NOISE IMPACT ANALYSIS

WAL-MART SUPERCENTER

CITY OF ONTARIO, CALIFORNIA

Prepared for:

David Evans and Associates, Inc.
Attn: Josephine Alido
10601 Civic Center Drive, Suite 10
Rancho Cucamonga, CA 91730

Date:

March 30, 2007

Project No.: P06-024N

NOISE SETTING

NOISE DESCRIPTORS

Sound is mechanical energy transmitted by pressure waves in a compressible medium such as air. Noise is generally defined as unwanted sound. Sound is characterized by various parameters that describe the rate of oscillation of sound waves, the distance between successive troughs or crests, the speed of propagation, and the pressure level or energy content of a given sound wave. In particular, the sound pressure level has become the most common descriptor used to characterize the loudness of an ambient sound level.

The unit of sound pressure expressed as a ratio to the lowest sound level detectable by a young person with good auditory acuity is called a decibel (dB). Because sound or noise can vary in intensity by over one million times within the range of human hearing, decibels are a logarithmic progression used to keep sound intensity numbers at a convenient and manageable level. Since the human ear is not equally sensitive to all sound frequencies within the entire spectrum, noise levels at maximum human sensitivity are factored more heavily into sound descriptions in a process called "A-weighting" written as dBA. Any further reference to decibels written as "dB" should be understood to be A-weighted.

Time variations in noise exposure are normally expressed in terms of a steady-state energy level equal to the energy content of the time varying period (called Leq), or, alternately, as a statistical description of the sound level that is exceeded over some fraction of a given observation period. Finally, because community receptors are more sensitive to unwanted noise intrusion during the evening and at night, state law requires that, for planning purposes, an artificial dB increment be added to quiet time noise levels in a 24-hour noise descriptor called the Community Noise Equivalent Level (CNEL).

NOISE STANDARDS

The City of Ontario has adopted noise/land use compatibility guidelines for acceptable community noise levels that are based upon the CNEL rating scale. The guidelines rank noise/land use compatibility in terms of varying degrees of acceptability of noise levels for various land use types.

The City of Ontario noise/land use compatibility standard for retail uses considers exterior levels of up to 70 dBA CNEL to be “clearly acceptable” with such uses. Exterior exposures up to 75 dBA CNEL are considered “normally compatible” with commercial retail without any need for dramatic acoustical upgrades. Residential uses are considered “clearly acceptable” with ambient noise environments of 60 dBA CNEL or less. The “normally acceptable” exterior noise level is 65 dBA CNEL for multi and single family residential uses. Land uses that are proposed with “normally acceptable” zones must demonstrate that adequate noise insulation features are incorporated into project design to not interfere with meeting interior noise exposure goals. The Ontario noise compatibility matrix is shown in Figure 1.

Figure 1

Ontario Land Use Compatibility Guidelines for Exterior Community Noise

Land Use Category	Community Noise Exposure CNEL, dB			
	Clearly Acceptable	Normally Acceptable	Normally Unacceptable	Clearly Unacceptable
Residential Single Family, Duplex	50-60	60-65	65-70	Above 70
Multi-Family	50-60	60-65	65-75	Above 75
Mobile Homes	50-60	60-65	--	Above 65
Schools, Libraries, Churches, Hospitals, Nursing Homes	50-60	60-65	65-70	Above 70
Transient Lodging: Motels, Hotels	50-65	65-70	70-80	Above 80
Auditoriums, Concert Halls, Amphitheaters	50-55	55-60	60-70	Above 70
Sports Arena, Outdoor Spectator Sports	50-60	60-65	65-75	Above 75
Playgrounds, Neighborhood Parks	50-65	65-70	70-75	Above 75
Commercial Offices	50-65	65-75	75-8-	Above 80
Commercial Retail	50-70	70-75	75-80	Above 80
Industrial, Manufacturing, Utilities	50-70	70-75	75-85	-

Clearly Acceptable: No special noise insulation required, assuming buildings of normal conventional construction.

Normally Acceptable: Acoustical reports will be required for major new construction. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.

Normally Unacceptable: New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

Clearly Unacceptable: New construction or development should generally not be undertaken.

Source: Ontario General Plan Noise Element

The City of Ontario's General Plan states that for single and multifamily residential projects, the CNEL should not exceed 65 dB at exterior living areas, or 45 dB at interior living areas. At commercial retail spaces, the interior CNEL should not exceed 55 dB. There is no exterior standard for commercial retail development.

Land Use	Interior Standard	Exterior Standard
Residential	45 dB CNEL	65 dB CNEL
Retail & Restaurants	55 dB CNEL	--

CNEL-based standards are used to make land use decisions as to the suitability of a given site for its intended use. They apply to those noise sources not amenable to local control such as on-road traffic, aircraft, trains, etc. Because cities cannot regulate the noise created by such sources, they control the types of land use or levels of mitigation required by the receiving property. The City's General Plan therefore does not specifically regulate the noise transmission from one land use to another, but rather identifies the acceptable levels of noise experienced by a land use from noise sources that are exempted from local control (on-road traffic, Ontario Airport, railroads, etc.)

Those sources that are amenable to direct regulation are detailed in the City of Ontario Municipal Code, Section 9-1.3305. Noise standards are shown for noise emanating from one property and crossing the property line of another property. Tables 1 and 2 summarize the City interior and exterior noise standards for various zoning classifications.

Because this area is mixed use, unacceptable noise levels at the residential portion of the site emanating from the adjacent commercial portion of the site could arise. According to the City of Ontario Noise Control Ordinance, "Where two (2) or more dissimilar land uses occur on a single property, the more restrictive noise standard shall apply", (Section 9-1.3305). Mixed land uses would therefore be constrained to meet the residential noise standard at any location where residential and non-residential uses share a common property line.

Construction activities are exempt from noise regulations if they occur between the hours of 7:00 a.m. and 7:00 p.m. on weekdays and on Saturdays. Construction activities are not permitted on Sundays or national holidays.

TABLE 1

INTERIOR AND EXTERIOR NOISE STANDARDS
City of Ontario

Maximum Exterior Noise Levels		
	Noise Level (dBA)	
Receiving Land Use Category	10 p.m. to 7 a.m.	7 a.m. to 10 p.m.
Residential (except multi-family)	45	65
Multi-family residential and mobile home parks	50	65
Commercial (all C Zones, including AP)	60	65
Light Industrial (M1, M2)	70	70
Heavy Industrial (M3)	70	70

1. If ambient levels exceed any of these noise limits, the threshold is adjusted upward to equal the background.

2. If the noise is continuous, the Leq for any hour will be represented by any lesser time period within that hour. Noise measurements of five (5) minutes or less will thus suffice to define the noise level.

3. If the noise is intermittent, the Leq for any hour may be represented by a time period typical of the operating cycle. Measurement of intermittent noise is to be made of at least three (3) noisy/quiet periods. Alternatively, measurements may be taken at two (2) periods of at least fifteen (15) minutes each may be used.

TABLE 2

INTERIOR AND EXTERIOR NOISE STANDARDS
City of Ontario

Interior Noise Standards				
Land Use Type	Time Interval	Maximum Noise Level (dBA)		
Multi-family residential		Anytime	1 min./1 hr.	5 min./1 hr.
	10 p.m. to 7 a.m.	45	40	35
	7 a.m. to 10 p.m.	55	50	45

1. If the ambient noise level inside a receiving dwelling unit exceeds permissible limits, the allowable noise exposure standard in that category shall be the measured ambient noise for a cumulative period of five (5) minutes in any one (1) hour, ambient plus five (5) dBA for one (1) minute within any one (1) hour, and shall not exceed the ambient plus ten (10) dBA at any time (9-1.3305).

BASELINE NOISE LEVELS

The City of Ontario is located in the southwestern portion of San Bernardino County and is developed with a mix of land uses. This project is a proposed redevelopment of previous retail uses. The project site has nearby residential neighborhoods on the west, south and east of the site and commercial/retail uses to the north. Existing traffic noise derives from the I-10 Freeway to the north, from Mountain Avenue, a primary arterial roadway to the east and from 5th Street to the south and from 6th Street to the north.

Noise measurements were made in order to document existing baseline levels in the area, particularly for the homes potentially most impacted by the project. Noise measurements were conducted on Monday April 24 and Tuesday April 25, 2006, for 24-48 hours at two locations and Thursday April 20 and Friday April 21, 2006 at three locations. The hourly results of the measurements are shown in the appendix of this report and summarized below. The locations of the noise meters are shown in Figure 2:

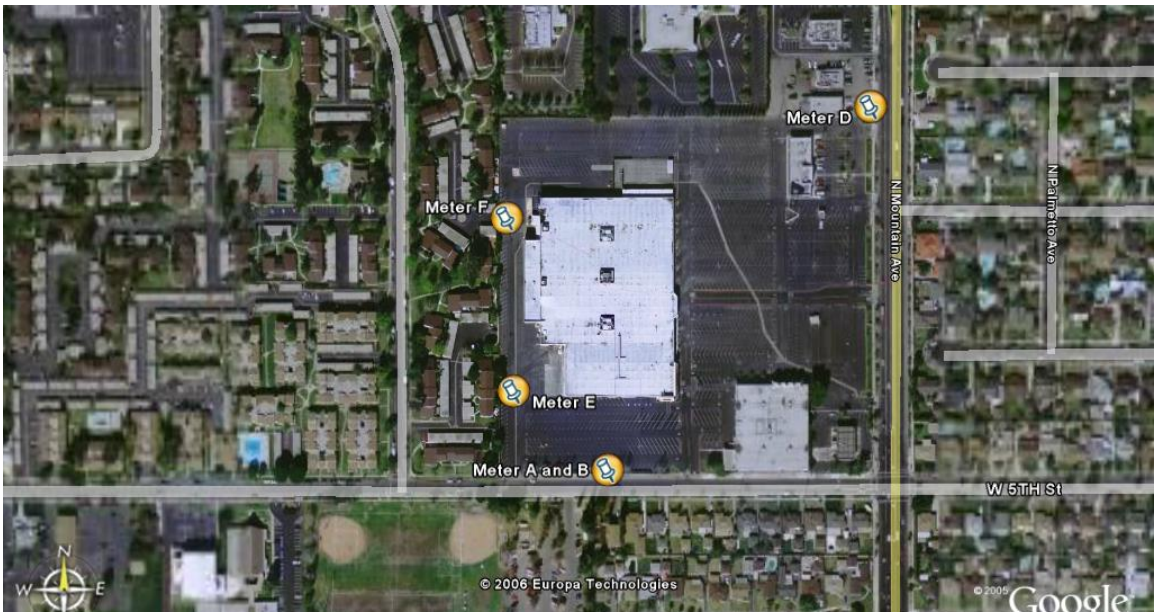
Existing Noise Levels

Location	Location	CNEL
Meter "A"	Southern Property Line, 60 feet to 5th Street C/L, Across from last residence/Anthony Munoz Park	64.2 dB
Meter "B"	Southern Property Line, 60 feet to 5th Street C/L, Across from last residence/Anthony Munoz Park	63.7 dB
Meter "D"	Eastern Property Line, Along Mountain Ave., 65 feet to Mountain C/L	71.5 dB
Meter "E"	Western Property Line, Southern Half, Closer to 5th Street	59.8 dB
Meter "F"	Western Property Line, Northern Half-Closer to 6th Street	59.2 dB

The site and its environs already experience elevated noise levels. Residences along Mountain Avenue already experience CNEL's in excess of Ontario residential noise standards. With the exception of traffic, the proposed project is held accountable not to CNEL thresholds, but to Leq's. However, the Ontario Municipal Code states that if ambient levels exceed any of these noise limits specified in Table 1, the threshold is adjusted upward to equal the background (Section 9-1.3305-8). The nocturnal residential standard is 45 dB Leq unless background levels already exceed this value. Night time (10 p.m. to 7 a.m.) hourly Leq's measured from 50-65 dB. Therefore, the lower limit of 50 dB Leq was used as the enforceable night time threshold for all residential uses for noise generation crossing from the proposed project site to residential receivers. The daytime standard remains at 65 dB Leq.

FIGURE 2

NOISE METER LOCATIONS
ONTARIO WAL-MART



LAND USE NOISE IMPACTS

THRESHOLDS OF SIGNIFICANCE

According to the current CEQA Appendix G guidelines, noise impacts are considered potentially significant if they cause:

a. Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies. Noise levels exceeding the City of Ontario Noise Standards would be considered significant.

b. Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.

c. A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.

d. A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

Two characteristic noise sources are typically identified with land use redevelopment such as that proposed for the development of the Ontario Wal-Mart Supercenter. Construction activities, especially heavy equipment, will create short-term noise increases near the project site. Such impacts may be important for nearby noise-sensitive receptors such as the existing residential uses. Upon completion, project-related traffic may cause an incremental increase in area-wide noise levels throughout the project area. Traffic noise impacts are analyzed to insure that the project does not adversely impact the acoustic environment of the surrounding community. This project may cause an increase in area wide traffic but the reuse nature of this project will require comparison of the various alternate site uses.

CEQA Guidelines also identify potential impact significance due to aircraft noise. CEQA states that for a project located within an airport land use plan or where such a plan has not been adopted, within two miles or an airport, a project could have a significant effect on the environment. This project is more than 3 miles from the Ontario International Airport and more than 2 miles from Cable Airport. Airport noise is less-than-significant.

Construction noise is typically governed by ordinance limits on allowable times of equipment operations. The City of Ontario Noise Ordinance limits the hours of construction operation to be between the hours of 7 a.m. to 7 p.m. Monday to Saturday. No construction is permitted on Sundays or Federal Holidays.

The term "substantial increase" is not defined by any responsible agency. The limits of perceptibility by ambient grade instrumentation (sound meters) or by humans in a

laboratory environment is around 1.5 dB. Under ambient conditions, people generally do not perceive that noise has clearly changed until there is a +3 dB difference. A threshold of 3 dB is commonly used to define "substantial increase." A survey of multiple agencies that have adopted numerical noise impact CEQA implementation guidelines almost universally have definited +3 dB as a substantial noise increase because it represents the human perception threshold.[1] However, because decibels are a logarithmic scale, it requires a doubling of source strength (number of vehicles, people, etc.) to create a +3 dB increase. Few projects individually create a doubling of noise generators, especially in an already noisy environment. The definition of “substantially worsen” should therefore be more stringent if noise standards are already exceeded under baseline conditions. A noise increase of +1.5 dB CNEL as the lowest sound level that can be reliably measured or perceived should therefore be considered as a substantial worsening if baseline levels already exceed local planning standards.

DEMOLITION/CONSTRUCTION NOISE IMPACTS

Temporary construction noise impacts vary markedly because the noise strength of construction equipment ranges widely as a function of the equipment used and its activity level. Short-term construction noise impacts tend to occur in discrete phases dominated initially by earth-moving sources, then by foundation and parking area construction, and finally for finish construction.

As shown in Figure 3, heavy equipment noise can exceed 90 dB(A) and averages about 85 dB(A) at 50 feet from the source when the equipment is operating at typical loads. Most heavy equipment operates with varying load cycles over any extended period of time. The upper end of the noise generation range shown in Figure 3 thus represents short-term effects, while the longer term averages are most representative of the lower end of the indicated noise curves.

Point sources of noise emissions are atmospherically attenuated by a factor of 6 dB per doubling of distance. The loudest construction may require 500 feet of distance between the source and a nearby receiver to reduce the average 85 dB(A) source strength to a generally acceptable 65 dB exterior exposure level.

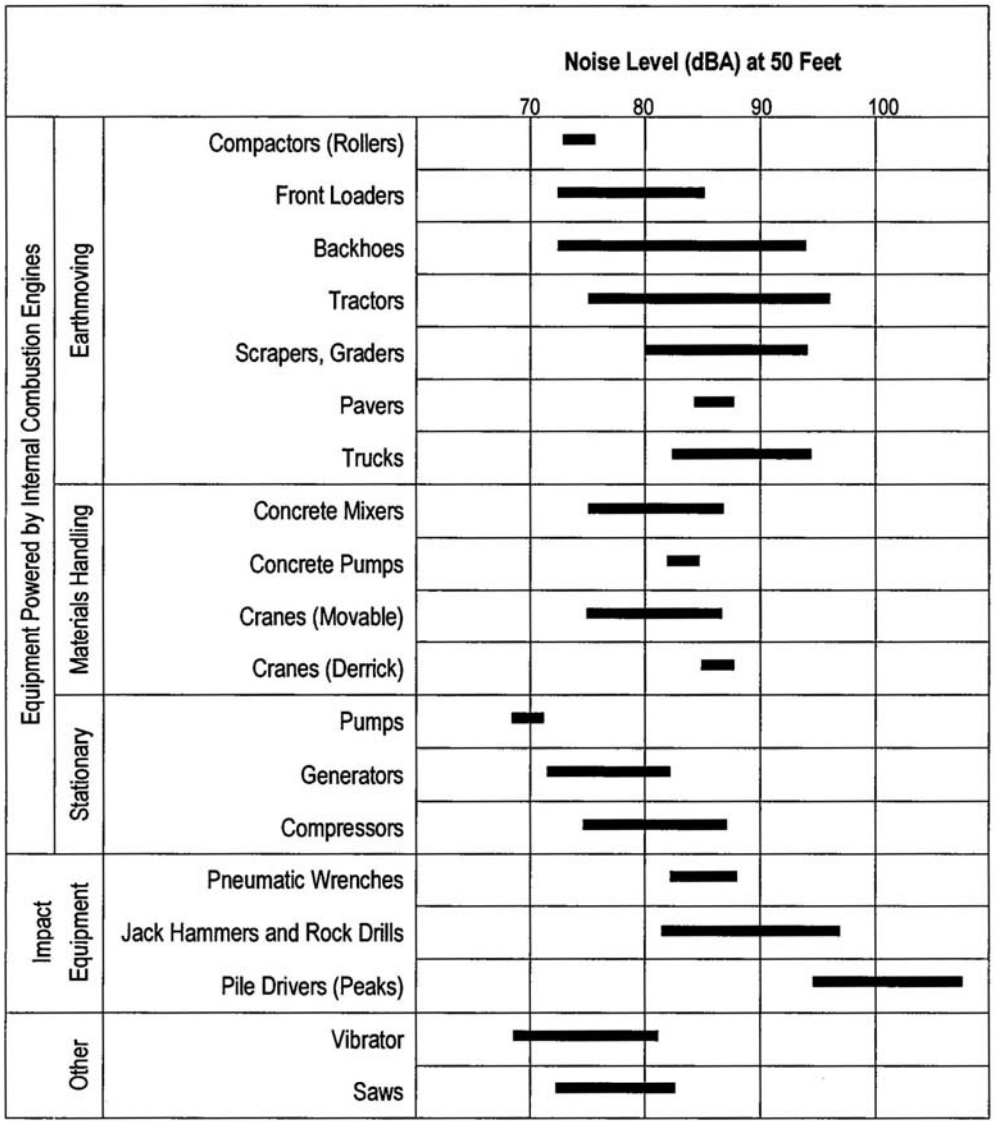
The nearest residences east of the site are located in an area where construction noise will be intermittently audible, though such noise will be confined to the daytime hours of lesser noise sensitivity. Because of proximity, construction noise impacts would most likely affect multi-family homes along Elderberry Court to the west, and single-family residential uses along Fifth Street to the south during excavation and grading. Only the residential uses to the west are not separated from the site by a roadway. Construction of an 8-foot masonry wall along the western site perimeter is recommended to minimize site operations noise intrusion at the nearest residences. Erection of this wall is recommended as one for the first site development actions to reduce any demolition and new construction noise audibility. With the barrier and with time limits on construction activities to hours of lesser noise sensitivity (7 a.m. – 7 p.m., Mondays –Saturdays), temporary construction activity impacts even during maximum noise generation would be less-than-significant at the closest residential receivers.

The single-family residential uses along Mountain Avenue to the east are separated sufficiently from the primary construction areas and most construction noise will be masked by the traffic noise along Mountain Avenue, which is currently in excess of 73 dB CNEL at 50 feet from the roadway centerline. Construction noise would not be significant for residences along Mountain Avenue.

The homes across Fifth Street are more than 150 feet from the nearest Wal-Mart façade. Measured noise levels adjacent to Fifth Street are approximately 64 dB CNEL. The background traffic noise and the distance from construction will ensure that construction noise is not significant for residences south of Fifth Street.

Figure 3

Typical Construction Equipment Noise Generation Levels



Source: EPA PB 206717, Environmental Protection Agency, December 31, 1971, "Noise from Construction Equipment and Operations."

PROJECT-RELATED VEHICULAR NOISE IMPACTS

Noise will change as a result of project-related traffic. Project-related traffic includes trips generated by shoppers, by employees, and by various delivery vehicles (Wal*Mart trucks as well as numerous jobber trucks such a baked goods, beverages, or snack foods). The proposed project uses are designed to accommodate the retail shopping demand for the growing population in the Ontario area and the surrounding community. The same vehicles would be on local roads driving elsewhere for the same retail resources if they were not available locally.

Area wide long-term noise concerns from the increase of retail uses at the project site center primarily on mobile source emissions on project area roadways. These concerns were addressed using the California specific vehicle noise curves (CALVENO) in the federal roadway noise model (the FHWA Highway Traffic Noise Prediction Model, FHWA-RD-77-108). The model calculates the Leq noise level for a particular reference set of input conditions, and then makes a series of adjustments for site-specific traffic volumes, distances, speeds, or noise barriers. By way of reference, a +1.0 dB increase in noise level is an imperceptible increase even under quiet conditions, whereas a +3.0 dB increase becomes noticeable when the sound is super- imposed upon typical exterior noise levels.

Table 3 summarizes the 24-hour CNEL level at 50 feet from the roadway centerline along a number of area roads for existing conditions and for future conditions, with and without the project. Specifically, five time frames were examined:

1. Existing Conditions (2006).
2. 2008 Without Project - Assumes a 2% per year growth rate from existing conditions.
3. 2008 With 1997 Specific Land Use - Assumes that the shopping center approved in the 1997 Specific Plan is operational at the site.
4. 2008 With Existing Land Use - Assumes approved land uses (Target, Toys R Us, Food 4 Less) are operational at the site.
5. 2008 With Project - Assumes Wal-Mart Supercenter is built and operational.

From this data the following comparisons can be made:

1. <u>Comparison of 2008 Wal-Mart Supercenter to existing 2006 conditions</u>. Contrast of these two conditions provides the cumulative project impact or the change from traffic as it currently exists to what it will be with the addition of the project. Most roadway segments analyzed will see a modest increase, with a +0.4 dB CNEL average. The roadway segment with the largest increase, +1.0 dB CNEL, is on W. 5th Street between Elderberry and Mountain. This increase is much lower than the adopted significance thresholds.

   <u>Comparison of 2008 Wal-Mart Supercenter to 2008, no project</u>. This comparison provides the "project only" increase. Again, most roadway segments will see a very modest increase, with an average of +0.2 dB CNEL per segment. The

Table 3
Ontario Wal-Mart Supercenter Traffic Noise Impact Analysis
(dBA CNEL at 50 feet from centerline)

Roadway Segment:	Existing	2008 Base	2008 W/1997 Land Use	2008 W/Existing Land Use	2008 W/Project
Benson Ave:					
N of 6th St	68.6	68.8	68.9	68.9	68.8
S of 6th St	68.1	68.3	68.4	68.4	68.3
N of 5th St	67.9	68.2	68.2	68.2	68.2
S of 5th St	67.4	67.6	67.7	67.7	67.7
Mountain Ave:					
N of 8th St	73.1	73.3	73.4	73.4	73.4
8th St - 7th St	73.0	73.1	73.4	73.4	73.3
7th St - I-10 WB	73.5	73.7	73.9	73.9	73.9
I-10 WB - I-10 EB	73.4	73.5	74.0	74.0	73.9
I-10 EB - 6th St	73.4	73.6	74.2	74.3	74.1
6th St - 5th St	73.1	73.3	73.6	73.7	73.5
5th St - 4th St	72.9	73.0	73.4	73.5	73.3
4th St - Holt	72.8	72.9	73.1	73.2	73.1
S of Holt	73.2	73.4	73.5	73.5	73.5
San Antonio Ave:					
N of 6th St	67.8	68.0	68.0	68.0	68.0
6th St - 5th St	67.6	67.8	67.8	67.8	67.8
S of 5th St	67.7	67.8	67.9	67.9	67.9
W 8th St:					
W of Mountain	70.0	70.1	70.3	70.3	70.2
E of Mountain	69.3	69.5	69.6	69.6	69.6
W 7th St:					
W of Mountain	68.5	68.7	68.7	68.7	68.7
W 6th St:					
W of Benson	60.7	60.9	60.9	60.9	60.9
E of Benson	62.5	62.7	62.7	62.7	62.7
W of Mountain	66.3	66.4	66.4	66.4	66.4
Mountain-San Antonio	64.1	64.2	64.2	64.2	64.2
E of San Antonio	63.1	63.3	63.3	63.3	63.3
W 5th St:					
W of Benson	64.1	64.3	64.3	64.3	64.3
Benson-Jasmine	63.9	64.1	64.6	64.6	64.5
Jasmine-Helen	63.8	64.0	64.4	64.5	64.3
Helen-Elderberry	64.2	64.4	64.8	64.9	64.7
Elderberry-Mountain	64.7	64.8	65.9	66.1	65.7
Mountain-San Antonio	62.6	62.8	63.3	63.3	63.1
E of San Antonio	62.2	62.4	62.7	62.8	62.6
W 4th St:					
W of Mountain	67.0	67.2	67.3	67.3	67.3
E of Mountain	67.7	67.9	68.0	68.0	68.0
Holt Blvd:					
W of Mountain	73.1	73.3	73.3	73.3	73.3
E of Mountain	73.1	73.3	73.3	73.3	73.3

segment with the largest net increase, +0.9 dB CNEL is on W 5th Street, between Elderberry and Mountain. This increase much lower than the adopted significance thresholds.

2. Comparison of the 2008 Wal-Mart Supercenter to 2008 with the land use approved in the 1997 Specific Plan. This scenario compares the proposed land use to the approved land use and shows that all segments would experience a reduction in noise or no increase.

3. Comparison of 2008 Wal-Mart Supercenter to existing land use siting. This alternative siting scenario assumes that the Target, Toys R Us and Food 4 Less are still operational in 2008. The average roadway segment would experience a negligible decrease, < 0.1 dB CNEL, in traffic noise.

The site is now mostly vacant and any redevelopment will result in an increase in the noise environment and overall noise levels. However, even the cumulative impact, a comparison of the future with Wal-Mart and existing vacant land uses does not yield results which exceed the most stringent 1.5 dB CNEL significant threshold on any roadway segment examined. Comparison of alternative land uses for the site yields equivalent results. The Wal-Mart or any redevelopment project will slightly increase overall area wide noise levels, but there is no appreciable difference for any examined development scenario.

Maximum expansion of the 65 dB CNEL contour is seen in Table 4 to occur along Mountain Avenue. A maximum increase of 15 feet in contour distance occurs for the "plus-project" versus "no-project condition." in 2008, but this is at the I-10 connectors. The maximum increase closer to the project site is on Mountain from 6th Street to south of Holt, which is projected to experience a 65 dB CNEL contour increase of 10 feet in the project/no project comparison. However any alternate land use for the project site (as opposed to leaving the site undeveloped) yields similar contours with no appreciable difference (+/- 10 feet) in the project versus current zoning use. An increased contour distance of 10 feet would not expose any noise-sensitive areas to excess noise at locations where standards are currently met, or make measurably worse any existing violations.

Table 4 –Ontario Wal-Mart Supercenter Traffic Noise Impact Analysis
Short Term Distance to 65 CNEL (in feet) from Road Centerline

Roadway Segment	Existing	2008	2008 W/1997 Land Use	2008 W/Existing Land Use	2008 W/Project
Benson Ave:					
N of 6th St	85	90	90	90	90
S of 6th St	80	85	85	85	85
N of 5th St	80	85	80	85	80
S of 5th St	75	75	75	75	75
Mountain Ave:					
N of 8th St	175	180	180	180	180
8th St - 7th St	170	175	180	180	180
7th St - I-10 WB	185	190	195	200	195
I-10 WB - I-10 EB	180	185	200	200	195
I-10 EB - 6th St	185	185	205	210	200
6th St - 5th St	175	180	190	190	185
5th St - 4th St	170	170	185	185	180
4th St - Holt	165	170	175	175	175
S of Holt	175	180	185	185	185
San Antonio Ave:					
N of 6th St	75	80	80	80	80
6th St - 5th St	75	75	80	80	75
S of 5th St	75	75	80	80	80
W 8th St:					
W of Mountain	110	110	115	115	110
E of Mountain	95	100	100	100	100
W 7th St:					
W of Mountain	85	90	90	90	90
W 6th St:					
W of Benson	<50	<50	<50	<50	<50
E of Benson	<50	<50	<50	<50	<50
W of Mountain	60	60	60	60	65
Mountain-San Antonio	<50	<50	<50	<50	<50
E of San Antonio	<50	<50	<50	<50	<50
W 5th St:					
W of Benson	<50	<50	<50	<50	<50
Benson-Jasmine	<50	<50	<50	<50	<50
Jasmine-Helen	<50	<50	<50	<50	<50
Helen-Elderberry	<50	<50	<50	50	<50
Elderberry-Mountain	50	50	60	60	55
Mountain-San Antonio	<50	<50	<50	<50	<50
E of San Antonio	<50	<50	<50	<50	<50
W 4th St:					
W of Mountain	70	70	70	70	70
E of Mountain	75	80	80	80	80
Holt Blvd:					
W of Mountain	175	180	180	180	180
E of Mountain	175	180	180	180	180

ON-SITE NOISE GENERATION

The primary noise concern for siting a commercial operation in proximity to off-site residences is that the activities in support of the commercial use may create a noise nuisance at the nearest sensitive receivers. Commercial support activities could include delivery/unloading of heavy goods, maintenance activities such as refuse collection or parking lot sweeping, or stacking or retrieval of temporary outdoor storage. Early morning truck traffic could also be a nuisance.

The proposed project will replace existing commercial retail uses which, when operational, were active (and noisy) in the past. The project would reintroduce potential noise impacts that existed when the center was active. The surrounding residential community coexisted with an active commercial center in the past.

Single events could include operation of truck unloading, trucks at low-speed and high-rpm shifting gears, trash pick-up, etc. Minimization of nuisance potential can be achieved by time limits on activities to less sensitive hours, or by creating a noise propagation barrier between the source and receiver.

A Hollywood Video store in the northeast corner and a gas station in the southeast corner are the only active businesses on the project site. The site also contains several abandoned buildings, formerly the Target, Food 4 Less and Toys R Us. There are residential uses to the south, east and west. The residential uses to the west are the only ones not separated from the site by a road. Ambient noise levels will increase with the redevelopment of the area. Design strategies and conformity with City noise ordinances can help prevent conflicts due to commercial site operations in an area with residential uses.

The proposed Wal-Mart Supercenter will have 2 loading docks, one along the southwest corner of the building closer to 5th Street, and the other on the northwest corner of the building. Both loading docks will be protected on their exterior side by a 10 foot wall, or by the building itself. There are no roofs above the loading dock area.

Two trash compactors are located on the western perimeter of the building (one by each loading dock). Truck deliveries will be through loading docks and drive aisles at the western perimeter of the property. The northwestern corner of the site would be paved and will serve as a truck turn-around.

Anticipated Delivery Schedule

The following weekly delivery schedule is expected:

Usage:	Type:	No. Weekly Deliveries:	No. Holiday Extra Deliveries:
General Merchandise	Semi-Trucks	22	4-6
Grocery	Semi-Trucks	13	2-3
Local Vendor	Small-Medium Trucks	40-50	--

Assuming a 6 day/week delivery schedule, a typical non-holiday daily schedule would entail approximately 6 Wal-Mart semi-truck deliveries and 8 smaller truck deliveries. The smaller local vendor trucks would include baked goods, soft drinks, bottled water, beer, etc. Most vendor vehicles are gasoline-powered, but several of the liquid product vendor trucks may be diesel-fueled. It is assumed that two vendor trucks per day may be diesel. During the holiday season there could be as many as 7 semi-truck deliveries per day. As a worst case scenario it is assumed that 3 heavy trucks might be delivering and unloading within the same hour of the day.

Loading Dock and Trash Compactor Noise

Commercial activity noise levels have been monitored at the rear of a number of big box and large shopping centers. A very detailed noise study was conducted at a very busy Home Depot in Torrance, California, in 1998. This study isolated various individual activity components (trucks, back-up alarms, idling engines, etc.), and monitored both the spectral components as well as the A-weighted integrated noise level.

The relevant noise ordinance performance standard is an hourly energy-weighted average (LEQ). In order to utilize a set of isolated activity data to construct the LEQ, detailed knowledge on the duration and location of each activity must be specified. An alternative data source for truck unloading reference noise data was therefore evaluated that already combined all unloading activities into a single LEQ measurement. The reference noise level for unloading semi-trucks and for associated ancillary activities is 67 dB LEQ at 50 feet from the center of the activities with no noise protection.

The project loading dock for trucks includes a foam seal and enhanced bumpers on the deck leveler to reduce dock mating noise. The rubber gasket provides a tight connection between the truck and the building. All unloading can be done directly into the building. The project dock activity may therefore be slightly quieter than the measured prototype data source, but the measured data were used as a worst-case condition. The hourly average reference noise levels at a 50-foot analysis distance for the project impact analysis are as follows:

Noise Generating Activity	Reference Level @ 50'	Data Source
Semi-Truck Unloading	67 dBA	El Cajon Study
Med. Box Truck Unloading*	65 dBA	Harbor Center Analysis
Trash Compactor	51 dBA	Shiloh Center Study

* Box truck merged with dock, fork lift operating inside receiving area

The nearest neighbors to the proposed Wal-Mart loading dock activities are Elderberry Court to the west of the site. These are multi-family two story structures. There are also single family residences across 5th Street who may be affected by truck delivery and loading dock noise at the southwestern corner of the proposed Wal-Mart Store.

The following is the distance from the noise nuisance source to the nearest residential use:

Distance to Homes along Elderberry Court

Activity:	Location:	Distance to Homes:
Loading dock	Southwest Corner	85 feet
Trash Compactors	Southwest Corner	70 feet
Loading dock	Northwest Corner	75 feet
Trash Compactors	Northwest Corner	60 feet

Distance to Homes South of 5th Street

Activity:	Location:	Distance to Homes:
Loading dock	Southwest Corner	165 feet
Trash Compactors	Southwest Corner	175 feet
Loading dock	Northwest Corner	560 feet
Trash Compactors	Northwest Corner	560 feet

For direct line-of-sight conditions, the above data were adjusted for geometrical (spherical) spreading losses at 6 dB per distance doubling between the source and the closest receiver. Additionally, -10 dB was allowed because each loading area will be fully enclosed on three sides. The noise exposure at the closest off-site residence due to spreading losses and partial dock enclosure is calculated as follows:

Elderberry Court

Noise Source	Attenuation for Noise Wall	Spreading Loss	Residual Level
Semi-Truck Unloading	10 dB	4 dB	53 dB LEQ
Medium Box Unloading	10 dB	4 dB	51 dB LEQ
Trash Compactor	10 dB	1 dB	40 dB LEQ

5th Street

Noise Source	Attenuation for Noise Wall	Spreading Loss for Receiver Distance	Residual Level
Flat Bed Truck Unloading	10 dB	10 dB	47 dB LEQ
Medium Box Unloading	10 dB	10 dB	45 dB LEQ
Trash Compactor	10 dB	11 dB	30 dB LEQ

None of the activities will exceed the daytime noise ordinance of 65 dB. Even unloading of 2 semi-trucks simultaneously would yield 56 dB of noise for residences to the west and 3 semi-trucks unloaded simultaneously would yield 58 dB of noise.

However, the nighttime standard of 50 dB would be exceeded even during the unloading of a single semi-truck or medium truck. Therefore, if it is desired to have trucks unloading at either dock at night between 10 p.m. and 7 a.m., more substantial loading dock noise attenuation features would be necessary. A completely roofed loading dock and roll-up doors that are all closed during trailer unloading, would allow for nocturnal unloading operations without exceeding City standards.

Running the trash compactor will not affect daytime or nighttime noise standards at the closest residential uses. Noise generated by the trash compactors is anticipated to be less than significant.

Therefore the following mitigation measures are recommended:

1. Unless the loading docks have a fully covered roof area and are enclosed by roll-up doors at the tractor end, trailer unloading may not occur during nighttime hours of 10 p.m. and 7 a.m.

2. No limitations or mitigation is required for usage of the trash compactors.

Delivery Truck Movements

Delivery trucks will typically be routed through the westernmost drive aisle. The following is the noise level associated with delivery truck pass by assuming the truck is traveling 15 miles per hour:

Source:	Distance	Single Event Movement Leq*	One Truck In and Out (2 Movements) Leq	Two Trucks in and Out (4 Movements) Leq
Heavy Truck Pass-by	50 feet	49 dB	52 dB	55 dB
Medium Truck Pass-by	50 feet	42 dB	45 dB	48 dB

* assumes one truck either entering or leaving

Attenuating for the actual distance to the residences on Elderberry Court of 35 feet yields the following resultant noise levels:

Source:	Distance	Single Event Movement Leq*	One Truck In and Out (2 Movements) Leq	Two Trucks in and Out (4 Movements) Leq
Heavy Truck Pass-by	35 feet	51 dB	54 dB	57 dB
Medium Truck Pass-by	35 feet	44 dB	47 dB	50 dB

As a typical maximum activity condition, it was estimated that two trucks per hour (one semi, one medium duty) arrive and depart during one delivery hour. The noise level from two truck movements per hour (each entering and leaving) for one semi- and one medium-truck along the western drive aisle truck route is 55 dB LEQ. This is well below the daytime noise threshold of 65 dB, but would exceed the nighttime standard of 50 dB.

If the loading docks are better sound attenuated and truck unloading was feasible during nighttime hours, heavy truck pass-by movements could still exceed the 50 dB threshold at residences to the west. Therefore, it is recommended that any potential nighttime truck routes exclude the western drive aisle. Trucks on-route to the northern loading dock could enter the site from Mountain Avenue or 6th Street, and trucks on-route to the southern loading dock could enter the site from 5th Street.

The following mitigation measures are proposed for truck delivery:

1. Heavy duty semi-trucks may not use the western drive aisle at night. Any semi-trucks delivering between 10 p.m. and 7 a.m. would either have to enter from Mountain Avenue, 6th Street or 5th Street.

2. Gates should be installed at each end of the western drive aisle that close at 10 p.m. and open at 7 a.m.

Mechanical Equipment (HVAC) Noise

Mechanical equipment typically includes heating, ventilating, air-conditioning and refrigeration equipment. Noise generated by rooftop mounted mechanical equipment varies significantly depending upon the equipment type and size. However, based on measurements at other similar commercial centers and literature from Trane Industries, noise levels of 54 dBA at 50 feet from external mechanical systems can be anticipated for the project. Noise levels would be reduced due to shielding from the rooftop parapets and distance. The parapets would break the line of sight between the rooftop mechanical equipment and the nearest existing residences. The parapets are particularly effective in shielding noise for ground story receivers.

The potential noise impacts associated with the mechanical equipment upon the nearest existing 2nd story residences would be approximately 44 dBA. This is based on a minimal distance of 85 feet from the nearest HVAC rooftop equipment and the nearest building on Elderberry Court. Additionally -5 dBA was taken for the attenuation from the parapet walls planned for the Wal-Mart Supercenter.

The noise impact to the nearest existing residences would be less than significant if all rooftop mechanical equipment is fully screened as indicated in the site plans. Regardless, the applicant will be required to submit engineering and acoustical specifications for project mechanical equipment for review prior to the issuance of building permits which demonstrates that the equipment design combined with distance separation and parapets or screen walls will not exceed the City of Ontario noise standards for any adjacent residences.

Parking Lot Cleaning and Trash Pick-Up

Because of nighttime noise standards it is recommended that parking lot cleaning and trash pick up be limited to daytime hours of 7 a.m. and 10 p.m.

Parking Lot Noise

Major noise sources in the project parking lot will include engine starting, car horns, door slams, slowly moving vehicles, and human voices. There are residential uses along three perimeters of the parking areas. The residences to the west of the project site, along Elderberry Court will be shielded from parking lot activity noise by the building itself. The residences to the east of the project are across Mountain Avenue, where the current daily traffic noise was measured to be over 70 dB CNEL and predicted by the traffic model to be well over 70 dB CNEL at 50 feet from the roadway centerline. Additionally, residences to the east of Mountain Avenue are located approximately 300 feet from the central portion of the major parking area. Parking lot noise is not expected to be significant for residences to the west and east of the project site.

There is a small quantity of parking spaces adjacent to the 5th Street perimeter. Residences to the south of 5th Street are closest to the planned parking areas. Along the southern parking lot boundary the nearest parking spaces would be within approximately 80 feet of the nearest residential property line. There are approximately 180 parking spaces in the southerly area of the parking lot adjacent to the gas station and loading dock. Many of these parking stalls would typically not be desirable as they would require a substantial walk to the Wal-Mart entrance. Nevertheless, the worst case condition is assumed to exist on an extremely busy day where all 180 cars enter or exit the southerly parking area in the same hour in the same drive aisle. The predicted resultant noise would be approximately 50 dB Leq at 80 feet if all cars entered or exited the same drive aisle in the same hour, assuming a travel speed of 25 mph. Likely slower travel speeds would result in lower noise values.

The current traffic noise along 5th Street at 50 feet from the roadway centerline is approximately 65 dB CNEL which will partially mask parking lot noise. Parking lot activity noise will be shielded by probable grade separation with a planned retaining wall along the southern site boundary. The retaining wall would additionally be topped by a 4-foot high village wall. The noise barrier would shield residents from parking lot activity noise, particularly during the later hours when most shoppers will be parked close to the front door of the store well away from 5th Street. Employee parking should be located along the noisier Mountain Avenue site perimeter to further minimize vehicle start-ups or parking activities during noise-sensitive hours in close proximity to 5th Street residences. Therefore the following mitigation is recommended:

1. Residential uses to the west of the project site will be shielded from parking lot noise by the building itself and by nocturnal closure of drive-aisle gates. Parking lot noise for residential uses to the east of the site across Mountain Avenue will not be affected because of the masking of traffic noise along Mountain Avenue and the distance to the parking areas.

2. A 4-foot village wall wall is recommended atop any retaining wall along the southern site perimeter to shield residences to the south, across 5th Street, from potential parking lot activity noise.

3. Late night employee parking should be designated along the eastern site perimeter closest to Mountain Avenue to minimize arrival/departure noise closest to 5th Street during noise-sensitive hours.

CONSTRUCTION VIBRATION IMPACTS

Vibration may be associated with project construction and operations. Vibrations may range from minor rattling of windows to ground motion that can damage structures. The City of Ontario has no adopted significance thresholds for vibration. Vibration may be expressed through a number of parameters that describe the displacement, the vibration velocity, or acceleration experienced by an object. In ambient applications, a root-mean-square vibration velocity of 0.01 inches per second is often taken as a possible nuisance level (FTA, Transit Noise and Vibration Impact, 1995). Minor structural damage may be experienced when vibration velocities reach 1.0 inch/second. The vibration velocity for a loaded truck traveling at full speed on a bumpy road is typically 0.02 inch/second at 25 feet. Beyond 50 feet, vibrations from on-road traffic have normally been dampened to less than 0.01 inch per second. Project-related delivery trucks will not be traveling at great speed as they negotiate entry driveways and traffic control devices, and their set-back from residential interiors is usually more than 50 feet.

A bulldozer has a rated vibration velocity of 0.3 inches per second at 25 feet. Ground absorption reduces this level to below the nuisance threshold within 75 feet of the activity. Large bulldozers will normally not operate within 75 feet of occupied homes during project construction. Smaller construction equipment that may operate at the site perimeter during site development has a smaller initial vibration impulse, and again will be undetectable at the nearest homes. The combination of adequate set-back and limited vibration generation from project construction or operations will maintain off-site vibration perception at less than nuisance levels.

SUMMARY AND MITIGATION

Construction and Demolition Noise

Construction activities from project redevelopment may impact existing surrounding residential uses. Such impacts are primarily onsite and are mitigated by required compliance with grading/construction permits. These considerations include:

1. All construction and general maintenance activities, except in an emergency, shall be limited to the hours of 7:00 a.m. to 7:00 p.m. and prohibited on Sundays and all federally proclaimed holidays.

2. Staging areas shall be located away from existing residences.

3. All construction equipment shall use properly operating mufflers.

Traffic Noise Increases

Project-related off-site traffic noise changes on existing streets will be less-than-significant, and will not substantially alter the existing and forecasted noise environment. Even the cumulative impact, a comparison of the future with Wal-Mart and existing vacant land uses do not yield results which exceed the +3 dB CNEL significance threshold on any roadway segment examined. Comparison of alternative land uses for the site including the land use approved in the 1997 Specific Plan and previously operational land uses (Target, Toys R Us, and Food 4 Less) yields equivalent traffic noise results. The Wal-Mart, or any redevelopment project will slightly increase overall area wide noise levels but there is no appreciable difference for any examined development scenario.

Loading Dock and Trash Compactor Noise

The unloading activities associated with both semi-trucks and medium-duty trucks will exceed noise ordinance thresholds at residences to the west of the project site, along Elderberry Court, at night but not day. Therefore the following mitigation is recommended:

1. Unless the loading docks have a fully covered roof area and are enclosed by roll-up doors, unloading may not unload during nighttime hours of 10 p.m. and 7 a.m.

2. No limitations or mitigation is required for usage of the trash compactors as long as the current screened design is implemented.

Delivery Truck Movement

No restrictions on truck delivery are required during daytime hours, even along the western drive aisle. However, to avoid noise impacts for the residences along Elderberry Court, the western drive aisle shall not be used by heavy duty or semi-trucks during the hours of 10:00 p.m. and 7:00 a.m. The drive aisle shall be restricted from use by gates that are closed and locked between 10 p.m. and 7 a.m.

Trash Pick Up and Parking Lot Cleaning

To assure compliance with the City of Ontario Noise Standards parking lot cleaning and trash pick up shall be confined to the hours of 7:00 a.m. and 10:00 p.m.

Rooftop Mechanical Equipment

It is not anticipated that rooftop mechanical equipment will exceed the City of Ontario Noise Standards; however the applicant shall submit engineering drawings and acoustical specifications for project mechanical equipment demonstrating that the equipment design, location and screens will not exceed noise thresholds for any adjacent residential uses.

Parking Lot Activity Noise

1. Residential uses to the west of the project site will be shielded from parking lot noise by the building itself. Parking lot noise for residential uses to the east of the site across Mountain Avenue will not be affected because of the masking of traffic noise along Mountain Avenue and the distance to the parking areas.

2. A 4-foot high village wall is recommended atop any retaining wall along the non-driveway southern site perimeter to shield residences to the south from potential parking lot activity noise.

3. Late night employee parking should be designated along the eastern site perimeter closest to Mountain Avenue to minimize arrival/departure noise closest to 5th Street during noise-sensitive hours.

References:

- City of Los Angeles, CEQA Thresholds Guide,
- City of San Diego Traffic Noise Significance Thresholds for HUD Funded Projects,
- City of Lake Forest CEQA Significance Thresholds Guide for Traffic Noise,
- Caltrain Electrification Program/ CEQA Significance Thresholds Table 5.1-1, and
- Barstow Sanitary Landfill Thresholds of Significance prepared by Wieland Associates, AES Highgrove Power Plant/Ontario/Subsection 8.5 Noise.