	☒
g) Result in inadequate parking capacity?*	☐	☐	☐	☒

* Not in CEQA Appendix G.

Existing Conditions

Existing intersection Level of Service (LOS) was evaluated using the 2000 *Highway Capacity Manual* (HCM) methodology at selected study intersections where there is a potential that the proposed project may result in substantial effects to transportation and circulation. The LOS methodology is a qualitative description of the performance of an intersection based on average delay per vehicle. For signalized intersections, the HCM methodology determines the capacity of each lane group approaching the intersection and calculates an average delay (in seconds per vehicle) for each of the various movements at the intersection. A combined weighted average delay and LOS are then presented for the intersection. For unsignalized intersections, the average delay and LOS for the worst stop-controlled approach at the intersection are presented. Adjustments are typically made to the capacity of each intersection to account for various factors that reduce the ability of the streets to accommodate vehicles (such as the "downtown" nature of the area, number of pedestrians, bus stops, vehicle types, lane widths, grades, on-street parking, and queues).

Intersection LOS ranges from LOS A, which indicates free flow or excellent conditions with short delays, to LOS F, which indicates congested or overloaded conditions with extremely long delays. LOS definitions for signalized and unsignalized intersections are described in Table 3-6. In San Francisco, LOS A through LOS D are considered excellent to satisfactory service levels, and LOS E and LOS F represent unacceptable service levels.

Table 3-6: Intersection Level of Service Definitions

LOS	Description	Average Delay (seconds / vehicle)	
		Signalized Intersections	**Unsignalized Intersections**
A	Little or no delay	$\leq$ 10.0	$\leq$ 10.0
B	Short traffic delay	> 10.0 and $\leq$ 20.0	> 10.0 and $\leq$ 15.0
C	Average traffic delay	> 20.0 and $\leq$ 35.0	> 15.0 and $\leq$ 25.0
D	Long traffic delay	> 35.0 and $\leq$ 55.0	> 25.0 and $\leq$ 35.0
E	Very long traffic delay	> 55.0 and $\leq$ 80.0	> 35.0 and $\leq$ 50.0
F	Extreme traffic delay	> 80.0	> 50.0

Source: Transportation Research Board, 2000.

It should be noted that delay for intersections operating at LOS F is typically reported as "greater than 80.0 seconds" for signalized intersections and "greater than 50.0 seconds" for unsignalized intersections, as 80.0 seconds and 50.0 seconds are generally considered the limits of the meaningful range for the analysis methodology for signalized and unsignalized intersections. In these situations, the volume-to-capacity (v/c) ratio is also presented to facilitate comparison between scenarios.

Intersection LOS was analyzed at the following three (3) study intersections using Trafficware's Synchro 8 software package:

1. Third Street / Perry Street;
2. Third Street / Harrison Street; and,
3. Third Street / Folsom Street.

Consistent with typical intersection analyses as described in the San Francisco Planning Department's *Transportation Impact Analysis Guidelines for Environmental Review* (October 2002), operations at the study intersections were analyzed for the weekday PM peak hour, defined as the four consecutive 15-minute periods during the weekday PM peak period (4:00 PM to 6:00 PM) exhibiting the highest overall traffic volumes. These three intersections were selected because they are expected to show the highest increase in total traffic volumes during the weekday PM peak period as a result of the proposed project.

Intersection turning movement counts at the three study intersections were collected on Tuesday, October 9, 2012. Traffic signal timing plans were obtained from the San Francisco Municipal Transportation Agency (SFMTA). Existing lane geometries (including peak period tow-away restrictions and transit-only lanes) were gathered from field observations. Observations of roadway operations found that the transit-only lanes on Third Street were used primarily by transit vehicles only. Existing Conditions weekday PM peak hour intersection lane geometry and traffic volumes are illustrated in Figure 3-1. Existing Conditions weekday PM peak hour intersection LOS is summarized in Table 3-7.

Table 3-7: Existing Conditions – Weekday PM Peak Hour Intersection Level of Service

Intersection	Existing Conditions		
	Traffic Control	**LOS**	**Delay (seconds / vehicle)**
1 Third Street / Perry Street	One-way stop		
Westbound Perry Street		C	15.9
Intersection average		A	0.1
2 Third Street / Harrison Street	Signal	B	16.9
3 Third Street / Folsom Street	Signal	C	22.1

Source: AECOM, 2013c.

Figure 3-1: Existing Conditions Intersection Lane Geometry and Traffic Volumes

Source: AECOM, 2013.

In order to facilitate comparison with the Existing plus Project Conditions analysis, delay and LOS at Third Street / Perry Street are reported for the stop-controlled approach (westbound Perry Street) and the intersection as a whole. Likewise, at Third Street / Harrison Street and Third Street / Folsom Street, delays associated with transit vehicles in the Third Street transit-only lane have been omitted from the analysis. As shown in Table 3-7, all three study intersections currently operate at acceptable LOS (LOS D or better) during the weekday PM peak hour.

Regulatory Framework

San Francisco Transportation/Traffic-related policies

The San Francisco Planning Department uses the following significance criterion for the determination of intersection-related impacts associated with a proposed project:

- The operational impact on signalized intersections is considered significant when project-related traffic causes the intersection level of service to deteriorate from LOS D or better to LOS E or LOS F, or from LOS E to LOS F. The operational impacts on unsignalized intersections are considered potentially significant if project-related traffic causes the level of service at the worst approach to deteriorate from LOS D or better to LOS E or LOS F and the California Manual on Uniform Traffic Control Devices (California MUTCD) signal warrants would be met, or would cause California MUTCD signal warrants to be met when the worst approach is already operating at LOS E or LOS F. The project may result in significant adverse impacts at intersections that operate at LOS E or LOS F under existing conditions depending upon the magnitude of the project's contribution to the worsening of the average delay per vehicle. In addition, the project would have a significant adverse impact if it would cause major traffic hazards or contribute considerably to cumulative traffic increases that would cause deterioration in levels of service to unacceptable levels.

Impact Discussion

3.16a. Less-Than-Significant Impact. A significant impact may occur if the project would cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system or if adopted San Francisco thresholds for a significant project impact are exceeded for roadways and intersections that would carry project-generated traffic.

Existing plus Project Conditions

Golden Gate Transit Commute Bus pull-outs from the existing Mid-day Bus Parking Facility during the weekday PM peak hour were added to traffic volumes on the affected turning movements at the three study intersections. As described previously, the proposed project would also involve geometry and signalization changes at the Third Street / Perry Street intersection, which were also accounted for in the Existing plus Project Conditions analysis. In particular, the change in directionality of Perry Street would result in outlet traffic from the segment of Perry Street between Third Street and Fourth Street using the Third Street / Perry Street intersection instead of the Fourth Street / Perry Street intersection. Although the actual volume of traffic currently using this segment of Perry Street is minimal, it provides secondary parking / loading access for several parcels with primary entrances along Harrison Street. As a result, a nominal volume of non-bus traffic was assumed for the eastbound approach at the Third Street / Perry Street intersection.

Consistent with the *Golden Gate Transit San Francisco Mid-Day Bus Parking Facility Draft Preliminary Design Evaluation Report* (November 6, 2012) prepared by URS and associated analysis work conducted by Fehr & Peers, the analysis assumes a three-phase signal (northbound Third Street, eastbound Perry Street, and westbound Perry Street), with the new pedestrian phase across Third Street operating with both Perry Street phases.

The resulting weekday PM peak hour intersection lane geometry and traffic volumes are illustrated in Figure 3-2. The resulting Existing plus Project Conditions weekday PM peak hour intersection LOS is summarized in Table 3-8.

Table 3-8: Existing plus Project Conditions – Weekday PM Peak Hour Intersection Level of Service

Intersection	Existing Conditions			Existing plus Project Conditions		
	Traffic Control	**LOS**	**Delay (seconds / vehicle)**	**Traffic Control**	**LOS**	**Delay (seconds / vehicle)**
1 Third Street / Perry Street	OWSC			Signal		
Westbound Perry Street		C	15.9		C	29.0
Eastbound Perry Street					C	21.0
Intersection average		A	0.1		A	7.8
2 Third Street / Harrison Street	Signal	B	16.9	Signal	B	16.9
3 Third Street / Folsom Street	Signal	C	22.1	Signal	C	22.3

Notes:
OWSC = One-way stop control
Source: AECOM, 2013c.

As shown in Table 3-8, the proposed project would have a negligible effect on overall traffic operations at the Third Street / Harrison Street and Third Street / Folsom Street intersections. The introduction of a new traffic signal (and associated traffic volumes) and signalized crosswalk across Third Street at the Third Street / Perry Street intersection would slightly degrade intersection average delay compared to Existing Conditions, but the intersection as a whole would still operate at LOS A while facilitating bus egress out of the new Golden Gate Transit Mid-day Bus Parking Facility and pedestrian connectivity across Third Street.

Figure 3-2: Existing plus Project Conditions Intersection Lane Geometry and Traffic Volumes

Source: AECOM, 2013.

Cumulative (2030) Conditions

The Cumulative (2030) Conditions analysis is based on technical work conducted for the *Transit Center District Plan and Transit Tower Draft Environmental Impact Report* (EIR) (Planning Department Case Number 2007.0558E and 2008.0789E; SCH #2008072073)—hereafter referred to as the "Transit Center District Plan EIR")—published by the San Francisco Planning Department on September 28, 2011. Use of the *Transit Center District Plan EIR* technical work ensures that the analysis of Cumulative (2030) Conditions considers both background growth in the city and region (such as buildout of the *Market / Octavia Plan*, the Eastern Neighborhoods rezoning, and the *Treasure Island Redevelopment Plan*) and growth attributable to specific parcels in and around the Transit Center District Plan area. The *Transit Center District Plan EIR* technical work also assumes various changes to the transportation network—such as the *Rincon Hill Streetscape Master Plan*, the Central Subway, and the Transit Effectiveness Project—that would likely affect traffic patterns and volumes in and around the project site.

Additional modifications to the *Transit Center District Plan EIR* technical work were made as needed to account for intersections not explicitly studied in the EIR and specific elements of the proposed project (such as the rerouted bus traffic) that represent departures from the original assumptions contained in the *Transit Center District Plan EIR* analysis.

Cumulative (2030) Conditions weekday PM peak hour intersection lane geometry and traffic volumes are illustrated in Figure 3-3. The resulting Cumulative (2030) Conditions weekday PM peak hour intersection LOS is summarized in Table 3-9.

Table 3-9: Cumulative (2030) Conditions – Weekday PM Peak Hour Intersection Level of Service

Intersection	Existing plus Project Conditions		Cumulative (2030) Conditions		
	LOS	Delay (seconds / vehicle)	LOS	Delay (seconds / vehicle)	v/c
1 Third Street / Perry Street	A	7.8	A	6.8	
2 Third Street / Harrison Street	B	16.9	**F**	**> 80.0**	**1.26**
3 Third Street / Folsom Street	C	22.1	**F**	**> 80.0**	**1.16**

Notes:
Bold indicates unacceptable conditions (LOS E or LOS F).
Source: AECOM, 2013c.

It should be noted that explicit forecasts were not calculated for bus traffic in the transit-only lanes along Third Street, as the actual bus volumes are uncertain and highly dependent on Muni service plans following the opening of the Central Subway. Omission of transit-only traffic has no effect on the analysis results, as this bus traffic is segregated from the general travel lanes considered in the intersection LOS analysis. Bus traffic not in transit-only lanes (e.g., along Harrison Street or Folsom Street) was assumed to exhibit growth rates similar to those for general traffic. As the current level of bus traffic not using transit-only lanes is minimal, the effect of the growth rate assumptions for this traffic on overall intersection performance are mostly negligible.

Figure 3-3: Cumulative (2030) Conditions Intersection Lane Geometry and Traffic Volumes

Source: AECOM, 2013.

As shown in Table 3-9, the Third Street / Perry Street intersection would continue to operate at LOS A under Cumulative (2030) Conditions, but the Third Street / Harrison Street and Third Street / Folsom Street intersections would degrade to LOS F, with v/c ratios over 1.00.

Consistent with San Francisco Planning Department standard methodologies, a review of the proposed project's contribution to intersection critical movements at these two intersections was conducted to determine if the proposed project would represent a significant contribution to the failing conditions. The proposed project's contribution to critical movement volumes at these locations is summarized in Table 3-10.

Table 3-10: Cumulative (2030) Conditions – Project Contribution to Intersections

Intersection	Critical Movement	Project Contribution to Critical Movement
2 Third Street / Harrison Street	NBT	0.0%
	WBT	0.0%
3 Third Street / Folsom Street	NBT	0.0%
	EBL	0.0%

Source: AECOM, 2013c.

As shown in Table 3-10, the proposed project would not contribute traffic to any of the critical movements at the two study intersections failing under Cumulative (2030) Conditions. In particular, project-generated traffic at the Third Street / Harrison Street intersection would be confined to the transit-only lane along Third Street and would have a negligible effect on traffic operations in the adjacent northbound travel lanes. At the Third Street / Folsom Street intersection, the proposed project would add traffic to the northbound right-turn movement, which is not expected to be an intersection critical movement. Therefore, this would be a less-than-significant impact.

3.16b. Less-Than-Significant Impact. A significant impact may occur where adopted Caltrans, San Francisco County Transportation Authority (SFCTA), and Metropolitan Transportation Commission (MTC) thresholds for a significant project impact are exceeded.

The proposed project primarily involves changes to the alignment of existing bus routes on city streets, and is not expected to result in any new operational vehicle trips beyond existing traffic, nor add traffic to Caltrans facilities such as freeway mainlines or ramps.

While the proposed project would reroute bus traffic onto Third Street, which is designated as part of the local Congestion Management Program (CMP) roadway network by the SFCTA, the existing routes already direct bus traffic onto Folsom Street, which is also part of the CMP-designated roadway network. As a result, the proposed project only involves the rerouting of bus traffic from one CMP-designated roadway segment to another CMP-designated roadway segment. Given this consideration, the overall effects of the proposed project on the CMP-designated roadway network are expected to be minimal, and no additional project-related effects are expected beyond those already considered in the analysis of LOS at the three affected study intersections along Third Street. Therefore, this would be a less-than-significant impact.

3.16c. No Impact. A significant impact would occur if the proposed project would result in a change in air traffic patterns.

The proposed project would not include any aviation-related uses and would, therefore, not result in a change in air traffic patterns. Thus, no impact would occur.

3.16d. No Impact. A significant impact would occur if the proposed project includes new roadway design or introduces new land use or project features into an area with specific transportation requirements and characteristics that have not been previously experienced in that area, or if project access or other features were designed in such a way as to create hazardous conditions.

The proposed project would involve a reversal of the directionality of Perry Street from one-way westbound traffic to one-way eastbound traffic and the installation of a new traffic signal at the Third Street / Perry Street intersection to facilitate bus egress out of the new Mid-day Bus Parking Facility. Access would still be available to parcels along Perry Street, and no features of the proposed project are expected to create hazardous conditions. Thus, no impact would occur.

3.16e. Less-Than-Significant Impact. A significant impact would occur if the project design does not provide emergency access meeting the requirements of the San Francisco Fire Department or in any other way threatens the ability of emergency vehicles to access and serve the project site or adjacent uses.

The proposed project would involve a reversal of the directionality of Perry Street from one-way westbound traffic to one-way eastbound traffic, but emergency access would still be available to parcels along Perry Street. Therefore, the proposed project would have a less-than-significant impact on emergency access.

3.16f. No Impact. A significant impact may occur if the proposed project were to conflict with adopted policies or involve modification of existing alterative transportation facilities located on- or off-site.

As a transit-related project, the proposed project would encourage alternative transportation by facilitating Golden Gate Transit Commute Bus operations in Downtown San Francisco. The proposed traffic signal at the Third Street / Perry Street intersection would also include a signalized crosswalk across Third Street, enhancing pedestrian connectivity across a high-volume roadway in a dense, urban environment. The proposed project would add new bus traffic to existing transit-only lanes along Third Street, but this, in and of itself, would not represent a conflict with adopted policies, plans, or programs supporting alternative transportation. Use of the transit-only lanes by Golden Gate Transit Commute Bus services would actually encourage alternative transportation by increasing the average speed and reducing the average travel times of these services. Therefore, no impacts to adopted policies, plans, or programs supporting alternative transportation would occur.

3.16g. No Impact. A significant impact may occur if the proposed project resulted in inadequate parking capacity.

Since the proposed project would not result in new habitable or employment-related land uses, the proposed project would not be required to provide new parking spaces. Therefore, no parking deficiency is anticipated, and there would be no impact related to parking capacity.

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Memorandum

To	Daniel Ng, PE Golden Gate Bridge, Highway and Transportation District	Pages	8
CC	John Eberle, PE Maurice Palumbo, PE		
Subject	Transbay Terminal EIR / EIS Addendum: Golden Gate Transit San Francisco Mid-Day Bus Parking Facility – Air Quality and Greenhouse Gases		
From	Jeffrey Chan, PTP Todd Haurin, LEED AP		
Date	January 6, 2013		

This memorandum summarizes the existing and future-year conditions technical analysis relating to air quality and greenhouse gases for Golden Gate Transit's new San Francisco Mid-day Bus Parking Facility Relocation Project. The analysis efforts described in this memorandum will be incorporated into an addendum to the Final Transbay Terminal / Caltrain Downtown Extension / Redevelopment Project Environmental Impact Statement / Environmental Impact Report (SCH #95063004) ("Transbay EIS / EIR"), originally published in March 2004.[1]

Methodology

In order to reflect the subtle air quality and climate impacts from the changes associated with the reroute of Golden Gate Transit "Commute Bus" and "Basic Bus" services from the current Mid-Day Bus Parking Facility located at Eighth Street / Harrison Street to the proposed facility at Third Street / Perry Street, a sophisticated multi-phase emissions estimation model, such as the California Emissions Estimator Model (CalEEMod) or URBEMIS is not required. In addition, URBEMIS is no longer being updated and references an out-of-date version of the EMission FACtors (EMFAC) model. Although the Bay Area Air Quality Management District (BAAQMD) California Environmental Quality Act Air Quality Guidelines (May 2012) recommend using CalEEMod or URBEMIS, it also permits the use of hand calculations, especially since these analytic tools can be burdensome and overly complex for a comparatively straightforward analysis.

The emissions required to be calculated for this exercise include the Scope 1 emissions (i.e., the direct emissions from mobile or stationary sources) of criteria pollutants and greenhouse gases (GHGs) from the Commute Bus and Basic Bus services and Scope 2 GHG emissions (i.e., the indirect emissions from purchased electricity) from the built structures and street lighting for the existing and new bus parking facilities. A qualitative assessment of toxic air contaminants (TACs) was also conducted.

The criteria pollutant and GHG emissions have been calculated using a spreadsheet containing diesel urban bus emission factors taken from EMFAC2011[2], the latest installment of the widely accepted EMFAC model

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(1) Under the proposed project, the Golden Gate Transit "Basic Bus" services would operate in the fashion considered in the Transbay EIS/EIR.

(2) EMFAC2011 can be accessed at http://www.arb.ca.gov/msei/modeling.htm.

designed by the California Air Resources Board (CARB) to provide emissions estimations for various types of on-road vehicles. EMFAC is continuously updated to reflect changing conditions, such as newer vehicle model years and stricter vehicle emissions regulations. As EMFAC2011 does not provide trace GHG emission factors of methane (CH_4) and nitrous oxide (N_2O) for vehicles or for Scope 2 GHG emissions from purchased electricity, trace mobile GHG emission factors were referenced from CARB's Local Government Operations Protocol (LGOP).[3]

Annual electricity use from the buildings and exterior lighting at the existing and new parking facility sites was estimated using data from the California Commercial End-Use Survey (CEUS), prepared by the California Energy Commission (CEC), for operations located in the Pacific Gas & Electric (PG&E) service territory. Scope 2 GHG emissions from this estimated annual electricity usage were calculated using the local PG&E grid emission factor for carbon dioxide (CO_2).[4] As PG&E does not provide trace GHG emission factors for CH_4 and N_2O from its electricity production, the trace GHG emission factors from the California state grid were referenced from CARB's LGOP.

Emissions Sources

The proposed relocation of the Mid-day Bus Parking Facility would result in route changes for Golden Gate Transit Commute Bus and Basic Bus services. The operation of the new Mid-Day Bus Parking Facility and associated diesel-fueled buses carrying passengers will result in direct emissions of criteria pollutants and both direct and indirect emissions of GHGs from purchased electricity.

It is important to note that Golden Gate Transit's existing bus services already generate some level of emissions. As the Proposed Project involves the relocation of the Mid-Day Bus Parking Facility and associated reroutes to bus services, the air quality and GHG emissions analysis focuses on the geographical area where the bus routes will change. As described in Transbay Terminal EIR / EIS Addendum: Golden Gate Transit San Francisco Mid-Day Bus Parking Facility – Transportation and Circulation (dated December 19, 2012) (hereafter referred to as the "Transportation and Circulation Technical Memorandum"), the route changes would be confined to several streets in the South of Market (SoMa) District of San Francisco, and can be captured by defining an analysis area bounded by Market Street to the north, Stillman Street to the south, Main Street to the east, and Ninth Street to the west.

Vehicle miles traveled (VMT) within the analysis area for the baseline and Proposed Project scenarios were determined by examining the distances of the current and proposed routes for each bus line. Table 1 summarizes existing Golden Gate Transit service (i.e., scheduled trips) in San Francisco, while Table 2 summarizes the changes to route distances within the analysis area bounded by Market Street, Stillman Street, Main Street and Ninth Street. Approximate route distances were obtained using aerial images of the analysis area.

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[3] In cases where users may need to estimate a project's GHG emissions manually, BAAQMD recommends using CARB's most current LGOP as appropriate for guidance. The LGOP can be accessed at http://www.arb.ca.gov/cc/protocols/localgov/pubs/lgo_protocol_v1_1_2010-05-03.pdf.

[4] Taken from the California Public Utilities Commission (CPUC) GHG Calculator forecast for 2013, worksheet tab "CO2 Allocations," cell AH37. The spreadsheet can be accessed at http://www.pge.com/includes/docs/pdfs/shared/environment/calculator/pge_ghg_emission_factor_info_sheet.pdf.

Table 1: Golden Gate Transit Service in San Francisco

Line	Scheduled Daily Trips			
	Weekday[1]		Weekend[2]	
	Inbound	Outbound	Inbound	Outbound
Basic Bus Services				
10 Strawberry – Marin City – Sausalito	13	14	11	11
70 Novato – San Rafael – Marin City	17	21	17	19
80 Santa Rosa – Rohnert Park – Cotati – Petaluma – Novato – San Rafael – Marin City	6	6	19	18
101 Santa Rosa – Rohnert Park – Cotati – Petaluma – Novato – San Rafael	14	17	9	10
101X Santa Rosa – Rohnert Park – Cotati – Petaluma	2	1		
Subtotal	52	59	56	58
Commute Bus Services				
2 Marin Headlands – Marin City (Drake Avenue & Cole Drive) – Sausalito	6	4		
4 East Blithedale & Tower – Mill Valley Depot – Tam Junction – Manzanita Park & Ride	21	22		
8 Tiburon – Belvedere – Strawberry	2	1		
18 College of Marin – Larkspur – Corte Madera	7	7		
24 Manor – Fairfax – San Anselmo – Ross – Kentfield – College of Marin – Greenbrae	15	13		
27 San Anselmo – San Rafael	9	5		
38 Terra Linda – Northgate Mall	4	4		
44 Marinwood – Lucas Valley – San Rafael Transit Center	2	2		
54 San Marin – Novato	12	13		
56 Novato – San Marin – San Marin Drive – Rowland Boulevard Park & Ride	5	6		
58 Novato – Rowland Boulevard Park & Ride – Ignacio – Hamilton	4	3		
72 Santa Rosa – Rohnert Park	8	8		
72X Santa Rosa – Rohnert Park	3	3		
74 Cotati – West Petaluma	6	5		
76 East Petaluma	5	5		
92 Marin City – Sausalito	8	6		
93 Golden Gate Bridge Toll Plaza	9	3		
97 Larkspur Ferry Terminal	1			
Subtotal	127	110		

Source: Golden Gate Transit, 2012.

Notes:

(1) Mondays through Fridays, except holidays.

(2) Saturdays, Sundays, and holidays.

Table 2: Route Distances within Analysis Area

Service	Route Distance within Analysis Area (mi)			
	Existing		Proposed	
	Inbound	Outbound	Inbound	Outbound
Basic Bus Services				
Via Mission	3.20	3.35	1.55	1.30
Direct to facility[1]	0.50	--	1.55	1.30
Commute Bus Services				
Financial District routes	1.70	2.00	1.15	1.05
Civic Center routes	1.20	0.90	1.25	1.30

Source: AECOM, 2012.

Notes:
Distances rounded to the nearest 0.05 miles.

(1) Currently, one inbound run on Route 70 each day skips all Mission Street stops and heads directly to the existing Mid-Day Bus Parking Facility after crossing Market Street via Eighth Street. With the Proposed Project, this inbound run would be rerouted to serve the Mission Street stops and the new Transbay Transit Center Bus Plaza along the same route as the other Basic Bus services.

It is anticipated that the Project would comprise the following emissions sources:

- Existing fleet of Golden Gate Transit diesel buses, with a gross vehicle weight rating (GVWR) of over 14,000 pounds;
- One new modular office and shed at the new Mid-day Bus Parking Facility (Scope 2 GHG emissions only); and,
- New exterior lighting for the new Mid-day Bus Parking Facility (Scope 2 GHG emissions only).

It should be noted that the Proposed Project consists solely of operations at the new Mid-day Bus Parking Facility and associated changes to bus routes, and there would be no changes to overall level of service (i.e., number of trips). As such, the changes in VMT within the analysis area are assumed to represent the entirety of the Proposed Project's impacts related to bus-generated emissions. While there may be minor changes to dwell times at some stops as a result of the addition or elimination of some stops as part of the bus reroutes, total dwell-time emissions are expected to be similar to or lower than existing levels, as the Proposed Project would not affect overall ridership demand. While passengers would redistribute to other stops, the overall number of passengers would remain the same, such that dwell time would likely remain similar to existing conditions. In addition, emissions from bus acceleration and deceleration would likely decrease due to a reduction in the total number of stops. As a result, emissions related to dwell time as stops was omitted from this analysis.

It was also determined that the speed limit along Howard Street and Folsom Street within the analysis area is approximately 25 miles per hour (mph).[5] This was essential in assigning EMFAC emission factors based on speed.

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(5) Speed limits on some SOMA streets lowered to 25 MPH <http://sfappeal.com/news/2012/06/speed-limits-on-some-soma-streets-lowered-to-25-mph.php>, SF Appeal (June 7, 2012). Accessed January 3, 2013.

In order to calculate Scope 2 GHG emissions, the following data was required to simulate the operation of the existing and new bus parking facilities:

1. Type and size (ft^2) of the structures located (or to be located) on each site;
2. Type of energy inputs that the structures use (or will use) (e.g., electricity and / or natural gas); and,
3. Size of each site (ft^2).

Data on these analysis inputs was provided primarily by Golden Gate Transit, supplemented by measurements of the dimensions of the existing Mid-day Bus Parking Facility site using aerial images. The annual energy consumption from the structures and exterior lighting on both sites was estimated by multiplying the surface area of the structures and sites into the annual electric energy intensity ($kWh/ft^2/year$) based on representative data from the CEUS (for all end users, for small office buildings less than 30,000 ft^2 and exterior lighting located in the PG&E service area).

Criteria Pollutant and GHG Emission Calculations

Since vehicles emit criteria pollutants at different rates based on speed, the EMFAC emission rates for the criteria pollutants were taken at 5 mph intervals from 0 mph to 25 mph and averaged to calculate a single emission factor for each pollutant. This blended average was used to better simulate diesel buses traveling at various speeds along the existing and proposed routes. Carbon dioxide emissions do not vary based on speed, so a single emission factor for urban buses was taken from EMFAC. Emissions factors based on speed for CH_4 and N_2O were not available from EMFAC and thus were taken from the LGOP for heavy-duty highway vehicles on a grams per mile (g/mi) basis.

The total daily bus VMT for existing and proposed routes (based on the information contained in Table 1 and Table 2) were multiplied into their respective emission factors based on mileage to derive the daily emissions for criteria pollutants and GHG emissions. For daily emissions, a weighted average was calculated for Basic Bus services, as the total number of trips is different for weekday and weekend schedules. In order to estimate annual emissions, the daily emissions were multiplied by 365 days / year for Basic Bus services and by 260 days / year (five days per week, 52 weeks per year) for Commute Bus services.

In order to estimate Scope 2 GHG emissions from the electricity use at the existing and new sites, the annual energy consumption values (derived from the CEC CEUS) were multiplied into the 2013 forecasted PG&E grid electricity emission factor for CO_2. As described earlier, utility-specific CH_4 and N_2O trace GHG emission factors were not available, so the California grid averages from CARB's LGOP were taken for these two gases.

The surface areas for the existing and new sites were then multiplied into the annual electric energy intensity for exterior lighting for miscellaneous uses located in the PG&E service area to calculate the annual energy consumption from lighting. The same calculation procedures and emission factors were used to estimate GHG emissions from the structures on the existing and new sites.

Results and Significance Determination

Due to a legal judgment currently awaiting appeal, BAAQMD is not recommending use of its quantified significance thresholds for air pollutants of concern in its updated California Environmental Quality Act Air Quality Guidelines (May 2010) ("BAAQMD CEQA Guidelines"). As a result, the currently applicable BAAQMD CEQA air quality significance thresholds are based on the previous version of the BAAQMD CEQA Guidelines released in December 1999.

The BAAQMD CEQA Guidelines is an advisory document that provides lead agencies, consultants, and project applicants with uniform procedures for addressing air quality in environmental documents. In May 2010, BAAQMD updated the CEQA Guidelines with new quantitative thresholds for construction and operational-related criteria air pollutants and precursors, toxic air contaminants (TACs), and GHGs. However, in March 2012, the Alameda County Superior Court issued a judgment finding that the changes to the BAAQMD CEQA Guidelines qualify as a project under CEQA and that BAAQMD has not complied with CEQA as part of the adoption process. Therefore, at the time of this writing, BAAQMD is not recommending use of the updated 2010 CEQA Guidelines thresholds to evaluate air quality impacts. As a result, the thresholds of significance in the 1999 CEQA Guidelines must be relied upon to determine the significance of the Proposed Project's air quality impacts in the interim.

Criteria Pollutant Emissions

Determination of whether or not the Proposed Project would result in air quality impacts requires a comparison of daily and annual emissions of criteria pollutants based on the VMT calculations for the baseline and Project scenarios (i.e., existing and proposed bus routes, respectively). The resulting net change in daily and annual criteria pollutant emissions as a result of the Project is summarized in Table 3.

Table 3: Net Change in Criteria Pollutant Emissions

Emissions Source	Net Change in Criteria Pollutant Emissions					
	Absolute Change (lbs / day or tons / year)					Percentage Change
	ROG	CO	NO_x	PM_{10}	$PM_{2.5}$	
Daily Emissions						
Basic Bus Services	(0.39)	(1.43)	(4.62)	(0.10)	(0.09)	(57%)
Commute Bus Services	(0.32)	(1.20)	(3.86)	(0.08)	(0.08)	(37%)
Total	(1.27)	(4.71)	(15.19)	(0.32)	(0.30)	(46%)
Annual Emissions						
Basic Bus Services	(0.07)	(0.26)	(0.84)	(0.02)	(0.04)	(57%)
Commute Bus Services	(0.04)	(0.16)	(0.50)	(0.01)	(0.02)	(37%)
Total	(0.21)	(0.80)	(2.57)	(0.05)	(0.06)	(47%)

Source: AECOM, 2012.

Notes:
ROG = reactive organic gases
CO = carbon monoxide
NOx = nitrous oxides
PM_{10} = coarse particulate matter (diameter less than 10 µm)
$PM_{2.5}$ = fine particulate matter (diameter less than 2.5 µm)

As shown in Table 3, the Project would reduce daily and annual criteria pollutant emissions from bus VMT within the analysis area under the baseline scenario by almost 50% for each pollutant as result of the proposed route changes. It should be noted that the Proposed Project would result in not only reduced VMT, but also a net reduction in the total number of bus stops, further reducing air emissions beyond the values summarized in Table 3, as described earlier.

Localized Impacts

The BAAQMD has prepared a screening methodology for determining project-related carbon monoxide (CO) concentrations using worst-case conditions. According to this methodology, projects would have a less-than-significant effect if they are consistent with an applicable congestion management program and would not increase traffic volumes at intersections handling more than 44,000 vehicles per hour (with certain exceptions for tunnels, parking garages, and other areas where mixing of air is limited).

As described in the Transportation and Circulation Technical Memorandum, cumulative traffic volumes at the affected intersections are well below those set for the CO screening methodology in the 2012 BAAQMD CEQA Guidelines, establishing that the Proposed Project would result in a less-than-significant impact to localized concentrations.

The BAAQMD has also prepared methods to determine whether there are local community risk and hazard impacts from projects for both new sources and new receptors. The two pollutants of concern in this analysis are emissions of TACs and fine particulate matter ($PM_{2.5}$). It is important to note, however, that the buses are existing sources—as a result, this qualitative analysis focuses on determining whether or not there are receptors near the proposed routes. The overall changes to the bus routes are minor, and will generally shrink the geographical scope of the existing routes and orient them along new alignments only a few blocks away from their original routes. Nevertheless, an observational TAC analysis was performed to determine if sensitive receptors (e.g. residential areas, parks, schools, senior centers, etc.) were present near the new routes, presenting a potential hazard to human health.

As indicated in the Transportation and Circulation Technical Memorandum, the routes for Basic Bus services in the analysis area would shrink substantially. There is only a small addition to the route where buses will turn right from southbound Beale Street to serve the new Transbay Transit Center Bus Plaza and then make a right onto northbound Fremont Street, where the buses will rejoin the existing route. No nearby sensitive receptors were identified along the added route segment.

Likewise, routes for Financial District and Civic Center Commute Bus services would also shrink substantially. For Financial District Commute Bus services, there is only a small addition to the route where buses will turn left onto southbound Fourth Street and then travel approximately two and one-half blocks to make a left onto Perry Street and into the new Mid-day Bus Parking Facility. The buses will then exit onto northbound Third Street, traveling approximately one and one-half blocks before turning right onto eastbound Folsom Street to rejoin the existing route alignment. An existing day care center was identified at the corner of Fourth Street and Folsom Street, but subsequent research indicates that this center was established in 1970. The center is situated only one-and-a-half blocks from the existing route for Golden Gate Transit buses, but no indication of health risk was mentioned in the original addendum to the Transbay EIS / EIR, published in 2004.

The Civic Center Commute Bus services are the only services expected to see an expansion in geographical scope, as indicated in the Transportation and Circulation Technical Memorandum. The new route segments proposed for these services are already part of existing routes for both Basic Bus and Financial District Commute Bus services. Because of this route overlap, there would be no new exposure of TAC or $PM_{2.5}$ emissions to receptors.

These observations of reductions in total bus VMT and overlapping route segments between the existing and proposed routes show that the Proposed Project will either maintain or reduce the pollutant concentration exposure for sensitive receptors, indicating a less-than-significant impact for local community risk and hazard impacts.

In addition to low cumulative traffic volumes, reduced bus VMT, and overlapping route segments between the existing and proposed routes, the Proposed Project will result in a net decrease in the number of bus stops from the existing routes. Therefore, the Proposed Project can be safely considered a less-than-significant impact based on the air quality checklist in Appendix G of the CEQA Guidelines.

Climate Change Impacts

As explained previously, BAAQMD is not currently recommending use of the updated 2010 CEQA Guidelines thresholds to evaluate air quality impacts, instead directing lead agencies, consultants, and project applicants to use the thresholds of significance in the 1999 BAAQMD CEQA Guidelines. However, since the 1999 CEQA Guidelines lack GHG emissions thresholds and guidance, discretion lies within the lead agency to determine a project's climate change impacts. In order to determine the significance of any potential climate change impacts generated by the Proposed Project, the net change in GHG emissions was evaluated, as summarized in Table 4.

Table 4 shows that total GHG emissions are expected to decrease by 49 percent from the baseline as result of the Proposed Project. As a result, the Proposed Project is not expected to have an adverse contribution to significant cumulative impacts related to global climate change as found in the Greenhouse Gas Emissions Checklist in Appendix G of the CEQA Guidelines.

Table 4: Net Change in GHG Emissions

Emissions Source	Net Change in GHG Emissions	
	Carbon Dioxide Equivalent (CO_2e) (metric tons / year)	Percentage Change
Basic Bus Services	(158.05)	(57%)
Commute Bus Services	(93.96)	(37%)
Modular Office	(51.93)	(89%)
Exterior Lighting	(4.38)	(14%)
Total	(308.32)	(49%)

Source: AECOM, 2012.

Conclusion

Based on the above analysis, the Proposed Project is expected to result in less-than-significant impacts to air quality and GHG emissions.

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Memorandum

To	Daniel Ng, PE Golden Gate Bridge, Highway and Transportation District	Pages	15
CC	John Eberle, PE Maurice Palumbo, PE		
Subject	Transbay Terminal EIR / EIS Addendum: Golden Gate Transit San Francisco Mid-Day Bus Parking Facility – Noise and Vibration		
From	Jeffrey Chan, PTP Issa Mahmodi, A.M. ASCE		
Date	March 1, 2013		

This memorandum summarizes the existing and future-year conditions technical analyses relating to noise and vibration for Golden Gate Transit's new San Francisco Mid-day Bus Parking Facility. The analysis efforts described in this memorandum will be incorporated into an addendum to the Final Transbay Terminal / Caltrain Downtown Extension / Redevelopment Project Environmental Impact Statement / Environmental Impact Report (SCH #95063004) ("Transbay EIS / EIR"), originally published in March 2004.

As part of the replacement of the Transbay Terminal with the new Transbay Transit Center and the redevelopment of the surrounding area (the "Transbay Redevelopment Project"), Golden Gate Transit's previous San Francisco Mid-day Bus Parking Facility—located on the block bounded by Main Street, Beale Street, Howard Street, and Folsom Street—was proposed for relocation to the Project site, on the block bounded by Third Street, Fourth Street, Perry Street, and Stillman Street (under the Bay Bridge). However, in order to facilitate demolition of the Transbay Terminal and construction of the new Transbay Transit Center as well as the retrofit of the West Approach of the San Francisco–Oakland Bay Bridge, Golden Gate Transit's Mid-day Bus Parking Facility was temporarily relocated to its current location at Eighth Street and Harrison Street, freeing up space to construct the Temporary Transit Terminal for use by AC Transit, WestCAT, and Greyhound services while work proceeded on the future terminal building.

The Proposed Project represents the process of moving the Golden Gate Transit Mid-day Bus Parking Facility from its temporary location at Eighth Street and Harrison Street to the last planned location at the Project site. The proposed parking facility move is expected to yield a reduction in bus-related noise exposure in the vicinity of Eighth Street and Harrison Street, and an increase in bus-related noise exposure in the vicinity of the Project site. The effects of the proposed parking facility move, with respect to noise exposure, are studied in the following.

Applicable Impact Criteria

Federal Transit Administration

The Federal Transit Administration (FTA) has developed a methodology and significance criteria to evaluate noise impacts from surface transportation modes (i.e., passenger cars, trucks, buses, and rail), detailed in Transit Noise and Vibration Impact Assessment ("FTA Guidelines") (May 2006). The incremental noise level increase criteria included within the FTA Guidelines are based on studies of annoyance in communities

affected by transportation noise prepared by the United States Environmental Protection Agency (EPA), and are summarized in Table 1.

Table 1: FTA Impact Criteria for Noise-Sensitive Uses

Existing Day-Night Noise Level (L_{dn}) (dBA)	Allowable Noise Level Increase (dB)	
	Residences and Buildings Where People Normally Sleep[1]	Institutional Land Uses with Primarily Daytime and Evening Uses[2]
45	8	12
50	5	9
55	3	6
60	2	5
65	1	3
70	1	3
75	0	1
80	0	0

Source: Transit Noise and Vibration Impact Assessment, Federal Transit Administration, 2006.
Notes:
(1) This category includes residences, hospitals, and hotels where a nighttime sensitivity to noise is assumed to be of utmost importance.
(2) This category includes schools, libraries, theaters, and churches where it is important to avoid interference with activities such as speech, meditation, and concentration on reading material.

The scientific rationale for the choice of these criteria is explained in the FTA Guidelines. Starting from the EPA's definition of minimal noise impact as a 5 dB change from an established protective ambient level, the FTA extended the EPA's incremental impact criteria to higher baseline ambient levels. As baseline ambient levels increase, the allowable noise level increase is reduced to limit community annoyance (e.g., in residential areas with a baseline ambient noise level of 50 dBA L_{dn}, a 5 dB increase in noise levels would be acceptable, while at 70 dBA L_{dn}, only a 1 dB increase would be allowed).

The FTA has also developed guidelines for assessing the significance of ground-borne vibration produced by transportation sources and construction activity. Vibration impact criteria are summarized in Table 2.

These vibration criteria are related to ground-borne vibration levels that are expected to result in human annoyance, and are based on root mean square (RMS) velocity levels expressed in VdB. FTA experience with community response to ground-borne vibration indicates that when there are only a few train or bus events per day, higher vibration levels are needed to evoke the same community response that would be expected from more frequent events generating a similar level of vibration. The FTA criteria take this phenomenon into account by distinguishing between projects with "frequent" and "infrequent" events, where frequent is defined as more than 70 events per day.

To address the potential for structural damage to fragile buildings, Section 12.2.2 of the FTA Guidelines also recommends vibration impact thresholds of 0.2 in/sec peak particle velocity (PPV) (approximately 100 VdB) for fragile buildings and 0.12 in/sec PPV (approximately 95 VdB) for extremely fragile buildings. In this case, the FTA's general assessment criteria listed in Table 2 are more restrictive, and will therefore be used to assess Project effects in this analysis.

Table 2: FTA Impact Criteria for Ground-borne Vibration (General Assessment)

Land Use Category	Impact Levels (VdB; relative to 1 µin/sec)		
	Frequent Events[1]	Occasional Events[2]	Infrequent Events[3]
Category 1 Buildings where vibration would interfere with interior operations	65 [4]	65 [4]	65 [4]
Category 2 Residences and buildings where people normally sleep	72	75	80
Category 3 Institutional land uses with primarily daytime uses	75	78	83

Source: Transit Noise and Vibration Impact Assessment, Federal Transit Administration, 2006.

Notes:

(1) Defined as more than 70 vibration events of the same source per day.

(2) Defined as between 30 and 70 vibration events of the same source per day.

(3) Defined as fewer than 30 vibration events of the same source per day.

(3) This criterion limit is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes.

San Francisco General Plan

The San Francisco General Plan provides long-term guidance and policies for maintaining and improving the quality of life and the man-made and natural resources of the community. In particular, the Environmental Protection Element of the San Francisco General Plan is concerned primarily with avoiding or mitigating the adverse effects of transportation noise, and contains the following objectives and policies relevant to this analysis:

Objective 11: Promote land uses that are compatible with various transportation noise levels.

Policy 11.1 Discourage new uses in areas in which the noise level exceeds the noise compatibility guidelines for that use.

Policy 11.3 Locate new noise-generating development so that the noise impact is reduced.

The "Land Use Compatibility Chart for Community Noise" included in Policy 11.1 establishes the compatibility of different land use types within a range of ambient noise levels.

For residential uses:

- Noise exposure is considered "satisfactory, with no special noise insulation requirements" where the L_{dn} is 60 dBA or less.
- "New construction or development should be undertaken only after a detailed analysis of noise reduction requirements is made and needed noise insulation features included in the design" where the L_{dn} is between 60 dBA and 70 dBA.
- "New construction or development should generally be discouraged" where the L_{dn} is above 65 dBA.

For other noise-sensitive uses (i.e., schools, libraries, churches, hospitals, nursing homes):

- Noise exposure is considered "satisfactory, with no special noise insulation requirements" where the L_{dn} is 65 dBA or less.

- "New construction or development should be undertaken only after a detailed analysis of noise reduction requirements is made and needed noise insulation features included in the design" where the L_{dn} is between 62 dBA and 70 dBA.

- "New construction or development should generally not be undertaken" where the L_{dn} is above 65 dBA.

The Land Use Compatibility Chart for Community Noise is illustrated in Figure 1.

San Francisco Noise Ordinance

The San Francisco Noise Ordinance (Article 29, San Francisco Police Code, Section 2900) specifically recognizes that adverse effects on a community can arise from noise sources such as transportation, construction, mechanical equipment, entertainment, and human and animal behavior. In particular, the San Francisco Noise Ordinance makes the following declaration:

> It shall be the policy of San Francisco to maintain noise levels in areas with existing healthful and acceptable levels of noise and to reduce noise levels, through all practicable means, in those areas of San Francisco where noise levels are above acceptable levels as defined by the World Health Organization's Guidelines on Community Noise.

Section 2909 of the San Francisco Noise Ordinance limits noise from a fixed source[(1)] from causing the noise level measured inside any sleeping or living room in any dwelling unit located on residential property to 45 dBA between the hours of 10:00 PM to 7:00 AM or 55 dBA between the hours of 7:00 AM to 10:00 PM with windows open except where building ventilation is achieved through mechanical systems that allow windows to remain closed. It is assumed that these noise level limits are represented by the hourly L_{eq} descriptor (hourly average level).

Noise Level Measurements

AECOM performed ambient noise level measurements near existing noise-sensitive uses in the vicinity of the proposed Mid-Day Bus Parking Facility and along the proposed bus routes on Monday, January 7, 2013 and Tuesday, January 8, 2013.

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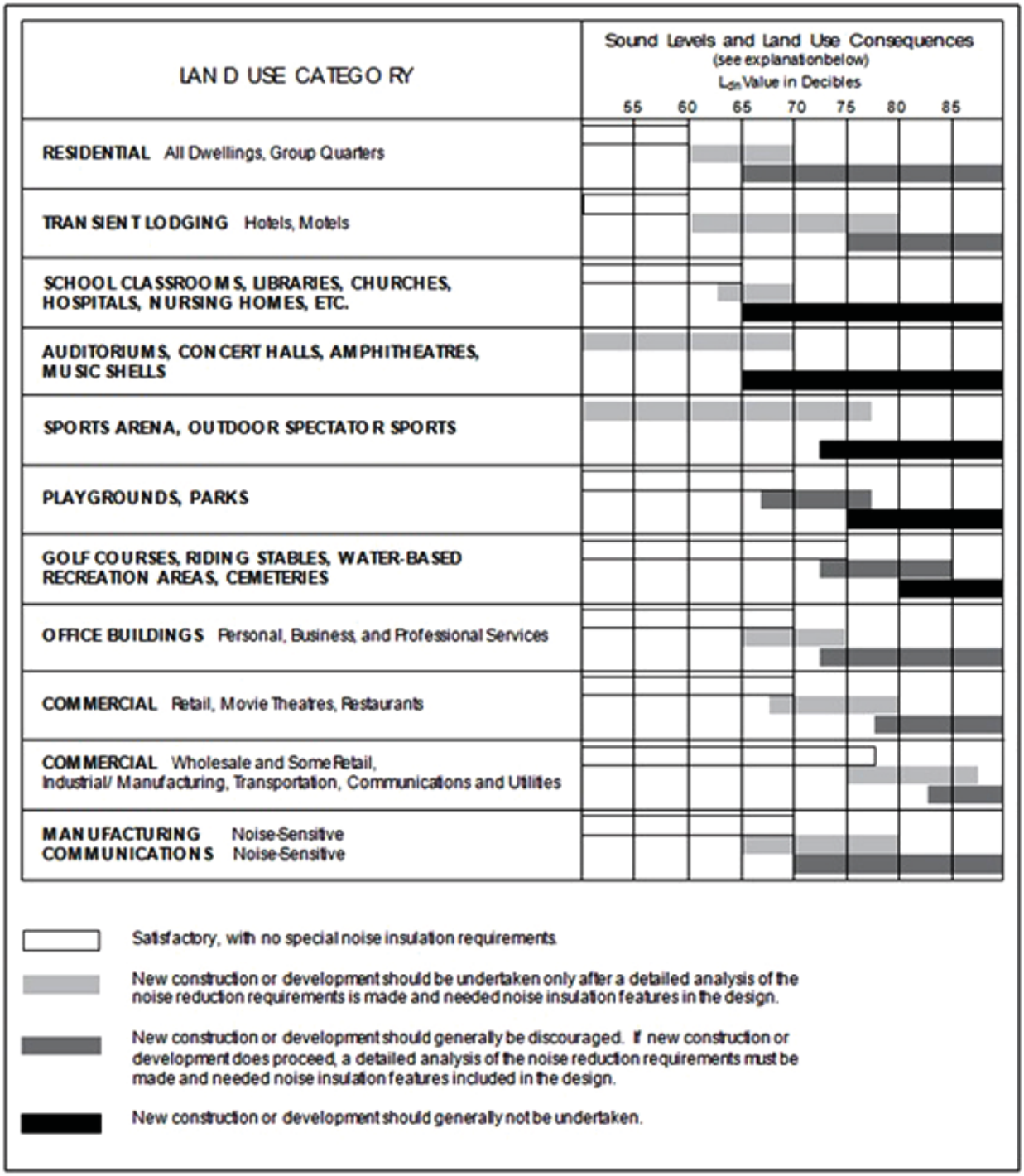
(1) By definition, the San Francisco Noise Ordinance (Section 2901(e)) states that "fixed source" refers to a machine or device capable of creating a noise level at the property upon which it is regularly located, including but not limited to industrial and commercial process machinery and equipment, pumps, fans, air-conditioning apparatus, or refrigeration machines. In this case, stationary, idling buses within the Project site are considered fixed (or stationary) noise sources.



SF General Plan Land Use Compatibility Chart.ai

San Francisco General Plan

Land Use Compatibility Chart for Community Noise

Figure 1

Measurement Equipment

Two sound level meters—Larson-Davis Laboratories (LDL) Model 820, Class 1 (Precision) sound level meters (serial number (SN) 820A1176 and SN 820A1298)—were used to measure ambient noise levels in the study area. The meters were programmed to record A-weighted sound levels using a "slow" response and calibrated immediately before use with LDL Model CAL200 calibrators (SN 2876 and SN 1176).

Short-Term Noise Level Measurements

Short-term (15-minute) noise level measurements and concurrent traffic counts were conducted at roadway segments affected by the proposed bus routes. These measurements were completed on the two survey days, between 10:00 AM and 6:00 PM when traffic was free-flowing. Two of these measurements and counts were used to "calibrate" the Federal Highway Administration (FHWA) Traffic Noise Model (TNM) Version 2.5, which was used to predict traffic noise levels in the Project vicinity. The short-term noise level measurement locations are shown in Figure 2.

For the traffic counts, vehicles were classified as automobiles, medium-duty trucks, motorcycles, and buses. An automobile was defined as a vehicle with two axles and four tires, primarily designed to carry passengers—small vans and light trucks were included in this category. Medium-duty trucks were defined as all cargo vehicles with two axles and six tires, while heavy-duty trucks were defined as all vehicles with three or more axles. Observed traffic speeds on the studied roadways ranged from 25 miles per hour (mph) to 35 mph.

Long-Term Noise Level Measurements

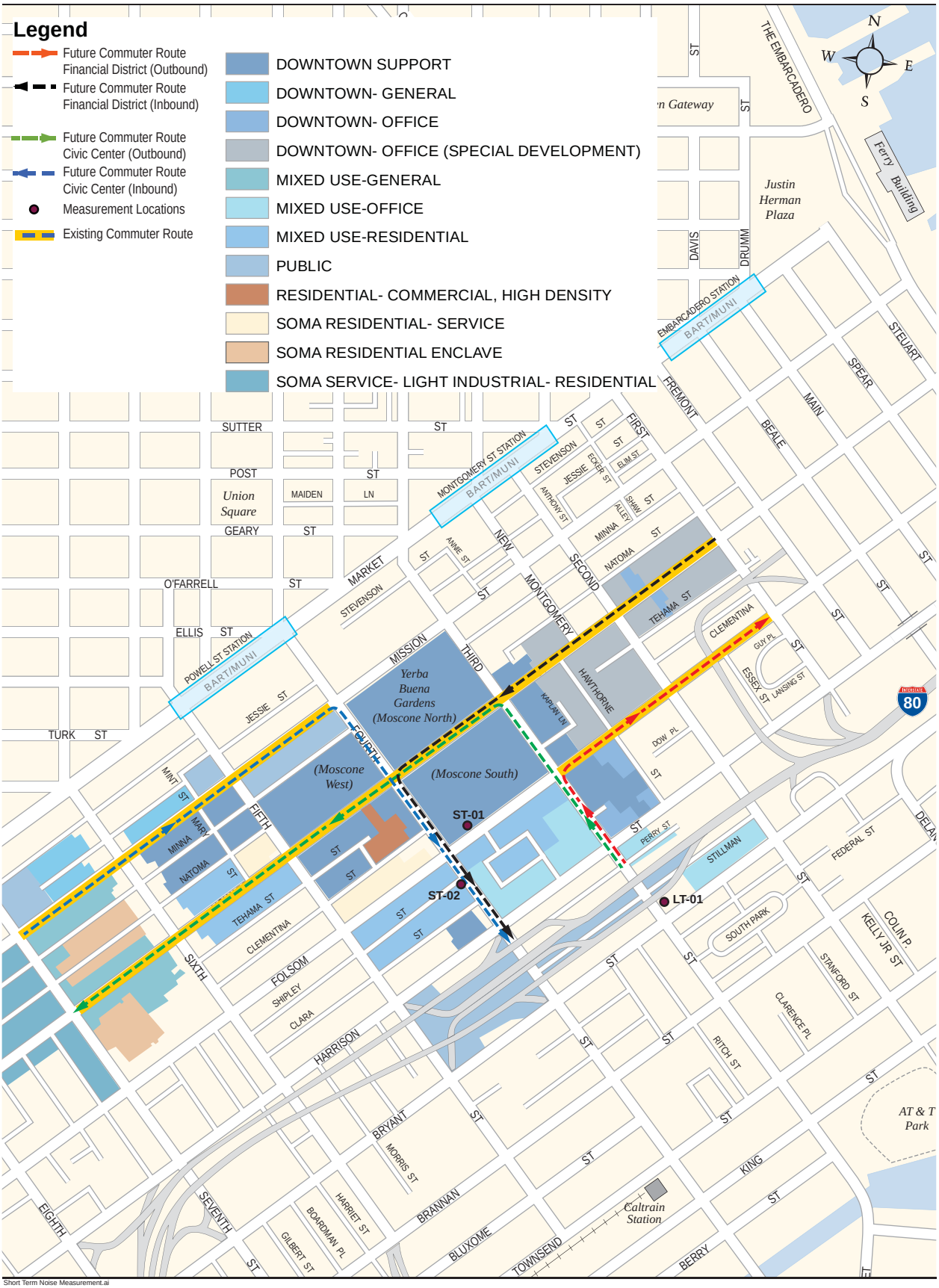
Long-term (24-hour) noise level measurements were taken in the vicinity of the Project site, at the residential property on the southeast corner of the Third Street / Stillman Street intersection. The measurement equipment was positioned on the third-floor fire escape, more than five feet removed from the residential building façade, a location representative of the closest noise-sensitive receivers to the Mid-Day Bus Parking Facility. The long-term measurement location is illustrated in Figure 2.

Measurement Results

The primary source of noise in the study area is traffic on local roadways, including traffic on the Bay Bridge (Interstate 80). Because of the constant traffic flow on the roadways, the short-term measurement intervals were sufficient to characterize hourly traffic noise levels. The results of the short-term and long-term noise measurements are summarized in Table 3 and Table 4, respectively.

As shown in Table 3, average noise levels (L_{eq}) measured along the existing and proposed Golden Gate Transit bus routes range from 64 dBA to 71 dBA. These levels are typical of a dense urban environment, particularly areas near major highways and arterials.

Day-night average sound levels (L_{dn}) were calculated based on the measured hourly L_{eq} noise level data. The L_{dn} is the 24-hour L_{eq} with a 10 dB "penalty" applied to noise levels during the noise-sensitive nighttime hours (10:00 PM to 7:00 AM). As shown in Table 4, the calculated L_{dn} at the long-term measurement site was 81 dBA. Similarly, hourly equivalent noise levels (hourly L_{eq}) ranged from 70 dBA to 79 dBA at this location during the measurement session. These levels are also typical of dense urban areas, similar to the results of the short-term noise level measurements.



Short Term Noise Measurement.ai

Noise Level Measurement Locations

Figure 2

Table 3: Short-Term Noise Level Measurement Results

Location	Date	Start Time	Duration	Noise Level (dBA)	
				Hourly Energy-Equivalent (L_{eq})	Maximum (L_{max})
ST-01	01/07/2013	15:39	15 minutes	71	88
ST-02		16:11		66	77
ST-03	01/08/2013	09:50		68	85
ST-04		10:21		68	80
ST-05		10:45		69	83
ST-06		11:17		68	79
ST-07		02:52		65	79
ST-08		13:39		64	77
ST-09		14:10		67	74

Source: AECOM, 2013.

Noise and Vibration Analyses

Traffic Noise

As mentioned above, all traffic noise modeling completed for this study utilized the FHWA's TNM, a computer model based on two FHWA reports: FHWA-PD-96-009 and FHWA-PD-96-010 (FHWA 2004). Key inputs to the TNM include the locations of roadways; vehicle volumes, speeds, and types; shielding features (e.g., topography and buildings); ground types; and receptor locations. Three-dimensional representations of these inputs were developed using available computer-aided design drawings, aerial photography, and topographic contours.

Model Calibration

The purpose of model calibration is to "fine-tune" the prediction model to actual site conditions that are not adequately accounted for by the model. Calibration is performed by algebraically adding a constant, or K-factor, to the noise level calculated in TNM 2.5. The magnitude of K-factors initially is determined by the difference between measured and modeled noise levels at specific points. Calibration factors may be positive or negative. Additional factors may be applied, based on the experience and judgment of the noise analyst performing the analysis. Two short-term noise level measurement locations (Site ST-01 and Site ST-02) were used for model calibration. These calibration results are summarized in Table 5.

As shown in Table 5, the results of the traffic noise modeling relative to the measured conditions show an accuracy of 2 dB. As FHWA policy for modeling using TNM 2.5 states that "no adjustments should be made for differences less than 3 dB" (FHWA 2004), no calibration offsets or adjustments were applied.

Model Results

TNM was used to estimate the subtle changes in traffic noise levels associated with the proposed Golden Gate Transit Mid-Day Bus Parking Facility. In this case, the facility would be moved from its current location

at Eighth Street and Harrison Street to the new location at Third Street and Perry Street, resulting in slight changes to bus routes in the vicinity of the site and introducing new bus-related traffic noise.

Table 4: Long-Term Noise Level Measurement Results

Time	Noise Level	
	Hourly Energy-Equivalent (dBA, L_{eq})	Average (Equivalent) (dBA)
07:00	76	Daytime noise level (L_D): 76
08:00	75	
09:00	78	
10:00	77	
11:00	77	
12:00	77	
13:00	76	
14:00	74	
15:00	76	
16:00	77	
17:00	72	
18:00	75	
19:00	79	
20:00	76	
21:00	76	
22:00	75	Nighttime noise level (L_N): 74
23:00	74	
00:00	72	
01:00	71	
02:00	70	
03:00	70	
04:00	72	
05:00	75	
06:00	77	
Day-Night (L_{dn})		81

Source: AECOM, 2013.

Table 5: Model Calibration Results

Location	Energy-Equivalent Noise Level (dBA, L_{eq})		K-factor (dB)
	Measured	Modeled	
ST-01	71.0	70.1	0.9
ST-02	65.6	63.6	2.0

Source: AECOM, 2013.

Traffic noise levels were calculated for Existing Conditions and Existing plus Project Conditions. Weekday PM peak hour turning movement counts at selected intersections along the proposed bus routes (oldest counts dating from 2007 and 2008) were multiplied by a factor of ten to estimate the average daily traffic (ADT) volumes needed to assess noise exposure in terms of the 24-hour noise level metric (L_{dn}). The calculated ADT volumes were inputted into TNM to calculate day-night average noise levels at selected receiver points along the proposed bus routes through the Project area, illustrated in Figure 3.

Receivers were modeled at a height of five feet above the ground (roadway) elevation at exterior locations. Vehicle mixes on all study area roadways were assumed to be the same as those counted during the short-term noise level measurement surveys.

Predicted noise levels for Existing Conditions and Existing plus Project Conditions at all receiver locations are shown in Table 6.

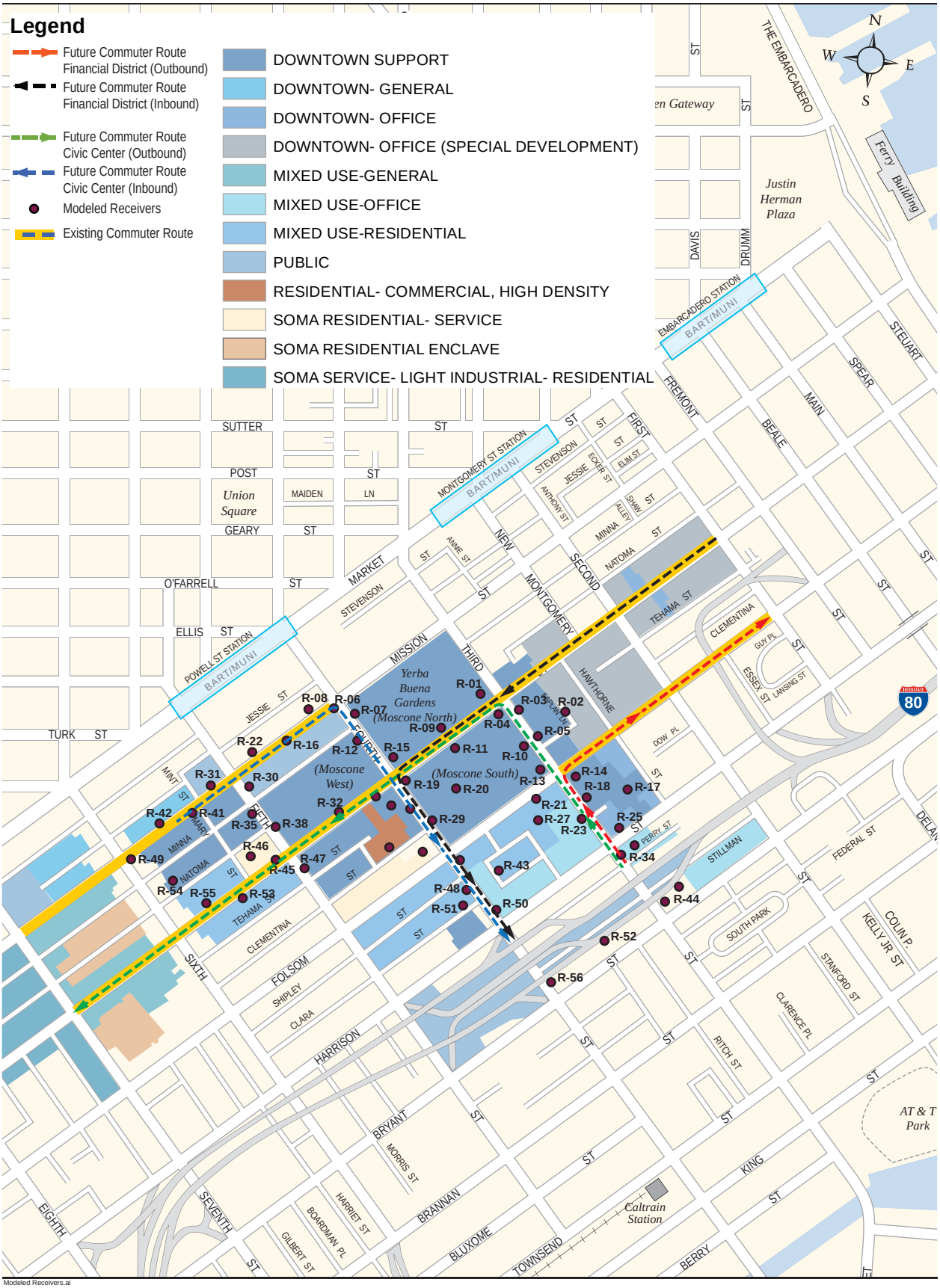
It should be noted that receivers R-02, R-17, R-20, R-27, R-28, R-33, R-35, R-37, R-43, R-46, R-51, R-52, and R-54 were modeled in the second rows of the buildings to predict the noise levels at noise sensitive areas behind the buildings. As shown in Table 6, the noise levels at these second-row receivers range from 26 dBA L_{dn} to 59 dBA L_{dn} under Existing Conditions, while predicted L_{dn} noise levels at noise-sensitive areas directly exposed to existing traffic are predicted to range from 64 dBA L_{dn} to 75 dBA L_{dn}.

Comparing the existing predicted noise levels to the applicable noise exposure criteria from the San Francisco General Plan (Objective 11), the existing noise levels in most areas within the Project vicinity already exceed the standard of 60 dBA L_{dn} for residential uses and 65 dBA L_{dn} for other noise-sensitive uses. However, the expected increase in traffic noise exposure attributable to the Project—no more than 0.2 dB, as shown in Table 6—would not be substantial in relation to the applicable San Francisco General Plan criteria of 60 dBA L_{dn} and 65 dBA L_{dn} or to the FTA noise level increase criteria summarized in Table 1.

Noise at the Mid-Day Bus Parking Facility

The proposed Mid-Day Bus Parking Facility, located underneath the West Approach of the San Francisco–Oakland Bay Bridge on the block bounded by Third Street, Fourth Street, Perry Street, and Stillman Street, will be used to store Commute Bus buses during the weekday midday period, eliminating the need for buses to deadhead to and from Golden Gate Transit's other yards in the North Bay. Buses at the Mid-Day Bus Parking Facility would generate noise when idling (i.e., engines powered but not in motion), but this noise exposure would be mitigated by the proposed twelve-foot-tall sound wall on the Stillman Street and Third Street sides of the Project site. This sound wall is expected to adequately mitigate facility noise exposure (including idling buses) at the closest neighboring residences on Stillman Street, resulting in noise levels well below measured daytime ambient levels in the Project area.

As required by the Transbay EIS / EIR, the proposed sound wall would incorporate acoustical absorption in order to mitigate reflected sound energy from buses, local traffic, and other community noise sources. Without this sound absorption component of the barrier, reflected sound would likely substantially increase noise exposure relative to the ambient condition, adversely affecting noise-sensitive uses on Stillman Street.



Modeled Receivers.ai

Modeled Receivers

Figure 3

Table 6: Predicted Noise Levels

Receiver	Predicted Noise Level (dBA L_{dn})		Net Change in Noise Level (dBA L_{dn})	Exceeds Criteria Under Existing Conditions?
	Existing Conditions	Existing plus Project Conditions		
R-01	69.3	69.3	0.0	Yes
R-02	26.2	26.2	0.0	No (Shielded)
R-03	75.2	75.2	0.0	Yes
R-04	69.6	69.7	0.1	Yes
R-05	72.7	72.7	0.0	Yes
R-06	71.8	71.8	0.0	Yes
R-07	71.4	71.4	0.0	Yes
R-08	67.2	67.2	0.0	Yes
R-09	66.8	66.8	0.0	Yes
R-10	66.8	66.8	0.0	Yes
R-11	65.0	65.0	0.0	Yes
R-12	72.7	72.7	0.0	Yes
R-13	69.0	69.0	0.0	Yes
R-14	70.3	70.4	0.1	Yes
R-15	70.7	70.7	0.0	Yes
R-16	69.7	69.7	0.0	Yes
R-17	39.6	39.6	0.0	No (Shielded)
R-18	71.8	71.8	0.0	Yes
R-19	73.3	73.3	0.0	Yes
R-20	30.3	30.4	0.1	No (Shielded)
R-21	60.2	60.2	0.0	Yes
R-22	68.5	68.5	0.0	Yes
R-23	69.5	69.6	0.1	Yes
R-24	73.7	73.7	0.0	Yes
R-25	67.6	67.6	0.0	Yes
R-26	74.2	74.2	0.0	Yes
R-27	45.0	45.0	0.0	No (Shielded)
R-28	29.7	29.7	0.0	No (Shielded)
R-29	70.4	70.4	0.0	Yes
R-30	63.5	63.5	0.0	Yes
R-31	71.2	71.3	0.1	Yes
R-32	73.8	73.8	0.0	Yes
R-33	27.1	27.2	0.1	No (Shielded)
R-34	75.3	75.3	0.0	Yes
R-35	58.7	58.7	0.0	No (Shielded)
R-36	65.8	65.9	0.1	Yes
R-37	30.2	30.3	0.1	No (Shielded)
R-38	61.2	61.2	0.0	Yes
R-39	64.6	64.6	0.0	Yes

Receiver	Predicted Noise Level (dBA L_{dn})		Net Change in Noise Level (dBA L_{dn})	Exceeds Criteria Under Existing Conditions?
	Existing Conditions	Existing plus Project Conditions		
R-40	71.3	71.4	0.1	Yes
R-41	67.9	68.0	0.1	Yes
R-42	68.0	68.1	0.1	Yes
R-43	54.1	54.1	0.0	No (Shielded)
R-44	70.9	70.9	0.0	Yes
R-45	71.3	71.2	(0.1)	Yes
R-46	57.9	57.8	(0.1)	No (Shielded)
R-47	65.1	65.0	(0.1)	Yes
R-48	74.2	74.3	0.1	Yes
R-49	67.2	67.3	0.1	Yes
R-50	75.0	75.1	0.1	Yes
R-51	36.0	36.1	0.1	No (Shielded)
R-52	58.3	58.3	0.0	No (Shielded)
R-53	72.8	72.8	0.0	Yes
R-54	26.7	26.7	0.0	No (Shielded)
R-55	70.1	70.1	0.0	Yes
R-56	70.1	70.3	0.2	Yes

Source: AECOM, 2013.

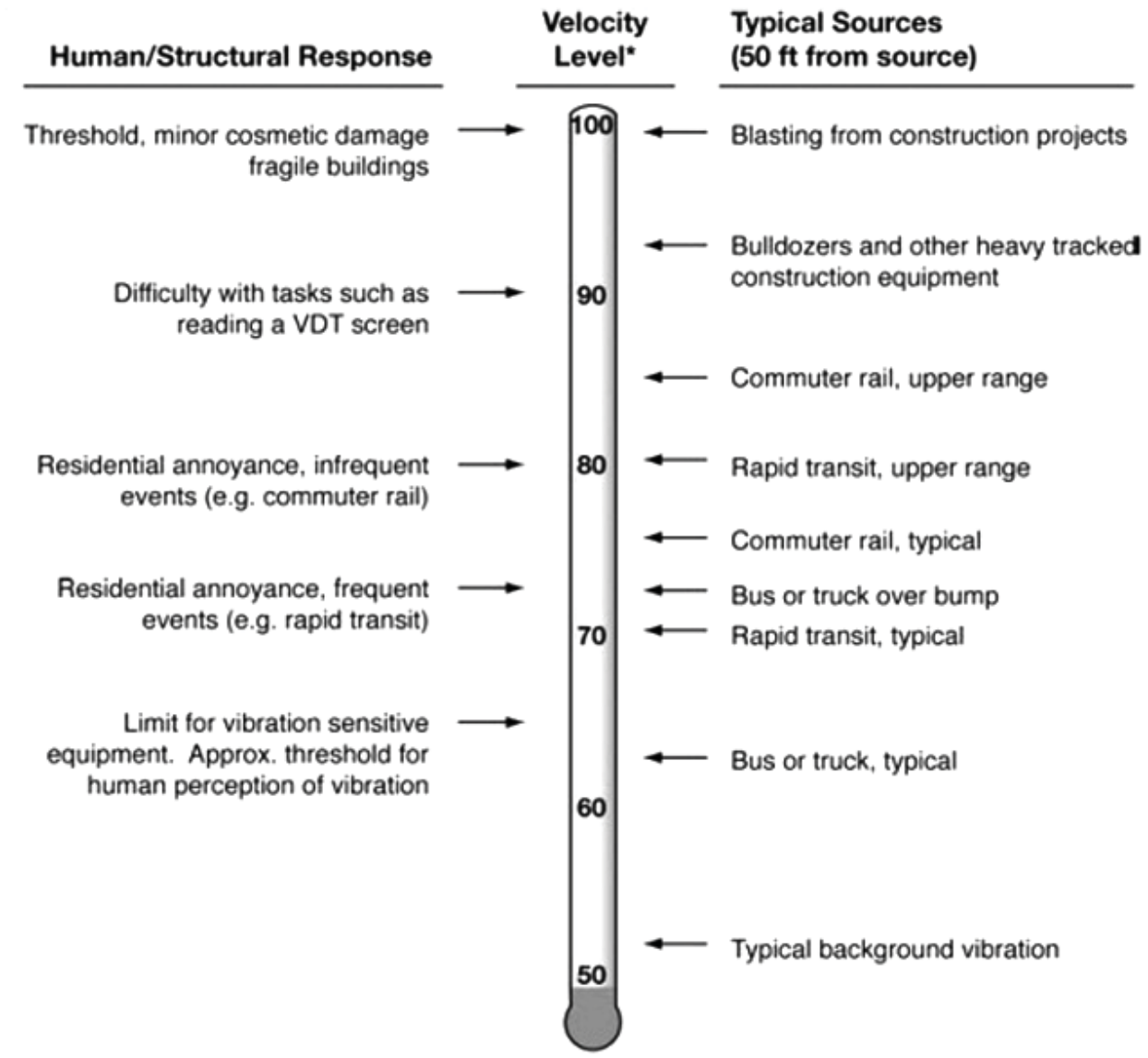
Vibration from Passing Buses

Ground-borne vibration can be a serious concern for nearby neighbors of a transit system, causing buildings to shake and rumbling sounds to be heard indoors. Ground-borne vibration associated with vehicle movements is usually the result of uneven interactions between the wheel and the road or rail surfaces. Examples of such interactions (and subsequent vibrations) include train wheels over a jointed rail, an untrue rail car wheel with "flats", and motor vehicle wheels hitting a pothole or manhole cover.

Unlike noise, which travels in air, transit vibration typically travels along the surface of the ground. Depending on the geological properties of the surrounding ground and the type of building structure exposed to transit vibration, vibration propagation may be more or less efficient. Buildings with a solid foundation set in bedrock are "coupled" more efficiently to the surrounding ground and experience relatively higher vibration levels than those buildings located in sandier soil.

Vibration induced by vehicle pass-bys can generally be discussed in terms of displacement, velocity, or acceleration. However, human responses and responses by monitoring instruments and other objects are more accurately described with velocity. Therefore, the vibration velocity level is used to assess vibration effects. To describe the human response to vibration, the average vibration amplitude, or RMS velocity, is used, expressed in terms of inches per second (in/sec) or decibels (VdB). All VdB vibration levels are referenced to 1 µin/sec.

Typical ground-borne vibration levels from transit and other common sources are shown in Figure 4.



** RMS Vibration Velocity Level in VdB relative to 10^{-6} inches/second*

SF General Plan Land Use Compatibility Chart.ai

Typical Ground-borne Vibration Levels from Transportation and Construction
Figure 4

In general, the vibration threshold of human perceptibility is approximately 65 VdB, as shown in Figure 4. Vibration levels in the range of 70 to 75 VdB are often noticeable but acceptable. Beyond 80 VdB, vibration levels are often considered unacceptable by building occupants, as described in the FTA Guidelines.

The Project would not include significant stationary sources of ground-borne vibration, such as heavy equipment operations, but operational ground-borne vibration in the Project vicinity would be generated by vehicular travel on local roadways and access streets. However, the rubber tires and suspension systems of buses provide vibration isolation, attenuating the vibration forces such that the resulting ground vibration is almost always below the threshold of human perception. In particular, the typical ground-borne vibration produced by a passing bus or truck is generally less than 65 VdB at 50 feet, and would, therefore, be imperceptible to sensitive receptors near the proposed routes, as the distance from the nearest sensitive receptor to the routes would be more than 50 feet, and associated vibration levels at these receivers would be less than the 65 VdB "human perceptibility" criterion.

In general, it is unusual for buses to cause ground-borne noise or vibration issues. When buses cause effects such as rattling of windows, the source is almost always airborne noise. In addition, even when vibration from vehicular traffic is perceptible, the cause can generally be traced to irregularities in the roadway surface such as potholes, bumps, misaligned expansion joints, or other discontinuities in the road surface. Removal of these discontinuities (e.g., smoothing bumps or filling in potholes) will usually solve vibration issues.

Summary and Conclusions

To satisfy the City's noise compatibility criteria for uses adjacent to the proposed bus routes, exterior noise exposure at the identified noise-sensitive uses should not exceed 60 dB L_{dn} for residential uses and 65 dB L_{dn} for schools, places of worship, and other non-residential uses that would be considered noise-sensitive. In general, noise exposure along the proposed routes currently exceeds the City's noise exposure limits, but noise levels with the Project as predicted by TNM would not represent a substantial increase above Existing Conditions. Noise from idling buses at the Project site would be mitigated by the proposed sound wall, which would reduce noise exposure well below the measured daytime ambient levels in the Project area.

Vibration levels associated with passing buses on the proposed bus routes would also not be expected to exceed the applied FTA criterion of 65 VdB at the closest residential or noise-sensitive receptors, as the buses would have sufficient vibration isolation such that ground-borne vibration would be imperceptible to these receptors. Any perceived vibration can generally be traced to discontinuities in the road surface, which can be repaired to reduce the vibration to levels below human perception.

As a result, the Project's effects related to noise and vibration are expected to be negligible.

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Memorandum

To	Daniel Ng, PE Golden Gate Bridge, Highway and Transportation District	Pages	21
CC	John Eberle, PE Maurice Palumbo, PE		
Subject	Transbay Terminal EIR / EIS Addendum: Golden Gate Transit San Francisco Mid-Day Bus Parking Facility – Transportation and Circulation (Final)		
From	Jeffrey Chan, PTP Anthony Mangonon		
Date	January 16, 2013		

This memorandum summarizes the existing and future-year conditions technical analysis relating to transportation and circulation for Golden Gate Transit's new San Francisco Mid-day Bus Parking Facility. The analysis efforts described in this memorandum will be incorporated into a seventh addendum to the Final Transbay Terminal / Caltrain Downtown Extension / Redevelopment Project Environmental Impact Statement / Environmental Impact Report (SCH #95063004) ("Transbay EIS / EIR"), originally published in March 2004.

Existing Golden Gate Transit Operations

Bus Routes

The Golden Gate Bridge, Highway and Transportation District ("District") owns, maintains, and operates all Golden Gate Transit bus services in San Francisco. Existing Golden Gate Transit operations in San Francisco consist of two types of services: "Basic Bus" services operate seven days a week, during both peak and off-peak periods, while "Commute Bus" services operate during weekday peak periods inbound into Downtown San Francisco in the mornings and outbound from Downtown San Francisco towards Marin and Sonoma Counties in the evenings. Existing Golden Gate Transit service in San Francisco is summarized in Table 1.

Basic Bus services (Routes 10, 70, 80, 101 and 101X) operate to and from Downtown San Francisco via Van Ness Avenue and Mission Street, with route alignment and stop locations in Downtown San Francisco as illustrated in Figure 1a. In the inbound direction, all Basic Bus services travel eastbound along Mission Street to the Temporary Transbay Terminal (on the block bounded by Howard Street, Folsom Street, Main Street, and Beale Street) before turning onto westbound Howard Street towards the existing Mid-day Bus Parking Facility (located at Eighth Street and Harrison Street), with the exception of one weekday (i.e., Mondays through Fridays, except holidays) run and one weekend (i.e., Saturdays, Sundays, and holidays) run on Route 70, which continue south on Eighth Street past Mission Street directly to the current Mid-day Bus Parking Facility.

Table 1: Golden Gate Transit Service in San Francisco

Routes	Scheduled Daily Trips			
	Weekday[1]		Weekend[2]	
	Inbound	Outbound	Inbound	Outbound
Basic Bus Services				
10 Strawberry – Marin City – Sausalito	13	14	11	11
70 Novato – San Rafael – Marin City	17	21	17	19
80 Santa Rosa – Rohnert Park – Cotati – Petaluma – Novato – San Rafael – Marin City	6	6	19	18
101 Santa Rosa – Rohnert Park – Cotati – Petaluma – Novato – San Rafael	14	17	9	10
101X Santa Rosa – Rohnert Park – Cotati – Petaluma	2	1		
Subtotal	52	59	56	58
Commute Bus Services				
2 Marin Headlands – Marin City (Drake Avenue & Cole Drive) – Sausalito	6	4		
4 East Blithedale & Tower – Mill Valley Depot – Tam Junction – Manzanita Park & Ride	21	22		
8 Tiburon – Belvedere – Strawberry	2	1		
18 College of Marin – Larkspur – Corte Madera	7	7		
24 Manor – Fairfax – San Anselmo – Ross – Kentfield – College of Marin – Greenbrae	15	13		
27 San Anselmo – San Rafael	9	5		
38 Terra Linda – Northgate Mall	4	4		
44 Marinwood – Lucas Valley – San Rafael Transit Center	2	2		
54 San Marin – Novato	12	13		
56 Novato – San Marin – San Marin Drive – Rowland Boulevard Park & Ride	5	6		
58 Novato – Rowland Boulevard Park & Ride – Ignacio – Hamilton	4	3		
72 Santa Rosa – Rohnert Park	8	8		
72X Santa Rosa – Rohnert Park	3	3		
74 Cotati – West Petaluma	6	5		
76 East Petaluma	5	5		
92 Marin City – Sausalito	8	6		
93 Golden Gate Bridge Toll Plaza	9	3		
97 Larkspur Ferry Terminal	1			
Subtotal	127	110		

Source: Golden Gate Transit, 2012.

Notes:

[1] Mondays through Fridays, except holidays.

[2] Saturdays, Sundays, and holidays.

Existing Bus Routes.ai

Existing Bus Routes: Basic Bus Services

Figure 1a

Existing Financial District Routes.ai

Existing Bus Routes: Financial District Commute Bus Services

Figure 1b

Existing Civic Center Routes.ai

Existing Bus Routes: Civic Center Commute Bus Services

Figure 1c

Commute Bus services can be classified into one of two different groups based on their general route to and from Downtown San Francisco:

- Via the Financial District (Routes 2, 4, 8, 18, 24, 27, 38, 44, 54, 56, 58, 72 / 72X, 74, 76, and 97); and,
- Via Civic Center (Routes 92 and 93).

All Financial District Commute Bus services travel along Doyle Drive, Richardson Avenue, Lombard Street, Van Ness Avenue, Beach Street / North Point Street, The Embarcadero, and Battery Street / Sansome Street. The exceptions are Route 97 and the first inbound trip on Route 27, which have the following route alignment east of Lombard Street: southbound Van Ness Avenue and eastbound Broadway Street to Battery Street and the Financial District. All Financial District Commute Bus services terminate at Eighth Street / Folsom Street in the inbound direction and begin at Seventh Street / Folsom Street in the outbound direction. Route alignment and stop locations are illustrated in Figure 1b.

For Civic Center Commute Bus services, Route 92 travels along Doyle Drive, Park Presidio Boulevard, Geary Boulevard, Webster Street, and Golden Gate Avenue / McAllister Street, while Route 93 travels along Van Ness Avenue similar to the Basic Bus services, but without serving stops along Mission Street east of the Civic Center area. In other words, Route 92 and Route 93 share the same route in the Civic Center area, but Route 92 takes Park Presidio Boulevard, Geary Boulevard, Webster Street, and Golden Gate Avenue / McAllister Street to and from the Golden Gate Bridge, while Route 93 takes Doyle Drive, Richardson Avenue, Lombard Street, and Van Ness Avenue. All Civic Center Commute Bus services terminate at Eighth Street / Folsom Street in the inbound direction and begin at Seventh Street / Market Street in the outbound direction. Route alignment and stop locations are illustrated in Figure 1c.

Mid-Day Bus Parking

Golden Gate Transit's current Mid-day Bus Parking Facility (Division 4) is located on the block generally bounded by Eighth Street, Ninth Street (specifically, Gordon Street), Folsom Street (specifically, Ringold Street), and Harrison Street. The parking facility can accommodate approximately 150 buses, and is currently used by all of Golden Gate Transit's San Francisco services, seven days a week and 24 hours a day, although it's primary function is to provide mid-day parking for Commute Bus services, eliminating the need to deadhead to and from Golden Gate Transit's other yards in San Rafael (Division 1), Novato (Division 2), and Santa Rosa (Division 3) after the weekday morning peak period and before the weekday evening peak period.

Future Golden Gate Transit Operations

As part of the replacement of the Transbay Terminal with the new Transbay Transit Center and the redevelopment of the surrounding area (the "Transbay Redevelopment Project"), Golden Gate Transit's previous San Francisco Mid-day Bus Parking Facility—located on the block bounded by Main Street, Beale Street, Howard Street, and Folsom Street—was proposed for relocation to the Project site, on the block bounded by Third Street, Fourth Street, Perry Street, and Stillman Street. However, in order to facilitate demolition of the Transbay Terminal and construction of the new Transbay Transit Center as well as the retrofit of the West Approach of the San Francisco–Oakland Bay Bridge, Golden Gate Transit's Mid-day Bus Parking Facility was temporarily relocated to the current location at Eighth Street and Harrison Street, freeing up space to construct the Temporary Transit Terminal for use by AC Transit, WestCAT, and Greyhound services while work proceeded on the future terminal building. The Proposed Project represents

the process of moving the Golden Gate Transit Mid-day Bus Parking Facility from the temporary location at Eighth Street and Harrison Street to the last planned location at the Project site.

Likewise, AC Transit, which originally stored its commuter buses on the elevated loop connecting the Transbay Terminal with I-80, would be provided with a separate Mid-day Bus Parking Facility on the opposite side of Third Street from Golden Gate Transit's Mid-day Bus Parking Facility. A dedicated bus ramp would be provided from the new AC Transit facility, connecting into the primary bus approach structure into the Transbay Transit Center, allowing AC Transit buses to directly access their platforms inside the Transbay Transit Center. A separate connecter ramp was proposed in the Transbay EIS / EIR to connect this approach structure with the existing I-80 off-ramp touching down midblock at Fremont Street between Howard Street and Folsom Street, allowing Golden Gate Transit buses departing the new parking facility to use the AC Transit ramp to bypass surface streets to access Fremont Street.

The Transbay EIS / EIR evaluated mid-day bus parking facilities for Golden Gate Transit and AC Transit underneath the Bay Bridge's west approach on the two blocks bounded by Perry Street, Stillman Street, Second Street, and Fourth Street. AC Transit would occupy the half of the site between Second Street and Third Street, while Golden Gate Transit would occupy the remaining half between Third Street and Fourth Street. As part of these changes, the functions currently performed for Golden Gate Transit's Commute Bus services by the current parking facility at Eighth Street / Harrison Street would be relocated to this new parking facility. The Transbay EIS / EIR estimated that this new parking facility would have the capacity to accommodate up to 140 buses and restricted use of the facility to weekdays only, between 7:00 AM and 6:00 PM. As a result, the facility would be used primarily to support Commute Bus operations, which would only use the new ramp and ramp connector in the outbound direction (i.e., primarily during the weekday evening peak periods).

In addition to the new Mid-day Bus Parking Facility, the Transbay Transit Center project also involves construction of a new street-level passenger terminal (the "Transbay Transit Center Bus Plaza") for bus services on the block bounded by Minna Street, Natoma Street, Beale Street, and Fremont Street, serving primarily Muni and Golden Gate Transit services. This facility would provide a total of four platforms, three to be used by San Francisco Municipal Railway (Muni) bus services and one reserved for Golden Gate Transit bus services. This fourth platform would be used by Golden Gate Transit's Basic Bus services.

Project Description

Since the publication of the Transbay EIS / EIR, however, the following changes have taken place:

- The District has determined that the capacity of the new facility, originally estimated at 140 buses, is actually substantially lower, due to the column reconfiguration implemented as part of the seismic retrofit of the Bay Bridge's west approach, the requirement to construct a sound wall on portions of the south and east sides of the site as shown in the Transbay EIS / EIR, and the limited ability to maneuver buses into, within, and off the site. The anticipated capacity of the new facility is now estimated to be 73 buses, based on conceptual engineering drawings currently being developed.

- The District has reconfigured the sound wall without narrowing the public right-of-way on Stillman Street, restricting bus ingress and egress to and from the new parking facility to Perry Street only.

- The District has proposed to have its weekday evening Commute Bus services depart the new parking facility using surface streets instead of the new dedicated ramp structures connecting the AC Transit Mid-day Bus Parking Facility with Fremont Street between Howard Street and Folsom Street. No changes are proposed to inbound Commute Bus services (the planned ramp structures were never designed to allow bus traffic from surface streets to directly enter the Mid-day Bus Parking Facility) or to Basic Bus services (these services would use the Transbay Transit Center Bus Plaza, and were never envisioned to use the planned ramp structures).

The realignment of outbound Commute Bus routes onto surface streets—as opposed to grade-separated ramps—requires an evaluation of the effect of additional bus traffic to intersections not originally analyzed in the Transbay EIS / EIR. This proposed realignment of Golden Gate Transit's Commute Bus services onto surface streets is hereafter referred to as the "Project".

In addition, several design features related to the new Mid-day Bus Parking Facility, but not explicitly related to the realignment of Golden Gate Transit's Commute Bus services, have also been assumed as part of the "Project" in the technical analysis:

- Reconfiguration of Perry Street from one-way westbound traffic to one-way eastbound traffic between Third Street and Fourth Street;

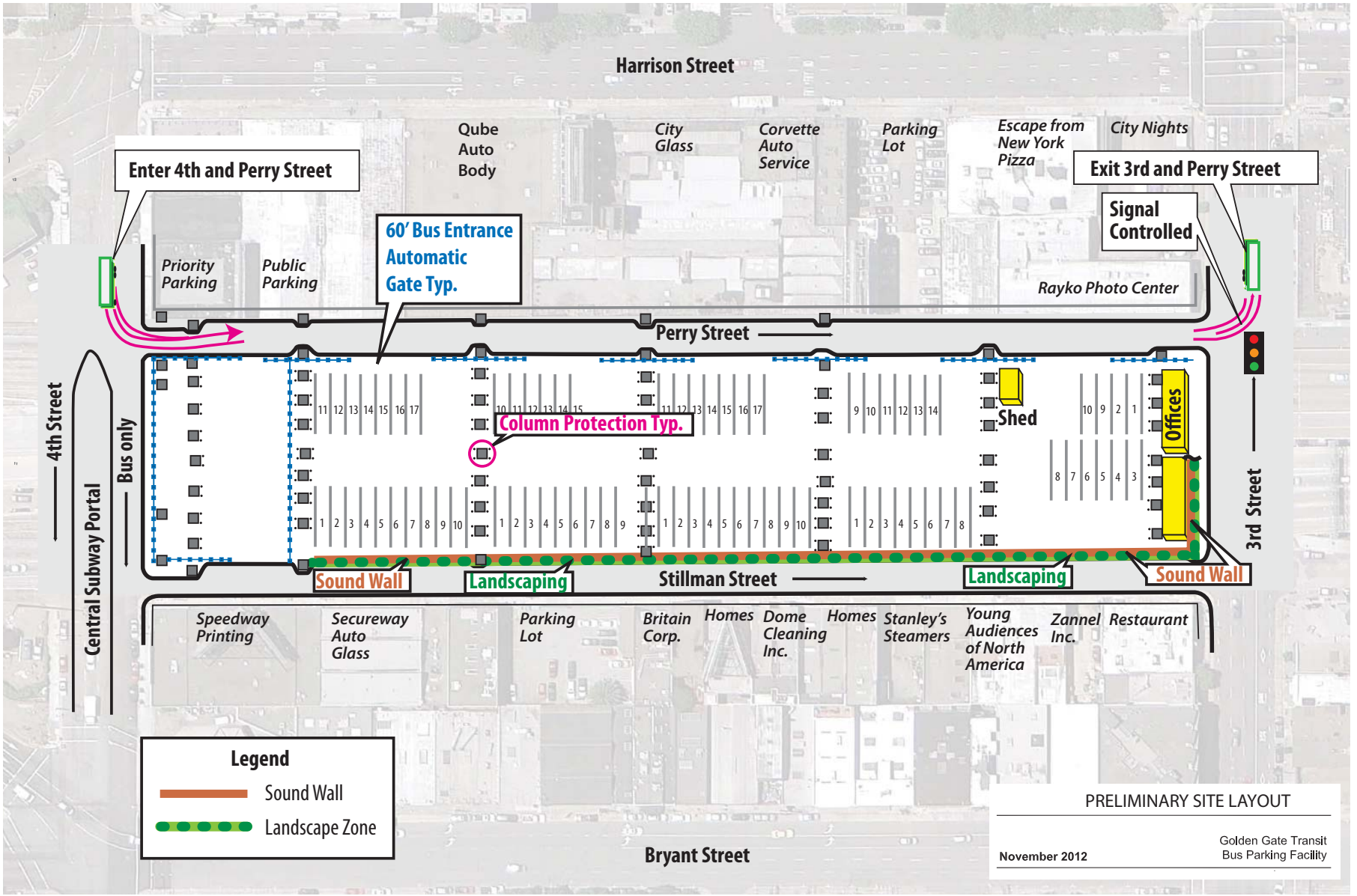
- Signalization of the Third Street / Perry Street intersection, including a midblock pedestrian crossing across Third Street on the south leg of the intersection; and,

- Removal of all on-street metered parking spaces along Perry Street due to curb modifications to enable bus ingress and egress.

The Project site plan, illustrating the conceptual engineering design for the new Mid-day Bus Parking Facility, is illustrated in Figure 2.

Analysis Methodology

Intersection Level of Service (LOS) was evaluated using the 2000 Highway Capacity Manual (HCM) methodology at selected study intersections where there is a potential that the Project may result in substantial effects to transportation and circulation. The LOS methodology is a qualitative description of the performance of an intersection based on average delay per vehicle. For signalized intersections, the HCM methodology determines the capacity of each lane group approaching the intersection and calculates an average delay (in seconds per vehicle) for each of the various movements at the intersection. A combined weighted average delay and LOS are then presented for the intersection. For unsignalized intersections, the average delay and LOS for the worst stop-controlled approach at the intersection are presented. Adjustments are typically made to the capacity of each intersection to account for various factors that reduce the ability of the streets to accommodate vehicles (such as the "downtown" nature of the area, number of pedestrians, bus stops, vehicle types, lane widths, grades, on-street parking, and queues).



Project Site Plan.ai

Project Site Plan
Figure 2

Intersection LOS ranges from LOS A, which indicates free flow or excellent conditions with short delays, to LOS F, which indicates congested or overloaded conditions with extremely long delays. LOS definitions for signalized and unsignalized intersections are described in Table 2. In San Francisco, LOS A through LOS D are considered excellent to satisfactory service levels, and LOS E and LOS F represent unacceptable service levels.

Table 2: Intersection Level of Service Definitions

LOS	Description	Average Delay (seconds / vehicle)	
		Signalized Intersections	Unsignalized Intersections
A	Little or no delay	$\leq$ 10.0	$\leq$ 10.0
B	Short traffic delay	> 10.0 and $\leq$ 20.0	> 10.0 and $\leq$ 15.0
C	Average traffic delay	> 20.0 and $\leq$ 35.0	> 15.0 and $\leq$ 25.0
D	Long traffic delay	> 35.0 and $\leq$ 55.0	> 25.0 and $\leq$ 35.0
E	Very long traffic delay	> 55.0 and $\leq$ 80.0	> 35.0 and $\leq$ 50.0
F	Extreme traffic delay	> 80.0	> 50.0

Source: Highway Capacity Manual, Transportation Research Board, 2000.

It should be noted that delay for intersections operating at LOS F is typically reported as "greater than 80.0 seconds" for signalized intersections and "greater than 50.0 seconds" for unsignalized intersections, as 80.0 seconds and 50.0 seconds are generally considered the limits of the meaningful range for the analysis methodology for signalized and unsignalized intersections. In these situations, the volume-to-capacity (v/c) ratio is also presented to facilitate comparison between scenarios.

Intersection LOS was analyzed at the following three (3) study intersections using Trafficware's Synchro 8 software package:

1. Third Street / Perry Street;
2. Third Street / Harrison Street; and,
3. Third Street / Folsom Street.

Consistent with typical intersection analyses as described in the San Francisco Planning Department's Transportation Impact Analysis Guidelines for Environmental Review (October 2002), operations at the study intersections were analyzed for the weekday PM peak hour, defined as the four consecutive 15-minute periods during the weekday PM peak period (4:00 PM to 6:00 PM) exhibiting the highest overall traffic volumes. These three intersections were selected because they are expected to show the highest increase in total traffic volumes during the weekday PM peak period as a result of the Project.

The intersection LOS analysis considers the following scenarios:

- Existing Conditions
  Existing conditions as of 2012.

- Existing plus Project Conditions
  Existing conditions as of 2012, plus the Project.

- Cumulative (2030) Conditions
  Future conditions in 2030, assuming background development growth in the city and region.

Existing Conditions

Intersection turning movement counts at the three study intersections were collected on Tuesday, October 9, 2012. Traffic signal timing plans were obtained from the San Francisco Municipal Transportation Agency (SFMTA). Existing lane geometries (including peak period tow-away restrictions and transit-only lanes) were gathered from field observations. Observations of roadway operations found that the transit-only lanes on Third Street were used primarily by transit vehicles only. Existing Conditions weekday PM peak hour intersection lane geometry and traffic volumes are illustrated in Figure 3. Existing Conditions weekday PM peak hour intersection LOS is summarized in Table 3.

In order to facilitate comparison with the Existing plus Project Conditions analysis, delay and LOS at Third Street / Perry Street are reported for the stop-controlled approach (westbound Perry Street) and the intersection as a whole. Likewise, at Third Street / Harrison Street and Third Street / Folsom Street, delays associated with transit vehicles in the Third Street transit-only lane have been omitted from the analysis. As shown in Table 3, all three study intersections currently operate at acceptable LOS (LOS D or better) during the weekday PM peak hour.

Table 3: Existing Conditions – Weekday PM Peak Hour Intersection Level of Service

Intersection		Existing Conditions		
		Traffic Control	LOS	Delay (seconds / vehicle)
1	Third Street / Perry Street	One-way stop		
	Westbound Perry Street		C	15.9
	Intersection average		A	0.1
2	Third Street / Harrison Street	Signal	B	16.9
3	Third Street / Folsom Street	Signal	C	22.1

Source: AECOM, 2012.

Existing plus Project Conditions

The relocation of Golden Gate Transit's Mid-day Bus Parking Facility, together with the realignment of Commute Bus services onto surface streets, would necessitate changes to Commute Bus routes and stops through the SOMA area. In particular, route segments along Howard Street and Folsom Street west of Fourth Street would be discontinued, together with the existing Golden Gate Transit stop at Fourth Street / Howard Street. New Commute Bus stops would be established in the inbound direction at Fourth Street / Folsom Street (a far-side stop shared with an existing Muni stop) and Third Street / Harrison Street (a new far-side stop). The changes to bus routes and stops are illustrated in Figure 4a, Figure 4b, and Figure 4c.

Information on weekday PM peak period Commute Bus pull-outs from the existing Mid-day Bus Parking Facility was obtained from Golden Gate Transit, and is summarized in Table 4 for 15-minute increments. As shown in Table 4, the maximum number of pull-outs during any four consecutive 15-minute periods is 42 trips.

Existing Volumes PM.ai

Existing Conditions Lane Geometry and Traffic Volumes
Weekday PM Peak Hour

Figure 3

Bus Routes base.ai

Bus Route Changes: Basic Bus Services

Figure 4a

Bus Route Changes: Financial District Commute Bus Services

Figure 4b

Bus Route Changes: Civic Center Commute Bus Services

Figure 4c

Table 4: Weekday PM Peak Period Commute Bus Pull-Outs

Time Period	Pull-Outs	Running Hourly Total
16:01 – 16:15	9	
16:16 – 16:30	12	
16:31 – 16:45	6	
16:46 – 17:00	15	42
17:01 – 17:15	9	42
17:16 – 17:30	11	41
17:31 – 17:45	4	39
17:46 – 18:00	7	31

Source: Golden Gate Transit, 2012.

These Project trips were added to traffic volumes on the affected turning movements at the three study intersections. As described previously, the Project would also involve geometry and signalization changes at the Third Street / Perry Street intersection, which were also accounted for in the Existing plus Project Conditions analysis. In particular, the change in directionality of Perry Street would result in outlet traffic from the segment of Perry Street between Third Street and Fourth Street using the Third Street / Perry Street intersection instead of the Fourth Street / Perry Street intersection. Although the actual volume of traffic currently using this segment of Perry Street is minimal, it provides secondary parking / loading access for several parcels with primary entrances along Harrison Street. As a result, a nominal volume of non-bus traffic was assumed for the eastbound approach at the Third Street / Perry Street intersection. Consistent with the Golden Gate Transit San Francisco Mid-day Bus Parking Facility Draft Preliminary Design Evaluation Report (November 6, 2012) prepared by URS and associated analysis work conducted by Fehr & Peers, the analysis assumes a three-phase signal (northbound Third Street, eastbound Perry Street, and westbound Perry Street), with the new pedestrian phase operating with both Perry Street phases.

The resulting weekday PM peak hour intersection lane geometry and traffic volumes are illustrated in Figure 5. The Existing plus Project Conditions weekday PM peak hour intersection LOS is summarized in Table 5.

Table 5: Existing plus Project Conditions – Weekday PM Peak Hour Intersection Level of Service

Intersection		Existing Conditions			Existing plus Project Conditions		
		Traffic Control	LOS	Delay (seconds / vehicle)	Traffic Control	LOS	Delay (seconds / vehicle)
1	Third Street / Perry Street	OWSC			Signal		
	Westbound Perry Street		C	15.9		C	29.0
	Eastbound Perry Street					C	21.0
	Intersection average		A	0.1		A	7.8
2	Third Street / Harrison Street	Signal	B	16.9	Signal	B	16.9
3	Third Street / Folsom Street	Signal	C	22.1	Signal	C	22.3

Source: AECOM, 2012.

Notes:
OWSC = One-way stop control

Existing + Project Volumes PM.ai

Existing Plus Project Conditions Lane Geometry and Traffic Volumes
Weekday PM Peak Hour

Figure 5

As shown in Table 5, the Project would have a negligible effect on overall traffic operations at the Third Street / Harrison Street and Third Street / Folsom Street intersections. The introduction of a new traffic signal (and associated traffic volumes) and signalized crosswalk across Third Street at the Third Street / Perry Street intersection would slightly degrade intersection average delay compared to Existing Conditions, but the intersection as a whole would still operate at LOS A while facilitating bus egress out of the new Golden Gate Transit Mid-day Bus Parking Facility and pedestrian connectivity across Third Street.

Cumulative (2030) Conditions

The Cumulative (2030) Conditions analysis is based on technical work conducted for the Transit Center District Plan and Transit Tower Draft Environmental Impact Report (EIR) (hereafter referred to as the "Transit Center District Plan EIR"), Planning Department Case Number 2007.0558E and 2008.0789E and State Clearinghouse Number 2008072073, published by the San Francisco Planning Department on September 28, 2011. Use of the Transit Center District Plan EIR technical work ensures that the analysis of Cumulative (2030) Conditions considers both background growth in the city and region (such as buildout of the Market / Octavia Plan, the Eastern Neighborhoods rezoning, and the Treasure Island Redevelopment Plan) and growth attributable to specific parcels in and around the Transit Center District Plan plan area. The Transit Center District Plan EIR technical work also assumes various changes to the transportation network—such as the Rincon Hill Streetscape Master Plan, the Central Subway, and the Transit Effectiveness Project—that would likely affect traffic patterns and volumes in and around the Project site.

Additional modifications to the Transit Center District Plan EIR technical work were made as needed to account for intersections not explicitly studied in the EIR and specific elements of the Project (such as the rerouted bus traffic) that represent departures from the original assumptions contained in the Transit Center District Plan EIR analysis.

Cumulative (2030) Conditions weekday PM peak hour intersection lane geometry and traffic volumes are illustrated in Figure 6. It should be noted that explicit forecasts were not calculated for bus traffic in the transit-only lanes along Third Street, as the actual bus volumes are uncertain and highly dependent on Muni service plans following the opening of the Central Subway. Omission of transit-only traffic has no effect on the analysis results, as this bus traffic is segregated from the general travel lanes considered in the intersection LOS analysis. Bus traffic not in transit-only lanes (e.g., along Harrison Street or Folsom Street) was assumed to exhibit growth rates similar to those for general traffic. As the current level of bus traffic not using transit-only lanes is minimal, the effect of the growth rate assumptions for this traffic on overall intersection performance are mostly negligible.

The resulting Cumulative (2030) Conditions weekday PM peak hour intersection LOS is summarized in Table 6.

As shown in Table 6, the Third Street / Perry Street intersection would continue to operate at LOS A under Cumulative (2030) Conditions, but the Third Street / Harrison Street and Third Street / Folsom Street intersections would degrade to LOS F, with v/c ratios over 1.00.

Cumulative Volumes PM.ai

Cumulative (2030) Conditions Lane Geometry and Traffic Volumes

Weekday PM Peak Hour

Figure 6

Table 6: Cumulative (2030) Conditions – Weekday PM Peak Hour Intersection Level of Service

Intersection		Existing plus Project Conditions		Cumulative (2030) Conditions		
		LOS	Delay (seconds / vehicle)	LOS	Delay (seconds / vehicle)	v/c
1	Third Street / Perry Street	A	7.8	A	6.8	
2	Third Street / Harrison Street	B	16.9	F	> 80.0	1.26
3	Third Street / Folsom Street	C	22.1	F	> 80.0	1.16

Source: AECOM, 2012.

Notes:
Bold indicates unacceptable conditions (LOS E or LOS F).

Consistent with San Francisco Planning Department standard methodologies, a review of the Project's contribution to intersection critical movements at these two intersections was conducted to determine if the Project would represent a significant contribution to the failing conditions. The Project's contribution to critical movement volumes at these locations is summarized in Table 7.

Table 7: Cumulative (2030) Conditions – Project Contribution to Intersections

Intersection		Critical Movement	Project Contribution to Critical Movement
2	Third Street / Harrison Street	NBT	0.0%
		WBT	0.0%
3	Third Street / Folsom Street	NBT	0.0%
		EBL	0.0%

Source: AECOM, 2012.

As shown in Table 7, the Project would not contribute traffic to any of the critical movements at the two study intersections failing under Cumulative (2030) Conditions. In particular, Project-generated traffic at the Third Street / Harrison Street intersection would be confined to the transit-only lane along Third Street and would have a negligible effect on traffic operations in the adjacent northbound travel lanes. At the Third Street / Folsom Street intersection, the Project would add traffic to the northbound right-turn movement, which is not expected to be an intersection critical movement.

Summary and Conclusions

In order to assess the potential transportation and circulation effects of the proposed relocation of Golden Gate Transit's Mid-day Bus Parking Facility to its final location, a quantitative analysis of weekday PM peak hour intersection LOS was conducted at three study locations (Third Street / Perry Street, Third Street / Harrison Street, and Third Street / Folsom Street) along the proposed route of Commute Bus services.

The analysis of Existing plus Project Conditions determined that the Project would have a negligible effect on overall traffic operations at the Third Street / Harrison Street and Third Street / Folsom Street intersections, while the Third Street / Perry Street would operate at LOS A after signalization and addition of Project-generated bus traffic.

Under Cumulative (2030) Conditions, the Third Street / Harrison Street and Third Street / Folsom Street intersections are expected to operate at LOS F, but the Project would not contribute traffic to any of the critical movements at these two locations.

As a result, the Project's effects on overall transportation and circulation under both Existing plus Project Conditions and Cumulative (2030) Conditions are expected to be negligible.