TRAFFIC NOISE IMPACT ANALYSIS

FOR

LAGUNA RIDGE TOWN CENTER
ELK GROVE, CA

PREPARED FOR:

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INTRODUCTION

This report describes the existing noise environment in the project vicinity and identifies potential noise impacts and mitigation measures associated with the proposed project. Specifically, this report analyzes potential traffic noise impacts due to, and upon, development of the proposed project site as well as stationary-source noise impacts associated with the development of a proposed medical center. Project impacts are evaluated relative to applicable noise level criteria and to the existing ambient noise environment.

ACOUSTIC FUNDAMENTALS

Noise is generally defined as sound that is loud, disagreeable, or unexpected. Sound is mechanical energy transmitted in the form of a wave because of a disturbance or vibration. Sound levels are described in terms of both amplitude and frequency. Amplitude is defined as the difference between ambient air pressure and the peak pressure of the sound wave. Amplitude is measured in decibels (dB) on a logarithmic scale. For example, a 65 dB source of sound, such as a truck, when joined by another 65 dB source results in a sound amplitude of 68 dB, not 130 dB (i.e., doubling the source strength increases the sound pressure by 3 dB). Amplitude is interpreted by the ear as corresponding to different degrees of loudness. Laboratory measurements correlate a 10 dB increase in amplitude with a perceived doubling of loudness and establish a 3 dB change in amplitude as the minimum audible difference perceptible to the average person.

The frequency of a sound is defined as the number of fluctuations of the pressure wave per second. The unit of frequency is the Hertz (Hz). One Hz equals one cycle per second. The human ear is not equally sensitive to sound of different frequencies. For instance, the human ear is more sensitive to sound in the higher portion of this range than in the lower and sound waves below 16 Hz or above 20,000 Hz cannot be heard at all. To approximate the sensitivity of the human ear to changes in frequency, environmental sound is usually measured in what is referred to as "A-weighted decibels" (dBA). On this scale, the normal range of human hearing extends from about 10 dBA to about 140 dBA (U.S. EPA 1971, Lipscomb and Taylor 1978). Common community noise sources and associated noise levels, in dBA, are depicted in **Exhibit 1**.

Noise can be generated by a number of sources, including mobile sources, such as automobiles, trucks and airplanes, and stationary sources, such as construction sites, machinery, and industrial operations. Noise generated by mobile sources typically attenuates at a rate between 3.0 to 4.5 dBA per doubling of distance. The rate depends on the ground surface and the number or type of objects between the noise source and the receiver. For mobile transportation sources, such as highways, hard and flat surfaces, such as concrete or asphalt, have an attenuation rate of 3.0 dBA per doubling of distance. Soft surfaces, such as uneven or vegetated terrain, have an attenuation rate of about 4.5 dBA per doubling of distance from the source. Noise generated by stationary sources typically attenuates at a rate of approximately 6.0 to 7.5 dBA per doubling of distance from the source (U.S. EPA 1971).

Sound levels can be reduced by placing barriers between the noise source and the receiver. In general, barriers contribute to decreasing noise levels only when the structure breaks the "line of sight" between the source and the receiver. Buildings, concrete walls, and berms can all act as effective noise barriers. Wooden fences or broad areas of dense foliage can also reduce noise, but are less effective than solid barriers.

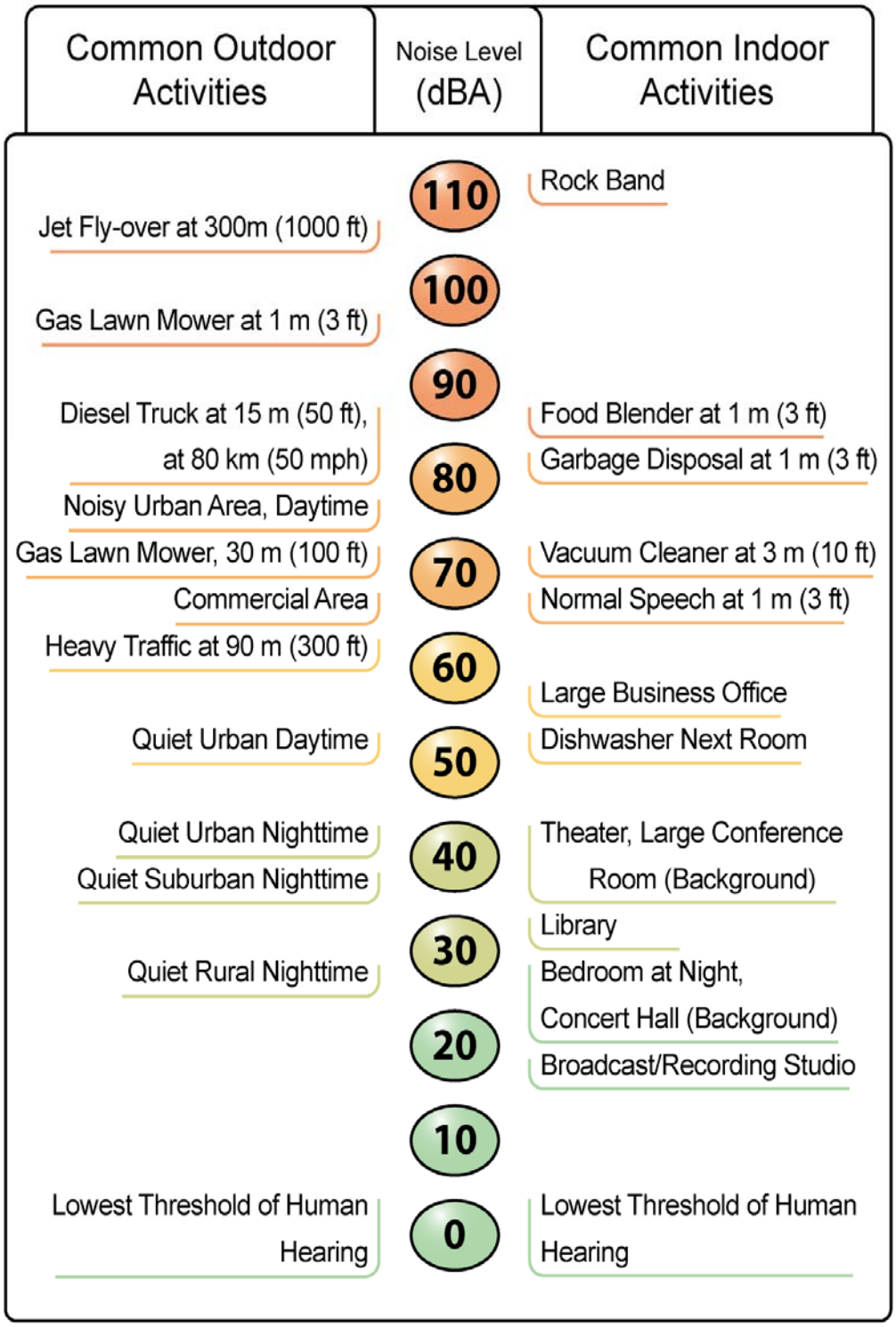

EXHIBIT 1

TYPICAL NOISE LEVELS

Noise Descriptors

The intensity of environmental noise fluctuates over time, and several descriptors of time-averaged noise levels are used. The three most commonly used descriptors are L_{eq}, L_{dn}, and CNEL. The energy-equivalent noise level, L_{eq}, is a measure of the average energy content (intensity) of noise over any given period. Many communities use 24-hour descriptors of noise levels to regulate noise. The day-night average noise level, L_{dn}, is the 24-hour average of the noise intensity, with a 10-dBA "penalty" added for nighttime noise (10 p.m. to 7 a.m.) to account for the greater sensitivity to noise during this period. CNEL, the community equivalent noise level, is similar to L_{dn} but adds an additional 5-dBA penalty for evening noise (7 p.m. to 10 p.m.). Another descriptor that is commonly discussed is the single-event noise exposure level (SENEL), also referred to as the sound exposure level (SEL). The SENEL/SEL describes a receiver's cumulative noise exposure from a single noise event, which is defined as an acoustical event of short duration (0.5 second), such as a backup beeper, the sound of an airplane traveling overhead, or a train whistle, and involves a change in sound pressure above a defined reference value (usually approximately 40 dBA). Noise analyses may also depend on measurements of L_{max}, the maximum instantaneous noise level during a specific period of time, and L_{min}, the minimum instantaneous noise level during a specific period. Common noise level descriptors are summarized in **Table 1**.

Table 1
Common Acoustical Descriptors

Descriptor	Definition
Energy Equivalent Noise Level (L_{eq})	The energy mean (average) noise level. The instantaneous noise levels during a specific period of time in dBA are converted to relative energy values. From the sum of the relative energy values, an average energy value (in dBA) is calculated.
Minimum Noise Level (L_{min})	The minimum instantaneous noise level during a specific period of time.
Maximum Noise Level (L_{max})	The maximum instantaneous noise level during a specific period of time.
Day-Night Average Noise Level (DNL or L_{dn})	The 24-hour Leq with a 10 dBA "penalty" for noise events that occur during the noise-sensitive hours between 10:00 p.m. and 7:00 a.m. In other words, 10 dBA is "added" to noise events that occur in the nighttime hours to account for increases sensitivity to noise during these hours.
Community Noise Equivalent Level (CNEL)	The CNEL is similar to the Ldn described above, but with an additional 5 dBA "penalty" added to noise events that occur between the hours of 7:00 p.m. to 10:00 p.m. The calculated CNEL is typically approximately 0.5 dBA higher than the calculated Ldn.
Single Event Level (SEL)	The level of sound accumulated over a given time interval or event. Technically, the sound exposure level is the level of the time-integrated mean square A-weighted sound for a stated time interval or event, with a reference time of one second.

Human Response to Noise

The human response to environmental noise is subjective and varies considerably from individual to individual. Noise in the community has often been cited as a health problem, not in terms of actual physiological damage, such as hearing impairment, but in terms of inhibiting general well-being and contributing to undue stress and annoyance. The health effects of noise in the community arise from interference with human activities, including sleep, speech, recreation, and tasks that demand concentration or coordination. Hearing loss can occur at the highest noise intensity levels. When community noise interferes with human activities or contributes to stress, public annoyance with the noise source increases. The acceptability of noise and the threat to public well-being are the basis for land use planning policies preventing exposure to excessive community noise levels.

Unfortunately, there is no completely satisfactory way to measure the subjective effects of noise or of the corresponding reactions of annoyance and dissatisfaction. This is primarily because of the wide variation in individual thresholds of annoyance and habituation to noise over differing individual experiences with noise. Thus, an important way of determining a person's subjective reaction to a new noise is the comparison of it to the existing environment to which one has adapted: the so-called "ambient" environment. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged. Regarding increases in A-weighted noise levels, knowledge of the following relationships will be helpful in understanding this analysis:

- Except in carefully controlled laboratory experiments, a change of 1 dB cannot be perceived by humans;
- Outside of the laboratory, a 3-dB change is considered a just-perceivable difference;
- A change in level of at least 5 dB is required before any noticeable change in community response would be expected. An increase of 5 dB is typically considered substantial;
- A 10-dB change is subjectively heard as an approximate doubling in loudness and would almost certainly cause an adverse change in community response.

EXISTING NOISE ENVIRONMENT

Noise-Sensitive Land Uses

Noise-sensitive land uses generally include those uses where exposure to noise would result in adverse effects, as well as uses where quiet is an essential element of their intended purpose. Residential dwellings are of primary concern because of the potential for increased and prolonged exposure of individuals to both interior and exterior noise levels. Other noise-sensitive land uses include hospitals, convalescent facilities, parks, hotels, churches, libraries, and other uses where low interior noise levels are essential. Noise-sensitive land uses located near the project site consist of residential land uses, the nearest of which are located to the north of the project site, across Elk Grove Boulevard, and to the south of the project site, across Civic Center Drive.

Ambient Noise Levels

To document the existing noise environment, ambient noise surveys were conducted by AMBIENT Air Quality & Noise Consulting at various locations in the project area. Short-term (10-minute) noise level measurements were conducted using a Larson Davis model 820 sound-level meter placed at a height of approximately 4.5 feet above the ground surface. Based on the measurements conducted, average daytime noise levels (in dBA L_{eq}) in the project area generally range from the mid 50s to upper 60s, dependent primarily on distance from nearby roadways. The dominant noise source noted during the survey was vehicular traffic on area roadways, including Elk Grove Boulevard and Bruceville Road. Measurement locations and corresponding measured daytime noise levels are summarized in **Table 2.**

Table 2
Ambient Daytime Noise Levels

Monitoring Location	Measured Noise Level (dBA)		
	Leq	Lmin	Lmax
Project Site, Northwestern Boundary	68.3	53.2	75.8
Project Site, Southwestern Boundary	66.2	51.8	72.8
Project Site, Northeastern Boundary	67.5	52.4	74.9
Project Site, Southern Boundary at	55.4	43.1	69.6
Noise measurements were conducted using a Larson Davis Laboratories Model 820 Type I integrating sound meter positioned at a height of approximately 4.5 feet above ground level and at a distance of 50 feet from the centerline of the near travel lane of adjacent roadways.			

REGULATORY FRAMEWORK

Local Plans, Policies, Regulations, and Ordinances

City of Elk Grove General Plan

The Noise Element of the City of Elk Grove General Plan contains policies designed to protect the community from the harmful and annoying effects of exposure to excessive noise. General Plan policies applicable to the proposed project are summarized in **Table 3**. The City's General Plan also includes maximum allowable noise standards for projects affected by transportation and non-transportation noise sources. Noise compatibility of proposed development is determined in comparison to these standards. The City's noise standards for projects affected by stationary (i.e., non-transportation) and transportation noise sources are summarized in **Tables 4 and 5**, respectively.

As depicted in **Table 4**, the City's maximum acceptable exterior noise standard for non-transportation noise sources is 55 dBA L_{eq} during the daytime hours (i.e., 7 a.m. to 10 p.m.) and 45 dBA during the nighttime hours (i.e., 10 p.m. to 7 a.m.) To account for increased annoyance potential, non-transportation sources with tonal, impulsive, or repetitive noise characteristics are reduce by 5 dBA. The City's maximum acceptable exterior noise standard for transportation noise sources is 60 dBA L_{dn}/CNEL (**Table 5**). Exterior noise levels of up to 65 dBA L_{dn}/CNEL may be allowed provided that available exterior noise level reduction measures have been incorporated into the project and interior noise levels do not exceed the City's interior noise standard of 45 dBA L_{dn}/CNEL. This interior noise standard is consistent with State of California Title 24 building insulation requirements, which establishes an interior noise standard of 45 dBA L_{dn}/CNEL for multi-family residential dwellings.

Table 3
City of Elk Grove General Plan
Applicable Noise Policies

General Plan Policy		Consistent with General Plan Policy?
NO-3	Noise created by new proposed non-transportation noise sources shall be mitigated so as not to exceed the noise level standards of Table NO-A as measured immediately within the property line of lands designated for noise-sensitive uses. *NO-3-Action 1:* Limit construction activity to the hours of 7 a.m. to 7 p.m. whenever such activity is adjacent to residential uses. *NO-3-Action 2:* Consider limiting the hours of operation for loading docks, trash compactors, and other noise-producing uses in commercial areas which are adjacent to residential uses. *NO-3-Action 3:* The City shall require that stationary construction equipment and construction staging areas be set back from existing noise-sensitive land uses.	Yes. No development is proposed as part of the proposed project. Any future development on the site will require discretionary approvals subject to environmental review. A mitigation measure has been incorporated to require analysis of noise levels associated with future development of medical uses and to identify noise-reduction measures necessary to ensure compliance with City of Elk Grove noise standards for non-transportation noise sources.
NO-4	Where proposed non-residential land uses are likely to produce noise levels exceeding the performance standards of Table NO-A at existing or planned noise-sensitive land uses, an acoustical analysis shall be required as part of the environmental review process so that noise mitigation may be included in the project design. The requirements for the content of an acoustical analysis are shown in Table NO-B.	
NO-8	Where noise mitigation measures are required to achieve the standards of Tables NO-A and NO-C, the emphasis of such measures shall be placed upon site planning and project design. The use of noise barriers shall be considered a means of achieving the noise standards only after all other practical design-related noise mitigation measures, including the use of distance from noise sources, have been integrated into the project.	

Note: Transportation noise sources are defined as traffic on public roadways, railroad line operations and aircraft in flight. Control of noise from these sources is preempted by Federal and State regulations. Other noise sources are presumed to be subject to local regulations, such as a noise control ordinance. Non-transportation noise sources may include industrial operations, outdoor recreation facilities, HVAC units, loading docks, etc.

Source: City of Elk Grove General Plan, Noise Element (Amended January 5, 2005)

Table 4
Performance Standards for Stationary (Non-Transportation) Noise Sources

Source	Noise Level (Hourly Leq, dBA)	
	Daytime (7a.m. to 10 p.m.)	Nighttime (10 p.m. to 7 a.m.)
Part 1: Typical Sources [1]	55	45
Part 2: Sources Which Are Tonal, Impulsive, Repetitive, or Consist Primarily of Speech or Music [2]	50	40

1. The standards above will apply generally to noise sources that are not tonal, impulsive, or repetitive in nature. Typical noise sources in this category would include HVAC systems, cooling towers, fans, blowers, etc.
2. The standards in Part 2 apply to noises which are tonal in nature, impulsive or repetitive, or which consist primarily of speech or music (e.g., humming sounds, outdoor speaker systems, etc.). Typical noise sources in this category include: pile drivers, drive-through speaker boxes, punch presses, steam valves, and transformer stations.

These noise level standards in Parts 1 and 2 above do not apply to residential units established in conjunction with industrial or commercial uses (e.g., caretaker dwellings).

The City may impose noise level standards which are more or less restrictive than those specified above based upon determination of existing low or high ambient noise levels.

Source: Elk Grove General Plan, Noise Element, Table NO-A (Amended January 5, 2005)

Table 5
Noise Standards for New Uses Affected by Transportation Noise

New Land Use	Outdoor Activity Areas [1] (dBA L_{dn}/CNEL)	Interior Spaces (dBA)	
		L_{dn}/CNEL	L_{eq}[2]
Residential	60[3]	45	--
Residential subject to noise from railroad tracks, aircraft overflights, or similar noise sources which produce clearly identifiable, discrete noise events (the passing of a single train, as opposed to relatively steady noise sources such as roadways)	60[3]	40[5]	--
Transient Lodging	60[4]	45	--
Hospitals & Nursing Homes	60[3]	45	--
Theaters, Auditoriums, Music Halls	---	--	35
Churches, Meeting Halls	60[3]	--	40
Office Buildings	--	--	45
Schools, Libraries, Museums	--	--	45
Playgrounds, Neighborhood Parks	70	--	--

1. Where the location of outdoor activity areas is unknown, the exterior noise level standard shall be applied to the property line of the receiving land use. Where it is not practical to mitigate exterior noise levels at patio or balconies of apartment complexes, a common area such as a pool or recreation area may be designated as the outdoor activity area.
2. As determined for a typical worst-case hour during periods of use.
3. Where it is not possible to reduce noise in outdoor activity areas to 60 dBA L_{dn}/CNEL or less using a practical application of the best-available noise reduction measures, an exterior noise level of up to 65 dBA L_{dn}/CNEL may be allowed provided that available exterior noise level reduction measures have been implemented and interior noise levels are in compliance with this table.
4. In the case of hotel/motel facilities or other transient lodging, outdoor activity areas such as pool areas may not be included in the project design. In these cases, only the interior noise level criterion will apply.
5. The intent of this noise standard is to provide increased protection against sleep disturbance for residences located near railroad tracks.

Source: City of Elk Grove General Plan Noise Element, Table NO-C (Amended January 5, 2005)

THRESHOLDS OF SIGNIFICANCE

In comparison to impacts already addressed in the Elk Grove Laguna Ridge Specific Plan (LRSP) DEIR, the proposed Specific Plan Amendment and Rezone project would not result in new noise or groundborne vibration impacts associated with construction-related activities. In addition, long-term operational noise and ground-borne vibration levels associated with the proposed shopping center and residential land uses would be consistent with those evaluated in the LRSP EIR. The reconfiguration of onsite land uses would, however, result in a potential change in vehicle traffic generation rates. In addition, development of the proposed medical center could result in new non-transportation source noise impacts to nearby noise-sensitive land uses not previously addressed in the LRSP EIR. This report, therefore, includes analysis of potential increases in traffic noise levels as well as, non-transportation source noise levels associated with the development of the proposed medical center. Noise impacts were evaluated based on the following thresholds of significance:

- *Long-Term Traffic Noise Levels* – Result in a substantial permanent long-term increase in ambient noise levels. For purposes of this analysis, increases in ambient noise levels were evaluated based on the following criteria:
  - Where existing traffic noise levels are less than 60 dBA CNEL at the outdoor activity areas of noise-sensitive uses, a 5 dBA increase in noise levels due to roadway improvement projects will be considered significant; and
  - Where existing traffic noise levels range between 60 and 65 dBA CNEL at the outdoor activity areas of noise-sensitive uses, a 3 dBA increase in noise levels due to roadway improvement projects will be considered significant; and
  - Where existing traffic noise levels are greater than 65 dBA CNEL at the outdoor activity areas of noise-sensitive uses, a 1.5 dBA increase in noise levels due to roadway improvement projects will be considered significant.
- *Long-term Noise Levels-Proposed Medical Center* – Result in the generation or exposure to noise levels that would exceed the City's applicable noise standards (**Table 4** of this report).

IMPACTS AND MITIGATION MEASURES

LONG-TERM TRAFFIC NOISE LEVELS

Impact 1 Implementation of the proposed project would not result in a significant increase in ambient transportation noise levels. As a result, this impact would be considered ***less than significant***.

The FHWA roadway noise prediction model was used to predict traffic noise levels along affected roadways for existing traffic conditions, with and without implementation of the proposed project. Modeling was conducted for roadways anticipated to be primarily affected by the proposed project, based on predicted traffic volumes obtained from the traffic analysis prepared for this project (Peters Engineering Group 2007). Modeling was conducted for existing and future cumulative conditions. Predicted traffic noise levels for existing and future cumulative conditions, with and without implementation of the proposed, are summarized in **Table 6** and **Table 7**, respectively. The project's contribution to traffic noise levels along area roadways was determined by comparing the predicted noise levels with and without project-

generated traffic. The predicted noise levels do not take into account shielding or reflection of noise from existing terrain or existing/future structures.

In comparison to existing conditions**,** implementation of the proposed project would result in predicted increases in traffic noise levels of approximately 0.6 dBA, or less, along area roadways. Under future cumulative conditions, implementation of the proposed project would result in predicted increases in traffic noise levels of approximately 0.4 dBA, or less, along area roadways. The proposed project would not result in a significant increase in ambient noise levels. As a result, this impact would be considered ***less than significant***.

Table 6
Predicted Increases in Traffic Noise Levels – Existing Conditions

Roadway Segment	Predicted Noise Level (dBA CNEL/L_{dn}) at 50 Feet From Near Travel Lane Centerline			
	No Project	Plus Project	Increase	Significant?
Elk Grove Blvd., Bruceville Rd. to Wymark Dr.	73.06	73.26	0.20	No
Elk Grove Blvd., Wymark Dr. to Big Horn Blvd.	73.06	73.39	0.33	No
Elk Grove Blvd., Big Horn Blvd. to Laguna Springs Dr.	72.93	73.38	0.45	No
Bruceville Rd., North of Elk Grove Blvd.	69.17	69.68	0.51	No
Bruceville Rd., South of Elk Grove Blvd.	69.74	70.33	0.59	No
Big Horn Blvd., North of Elk Grove Blvd.	65.10	65.54	0.44	No

Traffic noise levels were modeled using the FHWA Traffic Noise Prediction Model (FHWA-RD-77-108) based on traffic data obtained from the traffic analysis prepared for this project. Modeling assumes no natural or human-made shielding (e.g., vegetation, berms, walls, buildings).

Table 7
Predicted Increases in Traffic Noise Levels – Future Cumulative Conditions

Roadway Segment	Predicted Noise Level (dBA CNEL/L_{dn}) at 50 Feet From Near Travel Lane Centerline			
	No Project	Plus Project	Increase	Significant?
Elk Grove Blvd., Bruceville Rd. to Wymark Dr.	74.85	74.97	0.12	No
Elk Grove Blvd., Wymark Dr. to Big Horn Blvd.	74.74	74.94	0.20	No
Elk Grove Blvd., Big Horn Blvd. to Laguna Springs Dr.	73.84	74.04	0.20	No
Bruceville Rd., North of Elk Grove Blvd.	72.39	72.59	0.20	No
Bruceville Rd., South of Elk Grove Blvd.	70.34	70.74	0.40	No
Big Horn Blvd., North of Elk Grove Blvd.	70.58	70.82	0.24	No

Traffic noise levels were modeled using the FHWA Traffic Noise Prediction Model (FHWA-RD-77-108) based on traffic data obtained from the traffic analysis prepared for this project. Modeling assumes no natural or human-made shielding (e.g., vegetation, berms, walls, buildings).

LONG-TERM NOISE LEVELS – PROPOSED MEDICAL CENTER

Impact 2 Proposed medical office land uses could result in substantial increases in ambient noise levels that could exceed the City's noise standards at nearby noise-sensitive land uses. As a result, this impact would be considered ***potentially significant***.

Stationary noise sources commonly associated with medical centers are typically associated with building mechanical equipment, including cooling towers and back-up power generators. Noise levels associated with such equipment can reach levels of up to approximately 90-100 dBA. Mechanical equipment is typically located within buildings or separated from direct public exposure, such as on rooftop areas. In addition, increases in ambient noise levels at nearby noise-sensitive land uses could also occur associated with arrivals and departures of helicopters, in the event that a helipad were to be proposed as part of the proposed medical center. Noise levels at ground-level associated with helipad operations are dependent on multiple factors including flight path, helicopter operations, and helipad location/elevation.

The proposed medical center is still in preliminary stages of design. Depending on the specific equipment proposed, services provided, and site design, the proposed medical center could result in significant increases in ambient noise levels at nearby noise-sensitive land uses in excess of the City's noise standards. As a result, this impact would be considered *potentially significant*.

Recommended Mitigation Measure

- The City shall require an acoustical assessment to be performed to evaluate noise impacts associated wit the development of proposed onsite medical land uses. Where acoustical analysis determines that noise levels would exceed applicable noise standards, the City shall require the implementation of noise-reduction measures to reduce noise impacts to nearby noise-sensitive receptors. Such measure may include, but are not limited to, the incorporation of setbacks, sound barriers, berms, or equipment enclosures.

Significance After Mitigation

Implementation of the above mitigation measure would require analysis of noise impacts associated with the proposed medical center and that noise-reduction measures be incorporated to reduce associated impacts. The incorporation of noise-reduction measures and site design considerations can result in substantial reductions in operational noise levels. However, predicted operational noise levels at some nearby noise-sensitive land uses could still exceed the City's applicable noise standards. In addition, in the event that the proposed medical center were to include a helipad, it is unlikely that resultant noise levels at all nearby noise-sensitive land uses would be reduced to within acceptable levels. As a result, this impact would be considered ***significant and unavoidable***.

REFERENCES

City of Elk Grove. January 5, 2005. Elk Grove General Plan, Noise Element.

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Appendix A

Traffic Noise Modeling

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

EXISTING

ELK GROVE BLVD, BRUCEVILLE TO WYMARK
ADT: 40700 SPEED: 50 ACTIVE HALF WIDTH (FT): 18
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 73.06

ELK GROVE BLVD, WYMARK TO BIG HORN
ADT: 40700 SPEED: 50 ACTIVE HALF WIDTH (FT): 18
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 73.06

ELK GROVE BLVD, BIG HORN TO LAGUNA SPRINGS
ADT: 39500 SPEED: 50 ACTIVE HALF WIDTH (FT): 18
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 72.93

BRUCEVILLE, NORTH OF ELK GROVE
ADT: 21700 SPEED: 45 ACTIVE HALF WIDTH (FT): 18
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 69.17

BRUCEVILLE, SOUTH OF ELK GROVE
ADT: 24700 SPEED: 45 ACTIVE HALF WIDTH (FT): 18
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 69.74

BIG HORN, NORTH OF ELK GROVE
ADT: 8500 SPEED: 45 ACTIVE HALF WIDTH (FT): 18
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 65.10

EXISTING PLUS PROJECT

ELK GROVE BLVD, BRUCEVILLE TO WYMARK
ADT: 42700 SPEED: 50 ACTIVE HALF WIDTH (FT): 18
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 73.26

ELK GROVE BLVD, WYMARK TO BIG HORN
ADT: 44000 SPEED: 50 ACTIVE HALF WIDTH (FT): 18
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 73.39

ELK GROVE BLVD, BIG HORN TO LAGUNA SPRINGS
ADT: 43900 SPEED: 50 ACTIVE HALF WIDTH (FT): 18
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 73.38

BRUCEVILLE, NORTH OF ELK GROVE
ADT: 24400 SPEED: 45 ACTIVE HALF WIDTH (FT): 18
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 69.68

BRUCEVILLE, SOUTH OF ELK GROVE
ADT: 28300 SPEED: 45 ACTIVE HALF WIDTH (FT): 18

SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 70.33

BIG HORN, NORTH OF ELK GROVE
ADT: 9400 SPEED: 45 ACTIVE HALF WIDTH (FT): 18
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 65.54

CUMULATIVE

ELK GROVE BLVD, BRUCEVILLE TO WYMARK
ADT: 61500 SPEED: 50 ACTIVE HALF WIDTH (FT): 18
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 74.85

ELK GROVE BLVD, WYMARK TO BIG HORN
ADT: 60000 SPEED: 50 ACTIVE HALF WIDTH (FT): 18
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 74.74

ELK GROVE BLVD, BIG HORN TO LAGUNA SPRINGS
ADT: 48700 SPEED: 50 ACTIVE HALF WIDTH (FT): 18
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 73.84

BRUCEVILLE, NORTH OF ELK GROVE
ADT: 45500 SPEED: 45 ACTIVE HALF WIDTH (FT): 18
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 72.39

BRUCEVILLE, SOUTH OF ELK GROVE
ADT: 28400 SPEED: 45 ACTIVE HALF WIDTH (FT): 18
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 70.34

BIG HORN, NORTH OF ELK GROVE
ADT: 30000 SPEED: 45 ACTIVE HALF WIDTH (FT): 18
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 70.58

CUMULATIVE PLUS PROJECT

ELK GROVE BLVD, BRUCEVILLE TO WYMARK
ADT: 63200 SPEED: 50 ACTIVE HALF WIDTH (FT): 18
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 74.97

ELK GROVE BLVD, WYMARK TO BIG HORN
ADT: 62800 SPEED: 50 ACTIVE HALF WIDTH (FT): 18
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 74.94
DISTANCE TO NOISE CONTOUR (FEET) FROM NEAR-TRAVEL-LANE CENTERLINE
70 DBA CNEL: 115
65 DBA CNEL: 244
60 DBA CNEL: 530

ELK GROVE BLVD, BIG HORN TO LAGUNA SPRINGS
ADT: 51100 SPEED: 50 ACTIVE HALF WIDTH (FT): 18
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 74.04
DISTANCE TO NOISE CONTOUR (FEET) FROM NEAR-TRAVEL-LANE CENTERLINE
70 DBA CNEL: 100
65 DBA CNEL: 216
60 DBA CNEL: 465

BRUCEVILLE, NORTH OF ELK GROVE
ADT: 47600 SPEED: 45 ACTIVE HALF WIDTH (FT): 18
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 72.59

BRUCEVILLE, SOUTH OF ELK GROVE
ADT: 31100 SPEED: 45 ACTIVE HALF WIDTH (FT): 18
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 70.74
DISTANCE TO NOISE CONTOUR (FEET) FROM NEAR-TRAVEL-LANE CENTERLINE
70 DBA CNEL: 60
65 DBA CNEL: 130
60 DBA CNEL: 280

BIG HORN, NORTH OF ELK GROVE
ADT: 31700 SPEED: 45 ACTIVE HALF WIDTH (FT): 18
SITE CHARACTERISTICS: SOFT GRADE (PERCENT): .5
CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE = 70.82