
4. ENVIRONMENTAL CONSEQUENCES



4 . ENVIRONMENTAL CONSEQUENCES : SUMMARY

This section describes the potential environmental effects associated with implementation of the alternatives. The environmental analysis evaluates three types of effects: direct, indirect, and cumulative. Direct effects would be caused by an alternative and would occur at the time the alternative is implemented and the site is used and operated. Indirect effects would also be caused by an alternative but may be more removed in time or distance. Cumulative effects are the effects of the alternatives added to the effects of other past, present and reasonably foreseeable future plans, projects, and activities in the Presidio and surrounding area.

Table 11 summarizes the impacts associated with the alternatives evaluated in this EIS. The analysis is presented by alternative as follows:

- Section 4.1 discloses the potential environmental effects of Alternative 1, Science and Education Center (Updated Presidio GMPA Alternative).
- Section 4.2 discloses the potential environmental effects of Alternative 2, Sustainable Urban Village.
- Section 4.3 discloses the potential environmental effects of Alternative 3, Mixed-Use Development.
- Section 4.4 discloses the potential environmental effects of Alternative 4, Live/Work Village.
- Section 4.5 discloses the potential environmental effects of Alternative 5, Digital Arts Center (Preferred Alternative).
- Section 4.6 is a discussion of the environmental effects of Alternative 6, Minimum Management (No Action).
- Section 4.7 identifies mitigation measures that would reduce significant impacts to a less-than-significant level.

The focus of analysis within Section 4.1 is on the entire 60-acre Letterman Complex, since Alternative 1 would allow infill construction within the entire complex. Since new development and uses under Alternatives 2 through 5 would be limited to replacement construction within a 23-acre site within the complex and Alternative 6 would not involve any new construction, Sections 4.2 through 4.6 address direct impacts within the 23 acres, as well as any direct and indirect impacts on the remainder of the complex, the park, and surrounding areas. Within Sections 4.1 through 4.6, environmental effects are organized into the following impact topics. The rationale for the selection of topics is discussed by major category in Appendix A and in Section 1.5.

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|-------------------------------------------------------------------|--------------------------------------------------------------------------|
| ■ consistency with Presidio goals and approved plans and policies | ■ traffic and transportation systems |
| ■ solid waste | ■ cultural resources (including visual resources and visitor experience) |
| ■ water supply and distribution | ■ air quality |
| ■ schools | ■ noise |
| ■ housing | ■ cumulative impacts |
| ■ medical research | |

The methods used to predict impacts and criteria to determine whether an impact may be significant are included at the beginning of the discussion of impacts for Alternative 1 and apply to all alternatives. Cumulative



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impacts and unavoidable adverse effects are disclosed at the end of the discussion of each alternative. Tables 12 through 22 summarize by alternative a number of projections related to new uses within the Letterman Complex. They include water system demand, school enrollment, new housing demand, transportation mode use and parking demand, traffic volumes and levels of service (including cumulative) and estimated vehicular emissions. These projections were used in analyzing potential impacts on the topics listed above.



Table 11
Summary of Environmental Consequences

IMPACT	ALTERNATIVE 1: SCIENCE AND EDUCATION CENTER	ALTERNATIVE 2: SUSTAINABLE URBAN VILLAGE	ALTERNATIVE 3: MIXED-USE DEVELOPMENT	ALTERNATIVE 4: LIVE/WORK VILLAGE	ALTERNATIVE 5: DIGITAL ARTS CENTER	ALTERNATIVE 6: MINIMUM MANAGEMENT (NO ACTION)
Consistency with Presidio Goals and GMPA	<p>A science and education center would be consistent with the specific proposal in the GMPA for the Letterman Complex to serve as a science and education center. Would promote the GMPA concept for infill construction within the complex. New construction would be equal to the total amount of gross square feet (503,000) envisioned in the GMPA. Also consistent with most of the General Objectives of the GMPA. May not be consistent, however, with the General Objective to sustain the Presidio indefinitely as a great national park in an urban setting since there is no current demand for the 23-acre site for laboratory-based research.</p>	<p>General offices, housing and an inn/retreat would be consistent with the General Objectives of the GMPA. Would also be consistent with a number of the more specific, goals and planning principles of the GMPA. Would not implement the specific proposal in the GMPA for the Letterman Complex to serve as a science and education center. Replacement construction within the 23-acre site would not promote the GMPA concept for infill construction, and would increase the total amount of gross square feet of replacement construction (from 503,000 to approximately 900,000) envisioned in the GMPA. GMPA's key restrictions on maximum allowable square footage for the complex (1.3 million square feet) and maximum allowable height of new construction (60 feet)</p>	<p>General offices, lodge, conference center and senior assisted-living facilities would be consistent with the General Objectives of the GMPA. Would also be consistent with a number of the more specific goals and planning principles of the GMPA. Would not implement the specific proposal in the GMPA for the Letterman Complex to serve as a science and education center. Consistency of replacement construction would be similar to Alternative 2.</p>	<p>General offices and housing would be consistent with the General Objectives of the GMPA. Would also be consistent with a number of the more specific goals and planning principles of the GMPA. Would not implement the specific proposal in the GMPA for the Letterman Complex to serve as a science and education center. Consistency of replacement construction would be similar to Alternative 2.</p>	<p>A digital arts center would be consistent with the General Objectives of the GMPA. Would also be consistent with a number of the more specific goals and planning principles of the GMPA. Although Alternative 5 would not implement the specific proposal in the GMPA for the Letterman Complex to serve as a science and education center, it would retain and use the site for research purposes by a single tenant or a collaborative group of institutions, and use of the facilities by staff, visiting researchers and other special program participants as envisioned in the GMPA. Consistency of replacement construction with the GMPA would be similar to Alternative 2.</p>	<p>General offices may be inconsistent with the General Objective of the GMPA to provide for appropriate uses of the Presidio. Would also be inconsistent with a number of the more specific goals and planning principles of the GMPA. Specifically, it could conflict with the GMPA's major directions for the future of the Presidio and the Letterman Complex, because use of the LAIR may not be closely related to the park's purpose.</p>

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Consistency with Presidio GMPA – continued		would not be exceeded. Replacement construction would proceed in accordance with the Planning Guidelines and design review as recommended within the GMPA.				
Solid Waste						
Significant and Adverse Impact of Disposal of Demolition Debris Offsite (Mitigated to a Less-than- Significant Level by SW-1)	Would generate 35,400 tons of debris during construction activities. Minimal impact on regional landfills.	Would generate 80,000 tons of debris during construction activities. Minimal impact on regional landfills.	Impact would be similar to Alternative 2.	Impact would be similar to Alternative 2.	Impact would be similar to Alternative 2.	No building demolition would occur and no debris would be generated. No impact on regional landfills.

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Water Supply and Distribution						
Significant and Adverse Cumulative Impact of Water Consumption on Available Water (Mitigated to a Less-than-Significant Level by WS-1, WS-2, and WS-3)	Would demand 20,000 gallons per day (gpd) compared to 89,000 gpd threshold established for site. Would contribute to cumulative shortfalls on Presidio's local water supply (Lobos Creek).	Would demand 111,000 gpd compared to 89,000 gpd threshold established for site. Would contribute to cumulative shortfalls on Presidio's local water supply (Lobos Creek).	Would demand 68,000 gpd compared to 89,000 gpd threshold established for site. Would contribute to cumulative shortfalls on Presidio's local water supply (Lobos Creek).	Would demand 64,000 gpd compared to 89,000 gpd threshold established for site. Would contribute to cumulative shortfalls on Presidio's local water supply (Lobos Creek).	Would demand 72,000 gpd compared to 89,000 gpd threshold established for site. Would contribute to cumulative shortfalls on Presidio's local water supply (Lobos Creek).	Would demand 35,000 gpd compared to 89,000 gpd threshold established for site. Impact would be similar to Alternative 1.
Schools						
Less-than-Significant Impact on Capacity at San Francisco Unified School District Schools (No Mitigation Required)	District schools would be able to accommodate 92 schoolchildren likely to enroll in Marina district schools.	District schools would be able to accommodate 253 schoolchildren likely to enroll in Marina district schools.	Impact would be similar to Alternative 1 (92 schoolchildren).	District schools would be able to accommodate 273 schoolchildren likely to enroll in Marina district schools.	Impact would be similar to Alternative 1 (92 schoolchildren).	Impact would be similar to Alternative 1 (92 schoolchildren).

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Housing						
Significant, Unavoidable, and Adverse Impact due to Increase in Demand for Housing in City of San Francisco and Bay Area (Alternatives 3 and 5 Only)	Presidio housing stock would meet 100 percent of employment-related housing demand of 187 units.	Presidio housing stock, including 300 to 400 new houses proposed as part of the alternative, would meet 100 percent of employment-related housing demand of 385 units.	Presidio housing stock would meet 69 percent of employment-related housing demand of 385 units. New demand on regional housing would be 120 units, including 66 units in the city of San Francisco.	Presidio housing stock, including 400 to 450 new houses proposed as part of the project, would meet 100 percent of employment-related housing demand of 462 units.	Presidio housing stock would meet 55 percent of employment-related housing demand of 481 units. New demand on regional housing would be 216 units, including 119 units in the city of San Francisco.	Presidio housing stock would meet 100 percent of employment-related housing demand of 159 units.
Medical Research						
Beneficial (Alternatives 1, 1, 2 and 6) or Less-than-Significant (Alternatives 3, 4, and 5) Impacts on Medical Research in the Bay Area (No Mitigation Required)	Reuse of the site for medical research would have a beneficial impact on medical, life science and/or earth science research by providing research space at the site.	Reuse of a portion of the site for research on aging would have a beneficial impact on medical and life science research by providing research space at the site.	Conversion of the site to alternative uses would not have a negative impact on medical and life science research since research space would be met at other nearby locations (notably Mission Bay).	Impact would be the same as Alternative 3.	Impacts would be the same as Alternative 3.	Should the site be reused for medical research, the impacts would be similar to Alternative 1. Should the site be converted to alternative uses, the impacts would be the same as Alternative 3.

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Traffic and Transportation Systems						
Significant and Adverse Impact of Additional Traffic Volumes on Local Transportation Network (Mitigated to a Less-than-Significant Level by TR-1, TR-2, TR-3, TR-6, TR-7, and TR-8)	Average daily traffic would increase by about 4,560 external trips on weekdays. Impacts would be avoided by implementing intersection improvements at 3 locations (Lyon Street/Richardson Avenue/Gorgas Avenue, Lombard Street/Lyon Street, and Lombard Street/Presidio Boulevard).	Average daily traffic would increase by about 4,280 external trips on weekdays. Impacts would be avoided by implementing intersection and bicycle route improvements described in Alternative 1.	Average daily traffic would increase by about 4,460 external trips on weekdays. Impacts would be avoided by implementing intersection and bicycle route improvements described in Alternative 1.	Average daily traffic would increase by about 5,140 external trips on weekdays. Impacts would be avoided by implementing intersection and bicycle route improvements described in Alternative 1.	Average daily traffic would increase by about 4,360 external trips on weekdays. Impacts would be avoided by implementing intersection and bicycle route improvements described in Alternative 1.	Average daily traffic would increase by about 1,960 external trips on weekdays. Impacts would be avoided by coordinating with the city to implement intersection improvements described in Alternative 1.
Significant and Adverse Impact of Increased Parking Demand (Mitigated to a Less-than-Significant Level by TR-4 and TR-8)	Demand of 1,320 parking spaces would exceed the proposed supply of 1,150 spaces, which would require additional Transportation Demand Management (TDM) strategies to reduce shortfall of 170 spaces.	Demand of 1,110 parking spaces would exceed the proposed supply of 1,020 spaces, which would require additional TDM strategies to reduce shortfall of 90 spaces.	Proposed supply of 1,690 parking spaces is adequate to meet demand of 1,280 spaces.	Proposed supply of 1,390 parking spaces is adequate to meet demand of 1,160 spaces.	Proposed supply of 1,530 parking spaces is adequate to meet demand of 1,440 spaces.	Proposed supply of 770 parking spaces is adequate to meet demand of 580 spaces.

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Traffic and Transportation Systems – continued						
Beneficial Impact of TDM Measure (No Mitigation Required)	TDM measures as identified in TR-8 would be provided.	Additional TDM measures would reduce the number of trips that would leave the site.	Beneficial impact would be similar to Alternative 2.	Beneficial impact would be similar to Alternative 2.	Beneficial impact would be similar to Alternative 2.	TDM measures as identified in TR-8 would be provided.
Significant and Adverse Impact of Construction Equipment and Vehicles (Mitigated to a Less-than-Significant Level by TR-5)	Implementation of a Construction Traffic Management Plan would minimize inconveniences to local and regional traffic.	Similar to Alternative 1.	Similar to Alternative 1.	Similar to Alternative 1.	Similar to Alternative 1.	Inconvenience to local and regional traffic would be minimal since no substantial construction would occur.
Cultural Resources						
Beneficial Effect of Removing LAMC (Alternative 1) and Adverse Effect of Removing LAMC/LAIR (Alternatives 2-5) and Adding New Construction	Removal of LAMC and infill construction consistent with Planning and Design Guidelines for new construction would have a beneficial effect on the historic setting.	Removal of LAMC and LAIR and replacement construction consistent with Planning and Design Guidelines would foreclose opportunities for infill construction which would have an adverse effect on the adjacent historic hospital complex.	Adverse effect on the historic setting would be similar to Alternative 2.	Adverse effect on the historic setting would be similar to Alternative 2.	Adverse effect on the historic setting would be similar to Alternative 2.	No beneficial effect on historic setting since LAMC and LAIR would remain and building treatments would be minimal.

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Cultural Resources – continued						
<p>Adverse Effect on Historic Setting due to Retaining LAIR (Alternatives 1 and 6) or New Construction (Alternatives 2-5) (Adverse Effect Avoided for Alternatives 2-5 if CR-1 is Implemented)</p>	<p>Retention of the LAIR would only allow for the partial restoration of the historic setting of the earlier hospital complex and significant streetscapes. The building would continue to have an adverse effect on adjacent historic structures.</p>	<p>Siting of buildings along O'Reilly Avenue would have an adverse effect on adjacent historic structures unless CR-1 is implemented.</p> <p>Direct entry into the site would be inconsistent with the historic streetscape unless CR-1 is implemented.</p>	<p>Siting and length of connected buildings along O'Reilly Avenue would have an adverse effect on adjacent historic structures unless CR-1 is implemented.</p>	<p>The four office buildings would have an adverse effect on the historic setting because of their bulk and massing unless CR-1 is implemented.</p>	<p>Siting and length of connected buildings along O'Reilly Avenue would have an adverse effect on adjacent historic structures unless CR-1 is implemented.</p> <p>Buildings along western edge of the 23-acre site would isolate it from the adjacent historic hospital complex unless CR-1 is implemented.</p>	<p>Retention of the LAMC/LAIR would not allow for the restoration of the historic setting of the earlier hospital complex and significant streetscapes. The buildings would continue to have an adverse effect on adjacent historic structures.</p>
Visual						
<p>Significant and Adverse Visual Impacts (Unavoidable for Alternatives 1 and 6; Unavoidable for Alternatives 2 through 5 unless Potentially Mitigated to a Less-than-Significant Level by VR-1)</p>	<p>Should LAMC be retained, the visual integrity of the complex would continue to be diminished and regional views would remain significantly affected. Implementation of VR-2 would minimize visual impacts of new infill construction within the complex.</p>	<p>Removal of LAMC and LAIR and the introduction of lower-scaled new construction would enhance the visual integrity of the Letterman Complex. However, buildings located close to Lombard Street Gate would dominate entry views into the Presidio unless VR-1 is implemented.</p>	<p>Removal of LAMC and LAIR and the introduction of lower-scaled new construction would enhance the visual integrity of the Letterman Complex. However, historic view corridor at Edie Road would not be preserved unless VR-1 is implemented.</p>	<p>Removal of LAMC and LAIR and the introduction of lower-scaled new construction would enhance the visual integrity of the Letterman Complex. However, historic view corridors at Thornburg Road and Edie Road would not be preserved unless VR-1 is implemented.</p>	<p>Removal of LAMC and LAIR and the introduction of lower-scaled new construction would enhance the visual integrity of the Letterman Complex. However, historic view corridor at Edie Road would not be preserved unless VR-1 is implemented.</p>	<p>Retention of the LAMC and LAIR would continue to diminish the visual integrity of the complex and significantly affect regional views.</p>

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Visitor Experience						
Beneficial Impact on Visitor Experience (No Mitigation Required)	The 23-acre site would be used as a research and education facility that would provide new opportunities for residents and visitors to attend educational programs and learn about advances in health and science.	The two restaurants and inn/retreat on the 23-acre site would offer a village atmosphere that would enhance the visitor experience.	The village commons, lodge, conference center, culinary institute, restaurants, and shops would provide a lively community of diverse programs and activities to enhance the visitor experience.	The central public green, new pavilion at the green, and market hall would provide public gathering places. The library on history and genealogy, and museum and cultural center would provide new visitor opportunities. Education programs on conservation, sustainability, Internet technology, and environmental themes would enhance the Presidio community.	The 7-acre Great Lawn, water feature, promenade, and café would provide public gathering places. The museum for visual arts, visual effects archive, and screening/meeting rooms for community use would also enhance the visitor experience.	Organizations occupying LAMC and LAIR would most likely provide some public access and visitor programs that would provide beneficial effects.
Archeological Properties						
Adverse Effect on Archeological Properties (Adverse Effect Avoided by AR-1)	Ground-disturbing activities and construction projects have the potential to encounter archeological resources.	Effect on archeological resources would be similar to Alternative 1.	Effect on archeological resources would be similar to Alternative 1.	Effect on archeological resources would be similar to Alternative 1.	Effect on archeological resources would be similar to Alternative 1.	No adverse effect on archeological resources since no ground disturbance or new construction would occur.

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Air Quality						
Significant and Adverse Short-Term Demolition/Construction Impacts (Mitigated to a Less-Than-Significant Level by AQ-1 and AQ-2)	Heavy equipment could emit particulate matter (PM ₁₀). Feasible control measures would be employed to minimize PM ₁₀ emissions during construction.	Impacts and control measures would be similar to Alternative 1.	Impacts and control measures would be similar to Alternative 1.	Impacts and control measures would be similar to Alternative 1.	Impacts and control measures would be similar to Alternative 1.	PM ₁₀ emissions would be minimal because no substantial construction would occur.
Significant and Adverse Long-Term Regional Operation Impacts (Unavoidable for Alternatives 1 and 4 Only; Alternatives 2, 3, 5, and 6 Mitigated to a Less-than-Significant Level by AQ-3)	The approximately 88 lb/day of nitrogen oxides (NO _x) generated by increased traffic would exceed the Bay Area Air Quality Management District (BAAQMD) significance threshold of 80 lb/day.	Increased traffic would not result in regional operational emissions exceeding any of the BAAQMD's significance thresholds for reactive organic gases (ROG), NO _x or PM ₁₀ .	Impacts would be similar to Alternative 2.	The approximately 90 lb/day of NO _x generated by increased traffic would exceed the BAAQMD significance threshold of 80 lb/day.	Impacts would be similar to Alternative 2.	Impacts would be similar to Alternative 2.

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Air Quality – continued						
Less-Than-Significant Long-Term Local Operations Impacts (No Mitigation Required)	Localized carbon monoxide (CO) concentrations due to increased traffic would be approximately 7.9 ppm of CO on a 1-hour basis and 5.4 ppm of CO on an 8-hour basis. These roadside concentrations would not exceed the state ambient air quality standards for CO of 20 ppm on a one-hour basis and 9 ppm on an 8-hour basis.	Localized CO concentrations due to increased traffic would be less than Alternative 1 and would not exceed the state ambient air quality standards for CO.	Localized CO concentrations due to increased traffic would be less than Alternative 1 and would not exceed the state ambient air quality standards for CO.	Localized CO concentrations due to increased traffic would be less than Alternative 1 and would not exceed the state ambient air quality standards for CO.	Localized CO concentrations due to increased traffic would be less than Alternative 1 and would not exceed the state ambient air quality standards for CO.	Localized CO concentrations due to increased traffic would be less than Alternative 1 and would not exceed the state ambient air quality standards for CO.
Noise						
Significant, Unavoidable, and Adverse Short-Term Impact due to Demolition and Construction Activities (Mitigated but not to a Less than Significant Level by NO-1)	Demolition of the LAMC and infill construction would generate intermittent noise of a short-term nature. Noise would be noticeable to residents within the adjacent neighborhoods and recreational users outside the complex, but because noise	Demolition of the LAMC and LAIR and replacement construction would generate intermittent noise of a short-term nature. Noise would be noticeable to residents within the adjacent neighborhoods and recreational users outside the Letterman complex, but because	The short-term noise impact would be similar to Alternative 2.	The short-term noise impact would be similar to Alternative 2.	The short-term noise impact would be similar to Alternative 2.	The short-term noise impact would be avoided since no building demolition or replacement construction would occur.

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Noise – continued	would be attenuated over distance and masked by unrelated urban noise, noise levels are not expected to be disruptive or exceed noise thresholds in the San Francisco Noise Ordinance. Short-term impact tool use and demolition activities could be disruptive to people within the complex, particularly those closest to (i.e., within 250 feet from) construction equipment.	noise would be attenuated over distance and masked by unrelated urban noise, noise levels are not expected to be disruptive or exceed noise thresholds in the San Francisco Noise Ordinance. Short-term impact tool use and demolition activities could be disruptive to people within the complex, particularly those closest to (i.e., within 250 feet from) construction equipment.	Traffic volumes would be less than those shown for Alternative 1, and the associated noise level increases would be subsequently lower.	While traffic volumes would be approximately 11 percent above those shown for Alternative 1, existing sensitive receptors would not experience noticeable increases in peak traffic noise levels (i.e., greater than 3 dBA). New uses within the site would be consistent with the noise abatement criteria.	Traffic volumes would be less than those shown for Alternative 1, and the associated noise level increases would be subsequently lower.	Impacts of traffic noise would be less than those described under Alternative 4.
Less than Significant Long-Term Impact due to Traffic Noise Increases (No Mitigation Required)	Existing sensitive receptors would not experience noticeable increases in peak traffic noise levels (i.e., greater than 3 dBA). New uses within the site would be consistent with the noise abatement criteria.	Traffic volumes would be within 5 percent of those shown for Alternative 1, and the associated noise level increases would be nearly equivalent.	Traffic volumes would be less than those shown for Alternative 1, and the associated noise level increases would be subsequently lower.	While traffic volumes would be approximately 11 percent above those shown for Alternative 1, existing sensitive receptors would not experience noticeable increases in peak traffic noise levels (i.e., greater than 3 dBA). New uses within the site would be consistent with the noise abatement criteria.	Traffic volumes would be less than those shown for Alternative 1, and the associated noise level increases would be subsequently lower.	Impacts of traffic noise would be less than those described under Alternative 4.

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Cumulative Impacts						
Less-than-Significant Cumulative Impacts (No Mitigation Required)	Alternative 1 would contribute to cumulative impacts of other federal, state, and local actions on the following resources within the Presidio and surrounding neighborhoods: solid waste, water supply and distribution, schools, housing, traffic and transportation systems, cultural resources (including visitor experience and visual resources), air quality, and noise. Mitigation would address Alternative 1's contribution to cumulative impacts such that the total effect would not be significant.	Alternative 2 would contribute to cumulative impacts of other federal, state, and local actions on the following resources within the Presidio and surrounding neighborhoods: solid waste, water supply and distribution, schools, housing, traffic and transportation systems, cultural resources (including visitor experience and visual resources), air quality, and noise. Mitigation would address Alternative 2's contribution to cumulative impacts such that the total effect would not be significant.	Alternative 3 would contribute to cumulative impacts of other federal, state, and local actions on the following resources within the Presidio and surrounding neighborhoods: solid waste, water supply and distribution, schools, housing, traffic and transportation systems, cultural resources (including visitor experience and visual resources), air quality, and noise. Mitigation would address Alternative 3's contribution to cumulative impacts such that the total effect would not be significant.	Alternative 4 would contribute to cumulative impacts of other federal, state, and local actions on the following resources within the Presidio and surrounding neighborhoods: solid waste, water supply and distribution, schools, housing, traffic and transportation systems, cultural resources (including visitor experience and visual resources), air quality, and noise. Mitigation would address Alternative 4's contribution to cumulative impacts such that the total effect would not be significant.	Alternative 5 would contribute to cumulative impacts of other federal, state, and local actions on the following resources within the Presidio and surrounding neighborhoods: solid waste, water supply and distribution, schools, housing, traffic and transportation systems, cultural resources (including visitor experience and visual resources), air quality, and noise. Mitigation would address Alternative 5's contribution to cumulative impacts such that the total effect would not be significant.	Alternative 6 would contribute to cumulative impacts of other federal, state, and local actions on the following resources within the Presidio and surrounding neighborhoods: solid waste, water supply and distribution, schools, housing, traffic and transportation systems, cultural resources (including visitor experience and visual resources), air quality, and noise. Mitigation would address Alternative 6's contribution to cumulative impacts such that the total effect would not be significant.

Table 12
Water System Demand (gpd)

	ALTERNATIVE TOTAL EST. DAILY WATER DEMAND	BASELINE LAMC/LAIR WATER DEMAND	NET DIRECT IMPACT	PRESIDIO TOTAL WATER DEMAND WITH ALTERNATIVE	PEAK PRESIDIO DEMAND MET BY AVAILABLE PEAK LOBOS CREEK FLOW ^a	NET CUMULATIVE PEAK SHORTFALL ^b
Alternative 1	20,262 ^c	88,798	-68,536	1,621,464	1,400,000	221,464
Alternative 2	111,280 ^d	88,798	22,482	1,712,482	1,400,000	312,482
Alternative 3	67,850 ^e	88,798	-20,948	1,669,052	1,400,000	269,052
Alternative 4	63,836 ^f	88,798	-24,962	1,665,038	1,400,000	265,038
Alternative 5	84,574 ^g	88,798	-4,224	1,685,776	1,400,000	285,776
Alternative 6	35,398 ^h	88,798	-53,400	1,636,600	1,400,000	236,600

Source: Development Teams, GMPA EIS 1994 (NPS 1994a); BAE 1998a

Notes:

gpd = gallons per day

mgd = million gallons per day

^a Assumes peak flow for typical rainfall year (1.9 mgd) minus 0.5 mgd in-stream flow.

^b Assumes peak shortfall in June in typical and drier years.

^c Based on GMPA EIS (NPS 1994a) demand factor for Medical Research land use (10 gpd/employee).

^d Includes 14,000 gpd of gray water used for irrigation (see Table 13).

^e Includes 12,250 gpd of gray water used for irrigation (see Table 13).

^f Includes 11,781 gpd of gray water used for irrigation (see Table 13).

^g Includes 8,197 gpd of recycled storm water used for irrigation (see Table 13).

^h Based on office demand factor of 30 gpd/employee (BAE 1998a).



Table 13
Domestic and Irrigation Water Consumption (gpd)

	MEDICAL RESEARCH	OFFICE	INN	CONFERENCE CENTER	FITNESS/FOOD SERVICE/DAY CARE	ASSISTED LIVING	RESIDENTIAL	IRRIGATION	TOTAL
Alt. 1	9,700							10,562 ^a	20,262
Alt. 2		21,360	17,870				58,050	14,000 ^b	111,280
Alt. 3		21,600		4,000		13,200	16,800	12,250 ^b	67,850
Alt. 4		19,178					32,877	11,781 ^b	63,836
Alt. 5		33,750			17,925			20,548 ^c	72,223
Alt. 6		24,836						10,562 ^a	35,398

Source: Development Teams; BAE.

Notes:

gpd = gallons per day

^a Assumes potable water as primary water source for irrigation.

^b Assumes gray water as primary water source for irrigation.

^c Includes 12,351 gpd of potable water and 8,197 gpd of recycled storm water as primary water sources for irrigation.

Table 14
Public School Enrollment

	PRESIDIO HOUSEHOLDS ^a	TOTAL HOUSEHOLD POPULATION GENERATED BY ALTERNATIVE ^b	SCHOOL-AGED CHILDREN GENERATED BY ALTERNATIVE ^c	ESTIMATED PRIMARY/SECONDARY PUBLIC SCHOOL ENROLLMENT ^d	PRESIDIO PUBLIC SCHOOL GENERATION FACTOR ^e
Alt. 1	227	726	125	92	0.40
Alt. 2	627	2,006	345	253	0.40
Alt. 3	227	726	125	92	0.40
Alt. 4	677	2,166	372	273	0.40
Alt. 5	227	726	125	92	0.40
Alt. 6	227	726	125	92	0.40

Source: NPS 1994a; BAE.

Notes:

^a Proportionate share of total existing Presidio housing units allocated to each alternative plus any new housing units added by the alternative. Does not include units in former barracks.

^b Average Presidio household size, 3.2 persons per household, is based on the average household size for San Francisco (BAE).

^c The proportion of schoolchildren in relation to total population in the nine-County San Francisco Bay Area is 17.19% (BAE).

^d The proportion of schoolchildren enrolled in public school to total school-aged population in San Francisco is 73.36% (BAE).

^e Number of Presidio schoolchildren expected to enroll in public school per housing unit.



Table 15
Regional Housing Demand

ESTIMATES OF NET NEW REGIONAL HOUSING DEMAND

ALLOCATION OF NET NEW REGIONAL DEMAND TO SAN FRANCISCO BAY AREA SUB-REGIONS

	TOTAL EMPLOYMENT GENERATED BY ALTERNATIVE	NEW HOUSING DEMAND FROM OUTSIDE SAN FRANCISCO BAY AREA	PRESIDIO HOUSING UNITS ALLOCATED TO LAMC/LAIR PLUS NEW HOUSING	PERCENT OF HOUSING DEMAND GENERATED BY ALTERNATIVE MET AT PRESIDIO	NET NEW REGIONAL HOUSING DEMAND FROM ALTERNATIVE	55% OF TOTAL NEW SAN FRANCISCO HOUSING DEMAND	17% OF TOTAL NEW NORTH BAY HOUSING DEMAND	8% OF TOTAL NEW PENINSULA HOUSING DEMAND	20% OF TOTAL NEW EAST BAY HOUSING DEMAND
Alt. 1	970	187	265	100%	n/a	n/a	n/a	n/a	n/a
Alt. 2	2,000	385	665	100%	n/a	n/a	n/a	n/a	n/a
Alt. 3	2,000	385	265	69%	120	66	20	10	24
Alt. 4	2,400	462	715	100%	n/a	n/a	n/a	n/a	n/a
Alt. 5	2,500	481	265	55%	216	119	37	17	43
Alt. 6	828	159	265	100%	n/a	n/a	n/a	n/a	n/a

NET NEW HOUSING DEMAND AS PERCENTAGE OF VACANT REGIONAL HOUSING

	PERCENT OF CURRENT SAN FRANCISCO VACANCY	PERCENT OF CURRENT NORTH BAY VACANCY	PERCENT OF CURRENT PENINSULA VACANCY	PERCENT OF CURRENT EAST BAY VACANCY	ESTIMATE OF NEW REGIONAL HOUSING CONSTRUCTION	
Alt. 1	n/a	n/a	n/a	n/a	San Francisco Bay Area Housing Units 2000	2,429,230
Alt. 2	n/a	n/a	n/a	n/a	San Francisco Bay Area Housing Units 2010	2,655,100
Alt. 3	0.28%	0.09%	0.03%	0.05%	Net New Housing Units	225,870
Alt. 4	n/a	n/a	n/a	n/a		
Alt. 5	0.50%	0.17%	0.05%	0.09%		
Alt. 6	n/a	n/a	n/a	n/a		

Sources: Development Teams; Presidio Trust 1998d, 1998e; NPS 1994a; California Department of Finance; ABAG; BAE.

Notes:

n/a = not applicable

Vacancy rate is derived by the State Department of Finance using the 1990 Census and recent utility billing records. Because this estimate considers seasonal and condemned units "vacant," total vacant units may be overstated.

Table 16
Weekday External and Internal Trips and Parking Demand

	DAILY					p.m. PEAK HOUR					WEEKDAY PARKING DEMAND (SPACES)
	PERSON TRIPS				VEHICLE TRIPS	PERSON TRIPS				VEHICLE TRIPS	
	AUTO	TRANSIT	BIKE/PED	TOTAL		AUTO	TRANSIT	BIKE/PED	TOTAL		
Alternative 1											1,320
External	6,380	1,370	1,370	9,120	4,560	670	140	140	950	490	
Internal	1,220	490	730	2,440	870	100	40	60	200	70	
Alternative 2											1,110
External	5,990	1,280	1,280	8,550	4,280	710	150	150	1,010	520	
Internal	880	350	530	1,760	630	140	60	80	280	100	
Alternative 3											1,280
External	6,130	1,310	1,310	8,750	4,460	600	130	130	860	430	
Internal	890	360	530	1,780	640	90	40	50	180	60	
Alternative 4											1,160
External	7,200	1,540	1,540	10,280	5,140	840	180	180	1,200	600	
Internal	940	380	570	1,890	670	150	60	90	300	110	
Alternative 5											1,440
External	6,120	1,310	1,310	8,740	4,360	570	120	120	810	400	
Internal	770	310	460	1,540	550	70	30	40	140	50	
Alternative 6											580
External	2,730	590	590	3,910	1,960	290	60	60	410	220	
Internal	340	140	210	690	250	40	10	20	70	30	

Source: Wilbur Smith Associates

Note: Internal trips are trips made between the Letterman Complex and other parts of the Presidio or within the Letterman Complex. External trips are made between the Letterman Complex and areas outside the Presidio. Trip generation assumptions are provided in Appendix D.

Table 17
2010 P.M. Peak Hour Traffic Volumes at the Gates to the Presidio

	EXISTING ^b CONDITIONS	PERCENT CONTRIBUTION OF ALTERNATIVE TO TRAFFIC GROWTH ^a (2010)											
		ALTERNATIVE 1		ALTERNATIVE 2		ALTERNATIVE 3		ALTERNATIVE 4		ALTERNATIVE 5		ALTERNATIVE 6	
		vph	%	vph	%	vph	%	vph	%	vph	%	vph	%
Mason Street	610	960	14	970	17	960	11	980	16	960	12	940	9
Gorgas Avenue	280	790	61	820	63	770	57	880	65	750	55	580	30
Lombard Street	1,170	1,570	13	1,570	13	1,570	10	1,580	14	1,560	10	1,560	10
Presidio Boulevard	720	940	36	940	32	930	33	950	40	930	29	920	30
Arguello Boulevard	490	1,000	0	1,000	0	1,000	0	1,000	0	1,000	0	1,000	0
15th Avenue	130	300	0	300	0	300	0	300	0	300	0	300	0
Lincoln Boulevard	860	1,360	0	1,360	0	1,360	0	1,360	0	1,360	0	1,360	0
Golden Gate Plaza	750	1,190	0	1,190	0	1,190	0	1,190	0	1,190	0	1,190	0

Source: Wilbur Smith Associates

Notes:

vph = vehicles per hour — p.m. peak hour volume

^aPercent contribution of alternative-generated traffic to the growth in traffic volumes between existing and 2010 conditions.

^bNPS 1994b. Gorgas Avenue Gate traffic was reduced to reflect the discontinued use of LAMC. Traffic volume for the Gorgas Avenue Gate was taken from the Presidio Trust (1998f).

Table 18
2010 Weekday p.m. Peak-Hour Levels of Service

INTERSECTION	ALTERNATIVE 1			ALTERNATIVE 2			ALTERNATIVE 3			ALTERNATIVE 4			ALTERNATIVE 5			ALTERNATIVE 6		
	LOS	DELAY	V/C															
Proposed Richardson/Gorgas Access	---	---	---	B	7	0.72	B	7	0.73	B	7	0.73	B	7	0.73	---	---	---
Lyon/Richardson/Gorgas	D	31	0.99	A	2	0.85	---	---	---									
Francisco/Gorgas/Lyon	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	C	5	
Richardson/Francisco	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	B	12	0.86
Lombard/Lyon	F	199	1.74	F	196	1.74	F	193	1.73	F	203	1.75	F	193	1.73	F	190	1.73
Presidio/Lombard	E	33	1.33	E	38	1.37	E	33	1.33	E	39	1.37	E	31	1.32	D	28	1.29
Presidio/Letterman/Lincoln	C	16	1.25	C	17	1.31	C	16	1.23	C	18	1.33	C	16	1.21	C	15	1.16
Mason/Marina/Lyon ^a	C	1		C	1		C	1		C	1		C	1		C	1	
Doyle/Marina/Lyon	C	17	0.96	C	17	0.96	C	17	0.96	C	18	0.96	C	17	0.96	C	16	0.95

Source: Wilbur Smith Associates

Notes:

LOS = Level of Service

LOS A: Insignificant Delays. Progression is extremely favorable, and most vehicles arrive during the green phase. Most vehicles do not stop at all.

LOS B: Minimal Delays. Generally good progression, short cycle lengths, or both. More vehicles stop than with LOS A, causing higher levels of average delay. Drivers begin to feel restricted.

LOS C: Acceptable Delays. Fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear, though many still pass through the intersection without stopping.

Most drivers feel somewhat restricted.

LOS D: Tolerable Delays. The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high v/c

ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable. Queues may develop but dissipate rapidly, without excessive delays.

LOS E: Significant Delays. Considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures are frequent occurrences. Vehicles may wait through several signal cycles and long queues of vehicles form upstream.

LOS F: Excessive Delays. Considered to be unacceptable to most drivers. Often occurs with oversaturation, that is, when arrival flow rates exceed the capacity of the intersection. Poor progression and long cycle lengths may also be major contributing causes to such delay levels. Queues may block upstream intersections.

Delay = Average seconds of delay per vehicle.

v/c = critical volume-to-capacity ratio.

Alternative 1 roadway configuration assumes a single-intersection reconfiguration of the intersection near the Gorgas Avenue Gate.

Alternative 2, 3, 4, and 5 roadway configurations assume a two-intersection reconfiguration of the intersection near the Gorgas Avenue Gate.

Alternative 6 roadway configuration assumes the existing intersection configuration near the Gorgas Avenue Gate.

^a Delay represents average delay for entire intersection; level of service is that of the approach with the greatest delay.

--- = Intersection not affected by alternative.

Table 19
Cumulative p.m. Peak-Hour Vehicle Trip Generation

PROJECT		ALTERNATIVE					
		1	2	3	4	5	6
Letterman Complex	External	490	520	430	600	400	220
	Internal	70	100	60	110	50	30
15 Historic Buildings (Main Post)	External	370	370	370	370	370	370
	Internal	170	170	170	170	170	170
Public Health Service Hospital Complex	External	160	160	160	160	160	160
	Internal	280	280	280	280	280	280
Two Playing Fields: Morton Street (East Housing Area) and Paul Goode (North of Julius Kahn Playground)	External	20	20	20	20	20	20
	Internal	0	0	0	0	0	0
Presidio Housing (Presidio-Wide)	External	300	300	300	300	300	300
	Internal	220	220	220	220	220	220
Water Reclamation Plant (Letterman Complex)	External	0	0	0	0	0	0
	Internal	0	0	0	0	0	0
Crissy Field	External	60	60	60	60	60	60
	Internal	0	0	0	0	0	0
William Penn Mott, Jr. Visitor Center (Building 102, Main Post)	External	20	20	20	20	20	20
	Internal	0	0	0	0	0	0
Exploratorium	External	50	50	50	50	50	50
	Internal	0	0	0	0	0	0
2361 Lombard Street 126-Room Hotel ^a	External	-10	-10	-10	-10	-10	-10
	Internal	0	0	0	0	0	0
1880 Lombard Street Residential Building w/ 27 Units plus 11,000 sf Commercial (Marina District) ^a	External	-100	-100	-100	-100	-100	-100
	Internal	0	0	0	0	0	0
Electronic Toll Collection (Golden Gate Bridge) ^b	External	0	0	0	0	0	0
	Internal	0	0	0	0	0	0
Total	External	1,360	1,390	1,300	1,470	1,270	1,090
	Internal	740	770	730	780	720	700
Percentage Contributed by Letterman Complex to Total Added Cumulative Traffic		27	29	24	32	23	14

Source: Wilbur Smith Associates 1999.

Notes:

External trips are defined as trips between a location within the Presidio and a location outside the Presidio's boundaries. Internal trips are defined as trips made between two locations within the Presidio.

^a In order to provide a conservative analysis, the reduction of vehicle p.m. peak hour vehicle trips resulting from these projects has not been incorporated into the level of service analysis.

^b Electronic Toll Collection may increase traffic volume on Richardson Avenue during the a.m. peak hour, but would not cause an increase in p.m. peak-hour traffic volumes on Richardson Avenue.



Table 20
Cumulative p.m. Peak-Hour Levels of Service

INTERSECTION	ALTERNATIVE 1			ALTERNATIVE 2			ALTERNATIVE 3			ALTERNATIVE 4			ALTERNATIVE 5			ALTERNATIVE 6		
	LOS	DELAY	V/C															
Francisco/Gorgas/Lyon	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	B	3.8	---
Richardson/Francisco	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	B	9.5	0.74
Richardson/Lyon (single reconfigured intersection)	D	37.2	0.88	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Richardson/Lyon (two reconfigured intersections)	---	---	---	A	1.6	0.78	A	1.9	0.78	A	2.2	0.78	A	1.8	0.78	---	---	---
Richardson/Additional Access (two reconfigured intersections)	---	---	---	B	6.1	0.66	B	6.0	0.66	B	6.0	0.66	B	5.9	0.65	---	---	---
Lombard/Lyon	E	33.5	1.16	E	33.0	1.16	E	33.0	1.16	E	34.1	1.17	E	32.9	1.16	E	32.3	1.16
Mitigated	B	7.8	0.52	B	7.8	0.52	B	7.8	0.51	B	7.8	0.52	B	7.8	0.51	B	7.7	0.52
Presidio/Lombard	E	31.5	1.06	E	34.6	1.09	E	30.9	1.06	E	35.9	1.10	D	29.8	1.05	D	26.6	1.02
Mitigated	D	20.3	0.93	D	20.9	0.95	C	19.6	0.93	D	22.3	0.95	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Presidio/Letterman/Lincoln	B	8.3	0.83	B	8.5	0.88	B	8.1	0.82	B	9.0	0.90	B	7.9	0.80	B	7.3	0.76
Mason/Marina/Lyon ^a	B	1.0																
Doyle/Marina/Lyon	B	7.8	0.79	B	7.6	0.78	B	7.7	0.78	B	7.9	0.79	B	7.7	0.78	B	7.3	0.77

Source: Wilbur Smith Associates 2000

Notes:

LOS = Level of Service

LOS A: Insignificant Delays. Progression is extremely favorable, and most vehicles arrive during the green phase. Most vehicles do not stop at all.

LOS B: Minimal Delays. Generally good progression, short cycle lengths, or both. More vehicles stop than with LOS A, causing higher levels of average delay. Drivers begin to feel restricted.

LOS C: Acceptable Delays. Fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear, though many still pass through the intersection without stopping.

Most drivers feel somewhat restricted.

LOS D: Tolerable Delays. The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high v/c ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable. Queues may develop but dissipate rapidly, without excessive delays.

LOS E: Significant Delays. Considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures are frequent occurrences. Vehicles may wait through several signal cycles and long queues of vehicles form upstream.

LOS F: Excessive Delays. Considered to be unacceptable to most drivers. Often occurs with oversaturation, that is, when arrival flow rates exceed the capacity of the intersection. Poor progression and long cycle lengths may also be major contributing causes to such delay levels. Queues may block upstream intersections.

Delay = Average seconds of delay per vehicle.

v/c = critical volume-to-capacity ratio

--- = Intersection not affected by alternative.

Alternative 1 roadway configuration assumes a single-intersection reconfiguration of the intersection near the Gorgas Avenue Gate.

Alternative 2, 3, 4, and 5 roadway configurations assume a two-intersection reconfiguration of the intersection near the Gorgas Avenue Gate.

Alternative 6 roadway configuration assumes the existing intersection configuration near the Gorgas Avenue Gate.

The intersection of Presidio Boulevard/Lombard Street would not require mitigation under Alternatives 5 and 6.

^a Delay represents average delay for entire intersection; level of service is that of the approach with the greatest delay.

Table 21
Cumulative Parking Demand

PROJECT	ALTERNATIVE					
	1	2	3	4	5	6
Letterman Complex	1,320	1,110	1,280	1,150	1,440	580
15 Historic Buildings (Main Post)	960	960	960	960	960	960
Public Health Service Hospital Complex	270	270	270	270	270	270
Two Playing Fields: Morton Street (East Housing Area) and Paul Goode (North of Julius Kahn Playground)	80	80	80	80	80	80
Presidio Housing (Presidio-Wide)	1,020	1,020	1,020	1,020	1,020	1,020
Water Reclamation Plant (Letterman Complex)	2	2	2	2	2	2
Crissy Field	100	100	100	100	100	100
William Penn Mott, Jr. Visitor Center (Building 102, Main Post)	10	10	10	10	10	10
Exploratorium	520 ^a					
2361 Lombard Street 126-Room Hotel	100 ^b					
1880 Lombard Street Residential Building with 27 Units plus 11,000 sf Commercial (Marina District)	50 ^c					
Electronic Toll Collection (Golden Gate Bridge)	0	0	0	0	0	0
Total Presidio Parking Demand	4,432	4,222	4,392	4,262	4,552	3,692
Percentage Contributed by Letterman Complex to Total Cumulative Parking Demand	30	26	29	27	32	16

Source: Wilbur Smith Associates

Notes:

^a Represents projected parking *supply* rather than demand. The proposed supply is subject to negotiation with the Presidio Trust for 210 additional offsite parking spaces (Exploratorium 2000).

^{b, c} Represents projected parking *supply* rather than demand. The noted parking supply meets the requirements of the San Francisco Planning Code (CCSF 1999a, 1999b).



Table 22
Estimated Vehicular Emissions from Project-Related Traffic

POLLUTANT (lb/day)	BAAQMD SIGNIFICANCE THRESHOLD	ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 3	ALTERNATIVE 4	ALTERNATIVE 5	ALTERNATIVE 6
Reactive Organic Gases (ROG)	80	51.7	48.7	48.6	54.8	47.3	21.7
Nitrogen Oxides (NO _x)	80	88.4	73.8	74.7	89.8	74.1	36.9
Particulate Matter (PM ₁₀)	80	38.5	31.8	32.1	38.8	31.9	16.1
Carbon Monoxide (CO)	550 ^a	634.1	557.1	561.2	670.9	556.4	265.0

Source: EIP Associates. Emission estimates based on use of CARB's URBEMIS7G model.

Notes:

Bold indicates estimated emissions that would exceed BAAQMD significance threshold criteria.

^a BAAQMD's carbon monoxide screening threshold of 550 lb/day is not a significance threshold. It is an indicator of regional emissions sufficient in quantity to require a localized impact analysis.