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To: Members of the Planning Commission and other Interested Persons

From: Joan A. Kugler, Senior Environmental Planner

Date: August 7, 2008

Subject: Central Subway Comments & Responses Errata

Subsequent to the publication of the Comments and Reponses document, it was found that there were six additions and/or corrections that needed to be made. All of the additional language will be included in the Final Supplemental Environmental Impact Statement/Supplemental Impact Report when it is published. The replacement pages are attached to this memo with the new text highlighted in yellow. In some cases because of text continuing on to the next page, there is more than one replacement page included.

The revisions are:

1) On C&R page 3-133 - (in the response to comment AB-4); the additional sentence that was added to the text for Alternative 3A also needed to be added to the text for Alternative 3B to call out that the potential for capacity issues at the Powell Street Station would be for both options. These text changes will be on pages 3-44 and 3-45 of the Final when it is published.

2) On C&R page 3-137 - (in the response to AB-8); an additional sentence to clarify that operational impacts to the Powell Station with Alternative 3A would be the same as Alternative 2 except that specific improvements to the station would be addressed in cooperation with BART During final design. There would be an additional revision to the text for Alternative 3B as both alternatives have the same impact. (This was a correction to the original text of this page of the C&R document as the original text said that this language should be inserted on the previous page (pg. 5-15) under Alternative 2.) These text changes for both options will be on page 5-16 of the Final when it is published.

For these next four – The additions were made in the text of Chapters 3, 4, 5 or 6 based on the responses to the comments in Letter AB but left out of either the Summary table or the Table of CEQA Impacts in Chapter 7.

3) On C&R page 5-12 – in Table S-7 of the Summary in the area of Geology and Seismicity, an acknowledgment that similar to Alternative 2; the construction of Alternatives 3A and 3B could result in potential displacement of BART structures. This text changes for both options will be on page S-27 of the Final when it is published.

4) On C&R page 5-60 – additions to Table 7-2 in the area of transit construction, a less-than-significant impacts re: the potential for temporary disruption to BART service, that the BART entry at One Stockton Street would be temporarily closed during construction of the connection to the Union/Market St. station and that there may be pedestrian capacity issues at the Powell Street station. Added improvement measures for these additional impacts were included – that MTA and BART will prepare and enter into a Station Improvement Plan that will address these issues including monitoring pedestrian capacity and station improvements to increase capacity if found necessary. These text changes will be on pages 7-9 et sequence (because of roll over of text) of the Final when it is published.

5) Also on C&R page 5-60 – additions to Table 7-2 for Options 3A and 3B (page C&R 5-65c) in the area of Community Facilities added a less than significant impact stating that improvements to the Powell St. station in the areas of existing vertical circulation, platform capacity, lighting, ventilation, fire suppression and signage for way-finding shall all be jointly addressed by MTA and BART during final design. These text additions will be on pages 7-22 and 7-23 of the Final when it is published.

6) Also on C&R page 5-60 - additions to Table 7-2 for Options 3A and 3B (page C&R 5-65d) in the area of Geology and Seismicity, similar to the addition in the Summary Table, an acknowledgment that similar to Alternative 2; the construction of Alternatives 3A and 3B could result in potential displacement of BART structures. This text changes for both options will be on page 7-32 & 7-33 of the Final when it is published.

Attachment: Errata – Replacement Pages

ERRATA
August 7, 2008

Central Subway Final Supplemental Environmental Impact Statement/Supplemental Environmental Impact Report

Response to Comments, Volume II

July 11, 2008

Federal Transit Administration
U.S. Department of Transportation

City and County of San Francisco
Planning Department

Case No. 96.281E
State Clearinghouse No. 96102097

The attached pages have been revised from the Volume II document published on July 11, 2008. Please replace the original pages with those attached.

circulation in the concourse unpaid area; and capitalizing on Central Subway excavation along the Stockton alignment for BART to develop a police facility in the Hallidie Plaza area.

The general analysis done for the Draft SEIS/SEIR identified no significant impacts at the Powell Street Station, however, the Draft June 2008 Arup studies conducted for BART identified potential cumulative capacity/passenger flow and emergency vertical egress impacts in the joint-use areas at the underground Powell Street Station. While the assumptions used and the results of the study have not been fully reviewed and evaluated, the SFMTA agrees to address these issues as part of the Station Improvement Coordination Plan through monitoring of station activity levels and by incorporating project design features that will ensure the implementation of the Central Subway Project does not result in significant safety or pedestrian circulation impacts. To minimize potential station capacity impacts at the eastern end of the Powell Street Station concourse level, SFMTA and BART will explore design options to provide increased capacity for passenger flow between the Powell Street and UMS Stations. BART has identified potential for removal of the existing physical barrier on the south side of the fare gate and for relocation of the fare gates and adding up to five new fare gates to improve passenger flow in the BART non-paid area of the station. SFMTA has identified the potential for reopening a closed entrance (former CALFED entrance) to create additional capacity for pedestrian flow between the Powell Street and the UMS station. If the new pedestrian corridor is opened up under Market Street, then SFMTA will explore the possibility of adding a new elevator. SFMTA will continue to work with BART to address future potential capacity issues for station entries that may be necessary for the expansion of capacity of the joint-use station area.

A discussion of the potential for Powell Street Station impacts and an improvement measure are added as noted below to the Final SEIS/SEIR to ensure that the internal station circulation flows at the Powell Street Station meet BART's requirements for station circulation and that no new significant environmental impacts would occur as a result of the project implementation.

The sentence is added to the end of the first paragraph, page 3-44 and to the end of the first paragraph, page 3-45 to call out the potential capacity issues at Powell Street Station:

> "The Powell Street Station may also experience capacity issues at the concourse level due to increased passenger activity at the northeast end of the station."

The text of the second paragraph, page 3-44 is revised as follows:

> "Mitigation measures would be the same as those outlined under Alternative 2, except as noted below.

Page 5-15 of the SEIS/SEIR describes that Muni, in concert with the San Francisco Fire Department and the Department of Public Health, holds two to three emergency drills per year and emergency orientation sessions to ensure a coordinated response effort to emergencies occurring in the subway system. SFMTA has designed the emergency ventilation system for the Project such that it will not adversely effect the Powell Street BART station emergency ventilation.

The third paragraph, page 5-16 is revised as follows to address the additional use of the station due to the Central Subway:

> "The operation impacts would be the same as described above for Alternative 2, except improvements to the existing Powell Street Station, as needed for the connection to the UMS Station, will be addressed in cooperation with BART during final design of the station connections. This will include assessment and, if necessary, implementation of improvements to the existing vertical circulation, platform capacity, lighting, ventilation system, fire suppression system and way-finding. The emergency ventilation system for the UMS shall be designed and operating procedures written/revised and tested to ensure that the UMS and Powell Street Station emergency ventilation systems do not adversely affect each other during an emergency event or system test."

The sixth paragraph, page 5-16 is revised as follows:

> "The operation impacts would be the same as described above for Alternative ~~2~~ 3A.

No significant impacts are identified for the BART Emergency Plan or services at the Powell Street Station.

AB-9

Muni and BART currently provide security officers and would continue to provide security services at the Powell Street joint-use station for Central Subway passengers. Also, Muni "proof of payment" inspectors patrol the concourse. No significant impacts are identified for the BART security services based on increases to ridership from the Central Subway transfers, and no mitigation measures are described. Monitoring the need for added security services at the Powell Street Station would be the responsibility of both SFMTA and BART following start-up of the Central Subway operation. Resolution of issues would take place as provided for in the Station Improvement Coordination Plan and existing 1986 Muni/BART Joint Station Maintenance Agreement, First Supplement.

SFMTA will install security systems at the interface between the Powell Street Station and the UMS station and will perform a Threat and Vulnerability analysis. The San Francisco Police Department (SFPD) and SFMTA Security and Enforcement Division will provide security for the Union Square/Market Street Station (UMS). The 1986 BART/Muni Joint Station Maintenance Agreement, First Supplement includes an agreed-to process to re-apportion cost between BART and Muni based upon

The last sentence, first paragraph, page S-18 is revised as follows:

> "Under Alternative 3B, the pedestrian level of service would be reduced to LOS B, at the Chinatown Station, as a result of the increase in pedestrian activity rather than a reduction of effective sidewalk width."

The following text is added to the end of the second sentence, fourth paragraph, page S-18:

> "There would also be a temporary increase in truck traffic along the light rail alignment as a result of truck traffic associated with the removal of excavated soils and backfill around the guideway and station areas and delivery of materials."

Table S-7, pages S-19 and S-27 is revised as noted on the following pages.

The first two bullets, page S-32 are revised as follows:

- "traffic impacts in 2030 at the following locations: Fourth/Harrison Streets intersection (~~No Project/TSM Alternative – LOS B to LOS E in a.m. peak hour,~~ Alternative 3A, LOS ~~B~~ C to LOS E in ~~a.~~ p.m. peak hour, and Alternative 3B – LOS ~~B~~ C to LOS F in ~~a.m. and~~ p.m. peak hour) and Third/King Streets intersection (Alternatives 2, 3A, and 3B – LOS ~~D~~ E to LOS F in a.m. peak hour) all as a result of project implementation."

- "displacement of 10 small businesses (10 or fewer employees) ~~and 1 or 2 residential units~~ for Alternatives 2 and3A and displacement of 8 small businesses (10 or fewer employees) and 17 residential units (which would require a Planning Code amendment) for Alternative 3B in the predominantly minority and low-income Chinatown neighborhood;"

The second sentence, last paragraph starting on page S-33 and continuing to page S-34 is revised as follows:

> "It has been determined that this use of the plaza would not be considered a significant impact and a de ~~minimus~~ minimis finding for impact on Section 4(f) resources ~~is anticipated~~ for Alternative 3B has been concurred with by the Recreation and Parks Commission (see Appendix J) to satisfy Section 4(f) requirements."

GEOLOGY AND SEISMICITY Construction		*Significant Impacts:* 1.Construction period settlement could cause damage to existing building foundations, subsurface utilities, and surface improvements. 2. Construction of the shallow subway crossing over the BART tunnel would be expected to result in reduction of ground loads and upward displacement of the BART/Muni Metro tunnels. *Mitigation Measures:* 1. Provisions such as concrete diaphragm walls to support the excavation and instrumentation to monitor settlement and deformation would be used to ensure that structures adjacent to tunnel alignments are not affected by excavations. 2. Tunnel construction methods that minimize ground movement, such as pressure-faced TBMs, Sequential Excavation Method, and ground improvement techniques such as compensation grouting, jet grouting or underpinning will be used. 3. Rigorous geomechanical instrumentation would be used to monitor underground excavation and grouting or underpinning will be employed to avoid	*Significant Impacts:* Same as Alternative 2, except the use of TBMs for deep tunnel construction would minimize the impact to BART/Muni Metro tunnels. Similar to Alternative 2, the construction of a deep tunnel could result in the potential downward displacement of the BART structures. *Mitigation Measures:* Same as Alternative 2.	*Significant Impacts:* Same as Alternative ~~2~~ 3A. *Mitigation Measures:* Same as Alternative 2.

Fourth/Harrison Streets intersections for Alternative 3A and 3B (see Tables E-12 and E-13 in Appendix E). This determination was based on the examination of traffic volumes for the traffic movements which determine overall LOS intersection performance.

For Alternative 2, ~~two~~ three of the five intersections analyzed would operate at LOS E or F conditions for Cumulative 2030 conditions during the a.m. peak hour and three of the five intersections analyzed would operate at LOS ~~E or~~ F conditions for Cumulative 2030 conditions during the p.m. peak hour. There would be a project-specific significant traffic impact at the Third/King intersection compared to No Project/TSM conditions due to a deterioration of LOS from ~~D~~ E to F for the a.m. peak hour. The Project's share of future traffic growth at the Sixth/Brannan Streets intersection would constitute a cumulatively considerable contribution to adverse 2030 cumulative traffic conditions for the p.m. peak hour. Alternative 2 contributions to adverse cumulative conditions were found to be significant, in particular, as under Alternative 2 project-related traffic would constitute substantial percentages for critical volume movements that would operate with adverse conditions. As project-related traffic would represent a"

The Transit, Construction and Operation/Cumulative Impacts in Table 7-2, pages 7-9 and 10 are revised as noted on the following pages.

The Traffic, Operation/Cumulative Impacts and Mitigation Measures in Table 7-2, page 7-11 and 7-12 are revised as noted on the following pages.

The Parking, Operation/Cumulative Impacts for Alternative 3B in Table 7-2, page 7-14 is revised as noted on the following pages.

The Land Use Construction Impacts for Alternative 3B in Table 7-2,page 7-18 is revised as noted on the following pages.

The Socioeconomic Construction Impacts for Alternative 3B in Table 7-2,page 7-19 is revised as noted on the following pages.

The Community Facilities Operation/Cumulative Impacts in Table 7-2, page 7-22 and 7-23 are revised as noted on the following pages.

The Geology and Siesmicity Construction Impacts in Table 7-2, page 7-32 and 7-33 are revised as noted on the following pages.

The first sentence, third paragraph, page 7-46 is revised as follows:

> "For Alternative 3A, there would be a project-specific significant traffic impact at the Third/King Streets intersection compared to No Project/TSM conditions due to a deterioration of LOS from ~~D~~ E to F for the a.m. peak hour and Fourth/Harrison Streets due to a deterioration of LOS C to LOS ~~F~~ E in the p.m. peak hour compared to No Project/TSM conditions."

The second paragraph, page 7-47 is revised as follows:

> "For Alternative 3B, the impacts would be the same as described for Alternative 3A, except ~~that at the Fourth/Harrison Streets intersection there would also be a Project-specific impact in the a.m. peak hour where level of service would degrade from LOS E to~~

TRANSIT

Environmental Area/Impacts	Alternative 1 -No Project/TSM	Alternative 2 - EIS/EIR Enhanced Alignment	Alternative 3A - Fourth/Stockton Alignment Option A	Alternative 3B - Fourth/Stockton Alignment Option B
TRANSPORTATION **Transit** Construction	No construction impacts.	*Less-than-Significant Impact:* 1. Temporary reduction in traffic lanes on King, Third, Fourth, Harrison, Kearny, Geary, and Stockton Streets during construction would disrupt transit operations. 2. F-line service would be temporarily disrupted for the subway crossing of Market Street. 3. Rerouting of the 30-Stockton and 45-Union/Stockton trolley bus lines would likely be required. *Improvement Measures:* 1. DPT will develop detour routes for all non-transit related traffic to minimize the construction disruption to transit. 2. Overhead wires for the 30-Stockton and the 45-Union/Stockton lines will be temporarily relocated or reconstructed to alternative routes where feasible or motor coaches would be temporarily substituted on alternative routes.	*Less-than-Significant Impact:* Same as Alternative 2, except: 1. Reduction in traffic lanes would not occur on Third, Harrison, Kearny, or Geary Streets 2. Buses would be temporarily rerouted to the west side of Fourth Street. 3. The bus stop at the southwest corner of Fourth and Howard Streets would be temporarily relocated. 4. Construction of a TBM retrieval shaft near Washington Square would require temporary relocation of bus stops for the 30-Stockton and 45-Union/ Stockton and possible temporary shifting of overhead wires to accommodate continued transit service. 5. Excavation of the construction shaft under the I-80 freeway between Bryant and Harrison Streets would also impact Golden Gate Transit bus operations. 6. Temporary disruption to BART service could occur	*Less-than-Significant Impact:* Same as Alternative 3A, except: 1. The overall project duration of construction would be .5 years shorter. 2. The bus stop at the southwest corner of Fourth and Howard Streets would not need to be relocated. 3. The BART entry at One Stockton Street would need to be closed temporarily during construction. *Improvement Measures:* Same as Alternative ~~2~~ 3A.

Environmental Area/Impacts	Alternative 1 -No Project/TSM	Alternative 2 - EIS/EIR Enhanced Alignment	Alternative 3A - Fourth/Stockton Alignment Option A	Alternative 3B - Fourth/Stockton Alignment Option B
		3. SFMTA will provide signing related to transit changes in Chinese as well as English.	during construction. *Improvement Measures:* Same is Alternative 2, except SFMTA would coordinate with TJPA and GGBHTD to minimize construction impacts on Golden Gate Transit. SFMTA would stage excavation shaft construction and utility relocation to maintain access to the bus storage facility by Golden Gate buses and work with GGBHTD to develop bus detour routing plans for continued access. Access to the construction shaft would be scheduled to avoid conflict with the active bus periods. MTA and BART will prepare and enter into a Station Improvement Coordination Plan to include construction management procedures and processes to address any and all construction and operational impacts resulting from the tuneel boring. MTA will also coordinate with BART to develop bus bridges, if needed, public outreach, and other programs to minimize impacts to transit riders during construction.	

Environmental Area/Impacts	Alternative 1 -No Project/TSM	Alternative 2 - EIS/EIR Enhanced Alignment	Alternative 3A - Fourth/Stockton Alignment Option A	Alternative 3B - Fourth/Stockton Alignment Option B
Operation/Cumulative	*Less-than-Significant Impact:*	*Less-than-Significant Impact:*	*Less-than-Significant Impact:*	*Less-than-Significant Impact:*
	1. Muni Metro rail service on the Embarcadero and the 9AX San Bruno express buses are projected to experience capacity issues by 2030. The capacity constraints on the Embarcadero rail line between Market Street and Folsom Street would preclude capacity improvements for the rail service. 2. Surface transit travel times would increase as a result of increased congestion on streets. *Improvement Measure:* Muni will monitor ridership levels and modify service plans to increase transit capacity as ridership demand warrants.	The Central Subway rail service and the 9AX~~/BX~~ San Bruno express buses are projected to experience capacity issues by 2030. *Improvement Measure:* Same as Alternative 1.	Same as Alternative 2, except the Powell Street Station may also experience capacity issues at the concourse level due to increased passenger activity at the northeast end of the station. *Improvement Measure:* Same as Alternative 1, except the MTA and BART will prepare and enter into a Station Improvement Coordination Plan for the Powell Street Station that will provide for, at a minimum, implementation of allocation of cost for any station infrastructure improvements necessary to maintain pedestrian safety and a pedestrian level of service of D or better at the Powell Street Station as a result of the Central Subway Project.	1. The Central Subway rail service and the 9AX San Bruno Express are ~~is~~ projected to experience capacity issues by 2030. 2. The Powell Street Station may also experience capacity issues at the concourse level due to increased passenger activity at the northeast end of the station. *Improvement Measure:* Same as Alternative ~~1~~, 3A.

TRAFFIC

Environmental Area/Impacts	Alternative 1 -No Project/TSM	Alternative 2 - EIS/EIR Enhanced Alignment	Alternative 3A - Fourth/Stockton Alignment Option A	Alternative 3B - Fourth/Stockton Alignment Option B
Operation/Cumulative	*Significant Impacts:* ~~Increases in traffic congestion and delays would occur in~~	Significant Impacts: Increases in traffic congestion and delays would occur in 2030	*Significant Impacts:* ~~Increases in traffic congestion and delays would occur in 2030~~	*Significant Impacts:* 1. Same as Alternative 3A, except the Project would also

	~~2030 at all of the five intersections evaluated as a result of cumulative traffic growth.~~ Third/King ~~(a.m. peak only),~~ Streets intersection would degrade from LOS E to LOS F in the a.m. peak hour and would continue to operate at LOS F in the p.m. peak hour. Fourth/King~~,~~ and Sixth/Brannan Streets intersections would continue to operate at LOS E or F conditions in the a.m. and p.m. peak hours. ~~The intersection of Fourth and Harrison Streets would degrade from LOS B to LOS E when compared to the existing conditions.~~ ~~*Mitigation Measure:*~~ ~~Restriping the southbound curb lane of Fourth Street to accommodate a shared through/right-turn lane to Harrison Street would mitigate the impacts to LOS B resulting in a less-than-significant impact.~~ *Significant environmental effects which can not be avoided:* ~~None of the remaining traffic impacts could be reasonably mitigated.~~ The traffic impacts at Third/King, Fourth/King, and Sixth/Brannan Streets intersections could not be reasonably mitigated to a less-than-significant level.	at three out of the five intersections evaluated. The Project would have a significant traffic impact at the Third/King Streets intersection in the a.m. peak hour due to degradation in LOS from D E to F when compared to the No Project/TSM Alternative and a cumulatively considerable contribution to the cumulative traffic impacts at the Sixth/Brannan Streets intersection during the p.m. peak hour in 2030. Significant environmental effects which can not be avoided: The traffic impacts at Third/King and Sixth/Brannan Streets intersections could not be reasonably mitigated to a less-than-significant level.	~~at three out of the five intersections evaluated.~~ The Project would have a significant traffic impact at the Third/King Streets intersection in the a.m. peak hour due to a degradation in LOS from ~~D~~ E to F and at the Fourth/Harrison Streets intersection in the p.m. peak hour due to a degradation in LOS from C to E when compared to the No Project/ TSM Alternative. This alternative would have a cumulatively considerable contribution to the adverse cumulative traffic impacts at the King Street intersections with Third and Fourth Streets and the Fourth/Harrison Streets intersection during the p.m. peak hour in 2030. *Mitigation Measure:* Restriping the southbound curb lane of Fourth Street to accommodate a shared through/right-turn lane to Harrison Street would mitigate the impacts to LOS B resulting in a less-than-significant impact. *Significant environmental effects which can not be avoided:* The traffic impacts at the Third/King and Fourth/King Streets intersections could not be reasonably mitigated to a less- than-significant level.	have ~~a significant impact at the Fourth/Harrison Streets intersection during the a.m. peak hour when compared to the No Project/TSM Alternative and~~ a cumulatively considerable impact on the cumulative traffic impacts at the King Street and Third Streets intersection during a.m. peak hour ~~and the Fourth/Harrison Streets intersection during the p.m. peak hour~~ in 2030. 2. In addition, the portal at Fourth Street under I-80 may restrict ~~access to the proposed bus storage facility at Perry Street and~~ large truck movements onto Stillman Street. *Mitigation Measures:* Same as Alternative 3A, except MTA will explore ~~design modifications to the portal~~ with the TJPA and Golden Gate Transit options that will permit ~~bus access to Perry Street and~~ truck access to Stillman Street ~~that will~~ to reduce the impacts to a less-than-significant level. *Significant environmental effects which can not be avoided:* Same as Alternative 3A.

	less- than-significant level.		level.	

PARKING

Operation/Cumulative	No operation or cumulative impacts.	*Less-than-Significant Impact:* This alternative would eliminate 111 on-street parking spaces and 59 off-street parking spaces.	*Less-than-Significant Impact:* This alternative would eliminate 29 on-street parking spaces and 29 off-street parking spaces.	*Less-than-Significant Impact:* This alternative would eliminate 82 on-street parking spaces for the semi-exclusive option and ~~81~~79 spaces for the mixed-flow option and 59 off-street parking spaces. An additional 3 spaces may be removed on the north side of Ellis Street to accommodate emergency exiting.

EMERGENCY VEHICLE ACCESS

Operation/Cumulative	No operation or cumulative impacts	*Less-than-Significant Impact:* The introduction of a single-track median in the middle of Fourth Street would require fire trucks exiting Fire Station #8 on Bluxome Street to cross the entire trackway to travel contra-flow on Fourth Street. *Improvement Measures;* DPT will be upgrading traffic signals with emergency vehicle preemption equipment in order to minimize the emergency response time and improve signal operations.	*Less-than-Significant Impact:* Same as Alternative 2, except there would be a double-track median to cross in Fourth Street. *Improvement Measures;* Same as Alternative 2.	*Less-than-Significant Impact:* Same as Alternative 3A, except the trackway would be about 3 feet wider than under Alternative 2 and with two-way operation on Fourth Street, there would be no contra-flow travel. *Improvement Measures;* Same as Alternative 2.

LAND USE

Construction	No construction impacts.	*Less-than-Significant Impact:* Construction would not cause a change in land use patterns or neighborhood character, but would temporarily disrupt access to the adjacent uses as described under Transportation. *Improvement Measures:* Public information programs and signage will be used to minimize impacts to adjacent land uses during construction.	*Less-than-Significant Impact:* Same as Alternative 2, but would have a lesser area of surface disruption. *Improvement Measures:* Same as Alternative 2.	*Less-than-Significant Impact:* Same as Alternative 3A, except that the surface area of disruption would be greater than under Alternative 3A and an amendment of Planning Code would be required to allow the demolition of residential apartment units. *Improvement Measures:* Same as Alternative 2.

SOCIOECONOMIC (POPULATION AND HOUSING)

Construction	No construction impacts.	*Less-than-Significant Impact:* The Project would create temporary construction-related jobs that would not be expected to have a substantial effect on the regional population.	*Less-than-Significant Impact:* Same as Alternative 2.	*Less-than-Significant Impact:* Same as Alternative 2, except an amendment of Planning Code would be required to allow the demolition of residential apartment units.

COMMUNITY FACILITIES

Operation	*Less-than-Significant Impacts:* 1. Lack of transit investment could result in long-term degradation of mobility in the Corridor, but would not be expected to have a major affect on access to community facilities, parklands, or recreational facilities or cause major impedance for emergency response times.	*Less-than-Significant Impacts:* 1. The placement of vent shafts and station entries and elevators in Union Square Plaza would permanently remove 1,517 square feet of open space for transportation purposes. 2. Pedestrian traffic to and from the Union Square plaza would be increased as would pedestrian traffic on Hang Ah Alley. *Improvement Measures:* 1. During the final design, minimize the footprint of station entrances in Union Square plaza and locate them in such a manner as to minimize disruption to park users. 2. Design subway entrances so they are visually integrated with the existing park design. 3. Ensure subway entrances are maintained by MTA on a regular basis to keep them free of litter and graffiti in perpetuity. 4. The secondary access to the Chinatown Station could be closed to minimize impacts to Hang Ah Alley.	*Less-than-Significant Impacts:* Same as described for Alternative 2, except improvements to the existing Powell Street Station, as needed for the connection to the UMS Station, will be addressed in cooperation with BART during final design of the station connections. This will include assessment and, if necessary, implementation of improvements to the existing vertical circulation, platform capacity, lighting, ventilation system, fire suppression system and way-finding. The emergency ventilation system for the UMS shall be designed and operating procedures written/revised and tested to ensure that the UMS and Powell Street Station emergency ventilation systems do not adversely affect each other during an emergency event or system test. *Improvement Measures:* Same as described for Alternative 2.	*Less-than-Significant Impacts:* Same as Alternative ~~2~~ 3A, except that only 1,690 square feet of open space would be permanently removed for transportation purposes in Union Square. The vent shafts would be located in the Ellis/O'Farrell garage rather than in Union Square. Access to the Union Square/Market Street Station would be from Geary Street and would not result in increased pedestrian traffic through the plaza and access to and from Willie "Woo Woo" Wong Playground would not be impacted. *Improvement Measures:* Same as Alternative 2, except closure of Hang Ah Alley would not be relevant.

GEOLOGY AND SEISMICITY

GEOLOGY AND SEISMICITY Construction	No construction impacts.	*Significant Impacts:* 1. Construction period settlement could cause damage to existing building foundations, subsurface utilities, and surface improvements. 2. Construction of the shallow subway crossing over the BART tunnel would be expected to result in reduction of ground loads and upward displacement of the BART/Muni Metro tunnels. *Mitigation Measures:* 1. Provisions such as concrete diaphragm walls to support the excavation and instrumentation to monitor settlement and deformation would be used to ensure that structures adjacent to tunnel alignments are not affected by excavations. 2. Tunnel construction methods that minimize ground movement, such as pressure-faced TBMs, Sequential Excavation Method, and ground improvement techniques such as compensation grouting, jet grouting or underpinning will be used. 3. Rigorous geomechanical instrumentation would be used to monitor underground excavation and grouting or underpinning will be employed to avoid displacement of structures. 4. Automated ground movement	*Significant Impacts:* Same as Alternative 2, except the use of TBMs for deep tunnel construction would minimize the impact to BART/Muni Metro tunnels. Similar to Alternative 2, the construction of a deep tunnel could result in the potential downward displacement of the BART structures. *Mitigation Measures:* Same as Alternative 2. *Less-than-Significant Impacts:* Same as Alternative 2.	*Significant Impacts:* Same as Alternative 3. *Mitigation Measures:* Same as Alternative ~~2~~ 3A. *Less-than-Significant Impacts:* Same as Alternative 2.

		monitoring will be used to detect distortion on the BART/Muni Metro tunnels and grout pipes will be placed prior to tunnel excavation to allow immediate injection of compensation grouting to replace ground losses if deformation exceeds established thresholds. With the implementation of these mitigation measures the impacts would be less-than-significant. *Less-than-Significant Impacts:* Adherence to all applicable federal, state and local safety and health codes and practices for construction of the underground tunnels, shafts, and excavations would be required to minimize harm to workers should an earthquake occur during construction. MTA would also require contractors to submit a site-specific earthquake preparedness and emergency response plan as part of compliance with bid specifications.		