URS

August 29, 2008

Jeffrey A. Gorrell
Lenvik & Minor Architects
315 West Haley Street
Santa Barbara, CA 93101Santa Maria, CA 93455

Re: Community Noise Analysis for 110 West Sola Street, Santa Barbara, CA

Dear Mr. Gorrell:

In accordance with our agreement dated August 19, 2008, URS has completed estimates of current and future noise levels for the proposed mixed use building with four residential units above parking and commercial offices at the corner of West Sola Street and Chapala Street. In summary, we confirm that all required exterior living areas as proposed will have Day-Night Average Noise Levels (Ldn) of less than 60 decibels (dBA). Interior noise levels are also expected to be within the 45 dBA standard. Mitigation measures noted in this letter will help to ensure that these standards are met.

Demolition and construction noise from the project will be audible at the nearby residential uses in the neighborhood. This will be an intermittent and short-term effect. Several standard City of Santa Barbara conditions are included to help reduce construction noise and avoid a significant impact.

The following sections of this letter and attachments provide more details regarding these conclusions.

NOISE STANDARDS

Noise Element

The City of Santa Barbara Noise Element (1979, 1983) provides a thorough background discussion of noise and its effects on human health and quality of life. For the proposed project at 110 West Sola Street, the major noise issue involves vehicular traffic on adjacent streets, and its effect on the exterior and interior noise levels in proposed living areas.

The City Noise Element establishes land use compatibility guidelines in terms of the Day-Night Average Noise Level (Ldn) (City of Santa Barbara 1979:1.18-1.19). The Ldn is based on hourly average noise levels during different times of the day, and includes an adjustment or penalty for noise during nighttime hours (from 10:00 p.m. to 7:00 a.m.). The Ldn is defined more completely below (Potential Impacts). A similar 24-hour average noise level, with penalties in both the evening and nighttime hours, is the Community Noise Equivalent

EXHIBIT D

Level (CNEL). The CNEL and Ldn are often used interchangeably, and the City of Santa Barbara standards include both. Noise levels used in the standards and measurements described in this letter are expressed as decibels, using the "A" weighted frequency response that duplicates the sensitivity of the human ear (abbreviated dBA).

An additional term used in this report and in describing noise standards is "Equivalent Noise Level" or Leq. For a noise of varying loudness over a defined time period, the Leq is the computed constant value that represents the same amount of energy. Leq values are usually expressed for 1-hour periods, as in the hourly average noise levels that are used to define the Ldn described above. They may also be expressed for longer or shorter time periods.

The Noise Element establishes that 60 dBA is the maximum exterior Ldn compatible with residential development. For areas where the Ldn exceeds 60 dBA, residential project designs must include measures to reduce the Ldn in exterior living areas to 60 dBA or less.

The Noise Element also contains a standard for interior living areas, which must not exceed 45 dBA (City Santa Barbara, 1979:Figure 2). This standard is consistent with requirements of the State of California for all multi-family residential units, which are set forth in the State Building Code (Title 24 of the California Code of Regulations, Sections T25-28). Contemporary wood frame construction techniques typically provide up to a 20 dBA reduction in exterior to interior noise levels, so this 45 dBA interior noise level requirement is routinely achieved when exterior noise levels do not exceed 65 dBA. In order to demonstrate that the interior requirement is achieved, the state standards also require the preparation of an acoustical report for all multi-family dwellings where the exterior noise levels exceed 60 dBA.

Noise Ordinance

The project will involve demolition of the existing brick Magellan building, followed by construction activity for the proposed project. Existing residential uses across West Sola Street to the south, and in the block containing the project site, would be affected by such noise. These uses would potentially be affected by noise from mechanical ventilation or similar equipment noise from the project. The City of Santa Barbara Noise Ordinance (Chapter 9.16 of the Municipal Code) contains several provisions applicable to these noise sources:

TABLE 1:
Noise Ordinance Provisions

Section	Provision
9.16.015	Prohibits construction work at night
9.16.025B	Restricts use of non-electric mechanical equipment to normal daytime working hours
9.16.025.C	Restricts noise from all mechanical equipment to 60 dBA CNEL at property lines adjoining residential uses or zones

NOISE MONITORING RESULTS

The project site is located in the northwest quadrant of the intersection of West Sola Street and Chapala Street, where the Magellan building is currently located. The envelope of the proposed building is somewhat smaller than the existing Magellan building. The southern boundary of the proposed building would be approximately 35 feet from the centerline of West Sola Street. The eastern boundary would be approximately 60 feet from the centerline of Chapala Street. Figure 1 shows the project location and vicinity.

The noise environment at the site is dominated by vehicle traffic on Chapala and West Sola Streets. Noise monitoring was conducted on August 20, 2008, between 8:00 and 9:00 a.m. at the southeast corner of the project site. The measurement location is shown as M1 in Figure 2, showing the project site plan.

Measurements were made with a Larson-Davis Model 700 sound level meter, which was calibrated at 94 dB and 114 dB before the measurements. The calibration remained unchanged when checked after the measurements. Attachment 1 contains the results of the noise measurements, in tabular and graphic form, and also contains summaries of traffic counts taken in the area during the period of noise measurements. During the measurement period, a single very loud Harley Davidson motorcycle with modified exhaust passed along

Chapala Street. This event is obvious as a very high and anomalous peak at the start of minute 6 in Attachment 1, and was excluded from the computation of the Leq for the measurement period. During the approximately 20 minute measurement period, four city busses passed near the monitoring point. All were northbound on Chapala Street, and half of them turned to the east on West Sola Street.

The current Ldn value at M1, which is fully exposed to noise from both streets, is estimated to be 69.4 dBA. The Ldn values at other street locations around the second story perimeter of the proposed building range from 58.2 near the southwestern corner to 65.0 near the southeastern corner facing Chapala Street. Lower values will occur at segments of the project exterior facing away from the adjacent streets. The modeling procedures used in this determination and the results are discussed in the following section, Potential Impacts.

POTENTIAL IMPACTS

Traffic Noise

The Traffic Noise Model (TNM 2.5) published by the Federal Highway Administration (Lau et al 2004) was used to estimate hourly noise levels for traffic on roadways in the project vicinity. Attachment 2 contains the model input and results, including a confirmation of the accuracy of the model. The Model Confirmation input included the traffic count data from the period of noise measurements. The computed Leq from the TNM 2.5 model is 64.7 dBA, which is slightly higher than the measured 64.1 dBA.

For the computation of Ldn values and analysis of noise impacts, separate determinations were made for the daytime and nighttime hourly Leq values based on estimated traffic volumes for these periods. Then the daytime and nighttime results were combined to compute the Ldn, using the following equation:

$$Ldn = 10*\log\{(1/24)*[15*10^{Ld/10} + 9*10^{(Ln+10)/10}]\} \quad (1)$$

Where:

Ldn = Day-Night Average Noise Level
Ld = Hourly equivalent noise level for hours during the daytime, 15 hours from 7:00 a.m. to 10:00 p.m.
Ln = Hourly equivalent noise level for hours during the nighttime, 9 hours from 10:00 p.m. to 7:00 a.m.

Receiver locations were chosen to represent typical positions on outdoor patios identified in the project site plan as required outdoor living areas. In addition to these required outdoor living areas, the project plans also show several other smaller decks. Receiver locations were placed at all required outdoor living areas, the smaller outdoor decks, and at several other points along the exterior building walls.

The proposed building itself will act as an effective barrier to traffic noise for many of these exterior patios and decks by limiting much of the noise exposure to the adjacent street and blocking the line of site to the cross street.

Figure 2 shows the proposed site plan, with the modeled receiver locations. Ldn values were determined for current and future conditions at the second and third story receiver locations.

Traffic data were obtained from the City of Santa Barbara's web site, with a 10% increase to account for changes since the last City traffic counts. The project site is located in the downtown area, which is completely built out. Projections of future traffic volumes were not available for this project or location, but growth in traffic volumes is not expected to be significant. For this study, a 20% increase in automobile and truck traffic was assumed and the pattern and number of city busses was assumed to remain approximately constant. The distribution of other vehicle types was estimated from the traffic counts, and it was assumed that 85% of the traffic occurred during the daytime (7:00 a.m. to 10:00 p.m.) and 15% occurs during the nighttime. The traffic data for current and future conditions, and the assumptions used for vehicle types and distributions are shown in Attachment 2. As noted above, Attachment 2 contains all of the input data for each model run, done separately for daytime and nighttime periods. Results from the noise model and computation of the Ldn values for each receiver location are shown at the end of Attachment 2, and are summarized in Table 2 below.

These results indicate that for all of the required outdoor living areas, current and estimated future exterior Ldn values will remain below 60 dBA, and would not be considered a significant impact based on the City General Plan standards. Under the current conditions, most of the other proposed decks would also be under 60 dBA Ldn.

TABLE 2:
Summary of Traffic Noise Results

Location No.	Description	Current Ldn (dBA)	Future (2010) Ldn (dBA)
M1	Monitor Point, se corner of property	69.4	70.2
1P2	**Unit 1, Covered Patio**	**57.2**	**58.0**
1D2	Unit 1, covered deck in se corner	65.0	65.8
1SB2	Unit 1, southern balcony, 2nd story	63.1	63.9
1B3	Unit 1, southern wall, 3rd story	62.7	63.5
1UD	Unit 1, upper deck	58.9	59.7
2D2	Unit 2, southern covered deck	61.4	62.2
3D2	Unit 2 & 3, southern entry deck	52.8	53.5
4D2	Unit 4, southern covered deck	58.2	59.0
4S2	Unit 4, southern wall, 2nd story	59.6	60.4
4S3	Unit 4, southern wall, 3rd story	59.2	60.0
4W2	Unit 4, western wall, 2nd story	54.4	55.2
4UD	Unit 4, upper deck	53.2	54.0
4P2	**Unit 4, Patio**	**53.6**	**54.4**
3P2	**Unit 3 Patio**	**54.8**	**55.6**
3UD	Unit 3, upper deck	55.1	55.9
2P2	**Unit 2, Patio**	**57.0**	**57.8**
2UD	Unit 2, upper deck	56.1	56.9

Note: Locations and results in **bold** indicate required outdoor living areas.

Interior Noise Levels

Exterior building walls and window and door assemblies that meet current energy conservation requirements in California typically provide approximately 20 dBA reduction in noise levels. Interior noise levels under current conditions would all be at or below 45 dBA Ldn, since all exterior values are estimated at or below 65 dBA. For the future conditions, only one point (at the southeast corner of the project) would exceed 65 dBA, and this would only be by a fraction of a decibel (65.8 dBA).

On-Site Construction Noise

Noise levels from heavy equipment used for earth moving during construction typically range from 80-90 dBA at distances of 50 feet. Demolition activities may be somewhat louder than these limits, but would be very intermittent. Noise from these activities will be intrusive for the residential uses across West Sola Street and within the block containing the project site. The impacts will be intermittent and short-term; compliance with the City's Noise Ordinance provisions related to construction should provide adequate mitigation.

MTIGATION MEASURES

The exterior wall of the covered patio for Unit 1 (northeastern corner of the project site) should be solid (wood frame with stucco or other sheathing, as opposed to open railing), and should be four feet in height from the floor elevation. This will provide the necessary barrier attenuation to ensure that the required outdoor living space in this patio remains below 60 dBA Ldn.

The residential units expected to have exterior Ldn values in excess of 60 dBA (i.e. Units 1 and 2) should be provided with forced air ventilation so that residents can keep windows closed at night if desired. This will ensure that interior Ldn values will remain below 45 dBA.

Even though construction noise is a common and expected occurrence, the close proximity of existing residences warrants measures to help minimize the potential for noise impacts from construction noise within the project site. Typical conditions imposed by the City for such projects include (City of Santa Barbara, 2004):

- Noise generating construction activity should be prohibited on Saturdays, Sundays, and holidays and between the hours of 5 p.m. to 8 a.m. Holidays are defined as those days which are observed by the City of Santa Barbara as official holidays by City employees.
- All construction equipment, including trucks, should be professionally maintained and fitted with standard manufacturers' muffler and silencing devices.
- Staging and equipment areas shall be sited to minimize noise effects to residential and other noise-sensitive land uses. Temporary noise barriers shall be provided around the construction site as necessary to avoid extended disturbance to neighbors from construction noise.
- Within 10 days of commencement of construction, the applicant shall provide notice of construction schedule to surrounding neighborhood and post information on the site in a location visible to the public, including hours of operation and telephone contact number.

These measures will not eliminate construction noise, but will minimize the potential for significant impacts.

URS

If you have any questions regarding this analysis or require additional information, please call me.

Sincerely,
URS Corporation

John Larson
Project Environmental Planner

Enclosures:

Figure 1: Project Location and Vicinity

Figure 2: Site Plan (2nd story) and Noise Receiver Locations

Attachment 1: Noise Measurements

Attachment 2: Input and Results for TNM 2.5 Model

REFERENCES

Lau, Michael C., Cynthia S.Y. lee, Judith L. Rochat, Eric R. Boeker, Gregg G. Pleming, Kevin L. Cummins, and Joseph Ruggiero. 2004. FHWA Traffic Noise Model Version 2.5. U.S. Department of Transportation, Federal Highway Administration, Washington, D.C.

City of Santa Barbara. 1979. The City of Santa Barbara General Plan, Noise Element. Amended through 1983, prepared by Envicom Corporation for the City of Santa Barbara, Department of Community Development, Santa Barbara, CA.

City of Santa Barbara. January, 2004. Standard Short-term Construction-Related Mitigation. Planning Division, City of Santa Barbara, Santa Barbara, CA.

City of Santa Barbara. 2008. Daily Traffic Volume Maps. Obtained August 2008 from: http://www.santabarbaraca.gov/Government/Departments/PW/transops_main.htm

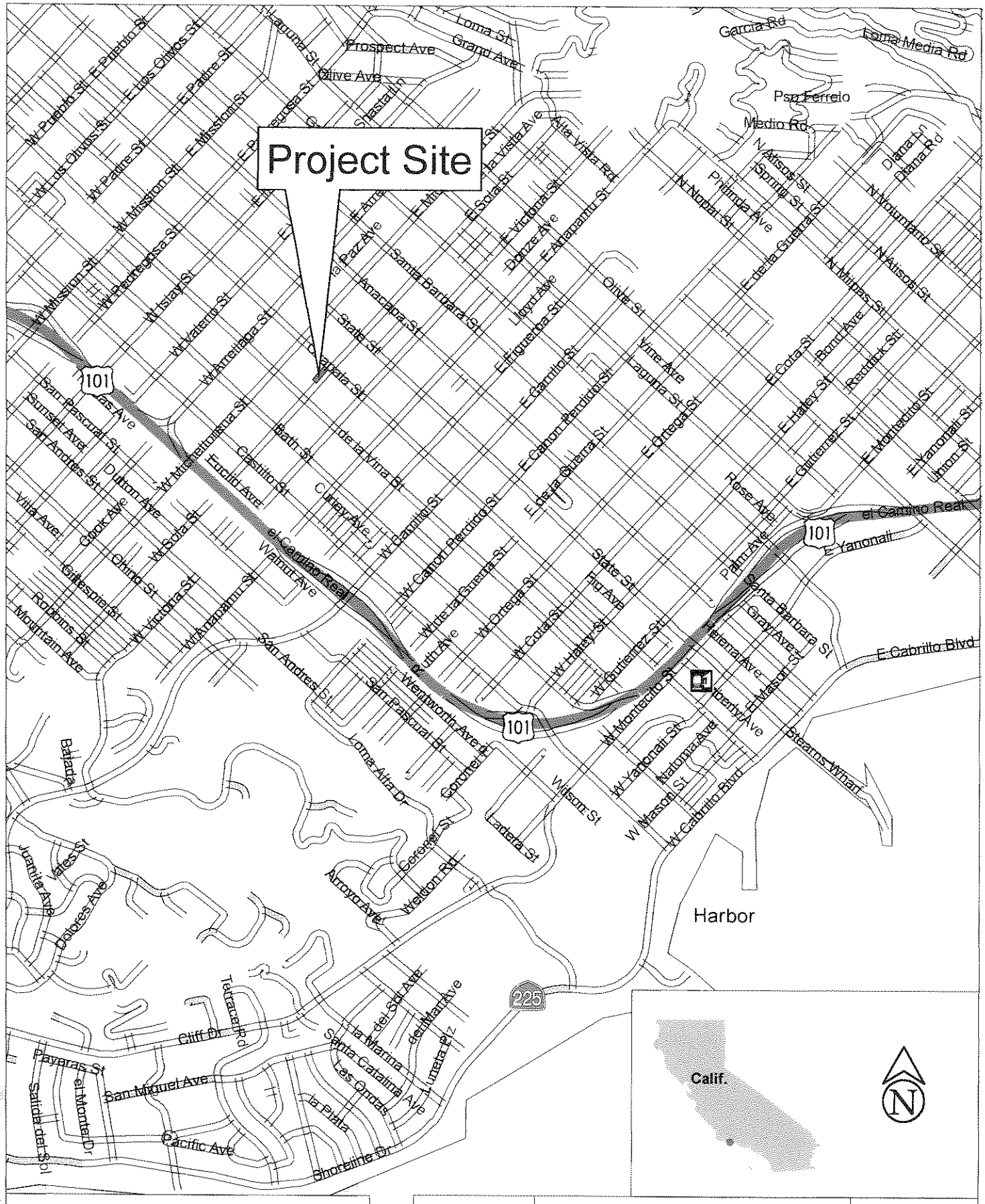

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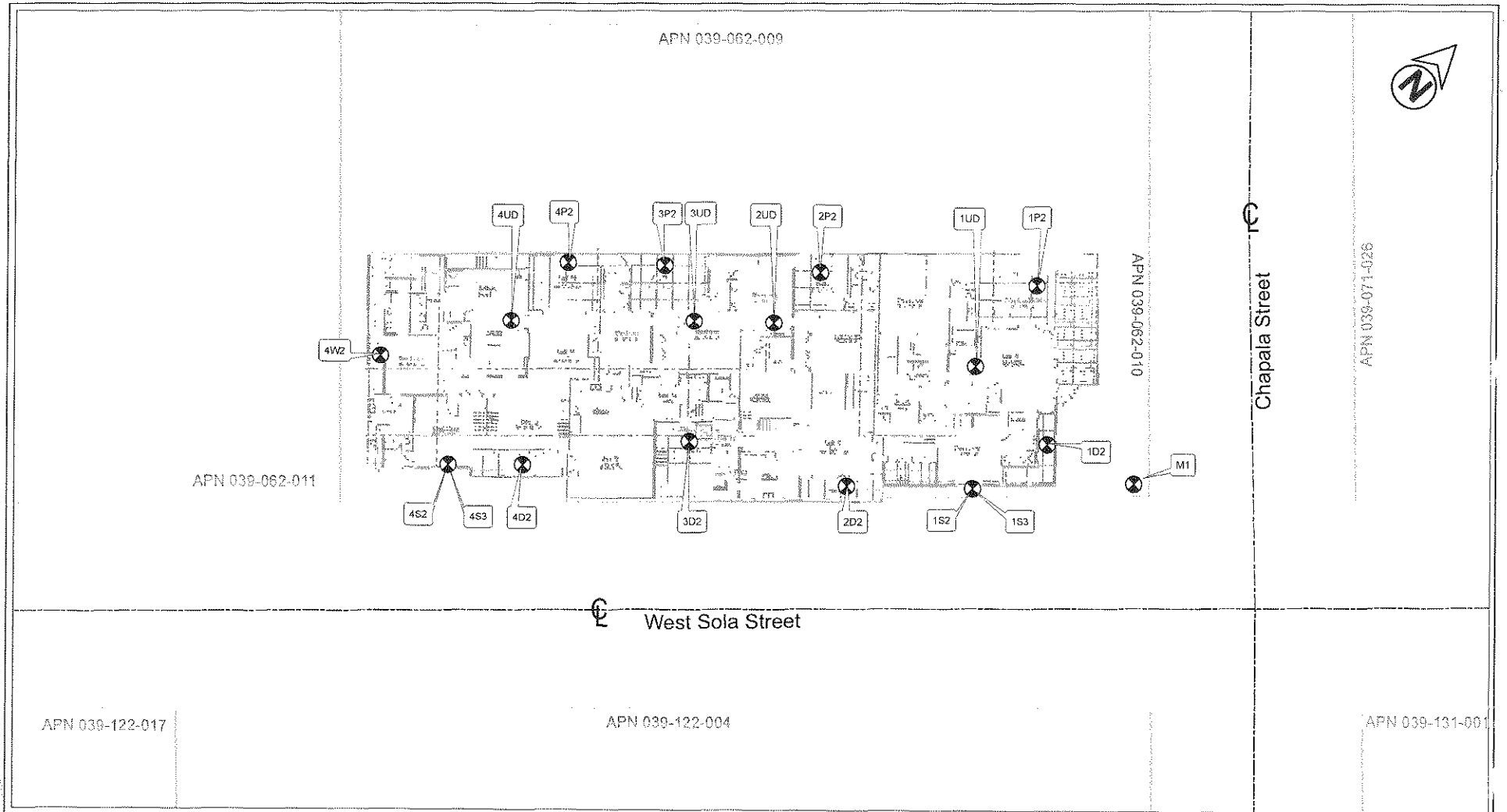
Figure 1: Project Site and Vicinity
110 West Sola Street, Santa Barbara, CA
Lenvik & Minor Architects

September 2008



LEGEND

- Noise Receivers
- Road Centerlines
- Assessor Parcels

1 inch equals 40 feet

0 40 80

Scale in Feet

URS	110 West Sola Street, Santa Barbara, CA Lenvik & Minor Architects	Figure 2: Site Plan (2nd Story) and Noise Receiver Locations	September 2008

Attachment 1: Noise Measurements

Location M1: Southeast Corner of Property 8/20/2008

Minute Number	Time	LVL	Lmin	Lmax	Lpk	
1	8:15:51	60	48.5	69.5	86	
2	8:16:51	59.5	48	68.5	83.5	
3	8:17:51	64.5	48	72	90.5	
4	8:18:51	60	49	69	83	
5	8:19:51	63.5	50.5	74.5	88.5	
6	8:20:51	83	52.5	102.5	116	(mortorcycle)
7	8:21:51	59	51.5	66.5	76.5	
8	8:22:51	62	49	69.5	84.5	
9	8:23:51	64	50	77	93.5	
10	8:24:51	68	51.5	80.5	95	
11	8:25:51	62	52	70.5	85	
12	8:26:51	64	56	77	90.5	
13	8:27:51	62.5	50	72	83	
14	8:28:51	66	48.5	79	88	
15	8:29:51	62.5	49	69.5	81	
16	8:30:51	62.5	51.5	70	82	
17	8:31:51	71	52	83	93	
18	8:32:51	59.5	50.5	68.5	84	
19	8:33:51	63	52	73	88	
20	8:34:51	64	52	73	86	
21	8:35:51	60	58	62.5	76	

Leq for Meas. = 70.8
Leq for Meas. = 64.1 (without motorcycle in minute 6)
Leq for Meas. =

Traffic Counts and Notes Count Duration= 21 minutes Speed approx. 25 mph
Chapala St. 22 feet to CL of road ne corner at W Sola St.

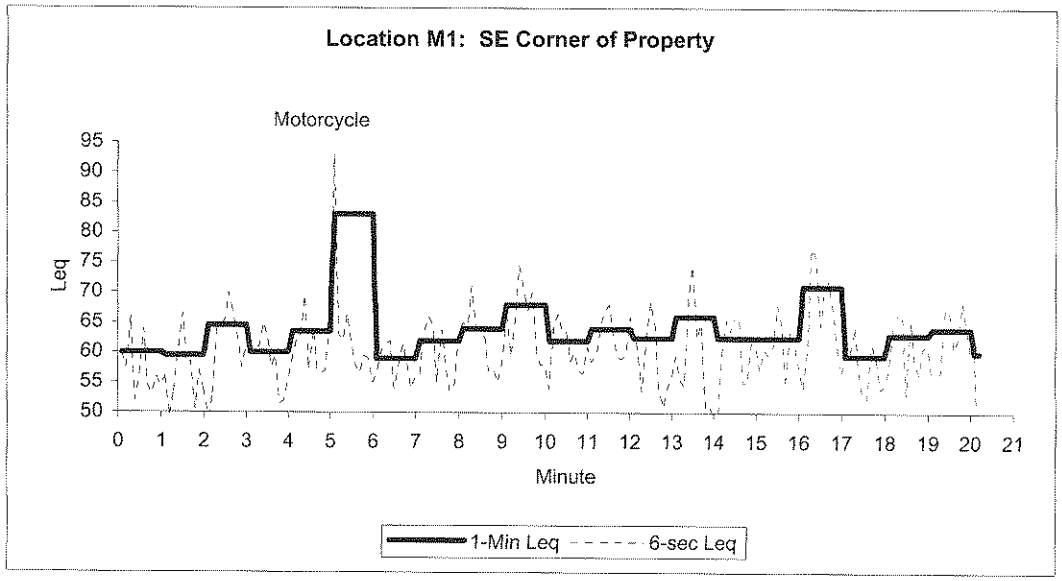
	For Period	Per Hour	%
Autos	102	291	93.6%
Med. Trks.	3	9	2.8%
Hvy. Trks.	0	0	0.0%
Busses	4	11	3.7%
Total	109	311	100%

Noise sources:
Local traffic, distant construction,
Motorcycle (HD) at 08:20:45
Busses at: 8:25:00 W Sola
8:27:00 Chapala
8:32:00 Chapala
8:35:00 W Sola

Traffic Counts and Notes Count Duration= 21 minutes Speed approx. 25 mph
W Sola St. 24 feet to CL of road ne corner at Chapala St.

	For Period	Per Hour	%
Autos	48	137	44.0%
Med. Trks.	0	0	0.0%
Hvy. Trks.	0	0	0.0%
Busses	0	0	0.0%
Total	48	137	44%

Attachment 1: Noise Measurements



Attachment 2

Input and Results for TNM 2.5 Model

Page

Model Confirmation
- Input 1
- Results 1

Current Day
- Input 2
- Results 3

Current Night
- Input 4
- Results 4

Future Day
- Input 5
- Results 6

Future Night
- Input 7
- Results 7

Attachment 2
Input and Results for TNM 2.5 Model

MODEL CONFIRMATION														
						27-Aug-08								
Larson						TNM 2.5								
INPUT: ROADWAYS								Average pavement type shall be used unless						
PROJECT/CONTRACT:	110 W Sola							a State highway agency substantiates the use						
RUN:	Model Confirmation							of a different type with the approval of FHWA						
Roadway			Points											
Name	Width		Name	No.	Coordinates (pavement)			Flow Control			Segment			
					X	Y	Z	Control Device	Speed Constraint	Percent Vehicles Affected	Pvmt Type	On Struct?		
	ft				ft	ft	ft		mph	%				
W Sola St	44		W end	1	-50	0	0	Stop	0	50	Average			
			Int Chapal	2	268	0	0				Average			
			E end	3	500	0	0							
Chapala St	42		S End	4	268	-100	0	Stop	0	50	Average			
			Int W Sola	5	268	0	0				Average			
			N End	6	268	300	0							
					27-Aug-08									
Larson					TNM 2.5									
INPUT: TRAFFIC FOR LAeq1h Volumes														
PROJECT/CONTRACT:	110 W Sola													
RUN:	Model Confirmation													
Roadway		Points												
Name		Name	No.	Segment										
				Autos		MTrucks		HTrucks		Buses		Motorcycles		
				V	S	V	S	V	S	V	S	V	S	
				veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph	
W Sola St		W end	1	137	25									
		Int Chapal	2	137	25									
		E end	3											
Chapala St		S End	4	291	25	9	25			11	25	1	25	
		Int W Sola	5	291	25	9	25			5	25	1	25	
		N End	6											
							27-Aug-08							
Larson							TNM 2.5							
RESULTS: SOUND LEVELS							Calculated with TNM 2.5							
PROJECT/CONTRACT:		110 W Sola												
RUN:		Model Confirmation												
BARRIER DESIGN:		INPUT HEIGHTS						Average pavement type shall be used unless						
								a State highway agency substantiates the use						
ATMOSPHERICS:		70 deg F, 50% RH						of a different type with approval of FHWA.						
Receiver														
Name	No.	#DUs	Existing	No Barrier					With Barrier					
			LAeq1h	LAeq1h		Increase over existing		Type	Calculated	Noise Reduction				
				Calculated	Crit'n	Calculated	Crit'n	Impact	LAeq1h	Calculated	Goal	Calculated		
							Sub'l Inc					minus		
												Goal		
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB		
M1	1	0	0	64.7	66	64.7	10	----	64.7	0	8	-8		
Dwelling Units		# DUs	Noise Reduction											
			Min	Avg	Max									
			dB	dB	dB									
All Selected		0	0	0	0									
All Impacted		0	0	0	0									
All that meet NR Goal		0	0	0	0									

Attachment 2
Input and Results for TNM 2.5 Model

CURRENT DAY														
						28-Aug-08								
Larson						TNM 2.5								
INPUT: ROADWAYS								Average pavement type shall be used unless						
PROJECT/CONTRACT:	110 W Sola							a State highway agency substantiates the use						
RUN:	Current Day							of a different type with the approval of FHWA						
Roadway			Points											
Name	Width		Name	No.	Coordinates (pavement)			Flow Control				Segment		
					X	Y	Z	Control Device	Speed Constraint	Percent Vehicles Affected		Pvmt Type	On Struct?	
	ft				ft	ft	ft		mph	%				
W Sola St	44		W end	1	50	0	0	Stop	0	50		Average		
			Int Chapal	2	268	0	0					Average		
			E end	3	500	0	0							
Chapala St	42		S End	4	268	-100	0	Stop	0	50		Average		
			Int W Sola	5	268	0	0					Average		
			N End	6	268	300	0							
					28-Aug-08									
Larson					TNM 2.5									
INPUT: TRAFFIC FOR LAeq1h Volumes														
PROJECT/CONTRACT:	110 W Sola													
RUN	Current Day													
Roadway		Points												
Name		Name	No.	Segment										
				Autos		MTrucks		HTrucks		Buses		Motorcycles		
				V	S	V	S	V	S	V	S	V	S	
				veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph	
W Sola St		W end	1	125	25									
		Int Chapal	2	125	25									
		E end	3											
Chapala St		S End	4	561	25	17	25			12	25	1	25	
		Int W Sola	5	561	25	17	25			6	25	1	25	
		N End	6											
					28-Aug-08									
Larson					TNM 2.5									
INPUT: BARRIERS														
PROJECT/CONTRACT:	110 W Sola													
RUN:	Current Day													
Barrier1	Points													
Name	Name	No.	Coordinates (bottom)			Height	Segment							
			X	Y	Z	at	Seg Ht Perturbs			On	Important			
						Point	Incre-ment	#Up	#Dn	Struct?	Reflec-tions?			
			ft	ft	ft	ft	ft							
	B0	33	185	105	0	18	0	0	0					
	B1	1	208	105	0	18	0	0	0					
	B2	2	208	90	0	18	0	0	0					
	B3	3	208	89.9	0	25	0	0	0					
	B4	4	208	66	0	25	0	0	0					
	B5	5	203	66	0	25	0	0	0					
	B6	6	203	51	0	25	0	0	0					
	B7	7	193	51	0	25	0	0	0					
	B8	8	193	50.9	0	35	0	0	0					
	B9	9	193	46	0	35	0	0	0					
	B10	10	173	46	0	35	0	0	0					
	B11	11	173	57	0	35	0	0	0					
	B12	12	172.9	57	0	25	0	0	0					
	B13	13	148.9	57	0	25	0	0	0					
	B14	14	148.9	53	0	25	0	0	0					
	B15	15	133.8	53	0	25	0	0	0					
	B16	17	133.8	53	0	35	0	0	0					
	B17	16	123.8	53	0	35	0	0	0					
	B18	18	123.8	42	0	35	0	0	0					
	B19	19	108.8	42	0	35	0	0	0					
	B20	20	108.7	42	0	25	0	0	0					
	B21	21	105	42	0	25	0	0	0					
	B22	22	105	63	0	25	0	0	0					
	B23	23	90	63	0	25	0	0	0					
	B24	24	90	42	0	25	0	0	0					
	B25	25	65	42	0	25	0	0	0					
	B26	26	65	53	0	25	0	0	0					
	B27	27	36	53	0	25	0	0	0					
	B28	28	35.9	53	0	35	0	0	0					
	B29	29	35.9	50	0	35	0	0	0					
	B30	30	17	50	0	35	0	0	0					
	B31	31	16.9	50	0	25	0	0	0					
	B32	32	16.9	102	0	25								

Attachment 2
Input and Results for TNM 2.5 Model

Larson						28-Aug-08 TNM 2.5								
INPUT: RECEIVERS														
PROJECT/CONTRACT:	110 W Sola													
RUN:	Current Day													
Receiver														
Name	No.	#DUs	Coordinates (ground)			Height	Input Sound Levels and Criteria				Active			
			X	Y	Z	above	Existing	Impact Criteria		NR	in			
						Ground	LAeq1h	LAeq1h	Sub'l	Goal	Calc.			
			ft	ft	ft	ft	dBA	dBA	dB	dB				
M1	1	0	240	35	0	4.92	0	66	10	8	Y			
1P2	2	1	193	100	0	19	0	66	10	8	Y			
1D2	3	1	208	55	0	19	0	66	10	8	Y			
1SB2	4	1	183	43	0	19	0	66	10	8	Y			
1SB3	5	1	183	43	0	29	0	66	10	8	Y			
1UD	6	1	183	78	0	29	0	66	10	8	Y			
2D2	7	1	146	43	0	19	0	66	10	8	Y			
3D2	8	1	100	55	0	19	0	66	10	8	Y			
4D2	9	1	52	50	0-Jan-00	19	0	66	10	8	Y			
4SB2	10	1	28	46	0	19	0	66	10	8	Y			
4SB3	11	1	28	46	0	29	0	66	10	8	Y			
4WB2	12	1	?	78	0	19	0	66	10	8	Y			
4UD	13	1	45	90	0	29	0	66	10	8	Y			
4P2	14	1	65	105	0	19	0	66	10	8	Y			
3P2	15	1	95	105	0	19	0	66	10	8	Y			
3UD	16	1	100	90	0	29	0	66	10	8	Y			
2P2	17	1	140	105	0	19	0	66	10	8	Y			
2UD	18	1	125	90	0	29	0	66	10	8	Y			
							28-Aug-08							
Larson							TNM 2.5							
RESULTS: SOUND LEVELS							Calculated with TNM 2.5							
PROJECT/CONTRACT:		110 W Sola												
RUN:		Current Day												
BARRIER DESIGN:		INPUT HEIGHTS						Average pavement type shall be used unless						
								a State highway agency substantiates the use						
ATMOSPHERICS:		70 deg F, 50% RH						of a different type with approval of FHWA.						
Receiver														
Name	No.	#DUs	Existing	No Barrier						With Barrier				
			LAeq1h	LAeq1h		Increase over existing		Type		Calculated	Noise Reduction			
				Calculated	Crit'n	Calculated	Crit'n	Impact		LAeq1h	Calculated	Goal	Calculated	
							Sub'l Inc						minus	
													Goal	
			dBA	dBA	dBA	dB	dB			dBA	dB	dB	dB	
M1	1	0	0	67	66	67	10	Snd Lvl		67	0	8	-8	
1P2	2	1	0	54.8	66	54.8	10	----		54.8	0	8	-8	
1D2	3	1	0	62.6	66	62.6	10	----		62.6	0	8	-8	
1SB2	4	1	0	60.7	66	60.7	10	----		60.7	0	8	-8	
1SB3	5	1	0	60.4	66	60.4	10	----		60.4	0	8	-8	
1UD	6	1	0	58.5	66	58.5	10	----		58.5	0	8	-8	
2D2	7	1	0	59	66	59	10	----		59	0	8	-8	
3D2	8	1	0	60.4	66	60.4	10	----		60.4	0	8	-8	
4D2	9	1	0	55.8	66	55.8	10	----		55.8	0	8	-8	
4SB2	10	1	0	57.2	66	57.2	10	----		57.2	0	8	-8	
4SB3	11	1	0	56.8	66	56.8	10	----		56.8	0	8	-8	
4WB2	12	1	0	52	66	52	10	----		52	0	8	-8	
4UD	13	1	0	50.8	66	50.8	10	----		50.8	0	8	-8	
4P2	14	1	0	51.2	66	51.2	10	----		51.2	0	8	-8	
3P2	15	1	0	52.4	66	52.4	10	----		52.4	0	8	-8	
3UD	16	1	0	52.7	66	52.7	10	----		52.7	0	8	-8	
2P2	17	1	0	54.6	66	54.6	10	----		54.6	0	8	-8	
2UD	18	1	0	53.7	66	53.7	10	----		53.7	0	8	-8	
Dwelling Units		# DUs	Noise Reduction											
			Min	Avg	Max									
			dB	dB	dB									
All Selected		17	0	0	0									
All Impacted		0	0	0	0									
All that meet NR Goal		0	0	0	0									

Attachment 2
Input and Results for TNM 2.5 Model

CURRENT NIGHT													
					28-Aug-08								
Larson					TNM 2.5								
INPUT: TRAFFIC FOR LAeq1h Volumes													
PROJECT/CONTRACT:	110 W Sola												
RUN:	Current Night												
Roadway		Points											
Name		Name	No.	Segment									
				Autos		MTrucks		HTrucks		Buses		Motorcycles	
				V	S	V	S	V	S	V	S	V	S
				veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph
W Sola St		W end	1	37	25								
		Int Chapal	2	37	25								
		E end	3										
Chapala St		S End	4	185	25	5	25			3	25	1	25
		Int W Sola	5	185	25	5	25			2	25	1	25
		N End	6										
							28-Aug-08						
Larson							TNM 2.5						
							Calculated with TNM 2.5						
RESULTS: SOUND LEVELS													
PROJECT/CONTRACT:		110 W Sola											
RUN:		Current Night											
BARRIER DESIGN:		INPUT HEIGHTS						Average pavement type shall be used unless					
								a State highway agency substantiates the use					
ATMOSPHERICS:		70 deg F, 50% RH						of a different type with approval of FHWA.					
Receiver													
Name	No.	#DUs	Existing	No Barrier					With Barrier				
			LAeq1h	LAeq1h		Increase over existing		Type	Calculated	Noise Reduction			
				Calculated	Crit'n	Calculated	Crit'n	Impact	LAeq1h	Calculated	Goal	Calculated	
							Sub'l Inc					minus	
												Goal	
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB	
M1	1	0	0	61.7	66	61.7	10	----	61.7	0	8	-8	
1P2	2	1	0	49.5	6-Mar-00	49.5	10	----	49.5	0	8	-8	
1D2	3	1	0	57.3	66	57.3	10	----	57.3	0	8	-8	
1SB2	4	1	0	55.4	66	55.4	10	----	55.4	0	8	-8	
1SB3	5	1	0	55	66	55	10	----	55	0	8	-8	
1UD	6	1	0	51.2	66	51.2	10	----	51.2	0	8	-8	
2D2	7	1	0	53.7	66	53.7	10	----	53.7	0	8	-8	
3D2	8	1	0	45.1	66	45.1	10	----	45.1	0	8	-8	
4D2	9	1	0	50.5	66	50.5	10	----	50.5	0	8	-8	
4SB2	10	1	0	51.9	66	51.9	10	----	51.9	0	8	-8	
4SB3	11	1	0	51.5	66	51.5	10	----	51.5	0	8	-8	
4WB2	12	1	0	46.7	66	46.7	10	----	46.7	0	8	-8	
4UD	13	1	0	45.6	66	45.6	10	----	45.6	0	8	-8	
4P2	14	1	0	46	66	46	10	----	46	0	8	-8	
3P2	15	1	0	47.2	66	47.2	10	----	47.2	0	8	-8	
3UD	16	1	0	47.4	66	47.4	10	----	47.4	0	8	-8	
2P2	17	1	0	49.3	66	49.3	10	----	49.3	0	8	-8	
2UD	18	1	0	48.4	66	48.4	10	----	48.4	0	8	-8	
Dwelling Units		# DUs	Noise Reduction										
			Min	Avg	Max								
			dB	dB	dB								
All Selected		17	0	0	0								
All Impacted		0	0	0	0								
All that meet NR Goal		0	0	0	0								

Attachment 2
Input and Results for TNM 2.5 Model

FUTURE DAY

27-Aug-08
Larson
TNM 2.5

INPUT: ROADWAYS
PROJECT/CONTRACT: 110 W Sola
RUN: Future Day

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with the approval of FHWA

Roadway Name	Width	Points Name	No.	Coordinates (pavement) X	Y	Z	Flow Control: Control Device	Speed Constraint	Percent Vehicles Affected	Segment Pvmt Type	On Struct?
	ft			ft	ft	ft		mph	%		
W Sola St	44	W end	1	-50	0	0	Stop	0	50	Average	
		Int Chapal	2	268	0	0				Average	
		E end	3	500	0	0					
Chapala St	42	S End	4	268	-100	0	Stop	0	50	Average	
		Int W Sola	5	268	0	0				Average	
		N End	6	268	300	0					

27-Aug-08
Larson
TNM 2.5

INPUT: TRAFFIC FOR LAeq1h Volumes
PROJECT/CONTRACT: 110 W Sola
RUN: Future Day

Roadway Name	Points Name	No.	Segment Autos V veh/hr	S mph	MTrucks V veh/hr	S mph	HTrucks V veh/hr	S mph	Buses V veh/hr	S mph	Motorcycles V veh/hr	S mph
W Sola St	W end	1	150	25								
	Int Chapal	2	150	25								
	E end	3										
Chapala St	S End	4	675	25	21	25			14	25	1	25
	Int W Sola	5	675	25	21	25			7	25	1	25
	N End	6										

<Organization?>
27-Aug-08
Larson
TNM 2.5

INPUT: BARRIERS
PROJECT/CONTRACT: 110 W Sola
RUN: Future Day

Barrier1 Name	Points Name	No.	Coordinates (bottom) X	Y	Z	Height at Point	Segment Seg Ht Perturbs Incre-ment	#Up	#Dn	On Struct?	Important Reflec-tions?
			ft	ft	ft	ft	ft				
	B0	33	185	105	0	18	0	0	0		
	B1	1	208	105	0	18	0	0	0		
	B2	2	208	90	0	18	0	0	0		
	B3	3	208	89.9	0	25	0	0	0		
	B4	4	208	66	0	25	0	0	0		
	B5	5	208	66	0	25	0	0	0		
	B6	6	208	51	0	25	0	0	0		
	B7	7	193	51	0	25	0	0	0		
	B8	8	193	50.9	0	35	0	0	0		
	B9	9	193	46	0	35	0	0	0		
	B10	10	173	46	0	35	0	0	0		
	B11	11	173	57	0	35	0	0	0		
	B12	12	172.9	57	0	25	0	0	0		
	B13	13	148.9	57	0	25	0	0	0		
	B14	14	148.9	53	0	25	0	0	0		
	B15	15	133.9	53	0	25	0	0	0		
	B16	17	133.8	53	0	35	0	0	0		
	B17	16	123.8	53	0	35	0	0	0		
	B18	18	123.8	42	0	35	0	0	0		
	B19	19	108.8	42	0	35	0	0	0		
	B20	20	108.7	42	0	25	0	0	0		
	B21	21	105	42	0	25	0	0	0		
	B22	22	105	63	0	25	0	0	0		
	B23	23	90	63	0	25	0	0	0		
	B24	24	90	42	0	25	0	0	0		
	B25	25	66	42	0	25	0	0	0		
	B26	26	66	53	0	25	0	0	0		
	B27	27	36	53	0	25	0	0	0		
	B28	28	35.9	53	0	35	0	0	0		
	B29	29	35.9	50	0	35	0	0	0		
	B30	30	17	50	0	35	0	0	0		
	B31	31	16.9	50	0	25	0	0	0		
	B32	32	16.8	102	0	25					

Attachment 2
Input and Results for TNM 2.5 Model

						27-Aug-08							
Larson						TNM 2.5							
INPUT: RECEIVERS													
PROJECT/CONTRACT:	110 W Sola												
RUN:	Future Day												
Receiver													
Name	No.	#DUs	Coordinates (grounc)			Height	Input Sound Levels and Criteria				Active		
			X	Y	Z	above	Existing	Impact Criteria		NR	in		
						Ground	LAeq1h	LAeq1h	Sub1	Goal	Calc.		
			ft	ft	ft	ft	dBA	dBA	dB	dB			
M1	1	0	240	35	0	4.92	0	66	10	8	Y		
1P2	2	1	193	100	0	19	0	66	10	8	Y		
1D2	3	1	206	55	0	19	0	66	10	8	Y		
1SB2	4	1	183	43	0	19	0	66	10	8	Y		
1SB3	5	1	183	43	0	29	0	66	10	8	Y		
1UD	6	1	183	78	0	29	0	66	10	8	Y		
2D2	7	1	145	43	0	19	0	66	10	8	Y		
3D2	8	1	100	55	0	19	0	66	10	8	Y		
4D2	9	1	62	50	0	19	0	66	10	8	Y		
4SB2	10	1	28	48	0	19	0	66	10	8	Y		
4SB3	11	1	28	48	0	29	0	66	10	8	Y		
4WB2	12	1	7	78	0	19	0	66	10	8	Y		
4UD	13	1	46	90	0	29	0	66	10	8	Y		
4P2	14	1	66	105	0	19	0	66	10	8	Y		
3P2	15	1	95	105	0	19	0	66	10	8	Y		
3UD	16	1	100	90	0	29	0	66	10	8	Y		
2P2	17	1	140	105	0	19	0	66	10	8	Y		
2UD	18	1	125	90	0	29	0	66	10	8	Y		
							27-Aug-08						
Larson							TNM 2.5						
							Calculated with TNM 2.5						
RESULTS: SOUND LEVELS													
PROJECT/CONTRACT:		110 W Sola											
RUN:		Future Day											
BARRIER DESIGN:		INPUT HEIGHTS						Average pavement type shall be used unless					
								a State highway agency substantiates the use					
ATMOSPHERICS:		70 deg F, 50% RH						of a different type with approval of FHWA.					
Receiver													
Name	No.	#DUs	Existing	No Barrier						With Barrier			
			LAeq1h	LAeq1h		Increase over existing		Type		Calculated	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n	Impact		LAeq1h	Calculated	Goal	Calculated
							Sub1 Inc						minus
													Goal
			dBA	dBA	dBA	dB	dB			dBA	dB	dB	dB
M1	1	0	0	67.8	66	67.8	10	Snd Lvl		67.8	0	8	-8
1P2	2	1	0	55.6	66	55.6	10	----		55.6	0	8	-8
1D2	3	1	0	63.4	66	63.4	10	----		63.4	0	8	-8
1SB2	4	1	0	61.5	66	61.5	10	----		61.5	0	8	-8
1SB3	5	1	0	61.2	66	61.2	10	----		61.2	0	8	-8
1UD	6	1	0	57.3	66	57.3	10	----		57.3	0	8	-8
2D2	7	1	0	59.8	66	59.8	10	----		59.8	0	8	-8
3D2	8	1	0	51.1	66	51.1	10	----		51.1	0	8	-8
4D2	9	1	0	56.6	66	56.6	10	----		56.6	0	8	-8
4SB2	10	1	0	58	66	58	10	----		58	0	8	-8
4SB3	11	1	0	57.6	66	57.6	10	----		57.6	0	8	-8
4WB2	12	1	0	52.8	66	52.8	10	----		52.8	0	8	-8
4UD	13	1	0	51.6	66	51.6	10	----		51.6	0	8	-8
4P2	14	1	0	52	66	52	10	----		52	0	8	-8
3P2	15	1	0	53.2	66	53.2	10	----		53.2	0	8	-8
3UD	16	1	0	53.5	66	53.5	10	----		53.5	0	8	-8
2P2	17	1	0	55.4	66	55.4	10	----		55.4	0	8	-8
2UD	18	1	0	54.5	66	54.5	10	----		54.5	0	8	-8
Dwelling Units		# DUs	Noise Reduction										
			Min	Avg	Max								
			dB	dB	dB								
All Selected		17	0	0	0								
All Impacted		0	0	0	0								
All that meet NR Goal		0	0	0	0								

Attachment 2
Input and Results for TNM 2.5 Model

FUTURE NIGHT													
<Organization?>					27-Aug-08								
Larson					TNM 2.5								
INPUT: TRAFFIC FOR LAeq1h Volumes													
PROJECT/CONTRACT:	110 W Sola												
RUN:	Future Night												
Roadway		Points											
Name		Name	No.	Segment									
				Autos		MTrucks		HTrucks		Buses		Motorcycles	
				V	S	V	S	V	S	V	S	V	S
				veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph
W Sola St		W end	1	44	25								
		Int Chapal	2	44	25								
		E end	3										
Chapala St		S End	4	199	25	6	25			4	25	1	25
		Int W Sola	5	199	25	6	25			2	25	1	25
		N End	6										
<Organization?>							27-Aug-08						
Larson							TNM 2.5						
							Calculated with TNM 2.5						
RESULTS: SOUND LEVELS													
PROJECT/CONTRACT:		110 W Sola											
RUN:		Future Night											
BARRIER DESIGN:		INPUT HEIGHTS						Average pavement type shall be used unless					
								a State highway agency substantiates the use					
ATMOSPHERICS:		70 deg F, 50% RH						of a different type with approval of FHWA.					
Receiver													
Name	No.	#DUs	Existing	No Barrier					With Barrier				
			LAeq1h	LAeq1h		Increase over existing		Type	Calculated	Noise Reduction			
				Calculated	Crit'n	Calculated	Crit'n	Impact	LAeq1h	Calculated	Goal	Calculated	
							Sub'l Inc					minus	
												Goal	
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB	
M1	1	0	0	62.5	66	62.5	10	----	62.5	0	8	-8	
1P2	2	1	0	50.3	66	50.3	10	----	50.3	0	8	-8	
1D2	3	1	0	58.1	66	58.1	10	----	58.1	0	8	-8	
1SB2	4	1	0	56.2	66	56.2	10	----	56.2	0	8	-8	
1SB3	5	1	0	55.8	66	55.8	10	----	55.8	0	8	-8	
1UD	6	1	0	52	66	52	10	----	52	0	8	-8	
2D2	7	1	0	54.5	66	54.5	10	----	54.5	0	8	-8	
3D2	8	1	0	45.8	66	45.8	10	----	45.8	0	8	-8	
4D2	9	1	0	51.3	66	51.3	10	----	51.3	0	8	-8	
4SB2	10	1	0	52.7	66	52.7	10	----	52.7	0	8	-8	
4SB3	11	1	0	52.3	66	52.3	10	----	52.3	0	8	-8	
4WB2	12	1	0	47.5	66	47.5	10	----	47.5	0	8	-8	
4UD	13	1	0	46.3	66	46.3	10	----	46.3	0	8	-8	
4P2	14	1	0	46.7	66	46.7	10	----	46.7	0	8	-8	
3P2	15	1	0	47.9	66	47.9	10	----	47.9	0	8	-8	
3UD	16	1	0	48.2	66	48.2	10	----	48.2	0	8	-8	
2P2	17	1	0	50.1	66	50.1	10	----	50.1	0	8	-8	
2UD	18	1	0	49.2	66	49.2	10	----	49.2	0	8	-8	
Dwelling Units		# DUs	Noise Reduction										
			Min	Avg	Max								
			dB	dB	dB								
All Selected		17	0	0	0								
All Impacted		0	0	0	0								
All that meet NR Goal		0	0	0	0								