5.6 NOISE

5.6.1 Affected Environment

The dominant noise sources at SBMR include military and personal vehicle traffic, small arms and heavy weapons firing, and helicopter flight activity. Noise from heavy weapons firing affects most of the Main Post. No live-fire training occurs in SBER, and there are no firing ranges or ordnance impact areas there. The 65 dBA Ldn contour around WAAF extends onto Leilehua Golf Course, but not into any residential area (USAEHA 1993B; US Army CHPPM 1999). Individual detonations from heavy weapons firing are readily audible in residential areas near the boundaries of the base. Noise from aircraft and helicopter flight activity at WAAF also affects on-post housing areas and residential areas beyond the base boundaries.

The noise complaint program for Army installations in Hawai'i is managed through the Public Affairs Office, Community Relations Department at Schofield Barracks (phone number 808 655-2919 or at http://www.25IDL.army.mil/). Noise and other complaints are logged with a brief checklist form to summarize the nature of the complaint and the activity or equipment that appears to be generating the complaint. Complaints regarding aircraft or helicopter operations are referred to the Aviation Division for investigation and follow-up. Complaints related to other noise sources or activities are referred to the appropriate unit or office for investigation and follow-up.

Low altitude aircraft and helicopter flight activity are a source of periodic noise complaints from communities surrounding SBMR. Small arms firing, heavy weapons firing, use of simulators, use of demolition charges, and vehicle traffic also generate occasional noise complaints. Most complaints are about discrete events rather than about overall average noise conditions.

Estimated noise contours from existing artillery firing and other high explosives use are shown in Figure 5-16. Noise zones are based on Army land use compatibility and CHPPM guidelines. These guidelines are used to determine the best locations for varying activities when planning expansion into areas currently not exposed to any noise levels. Zone I (Ldn levels below 62 dBC) Are considered compatible with all residential land use. Approximately 15 percent of the population would be annoyed with these levels. Zone II conditions (Ldn levels of 62 to 70 DbC) are considered normally unacceptable for noise-sensitive land uses such as housing areas, educational facilities, and medical facilities. Approximately 15-39 percent of the population would be annoyed with these levels. Zone III conditions (Ldn levels over 70 dBC) are considered incompatible with residential and educational land uses. Forty percent or more of the population would be annoyed by these levels. Studies conducted by EPA found that people living in noisy areas have acclimated to those noise levels and are less affected by the increased noise levels than people living in relatively quite locations.

Figure 5-16
Existing Noise Levels at Schofield Barracks Military Reservation

The existing noise contours in Figure 5-16 represent a weighted average of annual noise conditions, not a constant average noise level. Noise levels at any time can be significantly lower or somewhat higher than the values indicated by the noise contours, since weighted average noise levels are disproportionately influenced by the loudest events. The Ldn noise contours shown in Figure 5-16 incorporate a 10 dB penalty factor for nighttime noise. Approximately 10 percent of large ordnance item use occurs during nighttime hours (from 10:00 PM to 7:00 AM).

Noise contours representing existing noise levels indicate that Zone II conditions affect all but the easternmost portion of the cantonment area and Zone III conditions (with an Ldn above 70 dBC) affect the western edge of the cantonment area (US Army CHPPM 2003). Off-post residential areas in the Wahiawa, Mililani Mauka, and Mililani Town areas are considered Zone I areas and therefore not impacted by present ordnance firing noise conditions. Zone II noise conditions (Ldn levels of 62 to 70 dBC) encompass most of the cantonment area on the Main Post, reaching to the vicinity of Heard Avenue in the eastern portion of the cantonment area and extend off-post into undeveloped areas north and south of the cantonment area. Solomon Elementary School and Hale Kula Elementary School are presently within the Zone II noise exposure area. However, because the elementary schools are not in use during nighttime hours, noise levels without the nighttime noise penalty factor are more representative of conditions during daytime use periods. In the absence of the nighttime noise penalty factor, Solomon Elementary School is currently exposed to Zone II conditions and Hale Kula Elementary School is currently exposed to Zone I conditions. Zone III conditions affect some of the western-most housing areas at SBMR. The Zone III contour extends east of Kahoolawe Avenue in the northwestern portion of the cantonment area and east of Beaver Road in the southwestern portion of the cantonment area.

Short-term noise monitoring in the western part of the cantonment area was conducted as part of the EA for the Mission Support Training Facility and the Information Services Facility (Y. Ebisu & Associates 2002). Noise levels along portions of Trimble Road and Beaver Road were measured for intervals of about one to one-and-a-half hours during daytime hours on two days in May 2002. Monitoring locations were on the north side of Trimble Road east and west of Beaver Road, and on the east side of Beaver Road north of Trimble Road. Average noise levels at distances of 50 to 66 feet (15 to 20 meters) from the centerline of the roadway ranged from 57.5 dBA to 61.7 dBA along Trimble Road. The average noise level at one location increased to 69.4 dBA when a fire truck with its siren going passed through the area. The fire truck siren produced a brief peak noise reading of about 100 dBA. The average noise level at a distance of 69 feet (21 meters) from Beaver Road was 59 dBA. Noise sources identifiable during these monitoring periods included vehicle traffic, helicopter flight activity, and artillery firing. Noise levels generally varied from slightly under 50 dBA to about 70 dBA, with occasional noise events exceeding 70 dBA. Maximum noise levels for the loudest vehicles and helicopters were typically between 70 and 80 dBA. Maximum noise levels from artillery firing were generally less than 70 dBA at these locations.

The noise study for the Mission Support Training Facility and the Information Services Facility (Y. Ebisu & Associates 2002) also summarizes data from an April 1993 noise

monitoring program at the nearby DPW 4 site. During periods of 155 mm howitzer firing, peak noise levels at the DPW 4 site were typically between 89 and 96 dBC, with a maximum of about 108 dBC. Fifteen of 154 events were measured at or above 100 dBC, and 30 events were measured at less than 85 dBC. The peak noise levels measured during the 1993 study do not indicate any blast noise exposure problems, since the measured C-weighted peak levels indicate that unweighted peak dB levels were under the 115 dB threshold normally associated with a moderate rate of complaints about blast noise (US Army CHPPM 2001).

5.6.2 Environmental Consequences

Summary of Impacts

Noise sources associated with project alternatives at SBMR include construction activity, ordnance use, military vehicle traffic, aircraft operations, and personal vehicle traffic. Of these sources, changes in ordinance use from the Proposed Action and the Reduced Land Acquisition (RLA) Alternative primarily affect the noise levels. Other sources have little to no effect on existing noise levels. Noise from ordnance use has been evaluated using computer modeling to develop estimated annual average Ldn contours. Ldn noise levels are a day-night average noise level, with a 10 dB penalty factor added to nighttime noise levels to account for the higher annoyance associated with nighttime as opposed to daytime noise conditions. Noise conditions are categorized into three noise exposure zones for evaluating land use compatibility conditions: Zone I - compatible for all uses, Zone II - normally unacceptable for noise sensitive land uses such as housing areas, educational facilities and medical facilities unless buildings have been constructed with Noise Level Reduction (NLR) features to lower interior noise levels, and Zone III - generally incompatible with residential, educational and medical land uses.

Noise contours are based on the following factors:

- Total decibel levels produced based on total rounds of ammunition fired
- Total duration of exposure
- Time of exposure with a penalty for nighttime exposure

Construction projects at SBMR would be far enough from noise-sensitive areas to avoid significant noise impacts under both the Proposed Action and Reduced Land Acquisition. There would be no construction noise impacts under No Action.

Based on the information discussed above under affected environment, existing impacts from ordinance use under the No Action would be considered significant due to the presence of noise-sensitive land uses in Zone III and the possibility that some of the noise-sensitive land uses in Zone II have not been constructed with high enough Noise Level Reductions to ensure compatibility (see Figure 5-16).

The Proposed Action and Reduced Land Acquisition (RLA) Alternative would only slightly expand the existing Zone II and Zone III noise contours. The Zone II noise contour would expand eastward by about 985 to 1,300 feet (300 to 400 meters). The Zone III noise contour

would stay relatively the same as existing conditions, except for a contraction westward by about 650 to 820 feet (200 to 250 meters) in an area outside the northern boundary of SBMR west of the cantonment area and an expansion eastward by about 325 to 490 feet (100 to 150 meters) in the southwestern portion of the cantonment area. Some additional on-post housing would be encompassed by the expanded Zone II and Zone III noise contours. No change would occur to on-post schools – with one elementary school, Solomon Elementary School remaining exposed to Zone II noise conditions during its hours of operation. The slight increase of the Zone II and Zone III noise exposure to on-post housing areas would be due to an increase in the number of 155mm artillery rounds fired and an increase in nighttime artillery and mortar firing under the Proposed Action and the RLA Alternative. The increase in training may result in an increase in noise complaints from surrounding communities. The Proposed Action and RLA Alternative would only slightly increase existing noise conditions as discussed under the No Action – thereby remaining a significant impact to persons residing on or working at SBMR (see Figure 5-17).

Tactical and support vehicles would continue to travel within SBMR and between SBMR and other installations during military training exercises under all alternatives. The size of the military vehicle fleet assigned to the 2nd Brigade would increase from 659 vehicles to 1,005 vehicles under the Proposed Action and the RLA Alternative. The expansion of the vehicle fleet based at SBMR would include introduction of the Stryker. Despite increased numbers of vehicles, traffic volumes and vehicle speeds typically would be too low to cause noise problems for areas surrounding roadways and vehicle trails. Consequently, noise from military vehicle traffic would be a less than significant impact under all alternatives.

The Proposed Action and the RLA Alternative would not result in any meaningful changes in helicopter flight operations at WAAF, and therefore there would be no significant noise impacts from helicopter flights. Improvements to WAAF under the Proposed Action and the RLA Alternative would improve facilities for C-130 aircraft operations. Increased use of WAAF by C-130 aircraft would produce only minor changes in airfield vicinity noise levels, since airfield operations would continue to be dominated by helicopter flight activity. Changes in airfield vicinity noise levels would be less than significant under the Proposed Action and the RLA Alternative. There would be no changes to airfield vicinity noise levels under No Action.

The Proposed Action and the RLA Alternative would both introduce UAV operations into military air space over SBMR. Because most UAV flight activity is expected to be at flight altitudes providing separation from other aircraft flight activity, there would be no significant change in aircraft noise levels over SBMR or SBER.

Total military and civilian personnel based at SBMR would increase by 5.5 percent under the Proposed Action or the RLA Alternative. This would not produce a significant noise impact from added personal vehicle traffic along off-post or on-post roadways. No Action would not produce any change in personnel numbers at SBMR; consequently, there would be no noise impact from increased personal vehicle traffic under No Action.

Figure 5-17
Proposed Action Noise Levels at Schofield Barracks Military Reservation

Table 5-18 summarizes the significance of noise impacts under the Proposed Action, the RLA Alternative, and No Action.

Table 5-18
Summary of Potential Noise Impacts at SBMR/WAAF

Impact Issues	Proposed Action	Reduced Land Acquisition	No Action
Noise from construction activities	⊙	⊙	○
Noise from ordnance use	⊗*	⊗*	⊗
Noise from military vehicle use	⊙	⊙	⊙
Noise from aircraft operations	⊙	⊙	⊙
Noise from added personnel vehicle traffic	⊙	⊙	○

In cases when there would be both beneficial and adverse impacts, both are shown on this table. Mitigation measures would only apply to adverse impacts.

* The PA and RLA would have a minor increase in noise over No Action. The determination of significance is based on existing No Action noise levels.

LEGEND:

⊗ = Significant
⊘ = Significant but mitigable to less than significant
⊙ = Less than significant
○ = No impact
\+ = Beneficial impact
N/A = Not applicable

Proposed Action

The Army was concerned about the accuracy of significant adverse noise impacts that had been identified in the Draft EIS. As such, the noise model input parameters that were used for the Draft EIS were more closely evaluated, and it was found that certain incorrect assumptions had been made, namely that two noise model input parameters were incorrect, as follows:

- For the SBMR blast noise model input parameters used in the Draft EIS, it was assumed that approximately 33 percent of the overall volume of large-caliber weapons fire would occur between 10:00 PM and 7:00 AM. Under closer evaluation, it was determined that a more accurate estimate of weapons firing volumes for the 10:00 PM to 7:00 AM time period was approximately 10 percent of the overall firing volume.
- The blast noise modeling efforts were found to reference a slightly outdated and inaccurate equipment package; the input parameters were corrected to include the correct SBCT equipment package.

Correction of these blast noise model input parameters reduced the lateral noise contours slightly, but did not change the overall determination of a significant adverse impact on the local noise environment at SBMR.

Significant Impacts

Impact 1: Noise from ordnance use. Noise levels from weapons firing and ordnance detonations are quite variable, with noise levels at long distances influenced in part by weather conditions. Small arms firing can produce relatively high peak noise levels at localized areas around the range. Equations for estimating noise from small arms firing typically predict the peak unweighted dB value (Lpk). Because human hearing does not respond as rapidly as do noise monitoring instruments to impulse noise events, the 1/8 second Lmax noise level measurement is a better indicator of how people perceive impulse noise than the unweighted peak dB measurement is. The 1/8 second Lmax value typically will be about 15 to 20 dB less than the Lpk measure. Limited studies of annoyance from noise near civilian shooting ranges have found that the A-weighted 1/8 second Lmax value is the most useful predictor of annoyance (Sorensen and Magnusson 1979). For most small arms types, the A-weighted decibel value will be about 3.5 dB less than the unweighted decibel value. Thus, the A-weighted Lmax for small arms firing is about 20 dB less than the peak unweighted dB value. Lmax noise levels from small arms firing are typically about 94 to 101 dBA at 500 feet and 86 to 93 dBA at 1,000 feet. Noise levels from small arms firing typically drop below levels that cause significant annoyance at distances of about 3,500 feet (1,066 meters). Most blank ammunition for small arms and machine guns has a smaller propellant charge than that used for live ammunition. Consequently, noise from small arms blank ammunition typically generates noise levels about 4 to 5 dB below the noise level from live ammunition firing. Noise levels from firing blank small arms ammunition typically drop below levels that cause significant annoyance at distances of 2,500 to 3,000 feet (760 to 915 meters). Detonations of large caliber ordnance, such as a shell from a 155mm howitzer, can produce high peak noise levels at distances of up to two miles (three kilometers) and will be audible over longer distances, depending on weather conditions.

Future noise contours under the Proposed Action are illustrated in Figure 5-17. These noise contours are based on large caliber weapons firing and explosives use (US Army CHPPM 2004). The types of ordnance accounted for in the modeling analysis included 105mm and 155mm artillery, 60mm, 81mm, and 120mm mortars, antipersonnel mines, 40mm grenades, hand grenades, rockets and anti-tank missiles, and demolition charges. The modeling of noise contours for high explosive ordnance use is based on the expected annual amount of ordnance firing and ordnance detonations, taking into account the following factors:

- The locations of weapons firing points, target areas, and demolition training facilities on each training range;
- The types of weapons fired from each firing point on each range facility;
- The number of ordnance rounds of different types (including propellant charge differences) fired from each type of weapon at each firing point, with separate consideration of daytime firing events and nighttime firing events;
- The number and types of explosive ordnance items detonated at target areas or demolition training facilities on each range, with separate consideration of daytime and nighttime detonation events.

The Proposed Action noise contours reflect the following changes in munitions use at SBMR:

- 28 percent decrease in 105mm high explosive artillery rounds;
- 41 percent increase in other types of 105mm artillery rounds;
- 110 percent increase in 155mm high explosive artillery rounds;
- 227 percent increase in other types of 155mm artillery rounds;
- 0.3 percent decrease in high explosive mortar rounds;
- 128 percent increase in other types of mortar rounds;
- 20 percent increase in grenades;
- 53 percent decrease in mines;
- 488 percent increase in rockets; and
- 56 percent decrease in demolition charges.

Based on these modeling results, there would be a modest expansion of Zone II conditions and some small changes in the location of Zone III conditions within the SBMR ROI under the Proposed Action. Zone II conditions would expand eastward by about 985 to 1,300 feet (300 to 400 meters) to encompass additional troop and family housing areas on the eastern side of the Main Post. Zone II conditions would affect some undeveloped areas north and south of SBMR, but would not expand into existing off-post residential areas. Solomon Elementary School and Hale Kula Elementary School would remain under the Zone II noise contour (see Figure 5-17). However, as discussed under Section 5.6.1, in the absence of the nighttime noise penalty factor, Hale Kula Elementary is within Zone I conditions versus Zone II. Zone III conditions would remain unchanged or actually contract slightly in the northern portion of the Main Post, but would expand eastward by about 325 to 490 feet (100 to 150 meters) in the southwest corner of the cantonment area. Some additional family housing units would be encompassed by the Zone III contour in this area. The Zone II and Zone III noise contours would affect a larger portion of the developed cantonment area than occurs under existing conditions. Although the numerical increase in noise levels within the cantonment area at SBMR would be small, existing noise levels already represent a significant impact. Therefore, noise from increased ordnance use under the Proposed Action would remain a significant impact on people residing on or working at SBMR.

The primary factor resulting in the slight expansion of Zone II and Zone III noise exposure areas would be due to an increase in the number of 155mm artillery rounds fired and an increase in nighttime artillery and mortar firing. As with the existing condition, only about 10 percent of the total artillery and mortar firing would occur during nighttime hours (10:00 PM to 7:00 AM), although the number of individual ordnance items fired or detonated at night would increase by about 35 percent under the Proposed Action. The 10 percent nighttime training factor at SBMR is less than the more typical 15 percent factor that occurs at most Army installations. The increase in nighttime noise generation may result in an increase in noise complaints from surrounding communities. Because noise conditions would change

only slightly from the No Action, the Proposed Action and RLA Alternative would continue to have a significant but only slightly increased noise impact from ordnance use.

Mitigation 1. The Army proposes to evaluate training techniques, scheduling and location to reduce overall noise impacts at SBMR. In this evaluation, the Army would consider, as feasible, the benefit of timing restrictions on training and moving certain training activities to PTA.

The Army proposes to provide noise-insulating measures whenever new buildings are constructed or existing buildings are renovated, such as modifications to window materials and cooling systems to noise sensitive land uses that are or that may become exposed to Zone II and Zone III noise conditions.

Less than Significant Impacts

Noise from construction activities. The Proposed Action would require 11 construction projects at SBMR and WAAF, plus construction of a military vehicle trail between SBMR and HMR. Construction activities would occur from 2004 through early 2009. Individual items of construction equipment typically generate noise levels of 80 to 90 dBA at a distance of 50 feet (15 meters). With multiple items of equipment operating concurrently, noise levels can be relatively high during daytime periods at locations within several hundred feet of active construction sites. The zone of relatively high construction noise levels typically extends to distances of 400 to 800 feet (122 to 244 meters) from the site of major equipment operations. Locations more than 1,000 feet (305 meters) from construction sites seldom experience significant levels of construction noise.

Table 5-19 summarizes the estimated minimum distance between the sites for proposed construction projects and the nearest noise-sensitive land uses.

Construction noise levels would vary throughout the duration of each construction project. Typical construction site noise levels have been estimated for the different major construction stages of selected projects that are relatively close to noise-sensitive land uses. The noise levels estimated for these projects provide a reasonable estimate of construction noise levels expected for other construction projects.

Figure 5-18 illustrates noise levels expected from the noisiest stage of construction (foundation excavation and paving) for the VFTF. Construction activities would generate average daytime noise levels of about 55 dBA at the closest noise-sensitive area. Because incremental Ldn contributions from construction activities would be less than 65 dBA at the nearest noise-sensitive areas (1,950 feet distant), construction noise would be a less than significant impact.

Table 5-19
Estimated Minimum Distance Between Construction Sites and Noise-Sensitive Land Uses

Proposed Project	Distance to Closest Noise-Sensitive Receptor	Noise-Sensitive Land Use Type
S1. Urban Assault Course and Training Facility	9,150 feet (2,789 meters)	family housing
S2. Virtual Fighting Training Facility	1,950 feet (594 meters)	family housing
S3. Range Control Facility	1,050 feet (320 meters) 1,050 feet (320 meters)	troop housing family housing
S4. Battle Area Complex	1,500 feet (457 meters) 4,350 feet (1,326 meters)	troop housing family housing
S5. Motor Pool Maintenance Shops	450 feet (137 meters) 1,050 feet (320 meters)	family housing Solomon Elementary School
S6. Tactical Vehicle Wash	900 feet (274 meters)	Wahiawā Middle School
S7. Fixed Tactical Internet	not evaluated	construction activities too limited to create noise issues
S9. QTR1 Qualification Training Range	1,500 feet (457 meters) 4,350 feet (1,326 meters)	troop housing family housing
S10. QTR2 Qualification Training Range	4,800 feet (1,463 meters)	family housing
S11. Multiple Deployment Facility	2,250 feet (686 meters)	family housing
S12. Upgrade WAAF Apron for C-130 Aircraft	1,500 feet (457 meters) 3,000 feet (914 meters)	family housing Wheeler Elementary and Intermediate School
S13. Helemanō Military Vehicle Trail	1,200 feet (366 meters) 1,000 feet (305 meters)	family housing Hale Kula Elementary School

Source: Tetra Tech staff analyses 2003

Figure 5-19 illustrates noise levels expected from the noisiest stage of construction (completion of the building shell) for the Range Control Facility. Construction activities would generate average daytime noise levels of about 63 dBA at the closest noise-sensitive area, which is 1,050 feet distant. Because incremental Ldn contributions from construction activities would be less than 65 dBA at the nearest noise-sensitive areas, construction noise would be a less than significant impact.

Figure 5-20 illustrates noise levels expected from the noisiest stage of construction (paving operations) for the Motor Pool Maintenance Shops. Most of the large vehicle parking area would be a substantial distance from family housing areas north of Lyman Road, but the closest portion of the area to be paved is about 450 feet (137 meters) from the housing area. When construction activity is closest to the housing area, daytime average noise impact

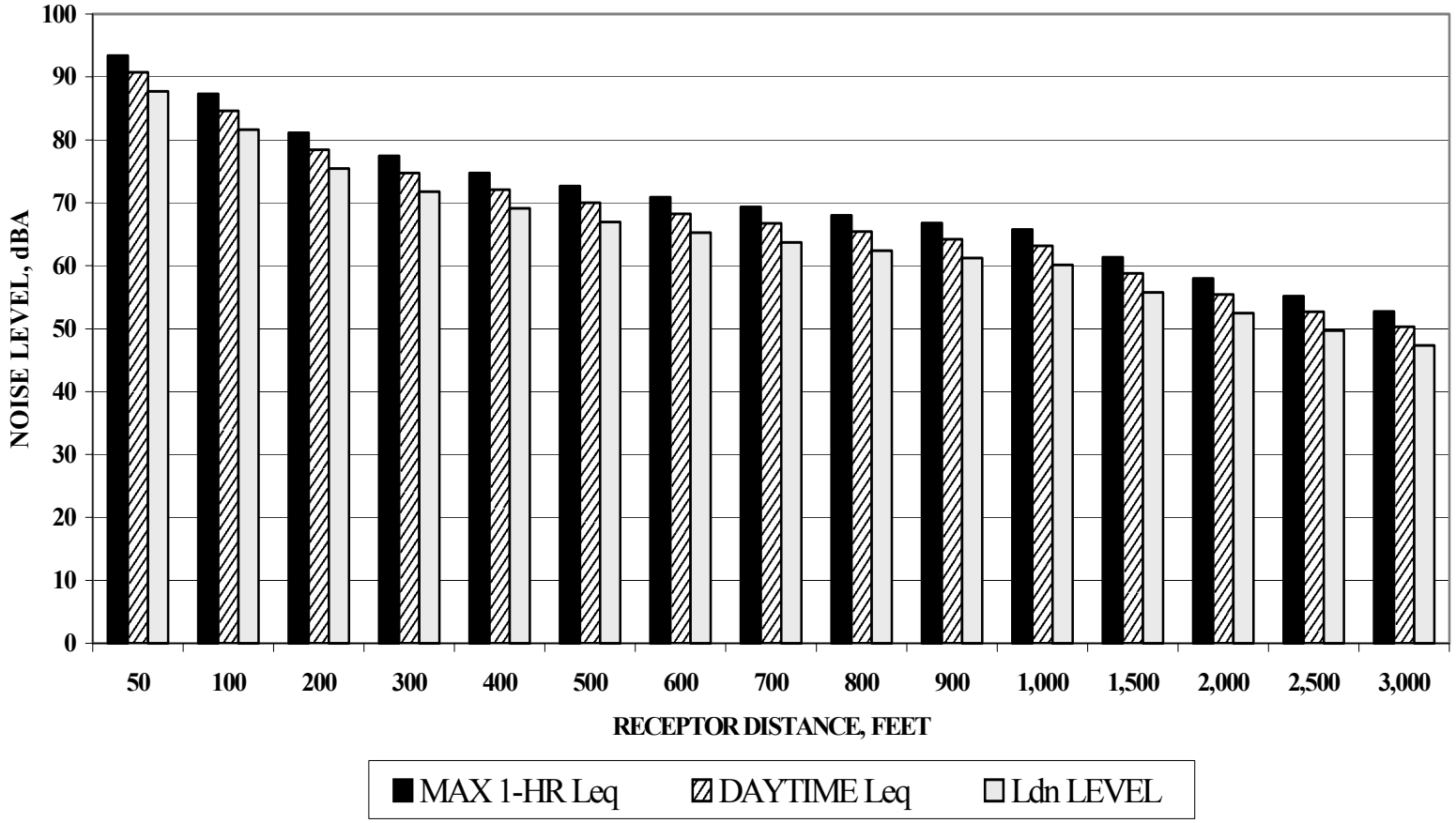

Figure 5-18 Construction Noise Impacts for Virtual Fighting Facility: Foundations & Paving

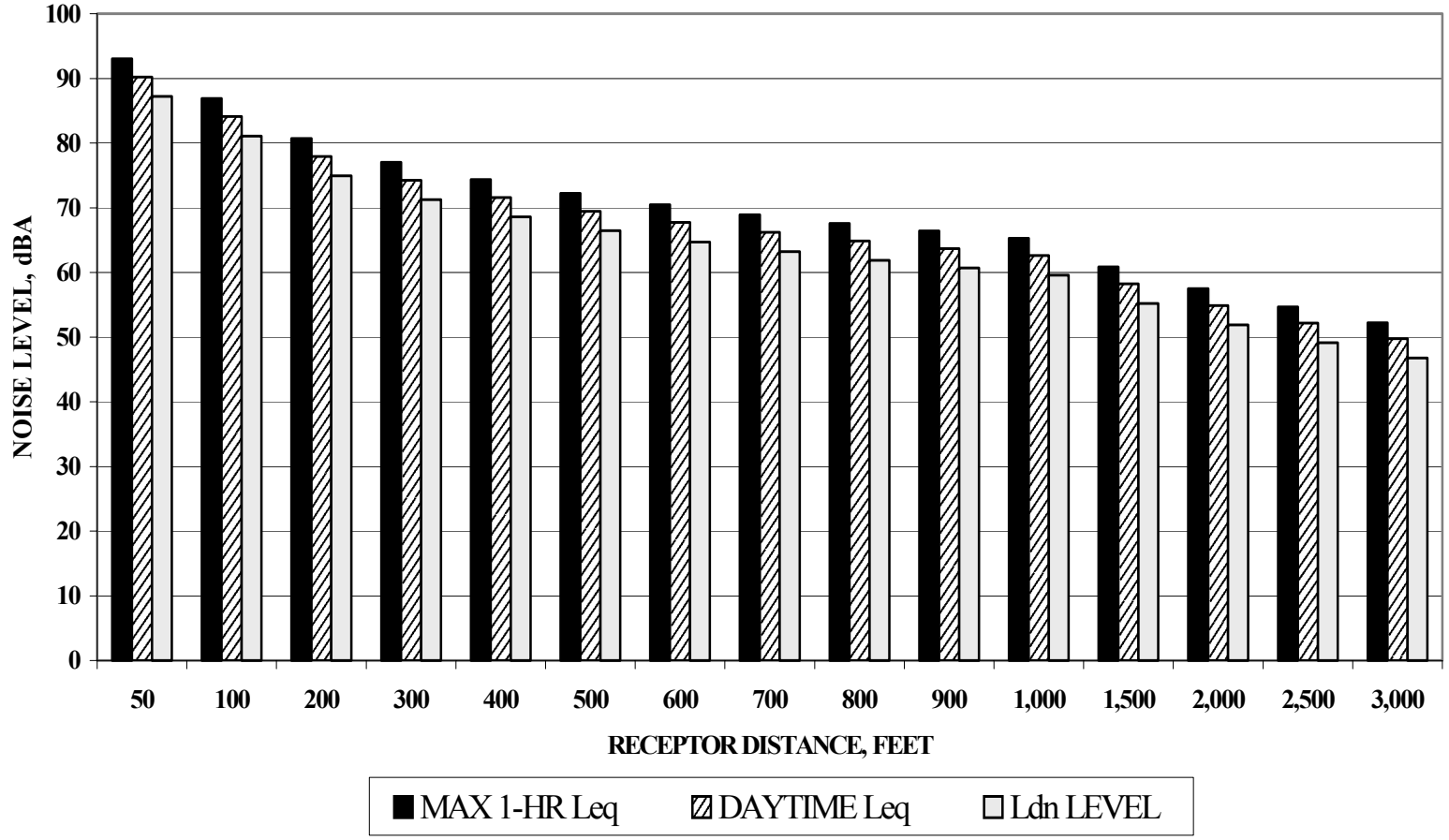

Figure 5-19 Construction Noise Impacts for Schofield Range Control Building: Building Shell

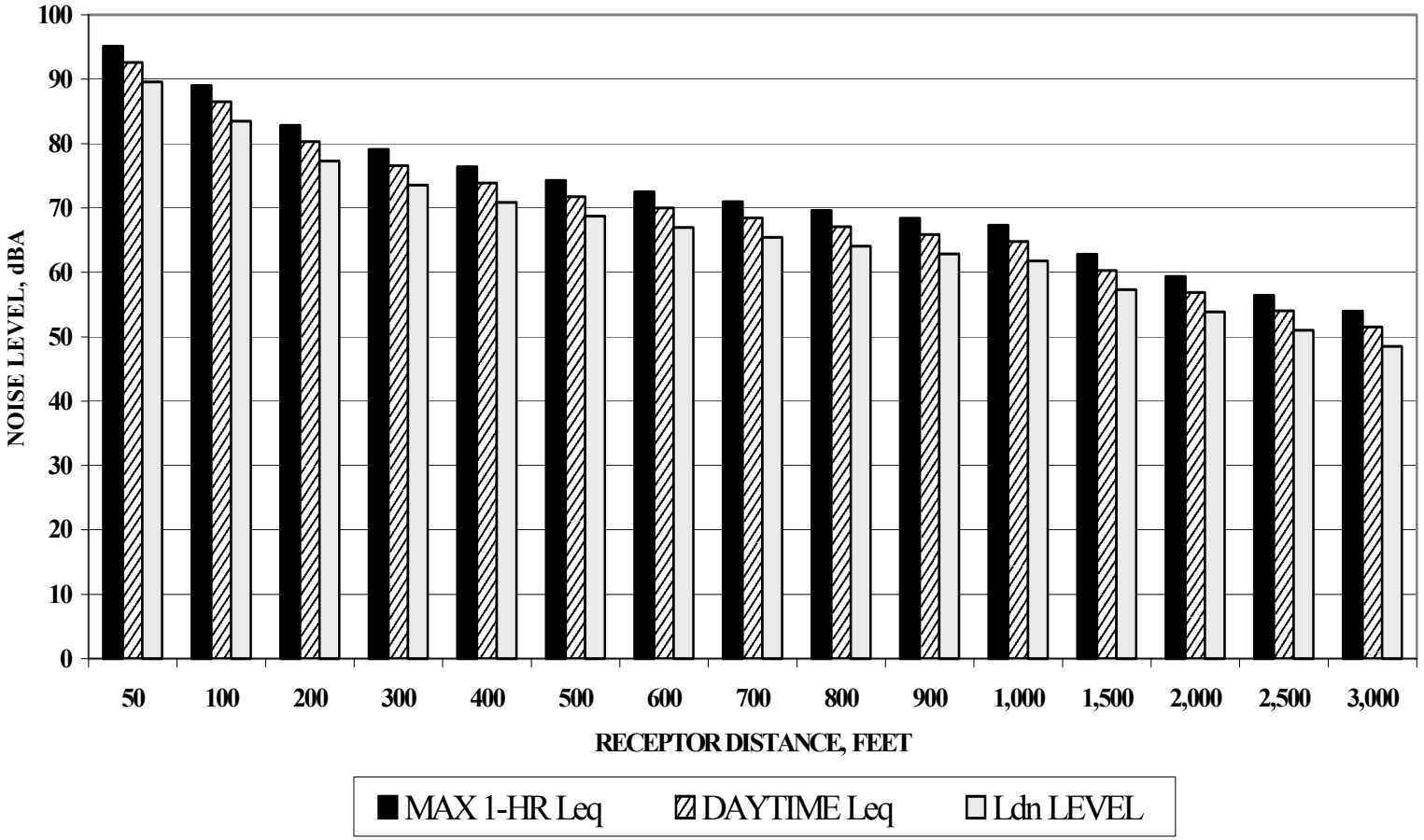

Figure 5-20 Construction Noise Impacts for Schofield Motor Pool Facility: Paving

would be about 72 dBA. The Ldn increment attributable to construction activities would be about 70 dBA. Maximum noise impacts at Solomon Elementary School would be a daytime average noise level of about 65 dBA and a maximum one-hour noise level of about 67 dBA. The noise estimates do not account for partial noise shielding that would be provided by buildings between the school site and the motor pool facility construction site. While construction activities would temporarily contribute Ldn increments of up to 70 dBA at the closest housing area, all of the noise would occur during daytime periods. No nighttime construction activity is expected. Consequently, this impact is considered less than significant.

Figure 5-21 illustrates noise levels expected from the noisiest stage of construction (excavation of lagoons and paving activities) for the Tactical Vehicle Wash Facility. Construction activities would generate average daytime noise levels of about 64 dBA at the closest noise-sensitive area, the south boundary of the Wahiawā Elementary School site (900 feet distant). Because average daytime noise contributions from construction activities would be less than 65 dBA at the nearest noise-sensitive area, construction noise would be a less than significant impact.

Figure 5-22 illustrates noise levels expected from the noisiest stage of construction (pavement removal) for the WAAF apron upgrade project. Construction activities would generate average daytime noise levels of about 60 dBA at the closest noise-sensitive area a family housing area 1,500 feet (460 meters) away. Average daytime noise levels would be about 51 dBA at the more distant Wheeler Elementary and Intermediate School (3,000 feet [900 meters] distant). Because incremental Ldn contributions from construction activities would be less than 65 dBA at the nearest noise-sensitive areas, construction noise would be a less than significant impact.

Most other construction projects would be further removed from noise-sensitive locations than the projects discussed above. Consequently, noise impacts from these projects would be less than the noise impacts discussed above. The noise levels presented in Figures 5-18 through 5-22 are typical and could be expected during construction of those other projects.

While construction schedules partially or fully overlap in various combinations, only two pairs of construction projects would occur concurrently in proximity to each other. The BAX and QTR1 would both be constructed in a similar time frame. These facilities would be 1,500 feet (457 meters) from the nearest noise sensitive area, a distance sufficient to offset the combined effect of construction activity at the two sites. The WAAF apron upgrade would occur concurrently with construction of the MDF. The MDF would be more than 750 feet (229 meters) further from the nearest noise sensitive area than the WAAF apron upgrade project site. Distances to the nearest noise-sensitive area are sufficient to avoid significant noise impacts from the concurrent construction activities.

Based on the analysis summarized above, construction activities associated with the Proposed Action would have a less than significant noise impact.

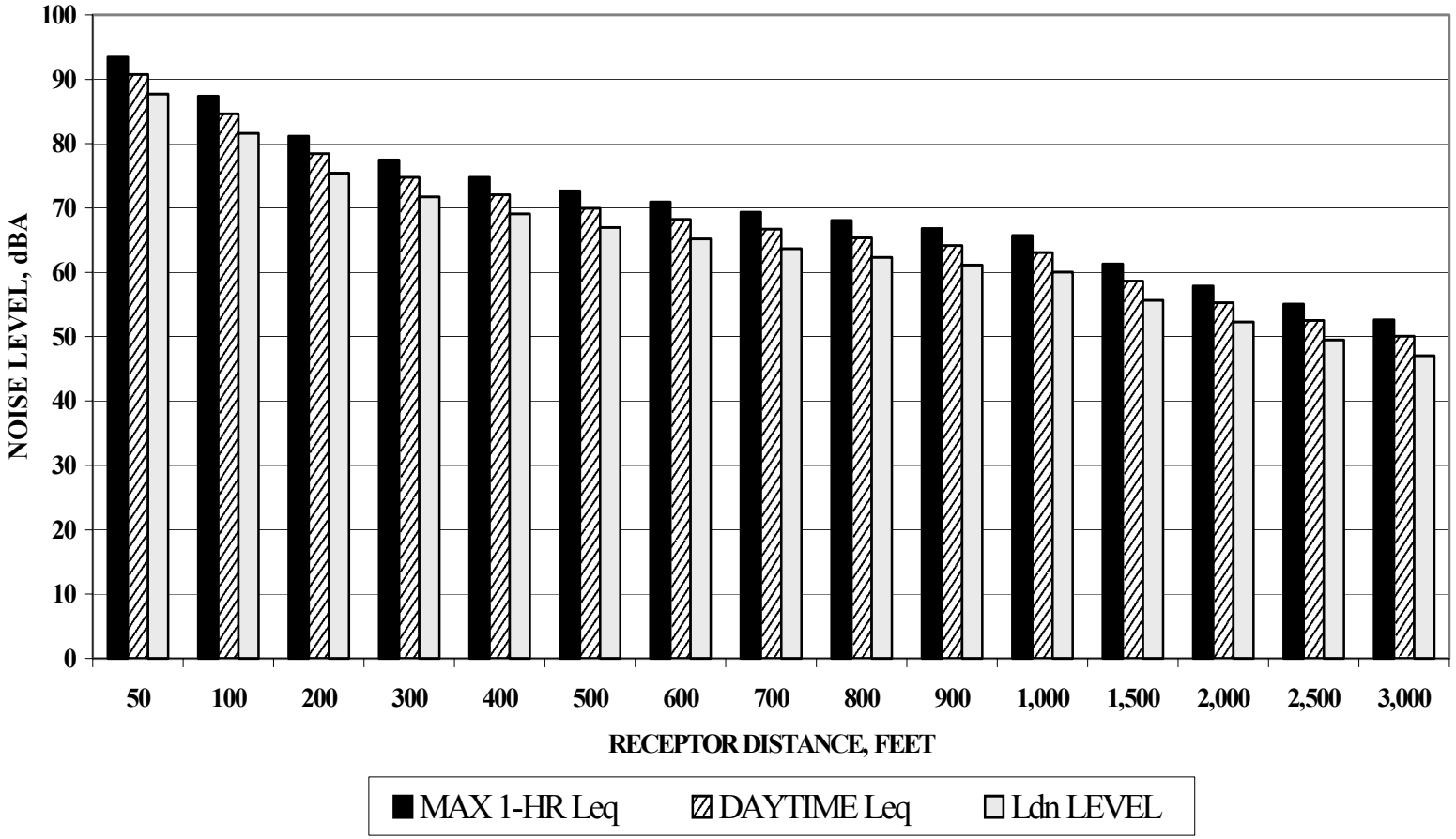

Figure 5-21 Construction Noise Impacts for Schofield Vehicle Wash Facility: Lagoons and Paving

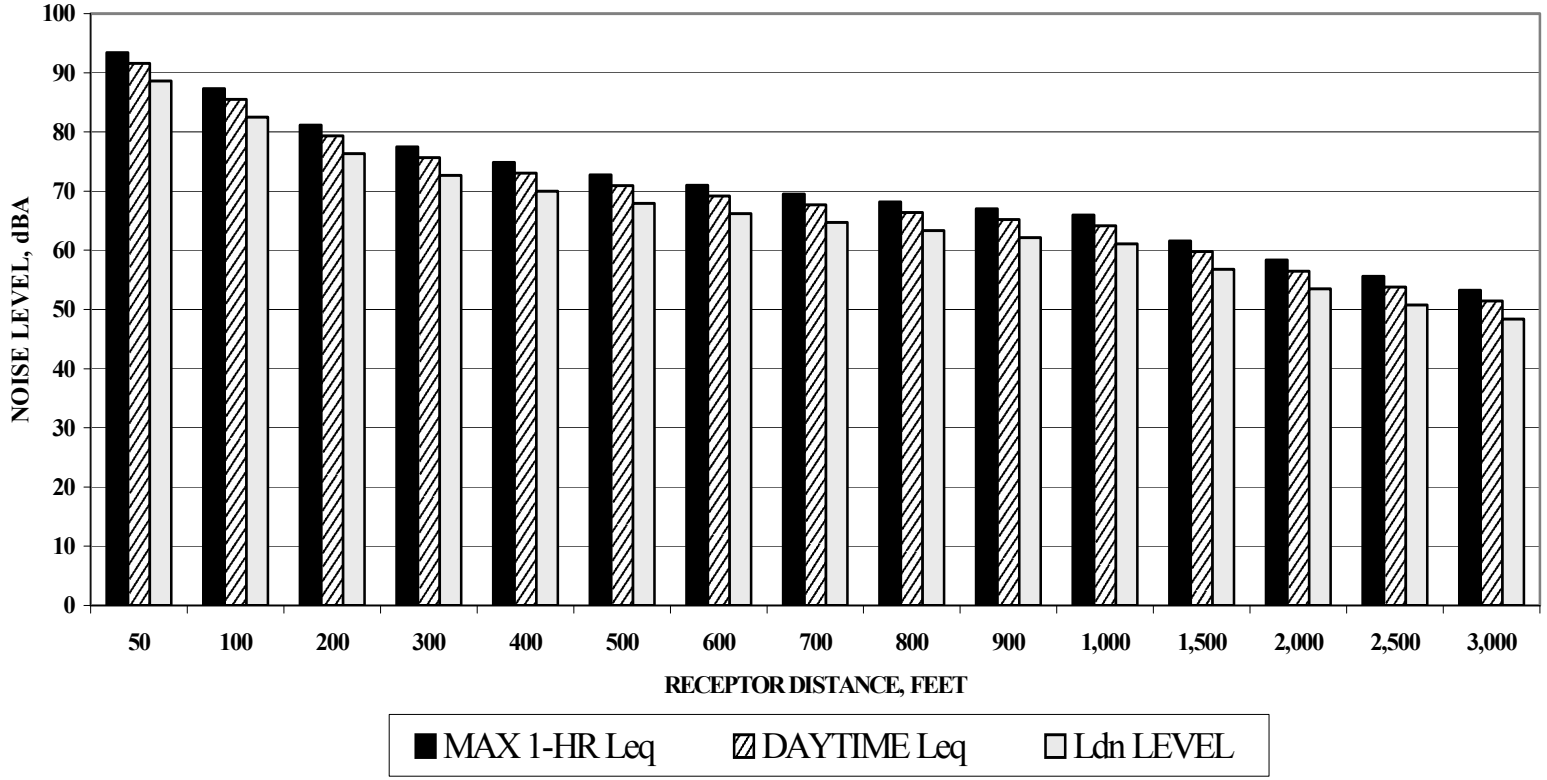

Figure 5-22 Construction Noise Impacts for Wheeler Airfield Apron Upgrade: Pavement Removal

Noise from military vehicle use. Tactical and support vehicles would travel within SBMR during military training exercises. Vehicles also would travel from SBMR to other installations in support of training exercises at those installations. Vehicle convoys using public roads on O'ahu are limited to no more than 24 vehicles in a group. Vehicles within a convoy group (also called convoy serials) typically are spaced about 165 to 330 feet (50 to 101 meters) apart. Convoy serials generally are spaced at least 15 to 30 minutes apart. These convoy procedures prevent situations where convoy vehicles dominate local traffic flow for substantial periods of time. Instead of creating conditions where military vehicle traffic dominates traffic noise conditions for a noticeable amount of time, convoy procedures result in noise from convoy traffic occurring as a sequence of multiple individual vehicle pass-by events within a background of normal traffic noise conditions.

Noise data are not readily available for most military vehicles, and noise data specific to the Stryker vehicle are not yet available. Noise data for heavy construction equipment provide some general guidance regarding expected noise levels from military vehicles. Vehicle noise generation equations used in highway traffic noise models provide additional useful noise estimates for various types of trucks and passenger vehicles. Limited vehicle drive-by noise data are available for the Bradley Fighting Vehicle (US Army Construction Engineering Research Laboratory 1985). The Bradley Fighting Vehicle is a tracked vehicle that has a larger engine (500 horsepower) and is heavier (25 to 33 tons) than the Stryker (which has a 350 horsepower engine and weighs 19 to 20 tons). Consequently, drive-by noise data for the Bradley Fighting Vehicle can be used as an upper limit for the expected noise levels from wheeled military vehicles.

Figure 5-23 summarizes maximum drive-by noise levels as a function of speed for various categories of vehicles. Noise levels for the three categories of multi-axle heavy trucks are quite similar at most vehicle speeds. Noise levels generated by the Stryker are expected to fall between those of multi-axle heavy trucks and those of the Bradley Fighting Vehicle.

Under the Proposed Action, the number of military vehicles assigned to the 2nd Brigade at SBMR would increase by slightly more than 52 percent. Most of the added vehicles would be Strykers, but 50 military vehicles of other types also would be added. Each of the 12 subordinate commands based at SBMR has its own vehicle fleet. The total government-owned vehicle fleet based at SBMR has not been inventoried for this EIS, but it exceeds 2,000 vehicles. Under the Proposed Action, Stryker vehicles would account for no more than 12 to 15 percent of the total military vehicle fleet based at SBMR. Military vehicle traffic, dominated by HMMWVs, light trucks, and medium trucks, would be expected to produce noise levels comparable to normal highway traffic that has a high fraction of medium and heavy trucks. Noise levels from individual vehicle pass-bys would be comparable to noise levels generated by typical highway truck traffic. The Stryker vehicle is expected to generate peak drive-by noise levels a few decibels higher than levels produced by typical multi-axle heavy trucks.

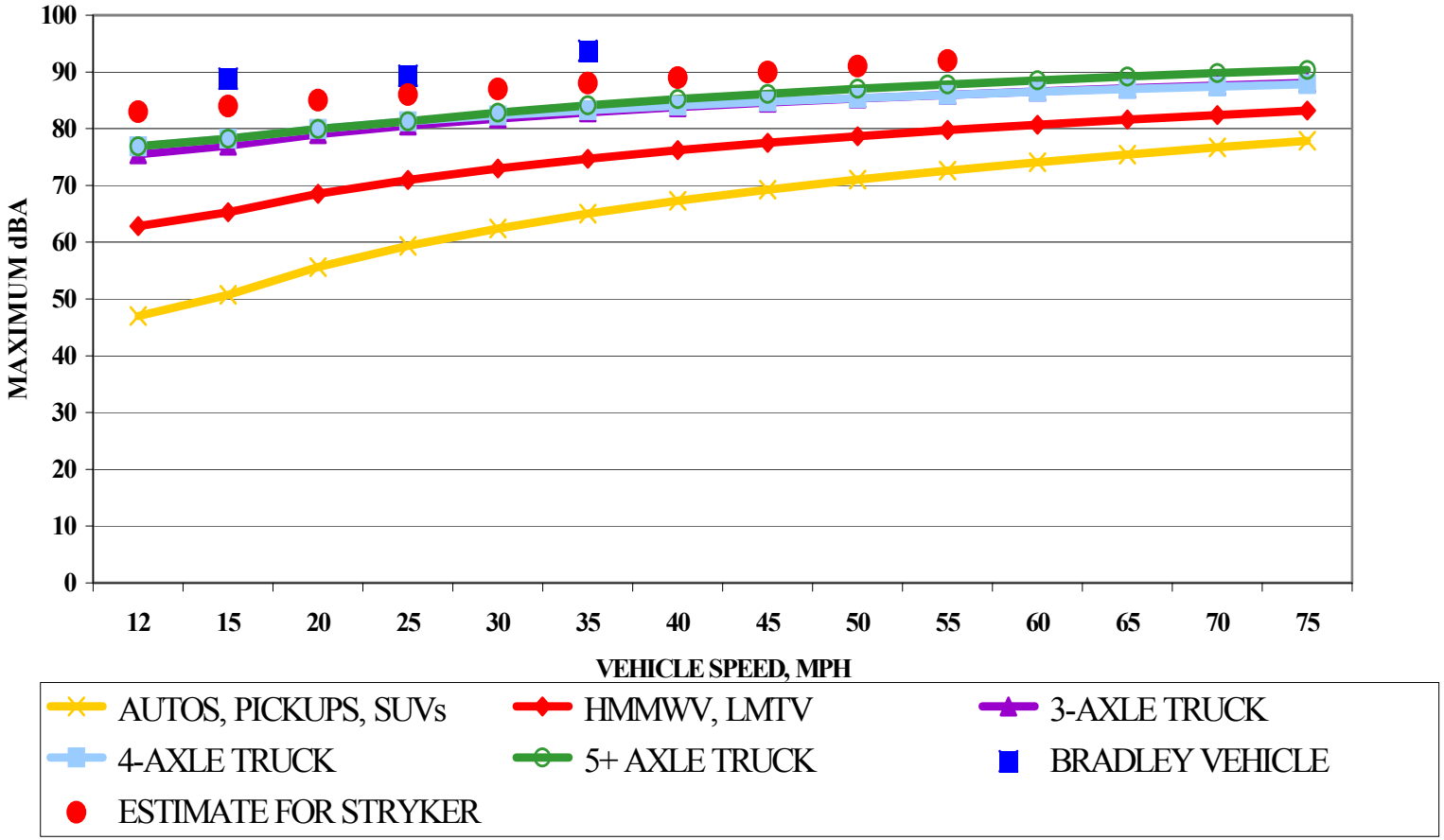

Figure 5-23 Peak Pass-by Noise Levels at 50 Feet (15 meters) for Different Vehicle Types

In general, it takes a doubling of noise source activity to create a 3 dBA increase in noise levels. This means that it takes a doubling of traffic volume to produce a 3 dBA change in resulting traffic noise levels. A 3 dBA noise level increase represents a 23 percent increase in perceived loudness. A 10 dBA noise level increase represents a doubling of perceived loudness. The procedures used for military convoy travel would prevent convoy traffic from substantially increasing traffic volumes on public roadways. Consequently, the Proposed Action would not produce any substantial change in traffic noise levels along public roads.

Noise levels along on-post roadways and along military vehicle trails would increase under the Proposed Action. However, overall traffic volumes and vehicle speeds generally are low for these types of roadways. As a result, noise increments attributable to vehicle traffic would remain within the Army's land use compatibility guidelines.

Traffic on military vehicle trails between SBMR and other installations would increase noise levels along the trail corridors during the periods of vehicle travel. Up to 56 vehicles might travel at one time between SBMR and DMR, and up to 173 vehicles might travel at one time between SBMR and KTA. Figure 5-24 illustrates average hourly noise levels for different volumes of vehicle traffic along a one-lane military vehicle trail such as Helemanō Trail. If the maximum number of vehicles departed within a single hour, the resulting hourly average noise level would be about 72 dBA at a distance of 50 feet (15 meters) from the trail, and less than 60 dBA at a distance of 400 feet (122 meters). Because there are no noise-sensitive land uses immediately adjacent to Helemanō Trail, these noise levels would be a less than significant impact. The smaller size of vehicle convoys to DMR would result in lower noise levels along the Dillingham Trail than along the Helemanō Trail.

Military vehicle maneuvers would occur along unpaved roads and in various off-road areas at SBMR and SBER. Vehicle noise during these activities would include peak pass-by noise levels as illustrated in Figure 5-23 and average hourly noise levels as illustrated in Figure 5-24. The peak pass-by noise levels illustrated in Figure 5-23 are representative of close distances (50 feet (15 meters) from the vehicle travel path). Peak pass-by noise levels would drop by 15 dBA at a distance of 500 feet (152 meters) from the travel path. Vehicle maneuvers would occur during both daytime and nighttime hours, making vehicle maneuver activity noise an issue of concern where residential land uses and school sites are close to SBER boundaries. Because vehicle speeds are low during most maneuver activities and because vehicles tend to be relatively dispersed during off-road maneuvers, maneuver activities would be expected to produce hourly average noise levels of less than 55 dBA at a distance of about 500 feet (152 meters), with brief peaks of 65 to 70 dBA. Such noise levels would not cause significant noise impacts at off-post noise-sensitive land uses during daytime hours. These noise levels would be more disturbing during nighttime hours. As noted in Chapter 2, the Army has established a 1,000-foot (305-meter) noise buffer along those portions of SBER that border residential areas of Wahiawā. As long as nighttime vehicle maneuver activity is minimized in this buffer area, vehicle noise from training and maneuver activities would be a less than significant impact under the Proposed Action.

Noise from aircraft operations. The Proposed Action would not result in any meaningful changes in flight operations at WAAF. Improvements to WAAF under the Proposed Action would improve facilities for C-130 aircraft operations. Increased use of WAAF by C-130 aircraft would increase airfield vicinity noise levels somewhat. However, noise conditions in the vicinity of WAAF would continue to be

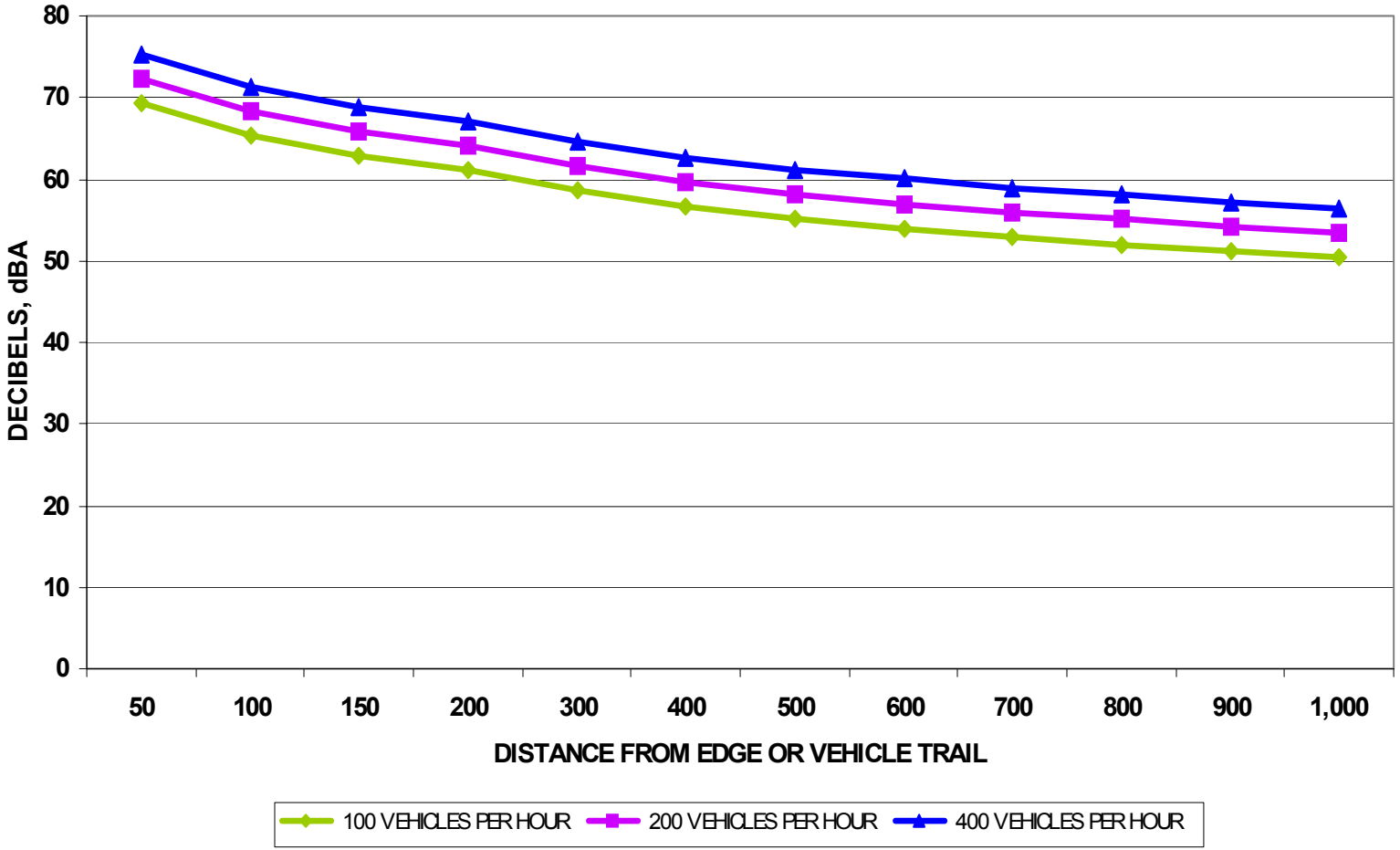

Figure 5-24 Hourly Average Traffic Noise Levels Along the Helemanō Military Vehicle Trail

dominated by helicopter flight operations. The 65 dBA Ldn contour around WAAF extends into Leilehua Golf Course but not into any residential area (USAEHA 1993b; US Army CHPPM 1999). Overall changes in airfield vicinity noise levels would be less than significant under the Proposed Action.

Current levels of helicopter and fixed wing aircraft flight operations would continue over SBMR and SBER under the Proposed Action, and UAV flight operations also would be conducted. Figure 5-25 illustrates peak flyover event noise levels for various helicopters, fixed wing aircraft, and the UAV. Noise level data for the Shadow 200 UAV are limited to ground test measurements with the engine at either an idle setting or at a high power setting. The Shadow 200 UAV produces a noise level of 85 dBA at a distance of about 70 feet (21 meters) when the engine is at an idle power setting, and a noise level of 85 dBA at a distance of about 342 feet (10 meters) when the engine is at a high power setting (US Army 2001a). The UAV noise levels shown in Figure 5-25 represent a high power setting. It is likely that typical flight operations would involve an engine power setting of less than 100 percent. Thus, the UAV noise levels presented in Figure 5-25 are probably a slight overestimate for typical flight conditions.

Helicopters normally operate at low flight altitudes. C-130 aircraft also may operate at low flight altitudes when conducting cargo drop training. In most cases, the UAV would be expected to operate at relatively high altitudes to avoid conflict with other helicopter and aircraft flight activity. As a result, the addition of UAV flight activity to current patterns of aircraft and helicopter flight operations would not result in any noticeable change in noise levels from aircraft flight operations. About half of the complaints received by SBMR are concerned with helicopter and fixed-wing aircraft operations over SBER or between WAAF and other installations. Although residents of areas surrounding SBMR are likely to file occasional complaints about low flying aircraft and helicopters, historically the complaints have been about discrete flyover events rather than overall average noise levels. As indicated by past estimates of noise contours around WAAF and by the noise contours for large caliber weapons firing, presented in Figure 5-17, noise levels associated with SBMR and SBER do not cause noise levels in off-post residential areas to exceed generally accepted land use compatibility criteria. Consequently, noise from aircraft operations at SBMR would be a less than significant impact under the Proposed Action.

Noise from added personal vehicle traffic. The Proposed Action would result in a 5.5 percent increase in combined military and civilian personnel based at SBMR. This would produce a change in traffic noise levels of only 0.23 dBA. Most people cannot detect a noise level change of less than 1.5 dBA. Consequently, noise from added personal vehicle traffic would be a less than significant impact under the Proposed Action.

No Impacts

Noise from construction activities. There would be no construction noise impacts from the construction of QTR2 at the SRAA because of its distance from any potential sensitive receptors.

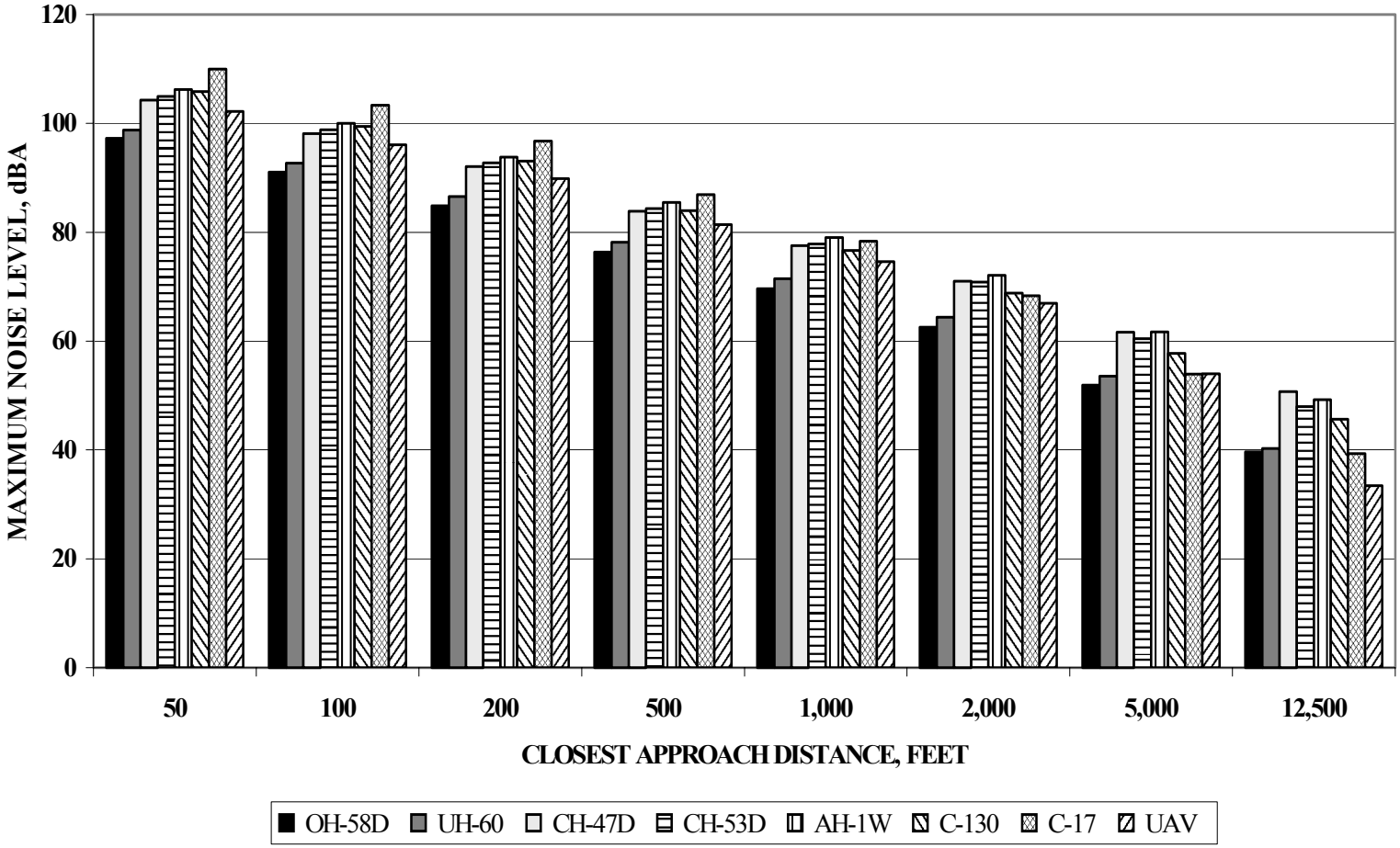

Figure 5-25 Maximum 1-Second Average Noise Levels from Aircraft and Helicopter Flyover Events

Reduced Land Acquisition

The RLA Alternative noise impacts would be the same as under the Proposed Action, with minor differences as discussed below.

Significant Impacts

Impact 1: Noise from ordnance use. The RLA Alternative would result in the proposed QTR2 range being located at PTA instead of in the SRAA. Except for the resulting reduction in small arms firing at SBMR, types and quantities of ordnance use would be the same as for the Proposed Action. Because noise from ordnance use is dominated by artillery and other high explosives use, noise conditions associated with ordnance use would be the same as previously discussed for the Proposed Action. Zone III conditions would expand slightly in the southern part of the Main Post to encompass some additional family housing areas. Zone II conditions would expand somewhat to encompass additional troop housing and family housing areas on the eastern side of the Main Post. Solomon Elementary School would continue to be exposed to Zone II noise conditions during its hours of operation. The increase in nighttime training may increase the frequency of complaints about noise and vehicle traffic. Because noise conditions would exceed Army standards for compatibility with family housing, troop housing, medical facilities, and schools, the RLA Alternative would continue to have a significant noise impact from ordnance use on persons residing on or working at SBMR.

Additional Mitigation 1. Potential mitigation measures being considered by the Army are:

- An evaluation of training techniques, scheduling and location to reduce overall noise impacts. In this evaluation, the Army would consider, as feasible, the benefit of timing restrictions on training and moving certain training activities to PTA.
- Providing noise insulation measures whenever new buildings are constructed or existing buildings are renovated, such as modifications to window materials and cooling systems to noise sensitive land uses that are or that may become exposed to Zone II and Zone III noise conditions.

Less than Significant Impacts

Noise from construction activities. The RLA Alternative would require the same new facilities as the Proposed Action, but the QTR2 range facility would be built at PTA rather than in the SRAA. Moving construction of QTR2 to PTA would not result in a decrease in construction noise impacts as compared to the Proposed Action, because, as noted above, there are no construction noise impacts associated with QTR2.

Noise from military vehicle use. Military vehicle use at SBMR would be nearly the same under the RLA Alternative as previously discussed under the Proposed Action. The major difference would be that there would be no on-post transport of troops to the QTR2 range. Other aspects of on-post and off-post military vehicle use would be the same. Consequently, similar vehicle activity under the RLA Alternative would have less than significant noise impacts.

No Action

Significant Impacts

Impact 1: Noise from ordnance use. Existing live-fire training would continue under No Action. As discussed in Section 5.6.1, much of the cantonment area is affected by Zone II and Zone III noise conditions. Solomon Elementary School would continue to be exposed to Zone II noise conditions during its hours of operation. Continued exposure of troop housing, family housing, and schools to Zone II and Zone III noise conditions would be a significant impact under No Action.

Additional Mitigation 1. Potential mitigation measures being considered by the Army are:

- An evaluation of training techniques, scheduling and location to reduce overall noise impacts. In this evaluation, the Army would consider, as feasible, the benefit of timing restrictions on training and moving certain training activities to PTA.
- Providing noise insulation measures whenever new buildings are constructed or existing buildings are renovated, such as modifications to window materials and cooling systems to noise sensitive land uses that are or that may become exposed to Zone II and Zone III noise conditions, with a priority given to school and family housing areas affected by Zone III conditions.

Less than Significant Impacts

Noise from military vehicle use. The fleet of military vehicles based at SBMR would remain unchanged (659 vehicles) under No Action. As noted in the discussion of the Proposed Action, military vehicle convoys, on-post vehicle traffic, vehicle traffic on military vehicle trails, and vehicle maneuver training activities would not generate significant noise levels. Consequently, noise from military vehicle traffic would be a less than significant impact under No Action.

Noise from aircraft operations. Flight operations from WAAF would remain the same as current conditions under No Action. Similarly, flight activity in the airspace over SBMR would be the same. Although residents of areas surrounding SBMR would continue to file occasional complaints about low flying aircraft and helicopters, the complaints generally would be about discrete flyover events rather than overall average noise levels. Consequently, noise from aircraft and helicopter flight operations is considered a less than significant impact under No Action.

No Impacts

Construction Noise. No SBCT construction projects are associated with No Action, so there would be no noise impacts from construction under No Action, although there might be minor impacts from current construction projects.

Noise from Added Personal Vehicle Traffic. There would be no additional personnel based at SBMR under No Action, so there would be no noise impacts from added personal vehicle traffic.