



# Gearsy Corridor Bus Rapid Transit Project

## APPENDIX C: MITIGATION MONITORING AND REPORTING PROGRAM

FINAL ENVIRONMENTAL IMPACT REPORT  
(EIR)



SAN FRANCISCO COUNTY TRANSPORTATION AUTHORITY

IN PARTNERSHIP WITH



November 2016

## **APPENDIX C**

### **Mitigation Monitoring and Reporting Program**

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### **Mitigation Monitoring & Reporting Program for the Geary Corridor Bus Rapid Transit Project in San Francisco, CA**

**by the  
San Francisco County Transportation Authority and San Francisco Municipal  
Transportation Agency**

## C.1 Introduction

This Mitigation Monitoring and Reporting Program (MMRP) is for the Geary Bus Rapid Transit (BRT) Project. The California Environmental Quality Act (CEQA) requires an enforceable mitigation monitoring program for projects. CEQA Section 21081.6 and CEQA Guidelines 15097(a) require public agencies to adopt a program for monitoring and reporting on the measures required to mitigate or avoid significant environmental impacts identified in the Final Environmental Impact Report (EIR). Under CEQA, the MMRP must be adopted when a public agency makes its findings pursuant to CEQA so that the mitigation requirements can be made conditions of project approval. Consistent with these requirements, this MMRP ensures compliance with all mitigation requirements set forth in the Final EIR that have been determined to be feasible under the CEQA Findings. These measures include, but are not limited to, elements that would be designed into the project and implementation of best management practices (BMPs) during construction. This MMRP will be kept on file in the offices of the San Francisco County Transportation Authority (SFCTA), 1455 Market Street, 22nd Floor, San Francisco, CA 94103.

## C.2 Mitigation Monitoring & Reporting Program

Analysis of each environmental factor in Chapters 3 through 7 of the Draft EIS/EIR includes discussion of the regulatory setting, affected environment, environmental consequences (including permanent/project operational impacts, construction impacts, and cumulative impacts), and mitigation and improvement measures for each project alternative, including the locally preferred alternative (LPA). This MMRP includes all feasible mitigation measures that are applicable to the adopted project, the Hybrid Alternative/SRA, which is also the LPA. In addition to identified mitigation measures, this MMRP includes several “improvement measures.” Improvement measures identified in the Final EIR are not needed to avoid or reduce significant impacts, but either embody regulatory requirements or are standard construction procedures or best practices that are recommended to reduce or avoid impacts that are less than significant. The purpose of the MMRP is to list all mitigation and improvement measures adopted for the Geary BRT Project and the milestones at which measures must be implemented. The MMRP also identifies the implementing, enforcing, and monitoring entities. SFCTA, as the lead agency under CEQA, will oversee the implementation of the mitigation and monitoring program through project implementation, including construction, testing, and initial operations. SFCTA will designate a Mitigation Monitoring Manager to oversee the monitoring and reporting of all mitigation and improvement measures. The San Francisco Municipal Transportation Agency (SFMTA), as a responsible agency under CEQA, will be the entity that will construct and operate the project and will be responsible for carrying out mitigation measures that must be implemented as part of

project design, construction, and operation. SFMTA shall designate a mitigation and monitoring coordinator to oversee the implementation of all relevant mitigation measures.

To ensure compliance with the MMRP, further agreements between SFCTA and SFMTA will require SFMTA to implement or, through contracts, ensure implementation of, the avoidance, mitigation, and improvement measures. SFCTA (or its Consultant) will conduct periodic audits of the construction site, and through the agreements will have authority to resolve with SFMTA any issues that arise concerning compliance with mitigation requirements on the part of SFMTA or its contractor. Through its CEQA Findings, SFCTA will also urge other agencies that will issue permits for the work, including the Department of Public Works and California Department of Transportation (Caltrans) to require compliance with the mitigation measures through their permits.

**Table C-1** is organized by environmental discipline, or affected resource. It provides a list of the mitigation and improvement measures identified in the Final EIR and includes a summary of the following information:

- **Affected Resource:** Provides a broad title of the impact or effect that is to be mitigated or improved.
- **Contractor:** Refers to any contractor hired by SFMTA to implement the project.
- **Mitigation and Improvement Measures:** Provides a brief description of the mitigation or improvement measures. The MMRP includes all mitigation and improvement measures identified in the Final EIR that SFCTA and SFMTA found feasible and adopted as part of the CEQA Findings for the project. SFCTA will ensure that these measures are fully enforceable, in most cases by SFMTA, by making them conditions of project funding. Through agreements with SFMTA, SFCTA will require SFMTA to incorporate the measures into design documents, construction specifications, and project operational procedures. Other agencies may assist SFCTA in monitoring compliance with mitigation measures, such as the Federal Transit Administration (FTA), Department of Public Works, or Caltrans through their permitting and funding authority.
- **Implementation Procedure:** Describes by whom and when the mitigation and improvement measures must be implemented.
- **Implementation Responsibility:** Describes who is responsible for implementing the mitigation and improvement measures. In most cases it is SFMTA or the Contractor.
- **Implementation Schedule:** Identifies the project phase or milestone at which the mitigation and improvement measures must be implemented. The Mitigation Monitoring Manager must approve that the mitigation measure is adequately addressed at each phase of project development.
- **Monitoring Responsibility:** Identifies the agency responsible for ensuring that mitigation measures are implemented. In most cases it is SFMTA.
- **Report Recipient:** Identifies the agencies that will be notified that the mitigation measures have been implemented adequately.

**Table C-1 Mitigation Monitoring & Reporting Program for the Geary BRT Project**

NO.	AFFECTED RESOURCES	MITIGATION & IMPROVEMENT MEASURES	IMPLEMENTATION PROCEDURE	IMPLEMENTATION RESPONSIBILITY	IMPLEMENTATION SCHEDULE	MONITORING RESPONSIBILITY	REPORTING RECIPIENT
1(l)	Pedestrian and Bicycle Transportation	I-PED-1. Include WalkFirst pedestrian safety recommendations where possible as part of project design (WalkFirst recommendations described in detail in Appendix D-8).			Final design		SFCTA Planning Department
2(l)	Pedestrian and Bicycle Transportation	I-PED-2. Use Universal Design Principles to inform detailed engineering design of pedestrian and station facilities to enhance access for disabled persons.			Final design		SFCTA
3(l)	Pedestrian and Bicycle Transportation	I-PED-3. Include state of the practice bicycle safety and design treatments for the Masonic-to-Presidio bicycle connection, including current design guidance from the City's Bicycle Plan and other state and national sources.			Final design		SFCTA
4(l)	Pedestrian and Bicycle Transportation	I-PED-4. Monitor pedestrian safety on parallel streets to assess if and how changes in traffic volumes affect pedestrian safety, and identify improvements to address safety issues if necessary.			Construction phase		SFCTA
5(l)	Parking and Loading Conditions	I-PRK-1. On-street parking should be created where bus stops are consolidated or relocated, as feasible.	SFMTA to implement as part of construction planning phase. Per contract specifications, Contractor to implement during construction.	SFMTA	Construction planning phase, construction phase	SFMTA to prepare weekly reports during applicable phase of project construction.	SFCTA
6(l)	Parking and Loading Conditions	I-PRK-2. Additional on-street parking should be provided from lane striping and infill spaces where feasible. With reconfiguration of the street, opportunities would exist to create additional parking spaces, for example by converting parallel spaces to back-in angled spaces where a reduction in the number of travel lanes allows.	SFMTA to implement as part of construction planning phase. Per contract specifications, Contractor to implement during construction.	SFMTA	Construction planning phase, construction phase	SFMTA to prepare weekly reports during applicable phase of project construction.	SFCTA

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7(I)	Parking and Loading Conditions	<p>I-PRK-3. Where removal of curb spaces is necessary, retention and replacement of parking spaces for people with disabilities should be prioritized over retention of all other spaces. Among remaining spaces, retention and replacement of loading spaces shall be prioritized over retention of general and short-term parking spaces. Where feasible, parking spaces for people with disabilities and loading spaces shall be relocated on the same block face as they currently exist. In locations where this is not feasible, such parking spaces and loading spaces should be relocated to the nearest cross street close to its intersection with Geary Boulevard.</p>	<p>SFMTA to implement as part of construction planning phase. Per contract specifications, Contractor to implement during construction.</p>	SFMTA	Construction planning phase, construction phase	SFMTA to prepare weekly reports during applicable phase of project construction.	SFCTA
8(A)	Parking and Loading Conditions	<p>A-PRK-4. Where there are multiple options available to relocate lost loading spaces, the project team shall work with affected land uses, including businesses owners, to identify which location best meets local loading needs and the purpose and need of the project. If space is not available to relocate loading spaces, then loading spaces shall be consolidated with existing nearby loading zones that have additional capacity.</p>			Final design		SFCTA
9(M)	Community Impacts	<p>M-CI-C1. A Transportation Management Plan (TMP) that includes traffic rerouting, a detour plan, and public information procedures shall be developed during the design phase with participation from local agencies, other major project proponents in the area, local communities, business associations, and affected drivers. Early and well-publicized announcements and other public information measures would be implemented prior to and during construction to minimize confusion, inconvenience, and traffic congestion. The TMP shall include at minimum the following provisions:</p> <ul style="list-style-type: none"> <li>Construction planning shall seek to minimize nighttime construction in residential areas and minimize daytime construction impacts on</li> </ul>	<p>SFMTA to implement as part of construction planning phase. Per contract specifications, Contractor to implement during construction.</p>	SFMTA - planning Contractor - construction	Construction planning phase, construction phase	SFMTA to oversee approvals from Caltrans and SFDPW. SFMTA to provide weekly reports on adherence to TMP throughout construction duration.	SFCTA Caltrans SFDPW

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		<p>retail and commercial areas.</p> <ul style="list-style-type: none"> <li>• As part of the TMP public information program, San Francisco Municipal Transportation Agency (SFMTA) shall coordinate with adjacent properties along the Geary corridor to determine the need for colored parking spaces (i.e., loading zones) and work to identify locations for replacement spaces or plan construction activities to minimize impacts from the loss of these spaces. SFMTA shall also coordinate with adjacent properties along the Geary corridor to ensure that pedestrian access to these properties is maintained.</li> <li>• The TMP shall incorporate SFMTA’s process for accepting and addressing complaints. This includes provision of contact information for the Project Manager, Resident Engineer, and Contractor on project signage with direction to call if there are any concerns. Complaints would be logged and tracked to ensure they are addressed.</li> <li>• The TMP shall identify or otherwise designate adequate passenger and truck loading zones to be maintained for adjacent land uses, including maintaining access to driveways and providing adequate loading zones on the same or adjoining street block face.</li> </ul>					
10(MIN)	Visual Resources	<p><b>MIN-VQ-C1.</b></p> <ul style="list-style-type: none"> <li>• Project construction shall be phased to reduce the period of disruption at any particular location to the shortest practical length of time.</li> <li>• Construction lighting shall be shielded and directed to limit direct illumination to within the area of work and avoid all light trespass.</li> <li>• Construction staging and storage</li> </ul>	Per contract specifications, Contractor to implement during construction.	Contractor	Construction	SFTMA to provide weekly reports outlining adherence to standards throughout construction duration.	SFCTA

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		areas shall be screened by visually opaque screening wherever they will be exposed to public view for extended periods of time.					
11(l)	Visual Resources	I-VQ-2. In order to maximize overall Geary corridor visual unity, a consistent palette of street tree types could be developed, reviewed by City planning staff, and applied throughout the Geary corridor.					SFCTA
12(l)	Visual Resources	I-VQ-3. Coordinate with Geary corridor planning efforts of the City planning department. Station design could be coordinated with long-term urban design studies of the City planning department, including studies for the Divisadero to Laguna Street segment of the Geary corridor.					SFCTA Planning Department
13(MIN)	Cultural Resources	MIN-CUL-C1. Limit the use of construction equipment that creates high vibration level, such as vibratory rollers.	Per contract specifications, Contractor to implement during construction.	Contractor	Construction	SFTMA to provide weekly reports outlining adherence to standards throughout construction duration.	SFCTA
14(MIN)	Cultural Resources	MIN-CUL-C2. Develop and implement a Vibration Reduction and Minimization Plan, which would include the identification of vibration-sensitive structures using distance impact thresholds.	SFMTA to perform independent noise and vibration monitoring. Contractor to implement modifications as needed during project construction, per contract specifications.	Contractor	Final design and construction	SFMTA to provide weekly reports on compliance with City noise ordinance throughout construction duration.	SFCTA
15(MIN)	Cultural Resources	MIN-CUL-C3. During advanced conceptual engineering or final design phases, an individual assessment of vibration-sensitive structures would be conducted where construction activities and equipment would exceed FTA's impact distance guidance for category IV structures.	SFMTA to perform independent assessment of vibration-sensitive structures. Contractor to implement modifications as needed during project construction, per contract specifications.	Contractor	Final design and construction	SFTMA to provide weekly reports outlining adherence to standards throughout construction duration.	SFCTA

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16(MIN)	Cultural Resources	<b>MIN-CUL-C4.</b> Conduct vibration monitoring during construction.	Per contract specifications, Contractor to implement during construction.	Contractor	Construction	SFTMA to provide weekly reports outlining adherence to standards throughout construction duration.	SFCTA
17(A/MIN)	Cultural Resources	<b>A-CUL-C5.</b> Design proposed stations and stops in the vicinity of the Golden Triangle Streetlights, Japan Center light standards, and components of the AWSS to avoid the removal, relocation, or damage to these historic structures. OR <b>MIN-CUL-C6.</b> In the event that avoidance of the Golden Triangle Streetlights, Japan Center light standards, and AWSS are infeasible, all effort will be made first for relocation of such elements within the immediate vicinity of their original location while maintaining placement (distance) within the sidewalk in respect to curb and/or adjacent buildings. For the light standards, additional effort would be made to relocate a light standard within the same block if there is a site where the original light standard has been removed or replaced by modern standards; and last, relocation to an available site within the historic property boundary where an original standard has been removed or replaced by modern standards.	SFMTA in coordination with SFDPW and SFPUC with approval by SF Arts Commission and HPC.	SFMTA, SFDPW, SFPUC	Final design	SFMTA to oversee approvals by SF Arts Commission and SF HPC	SFCTA Planning Department
18(I)	Cultural Resources	<b>I-CUL-C7.</b> Harmonize the visual qualities of built elements of the project alternatives with adjacent historic properties through careful consideration of design, lighting, materials, and color choices that would complement and be sensitive to nearby historic properties.	SFMTA in coordination with SFDPW and SFPUC with approval by SF Arts Commission and HPC.	SFMTA, SFDPW, SFPUC	Final design	SFMTA to oversee approvals by SF Arts Commission and SF HPC	SFCTA Planning Department

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19(MIN)	Cultural Resources	<p><b>MIN-CUL-C8.</b> Focused archival research will identify any specific areas within the APE that may be likely to contain potentially significant remains, and methods and findings will be documented as an addendum to the current report. The Phase I addendum report will be submitted to the City's Environmental Review Officer (ERO) and the SHPO for concurrence. Research will be initiated once the project's APE map is finalized identifying the major Areas of Direct Impact. The Addendum Survey Report would include:</p> <ul style="list-style-type: none"> <li>• A contextual and documentary research section that addresses the development of urban infrastructure that provides a basis for evaluating potential resources as they relate to the history of San Francisco.</li> <li>• A cut-and-fill reconstruction of the corridor, comparing the modern versus mid-1800s ground surface elevations, to fine-tune the initial prehistoric sensitivity assessment, and refining the location of high-sensitivity locations where prehistoric remains may be preserved.</li> <li>• Relevant profiles and plan views of specific blocks to illustrate the methods used in analyzing available documentation.</li> <li>• Summary and conclusions to provide detailed information on locations that have the potential to contain extant historic-era and prehistoric archaeological remains that might be evaluated as significant resources, if any.</li> </ul> <p>Two results are possible based on documentary research:</p> <ul style="list-style-type: none"> <li>• No or low potential for sensitive locations: major Areas of Direct impact have no potential to retain</li> </ul>	<p>Qualified archaeologist to conduct research during final design to inform construction planning and further consultation with SHPO.</p>	<p>SFCTA to provide qualified archaeologist to implement.</p>	<p>Final design</p>	<p>Agencies to submit Addendum Survey Report to SHPO as part of ongoing Section 106 consultation. SFMTA to provide final design and oversee archaeology approvals from the Planning Department.</p>	<p>SFCTA SHPO Planning Department</p>

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		<p>extant archaeological remains that could be evaluated as significant resources. No further work would be recommended, beyond adherence to the Unanticipated Discovery Plan.</p> <ul style="list-style-type: none"> <li>Potential sensitive locations: if major Areas of Direct Impact contain locations with moderate to high potential to retain extant historic or prehistoric archaeological remains that could be evaluated as significant resources, further work would be carried out, detailed in a Testing and Treatment Plan.</li> </ul>					
20(MIN)	Cultural Resources	<p><b>MIN-CUL-C9.</b> Depending on the results of archival research, in concert with the City's ERO, project avoidance areas or, more likely, areas requiring presence/absence investigations for cultural resources will be identified and fieldwork undertaken following exposure of the ground surface, but prior to construction to identify buried cultural resources.</p>	<p>Qualified archaeologist to conduct research during final design to inform construction planning and further consultation with SHPO.</p>	<p>SFCTA to provide qualified archaeologist to implement.</p>	<p>Pre-construction</p>	<p>Agencies to submit Addendum Survey Report to SHPO as part of ongoing Section 106 consultation. SFMTA to provide final design and oversee archaeology approvals from the Planning Department.</p>	<p>SFCTA SHPO Planning Department</p>
21(MIN)	Cultural Resources	<p><b>MIN-CUL-C10.</b> A Testing and Evaluation/Treatment Plan, if required, will provide archaeological protocols to be employed immediately prior to project construction to test areas identified as potentially significant or having the potential to contain buried cultural resources. In case such areas might be unavoidable, minimization measures will be proposed. The procedures detailed in the Treatment Plan would be finalized in consultation with the City's ERO and the SHPO.  For historic-era resources, work would initially entail detailed, focused documentary research to evaluate the potential significance of any archaeological material identified during</p>	<p>Per contract specifications, qualified archaeologist to instruct construction crews on this procedure prior to start of construction and throughout construction, as needed. Construction crew members to implement if needed during project construction.</p>	<p>SFCTA to provide qualified archaeologist to prepare Testing and Treatment Plan, if required. Contractor or SFMTA to provide qualified archaeologist to implement Testing and Treatment Plan if</p>	<p>Construction</p>	<p>Agencies to consult with SHPO on a Testing and Treatment Plan to complete the Section 106 process. SFMTA to monitor instruction and to provide weekly reports of archaeological findings and procedures throughout project construction duration as well as verification of training of all</p>	<p>SFCTA SHPO Planning Department</p>

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		<p>initial research that might be preserved. Significance would be based on the data-potential of possible remains applied to accepted research designs. Two results could ensue:</p> <ul style="list-style-type: none"> <li>• No potentially significant remains: if no locations demonstrate the potential for significant remains, no further archaeological testing would be recommended.</li> <li>• Potentially significant remains: if any locations have the potential to contain significant remains, then appropriate field methods will be proposed, including compressed testing and data-recovery efforts. Testing will be initiated immediately prior to construction, when there is access to historic ground levels. Should a site or site feature be found and evaluated as potentially significant, data recovery would take place immediately upon discovery if avoidance of the site is still not possible.</li> </ul> <p>For prehistoric resources, a Treatment Plan will identify relevant research issues for resource evaluation, and pragmatic methods to identify, evaluate, and conduct data recovery if needed. This may include a pre-construction geoarchaeological coring program or a compressed three-phase field effort occurring prior to construction when the ground surface is accessible.</p>		required.		relevant construction crew staff working on job site.	
22(MIN)	Cultural Resources	<p><b>MIN-CUL-C11.</b> Upon completion of all fieldwork, a technical report shall be prepared. This Final Archaeological Resources Report (FARR) shall document all field and laboratory methods, analysis, and findings. The FARR shall be subject to review and approval by the City's ERO and the SHPO. Copies of the approved FARR shall be submitted to the City's ERO, the SHPO, and the Northwest</p>	<p>Qualified archaeologist to prepare report to inform construction planning and further consultation with SHPO.</p>	<p>SFCTA to provide qualified archaeologist to implement.</p>	<p>Pre-construction</p>	<p>Agencies to Submit Addendum Survey Report to SHPO as part of ongoing Section 106 consultation. SFMTA to provide final design and oversee archaeology approvals from the</p>	<p>SFCTA SHPO Planning Department</p>

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		Information Center (NWIC), together with any associated archaeological site records.				Planning Department.	
23(MIN)	Cultural Resources	<b>MIN-CUL-C12.</b> If buried cultural resources are encountered during construction activities, construction will be halted and the discovery area isolated and secured until a qualified archaeologist assesses the nature and significance of the find.	Per contract specifications, construction crews to be instructed on this policy prior to start of construction and throughout construction, and to implement if needed during project construction.	Contractor to provide qualified archaeologist to implement.	Construction	SFMTA to monitor instruction and to provide weekly reports of archaeological findings and procedures throughout project construction duration.	SFCTA SHPO Planning Department
24(MIN)	Cultural Resources	<b>MIN-CUL-C13.</b> If human remains are discovered, the County coroner will be notified as soon as is reasonably possible (CEQA Section 15064.5). There will be no further site disturbance where the remains were found. If the remains were determined to be Native American, then the coroner is responsible for contacting the California Native American Heritage Commission (NAHC) within 24 hours. The NAHC, pursuant to Public Resources Code (PRC) Section 5097.98 will notify those persons it believes to be the most likely descendant (MLD). Treatment of the remains will be dependent on the views of the MLD.	Per contract specifications, construction crews to be instructed on this policy prior to start of construction and throughout construction, and to implement if needed during project construction.	Contractor to provide qualified archaeologist to implement.	Construction	SFMTA to monitor instruction and to provide weekly reports of archaeological findings and procedures throughout project construction duration.	SFCTA County Coroner NAHC Planning Department
25(MIN)	Cultural Resources	<b>MIN-CUL-C14.</b> In the event that paleontological resources are encountered during any phase of project construction, all soil-disturbing activity within 100 feet of the find shall be temporarily halted until a qualified paleontologist can assess the significance of the find and provide proper management recommendations.	Per contract specifications, construction crews to be instructed on this policy prior to start of construction and throughout construction, and to implement if needed during project construction.	Contractor to provide qualified paleontologist to implement.	Construction	SFMTA to monitor instruction and to provide weekly reports of paleontological findings and procedures throughout project construction duration.	SFCTA SHPO Planning Department

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26(MIN)	Utilities	<b>MIN-UT-1.</b> BRT construction shall be closely coordinated with concurrent utility projects planned within the Geary corridor.	SFMTA, SFPUC, and SFDPW to implement as part of construction planning phase, including coordination with the Committee for Utility Liaison on Construction and Other Projects (CULCOP) and the San Francisco Street Construction Coordination Center.	SFMTA, SFPUC, and contractor	Permitting and construction (planning phase)	SFMTA to oversee approvals from SFDPW.	SFCTA
27(MIN)	Utilities	<b>MIN-UT-2.</b> Inspection and evaluation of sewer pipelines within the project limits shall be undertaken to assess the condition of the pipelines and need for replacement. Drain inlets on the corridor shall also be inspected to assess condition and confirm functionality. Spot repairs or minor replacement-in-place of sewers may be performed during construction of the project if desired by SFPUC and agreed to by SFMTA.	SFMTA and SFPUC to conduct needed sewer inspections during final design.	SFMTA, SFPUC	Final design and construction (planning phase)	SFMTA to oversee approvals from SFDPW.	SFCTA
28(MIN)	Utilities	<b>MIN-UT-3.</b> During planning and design, consideration would be given to ensure that Geary corridor station facilities do not prevent access to the underground auxiliary water supply service (AWSS) lines. Adequate access for specialized trucks to park next to gate valves shall be maintained. Gate valves shall not be located beneath medians, station platforms, or sidewalks.	SFMTA, SFDPW, SFPUC, and the San Francisco Fire Department to coordinate and plan during final design, and again for construction planning. Per contract specifications, Contractor to implement during construction.	SFMTA, SFPUC, and the San Francisco Fire Department	Final design and construction	SFMTA to oversee approvals from SFPUC and San Francisco Fire Department. SFMTA to provide weekly reports on accessibility of AWSS lines and gate valves throughout construction duration.	SFCTA
29(MIN)	Utilities	<b>MIN-UT-4.</b> In situations where utility facilities are being protected in place, SFMTA shall create a plan to accommodate temporary closure of the transitway and/or stations in coordination with utility providers to allow utility providers to perform maintenance, emergency repair, and upgrade/replacement of underground facilities that may be located beneath project features such as the BRT transitway, station platforms, or curb bulbs. Signage for BRT patrons and safety	SFMTA to coordinate with utility providers, SFDPW, the SFPUC and San Francisco Fire Department during final design to ensure project design considers utility maintenance programs, including those overlapping with project construction.	SFMTA	Final design and construction	SFMTA to oversee approvals from SFPUC, San Francisco Fire Department, and SFDPW.	SFCTA

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		<p>protocols for Muni operators and utility providers shall be integrated into this plan.</p>					
30(MIN)	Geology/Soils/ Seismic/ Topography	<p><b>MIN-GE-C1.</b> Shoring will be typically required for all cuts deeper than five feet. Shoring design of open excavations must consider the potential surcharge load from neighboring structures. Furthermore, the potential for lateral movement of excavation walls as a result of earthquake-related surcharge load from nearby structures must also be assessed. The following shoring and slope stability BMPs will be implemented during construction:</p> <ul style="list-style-type: none"> <li>• Heavy construction equipment, building materials, excavated soil, and vehicle traffic shall be kept away from the edge of excavations, generally a distance equal to or greater than the depth of the excavation.</li> <li>• In the event of wet weather, storm runoff shall be prevented from entering the excavation. Excavation sidewalls can be covered with plastic sheeting, and berms can be placed around the perimeter of the excavated areas.</li> <li>• Sidewalks, slabs, pavement, and utilities adjacent to proposed excavations shall be adequately supported during construction.</li> </ul>	Per contract specifications, contractor to implement during construction.	Contractor	Construction	SFMTA to oversee cuts and provide weekly reports describing the shoring technique used on all cuts deeper than five feet throughout project construction duration.	SFCTA
31(MIN)	Geology/Soils/ Seismic/ Topography	<p><b>MIN-GE-1.</b> A geotechnical consultant shall review the design of the build alternatives and offer recommendations best suited to the build alternative carried forward. Any recommendations provided by the geotechnical consultant shall be incorporated into the final plans, and are likely to include the following:</p> <p><b>MIN-GE-1a.</b> For lightly loaded structures such as bus stops, canopies, and walls, incorporate geotechnical and/or structural</p>	Per contract specifications, Contractor to implement during design and construction phase, in preparation of construction of station platforms.	Contractor	Final design/ permitting/ construction	SFMTA to provide weekly report on soil modification treatments throughout project construction duration.	SFCTA

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32(MIN)	Hazards and Hazardous Materials	<p>methods to mitigate the effects of liquefaction on the foundations during final design. The geotechnical mitigation methods may range from recompaction of the upper material to provision of a mechanically stabilized earth (MSE) foundation system. The structural mitigation methods may range from planning for repairs/maintenance after a seismic event to supporting the improvements on mat foundations or interconnected beam foundations to tolerate the anticipated seismic settlement without collapse.</p> <p><b>MIN-GE-1b.</b> Fill soils shall be overexcavated and replaced with engineered fill as needed.</p> <p><b>MIN-GE-1c.</b> Deeper foundations shall be designed for station platforms and canopies located in areas of fill or areas mapped as liquefaction areas, as needed.</p> <p><b>MIN-HZ-C1.</b> Prior to construction, a limited Preliminary Site Investigation (Phase I) shall be performed to investigate hazardous materials concerns related to soil, groundwater, and construction materials on the Geary corridor, as identified in this section. Areas where soils will be disturbed during construction shall be sampled and tested for contaminants specific to the hazardous materials concerns identified in that location. Soil analytical results shall be screened against the Regional Water Board's Environmental Screening Levels (ESLs) and other applicable risk-based standards to determine appropriate actions to ensure the protection of construction workers, future site users, and the environment and also be screened against state and federal hazardous waste thresholds to determine soil management options. Representative samples of exposed shallow soils shall be</p>	SFMTA to implement following final design.	SFMTA	Final design/construction planning	SFMTA to provide a report with findings.	SFCTA Caltrans

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		<p>collected within 30 feet of the edge of the roadway and analyzed for total lead and soluble lead. For example, aerially-deposited lead is a potential concern throughout the Geary corridor, while naturally-occurring asbestos is potentially present in only a small portion of the Geary corridor. Accordingly, samples in all areas shall be analyzed for total and soluble lead; samples from excavation areas overlying serpentinite bedrock shall also be analyzed for asbestos. Additional investigation may be required to fully evaluate potential hazardous materials issues if concerns are identified during the Preliminary Site Investigation. All environmental investigations at the project shall be provided to project contractors, so the findings may be incorporated into their Health and Safety and Hazard Communication Programs.</p>					
33(MIN)	Hazards and Hazardous Materials	<p><b>MIN-HZ-C2.</b> Prior to construction, groundwater shall be collected in areas near reported hazardous materials release sites and analyzed for TPH and volatile organic compounds if project excavations were to extend into the groundwater in those areas. Hazardous materials releases sites that have affected groundwater near the Geary corridor are located at 3675 Geary Boulevard, 450 Mission Street, and 2130 O'Farrell Street.</p> <p>Additional hazardous materials releases may occur or be discovered in the future. Therefore, an updated review of regulatory agency records shall be conducted prior to the groundwater investigation, to ensure that groundwater that will be encountered during construction is properly investigated.</p>	<p>SFMTA shall implement testing of groundwater prior to construction to inform construction planning.</p> <p>Per contract specifications, Contractor shall adhere to Construction Implementation Plan.</p>	SFMTA	Final design/ construction planning	<p>SFMTA to provide report outlining hazardous building materials and shall include procedures in Construction Implementation Plan.</p> <p>SFMTA to provide weekly reports on adherence to Construction Implementation Plan throughout construction duration.</p>	SFCTA Caltrans

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34(MIN)	Hazards and Hazardous Materials	<b>MIN-HZ-C3.</b> A Hazardous Building Materials survey shall be conducted prior to construction. The survey shall minimally sample traffic paint and structures to be demolished or modified.	SFMTA shall implement testing of structures to be demolished prior to construction to inform construction planning. Per contract specifications, Contractor shall adhere to Construction Implementation Plan.	SFMTA	Final design/ construction planning	SFMTA to provide report outlining hazardous building materials and shall include procedures in Construction Implementation Plan. SFMTA to provide weekly reports on adherence to Construction Implementation Plan throughout construction duration.	SFCTA Caltrans
35(MIN)	Hazards and Hazardous Materials	<b>MIN-HZ-C4.</b> Based on the findings and recommendations of the Preliminary Site Investigation, the project may need to implement special soil, groundwater, and construction materials management and disposal procedures for hazardous materials, as well as construction worker health and safety measures during construction. In addition to the findings and recommendations of the Preliminary Site Investigation, the following measures shall be implemented prior to construction. <ul style="list-style-type: none"> <li>• Groundwater from dewatering of excavations, if any, should be stored in Baker tank(s) during construction activities and the water should be characterized prior to disposal or recycling.</li> <li>• A construction risk management plan should be implemented by contractors with procedures for identifying and mitigating potentially unreported releases of hazardous materials.</li> </ul>	Per contract specifications, plan (including special provisions) to be written by Contractor as part of construction planning phase.	Contractor	Construction (planning phase)	SFMTA to oversee approval from Caltrans. SFMTA to provide weekly reports on adherence to plan throughout construction duration.	SFCTA Caltrans

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36(MIN)	Hydrology and Water Quality	<b>MIN-HY-C1.</b> Any construction work that adversely affects the combined sewer system will require coordination with SFPUC, and construction-related activities shall be consistent with the SFPUC's <i>Keep it on Site, Pollution Prevention Guide for the Construction Industry</i> . <sup>2</sup>	SFMTA shall obtain any needed approval from SFPUC.	SFMTA, SFPUC, and Contractor	Permitting and construction (planning phase)	SFMTA to oversee approvals from SFPUC.  SFMTA to provide weekly reports on adherence to <i>Keep it on Site</i> guidelines throughout construction duration.	SFCTA RWQCB
37(MIN)	Hydrology and Water Quality	<b>MIN-HY-1.</b> Landscape areas shall be designed to minimize and reduce total runoff. Any irrigation and fertilizers shall be used to the minimum extent practicable and feasible.	SFMTA and landscape architects to implement during landscape design. SFDPW to implement water and fertilizer usage during project operation.	SFMTA, SFDPW	Final design and operation	SFMTA to oversee approvals from SF Arts Commission and Planning Department.	SFCTA
38(MIN)	Noise and Vibration	<b>MIN-NOISE-C1.</b> A Vibration Reduction and Minimization Plan shall be developed to avoid construction vibration damage using all reasonable and feasible means available. The Plan shall provide a procedure for establishing thresholds and limiting vibration values for structures with a potential to be adversely affected. The following steps shall be taken in development of the location-specific vibration reduction plan: <ul style="list-style-type: none"> <li>• Potential vibration-sensitive structures shall be identified using the distance impact thresholds in the final engineering drawings;</li> <li>• Vibration-sensitive structures shall be individually assessed to identify the structure's ability to withstand the loads and displacements due to construction vibrations;</li> <li>• Construction related vibration in proximity to identified vibration-sensitive historic structures shall not be allowed to exceed the recommended levels set forth in</li> </ul>	SFMTA to perform independent noise and vibration monitoring.  Contractor to implement modifications as needed during project construction, per contract specifications.	Contractor	Final design and construction	SFMTA to provide weekly reports on compliance with City noise ordinance throughout construction duration.	SFCTA

<sup>2</sup> San Francisco Public Utilities Commission. *Keep it on Site, Pollution Prevention Guide for the Construction Industry*. Available at: <http://sfwater.org/modules/showdocument.aspx?documentid=4622>.

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		<p>pertinent FTA guidance;</p> <ul style="list-style-type: none"> <li>• Peak particle velocities shall be monitored and recorded near sensitive receptors identified where the highest vibration producing activities occur;</li> <li>• Rubber tired instead of tracked vehicles shall be used near vibration sensitive areas;</li> <li>• Pavement breaking shall be prohibited during nighttime hours; and</li> <li>• Residents within 300 feet of areas where construction activities and pavement breaking will take place shall be notified at least two weeks in advance of the proposed activity through the media and mail. A program shall be implemented to receive and respond to public complaints regarding vibration during construction.</li> </ul>					
39(MIN)	Noise and Vibration	<p><b>MIN-NOISE-C2.</b> Project construction shall implement best practices in equipment noise control, including the following:</p> <ul style="list-style-type: none"> <li>• Use newer equipment with improved noise muffling and ensure that all equipment items have the manufacturers' recommended noise abatement measures, such as mufflers, engine covers, and engine vibration isolators intact and operational. Newer equipment will generally be quieter in operation than older equipment. All construction equipment should be inspected at periodic intervals to ensure proper maintenance and presence of noise control devices (e.g., mufflers and shrouding).</li> <li>• Perform all construction in a manner that minimizes noise. Utilize construction methods or equipment that will provide the lowest level of noise effects.</li> </ul>	Per contract specifications, Contractor to implement during construction.	Contractor	Construction	SFMTA to provide weekly reports outlining adherence to standards throughout construction duration.	SFCTA

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		<ul style="list-style-type: none"> <li>• Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes.</li> <li>• Impact tools and equipment, such as jack hammers, shall have intake exhaust mufflers and acoustically attenuating shields or shrouds recommended by the manufacturers and approved by the Director of Public Works or the Director of Building Inspection.</li> </ul>					
40(MIN)	Noise and Vibration	<p><b>MIN-NOISE-C3.</b> Project construction will conduct truck loading, unloading, and hauling operations so that noise and vibration are kept to a minimum by carefully selecting routes to avoid passing through residential neighborhoods to the greatest possible extent.</p>	<p>Per contract specifications, Contractor to implement daily during project construction.</p>	Contractor	Construction	<p>SFMTA to provide weekly reports on adherence to noise and vibration minimization practices throughout construction duration.</p>	SFCTA
41(MIN)	Noise and Vibration	<p><b>MIN-NOISE-C4.</b> Perform independent noise monitoring in sensitive areas, as needed, to demonstrate compliance with applicable noise limits. Require contractors to modify and/or reschedule their construction activities if monitoring determines that maximum limits are exceeded at residential land uses per the City Noise Ordinance.</p>	<p>SFMTA to perform independent noise and vibration monitoring. Contractor to implement modifications as needed during project construction, per contract specifications.</p>	Contractor	Construction	<p>SFMTA to provide weekly reports on compliance with City noise ordinance throughout construction duration.</p>	SFCTA
42(MIN)	Noise and Vibration	<p><b>MIN-NOISE-C5.</b> Temporary sound walls, curtains, or other noise canceling technologies may be used in locations where sensitive receptors could experience construction-related noise exceedances.</p>	<p>Per contract specifications, Contractor to implement daily during project construction.</p>	Contractor	Construction	<p>SFMTA to provide weekly reports on adherence to noise and vibration minimization practices throughout construction duration.</p>	SFCTA

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43(MIN)	Biological Resources	<b>MIN-BO-C1.</b> Mature trees shall be preserved and incorporated into the project landscape plan as feasible, as well as the planting of replacement trees and landscaping. For each tree removed, a replacement tree is required.	A qualified arborist will be on the landscape design team to work with SFMTA and SFPDPW staff to identify preservation opportunities for mature trees.	Qualified arborist, SFMTA, SFPDPW	30% design through final design	SFMTA to provide CER, final design, and oversee project approvals from SFPDPW Bureau of Urban Forestry.	SFCTA
44(MIN)	Biological Resources	<b>MIN-BO-C2.</b> To preclude potential effects under the MBTA, tree removal shall occur outside nesting bird season (February 1 through August 31). Regardless of time of year, preconstruction surveys shall be performed prior to tree removal to determine occurrence of nesting birds. If active protected bird nests are encountered during preconstruction surveys, no-disturbance buffers would be created around active protected bird and/or raptor nests during the breeding season, or until it is determined that all young have fledged. Typical buffers include 500 feet for raptors and 50 feet for passerine nesting birds. The size of the buffer zones and types of construction activities restricted in these areas may be further modified during consultation with CDFW, and shall be based on existing noise and human disturbance levels at the project site. Nests initiated during construction are presumed to be unaffected, and no buffer will be necessary. The "take" of any individual protected birds shall be prohibited. Monitoring of active nests when construction activities encroach upon established buffers may be required by CDFW.	Per contract specifications, a qualified wildlife biologist will implement preconstruction survey and exclusion structures and buffers as needed prior to construction and monitor as needed during construction.	Contractor will provide a qualified wildlife biologist to implement.	Pre-construction/ construction	SFMTA to provide weekly report throughout project construction duration.	SFCTA
45(MIN)	Biological Resources	<b>MIN-BO-C3.</b> Seed palettes used for revegetation of disturbed areas shall be reviewed to prevent introduction of invasive species to the site. Follow-up site maintenance shall include a protocol for landscaping staff to recognize weeds and perform maintenance in a manner that prevents weed establishment.	Qualified landscape architect will exclude noxious weeds from landscape plan.	Qualified landscape architect provided by SFMTA.	Final design	SFMTA to provide final design and oversee project approvals from SFPDPW Bureau of Urban Forestry.	SFCTA