NOISE IMPACT ANALYSIS

BLOOMINGTON TRUCK TERMINAL

LSA

June 2013

NOISE IMPACT ANALYSIS

BLOOMINGTON TRUCK TERMINAL

Submitted to:

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LSA Project No. PAC1301

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TABLE OF CONTENTS

APPENDIX

FIGURES AND TABLES

FIGURES

TABLES

INTRODUCTION

This noise impact analysis has been prepared to evaluate the potential noise impacts and identify feasible mitigation measures associated with the Bloomington Truck Terminal project, located in the unincorporated community of Bloomington in San Bernardino County (County), California. This report is intended to satisfy County requirements for a project-specific noise impact analysis by examining the short-term and long-term noise impacts on and adjacent to the project site, by evaluating the effectiveness of noise control measures incorporated as part of the project design, and by proposing additional mitigation to reduce noise impacts.

Project Location

The site is located north of Slover Avenue, south of the Union Pacific Railroad (UPRR), east of Locust Avenue, and west of Linden Avenue. The project site is bounded to the north by several rail lines and the Interstate 10 (I-10) Freeway; to the east by existing industrial uses, vacant land, and Linden Avenue; to the west by existing industrial uses, with nonconforming residential uses farther to the west across Locust Avenue; and to the south by Slover Avenue and residences to the south across Slover Avenue. The closest residences to the west are approximately 100 feet (ft) from the project's western boundary and are approximately 500 ft from the center of the dock doors on the west side of the building. There are also residences to the east of the proposed dock doors, approximately 1,150 ft from the center of the dock doors on the east side of the building. To the south of Slover Avenue, there is a mix of residential homes approximately 800 ft from the center of the dock doors proposed on the east side of the building. Figure 1 illustrates the location of the project.

Project Description

Pacific Industrial proposes to construct a 708,240-square-foot (sf) high-cube distribution warehouse facility on a T-shaped, 36.7-acre (ac) site. The facility will include the construction of a single building containing a total of 20,000 sf of ancillary office space located in two corners of the building. The building length will run north-south and measures approximately 1,092 ft, and the width of the building will run east-west and measures 740 ft. The building will include 104 truck bays/doors. The truck bays/doors will be located on the east and west sides of the building. Access to the site will be provided via three locations. Two full-access driveways will be located on Slover Avenue on the south end of the site, and a single driveway will be located on Locust Avenue on the north end of the site. Truck trailer parking will be located along the east and west sides of the building across from a truck court in front of the building dock doors and in a trailer parking yard located at the Locust Avenue driveway in the north end of the site. Passenger vehicle parking for employees will also be located within the Locust Avenue lot, as well as wrapped around the south end of the building near the Slover Avenue driveways and near the north corners of the building. Figure 2 depicts the project's proposed site plan.

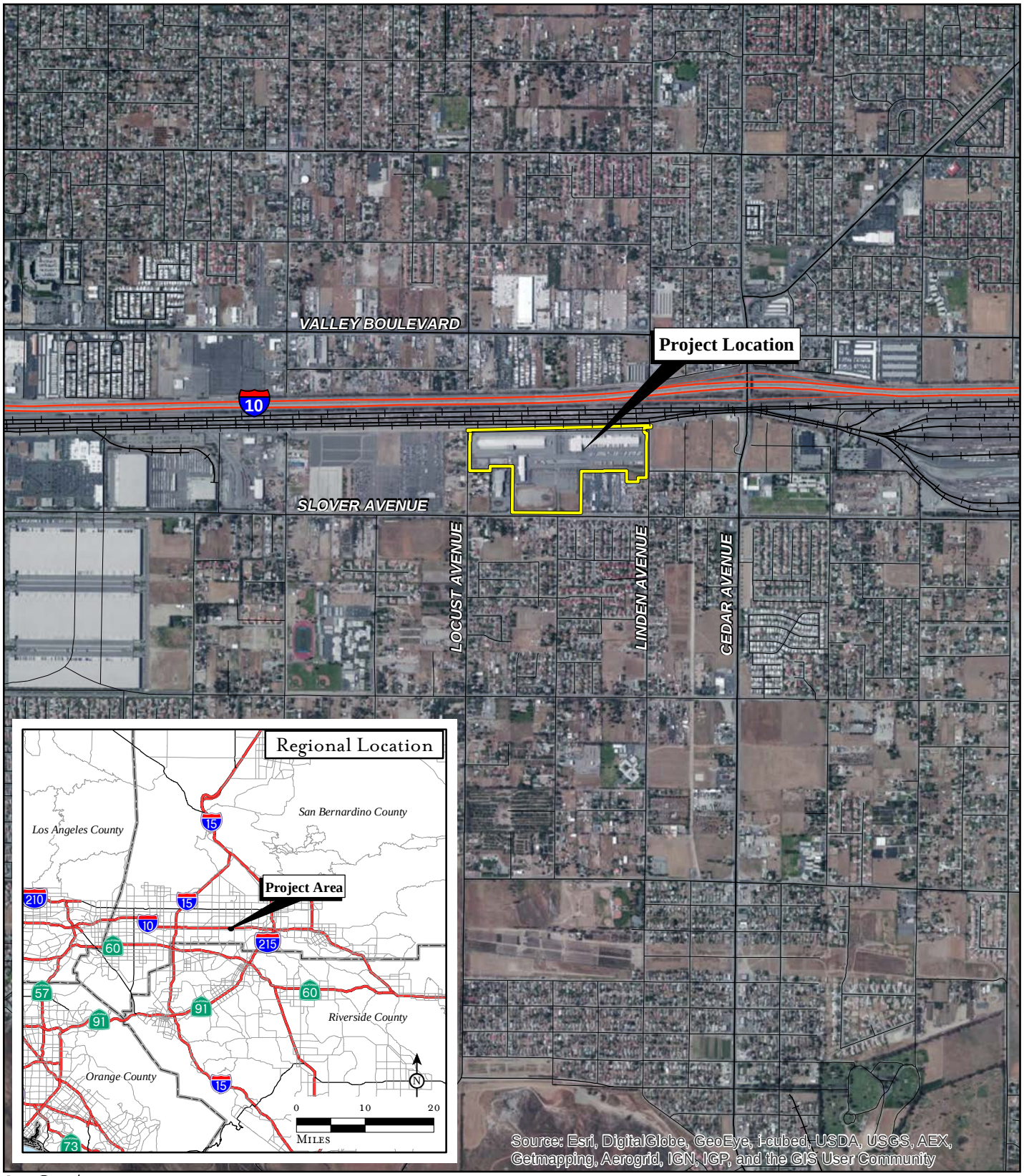

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FIGURE 1

N

0 1,000 2,000

Feet

Slover Truck Terminal
Noise Study

SOURCE: ESRI World Imagery, 2010; Thomas Bros., 2009

Regional and Project Location

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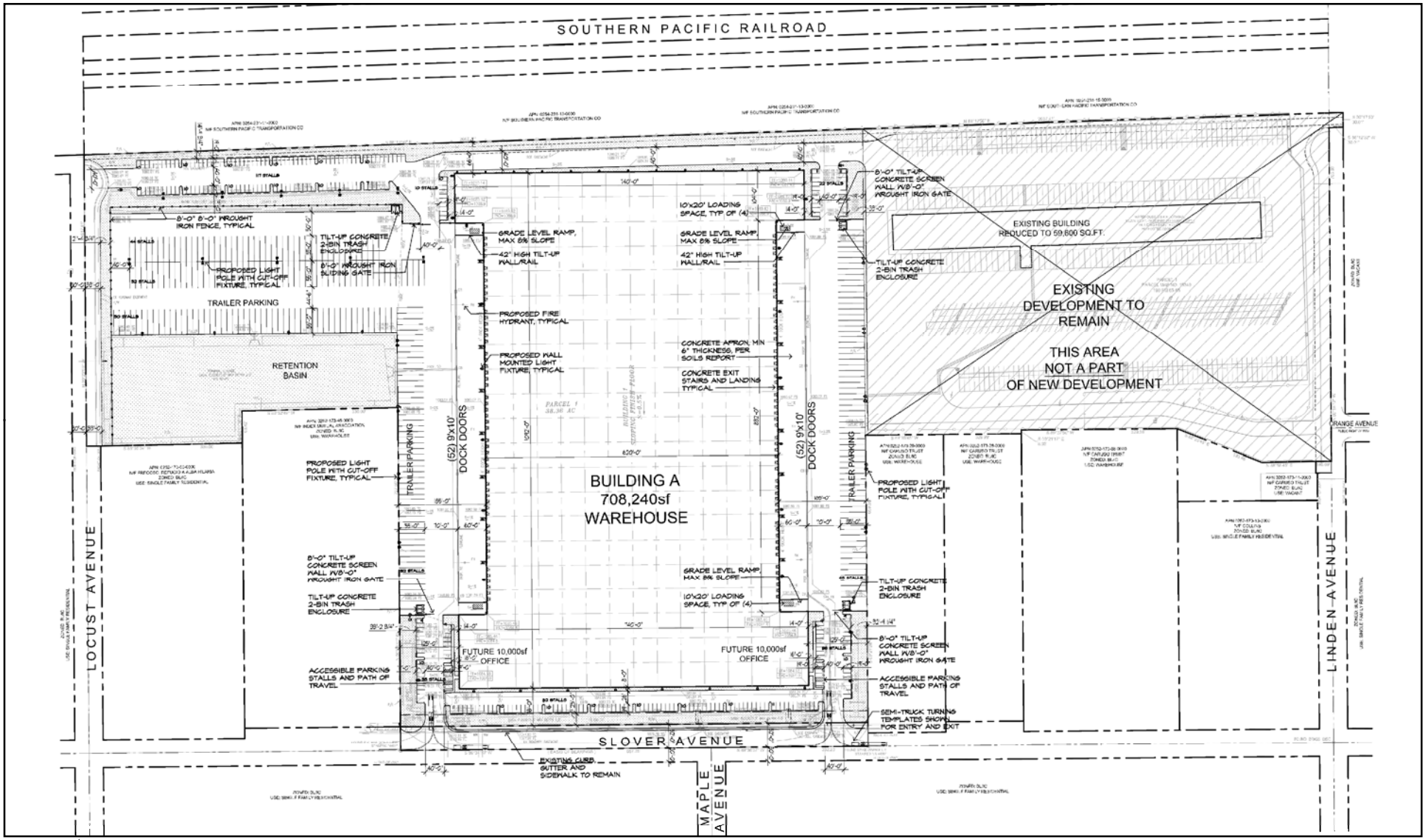

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FIGURE 2

N

0 150 300

FEET

SOURCE: Douglas Franz Architects, Inc. 25 Feb, 2013.

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SloverTruck Terminal
Noise Study

Tentative Tract Map

The project site is currently occupied by a fully functioning trucking facility operated by YRC Freight. The facility includes a total of approximately 197,771 sf of building area within three buildings and associated truck bays, truck and passenger vehicle parking lots, and truck courts. Development of the project will result in the demolition of approximately 138,171 sf of building area consisting of complete removal of the two west buildings and partial removal of the east building. Upon completion of the proposed project, the east building will be reduced to approximately 59,600 sf of building area and will be retained and reconfigured for ongoing operations by YRC Freight or another suitable tenant. A connecting driveway is proposed in the northeast corner of the proposed project site to allow consolidated operations between the proposed 708,240 sf building and the reconfigured building in the event both buildings are feasible for lease to a single user.

The project site is located within the Bloomington Community Plan and is located in a Community Industrial (IC) Zoning District as shown in the County of San Bernardino General Plan (County of San Bernardino 2007 General Plan, County of San Bernardino, Map FH29A, adopted March 13, 2007). Land use entitlements required for the project include a Conditional Use Permit (CUP) and a Tentative Parcel Map (TPM). A CUP is required because the proposed new building exceeds the 80,000 square foot threshold for the IC District. A TPM is required to subdivide the site into two legal parcels, one property for the warehouse building, and the second property for the existing building to be reconfigured.

It is anticipated that all of the construction work associated with the proposed project on the project site would take approximately 45–60 days to complete. This work will require an average of 10 on-site workers per day with a peak of 14 workers per day. Worker commute vehicles will account for the majority of construction traffic trips to and from the site. It is estimated that there will be approximately 10 pieces of construction equipment on site each work day. Construction equipment would include the following:

- Scrapers
- Water trucks
- Pickup and flatbed trucks
- Compactor
- Dozers
- Material delivery trucks
- Dump trucks

Because mass grading of the site was conducted as part of the YRC Freight facility construction, further mass grading would not be required over the majority of the project site. Rather, excavation, soil placement, and recompaction would be required.

METHODOLOGY RELATED TO NOISE IMPACT ASSESSMENT

Evaluation of noise impacts associated with the project includes the following:

- Determine the short-term construction noise impacts on off-site sensitive land uses;

- Determine the long-term project-related traffic noise impacts on off-site noise-sensitive uses;
- Determine the long-term traffic impacts on the proposed on-site uses;
- Determine the long-term on-site operational noise impacts on off-site sensitive uses; and
- Determine the required mitigation measures to reduce short-term and long-term noise impacts.

This noise impact analysis utilizes County noise standards, including the County's Noise Element of the General Plan, as thresholds against which potential noise impacts are evaluated.

CHARACTERISTICS OF SOUND

Sound is increasing in the environment and can affect quality of life. Noise is usually defined as unwanted sound. Noise consists of any sound that may produce physiological or psychological damage and/or interfere with communication, work, rest, recreation, and sleep.

To the human ear, sound has two significant characteristics: pitch and loudness. Pitch is generally an annoyance, while loudness can affect the ability to hear. Pitch is the number of complete vibrations (or cycles per second) of a wave, resulting in the tone's range from high to low. Loudness is the strength of a sound and describes a noisy or quiet environment; it is measured by the amplitude of the sound wave. Loudness is determined by the intensity of the sound waves combined with the reception characteristics of the human ear. Sound intensity refers to how hard the sound wave strikes an object, which in turn produces the sound's effect. This characteristic of sound can be precisely measured with instruments. The analysis of a project defines the noise environment of the project area in terms of sound intensity and its effect on adjacent sensitive land uses.

MEASUREMENT OF SOUND

Sound intensity is measured through the A-weighted scale to correct for the relative frequency response of the human ear. That is, an A-weighted noise level de-emphasizes low and very high frequencies of sound similar to the human ear's de-emphasis of these frequencies. Unlike linear units, such as inches or pounds, decibels (dB) are measured on a logarithmic scale representing points on a sharply rising curve.

For example, 10 dB are 10 times more intense than 1 dB, 20 dB are 100 times more intense, and 30 dB are 1,000 times more intense. Thirty decibels (30 dB) represent 1,000 times as much acoustic energy as 1 dB. The decibel scale increases as the square of the change, representing the sound-pressure energy. A sound as soft as human breathing is about 10 times greater than 0 dB. The decibel system of measuring sound gives a rough connection between the physical intensity of sound and its perceived loudness to the human ear. A 10 dB increase in sound level is perceived by the human ear as only a doubling of the loudness of the sound. Ambient sounds generally range from 30 A-weighted decibels (dBA) (very quiet) to 100 dBA (very loud).

Sound levels are generated from a source, and their decibel level decreases as the distance from that source increases. Sound dissipates exponentially with distance from the noise source. For a single point source, sound levels decrease approximately 6 dB for each doubling of distance from the source. This drop-off rate is appropriate for noise generated by stationary equipment. If noise is

produced by a line source, such as highway traffic or railroad operations, the sound decreases 3 dB for each doubling of distance in a hard site environment. Line source noise in a relatively flat environment with absorptive vegetation decreases 4.5 dB for each doubling of distance.

There are many ways to rate noise for various time periods, but an appropriate rating of ambient noise affecting humans also accounts for the annoying effects of sound. Equivalent continuous sound level (L_{eq}) is the total sound energy of time-varying noise over a sample period. However, the predominant rating scales for human communities in the State of California (State) are the L_{eq} and community noise equivalent level (CNEL) or the day-night average level (L_{dn}) based on dBA. CNEL is the time-varying noise over a 24-hour period, with a 5 dBA weighting factor applied to the hourly L_{eq} for noises occurring from 7:00 p.m. to 10:00 p.m. (defined as relaxation hours) and a 10 dBA weighting factor applied to noise occurring from 10:00 p.m. to 7:00 a.m. (defined as sleeping hours). L_{dn} is similar to the CNEL scale but without the adjustment for events occurring during the evening hours. CNEL and L_{dn} are within 1 dBA of each other and are normally exchangeable. The noise adjustments are added to the noise events occurring during the more sensitive hours.

Other noise rating scales of importance, when assessing the annoyance factor, include the maximum noise level (L_{max}), which is the highest exponential time-averaged sound level that occurs during a stated time period. The noise environments discussed in this analysis are specified in terms of L_{max} for short-term noise impacts. L_{max} reflects peak operating conditions and addresses the annoying aspects of intermittent noise.

Another noise scale often used together with the L_{max} in noise ordinances for enforcement purposes is noise standards in terms of percentile noise levels. For example, the L_{10} noise level represents the noise level exceeded 10 percent of the time during a stated period. The L_{50} noise level represents the median noise level. Half of the time the noise level exceeds this level, and half of the time it is less than this level. The L_{90} noise level represents the noise level exceeded 90 percent of the time and is considered the background noise level during a monitoring period. For a relatively constant noise source, the L_{eq} and L_{50} are approximately the same.

Noise impacts can be described in three categories. The first is audible impacts, which refers to increases in noise levels noticeable to humans. Audible increases in noise levels generally refer to a change of 3 dB or greater, since this level has been found to be barely perceptible in exterior environments. The second category, potentially audible, refers to a change in the noise level between 1 and 3 dB. This range of noise levels has been found to be noticeable only in laboratory environments. The last category is changes in noise level of less than 1 dB, which are inaudible to the human ear. Only audible changes in existing ambient or background noise levels are considered potentially significant.

PHYSIOLOGICAL EFFECTS OF NOISE

Physical damage to human hearing begins at prolonged exposure to noise levels higher than 85 dBA. Exposure to high noise levels affects the entire system, with prolonged noise exposure in excess of 75 dBA increasing body tensions and thereby affecting blood pressure and functions of the heart and the nervous system. In comparison, extended periods of noise exposure above 90 dBA would result in permanent cell damage. When the noise level reaches 120 dBA, a tickling sensation occurs in the human ear, even with short-term exposure. This level of noise is called the threshold of feeling. As

the sound reaches 140 dBA, the tickling sensation is replaced by the feeling of pain in the ear. This is called the threshold of pain. A sound level of 160 to 165 dBA will potentially result in dizziness or loss of equilibrium. The ambient or background noise problem is widespread and generally more concentrated in urban areas than in outlying, less-developed areas.

Table A lists definitions of acoustical terms; Table B shows common sound levels and their noise sources; and Table C shows land use compatibility for exterior community noise, as recommended by the California Department of Health, Office of Noise Control.

Table A: Definitions of Acoustical Terms

Term	Definition
Decibel, dB	A unit of noise level that denotes the ratio between two quantities that are proportional to power; the number of decibels is 10 times the logarithm (to the base 10) of this ratio.
Frequency, Hz	Of a function periodic in time; the number of times that the quantity repeats itself in one second (i.e., number of cycles per second).
A-Weighted Sound Level, dBA	The sound level obtained by use of A-weighting. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. All sound levels in this report are A-weighted, unless reported otherwise.
L_{02}, L_{08}, L_{50}, L_{90}	The fast A-weighted noise levels that are equaled or exceeded by a fluctuating sound level 2 percent, 8 percent, 50 percent, and 90 percent of a stated time period.
Equivalent Continuous Noise Level, L_{eq}	The level of a steady sound that, in a stated time period and at a stated location, has the same A-weighted sound energy as the time-varying sound.
Community Noise Equivalent Level, CNEL	The 24-hour A-weighted average sound level from midnight to midnight, obtained after the addition of 5 dB to sound levels occurring in the evening from 7:00 p.m. to 10:00 p.m. and after the addition of 10 dB to sound levels occurring in the night between 10:00 p.m. and 7:00 a.m.
Day/Night Noise Level, L_{dn}	The 24-hour A-weighted average sound level from midnight to midnight, obtained after the addition of 10 dB to sound levels occurring in the night between 10:00 p.m. and 7:00 a.m.
L_{max}, L_{min}	The maximum and minimum A-weighted sound levels measured on a sound level meter during a designated time interval using fast-time averaging.
Ambient Noise Level	The all-encompassing noise associated with a given environment at a specified time; usually a composite of sound from many sources from many directions, near and far; no particular sound is dominant.
Intrusive	The noise that intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, time of occurrence, tonal or informational content, and the prevailing ambient noise level.

Source: Handbook of Acoustical Measurement and Noise Control, 1991.

Table B: Common Sound Levels and Their Noise Sources

Noise Source	A-Weighted Sound Level in Decibels	Noise Environments	Subjective Evaluations
Near Jet Engine	140	Deafening	128 times as loud
Civil Defense Siren	130	Threshold of Pain	64 times as loud
Hard Rock Band	120	Threshold of Feeling	32 times as loud
Accelerating Motorcycle a Few Feet Away	110	Very Loud	16 times as loud
Pile Driver; Noisy Urban Street/Heavy City Traffic	100	Very Loud	8 times as loud
Ambulance Siren; Food Blender	95	Very Loud	—
Garbage Disposal	90	Very Loud	4 times as loud
Freight Cars; Living Room Music	85	Loud	—
Pneumatic Drill; Vacuum Cleaner	80	Loud	2 times as loud
Busy Restaurant	75	Moderately Loud	—
Near Freeway Auto Traffic	70	Moderately Loud	Reference Level
Average Office	60	Quiet	½ as loud
Suburban Street	55	Quiet	—
Light Traffic; Soft Radio Music in Apartment	50	Quiet	¼ as loud
Large Transformer	45	Quiet	—
Average Residence without Stereo Playing	40	Faint	⅛ as loud
Soft Whisper	30	Faint	—
Rustling Leaves	20	Very Faint	—
Human Breathing	10	Very Faint	Threshold of Hearing
—	0	Very Faint	—

Source: Compiled by LSA Associates, Inc., 2004.

Table C: Land Use Compatibility for Exterior Community Noise

Land Use Category	Noise Range (L_{dn} or CNEL), dB			
	I	II	III	IV
Passively used open spaces	50	50–55	55–70	70+
Auditoriums, concert halls, amphitheaters	45–50	50–65	65–70	70+
Residential, low-density single-family, duplex, mobile homes	50–55	55–70	70–75	75+
Residential multifamily	50–60	60–70	70–75	75+
Transient lodging, motels, hotels	50–60	60–70	70–80	80+
Schools, libraries, churches, hospitals, nursing homes	50–60	60–70	70–80	80+
Actively used open spaces, playgrounds, neighborhood parks	50–67	–	67–73	73+
Golf courses, riding stables, water recreation, cemeteries	50–70	–	70–80	80+
Office buildings, business commercial and professional	50–67	67–75	75+	–
Industrial, manufacturing, utilities, agriculture	50–70	70–75	75+	–

Source: California Department of Health, Office of Noise Control, 1976.
Noise Range I—Normally Acceptable: Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.
Noise Range II—Conditionally Acceptable: New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made, and needed noise insulation features are included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning, will normally suffice.
Noise Range III—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.
Noise Range IV—Clearly Unacceptable: New construction or development should generally not be undertaken.

L_{dn} = day-night average noise level
L_{max} = maximum noise level

SETTING

Existing Sensitive Land Uses in the Project Area

Sensitive receptors include residences, schools, hospitals, and similar uses sensitive to noise. There are existing sensitive receptors near the project site that include single-family residences adjacent to the western property line of the proposed site along Locust Avenue, single-family residences adjacent to the southeastern portion of the proposed site along Linden Avenue, and single-family residences south of the proposed site across Slover Avenue on the opposite side of the street. The nearest residences to the west are adjacent to the proposed project's western property line, approximately 100 ft from the project's property line. The residences to the south are approximately 160 ft from the proposed project's southern property line along Slover Avenue. Other land uses around the project site include a mix of industrial and commercial uses. The sensitive land uses would be exposed to noise generated during construction and operation of the project.

Overview of the Existing Ambient Noise Environment

Ambient or background noise levels are typically a composite of sounds from many sources located both near and far, without any particular sound being dominant. The primary existing noise sources in the project area are transportation facilities. Traffic on Slover Avenue, Linden Avenue, Locust Avenue,

the I-10 Freeway, and other local streets contribute to the ambient noise levels in the project vicinity. Noise from motor vehicles is generated by engine vibrations, the interaction between the tires and the road, and the exhaust system. In addition to vehicular traffic, there are UPRR mainline railroad tracks and a UPRR yard to the north of the project site. Train noise and rail yard operations also contribute to the ambient noise in the project area. Commercial and private aircraft flying overhead contribute a small portion of the ambient noise to the project area. Wildlife such as birds also contributes a small portion of the ambient noise to the project area. The dominant noise sources for the residences located on the northern end of Locust Avenue (northwest of the project site) are the I-10 Freeway and the UPRR yard operations. The dominant noise source for the residences located southwest and southeast of the project site and south of Slover Avenue is the traffic on Slover Avenue.

Ambient Noise Measurements. LSA Associates, Inc. (LSA) conducted short-term noise level measurements at four single-family residences in the project's vicinity in Bloomington, California, on June 9, 2011, for a proposed industrial use west of the current project site. Since the land uses and noise sources in the project area have not changed during the past year, the same ambient noise levels would still be applicable to the current noise environment in the project area. All of the measurements were conducted using a Larson Davis 831 – Type 1 – 1/3rd-Octave Integrating Sound Level Meter (SLM) (Serial No. 2441). The SLM was field-calibrated before and after the measurement of noise levels; the measurements were made with A-weighting, and the SLM was placed 5 ft above the ground. All short-term ambient noise level measurements were made using 20-minute periods, and analyzed with L_{eq}, which performs integration (energy averaging) of the sound levels over the measurement period. The weather data was recorded during each noise measurement using a Kestrel 3000 pocket weather station.

The results of the short-term ambient noise level measurements are shown in Table D, which summarizes the location, description of the noise measurement, and the noise level (L_{eq}) of the short-term measurements.

- **ST-1:** 10349 Alder Avenue, Bloomington, California. The noise monitor was placed in the backyard outdoor use zone of this single-family residence, 30 ft east of the eastern facade of the residence and 16 ft north of the southern facade. Dominant noise sources during the measurement were the traffic on the I-10 Freeway and the UPRR operations. Other contributing noise sources were birds and commercial aircraft. The residence has a 5 ft tall block wall that runs along the northern and eastern property lines.
- **ST-2:** 10431 Alder Avenue, Bloomington, California. The owner of this residence was not at home to grant access to the property; therefore, the noise monitor was placed at the southwestern corner of the property line of this single-family residence. The location was 17 ft east of the eastern edge of Alder Avenue and 42 ft south of the southern edge of the residence's driveway. Dominant noise sources during the measurement were the traffic on Alder Avenue and Slover Avenue. Other contributing noise sources were birds, industrial noise, and commercial aircraft. The residence has a 6 ft tall block wall that runs along the northern and eastern property lines.

Table D: Short-Term Ambient Noise Level Measurement Results

ID	Location	Description	$L_{eq\ 20\ min}$ dBA
ST-1	10349 Alder Avenue, Bloomington, California Single-Family Residence	Backyard outdoor use zone; traffic on I-10 and UPRR operations.	52.0
ST-2	10431 Alder Avenue, Bloomington, California Single-Family Residence	Southwestern property line; traffic on Alder Avenue, Slover Avenue and I-10.	55.1
ST-3	17744 Slover Avenue, Bloomington, California Single-Family Residence	Backyard outdoor use zone; traffic on Slover Avenue.	50.3
ST-4	10592 Laurel Avenue, Bloomington, California Single-Family Residence	Backyard outdoor use zone; traffic on Slover Avenue.	57.9

Source: LSA Associates, Inc. May 2011.

dBA = A-weighted decibels
I-10 = Interstate 10
$L_{eq\ 20\ min}$ = equivalent continuous level over a period of 20 minutes
UPRR = Union Pacific Railroad

- **ST-3:** 17744 Slover Avenue, Bloomington, California. The noise monitor was placed in the backyard outdoor use zone of this single-family residence, 9 ft west of the eastern facade of the residence and 13 ft north of the northern facade of the residence. The dominant noise source during the measurement was traffic on Slover Avenue and Alder Avenue. Other contributing noise sources were birds and industrial noise. The residence has a 6 ft tall block wall the runs along the northern and eastern property lines and a 5 ft tall wood fence that runs along the western property line.
- **ST-4:** 10592 Laurel Avenue, Bloomington, California. The noise monitor was placed in the backyard outdoor use zone of this single-family residence, 16 ft west of the western facade of the shed and 3 ft north of the northern facade of the shed. The dominant noise source during the measurement was traffic on Slover Avenue and Laurel Avenue. The other contributing noise source was birds. The residence has a chain-link fence that surrounds the property, but no walls to provide noise shielding.

Existing Traffic Noise

The Federal Highway Administration (FHWA) Highway Traffic Noise Prediction Model (FHWA RD-77-108) was used to evaluate traffic-related noise conditions along Slover Avenue, Locust Avenue, Linden Avenue, Maple Avenue, and Orange Avenue in the project vicinity. This model requires various parameters, including traffic volumes, vehicle mix, vehicle speed, and roadway geometry to compute typical equivalent noise levels during daytime, evening, and nighttime hours. The resulting noise levels are weighted and summed over 24-hour periods to determine the CNEL values. Table E lists the existing (2013) traffic noise levels on these roadways in the project vicinity.

Table E: Existing (2013) Traffic Noise Levels

Roadway Segment	ADT	Centerline to 70 CNEL (ft)	Centerline to 65 CNEL (ft)	Centerline to 60 CNEL (ft)	CNEL (dBA) 50 ft from Centerline of Outermost Lane
Slover Avenue West of Locust Avenue	8,700	< 50	81	174	67.4
Slover Avenue Between Locust Avenue Driveway 2	8,600	< 50	80	173	67.4
Slover Avenue Between Driveway 2 and Maple Avenue	9,400	< 50	85	183	67.8
Slover Avenue Between Maple Avenue and Driveway 3	9,300	< 50	85	182	67.1
Slover Avenue Between Driveway 3 and Linden Avenue	7,800	< 50	76	162	66.4
Slover Avenue East of Linden Avenue	5,200	< 50	58	124	65.2
Locust Avenue North of Slover Avenue	190	< 50	< 50	< 50	43.5
Locust Avenue South of Slover Avenue	3,100	< 50	< 50	74	61.8
Maple Avenue South of Slover Avenue	1,000	< 50	< 50	< 50	54.2
Linden Avenue North of Orange Avenue	50	< 50	< 50	< 50	37.7
Linden Avenue Between Orange Avenue and Slover Avenue	2,500	< 50	< 50	< 50	54.7
Linden Avenue South of Slover Avenue	1,900	< 50	< 50	< 50	53.5
Orange Avenue East of Linden Avenue	3,400	< 50	< 50	52	59.5

Source: LSA Associates, Inc., June 2013.
Note: Traffic noise within 50 ft of the roadway centerline should be evaluated with site-specific information.

ADT = average daily traffic
CNEL = Community Noise Equivalent Level
dBA = A-weighted decibels
ft = feet

These noise levels represent the worst-case scenario, which assumes that no shielding is provided between traffic and the location where the noise contours are drawn. Table E indicates that the existing traffic noise levels in the project vicinity are moderate along roadway segments adjacent to the project site, with the 70 dBA CNEL contour line confined to within the roadway along the length of Slover Avenue, and the 70 and 65 dBA CNEL contour lines both confined within the roadway for the length of Maple Avenue, Locust Avenue, Orange Avenue, and Linden Avenue. The specific assumptions used in developing these noise levels and the model printouts are provided in Appendix A.

County of San Bernardino Noise Standards

Noise Element of the General Plan. The County adopted a Noise Element in its General Plan (first adopted in 1989, revised in 1996). One of the general goals of the Noise Element is to develop and adopt specific policies and an effective implementation program to abate and avoid excessive noise exposures in the County by requiring that effective noise mitigation measures be incorporated into the

design of new noise-generating and new noise-sensitive land uses. The County has adopted specific policies to accomplish the goals of the Noise Element, including the following:

1. Areas within the County shall be designated as "noise-impacted" if exposed to existing or projected future exterior noise levels from mobile or stationary sources exceeding the standards listed in Tables F and G.

Table F: Interior/Exterior Noise Level Standards – Mobile Noise Sources

Categories	Land Use	L_{dn} or CNEL, dBA	
		Interior Standard[1]	Exterior Standard[2]
Residential	Single-family and multifamily, duplex, mobile homes	45	60[3]
Commercial	Hotel, motel, transient lodging	45	60[3]
	Commercial retail, bank, restaurant	50	NA
	Office building, research and development, professional offices	45	65
	Amphitheater, concert hall, auditorium, movie theater	45	NA
Institutional	Hospital, nursing home, school, classroom, church, library	45	65
Open Space	Park	NA	65

Source: County of San Bernardino Noise Element, 1989 and 1996.

[1] Indoor environment excluding: bathrooms, kitchens, toilets, and corridors.

[2] Outdoor environment limited to: private yard of single-family dwellings, multifamily private patios or balconies, mobile home parks, hospital/office building patios, park picnic areas, school playgrounds, hotel and motel recreation areas.

[3] An exterior noise level of up to 65 dBA L_{dn} (or CNEL) will be allowed provided exterior noise levels have been substantially mitigated through a reasonable application of the best available noise reduction technology and interior noise exposure does not exceed 45 dBA L_{dn} (or CNEL) with windows and doors closed. Requiring that windows and doors remain closed to achieve an acceptable interior noise level will necessitate the use of air conditioning or mechanical ventilation.

CNEL = Community Noise Equivalent Level
dBA = A-weighted decibels
L_{dn} = day-night average noise level
N/A = not applicable

Table G: Maximum Exterior Noise Limits, L_N (dBA)

Receiving Land Use	Time Period	L_{50}	L_{25}	L_8	L_2	L_{max}
Residential (single-family and multifamily)	Day: 7:00 a.m.–10:00 p.m.	55	60	65	70	75
	Night: 10:00 p.m.–7:00 a.m.	45	50	55	60	65

Source: County of San Bernardino, County Code.

dBA = A-weighted decibels
L_2 = the noise level exceeded 2 percent of the time during a stated period
L_8 = the noise level exceeded 8 percent of the time during a stated period
L_{25} = the noise level exceeded 25 percent of the time during a stated period
L_{50} = the noise level representing the median noise level; half the time the noise level exceeds this level and half the time it is less than this level
L_{max} = maximum noise level
L_N = percentile noise exceedance level

2. The County shall enforce the State Noise Insulation Standards (California Code of Regulation, Title 24) and Chapter 35 of the Uniform Building Code (UBC).

Condition subdivision approval adjacent to any developed/occupied noise-sensitive land uses by requiring the developer to submit a construction-related noise mitigation plan to the County for review and approval prior to issuance of a grading permit. The plan must depict the location of construction equipment and how the noise from this equipment will be mitigated during construction of this project through the use of such methods as:

- Temporary noise attenuation fences
- Preferential location of equipment
- Use of current technology and noise suppression equipment

The County has adopted a new General Plan (March 2007). The newly adopted Noise Element has the following policies:

N1.1 Designate areas within San Bernardino County as "noise impacted" if exposed to existing or projected future exterior noise levels from mobile or stationary sources exceeding the standards listed in Chapter 83.01 of the Development Code.

N1.2 Ensure that new development of residential or other noise-sensitive land uses is not permitted in noise-impacted areas unless effective mitigation measures are incorporated into the project design to reduce noise levels to the standards of noise-sensitive land uses include residential uses, schools, hospitals, nursing homes, places of worship, and libraries.

N1.3 When industrial, commercial, or other land uses, including locally regulated noise sources, are proposed for areas containing noise-sensitive land uses, noise levels generated by the proposed use will not exceed the performance standards of Table N-2 within outdoor activity areas. If outdoor activity areas have not yet been determined, noise levels shall not exceed the performance standards listed in Chapter 83.01 of the Development Code at the boundary of areas planned or zoned for residential or other noise-sensitive land uses.

N1.4 Enforce the state noise insulation standards (California Administrative Code, Title 24) and Chapter 35 of the California Building Code (CBC).[1]

N1.5 Limit truck traffic in residential and commercial areas to designated truck routes; limit construction, delivery, and through-truck traffic to designated routes; and distribute maps of approved truck routes to County traffic officers.

N1.6 Enforce the hourly noise-level performance standards for stationary and other locally regulated sources, such as industrial, recreational, and construction activities, as well as mechanical and electrical equipment.

N1.7 Prevent incompatible land uses, by reason of excessive noise levels, from occurring in the future.

County of San Bernardino 2007 Development Code

The County's Development Code, Section 83.01.080, sets noise standards for stationary noise sources as shown in Table H.

Table H: Noise Standards for Stationary Noise Sources

Affected Land Uses (Receiving Noise)	7:00 a.m. to 10:00 p.m. (L_{eq})	10:00 p.m. to 7:00 a.m. (L_{eq})
Residential	55 dBA	45 dBA
Professional Services	55 dBA	55 dBA
Other Commercial	60 dBA	60 dBA
Industrial	70 dBA	70 dBA

Source: County of San Bernardino Development Code, April 2007.
dBA = A-weighted decibels
L_{eq} = equivalent continuous sound level

Maximum Exterior Noise Limits. Section 83.01.080 of the County Development Code limits exterior noise attributable to stationary noise sources at residential properties to 55 dBA from 7:00 a.m. to 10:00 p.m. and 45 dBA from 10:00 p.m. to 7:00 a.m. It is unlawful for any person to create noise at noise-sensitive land uses that causes the sound level to exceed the following:

- The noise standard for a cumulative period of more than 30 minutes in any hour
- The noise standard plus 5 dBA for a cumulative period of more than 15 minutes in any hour
- The noise standard plus 10 dBA for a cumulative period of more than 5 minutes in any hour

[1] Title 24 requires that an acoustical analysis be prepared for all new developments of multifamily dwellings, condominiums, hotels, and motels proposed for areas within the 60 dB L_{dn} (or CNEL) contour of a major noise source for the purpose of documenting that an acceptable interior noise level of 45 dB L_{dn} (or CNEL) or below will be achieved with the windows and doors closed. UBC Chapter 35 requires that common wall and floor/ceiling assemblies within multifamily dwellings comply with minimum standards for the transmission of airborne sound and structure-borne impact noise.

- The noise standard plus 15 dBA for a cumulative period of more than 1 minute in any hour
- The noise standard plus 20 dBA for any period of time

Construction Hours. Section 83.01.080 of the County Development Code limits the hours of construction to between the hours of 7:00 a.m. and 7:00 p.m., Monday through Saturday. No construction is permitted on Sundays and federal holidays.

On noise standards for adjacent mobile noise sources, the County's Development Code, Section 83.01, has noise standards similar to those identified in Table F. In addition, Table I lists noise standards for other structures that require these structures to be sound, attenuated against the combined input of all present and projected exterior noise to not exceed the criteria.

Table I: Noise Standards for Other Structures

Typical Uses	12-Hour Equivalent Sound Level (Interior) in dBA L_{dn}
Educational, institutions, libraries, meeting facilities, etc.	45
General office, reception, etc.	50
Retail stores, restaurants, etc.	55
Other areas for manufacturing, assembly, testing, warehousing, etc.	65

Source: County of San Bernardino Development Code, April 2007.
dBA = A-weighted decibels
L_{dn} = day/night noise level

In addition, the average of the maximum levels on the loudest of intrusive sounds occurring during a 24-hour period shall not exceed 65 dBA interior.

PROJECT IMPACTS

Construction Noise Impact

Short-term noise impacts would be associated with site preparation, grading, building erection, and tenant improvement within the building. Construction-related, short-term noise levels would be higher than existing ambient noise levels in the project area, but would no longer occur once tenant improvement of the project building is completed.

Two types of short-term noise impacts could occur during construction on the project site. First, construction crew commutes and the transport of construction equipment and materials to the site for the proposed project would incrementally increase noise levels on access roads leading to the site. There will be a relatively high single-event noise exposure potential at a maximum level of 87 dBA L_{max} with trucks passing at 50 ft. However, soils will be balanced on site, and no import or export of the soils/dirt is expected. Therefore, the projected construction traffic will be minimal when compared to the existing traffic volumes on Slover Avenue, Linden Avenue, Locust Avenue, I-10, and other affected streets; and its associated long-term noise level change will not be perceptible. Therefore, short-term construction-related worker commutes and equipment transport noise impacts would not be substantial.

The second type of short-term noise impact is related to noise generated during site preparation, grading, building erection, and tenant improvement within the building. Table J lists the maximum noise levels recommended in "Noise Control of Buildings and Manufacturing Plants" (Bolt, Beranek & Newman, 1987) for noise impact assessments for typical construction equipment based on a distance of 50 ft between the equipment and a noise receptor.

Table J: Typical Maximum Construction Equipment Noise Levels (L_{max})

Type of Equipment	Range of Maximum Sound Level Measured at 50 ft (dBA)	Suggested Maximum Sound Level for Analysis at 50 ft (dBA)
Pile Drivers (12,000 to 18,000 ft-lb/blow)	81–96	93
Rock Drills	83–99	96
Jackhammers	75–85	82
Pneumatic Tools	78–88	85
Pumps	74–84	80
Scrapers	83–91	87
Haul Trucks	83–94	88
Cranes	79–86	82
Portable Generators	71–87	80
Rollers	75–82	80
Dozers	77–90	85
Tractors	77–82	80
Front-End Loaders	77–90	86
Hydraulic Backhoes	81–90	86
Hydraulic Excavators	81–90	86
Graders	79–89	86
Air Compressors	76–89	86
Trucks	81–87	86

Source: Noise Control for Buildings and Manufacturing Plants; Bolt, Beranek, & Newman, 1987.
dBA = A-weighted decibels
ft = feet
ft-lb/blow = foot-pounds per blow

Construction of the proposed project is expected to require the use of scrapers, dozers, and trucks. Based on the Suggested Maximum Sound Level for Analysis at 50 ft (dBA) column in Table J, the maximum noise level generated by scrapers is assumed to be 87 dBA L_{max} at 50 ft. The maximum noise level generated by dozers is approximately 85 dBA L_{max} at 50 ft. The maximum noise level generated by trucks is approximately 86 dBA L_{max} at 50 ft. Combined together with these activities occurring at the same time, active construction area would result in approximately 91 dBA L_{max} at a distance of 50 ft.

Existing land uses in the vicinity of the project area may be subject to short-term, intermittent noise generated by on-site tenant improvement activities. The closest residence in the vicinity of the project area is the residence located 100 ft to the west of the project site that would be subject to short-term noise reaching 85 dBA L_{max} generated by construction activities near the western project boundary. The next closest residences in the vicinity of the project area are located to the south of the project site south of Slover Avenue at a distance of 160 ft and would be subject to short-term noise reaching 81 dBA L_{max} generated by construction activities in the southern portion of the project site. Vehicular traffic on Slover Avenue would provide a masking effect for these residences from construction noise at the project site. Construction on the project site would follow the County's permitted hours, and no additional mitigation is necessary.

Long-Term On-Site Stationary Source Impacts

Potential long-term noise impacts would be associated with stationary sources on the project site. These activities are potential point sources of noise that could affect off-site noise-sensitive receptors such as residences.

Because the proposed project has no pre-determined clients identified, there would be no rooftop heating, ventilation, and air conditioning (HVAC) mechanical equipment or trash compactor installed at project completion. The mechanical equipment would not be installed until the building is leased to a specific tenant. Similarly, the type of trucks and operating hours would not be specified until a tenant is identified. Therefore, the following noise impact analysis is based on assumptions from similar facilities evaluated by LSA in the past. In addition, since the refrigerated trucks (reefers) generate higher noise than the nonrefrigerated trucks, the following analysis that was based on the assumptions that refrigerated trucks would be used on the project site represents the worst-case scenario. A scenario with all diesel trucks but no reefers is also discussed with lesser noise impacts.

A sound study and zoning compliance report by Epsilon Associates, Inc. (Epsilon) (September 14, 2007) evaluated potential noise sources for a warehouse/distribution center that included the following: electric and diesel refrigeration trailers (reefers); rooftop HVAC mechanical equipment; and idling diesel trucks. Epsilon used manufacturer-published sound data for most of the sources and measurements of a ThermoKing Super II TC trailer for the diesel reefers. Table K lists the reference sound levels for a single unit. It should also be noted that the sound power level (PWL) shown in Table K represents the rate per unit time at which sound energy is radiated, whereas the sound pressure level (SPL) represents the root-mean-square of the instantaneous sound pressure felt by the human ear or any sound-detecting instrument. When calculating the SPL at a certain distance from the equipment emitting PWL, sound propagation through the open air will account for the geometrical divergence, air absorption, ground attenuation, and other factors. Other on-site noise-producing activities include doors slamming, vehicle engine start-ups, and people conversing in a parking lot.

Truck Idling and Loading/Unloading: Combination of Refrigerated Trucks and Nonrefrigerated Trucks. There are 52 dock doors proposed on the east side of the building and 52 dock doors on the west side of the building. During loading and unloading activities, noise would be generated by the trucks' engines, exhaust systems, and brakes during low-speed gear shifting; braking activities; backing up toward the docks; dropping down the dock ramps; and maneuvering away from the docks. As a worst-case scenario, it is assumed that the proposed facility, in addition to use the

Table K: Equipment Sound Power Levels (dBA)

Sound Source	Sound Power Level Per Unit (dBA)
Trane Rooftop Compressor and Condenser Fans (27.5–35 Ton)	99
UBG Upblast Exhaust Fans	95
ThermoKing SB-200 Trailer Refrigeration Unit (60-Hertz Standby Electric Reefer)	96
ThermoKing Super II TC Trailer Refrigeration Unit at High Idle (Diesel Reefer)	104
Diesel Truck Idling	96

Source: Epsilon Associates Inc., September 14, 2007.
dBA = A-weighted decibels

regular trucks to deliver nonperishable goods, would use refrigerated trucks (reefers) to deliver food, and these trucks need to keep their engine running/idling until all food items are unloaded. Noise associated with loading/unloading activities would affect existing residential uses to the west, east, and southeast of the site. Delivery trucks for the proposed on-site uses would result in a maximum (sound power) noise level similar to noise readings obtained from the Epsilon sound study for a similar use in East Allen Township, as shown in Table K.

It is assumed that there would be three types of trucks that are expected to operate on the project site: electric reefers, diesel reefers, and diesel trucks. It is further assumed that there will be 20 electric reefers, 20 diesel reefers, and 40 diesel trucks operating on site at the same time on a peak day. Finally, it is assumed that the reefers will use the dock doors on the eastern (cooler and conditioned storage) portion of the building, with 10 electric reefers and 10 diesel reefers on the north side and similar numbers of reefers on the south side. Similarly, it is assumed that 20 diesel trucks will use the dock doors on the north side and 20 diesel trucks on the south side of the western (dry storage) portion of the building. It is assumed that the reefers would idle continuously to keep the food refrigerated. The diesel trucks, however, would idle no more than 5 minutes during each loading/unloading operation per the requirement of the California Air Resources Board (ARB) and South Coast Air Quality Management District (SCAQMD) on truck idling. Therefore, although there would be potentially 40 trucks on site for loading/unloading at the same time on a peak day, for practical operations, it is anticipated that no more than 10 diesel trucks would be idling at the same time on the project site. The following analysis, however, assumed that all 40 trucks would be idling at the same time.

When sound propagates through open space, it will attenuate by the distance divergence, air absorption, and ground attenuation. In addition, if there are natural (earthen berm) or man-made (sound wall or buildings) barriers between the source and the receptor location, further noise reduction can be expected. Because the trucks would be distributed over the 52 dock doors on the east side of the proposed warehouse building and the 52 dock doors on the west side of the building, the potential noise level associated with truck idling is based on the average distance from these dock doors, or measured to the midpoint of the 52 dock doors on the east and west sides of the building. For example, the average distance from the eastern dock doors to the residence along Linden Avenue to the east of the project site is 1,150 ft. There are residences to the south of the project site (south of Slover Avenue) that are approximately 800 ft from the midpoint of the dock doors. Existing

residences to the west of the project site are approximately 500 ft from the midpoint of the dock doors on the west side of the building.

Table L lists the worst-case noise levels at the nearest residences adjacent to the project on the west, east, and southeast of the project site from the operations of on-site reefers and diesel trucks. It should be noted that residences to the south are blocked by the building itself from the truck loading docks and would receive at least 10 dBA in noise attenuation from loading/unloading operations on the project site. Similarly, there are existing buildings and a perimeter wall to the west and east of the project site that would provide at least a 10 dBA noise reduction for land uses to the east or west of the site.

Table L: Predicted Sound Levels from Combinations of Diesel Trucks and Reefers

Source	Number of Units	Residences		
		West (500 ft)	East (1,150 ft)	Southeast (800 ft)
Diesel Trucks	40	60 dBA L_{eq}	N/A	N/A
Electric Reefers	20	N/A	50 dBA L_{eq}	53 dBA L_{eq}
Diesel Reefers	20	N/A	58 dBA L_{eq}	61 dBA L_{eq}
Combined Truck Noise	–	60 dBA L_{eq}	59 dBA L_{eq}	62 dBA L_{eq}
Attenuation by Building/Wall	–	10 dBA[1]	10 dBA[2]	10 dBA[2]
Truck Noise at Residence	–	50 dBA L_{eq}	49 dBA L_{eq}	52 dBA L_{eq}
County Noise Standard	–	55 dBA L_{50}/Day 45 dBA L_{50}/Night		

Source: LSA Associates, Inc., May 2013.
[1] Provided by the existing buildings and perimeter walls.
[2] Provided by onsite southern building edge.
dBA = A-weighted decibels
ft = feet
L_{50} = percentile noise exceedance level
L_{eq} = equivalent continuous sound level
N/A = blocked by building completely and much lower than the other trucks

Table L shows that these noise levels are lower than the County maximum exterior noise standards of 75 dBA L_{max} during the day (7:00 a.m.–10:00 p.m.) and 65 dBA L_{max} during the night (10:00 p.m.–7:00 a.m.). However, due to the multiple loading docks, it is assumed likely that the maximum loading and unloading noise will continue for more than 30 minutes in an hour especially on the eastern (cooler and conditioned storage) portion of the building. These loading and unloading activities would be spread out along the loading dock doors. Therefore, truck operating noise is required to meet the most stringent noise standard of the L_{50} noise level at the residence that is not to be exceeded for more than 30 minutes in any hour.

Residences to the West. The existing building to the west between the dock doors and existing residences to the west, with a height of 10 ft or more, would provide more than 10 dBA in noise reduction, reducing the noise levels at these residences along Locust Avenue to less than the daytime noise standard of 55 dBA L_{50}, but would potentially expose these residences to exceed

the nighttime noise standard of 45 dBA L_{50}. Since the existing building would provide 10 dBA or more noise attenuation for the on-site loading/unloading noise, it is not feasible or practical to construct additional walls with a height that would be effective to obtain an additional 5 dBA in noise reduction required to bring the noise level down to 45 dBA L_{eq} or L_{50}. Therefore, restrictions on nighttime operations on the western half of the dock doors would be required. As a rule of thumb, a 3 dBA reduction can be achieved with the reduction of the total number of trucks idling in half. Therefore, having a maximum limit of 10 diesel trucks, or 1/4 of the total dock doors on the west side, that can be idling at the same time on the western side of the building would reduce the nighttime noise level to 45 dBA L_{eq} or lower for the residences to the west of the project site. Since diesel trucks will be subject to the 5 minutes maximum idling time for each delivery trip, it is not anticipated that there would be more than 10 trucks idling at the same time during the nighttime hours on the west side of the building. However, if more than 10 diesel trucks are idling at the same time on the west side of the building during nighttime hours, truck noise could potentially exceed the County's nighttime noise standard at the nearest residence to the west of the project site along Locust Avenue.

Residences to the East. The existing building and perimeter wall along the property boundary to the east of the project site would provide more than 10 dBA in noise reduction, reducing the noise levels at these residences along Linden Avenue to less than the daytime noise standard of 55 dBA L_{50}, but would potentially expose these residences to exceedances of the nighttime noise standard of 45 dBA L_{50}. Since the existing building and perimeter wall to the east would provide 10 dBA or more noise attenuation for the on-site loading/unloading noise, it is not feasible or practical to construct another barrier or raise the existing building/wall height effectively to obtain an additional 4 dBA in noise reduction required to bring the noise level down to 45 dBA L_{eq} or L_{50}. Therefore, restrictions on nighttime operations on the eastern half of the dock doors would be required. As a rule of thumb, a 3 dBA reduction can be achieved with the reduction of the total number of trucks idling by half. Therefore, having a maximum limit of 16 diesel trucks that can be idling at the same time on the eastern side of the building would reduce the nighttime noise level to 45 dBA L_{eq} or lower for the residences to the east of the project site. Since diesel trucks will be subject to the 5-minute maximum idling time for each delivery trip, it is not anticipated that there would be more than 16 trucks idling at the same time during the nighttime hours on the east side of the building. However, if more than 16 diesel trucks are idling at the same time on the east side of the building during nighttime hours, truck noise could potentially exceed the County's nighttime noise standard at the nearest residences to the east along Linden Avenue.

Residences to the Southeast. For the residences south across Slover Avenue, the average distance from the loading docks would be 1,150 ft for the residences directly adjacent to Slover Avenue. The L_{eq} noise level would be 52 dBA L_{eq} at the nearest residences 1,150 ft away. This noise level is below the daytime (7:00 a.m.–10:00 p.m.) standard of 55 dBA L_{50}. However, if the loading and unloading activities were to occur during the nighttime (10:00 p.m.–7:00 a.m.) for this same 30 plus minutes in an hour, the 52 dBA L_{eq} noise level would exceed the nighttime (10:00 p.m.–7:00 a.m.) standard of 45 dBA L_{50}. Since the building edge is already assumed to provide 10 dBA or more in noise attenuation, it is not practical or feasible to construct a noise barrier along the project's southern boundary to achieve another 7 dBA in noise reduction. Therefore, restrictions on nighttime operations, such as limiting to a total of 8 reefers to use the

dock doors on the east side of the building during nighttime hours, need to be implemented. Because this maximum number of reefer trucks is less than the restriction for the residences to the east, it should be the maximum number of reefer trucks that can be operating on the east side of the building during nighttime hours.

Truck Idling and Loading/Unloading: All Nonrefrigerated Trucks. As a lesser-impact scenario, it is assumed that the proposed facility would allow the use of regular trucks to deliver nonperishable goods only. Noise associated with loading/unloading activities would affect existing residential uses to the east and south/southwest of the site.

It is assumed that there will be 80 diesel trucks operating on site at the same time on a peak day. It is also assumed that half of the trucks will use the dock doors on the eastern portion of the building, and half of the diesel trucks will use the dock doors on the western portion of the building. The diesel trucks would idle no more than 5 minutes during each loading/unloading operation per the requirement of the ARB and SCAQMD on truck idling. Therefore, although there would be potentially 80 trucks on site for loading/unloading at the same time on a peak day, for practical operations, it is anticipated that no more than 20 diesel trucks would be idling at the same time on the project site. The following analysis, however, assumed that all 80 trucks would be idling at the same time.

Because the trucks would be distributed over the 52 dock doors, respectively, on the east and west side of the proposed warehouse building, the potential noise level associated with truck idling is based on the average distance from these dock doors, or measured to the midpoint of the dock doors on each side. For example, the average distance from the eastern dock doors to the residence along Locust Avenue to the west of the project site is 500 ft. There are residences to the southeast of the project site (south of Slover Avenue) that are approximately 800 ft from the midpoint of the dock doors and existing residences to the east approximately 1,150 ft to the midpoint of the dock doors.

Table M lists the worst-case noise levels at the nearest residences adjacent to the project on the west, east, and southeast of the project site from the operations of on-site diesel trucks. It should be noted that residences to the south are blocked by the building itself from the truck loading docks and would receive at least 10 dBA in noise attenuation from loading/unloading operations on the project site. There is an existing building and perimeter wall to the west and east of the project site that would provide 10 dBA or more in noise reduction to the residence on the west and east of the project site.

Table M shows that these noise levels are lower than the County maximum exterior noise standards of 75 dBA L_{max} during the day (7:00 a.m.–10:00 p.m.) and 65 dBA L_{max} during the night (10:00 p.m.–7:00 a.m.). However, due to the multiple loading docks, it is assumed likely that the maximum loading and unloading noise will continue for more than 30 minutes in an hour. These loading and unloading activities would be spread out along the loading dock doors. Therefore, truck operating noise is required to meet the most stringent noise standard of the L_{50} noise level at the residence that is not to be exceeded for more than 30 minutes in any hour.

Table M: Predicted Sound Levels from Diesel Trucks

Source	Number of Units	Residences		
		West (500 ft)	Southeast (800 ft)	East (1,150 ft)
Diesel Trucks	40	60 dBA L_{eq}	56 dBA L_{eq}	53 dBA L_{eq}
Attenuation by Building/Wall	–	10 dBA[1]	10 dBA[2]	10 dBA[2]
Truck Noise at Residence	–	50 dBA L_{eq}	46 dBA L_{eq}	43 dBA L_{eq}
County Noise Standard	–	55 dBA L_{50}/Day 45 dBA L_{50}/Night		

Source: LSA Associates, Inc., May 2013.
[1] Provided by an existing 6 ft high concrete wall along the eastern boundary.
[2] Provided by southern building (future office space) edge.
dBA = A-weighted decibels
ft = feet
L_{50} = percentile noise exceedance level
L_{eq} = equivalent continuous sound level
N/A = not applicable

Residences to the West. The existing building to the west of the project site would provide 10 dBA or more in noise reduction, reducing the noise levels at the residences to the west to less than the daytime noise standard of 55 dBA L_{50}, but would potentially expose these residences to exceed the nighttime noise standard of 45 dBA L_{50}. Since the existing building and perimeter wall already provides 10 dBA or more noise attenuation for the on-site loading/unloading noise, it is not feasible or practical to construct another barrier or raise the existing building height effectively to obtain an additional 5 dBA in noise reduction required to bring the noise level down to 45 dBA L_{eq} or L_{50}. Therefore, restrictions on nighttime operations on the western half of the dock doors would be required. As a rule of thumb, a 3 dBA reduction can be achieved with the reduction of the total number of trucks idling in half. Therefore, limiting to a maximum of 12 diesel trucks that can be idling at the same time on the western side of the building would reduce the nighttime noise level to 45 dBA L_{eq} or lower for the residences to the west of the project site. Since diesel trucks will be subject to the 5 minutes maximum idling time for each delivery trip, it is not anticipated that there would be more than 12 trucks idling at the same time during the nighttime hours on the west side of the building. However, if more than 12 diesel trucks are idling at the same time on the west side of the building during nighttime hours, truck noise could potentially exceed the County's nighttime noise standard at the nearest residences to the west along Locust Avenue.

Residences to the Southeast. For the residences to the southeast along Slover Avenue, the average distance from the loading docks would be 800 ft for the residences directly adjacent to Slover Avenue. The L_{eq} noise level would be 46 dBA L_{eq} at the residences 800 ft away. This noise level is below the daytime (7:00 a.m.–10:00 p.m.) standard of 55 dBA L_{50}. However, if the loading and unloading activities were to occur during the nighttime (10:00 p.m.–7:00 a.m.) for this same 30 plus minutes in an hour, the 46 dBA L_{eq} noise level at the residences to the east would exceed the nighttime (10:00 p.m.–7:00 a.m.) standard of 45 dBA L_{50}. Since the project building is already assumed to provide 10 dBA or more in noise attenuation, it is not practical or feasible to construct a noise barrier along the project's eastern or southern boundary for noise

mitigation purposes. Therefore, restrictions on nighttime operations, such as limiting to a total of 31 trucks that use the dock doors on the east side of the building during nighttime hours, need to be implemented.

Residences to the East. For the residences to the east across Linden Avenue, the average distance from the loading docks would be 1,150 ft for the residences directly adjacent to Linden Avenue. The L_{eq} noise level would be 43 dBA L_{eq} at the nearest residences 1,150 ft away. This noise level is below the daytime (7:00 a.m.–10:00 p.m.) standard of 55 dBA L_{50} and the nighttime (10:00 p.m.–7:00 a.m.) standard of 50 dBA L_{eq} noise level at the residences to the east. Therefore, no restrictions on nighttime operations at the dock doors on the east side of the building during nighttime hours need to be implemented for residences to the east.

Rooftop Equipment Noise. The proposed project would have rooftop condenser fans and exhaust fans. Based on Table K, each condenser fan generates a source PWL of 99 dBA and each exhaust fan generates a source PWL of 95 dBA. It is estimated that there would be 8 upblast exhaust fans on the western (dry storage) portion of the building and 6 condenser fans on the eastern (cooler and conditioned storage) portion of the building. These exhaust fans and condenser fans are assumed to be spread out over the roof of the building with varying distances to the adjacent residences to the northwest, west, and south of the project site. Even though the average distance to the condenser fans and/or exhaust fans would be longer than those of the dock doors, this analysis uses the distance to the dock doors to simplify the process. Actual noise attenuation from distance divergence from the condenser/exhaust fans would be more than analyzed below. In addition to the effect of distance divergence and air absorption, the roof edge creates a natural noise barrier that reduces noise levels from these rooftop exhaust fans by an average of 13 dBA. Table N lists the projected noise level at the nearest residences adjacent to the project site. None of these noise levels would exceed the County's noise standards. No mitigation measures would be required.

Table N: Predicted Noise Level from Rooftop Fans

Source	Number of Units	Residences		
		West (500 ft)	East (1,150 ft)	Southeast (800 ft)
Exhaust Fans	8	49 dBA L_{eq}	42 dBA L_{eq}	45 dBA L_{eq}
Condenser Fans	6	52 dBA L_{eq}	45 dBA L_{eq}	48 dBA L_{eq}
Combined Fan Noise		53.5 dBA L_{eq}	46.5 dBA L_{eq}	49.5 dBA L_{eq}
Building Attenuation		13 dBA	13 dBA	13 dBA
Fan Noise at Residence		40.5 dBA L_{eq}	33.5 dBA L_{eq}	36.5 dBA L_{eq}

Source: LSA Associates, Inc., May 2013.
dBA = A-weighted decibels L_{eq} = equivalent continuous sound level
ft = feet

Parking Lot Activity. Proposed parking facilities are located along the perimeter of the proposed project site. Representative parking activities, such as employees conversing and doors slamming, would generate approximately 60–70 dBA L_{max} at 50 ft intermittently. This level of noise is much lower than that of the truck idling and loading/unloading activities. The nearest residential home to the west is located approximately 450 ft from the edge of the parking lot, and the residences on the

south side of Slover Avenue are located at least 550 ft from that edge of the parking lot. With the noise barriers combined with noise attenuation from the distance divergence, noise in the parking lot would be attenuated to below 55 dBA L_{max}. Thus, neither the residence to the west along Locust Avenue nor the residences on the south side of Slover Avenue are anticipated to experience a significant noise issue with respect to parking lot activity.

Long-Term Traffic Noise Impact

The FHWA Highway Traffic Noise Prediction Model (FHWA RD-77-108) was used to evaluate traffic-related noise conditions along Slover Avenue, Maple Avenue, Locust Avenue, Linden Avenue, and Orange Avenue in the project vicinity. This model requires various parameters, including traffic volumes, vehicle mix, vehicle speed, and roadway geometry to compute typical equivalent noise levels during daytime, evening, and nighttime hours. The resulting noise levels are weighted and summed over 24-hour periods to determine the CNEL values. The future traffic average daily traffic (ADT) volumes were taken from the Traffic Impact Analysis prepared for the proposed project (LSA, May 2013). Table O lists the existing (2013) with project traffic noise levels. Tables P and Q respectively list the 2014 without and with project traffic noise levels. These noise levels represent the worst-case scenario, which assumes that no shielding is provided between the traffic and the location where the noise contours are drawn. The specific assumptions used in developing these noise levels and the model printouts are provided in Appendix A.

Off-Site Traffic Noise Impacts. Tables O and Q show that project-related traffic would have a 0.5 dBA or less in noise level increase along most roadway segments in the project vicinity, except along Linden Avenue north of Slover Avenue, where the existing and 2014 with project scenario would be 2.9 dBA higher compared to their respective no project scenario. As described above in the Measurement of Sound section, a noise level change of 3 dBA or less are generally considered to be below the threshold of noticeable hearing. Most of the roadways would have an increase well below 3 dBA. The segment of Linden Avenue that would have a 2.9 dBA increase with the project traffic would still have its 60 dBA CNEL noise contour confined to within the roadway right-of-way and no significant traffic noise impacts for land uses along this segment of the road would occur. Therefore, no significant off-site traffic noise impacts from project-related traffic would occur; therefore, no mitigation measures are required.

On-Site Traffic Noise Impacts. Because the proposed project is not considered noise sensitive, no significant traffic noise impacts on on-site uses would occur; therefore, no mitigation measures are required.

Table O: Existing (2013) With Project Traffic Noise Levels

Roadway Segment	ADT	Centerline to 70 CNEL (ft)	Centerline to 65 CNEL (ft)	Centerline to 60 CNEL (ft)	CNEL (dBA) 50 ft from Centerline of Outermost Lane	Increase CNEL (dBA) 50 ft from Centerline of Outermost Lane
Slover Avenue West of Locust Avenue	8,700	< 50	81	174	67.4	0.0
Slover Avenue Between Locust Avenue Driveway 2	8,800	< 50	82	176	67.5	0.1
Slover Avenue Between Driveway 2 and Maple Avenue	9,700	< 50	87	187	67.9	0.1
Slover Avenue Between Maple Avenue and Driveway 3	9,600	< 50	87	186	67.3	0.2
Slover Avenue Between Driveway 3 and Linden Avenue	8,000	< 50	77	165	66.5	0.1
Slover Avenue East of Linden Avenue	5,500	< 50	60	128	65.4	0.2
Locust Avenue North of Slover Avenue	370	< 50	< 50	< 50	46.4	2.9
Locust Avenue South of Slover Avenue	3,100	< 50	< 50	74	61.8	0.0
Maple Avenue South of Slover Avenue	1,000	< 50	< 50	< 50	54.2	0.0
Linden Avenue North of Orange Avenue	50	< 50	< 50	< 50	37.7	0.0
Linden Avenue Between Orange Avenue and Slover Avenue	2,700	< 50	< 50	< 50	55.0	0.3
Linden Avenue South of Slover Avenue	1,900	< 50	< 50	< 50	53.5	0.0
Orange Avenue East of Linden Avenue	3,400	< 50	< 50	52	59.5	0.0

Source: LSA Associates, Inc., June 2013.
Note: Traffic noise within 50 ft of the roadway centerline should be evaluated with site-specific information.
ADT = average daily traffic
CNEL = Community Noise Equivalent Level
dBA = A-weighted decibel
ft = feet

Table P: 2014 Baseline Traffic Noise Levels

Roadway Segment	ADT	Centerline to 70 CNEL (ft)	Centerline to 65 CNEL (ft)	Centerline to 60 CNEL (ft)	CNEL (dBA) 50 ft from Centerline of Outermost Lane
Slover Avenue West of Locust Avenue	9,200	< 50	84	181	67.7
Slover Avenue Between Locust Avenue Driveway 2	8,900	< 50	82	177	67.5
Slover Avenue Between Driveway 2 and Maple Avenue	9,500	< 50	86	185	67.8
Slover Avenue Between Maple Avenue and Driveway 3	9,500	< 50	86	185	67.2
Slover Avenue Between Driveway 3 and Linden Avenue	8,000	< 50	77	165	66.5
Slover Avenue East of Linden Avenue	5,400	< 50	59	127	65.4
Locust Avenue North of Slover Avenue	190	< 50	< 50	< 50	43.5
Locust Avenue South of Slover Avenue	3,300	< 50	< 50	77	62.1
Maple Avenue South of Slover Avenue	1,100	< 50	< 50	< 50	54.6
Linden Avenue North of Orange Avenue	50	< 50	< 50	< 50	37.7
Linden Avenue Between Orange Avenue and Slover Avenue	2,500	< 50	< 50	< 50	54.7
Linden Avenue South of Slover Avenue	2,000	< 50	< 50	< 50	53.7
Orange Avenue East of Linden Avenue	3,500	< 50	< 50	53	59.6

Source: LSA Associates, Inc., June 2013.
Note: Traffic noise within 50 ft of the roadway centerline should be evaluated with site-specific information.

ADT = average daily traffic
CNEL = Community Noise Equivalent Level
dBA = A-weighted decibels
ft = feet

Table Q: 2014 With Project Traffic Noise Levels

Roadway Segment	ADT	Centerline to 70 CNEL (ft)	Centerline to 65 CNEL (ft)	Centerline to 60 CNEL (ft)	CNEL (dBA) 50 ft from Centerline of Outermost Lane	Increase CNEL (dBA) 50 ft from Centerline of Outermost Lane
Slover Avenue West of Locust Avenue	9,300	< 50	85	182	67.7	0.0
Slover Avenue Between Locust Avenue Driveway 2	9,100	< 50	84	179	67.6	0.1
Slover Avenue Between Driveway 2 and Maple Avenue	9,900	< 50	88	190	68.0	0.2
Slover Avenue Between Maple Avenue and Driveway 3	9,800	< 50	88	189	67.4	0.2
Slover Avenue Between Driveway 3 and Linden Avenue	8,300	< 50	79	169	66.6	0.1
Slover Avenue East of Linden Avenue	5,700	< 50	61	131	65.6	0.2
Locust Avenue North of Slover Avenue	370	< 50	< 50	< 50	46.4	2.9
Locust Avenue South of Slover Avenue	3,300	< 50	< 50	77	62.1	0.0
Maple Avenue South of Slover Avenue	1,100	< 50	< 50	< 50	54.6	0.0
Linden Avenue North of Orange Avenue	50	< 50	< 50	< 50	37.7	0.0
Linden Avenue Between Orange Avenue and Slover Avenue	2,800	< 50	< 50	< 50	55.2	0.5
Linden Avenue South of Slover Avenue	2,000	< 50	< 50	< 50	53.7	0.0
Orange Avenue East of Linden Avenue	3,500	< 50	< 50	53	59.6	0.0

Source: LSA Associates, Inc., June 2013.
Note: Traffic noise within 50 ft of the roadway centerline should be evaluated with site-specific information.
ADT = average daily traffic
CNEL = Community Noise Equivalent Level
dBA = A-weighted decibel
ft = feet

MITIGATION MEASURES

Construction Impacts

No mitigation is necessary.

Long-Term Operational Impacts

The following mitigation will be required for 24-hour operations at the proposed facility:

Combination of Reefers and Diesel Trucks Scenario:

- No more than 8 diesel reefers and electric reefers shall be operating at the same time during the nighttime hours (10:00 p.m. to 7:00 a.m.) on the east side of the building; and
- No more than 10 diesel trucks shall be idling at the same time during the nighttime hours (10:00 p.m. to 7:00 a.m.) on the west side of the building; plus,

All Nonrefrigerated Diesel Trucks Scenario and One of the Following Two Options:

- No more than 31 diesel trucks shall be operating at the same time during the nighttime hours (10:00 p.m. to 7:00 a.m.) on the east side of the building; and
- No more than 12 diesel trucks shall be idling at the same time during the nighttime hours (10:00 p.m. to 7:00 a.m.) on the west side of the building.

LEVEL OF SIGNIFICANCE AFTER MITIGATION

With implementation of the identified mitigation measures, potential short-term and long-term noise impacts would be reduced to a less than significant level.

REFERENCES

Bolt, Beranek & Newman, Noise Control for Buildings and Manufacturing Plants, 1987.

County of San Bernardino, Noise Element of the General Plan.

County of San Bernardino, Development Code 87.0905, Noise. 1995.

Federal Highway Administration, Highway Traffic Noise Prediction Model, FHWA RD-77-108, 1977.

LSA Associates, Inc., Traffic Impact Analysis, May 2013.

United States Environmental Protection Agency, Protective Noise Levels, Condensed Version of EPA Levels Document, 1978.

APPENDIX A

FHWA HIGHWAY TRAFFIC NOISE MODEL PRINTOUTS

TABLE Existing NP-01
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/03/2013
ROADWAY SEGMENT: Slover Avenue West of Locust Avenue
NOTES: Bloomington Truck Terminal - Existing NP

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 8700 SPEED (MPH): 50 GRADE: .5

	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

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 67.43

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL 70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	81.0	174.2	375.1

TABLE Existing NP-02
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/03/2013
ROADWAY SEGMENT: Slover Avenue Between Locust Avenue Driveway 2
NOTES: Bloomington Truck Terminal - Existing NP

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 8600 SPEED (MPH): 50 GRADE: .5

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

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 67.38

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	80.4	172.9	372.2

TABLE Existing NP-03
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/03/2013
ROADWAY SEGMENT: Slover Avenue Between Driveway 2 and Maple Avenue
NOTES: Bloomington Truck Terminal - Existing NP

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 9400 SPEED (MPH): 50 GRADE: .5

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

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 67.77

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	85.3	183.4	394.9

TABLE Existing NP-04
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/03/2013
ROADWAY SEGMENT: Slover Avenue Between Maple Avenue and Driveway 3
NOTES: Bloomington Truck Terminal - Existing NP

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 9300 SPEED (MPH): 50 GRADE: .5

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

ACTIVE HALF-WIDTH (FT): 12 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 67.14

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	85.3	182.3	392.0

TABLE Existing NP-05
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/03/2013
ROADWAY SEGMENT: Slover Avenue Between Driveway 3 and Linden Avenue
NOTES: Bloomington Truck Terminal - Existing NP

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 7800 SPEED (MPH): 50 GRADE: .5

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

ACTIVE HALF-WIDTH (FT): 12 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 66.37

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL	70 CNEL	65 CNEL	60 CNEL	55 CNEL
	0.0	76.1	162.2	348.7

TABLE Existing NP-06
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/03/2013
ROADWAY SEGMENT: Slover Avenue East of Linden Avenue
NOTES: Bloomington Truck Terminal - Existing NP

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 5200 SPEED (MPH): 50 GRADE: .5

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

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 65.19

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	57.7	123.7	266.2

TABLE Existing NP-07
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/03/2013
ROADWAY SEGMENT: Locust Avenue North of Slover Avenue
NOTES: Bloomington Truck Terminal - Existing NP

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 190 SPEED (MPH): 25 GRADE: .5

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

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 43.51

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL	70 CNEL	65 CNEL	60 CNEL	55 CNEL
	0.0	0.0	0.0	0.0

TABLE Existing NP-08
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/03/2013
ROADWAY SEGMENT: Locust Avenue South of Slover Avenue
NOTES: Bloomington Truck Terminal - Existing NP

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 3100 SPEED (MPH): 45 GRADE: .5

	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

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 61.80

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	73.6	158.1

TABLE Existing NP-09
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/03/2013
ROADWAY SEGMENT: Maple Avenue South of Slover Avenue
NOTES: Bloomington Truck Terminal - Existing NP

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 1000 SPEED (MPH): 35 GRADE: .5

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

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 54.19

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	0.0

TABLE Existing NP-10
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/03/2013
ROADWAY SEGMENT: Linden Avenue North of Orange Avenue
NOTES: Bloomington Truck Terminal - Existing NP

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 50 SPEED (MPH): 25 GRADE: .5

	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

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 37.72

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	0.0

TABLE Existing NP-11
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/03/2013
ROADWAY SEGMENT: Linden Avenue Between Orange Avenue and Slover Avenue
NOTES: Bloomington Truck Terminal - Existing NP

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 2500 SPEED (MPH): 25 GRADE: .5

	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

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 54.70

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	53.5

TABLE Existing NP-12
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/03/2013
ROADWAY SEGMENT: Linden Avenue South of Slover Avenue
NOTES: Bloomington Truck Terminal - Existing NP

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 1900 SPEED (MPH): 25 GRADE: .5

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

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 53.51

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL	70 CNEL	65 CNEL	60 CNEL	55 CNEL
	0.0	0.0	0.0	0.0

TABLE Existing NP-13
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/03/2013
ROADWAY SEGMENT: Orange Avenue East of Linden Avenue
NOTES: Bloomington Truck Terminal - Existing NP

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 3400 SPEED (MPH): 35 GRADE: .5

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

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 59.51

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	52.0	111.3

TABLE Existing P-01
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/03/2013
ROADWAY SEGMENT: Slover Avenue West of Locust Avenue
NOTES: Bloomington Truck Terminal - Existing P

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 8700 SPEED (MPH): 50 GRADE: .5

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

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 67.43

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	81.0	174.2	375.1

TABLE Existing P-02
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/03/2013
ROADWAY SEGMENT: Slover Avenue Between Locust Avenue Driveway 2
NOTES: Bloomington Truck Terminal - Existing P

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 8800 SPEED (MPH): 50 GRADE: .5

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

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 67.48

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	81.7	175.5	377.9

TABLE Existing P-03
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/03/2013
ROADWAY SEGMENT: Slover Avenue Between Driveway 2 and Maple Avenue
NOTES: Bloomington Truck Terminal - Existing P

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 9700 SPEED (MPH): 50 GRADE: .5

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

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 67.90

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	87.1	187.3	403.3

TABLE Existing P-04
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/03/2013
ROADWAY SEGMENT: Slover Avenue Between Maple Avenue and Driveway 3
NOTES: Bloomington Truck Terminal - Existing P

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 9600 SPEED (MPH): 50 GRADE: .5

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

ACTIVE HALF-WIDTH (FT): 12 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 67.28

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	87.1	186.2	400.4

TABLE Existing P-05
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/03/2013
ROADWAY SEGMENT: Slover Avenue Between Driveway 3 and Linden Avenue
NOTES: Bloomington Truck Terminal - Existing P

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 8000 SPEED (MPH): 50 GRADE: .5

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

ACTIVE HALF-WIDTH (FT): 12 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 66.48

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	77.3	165.0	354.6

TABLE Existing P-06
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/03/2013
ROADWAY SEGMENT: Slover Avenue East of Linden Avenue
NOTES: Bloomington Truck Terminal - Existing P

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 5500 SPEED (MPH): 50 GRADE: .5

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

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 65.44

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	59.8	128.4	276.3

TABLE Existing P-07
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/03/2013
ROADWAY SEGMENT: Locust Avenue North of Slover Avenue
NOTES: Bloomington Truck Terminal - Existing P

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 370 SPEED (MPH): 25 GRADE: .5

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

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 46.41

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	0.0

TABLE Existing P-08
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/03/2013
ROADWAY SEGMENT: Locust Avenue South of Slover Avenue
NOTES: Bloomington Truck Terminal - Existing P

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 3100 SPEED (MPH): 45 GRADE: .5

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

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 61.80

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	73.6	158.1

TABLE Existing P-09
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/03/2013
ROADWAY SEGMENT: Maple Avenue South of Slover Avenue
NOTES: Bloomington Truck Terminal - Existing P

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 1000 SPEED (MPH): 35 GRADE: .5

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

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 54.19

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	0.0

TABLE Existing P-10
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/03/2013
ROADWAY SEGMENT: Linden Avenue North of Orange Avenue
NOTES: Bloomington Truck Terminal - Existing P

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 50 SPEED (MPH): 25 GRADE: .5

	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

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 37.72

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	0.0

TABLE Existing P-11
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/03/2013
ROADWAY SEGMENT: Linden Avenue Between Orange Avenue and Slover Avenue
NOTES: Bloomington Truck Terminal - Existing P

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 2700 SPEED (MPH): 25 GRADE: .5

	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

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 55.04

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	56.3

TABLE Existing P-12
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/03/2013
ROADWAY SEGMENT: Linden Avenue South of Slover Avenue
NOTES: Bloomington Truck Terminal - Existing P

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 1900 SPEED (MPH): 25 GRADE: .5

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

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 53.51

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	0.0

TABLE Existing P-13
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/03/2013
ROADWAY SEGMENT: Orange Avenue East of Linden Avenue
NOTES: Bloomington Truck Terminal - Existing P

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 3400 SPEED (MPH): 35 GRADE: .5

	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

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 59.51

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	52.0	111.3

TABLE 2014 NP-01
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/03/2013
ROADWAY SEGMENT: Slover Avenue West of Locust Avenue
NOTES: Bloomington Truck Terminal - 2014 NP

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 9200 SPEED (MPH): 50 GRADE: .5

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

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 67.67

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	84.1	180.8	389.3

TABLE 2014 NP-02
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/03/2013
ROADWAY SEGMENT: Slover Avenue Between Locust Avenue Driveway 2
NOTES: Bloomington Truck Terminal - 2014 NP

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 8900 SPEED (MPH): 50 GRADE: .5

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

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 67.53

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	82.3	176.9	380.8

TABLE 2014 NP-03
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/03/2013
ROADWAY SEGMENT: Slover Avenue Between Driveway 2 and Maple Avenue
NOTES: Bloomington Truck Terminal - 2014 NP

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 9500 SPEED (MPH): 50 GRADE: .5

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

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 67.81

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	85.9	184.7	397.7

TABLE 2014 NP-04
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/03/2013
ROADWAY SEGMENT: Slover Avenue Between Maple Avenue and Driveway 3
NOTES: Bloomington Truck Terminal - 2014 NP

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 9500 SPEED (MPH): 50 GRADE: .5

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

ACTIVE HALF-WIDTH (FT): 12 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 67.23

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	86.5	184.9	397.6

TABLE 2014 NP-05
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/03/2013
ROADWAY SEGMENT: Slover Avenue Between Driveway 3 and Linden Avenue
NOTES: Bloomington Truck Terminal - 2014 NP

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 8000 SPEED (MPH): 50 GRADE: .5

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

ACTIVE HALF-WIDTH (FT): 12 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 66.48

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	77.3	165.0	354.6

TABLE 2014 NP-06
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/03/2013
ROADWAY SEGMENT: Slover Avenue East of Linden Avenue
NOTES: Bloomington Truck Terminal - 2014 NP

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 5400 SPEED (MPH): 50 GRADE: .5

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

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 65.36

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	59.1	126.8	272.9

TABLE 2014 NP-07
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/03/2013
ROADWAY SEGMENT: Locust Avenue North of Slover Avenue
NOTES: Bloomington Truck Terminal - 2014 NP

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 190 SPEED (MPH): 25 GRADE: .5

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

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 43.51

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	0.0

TABLE 2014 NP-08
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/03/2013
ROADWAY SEGMENT: Locust Avenue South of Slover Avenue
NOTES: Bloomington Truck Terminal - 2014 NP

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 3300 SPEED (MPH): 45 GRADE: .5

	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

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 62.07

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	76.7	164.8

TABLE 2014 NP-09
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/03/2013
ROADWAY SEGMENT: Maple Avenue South of Slover Avenue
NOTES: Bloomington Truck Terminal - 2014 NP

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 1100 SPEED (MPH): 35 GRADE: .5

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

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 54.61

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	52.7

TABLE 2014 NP-10
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/03/2013
ROADWAY SEGMENT: Linden Avenue North of Orange Avenue
NOTES: Bloomington Truck Terminal - 2014 NP

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 50 SPEED (MPH): 25 GRADE: .5

	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

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 37.72

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	0.0

TABLE 2014 NP-11
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/03/2013
ROADWAY SEGMENT: Linden Avenue Between Orange Avenue and Slover Avenue
NOTES: Bloomington Truck Terminal - 2014 NP

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 2500 SPEED (MPH): 25 GRADE: .5

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

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 54.70

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	53.5

TABLE 2014 NP-12
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/03/2013
ROADWAY SEGMENT: Linden Avenue South of Slover Avenue
NOTES: Bloomington Truck Terminal - 2014 NP

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 2000 SPEED (MPH): 25 GRADE: .5

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

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 53.74

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	0.0

TABLE 2014 NP-13
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/03/2013
ROADWAY SEGMENT: Orange Avenue East of Linden Avenue
NOTES: Bloomington Truck Terminal - 2014 NP

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 3500 SPEED (MPH): 35 GRADE: .5

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

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 59.63

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	53.0	113.5

TABLE 2014 P-01
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/03/2013
ROADWAY SEGMENT: Slover Avenue West of Locust Avenue
NOTES: Bloomington Truck Terminal - 2014 P

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 9300 SPEED (MPH): 50 GRADE: .5

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

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 67.72

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	84.7	182.1	392.1

TABLE 2014 P-02
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/03/2013
ROADWAY SEGMENT: Slover Avenue Between Locust Avenue Driveway 2
NOTES: Bloomington Truck Terminal - 2014 P

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 9100 SPEED (MPH): 50 GRADE: .5

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

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 67.62

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	83.5	179.5	386.5

TABLE 2014 P-03
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/03/2013
ROADWAY SEGMENT: Slover Avenue Between Driveway 2 and Maple Avenue
NOTES: Bloomington Truck Terminal - 2014 P

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 9900 SPEED (MPH): 50 GRADE: .5

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

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 67.99

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	88.3	189.9	408.8

TABLE 2014 P-04
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/03/2013
ROADWAY SEGMENT: Slover Avenue Between Maple Avenue and Driveway 3
NOTES: Bloomington Truck Terminal - 2014 P

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 9800 SPEED (MPH): 50 GRADE: .5

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

ACTIVE HALF-WIDTH (FT): 12 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 67.37

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	88.3	188.7	405.9

TABLE 2014 P-05
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/03/2013
ROADWAY SEGMENT: Slover Avenue Between Driveway 3 and Linden Avenue
NOTES: Bloomington Truck Terminal - 2014 P

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 8300 SPEED (MPH): 50 GRADE: .5

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

ACTIVE HALF-WIDTH (FT): 12 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 66.64

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	79.2	169.0	363.4

TABLE 2014 P-06
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/03/2013
ROADWAY SEGMENT: Slover Avenue East of Linden Avenue
NOTES: Bloomington Truck Terminal - 2014 P

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 5700 SPEED (MPH): 50 GRADE: .5

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

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 65.59

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	61.3	131.5	283.0

TABLE 2014 P-07
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/03/2013
ROADWAY SEGMENT: Locust Avenue North of Slover Avenue
NOTES: Bloomington Truck Terminal - 2014 P

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 370 SPEED (MPH): 25 GRADE: .5

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

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 46.41

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	0.0

TABLE 2014 P-08
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/03/2013
ROADWAY SEGMENT: Locust Avenue South of Slover Avenue
NOTES: Bloomington Truck Terminal - 2014 P

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 3300 SPEED (MPH): 45 GRADE: .5

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

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 62.07

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	76.7	164.8

TABLE 2014 P-09
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/03/2013
ROADWAY SEGMENT: Maple Avenue South of Slover Avenue
NOTES: Bloomington Truck Terminal - 2014 P

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 1100 SPEED (MPH): 35 GRADE: .5

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

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 54.61

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	52.7

TABLE 2014 P-10
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/03/2013
ROADWAY SEGMENT: Linden Avenue North of Orange Avenue
NOTES: Bloomington Truck Terminal - 2014 P

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 50 SPEED (MPH): 25 GRADE: .5

	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

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 37.72

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	0.0

TABLE 2014 P-11
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/03/2013
ROADWAY SEGMENT: Linden Avenue Between Orange Avenue and Slover Avenue
NOTES: Bloomington Truck Terminal - 2014 P

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 2800 SPEED (MPH): 25 GRADE: .5

	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

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 55.20

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	57.7

TABLE 2014 P-12
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/03/2013
ROADWAY SEGMENT: Linden Avenue South of Slover Avenue
NOTES: Bloomington Truck Terminal - 2014 P

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 2000 SPEED (MPH): 25 GRADE: .5

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

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 53.74

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	0.0	0.0

TABLE 2014 P-13
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 06/03/2013
ROADWAY SEGMENT: Orange Avenue East of Linden Avenue
NOTES: Bloomington Truck Terminal - 2014 P

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 3500 SPEED (MPH): 35 GRADE: .5

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

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

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* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 59.63

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	0.0	53.0	113.5
