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II-A-218

A METHOD FOR ASSESSING AUTOMOBILE NOISE

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Prepared for:

U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Noise Abatement and Control
Washington, D.C. 20460

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16. ABSTRACT

This study presents a methods that can be used to examine and quantify each factor contributing to motor vehicle noise produced by automobile accelerating on city/suburban streets. It is based on data collected in six different jurisdictions subject to a range of noise control programs and was developed to assist State/local jurisdictions to formulate or refine motor vehicle noise control programs.

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1. INTRODUCTION

This study has two goals:

- Develop a practical method for assessing the noise of motor vehicles
- Provide an analysis of the factors that affect motor vehicle noise.

1.1 Assessment of Motor Vehicle Noise

Many state and local jurisdictions are faced with complaints about noisy motor vehicles. Understandably, these jurisdictions would like to implement an effective program for minimizing motor vehicle noise. The primary goal of this study is to develop a method that will not only tell a jurisdiction how loud its motor vehicles are, but will also suggest why the vehicles are loud. Consequently, the study will suggest how the vehicles can be quieted most effectively.

There are many reasons why citizens may judge motor vehicles in their neighborhoods to be noisy. Nearby roads may carry large volumes of traffic. A major truck route may run near or through their neighborhood. An unusually high number of "hot-rodders" may "cruise" nearby streets. Many vehicles in the community may have defective or modified exhaust systems. Drivers may use "heavy foot" acceleration methods. Each of these circumstances can contribute to high motor vehicle noise levels, and, consequently, each must be identified and addressed if a jurisdiction hopes to reduce motor vehicle noise levels.

This study presents a method that can be used to examine separately and quantify each factor contributing to motor vehicle noise. Once quantified, the relative importance of the contributing factors can be judged, and a jurisdiction can formulate a program to control the most important factor or factors.

Specifically, the method presented here is developed for judging the noise produced by automobiles accelerating on city/suburban streets. Using fairly simple measurement procedures and simple (though somewhat tedious) computations, a jurisdiction can use the information in this report to judge whether its automobiles are noisier or quieter than "average." If the vehicles are noisier, the jurisdiction can judge whether the vehicles are noisy because they have audibly defective/modified exhaust systems or because drivers tend to accelerate more rapidly than "average."

Thus, the method presented here for assessing motor vehicle noise applies specifically to automobiles accelerating on city/suburban streets. In a general sense, however, the method is applicable to any type of motor vehicle and any mode of operation. The method of assessment depends upon collecting noise measurement data on a specified vehicle type operating in a specified mode. These data are then combined to yield "average" relationships for the vehicle type/mode of operation. This study uses automobiles accelerating on city/suburban streets. However, once the method for determining the "average" relationships is understood, similar relationships for any vehicle type/operating mode can be derived, provided that the corresponding noise measurement data are first collected.

1.2 Analysis of Factors Affecting Motor Vehicle Noise

In the process of developing and presenting the method for assessing motor vehicle noise, a secondary goal will be achieved: to analyze the four basic factors that determine how much noise motor vehicles make. The noise made by a motor vehicle depends upon

- Basic vehicle design
- Whether the vehicle's exhaust system has become defective with use
- Whether the vehicle's exhaust system has been modified
- How the vehicle is operated.

The method developed for use by jurisdictions must address the latter three factors, since state and local jurisdictions can conceivably exercise some control over defective/modified exhaust systems and over vehicle driver behavior. The first factor, the basic way the vehicle is designed, may be less amenable to state/local control, but will also be analyzed here. This factor is analyzed not only because it plays an important role in determining resultant levels of noise produced by motor vehicles, but also because the data gathered for this study and the method developed for motor vehicle noise assessment permit its analysis.

The following four sections and attached appendices document the study. Section 2 describes the methods used to collect and reduce the motor vehicle sound level data. Section 3 presents a detailed analysis of the reduced data and a discussion of the results. Section 4 discusses how a jurisdiction's motor vehicle noise control program might be structured to target most effectively the primary factors that contribute to motor vehicle noise. Section 5 outlines recommendations for further work. Finally, the appendices present data collection and reduction forms and the reduced data format to help jurisdictions understand/duplicate the data collection and analysis procedures for their own motor vehicles.

2. METHODS

2.1 Data Acquisition

2.1.1 General

Figure 1 shows, in idealized form, how the noise produced by a motor vehicle changes as the vehicle accelerates past an observer who is located 25 ft to the side of the road and approximately 120 ft down the road from where the vehicle begins acceleration. The sound level that this study examines is the maximum A-weighted passby sound level, shown as L_{max} in Fig. 1. That is, all data presented and analyzed in this study are the maximum A-weighted sound levels measured at a point 25 ft from the centerline of the lane of travel and at approximately 120 ft "downstream" from the start of acceleration.

2.1.2 Equipment setup

Figure 2 shows a schematic representation of a typical measurement site. Sites were selected so that there were no large acoustically reflective objects (parked cars, signs, houses, solid walls, or fences) within 50 ft of either the microphone or the vehicle path at its point closest to the microphone. The microphone height was adjusted to approximately 4-1/2 ft above the pavement surface. All measurements were made with the same digital readout sound level meter conforming to ANSI S1.4-1971, Type S1A, using the "fast" meter response and the "maximum hold" feature.

The microphone was placed on a tripod and connected to the sound level meter with a 60-ft cable. The person making the measurements attempted to sit unobtrusively, either on the ground

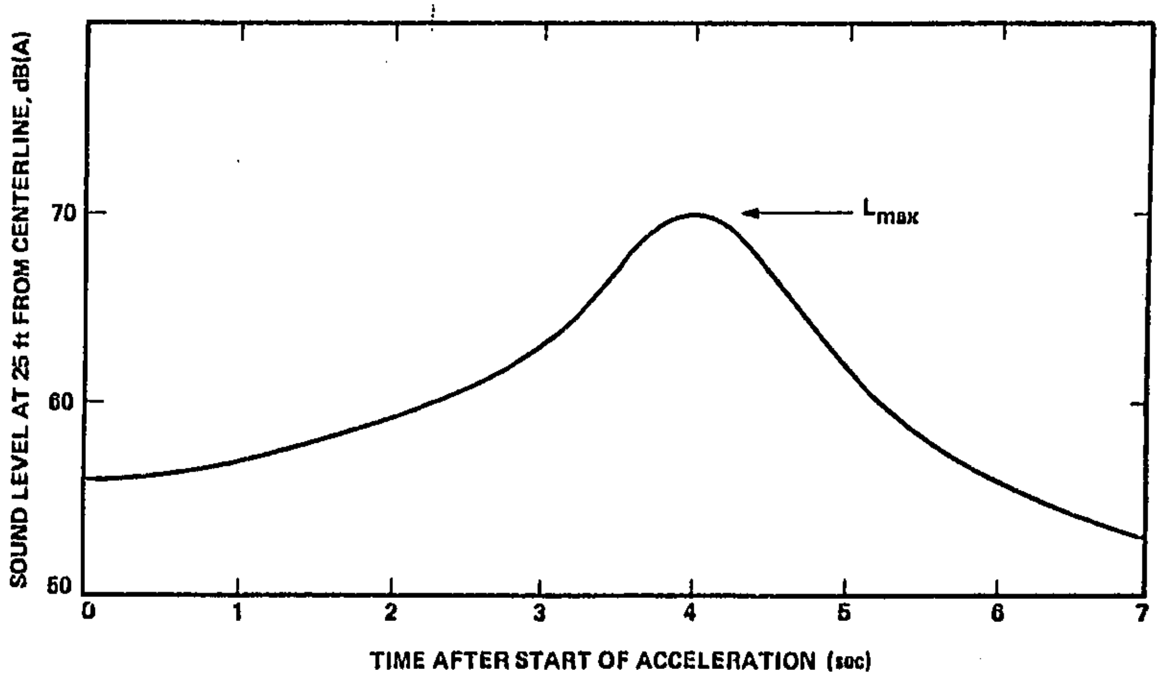

FIG. 1. IDEALIZED VEHICLE PASSBY SOUND LEVEL AS A FUNCTION OF TIME AFTER START OF ACCELERATION, AS MEASURED AT THE MICROPHONE LOCATION IN FIG. 2.

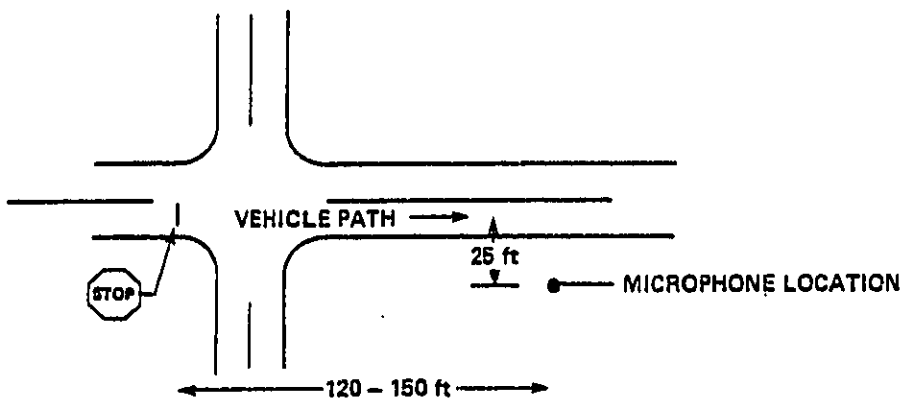

FIG. 2. SCHEMATIC OF TYPICAL VEHICLE PASSBY NOISE MEASUREMENT SITE.

or in a parked car as far from the microphone as permitted by the cable.

2.1.3 Measurement site location

Data were collected in six different jurisdictions around the country. The objective was to measure motor vehicles subject to as wide a range of noise control programs/laws as possible. Table 1 lists the jurisdictions alphabetically, briefly describes the type of motor vehicle noise control program/law for automobiles, identifies the measurement site location and dates measured, and gives the total number of automobiles measured and the speed limit for the road along which measurements were taken. Note that the site identifiers will be used throughout this study when referring to a specific site. The following paragraphs briefly summarize each jurisdiction's approach to motor vehicle noise control.

Birmingham, AL

Birmingham has the basic nonquantitative Uniform Vehicle Code type language in its law requiring that the vehicle be equipped at all times with a muffler in good working order to prevent excessive or unusual noise. The law also prohibits the use of a muffler cutout, bypass, or a muffler without baffles. In 1979, approximately 200 citations that imposed a fine were issued by the City of Birmingham. There is no periodic motor vehicle inspection.

Colorado Springs, CO

Colorado Springs seeks to control motor vehicle noise in at least three different ways. Officers use a patrol car-mounted

TABLE 1. VEHICLE PASSBY NOISE MEASUREMENT SITES SUMMARIZED.

Jurisdiction	Type of Program	Site Identifier	Site Location	Dates Measured	No. of Automobiles Measured	Speed Limit mph
Birmingham, AL	Citation for inadequate, illegal muffler.	B1	Northeast corner on 2nd Ave. S. at 68th St. S.	18,19 Oct. '78	484	30
		B2	Northeast corner on Huffman Rd. at Roebuck Dr./Hartinwood Rd.	18,19 Oct. '78	1,499	40
Colorado Springs, CO	Roadside measurement to enforce maximum passby level of 80 dB(A) at 25 ft or more in low-speed zones (35 mph or less); citation for inadequate, illegal muffler; compliance testing in response to complaints; public education.	C1	Southeast corner on San Miguel St. at Potter St.	17 Jan. '80	170	30
		C2	Southwest corner on Potter St. at San Miguel St.	15,16,17 Jan. '80	1,301	30
Eugene, OR	Stationary measurement at 20 in. from exhaust pipe opening to enforce 95 dB(A) to 97 dB(A) maximum; citation for unnecessary noise; voluntary compliance testing; public education.	E1	Northwest corner on Royal Ave. at Fairfield Ave.; North of Royal Ave. near Bertelsen Rd.*	2,3 Aug. '78	877	40
		E2	Northeast corner on Donald at 46th E.; Northwest corner on 24th W. at Polk.*	3,4 Aug. '78	641	25
Kansas City, MO	Annual inspection of exhaust system for mounting, muffler, leaks.	K1	Northwest corner on 64th St. N. at Antioch Rd./Prospect	4,5 Oct. '78	1,145	25
		K2	Northeast corner on Blue River Rd. at Red Bridge Rd.	5,6 Oct. '78	387	45
Southern California	Roadside measurement to enforce high-speed (over 35 mph) maximum passby level of 82 dB(A) at 50 ft.	S1	Northwest corner on Lexington Ave. at 3rd St., east of El Cajon near San Diego.	12,13 Sept. '78	1,314	40
Trotwood, OH	Roadside measurement to enforce low-speed (45 mph or less) maximum passby level of 80 dB(A) at 15 ft or more from noise source; voluntary compliance testing at schools; public education.	T1	Northwest corner on Main St. at Sunrise Ave.	12,13 Dec. '79	1,057	25
		T2	Southeast corner on Trotwood Blvd. at Stubbs Dr.	11 Dec. '79	452	20/35

*Sites E1 and E2 each contain data measured at two sites. Data from two sites on Royal Ave. were combined to give the 877 automobiles of E1; data from two different sites, both in similar residential areas, both having 25 mph speed limits were combined to give the 641 automobiles of E2.

microphone, while parked along city streets, to enforce the maximum permitted A-weighted sound level of 80 dB as measured at 25 ft or more from the vehicle passing by. Second, officers issue citations for illegal exhaust system modifications. Third, warning letters are sent to registrants of vehicles that citizens have alleged are excessively noisy. These letters generally result in voluntary submission to a vehicle noise compliance test and subsequent remedial action. (For more detail about the Colorado Springs program, see EPA report "Colorado Springs, Colorado, Case History of a Municipal Noise Control Program.") As of September 1979, approximately 800 summonses and 200 to 300 warnings had been issued for that year.

Eugene, OR

The Eugene police enforce motor vehicle noise control through citations for unnecessary noise, and by stationary testing of vehicles that are subjectively identified as likely to be in violation. The stationary test is made by measuring at 20 in. from the exhaust pipe outlet during specified engine rpm. The maximum permitted A-weighted sound levels are 95 dB for front engine automobiles, and 97 dB for rear engine automobiles. Eugene police have also attempted to encourage compliance by extensive public education through television, local papers, programs at area high schools, and noise clinics (voluntary testing). At the time of data collection (August 1978), the program had been actively enforced for three months, and about 200 citations had been issued.

Kansas City, MO

Missouri requires a safety inspection of all motor vehicles at licensed inspection stations. Vehicles are inspected at least once each year or whenever ownership of the vehicle is transferred. As part of the inspection, the exhaust system is examined to determine if it is properly mounted, if it has any leaks, whether the system has a muffler, if the muffler is located so that it might burn a person who enters or leaves the passenger compartment, and if exhaust discharge is properly directed. In 1977, from a test sample of 271,193 vehicles, about 6 percent had faulty exhaust systems.

*Southern California**

In unincorporated areas around San Diego, the California Highway Patrol (Border Division) measures maximum passby noise levels of vehicles in speed zones of over 35 mph to enforce, for automobiles, a maximum permitted A-weighted sound level of 82 dB as measured at a distance of 50 ft from the centerline of the lane of travel. In 1977, over 6000 citations were issued by the Border Division to vehicles that exceeded the maximum permitted levels.

Trotwood, OH

Trotwood police, though occasionally using a patrol car-mounted microphone for enforcing the maximum permitted passby A-weighted sound level of 80 dB at measurement distances of 15 ft or more from the motor vehicle, rely heavily on public awareness and voluntary motor vehicle noise testing. Testing schedules

*California Highway Patrol enforcement of the motor vehicle noise control program was discontinued in mid 1979. Noise measurements were made, however, during the fall of 1978 when the program was still actively enforced.

are publicized, and car window identifying stickers are given to owners of vehicles that are tested and that pass the test. Owners of vehicles that do not pass are informally cautioned that their vehicle may be in violation of the Trotwood motor vehicle noise control ordinance and that they could be cited during regular roadside enforcement procedures. The police regularly conduct tests at the high school so that students can measure their own cars and become familiar with the ordinance.

2.1.4 Data collection

As each vehicle pulled away from the stop sign and accelerated past the microphone location, three primary pieces of data were noted on a data sheet:

- vehicle category
- whether the vehicle looked or sounded defective/modified
- maximum A-weighted passby sound level.*

Appendix A shows the form of the data sheets that were used.

Categories

Engine size (number of cylinders) was the primary determinant of vehicle category. Vehicle noise characteristics

*Originally, there was interest in noting the elapsed time (ET) required for the vehicle to accelerate some specified distance, and in noting whether the vehicle was operating with wide-open throttle (WOT) (maximum acceleration). However, with simple equipment (a stopwatch), the elapsed time could not be determined accurately enough to be meaningful, and measurement personnel felt that they could not reliably judge whether a vehicle was operating with wide-open throttle.

should be closely related to the engine size. Thus, if vehicles are categorized by engine size, the noise data for a given category should be comparable from measurement site to measurement site.

A primary objective of this study is to determine if vehicle noise levels vary from site to site, and if they vary, why. Suppose the measured vehicle noise levels were not categorized by vehicle (engine) type. Some locations (jurisdictions) might have more 4-cylinder cars than others. If vehicle noise levels differed, it would be impossible to determine how much of the difference was due, say, to different acceleration rates, and how much was caused by the different mixes of large and small cars. Accordingly, eight different vehicle categories were selected, and they are described in Table 2.

Defective/Modified

As each vehicle was measured, the person making the measurements noted his/her judgment of whether or not the vehicle sounded as though it had a defective and/or modified exhaust system. In general, the sound produced by a defective/modified exhaust system was thought to be easily identifiable; it had the characteristic engine firing sound or "popping" that one associates with a poorly functioning system. Such subjective judgments may sometimes be in error and could conceivably result in systematic error. However, the measurement experiences suggested that if any systematic error existed, it would probably be in the identification of the quieter defective/modified vehicle. These quieter vehicles should not significantly affect overall study results since the easy-to-identify, noisier, defective/modified vehicles create most of the total roadside sound energy. In other words, misidentification of some of the quieter vehicles should not affect the general conclusions of this study.

For two categories, the PNT and BUG categories of Table 2, judgment of defective/modified exhaust systems was not easy to make and is considered unreliable. In these two categories, either unusually large numbers of vehicles had defective/modified systems, or nondefective/modified systems sounded almost the same as defective/modified systems. In other words, measurement personnel could not identify significant audible differences; almost all vehicles sounded somewhat defective/modified.

Measurement personnel noted on the data forms whether each vehicle was visibly defective/modified (they circled VIS, see Appendix A), and/or audibly defective/modified (they circled AUD).

Maximum A-Weighted Passby Sound Level

The sound level meter was set to "hold," on its digital display, the maximum A-weighted sound level that occurred as the vehicle accelerated past. This level was noted to tenths of a decibel on the data forms.

2.2 Data Reduction

The data acquisition procedures resulted in measurement of over 9000 automobile maximum passby sound levels at 11 different sites. Development of a method for assessing motor vehicle noise and motor vehicle noise control programs then became a problem of determining how these data could be reduced

TABLE 2. VEHICLE CATEGORY DESCRIPTIONS.

Category	Abbreviation	Description
Heavy V-8 engines	V-8	U.S.-manufactured passenger automobile models that are sold almost exclusively with the V-8 engine option; examples: Buick Century, Cadillac Seville, Chryslers, Ford LTD. (Does *not* include "CAL" vehicles.)
Light V-8 engines and 6-cylinder engines	COM	U.S.-manufactured ("compact") passenger automobile models that are sold almost exclusively with the 6-cylinder engine option, or with a mix of the 6-cylinder and V-8 engine options; examples: AMC Pacer, Buick Skyhawk, Dodge Aspen, Ford Mustang II.
Model Year 1977, 1978, 1979 full-size GM	CAL	General Motors-manufactured B- and C-body (new in 1977 model year) full-size passenger automobiles; examples: Buick Electra, Chevrolet Caprice, Oldsmobile Ninety Eight, Pontiac Bonneville. This category was identified to possibly serve as a standard vehicle for "calibrating" each site.
4-cylinder engines	IMP	All U.S.- and foreign-manufactured models that are sold almost exclusively with 4-cylinder engines; examples: Chevrolet Chevette, Dodge Colt, Mercury Capri (before 1979), Plymouth Horizon, most Datsuns, most Toyotas.
Pintos and Vegas	PNT	All Ford Pintos, Mercury Bobcats, Chevrolet Vegas, Pontiac Astres.
Volkswagen "Beetles" and buses	BUG	All rear engine Volkswagen "Beetles" and bus models.
Motorcycles	M/C	All motorcycles.
All other passenger automobiles.	MSC	U.S.- and foreign-manufactured passenger automobile models that do not fit into any other category; examples: Chevrolet Corvette, Datsun 280, Mercedes Benz, Volvo GL/GLE, Peugeot 604.

(e.g., mathematically combined or manipulated) to an understandable form. The following section describes how the data were reduced, and it attempts to relate the reduced form of the passby data to an intuitive understanding of motor vehicle noise and motor vehicle operation.

2.2.1 Histograms

Perhaps the first question that might be asked about the motor vehicle passby sound level data is: How loud are the vehicles? Obviously, at different accelerations, vehicles will generally make different amounts of noise. A few will be very loud, a few will be very quiet, and most will produce intermediate sound levels — neither as quiet as the quietest, nor as loud as the loudest.

One way to present this intuitive observation graphically is with a histogram. Figure 3 is a histogram constructed from some of the measured passby sound level data. Specifically, it combines all the measured passby levels produced by U.S.-manufactured passenger automobiles having 8- or 6-cylinder engines, as measured along roads with speed limits of 35 mph or less.* The figure shows how many 8- and 6-cylinder automobiles were measured as producing a given maximum passby A-weighted sound level. For example, 551 8- and 6-cylinder automobiles produced a maximum passby A-weighted sound level that was between 67 dB and 68 dB, or 51 vehicles had measured passby levels between 61 dB and 62 dB.

*It includes all vehicles in the V-8, COM, and CAL categories measured at sites B1, C1, C2, E2, K1, T1, and T2.

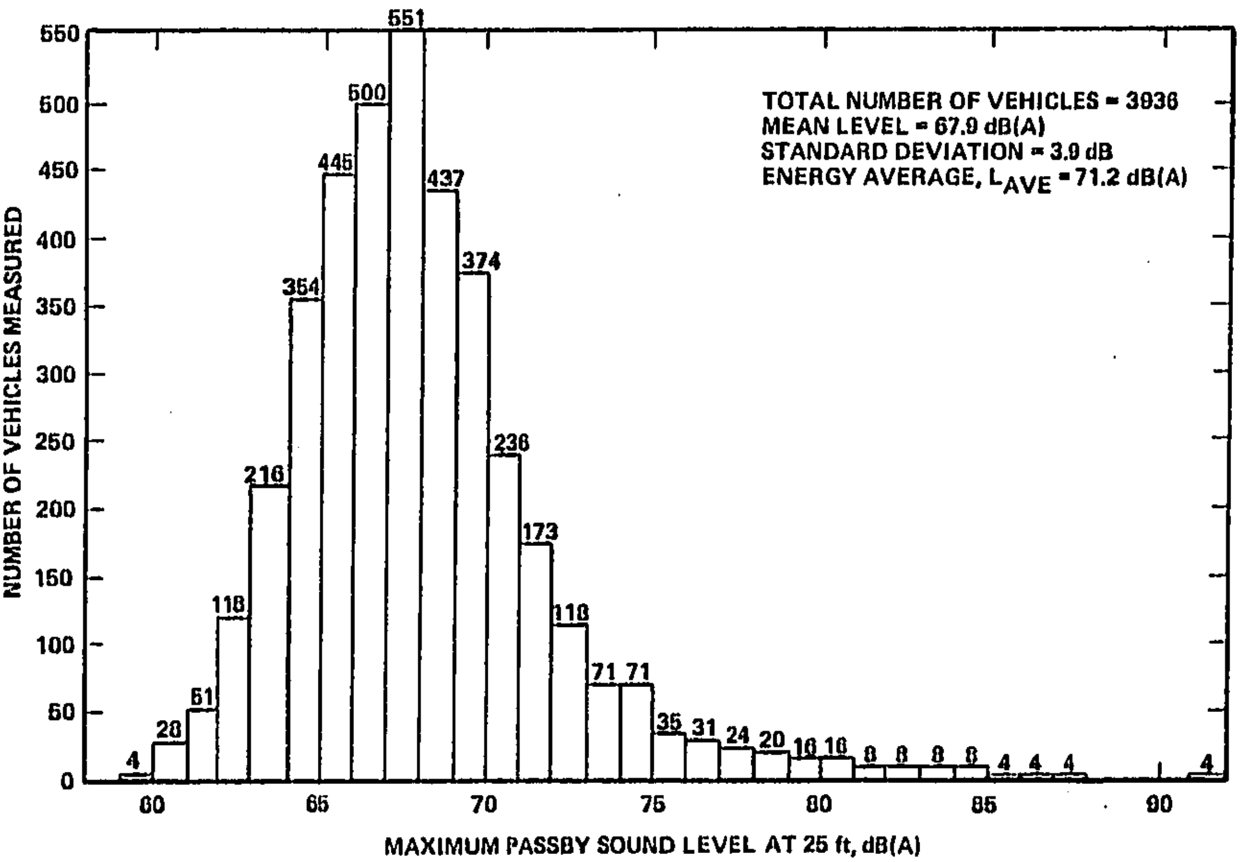

FIG. 3. HISTOGRAM SHOWING NUMBERS OF 8- AND 6-CYLINDER U.S.-MANUFACTURED AUTOMOBILES PRODUCING DIFFERENT MAXIMUM PASSBY SOUND LEVELS, AS MEASURED IN SPEED ZONES OF 35 mph OR LESS.

Figure 3 shows clearly how most 8- and 6-cylinder automobiles produce maximum passby levels that fall between 60 dB and 75 dB (as measured at 25 ft from the centerline of the lane of travel), but how a few automobiles produce levels well above this range. In other words, the histogram appears to have a "normal" or "Gaussian" distribution, that is, it shows the familiar bell-shaped distribution, except for the few noisy vehicles above approximately 75 dB.

2.2.2 Cumulative distributions

A second question about the passby data becomes apparent: What percentage of vehicles produce passby levels that exceed any specific level? The *cumulative distribution* of the data answers this question, and Fig. 4 presents the cumulative distribution of the data shown in Fig. 3.

The cumulative distribution in Fig. 4 is shown by the series of dots, and location of each dot can be determined directly from the information in Fig. 3. For example, 64 vehicles produced maximum passby sound levels equal to or exceeding 80 dB. Since a total of 3,936 vehicles were measured, 1.6 percent produced levels equal to or greater than 80 dB.

The dots of Fig. 4 are plotted on a special type of graph paper.* The percent scale is "stretched" or expanded for high and low percentages, and compressed for the middle percentages. This expansion and compression has two results. First, it means that data that have a normal or Gaussian distribution will plot as a straight line. Thus, as suggested earlier, except for the

*A copy of this graph paper is provided in Appendix A.

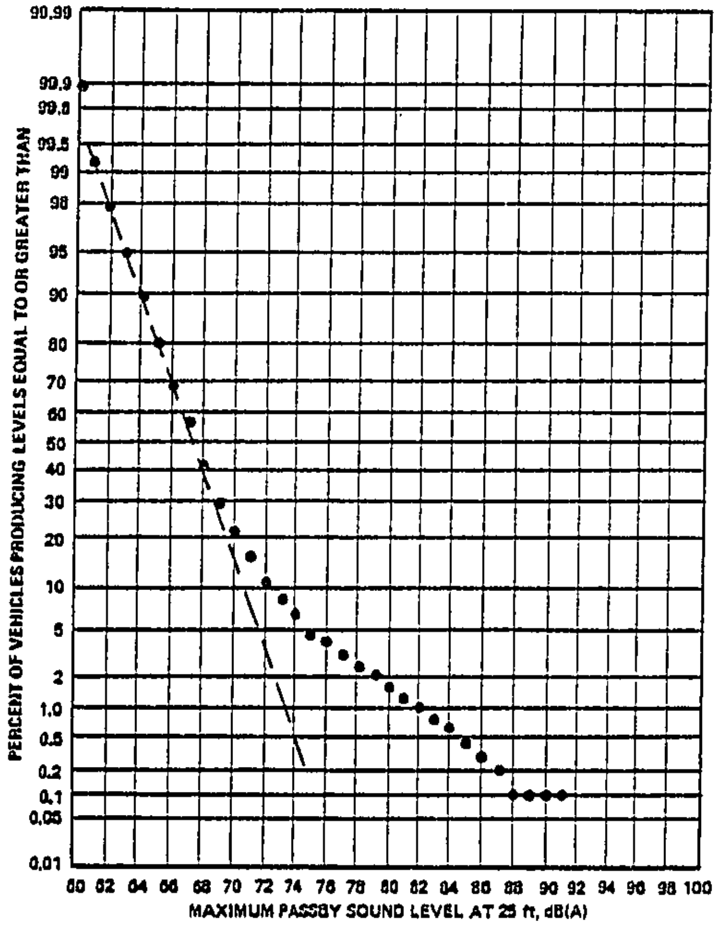

FIG. 4. CUMULATIVE DISTRIBUTION OF DATA SHOWN IN FIG. 3.

few vehicles above approximately 75 dB, the distribution is close to Gaussian; that is, it forms a bell-shaped curve on the histogram and produces a straight line on the special graph paper of Fig. 4. The dashed straight line in Fig. 4 is drawn for comparison.

Second, the expansion of the percent scale permits easy examination of the "tails," or the low and high ends, of the distribution. Figure 4 permits quick and accurate determination of how many vehicles exceed any specific high (or low) passby level. For example, if a maximum permitted passby sound level of 80 dB (at 25 ft) were imposed by law, 1.6 percent of all the U.S.-manufactured 8- and 6-cylinder automobiles measured in speed zones of 35 mph or less would be in violation.

Cumulative distributions permit quick comparison of different distributions (different vehicle populations). Figure 5 presents a histogram of the 8- and 6-cylinder automobiles, measured in speed zones of 35 mph or less, that were subjectively judged to have audibly defective/modified exhaust systems. For ease of comparison, it is plotted on a scale identical to that of Fig. 3. (Note that the data of Fig. 3 *include* the data of Fig. 5.) To clarify the shape of this distribution of defective/modified vehicles, it is replotted in Fig. 6, but with an expanded vertical scale. Figure 7 shows the cumulative distributions of both Fig. 3 and Fig. 5 or 6. These cumulative distributions clearly demonstrate that the entire distribution of defective/modified vehicles tends to be, on average, 2 dB to 8 dB louder than the total vehicle population.

A somewhat more meaningful comparison of defective/modified and nondefective/modified vehicles can be made. Figure 8 shows the histogram of all 8- and 6-cylinder automobiles judged *not*

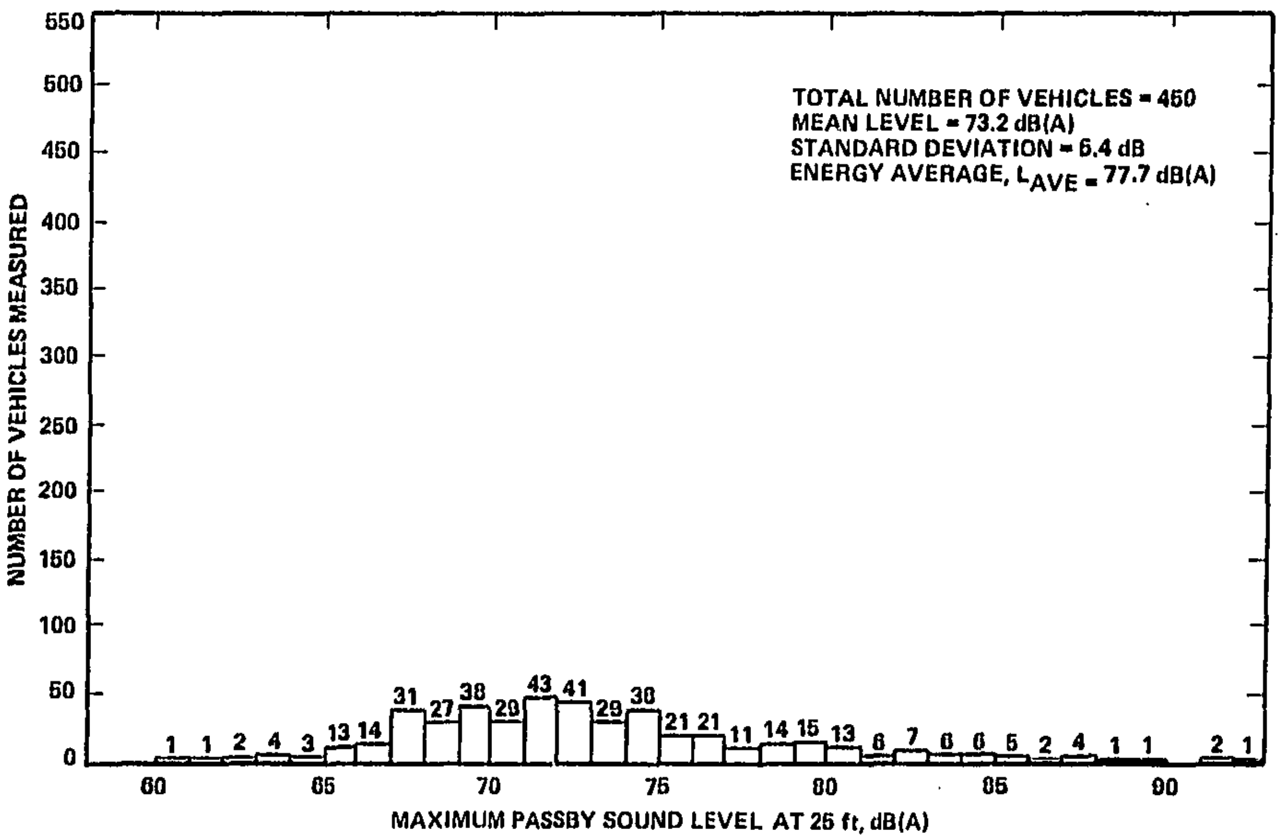

FIG. 5. HISTOGRAM SHOWING NUMBERS OF 8- AND 6-CYLINDER U.S.-MANUFACTURED AUTOMOBILES, MEASURED IN SPEED ZONES OF 35 mph OR LESS, THAT WERE JUDGED TO HAVE AUDIBLY DEFECTIVE/MODIFIED EXHAUST SYSTEMS.

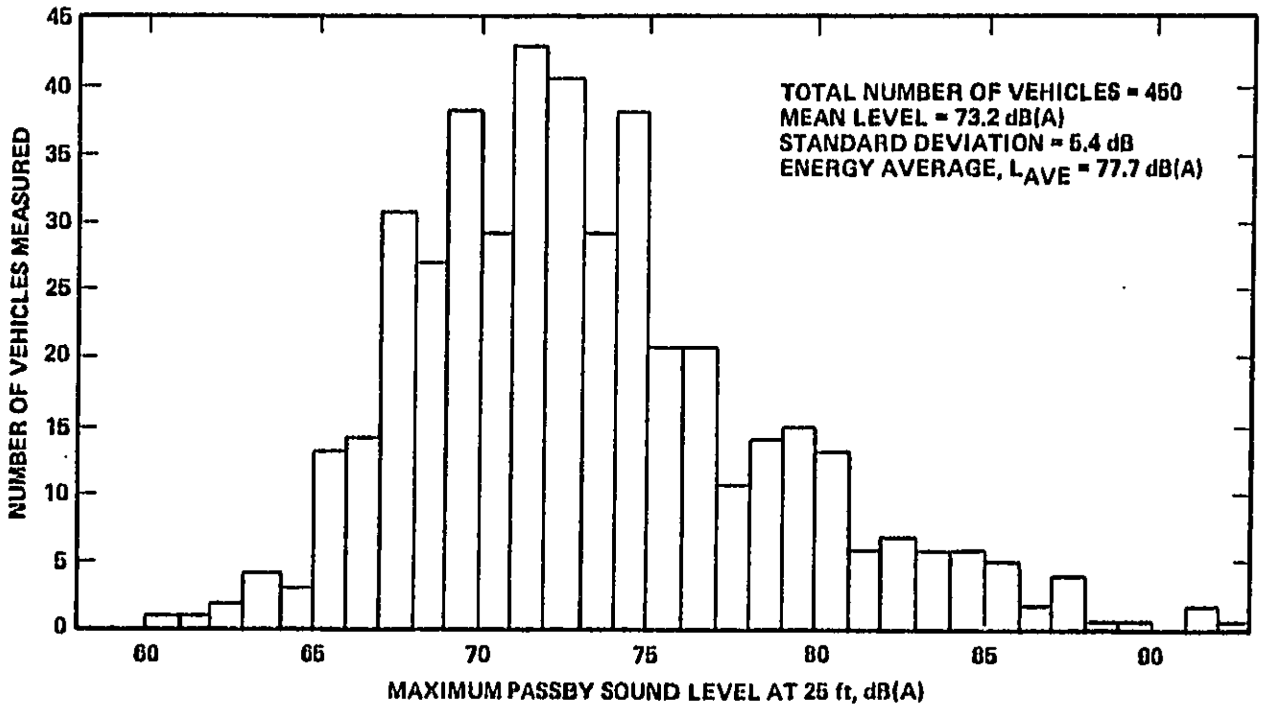

FIG. 6. HISTOGRAM OF DATA OF FIG. 5, BUT WITH EXPANDED VERTICAL SCALE.

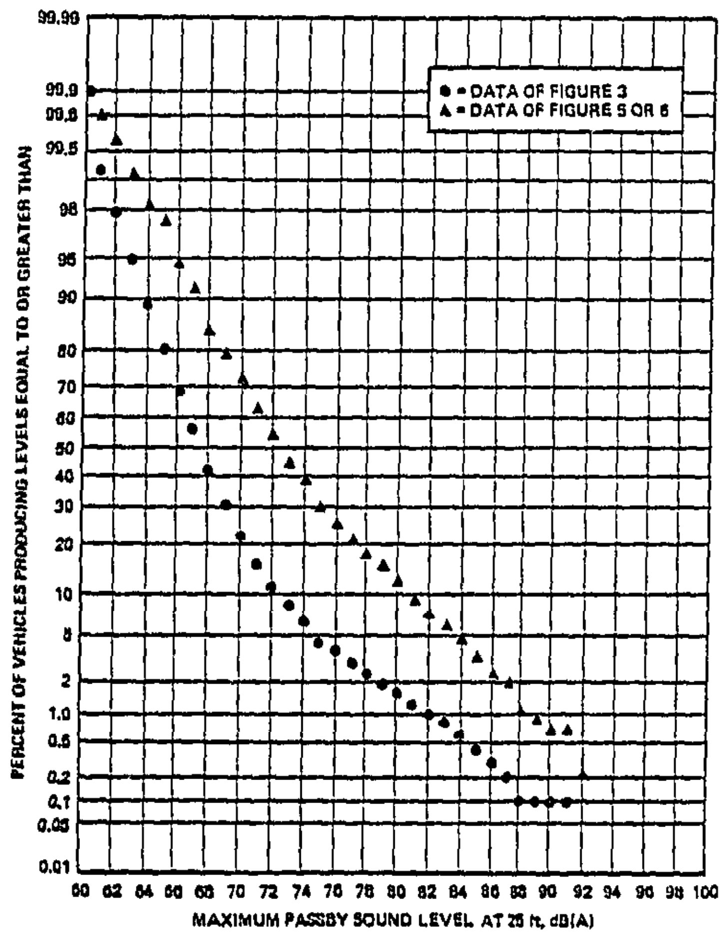

FIG. 7. CUMULATIVE DISTRIBUTIONS OF DATA SHOWN IN FIG. 3 AND IN FIG. 5 OR 6.

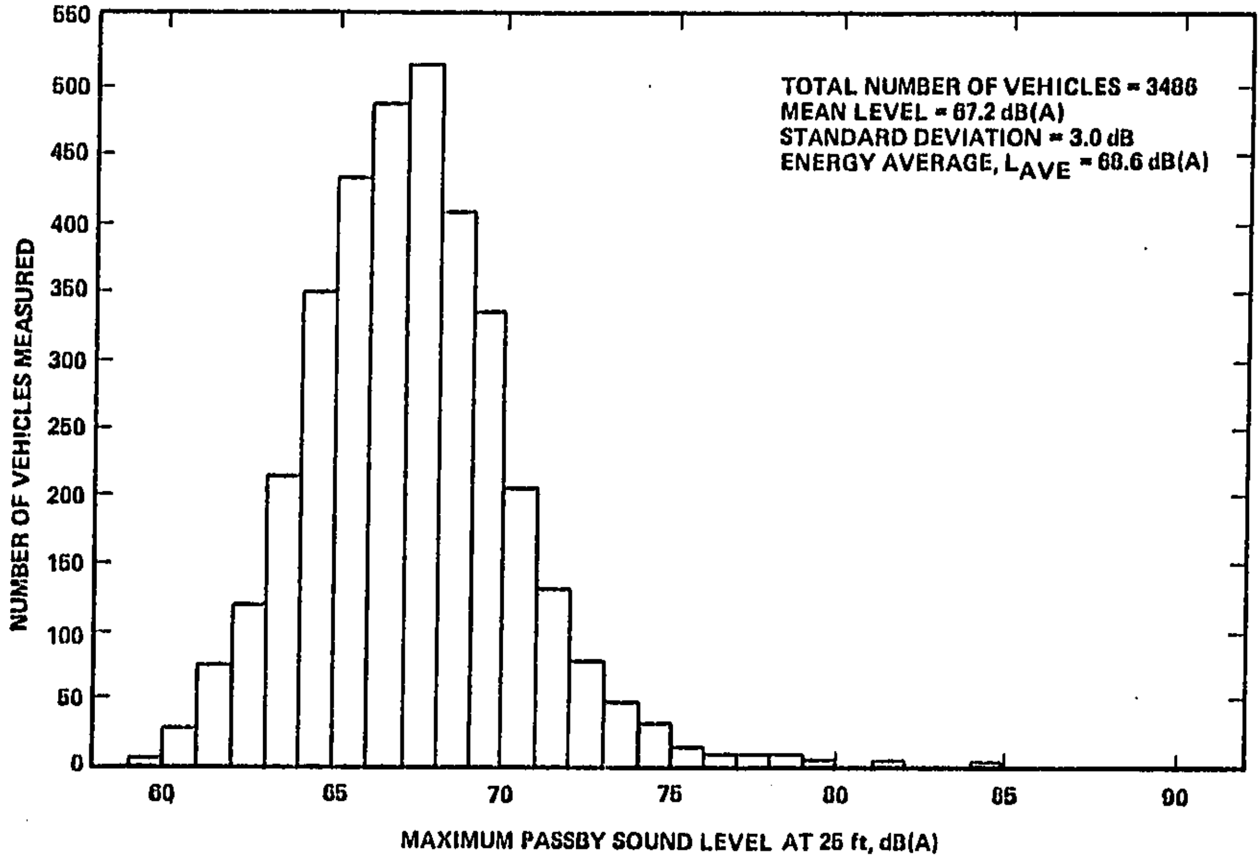

FIG. 8. HISTOGRAM SHOWING NUMBERS OF 8- AND 6-CYLINDER U.S.-MANUFACTURED AUTOMOBILES, MEASURED IN SPEED ZONES OF 35 mph OR LESS, THAT WERE JUDGED *NOT* TO HAVE AUDIBLY DEFECTIVE/MODIFIED EXHAUST SYSTEMS.

audibly defective/modified. (It is the histogram of Fig. 3 minus the histogram of Fig. 5 or 6.) Clearly, though there are still a few noisy vehicles, most of the louder vehicles were the audibly defective/modified vehicles of Fig. 5 or 6.

Figure 9 gives the cumulative distributions for all 8- and 6-cylinder vehicles (data of Fig. 3), for defective/modified 8- and 6-cylinder vehicles (Fig. 5 or 6), and for nondefective/modified 8- and 6-cylinder vehicles (Fig. 8). These cumulative distributions demonstrate at least three important points.

- It is not easy to "catch" defective/modified vehicles simply by enforcement of a maximum permitted passby sound level. For example, a maximum permitted level of 80 dB (at 25 ft) would be exceeded by only 12 percent of the measured defective/modified vehicles (54 vehicles).
- Nondefective/modified vehicles are not always quieter than defective/modified vehicles. (A corollary to the preceding point.) This conclusion is dependent on the judgment of which vehicles sound defective/modified and which do not. However, it would appear (and the data suggest) that nondefective/modified vehicles can be operated in a way that makes them as loud or louder than many defective/modified vehicles. For example, though approximately half of the defective/modified vehicles produce levels less than 72 dB, five percent of the nondefective/modified vehicles produce levels greater than 72 dB.
- Removal of all defective/modified vehicles affects primarily the upper tail of the total vehicle distribution. That is, if all defective/modified vehicles

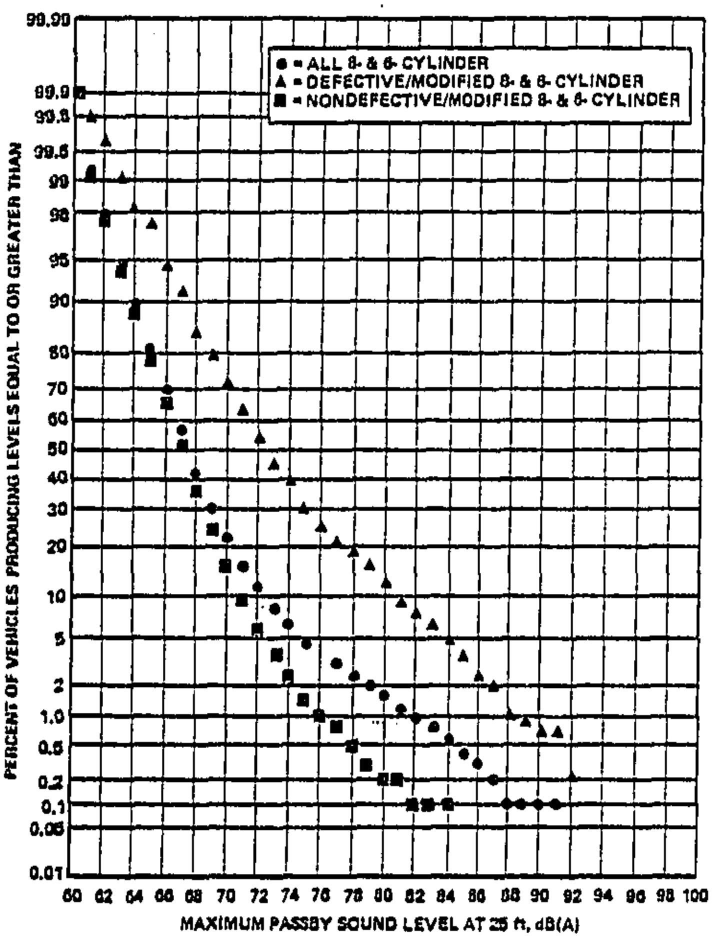

FIG. 9. CUMULATIVE DISTRIBUTIONS COMPARING ALL 8- AND 6-CYLINDER U.S.-MANUFACTURED AUTOMOBILES, 8- AND 6-CYLINDER AUTOMOBILES JUDGED DEFECTIVE/MODIFIED, AND 8- AND 6-CYLINDER AUTOMOBILES JUDGED *NOT* DEFECTIVE/MODIFIED, AS MEASURED IN SPEED ZONES OF 35 mph OR LESS.

were repaired, or eliminatd, the main effect would be a reduction in the number of very noisy vehicles.

Cumulative distributions can thus provide some insight into motor vehicle noise and into the effects of various regulatory controls. They will be used throughout this report to develop the method for judging motor vehicle noise and for identifying approaches to controlling motor vehicle noise.

Two other forms of data reduction will be used to develop the method of motor vehicle noise assessment. One, called here the "median vehicle level" or L_{50}, is derived directly from the cumulative distribution; while the other, the "energy-average vehicle level" or L_{ave}, is computed from the histogram.

2.2.3 Median vehicle level, L_{50}

The median vehicle level is simply the maximum passby A-weighted sound level that is exceeded by 50 percent of all vehicles. From Fig. 9, the following is derived.

Type of 8- and 6-Cylinder Automobiles	L_{50}, dB at 25 ft
All	67.5
Nondefective/Modified	67
Defective/Modified	72.5

Clearly, though L_{50} of the defective/modified vehicle population is significantly higher than L_{50} of the total vehicle population, the presence or absence of defective/modified vehicles has little effect on total vehicle population L_{50}. In other words, L_{50} of the nondefective/modified vehicle population should be a good baseline site descriptor; it can be used to characterize the general "noisiness" of the nonmodified/defective vehicles at a site. Section 3, Analysis and Results, looks further at the use of nonmodified/defective vehicle L_{50}.

2.2.4 Energy-average vehicle level, L_{ave}

The energy-average vehicle level is the average maximum passby A-weighted sound level that accounts for all sound energy produced by a given vehicle population. If all vehicles in a population were to produce a maximum passby level equal to L_{ave}, rather than their actual passby levels, a roadside observer would still be exposed to the same total sound energy that he/she receives from the actual vehicle population. For example, assume that all 3,936 vehicles of Fig. 3 produce a maximum passby sound level equal to an L_{ave} of 71.2 dB. Assume that these vehicles all accelerate past an observer. Next, assume that all vehicles produce their actual measured maximum passby level and again accelerate past the observer. For both cases, the observer is exposed to the same total sound energy.

How is L_{ave} computed? Appendix B gives a simple computation method that requires only a calculator that adds, subtracts, multiplies, and divides. More directly, the computational formula is:

$$L_{ave} = 10 \log \frac{1}{N}\left[\sum_i n_i \, 10^{L_i/10}\right] ,$$

where

L_i = maximum passby sound level of the ith interval of the histogram,

n_i = number of vehicles with measured maximum passby sound levels in the ith interval,

N = total number of vehicles measured = $\sum_i n_i$.

From Figs. 3, 5 or 6, and 8, the following values are computed:

Type of 8- and 6-Cylinder Automobiles	L_{ave}, dB at 25 ft
All	71.2
Nondefective/Modified	68.6
Defective/Modified	77.7

The defective/modified energy-average vehicle level is approximately 9 dB louder than the nondefective/modified vehicle level, and the total vehicle population energy-average vehicle level will be reduced about 2.5 dB if all defective modified vehicles were eliminated.

The energy-average vehicle level is important because it is related directly to the widely used motor vehicle noise descriptors of hourly equivalent sound level, L_{eq}, and day-night sound level, L_{dn}. All things being equal, a given change in L_{ave} will produce the same change in L_{eq} or L_{dn} for roadside locations exposed to the noise of accelerating vehicles. Thus, if all defective/modified vehicles of Fig. 3 were fixed or eliminated from the vehicle population, L_{eq} or L_{dn} due to these accelerating vehicles should be reduced about 2.5 dB.

3. ANALYSIS AND RESULTS

Section 3 analyzes and draws conclusions from the collected, reduced maximum passby sound level data. Section 3.1 examines the data and draws conclusions about the factors that determine how noisy motor vehicles are. Results of this examination are then used in Sec. 3.2 to develop fully the method for assessing the relative noisiness of a jurisdiction's motor vehicles.*

3.1 Factors Affecting Motor Vehicle Noise

Section 3.1 examines the four factors that influence the noise levels produced by motor vehicles:

- Basic vehicle design
- Defective exhaust systems
- Modified exhaust systems
- Vehicle operation.

Analysis is based on the cumulative distribution, the L_{ave}, and the L_{50} values. By comparing the cumulative distributions, the L_{ave}, and the L_{50} values for different vehicle populations, the relative importance of these factors can be quantified and understood.

3.1.1 Basic vehicle design

Vehicle design can be important not only because it determines how loud a vehicle will be when it is in good, nondefective,

*Appendix C contains all the reduced data used in these analyses. The data were reduced by computer, and the computer output is presented for each of the 11 individual measurement sites.

nonmodified condition, but also because design may determine how readily an exhaust system becomes defective, how difficult repair of the exhaust system is, and how easily an exhaust system can be modified. Though vehicle design and its noise-related effects may not be readily amenable to state/local or even Federal control, the data gathered for this study clearly demonstrate the significance of particular design classes of motor vehicles.

Specifically, the Volkswagen "Beetle," and motorcycles in general, can be separately analyzed. Figure 10 presents the cumulative distributions of vehicles measured along roads with speed limits of 40 mph and 45 mph (at sites B2, E1, K2, S1). The figure shows the distributions for all 8- and 6-cylinder U.S.-manufactured passenger automobiles (includes all automobiles in the V-8, COM, and CAL categories), all Volkswagen Beetles (BUG category), and all motorcycles (M/C category). It also gives the number of vehicles measured, N, and the energy-average vehicle level, L_{ave}, for each distribution. Both the BUG and M/C distributions are shifted 7 dB to 14 dB to the right of (louder than) the 8- and 6-cylinder distribution.

However, the numbers of BUGs and M/Cs are relatively small with respect to the total 8- and 6-cylinder population. BUGs constitute about 6 percent of the combined populations, and motorcycles about 2 percent. What, therefore, is the effect of these two vehicle types on the cumulative distribution of the combined populations? Figure 11 shows the cumulative distributions that result if first the BUGs and then the motorcycles are combined with the 8- and 6-cylinder vehicles. Clearly, the distribution shifts only slightly.

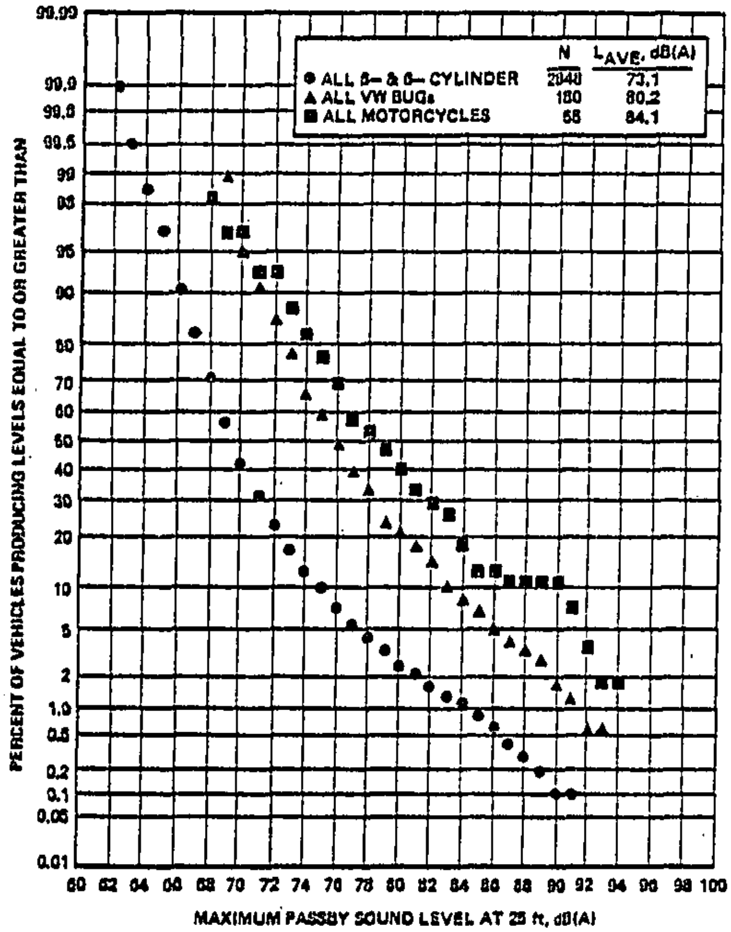

FIG. 10. CUMULATIVE DISTRIBUTIONS FOR ALL 8- AND 6-CYLINDER AUTOMOBILES, ALL VOLKSWAGEN BEETLES, AND ALL MOTORCYCLES, AS MEASURED IN SPEED ZONES OF 40 mph AND 45 mph.

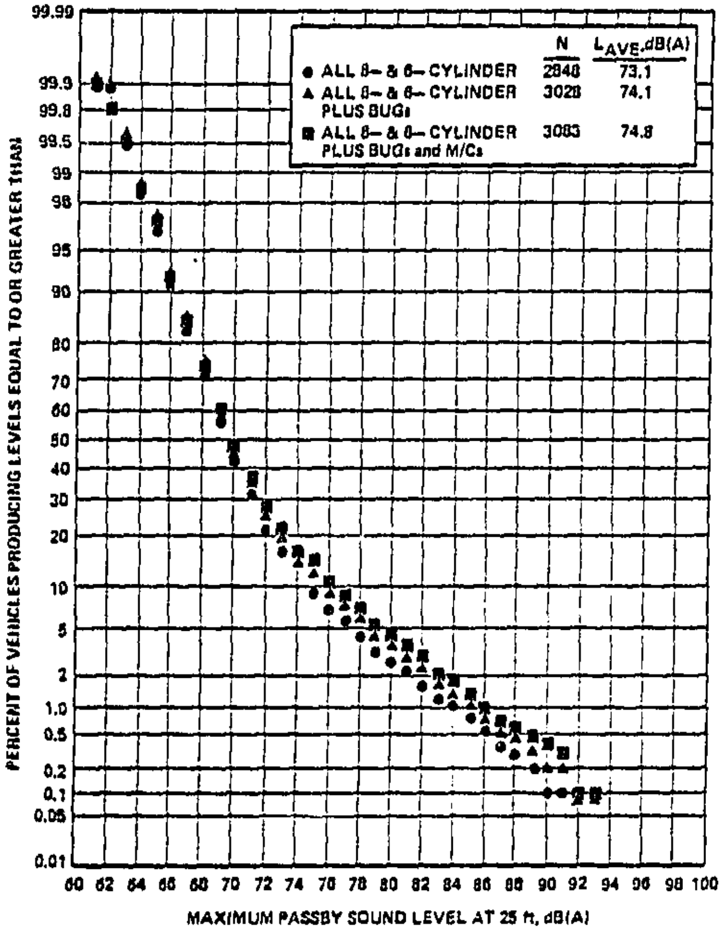

FIG. 11. CUMULATIVE DISTRIBUTIONS FOR ALL 8- AND 6-CYLINDER AUTOMOBILES, ALL 8- AND 6-CYLINDER AUTOMOBILES PLUS BUGs, ALL 8- AND 6-CYLINDER AUTOMOBILES PLUS BUGs AND M/Cs, AS MEASURED IN SPEED ZONES OF 40 mph AND 45 mph.

Does the slight shift of the cumulative distribution suggest that the vehicle categories of BUG and M/C are unimportant? Probably not. Motorcycles are generally recognized as a major contributor to community annoyance. A small shift of the upper tail may thus be significant, and a single, easily identifiable, noisy vehicle class may be, or could become, a significant contributor to community annoyance.

The implication is that from time to time vehicle manufacturers may design and produce a vehicle type that for one reason or another is, or becomes with age, unusually noisy. The data presented here suggest that such vehicle types can occur and that, even if the numbers of these unusual vehicles on the road are relatively small, the effects on community annoyance may be significant.

3.1.2 Defective/modified vehicles

Section 2.2 presented data showing how elimination of vehicles judged to be audibly defective/modified could shift downward the upper tail of the cumulative distribution. Figure 9 presented the cumulative distributions for 8- and 6-cylinder automobiles measured in speed zones of 35 mph or less. Figure 12 presents comparable data for measurements made in speed zones of 40 mph and 45 mph (sites B2, E1, K2, S1). Both Figs. 9 and 12 show how the number of loud vehicles is reduced in the nondefective/modified vehicle population. That is, if all defective/modified vehicles could be eliminated, the number of vehicles exceeding the higher levels would be reduced, and the high level tail of the cumulative distribution would be shifted to the left.

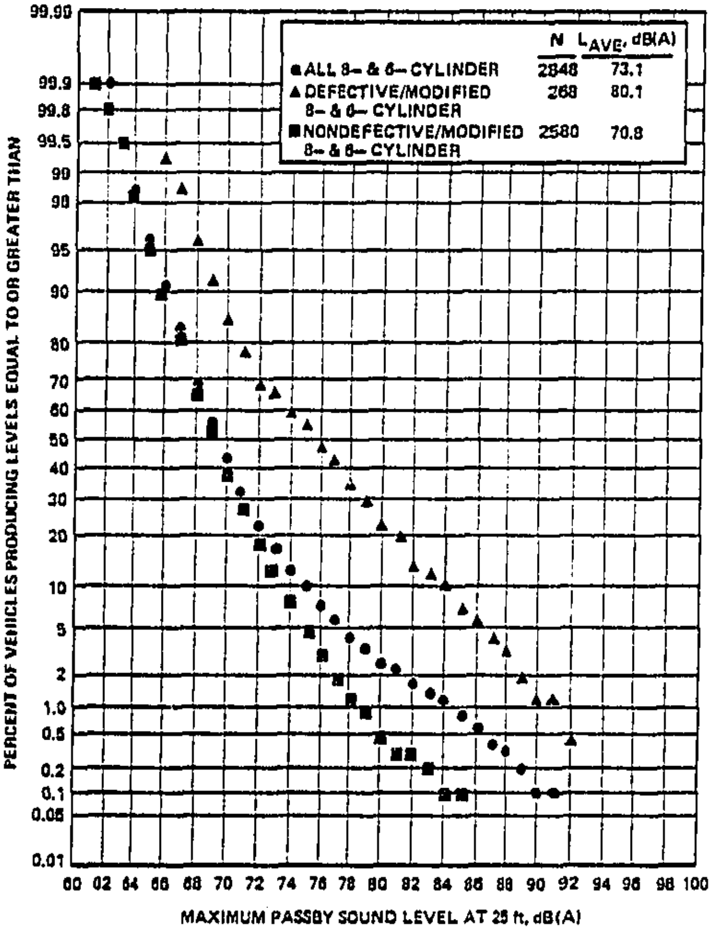

FIG. 12. CUMULATIVE DISTRIBUTIONS COMPARING ALL 8- AND 6-CYLINDER U.S.-MANUFACTURED AUTOMOBILES, 8- AND 6-CYLINDER AUTOMOBILES JUDGED DEFECTIVE/MODIFIED, AND 8- AND 6-CYLINDER AUTOMOBILES JUDGED *NOT* DEFECTIVE/MODIFIED, AS MEASURED IN SPEED ZONES OF 40 mph AND 45 mph.

In addition to shifting the tail of the distribution, defective/modified vehicles affect the energy-average vehicle level, L_{ave}. Values of L_{ave} are given in Fig. 12 for the high-speed site data, and Table 3 repeats these values as well as presenting the low-speed site data L_{ave}. If all defective/modified vehicles could be eliminated, it is apparent that energy-average sound levels would be reduced by 2.5 dB to 3 dB.

Table 3 also shows that the L_{ave} for defective/modified vehicles is 9 dB to 10 dB higher than the L_{ave} for nondefective/modified vehicles. L_{ave} can thus be used in two ways as an indicator of the effects of defective/modified vehicles:

- The difference between L_{ave} for *all* vehicles (see Table 3) and L_{ave} for *nondefective/modified* vehicles is a measure of the benefit to be derived from eliminating all defective/modified vehicles.
- The difference between L_{ave} for *defective/modified* vehicles and for *nondefective/modified* vehicles is a good measure of how loud the defective/modified vehicles are.

3.1.3 Combined effects of vehicle design and defective/modified vehicles

It is now possible to make an observation about the important role played by vehicle design. The previous discussion of vehicle design showed that Volkswagen Beetles and motorcycles increase L_{ave} by 1 dB to 2 dB (see Fig. 1). What, however, are the combined effects of these vehicle design types and the defective/modified vehicles?

TABLE 3. ENERGY-AVERAGE VEHICLE SOUND LEVELS, L_{ave}, BASED ON DATA MEASURED AT 25 ft FROM THE CENTERLINE OF THE LANE OF TRAVEL ALONG HIGH-SPEED AND LOW-SPEED ROADS.

Type of 8- and 6-Cylinder Automobiles	High-Speed Data*		Low-Speed Data†	
	N**	L_{ave}, dB	N**	L_{ave}, dB
All	2,848	73.1	3,936	71.2
Nondefective/Modified	2,580	70.8	3,486	68.6
Defective/Modified	268	80.1	450	77.7

*Data measured along roads having speed limits of 40 mph and 45 mph.

†Data measured along roads having speed limits of 35 mph or less.

**N = total number of 8- and 6-cylinder vehicles measured of the specified type.

The contributions of various types of vehicles are most easily determined by examining the effects the types have on L_{ave}. By beginning with L_{ave} for a combined vehicle population and then eliminating one vehicle type at a time, the relative importance of the types may be demonstrated. Starting with a vehicle population containing all 8- and 6-cylinder automobiles, all Volkswagen Beetles, and all motorcycles (as measured at high-speed sites), the two progressions of Table 4 are computed. In the two center columns, this table shows the values of L_{ave} for the total vehicle population and, moving downward, shows resulting values of L_{ave} as different vehicle types are eliminated from the population. To achieve the full possible 4-dB reduction of L_{ave}, all defective/modified 8- and 6-cylinder automobiles, all Beetles, and all motorcycles have to be eliminated. It is clear that each vehicle type contributes significantly to the total L_{ave}, and that elimination of only one of the noisy types provides less than half of the total possible reduction in decibels.

3.1.4 Vehicle operation

The way an operator accelerates his/her vehicle certainly affects the noise level generated by the vehicle. Even for vehicles with no audibly defective/modified exhaust system, operation must affect noise level. The data gathered in this study suggest that rates of acceleration, as indicated by maximum passby sound level distributions, vary from site to site, with sites in higher speed limit zones tending to have higher (louder) acceleration rates.

Figure 13 compares the cumulative distributions of non-defective/modified 8- and 6-cylinder automobiles as measured

TABLE 4. COMBINED EFFECTS OF VOLKSWAGEN BEETLES, MOTORCYCLES, AND DEFECTIVE/MODIFIED 8- AND 6-CYLINDER AUTOMOBILES ON L_{ave} THAT RESULTS FROM 8- AND 6-CYLINDER AUTOMOBILES. BASED ON DATA MEASURED AT 25 ft FROM CENTERLINE OF LANE OF TRAVEL IN SPEED ZONES OF 40 mph AND 45 mph.

Vehicle Population Mix	Resulting L_{ave}, dB		Vehicle Population Mix
All Vehicles*	74.8	74.8	All Vehicles*
Defective/Modified Eliminated	73.6	74.0	Volkswagen Beetles Eliminated
Volkswagen Beetles Eliminated	72.3	73.1	Motorcycles Eliminated
Motorcycles Eliminated	70.8	70.8	Defective/Modified Eliminated

*Includes all vehicles in V-8, COM, CAL, BUG, and M/C categories measured at sites B2, E1, K2, S1.

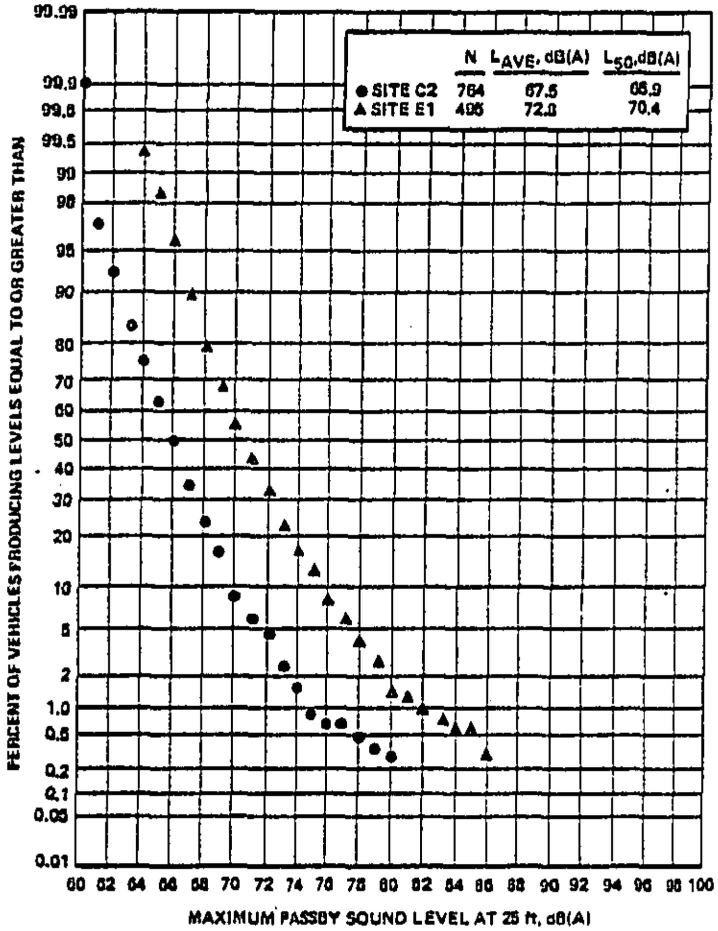

FIG. 13. CUMULATIVE DISTRIBUTIONS COMPARING NONDEFECTIVE/MODIFIED 8- AND 6-CYLINDER AUTOMOBILES, AS MEASURED AT SITE CZ (A 30 mph SITE) AND E1 (A 40 mph SITE).

at Site C2, where the speed limit was 30 mph, and at Site E1, where the speed limit was 40 mph. Since both distributions contain only the nondefective/modified 8- and 6-cylinder automobiles, it seems reasonable to assume that the clear 4-dB to 5-dB difference is attributable to different rates of acceleration. The on-site observations of measurement personnel tend to confirm this assumed difference in acceleration rate.

Figure 13 also gives the values of L_{50} that correspond to the distributions. Values of L_{50}, as mentioned earlier, are affected only slightly by the presence of defective/modified vehicles. In other words, L_{50} does not depend upon an observer's judgment of which vehicles are defective/modified, and which are not. Further, the value of L_{50}, for measurements of several hundred vehicles, is known with a high degree of precision; that is, the estimate of its value is likely to be correct to within approximately 1 dB. Since L_{50} does not depend upon the observer's judgment and does not depend upon which or how many vehicles are defective/modified, it should depend primarily upon the vehicle category measured and on the way those vehicles are operated. For a given category of vehicle, L_{50} should be directly related to how rapidly vehicles are accelerated. Thus, from site to site, for a given vehicle category, L_{50} should be a measure of the rate of acceleration at each site; the larger L_{50} is, the higher the rate of acceleration is.*

*To confirm that vehicle operation (rate of acceleration) plays an important role in determining the maximum passby sound level, a nondefective/modified Chevrolet Caprice was driven through a typical measurement site (like the site pictured schematically in Fig. 2) 13 times at different rates of acceleration. The measured maximum passby A-weighted sound levels covered a 15-dB range, from 64 dB to 79 dB. Acceleration noise thus seems to be a sensitive function of driver operation.

3.2 Assessment of Motor Vehicle Noise

By collecting and reducing data in accordance with the procedures described in Sec. 2, a jurisdiction can use the information provided in this subsection to assess how noisy its motor vehicles are, and whether they are noisy because they are defective/modified or because they are operated at high rates of acceleration. Additionally, jurisdictions will be able to estimate approximately how much benefit can be derived from limiting the numbers of defective/modified vehicles or from controlling vehicle operation.

Generally, a jurisdiction must collect maximum passby sound level data, reduce the data to yield values of L_{50} and L_{ave}, and compare these values with figures provided in this subsection. The following paragraphs describe the procedure step by step.

3.2.1 Collect data

Using the method of Sec. 2.1, collect maximum passby A-weighted sound levels by vehicle category. Use a form similar to that of Appendix A, but not all eight vehicle categories need be used. The assessment method will use only the 8- and 6-cylinder category and the IMP category (see Table 2),* but data should also be collected for the motorcycle, BUG, and MSC categories. Be certain to note whether or not each vehicle is audibly defective/modified.

*Recall that the 8- and 6-cylinder category comprises the V-8, COM, CAL categories described in Table 2.

The reliability of the assessment depends primarily on the number of audibly defective/modified vehicles measured. The number of these vehicles measured depends on the time spent measuring and on the number of audibly defective/modified vehicles that are present in the population. Now, the number present in the population depends upon vehicle categories. There will be many more defective/modified 8- and 6-cylinder vehicles than defective/modified 4-cylinder vehicles (IMP category) simply because there are more 8- and 6-cylinder vehicles on the road. Thus, for a given reliability, a far larger total sample is required for assessment of the 4-cylinder category than is required for assessment of the 8- and 6-cylinder category.

Tables 5 and 6 present percentages that can be used to estimate required total sample size. Table 5 presents, by site and category, the percent judged to be audibly defective/modified. Table 6 shows how the total on-road vehicle population is divided by vehicle category. Table 5 shows that, on average, 10.6 percent of all 8- and 6-cylinder vehicles and 6.2 percent of all 4-cylinder vehicles are judged audibly defective/modified.

If we assume that about 30 to 50 audibly defective/modified vehicles need to be measured, then, to judge the 8- and 6-cylinder vehicles, a total of 400 to 700 vehicles of all categories need to be measured.* To assess similarly the 4-cylinder

*The number of vehicles measured determines the statistical confidence which in turn depends upon the distribution of the data. See the appendix to Chapter 3 of "Fundamentals and Abatement of Highway Traffic Noise," available from the Federal Highway Administration, for a method to determine confidence limits.

TABLE 5. PERCENT AUDIBLY DEFECTIVE/MODIFIED BY VEHICLE CATEGORY, BY SITE.

Measurement Site	Vehicle Category	Percent Audibly Defective/Modified*
B1	8- and 6-cylinder	6.3
	IMP (4-cylinder)	7.7
B2	8- and 6-cylinder	8.7
	IMP (4-cylinder)	4.8
C1	8- and 6-cylinder	17.0
	IMP (4-cylinder)	--
C2	8- and 6-cylinder	13.1
	IMP (4-cylinder)	4.3
E1	8- and 6-cylinder	8.5
	IMP (4-cylinder)	3.9
E2	8- and 6-cylinder	3.7
	IMP (4-cylinder)	8.0
K1	8- and 6-cylinder	8.6
	IMP (4-cylinder)	8.0
K2	8- and 6-cylinder	6.7
	IMP (4-cylinder)	6.3
S1	8- and 6-cylinder	12.1
	IMP (4-cylinder)	5.3
T1	8- and 6-cylinder	13.8
	IMP (4-cylinder)	3.9
T2	8- and 6-cylinder	18.2
	IMP (4-cylinder)	9.8
Average of All Sites	8- and 6-cylinder	10.6
	IMP (4-cylinder)	6.2

*Please note that these percentages do not reflect a need or lack of need for motor vehicle noise control. It is not this percent that determines need, but rather the noise generated by these vehicles. A large percent may be audibly defective/modified, but they may be relatively quiet.

TABLE 6. APPROXIMATE 1978 ON-ROAD VEHICLE POPULATION MIX BY VEHICLE CATEGORY. BASED ON 6,400 VEHICLES MEASURED IN BIRMINGHAM, AL; EUGENE, OR; KANSAS CITY, MO; AND SOUTHERN CALIFORNIA.

Vehicle Category*	Percent of Total Population
8- and 6-cylinder†	71
PNT	5
BUG	4
IMP	16
M/C	1
MSC	3

*Categories described in Table 2.

†Includes Table 2 categories: V-8, COM, CAL.

vehicles, a total of 3,000 to 5,000 vehicles of all categories need to be measured. Stated another way, if every vehicle that passes by the microphone is measured, 400 to 700 vehicles must pass by before 30 to 50 audibly defective/modified 8- and 6-cylinder vehicles are measured; 3,000 to 5,000 vehicles must pass by before 30 to 50 defective/modified 4-cylinder vehicles are measured.

3.2.2 Reduce data

Perform the following steps, first using the data collected for the 8- and 6-cylinder vehicle category, and then using the data collected for the 4-cylinder vehicle category.

A. Construct three histograms:

   1. For all vehicles
   2. For audibly defective/modified vehicles
   3. For audibly nondefective/modified vehicles.

B. Using the histogram constructed in A.3, determine L_{50}. This can be done by plotting a cumulative distribution on the paper provided in Appendix A.

C. Using the histograms of A, above, and the worksheet of Appendix B, compute L_{ave} for each histogram; that is, compute L_{ave} for all vehicles (histogram of A.1), for audibly defective/modified vehicles (histogram of A.2), and for audibly nondefective/modified vehicles (histogram of A.3).

D. Using the Motor Vehicle Noise Assessment Worksheet of Appendix D, write down the values of L_{50} and L_{ave} as indicated, and perform the two subtractions required by lines 2.3 and 3.3 of that worksheet.

E. 8- and 6-Cylinder Vehicles: Plot the values of the Appendix D worksheet on Figs. 14 and 15.

- Figure 14: Plot the point determined by the worksheet values on lines 1 and 2.3.
- Figure 15: Plot the point determined by the worksheet values on lines 1 and 3.3.

F. 4-Cylinder Vehicles: Plot the values of the Appendix D worksheet on Figs. 16 and 17.

- Figure 16: Plot the point determined by the worksheet values on lines 1 and 2.3.
- Figure 17: Plot the point determined by the worksheet values on lines 1 and 3.3.

3.2.3 Assess motor vehicle noise

Each point plotted, using the steps in the preceding subsection, represents motor vehicle noise data gathered at a specific roadside site. These points permit a determination of whether the motor vehicles measured at each site are louder or quieter than the average of all vehicles measured for this study, and the points provide an estimate of why the vehicles measured at each site are loud. The plotted points also show how much benefit can be derived from controlling motor vehicle noise at a specific site and whether this benefit is more or less than average, as compared to the vehicles measured for this study. In other words, the motor vehicles measured for this study provide a baseline estimate of motor vehicle noise, and Figs. 14 through 17 allow any jurisdiction to compare its motor vehicles against this baseline. The following paragraphs tell how to make these comparisons.

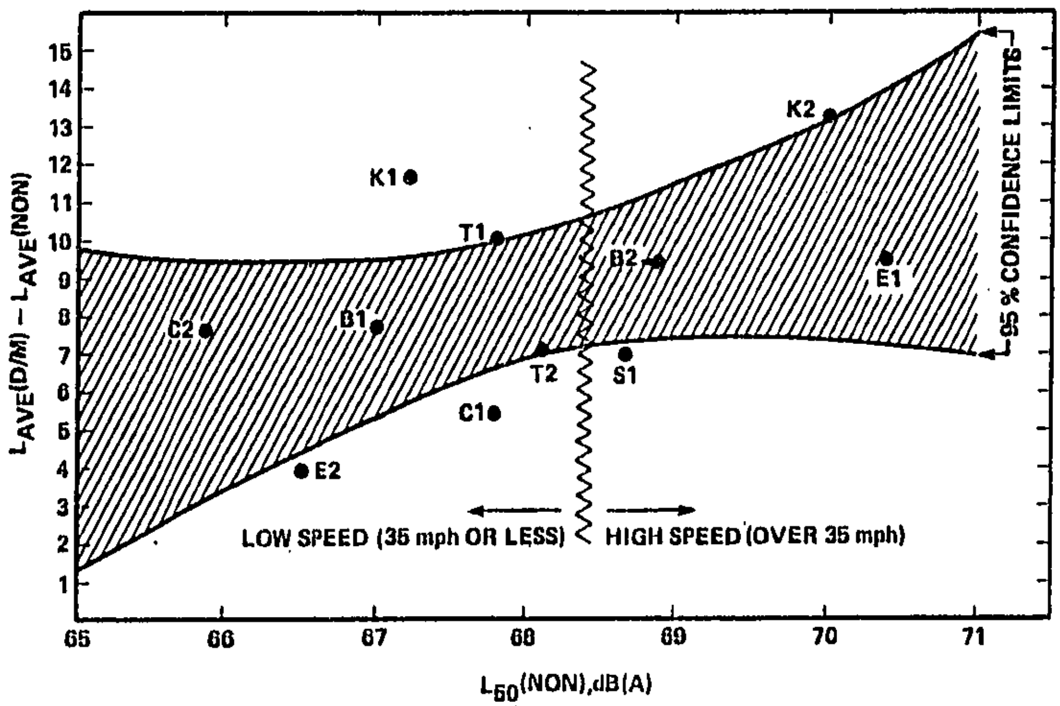

FIG. 14. 8- AND 6-CYLINDER AUTOMOBILES: DIFFERENCE BETWEEN AUDIBLY DEFECTIVE/MODIFIED VEHICLE L_{ave} AND AUDIBLY NONDEFECTIVE/MODIFIED VEHICLE L_{ave}, AS A FUNCTION OF NONDEFECTIVE/MODIFIED VEHICLE L_{50}.

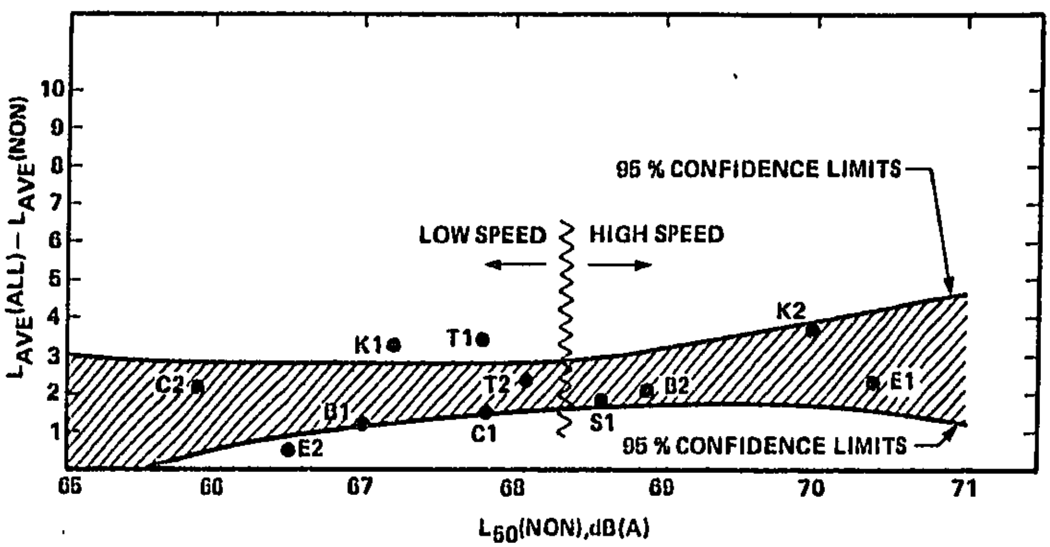

FIG. 15. 8- AND 6-CYLINDER AUTOMOBILES: DIFFERENCE BETWEEN ALL VEHICLE L_{ave} AND AUDIBLY NONDEFECTIVE/MODIFIED VEHICLE L_{ave}, AS A FUNCTION OF THE NONDEFECTIVE/MODIFIED VEHICLE L_{50}.

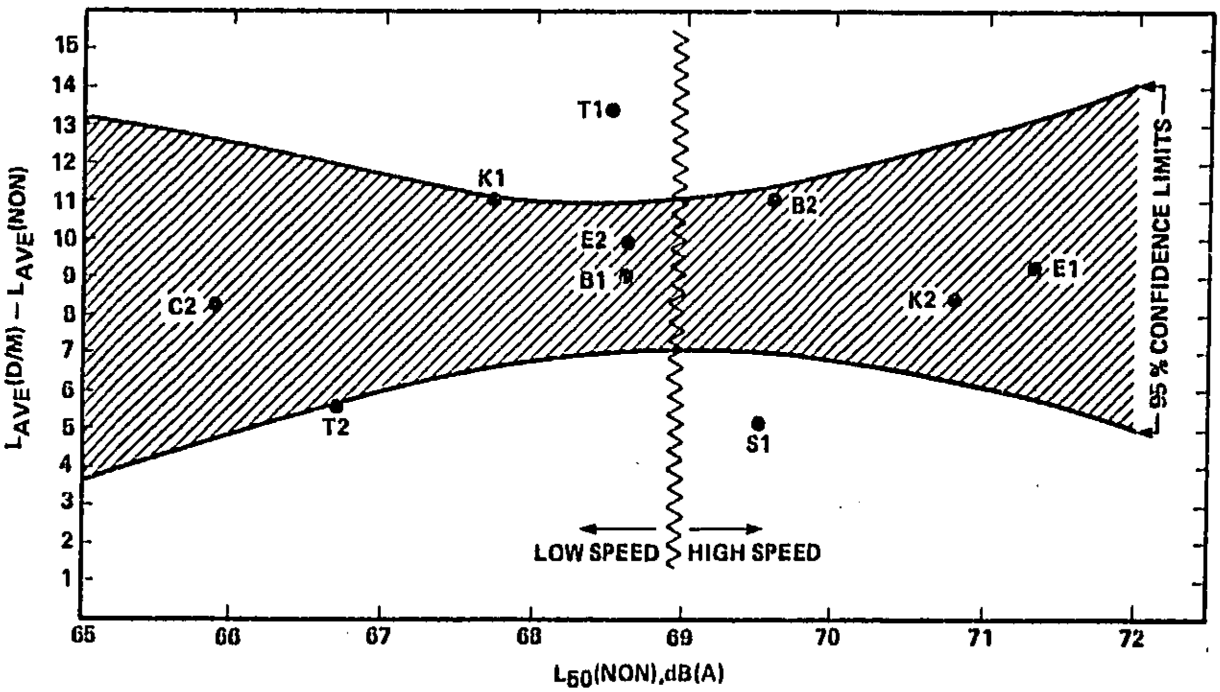

FIG. 16. 4-CYLINDER AUTOMOBILES: DIFFERENCE BETWEEN AUDIBLY DEFECTIVE/MODIFIED VEHICLE L_{ave} AND THE AUDIBLY NONDEFECTIVE/MODIFIED VEHICLE L_{ave}, AS A FUNCTION OF THE NONDEFECTIVE/MODIFIED VEHICLE L_{50}.

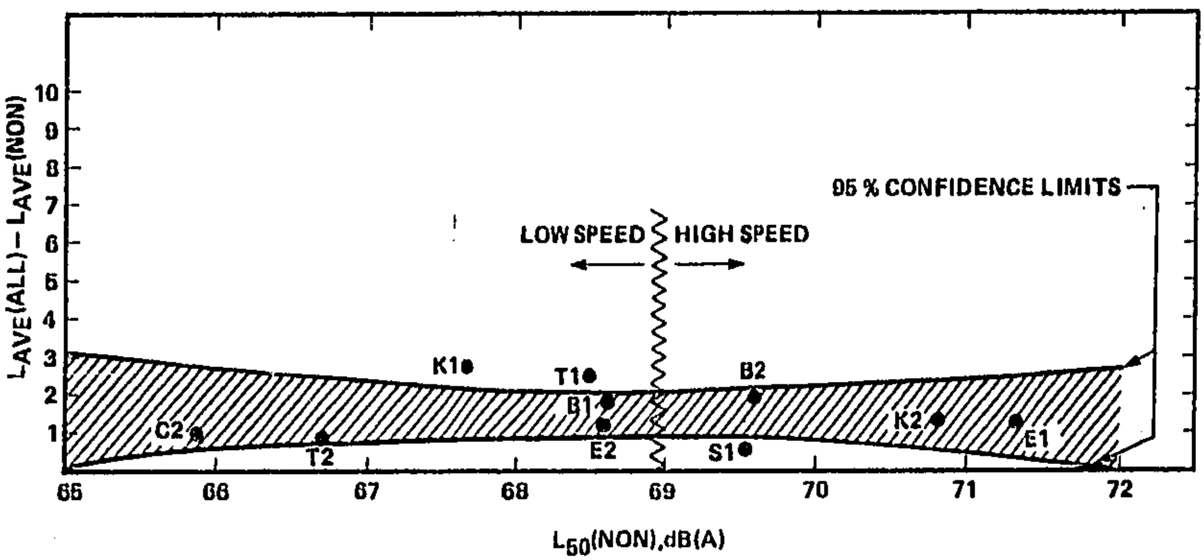

FIG. 17. 4-CYLINDER AUTOMOBILES: DIFFERENCE BETWEEN ALL VEHICLE L_{ave} AND AUDIBLY NONDEFECTIVE/MODIFIED VEHICLE L_{ave}, AS A FUNCTION OF THE NONDEFECTIVE/MODIFIED VEHICLE L_{50}.

Figures 14 and 16

These figures show how much noisier the audibly defective/modified vehicles are than the audibly nondefective/modified vehicles. The higher a plotted point is on the vertical scale, the noisier are the audibly defective/modified vehicles at the site represented by the point.

These figures also show how noisily vehicles accelerate. The farther to the right a plotted point is, the louder is the resulting noise that is due to high acceleration rates at the site.

The shaded area, enclosed by the "95 percent confidence limits" is the region where the plotted points would usually lie. Thus, a plotted point that lies at the top of or above this shaded area implies that audibly defective/modified vehicles at the site are unusually loud and/or unusually numerous. Conversely, plotted points located at the bottom of or below the shaded area imply that audibly defective/modified vehicles at the site are unusually quiet and/or unusually few in number.

The figures show the points that have been computed for each of the measurement sites of this study. (See Table 1 for identification/location of each site.) Thus, in Fig. 14 for example, sites K1, T1, and K2 seem to have unusually loud and/or numerous audibly defective/modified vehicles, and sites E2, C1, T2, and S1 have unusually quiet and/or few audibly defective/modified vehicles.

Figures 14 and 16 also permit judgments of whether or not vehicles at a site are accelerating more rapidly than average.

Vehicles accelerate more rapidly in high-speed zones (40 mph and 45 mph speed limits) than in low-speed zones (speed limits of 35 mph or less). Thus, each figure has a low-speed/high-speed dividing line. The location of this line is determined from the measurement data of this study. Low-speed sites should generally result in points that plot to the left of the line, and high-speed site points will generally plot to the right of the line. If a low-speed site plots close to this line or to the right of it, then the vehicles at this site are accelerating unusually rapidly, and consequently are unusually loud. Conversely, if a high-speed site plots close to this line or to the left of it, then the vehicles at the site are accelerating unusually slowly, and are unusually quiet for a high-speed zone.

Thus, in Fig. 14, vehicles at sites S1 and C2 are accelerating at unusually slow rates for their respective speed zones. On the other hand, vehicles at sites T2 and E1 are accelerating at unusually high rates for their speed zones.

Figures 15 and 17

These figures tell how much benefit can be expected if the number of audibly defective/modified vehicles is reduced. The higher a plotted point is in the vertical direction, the more benefit can be expected. For example, if all audibly defective/modified vehicles could be eliminated at site K2, approximately 3.5-dB to 4-dB reduction of L_{ave} would result. Sites that plot above or below the shaded area can expect higher than average or lower than average reductions, respectively, from elimination of audibly defective/modified vehicles. In Fig. 15, for example, site T1 will benefit more than average, but site E2 will benefit less than average.

Figures 15 and 17 also show how much benefit can be derived by modifying driver behavior, that is, by causing vehicle operators to accelerate less rapidly. The benefit possible depends upon how far to the right the plotted point lies, and upon the speed zones at the site. For high-speed zones, acceleration rates result, on average, in L_{50} (NON) (audibly nondefective/modified L_{50}) of 69 dB to 70 dB. Thus, in Fig. 15 for example, drivers at site E1 tend to accelerate at a somewhat faster rate than usual, and a 0.5-dB to 1.5-dB benefit might reasonably be achieved if drivers could be encouraged to accelerate less rapidly.*

It should be noted that the benefits from elimination of audibly defective/modified vehicles and from modifying driver behavior are additive. For example, at site E1 in Fig. 15, a 2-dB benefit should result from elimination of audibly defective/modified vehicles, and a 1-dB benefit should be produced by modifying driver behavior, for a total expected 3-dB benefit.

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*Note that though this benefit is in terms of reduction in L_{50} for audibly nondefective/modified vehicles, L_{50} (NON), approximately the same benefit in Lave (ALL) would also result. That is, though L_{50} and Lave for any vehicle population certainly are not equal, they vary proportionately: a reduction of 1 dB in L_{50} corresponds to a reduction of approximately 1 dB in Lave.

4. CONTROL OF MOTOR VEHICLE NOISE

Having identified the important factor or factors that contribute to motor vehicle noise at specific sites, and having quantified the benefit that can be achieved by controlling motor vehicle noise, a jurisdiction should be in a better position to develop or refine its motor vehicle noise control program. Section 4 discusses the basic components of motor vehicle noise control programs and attempts to relate these components to the factors (defective/modified exhaust systems, operator behavior) that affect motor vehicle noise.

The concepts expressed here do not offer a quick, easy fix for motor vehicle noise problems. Conversations with many different motor vehicle noise control officials have led to the same conclusions: motor vehicle noise *is* a cause of annoyance for many people; motor vehicle noise control is a complex problem requiring dedicated personnel, innovative approaches, and hard work.

The results of this study do, in fact, reaffirm the notion that motor vehicle noise control is a complex problem. Figures 14 through 17 show that jurisdictions with no real motor vehicle noise control program (B1, B2) can have vehicles that are no noisier than the vehicles of jurisdictions with active programs, and that, even within a single jurisdiction, motor vehicles at different sites can produce widely differing noise levels (E1, E2).

Thus, the following paragraphs are not expected to provide revolutionary new approaches to motor vehicle noise control, but rather to provide or encourage approaches that are logically developed and are based on a jurisdiction's needs and capabilities.

4.1 Site Specific Factors

The analysis method helps a jurisdiction identify needs on a site-by-site basis. Generally, community complaints will also perform this function, but the analysis method will help identify the main factors contributing to the noise problem. Thus the basic noise control program components of public education and enforcement can be targeted for locations with greatest need.

Simply spending a day or two at a site in order to make measurements can provide insight into the problem. Do noisy vehicles seem to pass by at a specific time of day? Are many of the noisy vehicles driven past just after the high school day ends? Do the noisy vehicles pass by mostly during the morning rush hour as people hurry to work?

4.2 Noise Control Program Components

A motor vehicle noise control program has at least two basic components:

- Public education
- Enforcement.

4.2.1 Education

Education of the public can almost always play a useful role. The public needs to be educated about:

- Any motor vehicle noise control laws that they must comply with and the consequences of noncompliance. For noise problems that result from modified vehicles, some jurisdictions have run special workshops at high schools. Use of radio, television, and newspaper coverage helps educate the public at large.

- The costs of not complying with the motor vehicle noise control laws. Often, people drive with a defective exhaust system because having it repaired takes time. Make sure they know that this neglect may result in an even greater loss of their time (and a loss of money?) if they are cited for noncompliance.
- The effects of motor vehicle noise on the community. Make people aware that the noise produced by motor vehicles does affect people. It is useful if actual complaint data can be presented, but avoid depicting the people who complain as chronic complainers. They generally are not. They are simply people who often have their activities disrupted by noise and who, in fact, generally represent (unknowingly) many other people who are annoyed but who do not complain.

4.2.2 Enforcement

It is likely that education will not be very effective unless the public also perceives a threat of enforcement. People must be convinced that there is a chance they will be cited if they drive vehicles with defective/modified exhaust systems, or if they accelerate too fast.

Probably the best method to convince people is by actually enforcing the law and giving citations. Note that it is important for enforcement action to include a final check of compliance. Simply levying a fine is generally not adequate. Courts, appeal boards, or selectmen, etc., seem unwilling to approve adequately high fines for noise offenses. It can be of little use to levy a fine that is less than the cost to repair/replace a defective/modified exhaust system. Offenders may choose to pay such a fine if it means they will not have to submit to a final compliance check.

Enforcement, however, is expensive. To correct a significant number of defective/modified vehicles requires that an enforcement officer spend hours on the street and in the courts. One method that has been used to reduce the hours actually spent on enforcement, while still maintaining the threat of enforcement, is the patrol car-mounted microphone. If people have been educated to know what the microphone looks like, the microphone's constant presence on patrol cars, even when it is not in use, may provide the necessary threat of enforcement.

Modified Exhaust Systems

The importance of the enforcement component probably varies depending upon whether the program objective is to reduce the number of modified vehicles, reduce the number of defective vehicles, or control operator behavior. Once a vehicle has been modified, an enforcement officer will have many opportunities to cite its operator. The vehicle has been modified because the owner wants it that way, and it will probably stay modified until he has been caught. To encourage correction of modified systems, a fairly high chance of being cited is probably necessary.

Defective Exhaust Systems

On the other hand, an owner does not necessarily want to drive a defective vehicle. It becomes defective as it ages, and it will probably be repaired sooner or later depending upon the owner's view of the time and money required for repair. Thus, the objective is generally not to make the owner take an action (repair the exhaust sytem) he does not want to take, but only to encourage him to take the action sooner. For most owners, a fairly small chance of being cited is probably adequate to encourage repair.

Vehicle Operation

Modifying vehicle operator characteristics is likely to be the most difficult factor to address. The offense is temporary, and in order for the operator to be cited, the offense must be observed. Thus, a fairly large amount of enforcement time giving warnings/citations is probably necessary to encourage vehicle operators to accelerate less rapidly.

4.3 Defective/Modified Exhaust Systems *vs* Vehicle Operation

As suggested by Sec. 4.2, motor vehicle noise control program components will vary somewhat depending upon whether the program is targeted primarily at defective/modified exhaust systems or at vehicle operation. Section 4.3 further outlines some of these variations.

4.3.1 Defective exhaust systems

Defective systems can be identified audibly and by visual inspection. For enforcement purposes, an officer can easily pick out, by ear, those vehicles likely to have defective systems. A quick visual inspection will then reveal holes in the muffler, broken exhaust/tail pipes, etc., and (assuming the jurisdiction has the appropriate motor vehicle equipment law) a warning/citation can be written. Thus, for correction of most defective systems, no detailed noise law with quantitative sound level provisions is, in theory, necessary.

In practice, however, sound level provisions may make challenges in court less likely or less successful. An officer may need a specific, objective reason for inspecting a vehicle.

Exceedance of some specified sound level limit can provide the necessary justification. If this justification is needed, however, the cost of enforcement is increased. The increase is caused not only by sound measurement equipment and training costs, but by the need for additional hours of enforcement to achieve a given number of vehicles cited.

4.3.2 Modified exhaust systems

Some types of modifications can be identified audibly and by visual inspection; for example, muffler cutouts or bypasses are easily cited if the law prohibits them. Often, though, modifications can be simply the use of "less effective" mufflers or exhaust systems. For identification of these types of modifications, a quantitative sound level limit and sound measurement procedure are probably necessary.

The owners who modify their vehicles are generally, however, a small percentage of all vehicle owners, and they may be relatively easy to reach through public education. These people are often well aware of the motor vehicle laws, since pursuing their interest in modified vehicles may (and frequently does) put them in conflict with these laws. They often have an interest in modification to the limit of the law. This interest, when combined with the pleasure they derive from working on their vehicles, may make them reachable through motor vehicle noise-testing workshops. A workshop that gives them the opportunity to measure the noise of their own vehicles and to determine whether or not the vehicles are in compliance with the law may attract a significant portion of the modified vehicle owners in a community. They will learn that an objective measuring instrument can pick out violators.

4.3.3 Vehicle operation

Affecting the way people accelerate their vehicles probably requires aggressive public education and enforcement. First, the people who accelerate too rapidly form no easily identifiable group that can be targeted for education. Thus, public education may have to be widespread and dispersed — through television, radio, and newspaper coverage.

Second, enforcement will require some legally justified sound level limit and corresponding roadside measurement procedure. The relationship between the enforced roadside sound level limit and resultant cumulative distribution is not well understood and may have to be developed on a jurisdiction-by-jurisdiction basis.

Finally, vehicle operation will be difficult to modify permanently. Vehicle operators can always be expected to modify their behavior when they drive past a parked patrol car, but when the patrol car is absent, the behavior returns to "normal."

5. RECOMMENDATIONS FOR FURTHER WORK

This report has attempted to provide a basic method for the assessment of motor vehicle noise. In theory, the method is generally applicable. Practically, however, the method is limited because it deals with only the two vehicle types (8- and 6-cylinder vehicles and 4-cylinder vehicles), it is based on measurements at only eleven sites in six jurisdictions, and it depends upon subjective determinations of which vehicles are defective/modified.

To be more useful, the method should account for other vehicle types and the relative numbers of each type. To be more reliable, data for additional sites/jurisdictions need to be included.

The energy-average vehicle level, L_{ave}, could be used to account for and judge the relative importance of each vehicle type. (See, for example, Table 4.) Worksheets could be developed from existing data to permit such judgments.

Figures 14 through 17 show shaded areas surrounded by 95 percent confidence limits. The wide separation of these limits is due to the scatter or the eleven (or ten) data points. These confidence limits can be narrowed, and the reliability of the method increased, if data were gathered from more sites/jurisdictions.

The method of assessment depends primarily on subjective judgments of which vehicles have (audibly) defective/modified exhaust systems and which do not. Though measurement personnel believed such judgments could be made reliably, no real proof can yet be given that such judgments are correct. Are vehicles that sound defective/modified, really defective/modified? How amenable to noise control are such audibly defective/modified vehicles? If they all had new, original equipment exhaust systems installed, would they be noisier than the audibly nondefective/modified vehicles?

Finally, the data gathered here represent the motor vehicle noise levels at a specific time and cannot show changes in noise levels with time. If, for example, Kansas City pursues a program of motor vehicle noise control, returning to sites K1 and to K2 would be useful after the program has been in effect and, perhaps, after various noise control approaches have been tried, to determine if there has been a measurable change in vehicle noise.

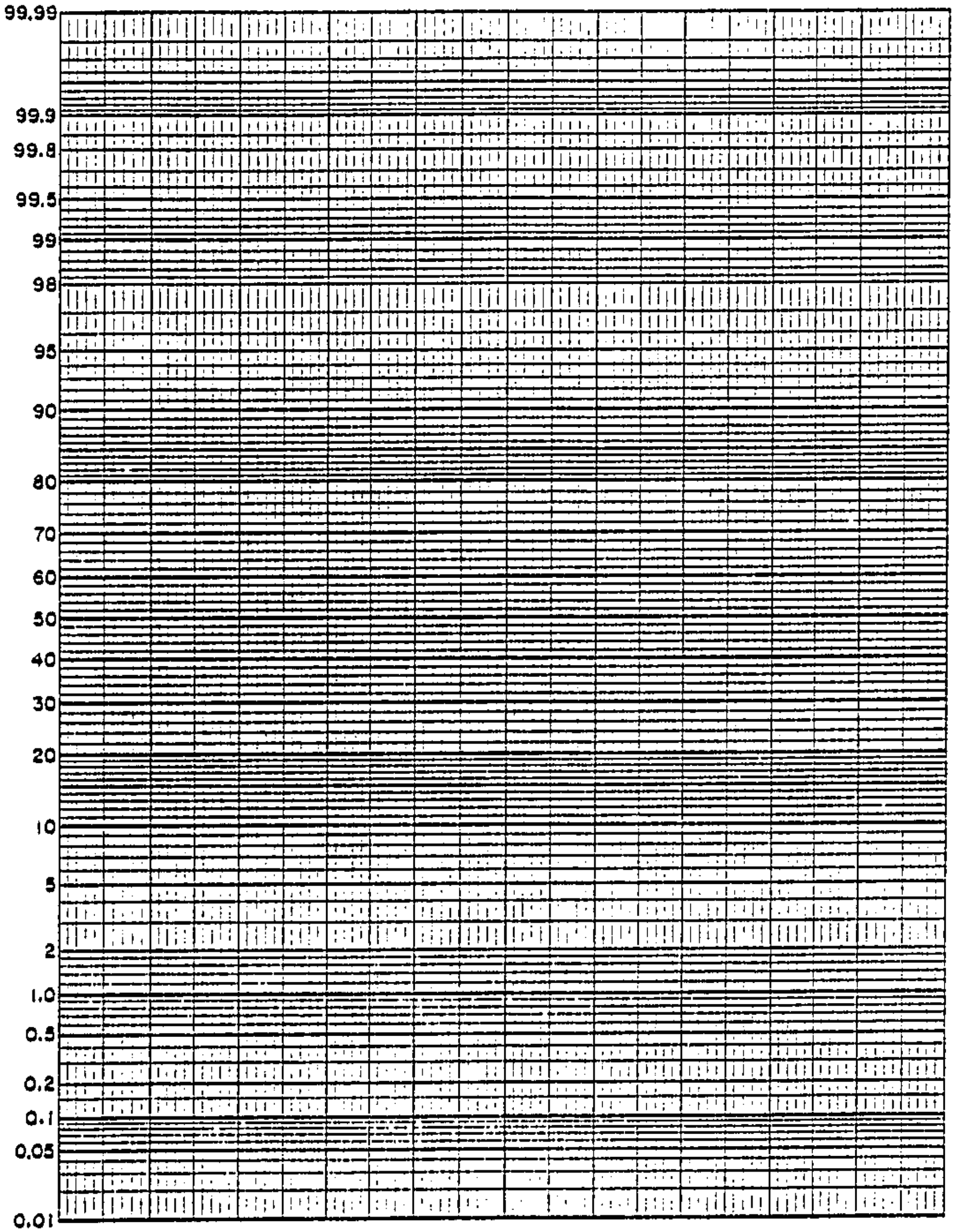
APPENDIX A. DATA COLLECTION FORM GAUSSIAN CUMULATIVE DISTRIBUTION GRAPH PAPER

SHEET NO. ________

Bolt Beranek and Newman Inc. CITY________________ SITE ____________

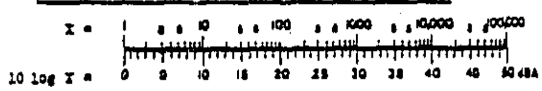
TIME	CATEGORY		DEF/MOD	LANE	ET (sec)	LEVEL (fast)
	V-A COM CAL PNT BUG IMP M/C MSC	WOT	VIS AUD	1 2	___	___
	V-A COM CAL PNT BUG IMP M/C MSC	WOT	VIS AUD	1 2	___	___
	V-A COM CAL PNT BUG IMP M/C MSC	WOT	VIS AUD	1 2	___	___
	V-A COM CAL PNT BUG IMP M/C MSC	WOT	VIS AUD	1 2	___	___
	V-A COM CAL PNT BUG IMP M/C MSC	WOT	VIS AUD	1 2	___	___
	V-A COM CAL PNT BUG IMP M/C MSC	WOT	VIS AUD	1 2	___	___
	V-A COM CAL PNT BUG IMP M/C MSC	WOT	VIS AUD	1 2	___	___
	V-A COM CAL PNT BUG IMP M/C MSC	WOT	VIS AUD	1 2	___	___
	V-A COM CAL PNT BUG IMP M/C MSC	WOT	VIS AUD	1 2	___	___
	V-A COM CAL PNT BUG IMP M/C MSC	WOT	VIS AUD	1 2	___	___
	V-A COM CAL PNT BUG IMP M/C MSC	WOT	VIS AUD	1 2	___	___
	V-A COM CAL PNT BUG IMP M/C MSC	WOT	VIS AUD	1 2	___	___
	V-A COM CAL PNT BUG IMP M/C MSC	WOT	VIS AUD	1 2	___	___
	V-A COM CAL PNT BUG IMP M/C MSC	WOT	VIS AUD	1 2	___	___
	V-A COM CAL PNT BUG IMP M/C MSC	WOT	VIS AUD	1 2	___	___
	V-A COM CAL PNT BUG IMP M/C MSC	WOT	VIS AUD	1 2	___	___
	V-A COM CAL PNT BUG IMP M/C MSC	WOT	VIS AUD	1 2	___	___
	V-A COM CAL PNT BUG IMP M/C MSC	WOT	VIS AUD	1 2	___	___
	V-A COM CAL PNT BUG IMP M/C MSC	WOT	VIS AUD	1 2	___	___
	V-A COM CAL PNT BUG IMP M/C MSC	WOT	VIS AUD	1 2	___	___
	V-A COM CAL PNT BUG IMP M/C MSC	WOT	VIS AUD	1 2	___	___
	V-A COM CAL PNT BUG IMP M/C MSC	WOT	VIS AUD	1 2	___	___
	V-A COM CAL PNT BUG IMP M/C MSC	WOT	VIS AUD	1 2	___	___
	V-A COM CAL PNT BUG IMP M/C MSC	WOT	VIS AUD	1 2	___	___
	V-A COM CAL PNT BUG IMP M/C MSC	WOT	VIS AUD	1 2	___	___

ET CORRESPONDS TO ____________________ FT


99.99
99.9
99.8
99.5
99
98
95
90
80
70
60
50
40
30
20
10
5
2
1.0
0.5
0.2
0.1
0.05
0.01

APPENDIX B. CALCULATION OF ENERGY-AVERAGE VEHICLE LEVEL, L_{ave}.

A Maximum Passby Sound Level	B Number of Vehicles	C Multiply By	D Equals
92-93		1780	
91-92		1410	
90-91		1120	
89-90		891	
88-89		708	
87-88		562	
86-87		447	
85-86		355	
84-85		282	
83-84		224	
82-83		178	
81-82		141	
80-81		112	
79-80		89.1	
78-79		70.8	
77-78		56.2	
76-77		44.7	
75-76		35.5	
74-75		28.2	
73-74		22.4	
72-73		17.8	
71-72		14.1	
70-71		11.2	
69-70		8.91	
68-69		7.08	
67-68		5.62	
66-67		4.47	
65-66		3.55	
64-65		2.82	
63-64		2.24	
62-63		1.78	
61-62		1.41	
60-61		1.12	
TOTALS			



1. Write number of vehicles measured in Column B for each maximum passby sound level interval shown in Column A.
2. Multiply each number of vehicles in Column B by respective values in Column C; write result in Column D.
3. Sum numbers of vehicles, Column B; write total.
4. Sum numbers in Column D; write total.
5. Divide total in Column D by total in Column B; write result, X, below:

X =

6. Convert X to 10 log X, using scale.

10 log X =

7. L_{ave} = 60 + 10 log X

= | dB(A) |

APPENDIX C. COMPUTER-REDUCED DATA

This appendix presents the listings of all computer-reduced maximum passby sound level data, by measurement site. The data are divided by low-speed (speed limits of 35 mph or less) and high-speed sites.

Columns:	(From left to right)
L(A):	Maximum A-weighted passby level as measured at 25 ft from centerline of lane of travel. Note that levels are shown as one-half dB ranges.
All Other Columns:	The remaining columns show percentage of vehicles having a measured maximum A-weighted passby level that falls within or above the level range shown in the first column, L(A). Each column shows these percentages for a different portion of the vehicle population.
8&6 All:	This column gives the percentages for all measured U.S.-manufactured autos with either 8-cylinder or 6-cylinder engines.
8&6 A&B:	Gives percentages for only the 8- and 6-cylinder U.S. autos that were judged to have audibly modified or defective muffler/exhaust systems. (A = *A*udibly modified/defective; B = *B*oth audibly and visually modified/defective.)
8&6 N&V:	Percentages for only the 8- and 6-cylinder U.S. autos that were *not* judged to have audibly modified or defective systems. (N = *N*either audibly nor visually modified/defective; V = *V*isually modified/defective only.)
IMP:	Columns headed with "IMP" give the same information as is given by columns headed with "8&6", but for autos with 4-cylinders (imports) only.
PNT:	Percentages for all Pintos and Vegas measured.
BUG:	Percentages for all Volkswagen "Beetles" and buses.

Rows:	At the bottom of each page are four rows giving the following information.
Sample Size:	Number of vehicles measured for that column.
Mean L(A):	Arithmetic mean A-weighted level for all vehicles measured for that column.
Std. Dev.:	Standard deviation of measured levels about the mean.
LEQ:	Energy-average maximum A-weighted passby level, or L_{ave}.

Low-Speed Sites

BIRMINGHAM,AL SITE 1 30MPH

PERCENTAGE OF VEHICLES WITHIN OR ABOVE A GIVEN SOUND LEVEL INTERVAL

L(A)	3&6 ALL	3&6 A&B	3&6 N&V	IMP ALL	IMP A&B	IMP N	PNT ALL	BUG ALL	END END
99.5- 99.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
99.0- 99.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
98.5- 98.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
98.0- 98.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
97.5- 97.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
97.0- 97.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
96.5- 96.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
96.0- 96.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
95.5- 95.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
95.0- 95.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
94.5- 94.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
94.0- 94.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
93.5- 93.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
93.0- 93.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
92.5- 92.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
92.0- 92.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
91.5- 91.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
91.0- 91.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
90.5- 90.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
90.0- 90.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
89.5- 89.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
89.0- 89.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
88.5- 88.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
88.0- 88.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.9	0.2
87.5- 87.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.9	0.4
87.0- 87.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.9	0.4
86.5- 86.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.9	0.4
86.0- 86.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.9	0.4
85.5- 85.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.9	0.4
85.0- 85.4	0.2	3.8	0.0	0.0	0.0	0.0	0.0	5.9	0.5
84.5- 84.9	0.2	3.8	0.0	0.0	0.0	0.0	0.0	17.6	1.0
84.0- 84.4	0.2	3.8	0.0	0.0	0.0	0.0	0.0	17.6	1.0
83.5- 83.9	0.2	3.8	0.0	0.0	0.0	0.0	0.0	17.6	1.0
83.0- 83.4	0.2	3.8	0.0	0.0	0.0	0.0	0.0	17.6	1.0
82.5- 82.9	0.2	3.8	0.0	0.0	0.0	0.0	0.0	17.6	1.0
82.0- 82.4	0.2	3.8	0.0	0.0	0.0	0.0	0.0	17.6	1.0
81.5- 81.9	0.2	3.8	0.0	0.0	0.0	0.0	0.0	17.6	1.0
81.0- 81.4	0.2	3.8	0.0	0.0	0.0	0.0	0.0	17.6	1.0
80.5- 80.9	0.2	3.8	0.0	0.0	0.0	0.0	0.0	17.6	1.0
80.0- 80.4	0.7	11.5	0.0	2.6	33.3	0.0	0.0	17.6	1.5
79.5- 79.9	1.0	15.4	0.0	2.6	33.3	0.0	0.0	23.5	2.0
79.0- 79.4	1.5	15.4	0.5	5.1	66.7	0.0	0.0	23.5	2.7
78.5- 78.9	1.5	15.4	0.5	5.1	66.7	0.0	0.0	35.3	3.1

78.0-	78.4	1.9	19.2	0.8	5.1	66.7	0.0	0.0	35.3	3.5
77.5-	77.9	1.9	19.2	0.8	5.1	66.7	0.0	0.0	35.3	3.5
77.0-	77.4	1.9	19.2	0.8	5.1	66.7	0.0	7.1	41.2	3.9
76.5-	76.9	2.4	23.1	1.0	5.1	66.7	0.0	7.1	41.2	4.5
76.0-	76.4	3.2	23.1	1.8	5.1	66.7	0.0	7.1	41.2	5.1
75.5-	75.9	3.6	30.8	1.8	5.1	66.7	0.0	7.1	58.8	6.1
75.0-	75.4	3.9	34.6	1.8	5.1	66.7	0.0	7.1	64.7	6.5
74.5-	74.9	4.9	34.6	2.9	5.1	66.7	0.0	7.1	64.7	7.4
74.0-	74.4	5.8	42.3	3.4	7.7	66.7	2.8	7.1	64.7	8.6
73.5-	73.9	6.6	42.3	4.2	10.3	66.7	5.6	7.1	64.7	9.4
73.0-	73.4	7.3	46.2	4.7	10.3	66.7	5.6	7.1	70.6	10.2
72.5-	72.9	9.2	61.5	5.7	12.8	66.7	8.3	7.1	70.6	12.3
72.0-	72.4	9.5	61.5	6.0	12.8	66.7	8.3	21.4	70.6	12.9
71.5-	71.9	12.4	69.2	8.5	17.9	66.7	13.9	21.4	82.4	15.4
71.0-	71.4	15.3	76.9	11.2	17.9	66.7	13.9	21.4	82.4	18.9
70.5-	70.9	17.8	80.8	13.5	23.1	66.7	16.7	28.6	82.4	21.3
70.0-	70.4	20.4	88.5	15.8	25.6	100.0	19.4	28.6	82.4	24.2
69.5-	69.9	24.6	92.3	20.0	30.8	100.0	25.0	35.7	88.2	26.5
69.0-	69.4	28.5	92.3	24.2	35.9	100.0	30.6	42.9	94.1	32.6
68.5-	68.9	33.3	92.3	29.4	56.4	100.0	52.8	42.9	100.0	38.5
68.0-	68.4	37.7	92.3	34.0	61.5	100.0	58.3	42.9	100.0	42.6
67.5-	67.9	46.2	96.2	42.9	64.1	100.0	61.1	50.0	100.0	50.2
67.0-	67.4	53.0	96.2	50.1	65.7	100.0	63.9	78.6	100.0	57.0
66.5-	66.9	59.6	100.0	56.9	71.8	100.0	69.4	78.6	100.0	63.1
66.0-	66.4	65.9	100.0	63.6	79.5	100.0	77.3	78.6	100.0	69.1
65.5-	65.9	72.5	100.0	70.6	89.7	100.0	88.9	78.6	100.0	75.1
65.0-	65.4	77.6	100.0	76.1	89.7	100.0	88.9	92.9	100.0	80.1
64.5-	64.9	83.9	100.0	82.9	92.3	100.0	91.7	100.0	100.0	85.9
64.0-	64.4	87.3	100.0	87.0	92.3	100.0	91.7	100.0	100.0	89.1
63.5-	63.9	90.0	100.0	89.4	94.9	100.0	94.4	100.0	100.0	91.2
63.0-	63.4	94.2	100.0	93.8	94.9	100.0	94.4	100.0	100.0	94.7
62.5-	62.9	97.6	100.0	97.4	94.9	100.0	94.4	100.0	100.0	97.5
62.0-	62.4	98.8	100.0	98.7	100.0	100.0	100.0	100.0	100.0	99.0
61.5-	61.9	99.5	100.0	99.5	100.0	100.0	100.0	100.0	100.0	99.6
61.0-	61.4	99.5	100.0	99.5	100.0	100.0	100.0	100.0	100.0	99.5
60.5-	60.9	99.5	100.0	99.5	100.0	100.0	100.0	100.0	100.0	99.5
60.0-	60.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
59.5-	59.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
59.0-	59.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
58.5-	58.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
58.0-	58.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
57.5-	57.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
57.0-	57.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
56.5-	56.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
56.0-	56.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
55.5-	55.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
55.0-	55.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
SAMPLE SIZE		411	26	385	39	3	36	14	17	461
MEAN L(A)		67.6	73.8	67.2	68.7	76.4	68.1	68.8	76.4	68.1
STD. DEV.		3.5	4.2	3.1	3.6	4.5	2.7	3.3	5.5	4.1
LEQ		69.8	75.4	68.5	70.9	78.1	69.0	70.4	80.1	71.5

BIRMINGHAM,AL SITE 1 30MPH (CONT)

PERCENTAGE OF VEHICLES WITHIN OR ABOVE A GIVEN SOUND LEVEL INTERVAL

L(A)	M/C ALL
99.5- 99.9	0.0
99.0- 99.4	0.0
98.5- 98.9	0.0
98.0- 98.4	0.0
97.5- 97.9	0.0
97.0- 97.4	0.0
96.5- 96.9	0.0
96.0- 96.4	0.0
95.5- 95.9	0.0
95.0- 95.4	0.0
94.5- 94.9	0.0
94.0- 94.4	0.0
93.5- 93.9	0.0
93.0- 93.4	0.0
92.5- 92.9	0.0
92.0- 92.4	0.0
91.5- 91.9	0.0
91.0- 91.4	0.0
90.5- 90.9	0.0
90.0- 90.4	0.0
89.5- 89.9	0.0
89.0- 89.4	0.0
88.5- 88.9	0.0
88.0- 88.4	0.0
87.5- 87.9	25.0
87.0- 87.4	25.0
86.5- 86.9	25.0
86.0- 86.4	25.0
85.5- 85.9	25.0
85.0- 85.4	25.0
84.5- 84.9	25.0
84.0- 84.4	25.0
83.5- 83.9	25.0
83.0- 83.4	25.0
82.5- 82.9	25.0
82.0- 82.4	25.0
81.5- 81.9	25.0
81.0- 81.4	25.0
80.5- 80.9	25.0
80.0- 80.4	25.0
79.5- 79.9	25.0
79.0- 79.4	25.0
78.5- 78.9	25.0

78.0- 78.4	25.0
77.5- 77.9	25.0
77.0- 77.4	25.0
76.5- 76.9	50.0
76.0- 76.4	50.0
75.5- 75.9	50.0
75.0- 75.4	50.0
74.5- 74.9	50.0
74.0- 74.4	75.0
73.5- 73.9	75.0
73.0- 73.4	75.0
72.5- 72.9	100.0
72.0- 72.4	100.0
71.5- 71.9	100.0
71.0- 71.4	100.0
70.5- 70.9	100.0
70.0- 70.4	100.0
69.5- 69.9	100.0
69.0- 69.4	100.0
68.5- 68.9	100.0
68.0- 68.4	100.0
67.5- 67.9	100.0
67.0- 67.4	100.0
66.5- 66.9	100.0
66.0- 66.4	100.0
65.5- 65.9	100.0
65.0- 65.4	100.0
64.5- 64.9	100.0
64.0- 64.4	100.0
63.5- 63.9	100.0
63.0- 63.4	100.0
62.5- 62.9	100.0
62.0- 62.4	100.0
61.5- 61.9	100.0
61.0- 61.4	100.0
60.5- 60.9	100.0
60.0- 60.4	100.0
59.5- 59.9	100.0
59.0- 59.4	100.0
58.5- 58.9	100.0
58.0- 58.4	100.0
57.5- 57.9	100.0
57.0- 57.4	100.0
56.5- 56.9	100.0
56.0- 56.4	100.0
55.5- 55.9	100.0
55.0- 55.4	100.0

SAMPLE SIZE	4
MEAN L(A)	77.3
STD. DEV.	5.8
LEQ	82.2

COLORADO SPRINGS,CO SITE 1 30MPH

PERCENTAGE OF VEHICLES WITHIN OR ABOVE A GIVEN SOUND LEVEL INTERVAL

L(A)	B&D ALL	B&6 A&B	B&6 N&V	IMP ALL	IMP A&B	IMP N&V	PNT ALL	BUG ALL
99.5- 99.9	0.0	0.0	0.0	0.0	******	0.0	0.0	0.0
99.0- 99.4	0.0	0.0	0.0	0.0	******	0.0	0.0	0.0
98.5- 98.9	0.0	0.0	0.0	0.0	******	0.0	0.0	0.0
98.0- 98.4	0.0	0.0	0.0	0.0	******	0.0	0.0	0.0
97.5- 97.9	0.0	0.0	0.0	0.0	******	0.0	0.0	0.0
97.0- 97.4	0.0	0.0	0.0	0.0	******	0.0	0.0	0.0
96.5- 96.9	0.0	0.0	0.0	0.0	******	0.0	0.0	0.0
96.0- 96.4	0.0	0.0	0.0	0.0	******	0.0	0.0	0.0
95.5- 95.9	0.0	0.0	0.0	0.0	******	0.0	0.0	0.0
95.0- 95.4	0.0	0.0	0.0	0.0	******	0.0	0.0	0.0
94.5- 94.9	0.0	0.0	0.0	0.0	******	0.0	0.0	0.0
94.0- 94.4	0.0	0.0	0.0	0.0	******	0.0	0.0	0.0
93.5- 93.9	0.0	0.0	0.0	0.0	******	0.0	0.0	0.0
93.0- 93.4	0.0	0.0	0.0	0.0	******	0.0	0.0	0.0
92.5- 92.9	0.0	0.0	0.0	0.0	******	0.0	0.0	0.0
92.0- 92.4	0.0	0.0	0.0	0.0	******	0.0	0.0	0.0
91.5- 91.9	0.0	0.0	0.0	0.0	******	0.0	0.0	0.0
91.0- 91.4	0.0	0.0	0.0	0.0	******	0.0	0.0	0.0
90.5- 90.9	0.0	0.0	0.0	0.0	******	0.0	0.0	0.0
90.0- 90.4	0.0	0.0	0.0	0.0	******	0.0	0.0	0.0
89.5- 89.9	0.0	0.0	0.0	0.0	******	0.0	0.0	0.0
89.0- 89.4	0.0	0.0	0.0	0.0	******	0.0	0.0	0.0
88.5- 88.9	0.0	0.0	0.0	0.0	******	0.0	0.0	0.0
88.0- 88.4	0.0	0.0	0.0	0.0	******	0.0	0.0	0.0
87.5- 87.9	0.0	0.0	0.0	0.0	******	0.0	0.0	0.0
87.0- 87.4	0.0	0.0	0.0	0.0	******	0.0	0.0	0.0
86.5- 86.9	0.0	0.0	0.0	0.0	******	0.0	0.0	0.0
86.0- 86.4	0.0	0.0	0.0	0.0	******	0.0	0.0	0.0
85.5- 85.9	0.0	0.0	0.0	0.0	******	0.0	0.0	0.0
85.0- 85.4	0.9	0.0	1.1	0.0	******	0.0	0.0	9.1
84.5- 84.9	0.9	0.0	1.1	0.0	******	0.0	0.0	9.1
84.0- 84.4	0.9	0.0	1.1	0.0	******	0.0	0.0	9.1
83.5- 83.9	0.9	0.0	1.1	0.0	******	0.0	0.0	9.1
83.0- 83.4	0.9	0.0	1.1	0.0	******	0.0	0.0	9.1
82.5- 82.9	1.8	5.3	1.1	0.0	******	0.0	0.0	9.1
82.0- 82.4	1.8	5.3	1.1	0.0	******	0.0	0.0	9.1
81.5- 81.9	1.8	5.3	1.1	0.0	******	0.0	0.0	9.1
81.0- 81.4	1.8	5.3	1.1	0.0	******	0.0	0.0	9.1
80.5- 80.9	1.8	5.3	1.1	0.0	******	0.0	0.0	9.1
80.0- 80.4	1.8	5.3	1.1	0.0	******	0.0	0.0	9.1
79.5- 79.9	2.7	10.5	1.1	0.0	******	0.0	0.0	9.1
79.0- 79.4	4.5	21.1	1.1	0.0	******	0.0	0.0	9.1
78.5- 78.9	5.4	26.3	1.1	0.0	******	0.0	0.0	27.3

78.0-	78.4	6.3	26.3	2.2	0.0	******	0.0	0.0	27.3
77.5-	77.9	7.1	26.3	3.2	0.0	******	0.0	0.0	27.3
77.0-	77.4	7.1	26.3	3.2	0.0	******	0.0	0.0	27.3
76.5-	76.9	7.1	26.3	3.2	0.0	******	0.0	0.0	27.3
76.0-	76.4	7.1	26.3	3.2	0.0	******	0.0	0.0	36.4
75.5-	75.9	8.0	31.6	3.2	3.0	******	3.0	0.0	36.4
75.0-	75.4	8.0	31.6	3.2	3.0	******	3.0	0.0	36.4
74.5-	74.9	8.9	31.6	4.3	3.0	******	3.0	0.0	36.4
74.0-	74.4	10.7	42.1	4.3	6.1	******	6.1	0.0	36.4
73.5-	73.9	12.5	47.4	5.4	6.1	******	6.1	0.0	45.5
73.0-	73.4	13.4	47.4	6.5	6.1	******	6.1	0.0	54.5
72.5-	72.9	17.9	63.2	8.6	9.1	******	9.1	0.0	54.5
72.0-	72.4	19.6	63.2	10.8	15.2	******	15.2	0.0	63.6
71.5-	71.9	22.3	68.4	12.9	18.2	******	18.2	16.7	72.7
71.0-	71.4	25.9	78.9	15.1	21.2	******	21.2	16.7	72.7
70.5-	70.9	28.6	78.9	18.3	33.3	******	33.3	33.3	72.7
70.0-	70.4	32.1	78.9	22.6	36.4	******	36.4	33.3	72.7
69.5-	69.9	35.7	89.5	24.7	42.4	******	42.4	33.3	81.8
69.0-	69.4	43.8	89.5	34.4	42.4	******	42.4	33.3	81.8
68.5-	68.9	49.1	94.7	39.3	51.5	******	51.5	33.3	81.8
68.0-	68.4	57.1	94.7	49.5	60.6	******	60.6	33.3	81.8
67.5-	67.9	58.0	94.7	50.5	63.6	******	63.6	50.0	81.8
67.0-	67.4	62.5	100.0	54.8	63.6	******	63.6	50.0	81.8
66.5-	66.9	64.3	100.0	57.0	75.8	******	75.8	66.7	81.8
66.0-	66.4	69.6	100.0	63.4	81.8	******	81.8	66.7	81.8
65.5-	65.9	74.1	100.0	68.8	84.8	******	84.8	83.3	81.8
65.0-	65.4	80.4	100.0	76.3	84.8	******	84.8	83.3	81.8
64.5-	64.9	83.9	100.0	82.6	87.9	******	87.9	100.0	90.9
64.0-	64.4	87.5	100.0	84.9	90.9	******	90.9	100.0	100.0
63.5-	63.9	87.5	100.0	84.9	93.9	******	93.9	100.0	100.0
63.0-	63.4	92.9	100.0	91.4	93.9	******	93.9	100.0	100.0
62.5-	62.9	96.4	100.0	95.7	97.0	******	97.0	100.0	100.0
62.0-	62.4	100.0	100.0	100.0	100.0	******	100.0	100.0	100.0
61.5-	61.9	100.0	100.0	100.0	100.0	******	100.0	100.0	100.0
61.0-	61.4	100.0	100.0	100.0	100.0	******	100.0	100.0	100.0
60.5-	60.9	100.0	100.0	100.0	100.0	******	100.0	100.0	100.0
60.0-	60.4	100.0	100.0	100.0	100.0	******	100.0	100.0	100.0
59.5-	59.9	100.0	100.0	100.0	100.0	******	100.0	100.0	100.0
59.0-	59.4	100.0	100.0	100.0	100.0	******	100.0	100.0	100.0
58.5-	58.9	100.0	100.0	100.0	100.0	******	100.0	100.0	100.0
58.0-	58.4	100.0	100.0	100.0	100.0	******	100.0	100.0	100.0
57.5-	57.9	100.0	100.0	100.0	100.0	******	100.0	100.0	100.0
57.0-	57.4	100.0	100.0	100.0	100.0	******	100.0	100.0	100.0
56.5-	56.9	100.0	100.0	100.0	100.0	******	100.0	100.0	100.0
56.0-	56.4	100.0	100.0	100.0	100.0	******	100.0	100.0	100.0
55.5-	55.9	100.0	100.0	100.0	100.0	******	100.0	100.0	100.0
55.0-	55.4	100.0	100.0	100.0	100.0	******	100.0	100.0	100.0

SAMPLE SIZE	112	19	93	33	0	33	6	11
MEAN L(A)	68.8	71.9	67.7	68.5	******	68.5	67.9	73.5
STD. DEV.	4.5	4.1	3.9	3.2	0.0	3.2	2.6	5.9
LEQ	72.2	75.1	70.7	69.7	382.3	69.7	68.6	77.4

COLORADO SPRINGS,CO SITE 2 30 MPH

PERCENTAGE OF VEHICLES WITHIN OR ABOVE A GIVEN SOUND LEVEL INTERVAL

L(A)	B&BAL	B&B A&B	B&B N&V	IMP ALL	IMP A&B	IMP N&V	PNT ALL	BUG ALL
99.5- 99.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
99.0- 99.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
98.5- 98.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
98.0- 98.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
97.5- 97.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
97.0- 97.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
96.5- 96.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
96.0- 96.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
95.5- 95.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
95.0- 95.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
94.5- 94.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
94.0- 94.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
93.5- 93.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
93.0- 93.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
92.5- 92.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
92.0- 92.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
91.5- 91.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
91.0- 91.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
90.5- 90.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
90.0- 90.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
89.5- 89.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
89.0- 89.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
88.5- 88.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
88.0- 88.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
87.5- 87.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
87.0- 87.4	0.1	0.9	0.0	0.0	0.0	0.0	0.0	0.0
86.5- 86.9	0.2	1.7	0.0	0.0	0.0	0.0	0.0	0.0
86.0- 86.4	0.2	1.7	0.0	0.0	0.0	0.0	0.0	0.0
85.5- 85.9	0.3	2.6	0.0	0.0	0.0	0.0	0.0	2.2
85.0- 85.4	0.3	2.6	0.0	0.0	0.0	0.0	0.0	2.2
84.5- 84.9	0.3	2.6	0.0	0.0	0.0	0.0	0.0	2.2
84.0- 84.4	0.3	2.6	0.0	0.4	9.1	0.0	0.0	4.4
83.5- 83.9	0.3	2.6	0.0	0.4	9.1	0.0	0.0	4.4
83.0- 83.4	0.3	2.6	0.0	0.4	9.1	0.0	0.0	4.4
82.5- 82.9	0.5	3.5	0.0	0.4	9.1	0.0	0.0	4.4
82.0- 82.4	0.6	4.3	0.0	0.4	9.1	0.0	0.0	6.7
81.5- 81.9	0.7	5.2	0.0	0.4	9.1	0.0	0.0	6.7
81.0- 81.4	0.7	5.2	0.0	0.4	9.1	0.0	0.0	6.7
80.5- 80.9	1.0	7.0	0.1	0.4	9.1	0.0	0.0	6.7
80.0- 80.4	1.3	7.9	0.3	0.4	9.1	0.0	0.0	6.7
79.5- 79.9	1.4	7.3	0.4	0.4	9.1	0.0	0.0	6.7
79.0- 79.4	1.5	8.7	0.4	0.4	9.1	0.0	0.0	6.7
78.5- 78.9	1.6	9.6	0.4	0.4	9.1	0.0	0.0	6.7

78.0- 78.4	1.9	11.3	0.5	0.4	9.1	0.0	0.0	6.7
77.5- 77.9	2.0	12.2	0.5	0.4	9.1	0.0	1.2	8.9
77.0- 77.4	2.4	13.9	0.7	0.4	9.1	0.0	1.2	11.1
76.5- 76.9	2.5	14.8	0.7	0.4	9.1	0.0	1.2	11.1
76.0- 76.4	2.7	16.5	0.7	0.4	9.1	0.0	2.4	13.3
75.5- 75.9	2.7	16.5	0.7	0.4	9.1	0.0	2.4	15.6
75.0- 75.4	3.3	19.1	0.9	0.8	9.1	0.4	4.8	20.0
74.5- 74.9	4.0	22.6	1.2	0.8	9.1	0.4	4.8	24.4
74.0- 74.4	4.8	25.2	1.7	1.2	9.1	0.8	7.2	24.4
73.5- 73.9	5.3	27.0	2.1	2.4	9.1	2.0	7.2	31.1
73.0- 73.4	5.6	28.7	2.4	3.1	18.2	2.5	10.8	33.3
72.5- 72.9	7.3	31.3	3.7	4.3	27.3	3.3	10.8	35.6
72.0- 72.4	8.6	34.8	4.7	5.5	45.5	3.7	13.3	35.6
71.5- 71.9	10.0	39.1	5.6	7.1	54.5	4.9	18.1	42.2
71.0- 71.4	11.0	43.5	6.2	8.6	63.6	6.1	24.1	44.4
70.5- 70.9	12.2	46.1	7.1	10.2	63.6	7.8	30.1	48.9
70.0- 70.4	14.1	49.6	8.8	11.8	63.6	9.4	32.5	53.3
69.5- 69.9	17.1	54.8	11.4	13.3	63.6	11.1	33.7	55.6
69.0- 69.4	21.5	60.9	15.6	16.5	63.6	14.3	37.3	60.0
68.5- 68.9	25.5	63.5	19.8	19.6	63.6	17.6	42.2	64.4
68.0- 68.4	29.5	69.6	23.4	24.7	63.6	23.0	43.4	68.9
67.5- 67.9	34.2	75.7	28.0	30.2	63.6	28.7	53.6	73.3
67.0- 67.4	40.2	80.9	34.0	37.3	72.7	35.7	57.8	75.6
66.5- 66.9	46.4	83.5	40.8	43.1	72.7	41.8	62.7	80.0
66.0- 66.4	53.4	84.3	48.7	49.4	72.7	48.4	66.3	80.0
65.5- 65.9	60.5	89.6	56.2	58.4	72.7	57.8	73.5	80.0
65.0- 65.4	67.0	92.2	63.2	65.1	72.7	64.8	83.1	84.4
64.5- 64.9	72.5	93.0	69.4	69.4	72.7	69.3	84.3	91.1
64.0- 64.4	77.8	93.9	75.4	77.3	90.9	76.6	89.2	95.6
63.5- 63.9	82.9	94.8	81.2	82.4	90.9	82.0	89.2	97.8
63.0- 63.4	88.1	96.5	86.8	87.1	90.9	86.9	92.8	97.8
62.5- 62.9	91.0	96.5	90.2	91.4	100.0	91.0	95.2	97.8
62.0- 62.4	93.5	98.3	92.8	94.1	100.0	93.9	95.2	97.8
61.5- 61.9	95.2	99.1	94.6	96.5	100.0	96.3	96.4	97.8
61.0- 61.4	97.4	99.1	97.1	98.4	100.0	98.4	96.4	100.0
60.5- 60.9	98.9	99.1	98.8	99.2	100.0	99.2	97.6	100.0
60.0- 60.4	99.9	100.0	99.9	100.0	100.0	100.0	100.0	100.0
59.5- 59.9	99.9	100.0	99.9	100.0	100.0	100.0	100.0	100.0
59.0- 59.4	99.9	100.0	99.9	100.0	100.0	100.0	100.0	100.0
58.5- 58.9	99.9	100.0	99.9	100.0	100.0	100.0	100.0	100.0
58.0- 58.4	99.9	100.0	99.9	100.0	100.0	100.0	100.0	100.0
57.5- 57.9	99.9	100.0	99.9	100.0	100.0	100.0	100.0	100.0
57.0- 57.4	99.9	100.0	99.9	100.0	100.0	100.0	100.0	100.0
56.5- 56.9	99.9	100.0	99.9	100.0	100.0	100.0	100.0	100.0
56.0- 56.4	99.9	100.0	99.9	100.0	100.0	100.0	100.0	100.0
55.5- 55.9	99.9	100.0	99.9	100.0	100.0	100.0	100.0	100.0
55.0- 55.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
SAMPLE SIZE	679	115	764	255	11	244	83	45
MEAN L(A)	66.7	71.0	65.1	65.3	70.5	66.1	68.0	70.9
STD. DEV.	3.8	5.3	3.1	3.2	5.7	2.9	3.7	5.4
LEQ	69.7	75.2	67.5	68.1	75.2	67.1	69.6	75.1

COLORADO SPRINGS,CO SITE 2 30MPH (CONT)

PERCENTAGE OF VEHICLES WITHIN OR ABOVE A GIVEN SOUND LEVEL INTERVAL

L(A)	M/C ALL
99.5- 99.9	0.0
99.0- 99.4	0.0
98.5- 98.9	0.0
98.0- 98.4	0.0
97.5- 97.9	0.0
97.0- 97.4	0.0
96.5- 96.9	0.0
96.0- 96.4	0.0
95.5- 95.9	0.0
95.0- 95.4	0.0
94.5- 94.9	0.0
94.0- 94.4	0.0
93.5- 93.9	0.0
93.0- 93.4	0.0
92.5- 92.9	0.0
92.0- 92.4	0.0
91.5- 91.9	0.0
91.0- 91.4	0.0
90.5- 90.9	0.0
90.0- 90.4	0.0
89.5- 89.9	0.0
89.0- 89.4	0.0
88.5- 88.9	0.0
88.0- 88.4	0.0
87.5- 87.9	0.0
87.0- 87.4	0.0
86.5- 86.9	0.0
86.0- 86.4	0.0
85.5- 85.9	0.0
85.0- 85.4	0.0
84.5- 84.9	0.0
84.0- 84.4	0.0
83.5- 83.9	0.0
83.0- 83.4	0.0
82.5- 82.9	0.0
82.0- 82.4	0.0
81.5- 81.9	0.0
81.0- 81.4	0.0
80.5- 80.9	0.0
80.0- 80.4	0.0
79.5- 79.9	0.0
79.0- 79.4	0.0
78.5- 78.9	50.0

78.0- 78.4	50.0
77.5- 77.9	50.0
77.0- 77.4	50.0
76.5- 76.9	50.0
76.0- 76.4	50.0
75.5- 75.9	50.0
75.0- 75.4	50.0
74.5- 74.9	50.0
74.0- 74.4	50.0
73.5- 73.9	50.0
73.0- 73.4	50.0
72.5- 72.9	50.0
72.0- 72.4	50.0
71.5- 71.9	50.0
71.0- 71.4	50.0
70.5- 70.9	50.0
70.0- 70.4	50.0
69.5- 69.9	50.0
69.0- 69.4	100.0
68.5- 68.9	100.0
68.0- 68.4	100.0
67.5- 67.9	100.0
67.0- 67.4	100.0
66.5- 66.9	100.0
66.0- 66.4	100.0
65.5- 65.9	100.0
65.0- 65.4	100.0
64.5- 64.9	100.0
64.0- 64.4	100.0
63.5- 63.9	100.0
63.0- 63.4	100.0
62.5- 62.9	100.0
62.0- 62.4	100.0
61.5- 61.9	100.0
61.0- 61.4	100.0
60.5- 60.9	100.0
60.0- 60.4	100.0
59.5- 59.9	100.0
59.0- 59.4	100.0
58.5- 58.9	100.0
58.0- 58.4	100.0
57.5- 57.9	100.0
57.0- 57.4	100.0
56.5- 56.9	100.0
56.0- 56.4	100.0
55.5- 55.9	100.0
55.0- 55.4	100.0
SAMPLE SIZE	2
MEAN L(A)	73.9
STD. DEV.	4.6
LEQ	75.0

EUGENE,OR SITES 2/4
25 MPH

PERCENTAGE OF VEHICLES WITHIN OR ABOVE A GIVEN SOUND LEVEL INTERVAL

L(A)	3&6 ALL	3&6 A&B	3&6 N&V	IMP ALL	IMP A&B		IMP N&V	PNT ALL	BUG ALL
99.5- 99.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
99.0- 99.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
98.5- 98.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
98.0- 98.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
97.5- 97.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
97.0- 97.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
96.5- 96.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
96.0- 96.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
95.5- 95.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
95.0- 95.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
94.5- 94.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
94.0- 94.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
93.5- 93.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
93.0- 93.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
92.5- 92.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
92.0- 92.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
91.5- 91.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
91.0- 91.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
90.5- 90.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
90.0- 90.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
89.5- 89.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
89.0- 89.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
88.5- 88.9	0.0	0.0	0.0	0.5	14.3	0.5	0.0	0.0	0.0
88.0- 88.4	0.0	0.0	0.0	0.5	14.3	0.5	0.0	0.0	0.0
87.5- 87.9	0.0	0.0	0.0	0.5	14.3	0.5	0.0	0.0	0.0
87.0- 87.4	0.0	0.0	0.0	0.5	14.3	0.5	0.0	0.0	3.6
86.5- 86.9	0.0	0.0	0.0	0.5	14.3	0.5	0.0	0.0	3.6
86.0- 86.4	0.0	0.0	0.0	0.5	14.3	0.5	0.0	0.0	3.5
85.5- 85.9	0.0	0.0	0.0	1.1	14.3	1.1	0.6	0.0	3.6
85.0- 85.4	0.0	0.0	0.0	1.1	14.3	1.1	0.6	0.0	3.5
84.5- 84.9	0.0	0.0	0.0	1.1	14.3	1.1	0.6	0.0	3.5
84.0- 84.4	0.0	0.0	0.0	1.1	14.3	1.1	0.6	0.0	3.5
83.5- 83.9	0.0	0.0	0.0	1.1	14.3	1.1	0.6	0.0	7.1
83.0- 83.4	0.3	0.0	0.3	1.1	14.3	1.1	0.6	0.0	7.1
82.5- 82.9	0.3	0.0	0.3	1.1	14.3	1.1	0.6	0.0	10.7
82.0- 82.4	0.3	0.0	0.3	1.1	14.3	1.1	0.6	0.0	10.7
81.5- 81.9	0.3	0.0	0.3	1.1	14.3	1.1	0.6	0.0	14.3
81.0- 81.4	0.3	0.0	0.3	1.6	14.3	1.6	1.1	0.0	14.3
80.5- 80.9	0.3	0.0	0.3	2.1	14.3	2.1	1.7	0.0	14.3
80.0- 80.4	0.3	0.0	0.3	2.7	14.3	2.7	2.2	0.0	17.9
79.5- 79.9	0.3	0.0	0.3	3.2	14.3	3.2	2.8	0.0	21.4
79.0- 79.4	0.6	3.4	0.3	3.2	14.3	3.2	2.8	0.0	21.4
78.5- 78.9	0.6	3.4	0.3	3.7	28.6	3.7	2.8	0.0	25.[illegible]

78.0- 78.4	0.6	3.4	0.3	4.8	42.9	4.8	3.3	0.0	25.[illegible]
77.5- 77.9	1.4	3.4	1.2	4.8	42.9	4.8	3.3	0.0	25.[illegible]
77.0- 77.4	1.7	3.4	1.5	5.3	42.9	5.3	3.9	0.0	25.[illegible]
76.5- 76.9	1.7	3.4	1.5	5.9	42.9	5.9	4.4	0.0	39.3
76.0- 76.4	1.9	6.9	1.5	6.4	57.1	6.4	4.4	0.0	39.3
75.5- 75.9	2.8	13.8	1.8	7.4	57.1	7.4	5.5	0.0	42.[illegible]
75.0- 75.4	3.3	17.2	2.1	7.4	57.1	7.4	5.5	3.1	46.4
74.5- 74.9	3.3	17.2	2.1	8.0	57.1	8.0	6.1	3.1	46.4
74.0- 74.4	4.1	24.1	2.4	9.0	57.1	9.0	7.2	3.1	57.1
73.5- 73.9	5.5	31.0	3.3	10.6	57.1	10.6	8.8	9.4	64.3
73.0- 73.4	6.1	34.5	3.6	13.3	71.4	13.3	11.0	15.6	64.3
72.5- 72.9	6.6	37.9	3.9	17.0	71.4	17.0	14.9	18.8	7[illegible]
72.0- 72.4	8.3	37.9	5.7	19.7	85.7	19.7	17.1	21.9	82.1
71.5- 71.9	10.8	41.4	8.1	22.3	85.7	22.3	19.9	28.1	82.1
71.0- 71.4	11.9	44.8	9.0	26.6	85.7	26.6	24.3	37.5	[illegible]
70.5- 70.9	14.6	51.7	11.4	30.9	85.7	30.9	28.7	46.9	85.7
70.0- 70.4	16.9	55.2	13.5	35.6	85.7	35.6	33.7	46.9	89.3
69.5- 69.9	19.6	58.6	16.2	40.4	85.7	40.4	38.7	46.9	89.3
69.0- 69.4	23.2	62.1	19.8	46.3	100.0	46.3	44.2	53.1	89.3
68.5- 68.9	27.6	75.9	23.4	53.7	100.0	53.7	51.9	53.1	89.3
68.0- 68.4	32.6	79.3	28.5	58.5	100.0	58.5	56.9	62.5	89.3
67.5- 67.9	39.5	82.8	35.7	67.6	100.0	67.6	66.3	68.8	92.[illegible]
67.0- 67.4	47.0	82.8	43.8	75.0	100.0	75.0	74.0	71.9	92.[illegible]
66.5- 66.9	53.0	86.2	50.2	79.8	100.0	79.8	79.0	71.9	92.[illegible]
66.0- 66.4	61.3	89.7	58.0	83.5	100.0	83.5	82.9	71.9	96.[illegible]
65.5- 65.9	67.4	93.1	65.2	87.2	100.0	87.2	86.7	84.4	100.[illegible]
65.0- 65.4	74.0	100.0	71.8	90.4	100.0	90.4	90.1	87.5	100.[illegible]
64.5- 64.9	80.4	100.0	78.7	92.0	100.0	92.0	91.7	93.3	100.[illegible]
64.0- 64.4	85.6	100.0	84.4	92.5	100.0	92.6	92.3	96.9	100.[illegible]
63.5- 63.9	89.8	100.0	88.9	93.6	100.0	93.6	93.4	96.9	100.[illegible]
63.0- 63.4	93.6	100.0	93.1	96.3	100.0	96.3	96.1	96.9	100.[illegible]
62.5- 62.9	96.1	100.0	95.8	97.3	100.0	97.3	97.2	100.0	100.[illegible]
62.0- 62.4	97.8	100.0	97.6	98.9	100.0	98.9	98.9	100.0	100.[illegible]
61.5- 61.9	98.3	100.0	98.2	98.9	100.0	98.9	98.9	100.0	100.[illegible]
61.0- 61.4	98.6	100.0	98.5	99.5	100.0	99.5	99.4	100.0	100.[illegible]
60.5- 60.9	99.4	100.0	99.4	99.5	100.0	99.5	99.4	100.0	100.[illegible]
60.0- 60.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.[illegible]
59.5- 59.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.[illegible]
59.0- 59.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.[illegible]
58.5- 58.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.[illegible]
58.0- 58.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.[illegible]
57.5- 57.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.[illegible]
57.0- 57.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.[illegible]
56.5- 56.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.[illegible]
56.0- 56.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.[illegible]
55.5- 55.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.[illegible]
55.0- 55.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.[illegible]
SAMPLE SIZE	362	29	333	188	7	188	181	32	[illegible]
MEAN L(A)	67.1	70.9	66.8	69.3	76.6	69.3	69.0	69.2	75.[illegible]
STD. DEV.	3.3	3.6	3.1	4.1	5.8	4.1	3.3	3.3	5.[illegible]
LEQ	68.9	72.4	68.4	72.6	81.3	72.5	71.4	70.4	78.[illegible]

EUGENE,OR SITES 2/4 25 MPH (CONT)

PERCENTAGE OF VEHICLES WITHIN OR ABOVE A GIVEN SOUND LEVEL INTERVAL

L(A)	M/C ALL
99.5- 99.9	0.0
99.0- 99.4	0.0
98.5- 98.9	0.0
98.0- 98.4	0.0
97.5- 97.9	0.0
97.0- 97.4	0.0
96.5- 96.9	0.0
96.0- 96.4	0.0
95.5- 95.9	0.0
95.0- 95.4	12.5
94.5- 94.9	12.5
94.0- 94.4	12.5
93.5- 93.9	12.5
93.0- 93.4	12.5
92.5- 92.9	12.5
92.0- 92.4	12.5
91.5- 91.9	12.5
91.0- 91.4	12.5
90.5- 90.9	12.5
90.0- 90.4	12.5
89.5- 89.9	12.5
89.0- 89.4	12.5
88.5- 88.9	12.5
88.0- 88.4	12.5
87.5- 87.9	12.5
87.0- 87.4	12.5
86.5- 86.9	12.5
86.0- 86.4	12.5
85.5- 85.9	12.5
85.0- 85.4	12.5
84.5- 84.9	12.5
84.0- 84.4	12.5
83.5- 83.9	12.5
83.0- 83.4	12.5
82.5- 82.9	12.5
82.0- 82.4	12.5
81.5- 81.9	12.5
81.0- 81.4	12.5
80.5- 80.9	12.5
80.0- 80.4	12.5
79.5- 79.9	12.5
79.0- 79.4	25.0
78.5- 78.9	25.0

78.0- 78.4	25.0
77.5- 77.9	25.0
77.0- 77.4	25.0
76.5- 76.9	25.0
76.0- 76.4	25.0
75.5- 75.9	25.0
75.0- 75.4	50.0
74.5- 74.9	50.0
74.0- 74.4	62.5
73.5- 73.9	87.5
73.0- 73.4	87.5
72.5- 72.9	87.5
72.0- 72.4	87.5
71.5- 71.9	87.5
71.0- 71.4	87.5
70.5- 70.9	87.5
70.0- 70.4	100.0
69.5- 69.9	100.0
69.0- 69.4	100.0
68.5- 68.9	100.0
68.0- 68.4	100.0
67.5- 67.9	100.0
67.0- 67.4	100.0
66.5- 66.9	100.0
66.0- 66.4	100.0
65.5- 65.9	100.0
65.0- 65.4	100.0
64.5- 64.9	100.0
64.0- 64.4	100.0
63.5- 63.9	100.0
63.0- 63.4	100.0
62.5- 62.9	100.0
62.0- 62.4	100.0
61.5- 61.9	100.0
61.0- 61.4	100.0
60.5- 60.9	100.0
60.0- 60.4	100.0
59.5- 59.9	100.0
59.0- 59.4	100.0
58.5- 58.9	100.0
58.0- 58.4	100.0
57.5- 57.9	100.0
57.0- 57.4	100.0
56.5- 56.9	100.0
56.0- 56.4	100.0
55.5- 55.9	100.0
55.0- 55.4	100.0

SAMPLE SIZE	8
MEAN L(A)	77.0
STD. DEV.	7.2
LEQ	85.3

KANSAS CITY, MO SITE 1 25 MPH

PERCENTAGE OF VEHICLES WITHIN OR ABOVE A GIVEN SOUND LEVEL INTERVAL

L(A)	8&6 ALL	8&6 A&B	8&6 N&V	IMP ALL	IMP A&B	IMP N&V	PNT ALL	BUG ALL
99.5- 99.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
99.0- 99.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
98.5- 98.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
98.0- 98.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
97.5- 97.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
97.0- 97.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
96.5- 96.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
96.0- 96.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
95.5- 95.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
95.0- 95.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
94.5- 94.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
94.0- 94.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
93.5- 93.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
93.0- 93.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
92.5- 92.9	0.1	1.2	0.0	0.0	0.0	0.0	0.0	0.0
92.0- 92.4	0.1	1.2	0.0	0.0	0.0	0.0	0.0	0.0
91.5- 91.9	0.1	1.2	0.0	0.0	0.0	0.0	0.0	0.0
91.0- 91.4	0.2	2.4	0.0	0.0	0.0	0.0	0.0	0.0
90.5- 90.9	0.2	2.4	0.0	0.0	0.0	0.0	0.0	0.0
90.0- 90.4	0.2	2.4	0.0	0.0	0.0	0.0	0.0	0.0
89.5- 89.9	0.2	2.4	0.0	0.0	0.0	0.0	0.0	0.0
89.0- 89.4	0.2	2.4	0.0	0.0	0.0	0.0	0.0	0.0
88.5- 88.9	0.2	2.4	0.0	0.0	0.0	0.0	0.0	2.9
88.0- 88.4	0.2	2.4	0.0	0.0	0.0	0.0	0.0	2.9
87.5- 87.9	0.3	3.7	0.0	0.0	0.0	0.0	0.0	2.9
87.0- 87.4	0.3	3.7	0.0	0.0	0.0	0.0	0.0	5.7
86.5- 86.9	0.3	3.7	0.0	1.1	14.3	0.0	0.0	5.7
86.0- 86.4	0.3	3.7	0.0	1.1	14.3	0.0	0.0	5.7
85.5- 85.9	0.4	4.9	0.0	1.1	14.3	0.0	0.0	5.7
85.0- 85.4	0.5	6.1	0.0	1.1	14.3	0.0	0.0	5.7
84.5- 84.9	0.8	8.5	0.1	1.1	14.3	0.0	1.8	5.7
84.0- 84.4	0.9	9.8	0.1	1.1	14.3	0.0	1.8	5.7
83.5- 83.9	1.4	14.6	0.1	1.1	14.3	0.0	1.8	5.7
83.0- 83.4	1.4	14.6	0.1	1.1	14.3	0.0	1.8	5.7
82.5- 82.9	1.4	14.6	0.1	1.1	14.3	0.0	1.8	5.7
82.0- 82.4	1.5	15.9	0.1	1.1	14.3	0.0	1.8	5.7
81.5- 81.9	1.8	19.5	0.1	1.1	14.3	0.0	1.8	5.7
81.0- 81.4	2.0	19.5	0.3	3.4	28.6	1.3	1.8	8.6
80.5- 80.9	2.2	22.0	0.3	3.4	28.6	1.3	1.8	8.6
80.0- 80.4	2.3	23.2	0.3	4.6	42.9	1.3	1.8	11.4
79.5- 79.9	2.7	28.0	0.3	4.6	42.9	1.3	1.8	11.4
79.0- 79.4	2.7	28.0	0.3	4.6	42.9	1.3	1.8	11.4
78.5- 78.9	2.9	30.5	0.3	5.7	57.1	1.3	1.8	11.4

78.0- 78.4	3.3	32.9	0.5	5.7	57.1	1.3	1.8	14.3
77.5- 77.9	3.8	37.8	0.6	5.7	57.1	1.3	1.8	14.3
77.0- 77.4	4.2	37.8	1.0	6.9	57.1	2.5	1.8	17.1
76.5- 76.9	4.6	40.2	1.3	6.9	57.1	2.5	1.8	17.1
76.0- 76.4	5.0	45.1	1.3	6.9	57.1	2.5	3.6	22.9
75.5- 75.9	5.5	48.8	1.5	8.0	57.1	3.8	7.3	22.9
75.0- 75.4	6.1	51.2	1.8	9.2	57.1	5.0	7.3	22.9
74.5- 74.9	6.9	53.7	2.5	10.3	71.4	5.0	9.1	34.3
74.0- 74.4	8.1	59.8	3.2	12.6	85.7	6.3	12.7	42.9
73.5- 73.9	9.4	65.9	4.1	12.6	85.7	6.3	12.7	48.6
73.0- 73.4	10.0	67.1	4.6	12.6	85.7	6.3	12.7	48.6
72.5- 72.9	11.1	69.5	5.6	16.1	85.7	10.0	23.6	48.6
72.0- 72.4	12.4	73.2	6.7	20.7	85.7	15.0	25.5	62.9
71.5- 71.9	14.2	75.6	8.4	21.8	85.7	16.3	29.1	62.9
71.0- 71.4	16.1	80.5	10.0	23.0	85.7	17.5	36.4	62.9
70.5- 70.9	18.8	82.9	12.7	23.0	85.7	17.5	43.6	68.6
70.0- 70.4	23.2	85.4	17.3	28.7	85.7	23.8	54.5	74.3
69.5- 69.9	27.8	87.8	22.2	33.3	85.7	28.8	60.0	80.0
69.0- 69.4	33.1	93.9	27.3	37.9	85.7	33.8	65.5	85.7
68.5- 68.9	38.3	96.3	32.8	40.2	85.7	36.3	72.7	88.6
68.0- 68.4	43.8	96.3	38.8	44.8	85.7	41.3	76.4	91.4
67.5- 67.9	49.8	97.6	45.4	56.3	85.7	53.8	78.2	94.3
67.0- 67.4	57.6	97.6	53.8	64.4	85.7	62.5	83.6	97.1
66.5- 66.9	64.0	97.6	60.6	67.8	100.0	65.0	87.3	100.0
66.0- 66.4	70.1	98.8	67.4	77.0	100.0	75.0	87.3	100.0
65.5- 65.9	75.2	98.8	73.0	82.8	100.0	81.3	87.3	100.0
65.0- 65.4	82.5	98.8	80.9	92.0	100.0	91.3	92.7	100.0
64.5- 64.9	88.4	98.8	87.4	94.3	100.0	93.8	94.5	100.0
64.0- 64.4	92.9	100.0	92.2	95.4	100.0	95.0	94.5	100.0
63.5- 63.9	95.6	100.0	95.2	96.6	100.0	96.3	96.4	100.0
63.0- 63.4	97.3	100.0	97.8	98.9	100.0	98.8	100.0	100.0
62.5- 62.9	98.5	100.0	98.4	98.9	100.0	98.8	100.0	100.0
62.0- 62.4	99.3	100.0	99.2	100.0	100.0	100.0	100.0	100.0
61.5- 61.9	99.6	100.0	99.5	100.0	100.0	100.0	100.0	100.0
61.0- 61.4	99.9	100.0	99.9	100.0	100.0	100.0	100.0	100.0
60.5- 60.9	99.9	100.0	99.9	100.0	100.0	100.0	100.0	100.0
60.0- 60.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
59.5- 59.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
59.0- 59.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
58.5- 58.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
58.0- 58.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
57.5- 57.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
57.0- 57.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
56.5- 56.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
56.0- 56.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
55.5- 55.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
55.0- 55.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
SAMPLE SIZE	953	82	971	87	7	80	55	35
MEAN L(A)	68.2	75.0	67.5	69.0	77.5	68.2	70.1	73.5
STD. DEV.	4.1	5.7	3.8	4.4	5.9	3.3	3.6	5.0
LEQ	72.2	80.5	68.9	72.8	80.9	70.0	72.4	77.9

KANSAS CITY,MO SITE 1 25MPH (CONT)

PERCENTAGE OF VEHICLES WITHIN OR ABOVE A GIVEN SOUND LEVEL INTERVAL

L(A)	M/C ALL
99.5- 99.9	0.0
99.0- 99.4	0.0
98.5- 98.9	0.0
98.0- 98.4	0.0
97.5- 97.9	0.0
97.0- 97.4	0.0
96.5- 96.9	0.0
96.0- 96.4	0.0
95.5- 95.9	0.0
95.0- 95.4	0.0
94.5- 94.9	0.0
94.0- 94.4	0.0
93.5- 93.9	0.0
93.0- 93.4	0.0
92.5- 92.9	0.0
92.0- 92.4	0.0
91.5- 91.9	0.0
91.0- 91.4	0.0
90.5- 90.9	0.0
90.0- 90.4	0.0
89.5- 89.9	0.0
89.0- 89.4	0.0
88.5- 88.9	0.0
88.0- 88.4	0.0
87.5- 87.9	0.0
87.0- 87.4	0.0
86.5- 86.9	0.0
86.0- 86.4	0.0
85.5- 85.9	0.0
85.0- 85.4	0.0
84.5- 84.9	0.0
84.0- 84.4	0.0
83.5- 83.9	0.0
83.0- 83.4	0.0
82.5- 82.9	0.0
82.0- 82.4	0.0
81.5- 81.9	0.0
81.0- 81.4	0.0
80.5- 80.9	0.0
80.0- 80.4	0.0
79.5- 79.9	0.0
79.0- 79.4	0.0
78.5- 78.9	0.0

78.0- 78.4	0.0
77.5- 77.9	0.0
77.0- 77.4	0.0
76.5- 76.9	0.0
76.0- 76.4	0.0
75.5- 75.9	0.0
75.0- 75.4	0.0
74.5- 74.9	0.0
74.0- 74.4	0.0
73.5- 73.9	0.0
73.0- 73.4	0.0
72.5- 72.9	33.3
72.0- 72.4	33.3
71.5- 71.9	66.7
71.0- 71.4	66.7
70.5- 70.9	66.7
70.0- 70.4	66.7
69.5- 69.9	66.7
69.0- 69.4	66.7
68.5- 68.9	100.0
68.0- 68.4	100.0
67.5- 67.9	100.0
67.0- 67.4	100.0
66.5- 66.9	100.0
66.0- 66.4	100.0
65.5- 65.9	100.0
65.0- 65.4	100.0
64.5- 64.9	100.0
64.0- 64.4	100.0
63.5- 63.9	100.0
63.0- 63.4	100.0
62.5- 62.9	100.0
62.0- 62.4	100.0
61.5- 61.9	100.0
61.0- 61.4	100.0
60.5- 60.9	100.0
60.0- 60.4	100.0
59.5- 59.9	100.0
59.0- 59.4	100.0
58.5- 58.9	100.0
58.0- 58.4	100.0
57.5- 57.9	100.0
57.0- 57.4	100.0
56.5- 56.9	100.0
56.0- 56.4	100.0
55.5- 55.9	100.0
55.0- 55.4	100.0

SAMPLE SIZE	3
MEAN L(A)	71.0
STD. DEV.	1.9
LEQ	71.4

TROTWOOD,OH SITE 1(A) 25MPH

PERCENTAGE OF VEHICLES WITHIN OR ABOVE A GIVEN SOUND LEVEL INTERVAL

L(A)	B&6 ALL	B&6 A&B	B&6 V&N	IMP ALL	IMP A&B	IMP N&V	PNT ALL	BUG ALL
99.5- 99.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
99.0- 99.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
98.5- 98.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
98.0- 98.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
97.5- 97.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
97.0- 97.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
96.5- 96.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
96.0- 96.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
95.5- 95.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
95.0- 95.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
94.5- 94.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
94.0- 94.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
93.5- 93.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
93.0- 93.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
92.5- 92.9	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.0
92.0- 92.4	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.0
91.5- 91.9	0.1	0.9	0.0	0.0	0.0	0.0	1.2	0.0
91.0- 91.4	0.1	0.9	0.0	0.0	0.0	0.0	1.2	0.0
90.5- 90.9	0.1	0.9	0.0	0.0	0.0	0.0	1.2	0.0
90.0- 90.4	0.1	0.9	0.0	0.0	0.0	0.0	1.2	0.0
89.5- 89.9	0.1	0.9	0.0	0.0	0.0	0.0	2.4	0.0
89.0- 89.4	0.1	0.9	0.0	0.0	0.0	0.0	2.4	0.0
88.5- 88.9	0.1	0.9	0.0	0.0	0.0	0.0	2.4	0.0
88.0- 88.4	0.2	1.8	0.0	0.0	0.0	0.0	2.4	0.0
87.5- 87.9	0.4	2.7	0.0	0.0	0.0	0.0	2.4	0.0
87.0- 87.4	0.5	3.5	0.0	0.0	0.0	0.0	2.4	0.0
86.5- 86.9	0.6	4.4	0.0	0.0	0.0	0.0	2.4	0.0
86.0- 86.4	0.6	4.4	0.0	0.0	0.0	0.0	2.4	0.0
85.5- 85.9	0.6	4.4	0.0	0.0	0.0	0.0	3.6	0.0
85.0- 85.4	0.7	5.3	0.0	0.0	0.0	0.0	3.6	0.0
84.5- 84.9	0.7	5.3	0.0	0.0	0.0	0.0	3.6	0.0
84.0- 84.4	0.7	5.3	0.0	0.0	0.0	0.0	3.6	0.0
83.5- 83.9	0.8	6.2	0.0	1.3	33.3	0.0	3.6	0.0
83.0- 83.4	0.9	7.1	0.0	3.9	100.0	0.0	3.6	0.0
82.5- 82.9	0.9	7.1	0.0	3.9	100.0	0.0	4.8	0.0
82.0- 82.4	1.1	8.0	0.0	3.9	100.0	0.0	4.8	0.0
81.5- 81.9	1.1	8.0	0.0	3.9	100.0	0.0	4.8	0.0
81.0- 81.4	1.3	9.7	0.0	3.9	100.0	0.0	6.0	0.0
80.5- 80.9	1.6	12.4	0.0	3.9	100.0	0.0	6.0	0.0
80.0- 80.4	1.9	14.2	0.0	3.9	100.0	0.0	7.2	0.0
79.5- 79.9	2.1	15.9	0.0	3.9	100.0	0.0	7.2	0.0
79.0- 79.4	2.5	18.6	0.0	3.9	100.0	0.0	9.6	3.6
78.5- 78.9	2.7	20.4	0.0	5.2	100.0	1.4	13.3	3.6

78.0- 78.4	3.0	23.0	0.0	5.2	100.0	1.4	12.0	10.7
77.5- 77.9	3.3	24.8	0.0	5.2	100.0	1.4	12.0	17.9
77.0- 77.4	3.5	24.8	0.3	5.2	100.0	1.4	13.3	21.4
76.5- 76.9	4.0	28.3	0.3	5.2	100.0	1.4	13.3	25.0
76.0- 76.4	4.7	32.7	0.4	5.2	100.0	1.4	15.7	35.7
75.5- 75.9	4.8	32.7	0.5	5.2	100.0	1.4	18.1	35.7
75.0- 75.4	5.3	36.3	0.5	6.5	100.0	2.7	18.1	42.9
74.5- 74.9	6.7	44.2	0.9	9.1	100.0	5.4	20.5	42.9
74.0- 74.4	7.2	47.8	1.1	11.7	100.0	8.1	21.7	50.0
73.5- 73.9	8.3	54.0	1.9	14.3	100.0	10.8	24.1	50.0
73.0- 73.4	9.7	57.5	2.4	18.2	100.0	14.9	30.1	57.1
72.5- 72.9	11.0	62.8	3.1	18.2	100.0	14.9	32.5	64.3
72.0- 72.4	13.2	69.9	4.6	18.2	100.0	14.9	33.7	67.9
71.5- 71.9	15.8	74.3	6.9	23.4	100.0	20.3	37.3	67.9
71.0- 71.4	18.6	77.0	9.7	27.3	100.0	24.3	38.6	67.9
70.5- 70.9	22.5	79.6	13.9	28.6	100.0	25.7	45.8	82.1
70.0- 70.4	26.2	82.3	17.6	29.9	100.0	27.0	51.8	89.3
69.5- 69.9	32.1	86.7	23.8	35.1	100.0	32.4	56.6	92.9
69.0- 69.4	38.3	88.5	30.7	37.7	100.0	35.1	59.0	96.4
68.5- 68.9	44.3	89.4	37.4	51.9	100.0	50.0	69.9	100.0
68.0- 68.4	52.3	91.2	46.4	57.1	100.0	55.4	74.7	100.0
67.5- 67.9	61.1	96.5	55.7	63.6	100.0	62.2	84.3	100.0
67.0- 67.4	69.5	98.2	65.1	71.4	100.0	70.3	89.2	100.0
66.5- 66.9	75.9	98.2	72.5	75.3	100.0	74.3	91.6	100.0
66.0- 66.4	83.5	99.1	81.2	84.4	100.0	83.8	94.0	100.0
65.5- 65.9	88.2	99.1	86.5	89.6	100.0	89.2	96.4	100.0
65.0- 65.4	91.9	99.1	90.3	93.5	100.0	93.2	96.4	100.0
64.5- 64.9	94.9	99.1	94.2	96.1	100.0	95.9	97.6	100.0
64.0- 64.4	97.3	99.1	97.0	96.1	100.0	95.9	98.8	100.0
63.5- 63.9	98.4	99.1	98.3	96.1	100.0	95.9	98.8	100.0
63.0- 63.4	99.1	100.0	98.9	97.4	100.0	97.3	100.0	100.0
62.5- 62.9	99.6	100.0	99.6	100.0	100.0	100.0	100.0	100.0
62.0- 62.4	99.9	100.0	99.9	100.0	100.0	100.0	100.0	100.0
61.5- 61.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
61.0- 61.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
60.5- 60.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
60.0- 60.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
59.5- 59.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
59.0- 59.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
58.5- 58.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
58.0- 58.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
57.5- 57.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
57.0- 57.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
56.5- 56.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
56.0- 56.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
55.5- 55.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
55.0- 55.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
SAMPLE SIZE	656	113	743	77	3	74	83	28
MEAN L(A)	68.3	74.5	67.9	69.3	33.4	68.7	71.5	73.6
STD. DEV.	3.6	5.1	2.3	4.2	7.2	3.1	5.3	3.1
LEQ	72.0	78.6	69.6	72.6	83.4	70.1	77.7	74.9

TROTWOOD,OH SITE 1(A) 25MPH (CONT)

PERCENTAGE OF VEHICLES WITHIN OR ABOVE A GIVEN SOUND LEVEL INTERVAL

L(A)	M/C ALL
99.5- 99.9	0.0
99.0- 99.4	0.0
98.5- 98.9	0.0
98.0- 98.4	0.0
97.5- 97.9	0.0
97.0- 97.4	0.0
96.5- 96.9	0.0
96.0- 96.4	0.0
95.5- 95.9	0.0
95.0- 95.4	0.0
94.5- 94.9	0.0
94.0- 94.4	0.0
93.5- 93.9	0.0
93.0- 93.4	0.0
92.5- 92.9	0.0
92.0- 92.4	0.0
91.5- 91.9	0.0
91.0- 91.4	0.0
90.5- 90.9	0.0
90.0- 90.4	0.0
89.5- 89.9	0.0
89.0- 89.4	0.0
88.5- 88.9	0.0
88.0- 88.4	0.0
87.5- 87.9	0.0
87.0- 87.4	0.0
86.5- 86.9	0.0
86.0- 86.4	0.0
85.5- 85.9	0.0
85.0- 85.4	0.0
84.5- 84.9	0.0
84.0- 84.4	0.0
83.5- 83.9	0.0
83.0- 83.4	0.0
82.5- 82.9	0.0
82.0- 82.4	0.0
81.5- 81.9	0.0
81.0- 81.4	0.0
80.5- 80.9	0.0
80.0- 80.4	0.0
79.5- 79.9	0.0
79.0- 79.4	0.0
78.5- 78.9	0.0

78.0-	78.4	0.0
77.5-	77.9	0.0
77.0-	77.4	0.0
76.5-	76.9	100.0
76.0-	76.4	100.0
75.5-	75.9	100.0
75.0-	75.4	100.0
74.5-	74.9	100.0
74.0-	74.4	100.0
73.5-	73.9	100.0
73.0-	73.4	100.0
72.5-	72.9	100.0
72.0-	72.4	100.0
71.5-	71.9	100.0
71.0-	71.4	100.0
70.5-	70.9	100.0
70.0-	70.4	100.0
69.5-	69.9	100.0
69.0-	69.4	100.0
68.5-	68.9	100.0
68.0-	68.4	100.0
67.5-	67.9	100.0
67.0-	67.4	100.0
66.5-	66.9	100.0
66.0-	66.4	100.0
65.5-	65.9	100.0
65.0-	65.4	100.0
64.5-	64.9	100.0
64.0-	64.4	100.0
63.5-	63.9	100.0
63.0-	63.4	100.0
62.5-	62.9	100.0
62.0-	62.4	100.0
61.5-	61.9	100.0
61.0-	61.4	100.0
60.5-	60.9	100.0
60.0-	60.4	100.0
59.5-	59.9	100.0
59.0-	59.4	100.0
58.5-	58.9	100.0
58.0-	58.4	100.0
57.5-	57.9	100.0
57.0-	57.4	100.0
56.5-	56.9	100.0
56.0-	56.4	100.0
55.5-	55.9	100.0
55.0-	55.4	100.0

SAMPLE SIZE	1
MEAN L(A)	76.9
STD. DEV.	0.0
LEQ	76.9

TROTWOOD,OH SITE 2(C) 20/35MPH

PERCENTAGE OF VEHICLES WITHIN OR ABOVE A GIVEN SOUND LEVEL INTERVAL

L(A)	8&6 ALL	8&6 A&B	8&6 N&V	IMP ALL	IMP A&B	IMP N&V	PNT ALL	BUG ALL
99.5- 99.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
99.0- 99.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
98.5- 98.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
98.0- 98.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
97.5- 97.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
97.0- 97.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
96.5- 96.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
96.0- 96.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
95.5- 95.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
95.0- 95.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
94.5- 94.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
94.0- 94.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
93.5- 93.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
93.0- 93.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
92.5- 92.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
92.0- 92.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
91.5- 91.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
91.0- 91.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
90.5- 90.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
90.0- 90.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
89.5- 89.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
89.0- 89.4	0.3	1.5	0.0	0.0	0.0	0.0	0.0	0.0
88.5- 88.9	0.3	1.5	0.0	0.0	0.0	0.0	0.0	0.0
88.0- 88.4	0.3	1.5	0.0	0.0	0.0	0.0	0.0	0.0
87.5- 87.9	0.3	1.5	0.0	0.0	0.0	0.0	0.0	0.0
87.0- 87.4	0.3	1.5	0.0	0.0	0.0	0.0	0.0	0.0
86.5- 86.9	0.3	1.5	0.0	0.0	0.0	0.0	0.0	0.0
86.0- 86.4	0.3	1.5	0.0	0.0	0.0	0.0	0.0	0.0
85.5- 85.9	0.3	1.5	0.0	0.0	0.0	0.0	0.0	0.0
85.0- 85.4	0.3	1.5	0.0	0.0	0.0	0.0	0.0	0.0
84.5- 84.9	0.8	4.5	0.0	0.0	0.0	0.0	0.0	0.0
84.0- 84.4	1.1	6.1	0.0	0.0	0.0	0.0	0.0	0.0
83.5- 83.9	1.1	6.1	0.0	0.0	0.0	0.0	0.0	0.0
83.0- 83.4	1.1	6.1	0.0	0.0	0.0	0.0	0.0	0.0
82.5- 82.9	1.4	6.1	0.3	0.0	0.0	0.0	0.0	0.0
82.0- 82.4	1.9	9.1	0.3	0.0	0.0	0.0	0.0	9.1
81.5- 81.9	1.9	9.1	0.3	0.0	0.0	0.0	0.0	9.1
81.0- 81.4	1.9	9.1	0.3	0.0	0.0	0.0	3.0	18.2
80.5- 80.9	1.9	9.1	0.3	2.4	0.0	2.7	3.0	18.2
80.0- 80.4	1.9	9.1	0.3	2.4	0.0	2.7	3.0	18.2
79.5- 79.9	1.9	9.1	0.3	2.4	0.0	2.7	3.0	18.2
79.0- 79.4	1.9	9.1	0.3	2.4	0.0	2.7	3.0	27.3
78.5- 78.9	1.9	9.1	0.3	2.4	0.0	2.7	3.0	27.3

78.0- 78.4	2.2	9.1	0.7	4.9	25.0	2.7	3.0	27.3
77.5- 77.9	2.2	9.1	0.7	4.9	25.0	2.7	3.0	27.3
77.0- 77.4	2.8	12.1	0.7	7.3	50.0	2.7	3.0	36.4
76.5- 76.9	3.0	12.1	1.0	7.3	50.0	2.7	3.0	36.4
76.0- 76.4	3.3	13.6	1.0	7.3	50.0	2.7	6.1	45.5
75.5- 75.9	4.1	16.7	1.3	7.3	50.0	2.7	6.1	45.5
75.0- 75.4	5.0	16.7	2.4	7.3	50.0	2.7	9.1	54.5
74.5- 74.9	6.3	21.2	3.0	9.8	50.0	5.4	9.1	63.6
74.0- 74.4	7.2	24.2	3.4	14.6	75.0	8.1	12.1	63.6
73.5- 73.9	9.1	27.3	5.1	14.6	75.0	8.1	12.1	72.7
73.0- 73.4	9.6	28.8	5.4	17.1	75.0	10.8	12.1	72.7
72.5- 72.9	11.6	33.3	6.7	19.5	75.0	13.5	15.2	72.7
72.0- 72.4	14.0	39.4	8.4	19.5	75.0	13.5	15.2	72.7
71.5- 71.9	17.4	47.0	10.8	22.0	75.0	16.2	27.3	72.7
71.0- 71.4	21.2	54.5	13.8	24.4	75.0	18.9	33.3	90.9
70.5- 70.9	25.1	60.6	17.2	24.4	75.0	18.9	39.4	90.9
70.0- 70.4	29.5	63.6	21.9	26.8	75.0	21.6	45.5	90.9
69.5- 69.9	34.2	66.7	26.9	29.3	75.0	24.3	48.5	90.9
69.0- 69.4	40.8	72.7	33.7	31.7	75.0	27.0	51.5	90.9
68.5- 68.9	49.0	81.8	41.9	31.7	75.0	27.0	66.7	90.9
68.0- 68.4	56.7	81.8	51.2	39.0	100.0	32.4	66.7	100.0
67.5- 67.9	64.5	89.4	58.9	46.3	100.0	40.5	78.8	100.0
67.0- 67.4	72.5	90.9	68.4	48.8	100.0	43.2	87.9	100.0
66.5- 66.9	78.0	93.9	74.4	58.5	100.0	54.1	90.9	100.0
66.0- 66.4	81.8	98.5	78.1	68.3	100.0	64.9	93.9	100.0
65.5- 65.9	85.4	98.5	82.5	78.0	100.0	75.7	97.0	100.0
65.0- 65.4	89.5	100.0	87.2	85.4	100.0	83.8	100.0	100.0
64.5- 64.9	93.1	100.0	91.6	90.2	100.0	89.2	100.0	100.0
64.0- 64.4	95.3	100.0	94.3	90.2	100.0	89.2	100.0	100.0
63.5- 63.9	96.7	100.0	96.0	92.7	100.0	91.9	100.0	100.0
63.0- 63.4	97.8	100.0	97.3	97.6	100.0	97.3	100.0	100.0
62.5- 62.9	98.6	100.0	98.3	97.6	100.0	97.3	100.0	100.0
62.0- 62.4	98.9	100.0	98.7	97.6	100.0	97.3	100.0	100.0
61.5- 61.9	99.4	100.0	99.3	100.0	100.0	100.0	100.0	100.0
61.0- 61.4	99.4	100.0	99.3	100.0	100.0	100.0	100.0	100.0
60.5- 60.9	99.4	100.0	99.3	100.0	100.0	100.0	100.0	100.0
60.0- 60.4	99.7	100.0	99.7	100.0	100.0	100.0	100.0	100.0
59.5- 59.9	99.7	100.0	99.7	100.0	100.0	100.0	100.0	100.0
59.0- 59.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
58.5- 58.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
58.0- 58.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
57.5- 57.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
57.0- 57.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
56.5- 56.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
56.0- 56.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
55.5- 55.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
55.0- 55.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
SAMPLE SIZE	363	66	297	41	4	37	33	11
MEAN L(A)	68.6	72.1	68.1	68.4	74.4	67.7	69.9	75.5
STD. DEV.	3.7	4.8	2.9	4.2	3.9	3.7	3.3	4.2
LEQ	71.8	76.4	69.4	71.1	75.7	70.2	71.7	77.4

TROTWOOD,OH SITE 2(C) 25/30MPH (CONT)
**

PERCENTAGE OF VEHICLES WITHIN OR ABOVE A GIVEN SOUND LEVEL INTERVAL

L(A)	M/C ALL
99.5- 99.9	0.0
99.0- 99.4	0.0
98.5- 98.9	0.0
98.0- 98.4	0.0
97.5- 97.9	0.0
97.0- 97.4	100.0
96.5- 96.9	100.0
96.0- 96.4	100.0
95.5- 95.9	100.0
95.0- 95.4	100.0
94.5- 94.9	100.0
94.0- 94.4	100.0
93.5- 93.9	100.0
93.0- 93.4	100.0
92.5- 92.9	100.0
92.0- 92.4	100.0
91.5- 91.9	100.0
91.0- 91.4	100.0
90.5- 90.9	100.0
90.0- 90.4	100.0
89.5- 89.9	100.0
89.0- 89.4	100.0
88.5- 88.9	100.0
88.0- 88.4	100.0
87.5- 87.9	100.0
87.0- 87.4	100.0
86.5- 86.9	100.0
86.0- 86.4	100.0
85.5- 85.9	100.0
85.0- 85.4	100.0
84.5- 84.9	100.0
84.0- 84.4	100.0
83.5- 83.9	100.0
83.0- 83.4	100.0
82.5- 82.9	100.0
82.0- 82.4	100.0
81.5- 81.9	100.0
81.0- 81.4	100.0
80.5- 80.9	100.0
80.0- 80.4	100.0
79.5- 79.9	100.0
79.0- 79.4	100.0

78.5-	78.9	100.0
78.0-	78.4	100.0
77.5-	77.9	100.0
77.0-	77.4	100.0
76.5-	76.9	100.0
76.0-	76.4	100.0
75.5-	75.9	100.0
75.0-	75.4	100.0
74.5-	74.9	100.0
74.0-	74.4	100.0
73.5-	73.9	100.0
73.0-	73.4	100.0
72.5-	72.9	100.0
72.0-	72.4	100.0
71.5-	71.9	100.0
71.0-	71.4	100.0
70.5-	70.9	100.0
70.0-	70.4	100.0
69.5-	69.9	100.0
69.0-	69.4	100.0
68.5-	68.9	100.0
68.0-	68.4	100.0
67.5-	67.9	100.0
67.0-	67.4	100.0
66.5-	66.9	100.0
66.0-	66.4	100.0
65.5-	65.9	100.0
65.0-	65.4	100.0
64.5-	64.9	100.0
64.0-	64.4	100.0
63.5-	63.9	100.0
63.0-	63.4	100.0
62.5-	62.9	100.0
62.0-	62.4	100.0
61.5-	61.9	100.0
61.0-	61.4	100.0
60.5-	60.9	100.0
60.0-	60.4	100.0
59.5-	59.9	100.0
59.0-	59.4	100.0
58.5-	58.9	100.0
58.0-	58.4	100.0
57.5-	57.9	100.0
57.0-	57.4	100.0
56.5-	56.9	100.0
56.0-	56.4	100.0
55.5-	55.9	100.0
55.0-	55.4	100.0

SAMPLE SIZE	1
MEAN L(A)	97.2
STD. DEV.	0.0
LEQ	97.2

High-Speed Sites

BIRMINGHAM,AL SITE 2 40 MPH

PERCENTAGE OF VEHICLES WITHIN OR ABOVE A GIVEN SOUND LEVEL INTERVAL

L(A)	B&6 ALL	B&6 A&B	B&6 N&V	IMP ALL	IMP A&B	IMP N&V	PNT ALL	BUG ALL
99.5- 99.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
99.0- 99.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
98.5- 98.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
98.0- 98.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
97.5- 97.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
97.0- 97.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
96.5- 96.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
96.0- 96.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
95.5- 95.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
95.0- 95.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
94.5- 94.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
94.0- 94.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
93.5- 93.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6
93.0- 93.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6
92.5- 92.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5
92.0- 92.4	0.0	0.0	0.2	0.0	0.0	0.0	0.0	2.6
91.5- 91.9	0.1	0.9	0.0	0.0	0.0	0.0	0.0	2.6
91.0- 91.4	0.1	0.9	0.0	0.0	0.0	0.0	0.0	2.5
90.5- 90.9	0.1	0.9	0.0	0.0	0.0	0.0	0.0	2.6
90.0- 90.4	0.1	0.9	0.0	0.0	0.0	0.0	0.0	2.6
89.5- 89.9	0.1	0.9	0.0	0.0	0.0	0.0	0.0	2.6
89.0- 89.4	0.1	0.9	0.0	0.0	0.0	0.0	0.0	2.6
88.5- 88.9	0.1	0.9	0.0	0.0	0.0	0.0	0.0	2.6
88.0- 88.4	0.2	1.9	0.0	0.0	0.0	0.0	0.0	5.1
87.5- 87.9	0.3	3.8	0.0	0.6	12.5	0.0	0.0	5.1
87.0- 87.4	0.3	3.8	0.0	0.6	12.5	0.0	0.0	5.1
86.5- 86.9	0.3	3.8	0.0	0.6	12.5	0.0	0.0	5.1
86.0- 86.4	0.3	3.8	0.0	0.6	12.5	0.0	0.0	5.1
85.5- 85.9	0.3	3.8	0.0	0.6	12.5	0.0	0.0	5.1
85.0- 85.4	0.4	4.7	0.0	0.6	12.5	0.0	0.0	7.7
84.5- 84.9	0.6	6.6	0.0	0.6	12.5	0.0	0.0	7.7
84.0- 84.4	0.7	8.5	0.0	0.6	12.5	0.0	0.0	10.3
83.5- 83.9	0.7	8.5	0.0	0.6	12.5	0.0	0.0	10.3
83.0- 83.4	0.7	8.5	0.0	0.6	12.5	0.0	0.0	10.3
82.5- 82.9	0.7	8.5	0.0	1.2	25.0	0.0	0.0	12.8
82.0- 82.4	0.8	9.4	0.0	1.8	37.5	0.0	0.0	17.9
81.5- 81.9	1.3	15.1	0.0	1.8	37.5	0.0	0.0	20.5
81.0- 81.4	1.7	19.8	0.0	2.4	50.0	0.0	0.0	25.5
80.5- 80.9	2.0	21.7	0.1	3.0	62.5	0.0	0.0	25.2
80.0- 80.4	2.0	22.6	0.1	3.0	62.5	0.0	1.8	23.2
79.5- 79.9	2.3	24.5	0.2	3.0	62.5	0.0	3.6	28.2
79.0- 79.4	2.6	28.3	0.2	3.0	62.5	0.0	3.6	33.3
78.5- 78.9	2.7	29.2	0.2	3.0	62.5	0.0	3.6	35.9

78.0- 78.4	3.1	34.0	0.2	3.6	62.5	0.6	3.6	35.9
77.5- 77.9	3.5	35.8	0.4	4.3	62.5	1.9	3.6	35.9
77.0- 77.4	3.7	37.7	0.4	4.8	62.5	1.9	3.6	35.9
76.5- 76.9	4.0	38.7	0.7	5.4	62.5	2.5	7.1	38.5
76.0- 76.4	5.1	46.2	1.3	7.2	62.5	4.4	8.9	38.5
75.5- 75.9	5.6	47.2	1.6	9.0	62.5	6.3	14.3	46.2
75.0- 75.4	6.8	54.7	2.2	10.2	62.5	7.6	14.3	48.7
74.5- 74.9	8.0	57.5	3.3	11.4	75.0	8.2	21.4	51.3
74.0- 74.4	9.1	58.5	4.5	15.7	75.0	12.7	23.2	51.3
73.5- 73.9	11.2	59.4	6.6	16.9	75.0	13.9	26.8	59.0
73.0- 73.4	13.1	61.3	8.6	19.3	75.0	16.5	32.1	79.5
72.5- 72.9	15.6	65.1	10.9	20.5	75.0	17.7	37.5	82.1
72.0- 72.4	18.4	67.0	13.9	24.7	75.0	22.2	48.2	87.2
71.5- 71.9	23.0	70.8	18.5	28.9	75.0	26.6	57.1	92.3
71.0- 71.4	27.0	75.5	22.4	31.9	75.0	29.7	60.7	92.3
70.5- 70.9	32.4	78.3	28.1	36.7	87.5	34.2	64.3	94.9
70.0- 70.4	37.4	82.1	33.2	44.6	87.5	42.4	69.6	94.9
69.5- 69.9	44.6	89.6	40.3	53.6	87.5	51.9	71.4	97.4
69.0- 69.4	52.2	94.3	48.3	56.6	87.5	55.1	82.1	100.0
68.5- 68.9	60.0	97.2	56.5	66.9	100.0	65.2	83.9	100.0
68.0- 68.4	67.6	98.1	64.7	74.7	100.0	73.4	89.3	100.0
67.5- 67.9	73.8	98.1	71.3	79.5	100.0	78.5	92.9	100.0
67.0- 67.4	80.4	99.1	78.6	83.1	100.0	82.3	94.6	100.0
66.5- 66.9	86.0	100.0	84.6	88.6	100.0	88.0	100.0	100.0
66.0- 66.4	90.2	100.0	89.3	92.2	100.0	91.8	100.0	100.0
65.5- 65.9	94.2	100.0	93.7	94.0	100.0	93.7	100.0	100.0
65.0- 65.4	97.0	100.0	96.7	95.3	100.0	95.6	100.0	100.0
64.5- 64.9	98.5	100.0	98.4	98.2	100.0	98.1	100.0	100.0
64.0- 64.4	99.3	100.0	99.3	99.3	100.0	98.7	100.0	100.0
63.5- 63.9	99.8	100.0	99.7	99.4	100.0	99.4	100.0	100.0
63.0- 63.4	99.9	100.0	99.9	99.4	100.0	99.4	100.0	100.0
62.5- 62.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
62.0- 62.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
61.5- 61.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
61.0- 61.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
60.5- 60.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
60.0- 60.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
59.5- 59.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
59.0- 59.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
58.5- 58.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
58.0- 58.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
57.5- 57.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
57.0- 57.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
56.5- 56.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
56.0- 56.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
55.5- 55.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
55.0- 55.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
SAMPLE SIZE	1225	105	1119	165	8	158	56	39
MEAN L(A)	69.7	75.6	69.1	70.2	78.6	69.8	71.8	76.7
STD. DEV.	3.5	5.3	2.6	3.3	6.2	3.1	3.1	3.4
LEQ	72.2	79.4	70.0	72.9	82.0	71.0	73.0	81.5

BIRMINGHAM, AL SITE 2 40 MPH (CONT)

PERCENTAGE OF VEHICLES WITHIN OR ABOVE A GIVEN SOUND LEVEL INTERVAL

L(A)	M/C ALL
99.5- 99.9	0.0
99.0- 99.4	0.0
98.5- 98.9	0.0
98.0- 98.4	0.0
97.5- 97.9	0.0
97.0- 97.4	0.0
96.5- 96.9	0.0
96.0- 96.4	0.0
95.5- 95.9	0.0
95.0- 95.4	0.0
94.5- 94.9	0.0
94.0- 94.4	0.0
93.5- 93.9	0.0
93.0- 93.4	0.0
92.5- 92.9	0.0
92.0- 92.4	0.0
91.5- 91.9	0.0
91.0- 91.4	0.0
90.5- 90.9	0.0
90.0- 90.4	0.0
89.5- 89.9	0.0
89.0- 89.4	0.0
88.5- 88.9	0.0
88.0- 88.4	0.0
87.5- 87.9	0.0
87.0- 87.4	0.0
86.5- 86.9	0.0
86.0- 86.4	0.0
85.5- 85.9	0.0
85.0- 85.4	0.0
84.5- 84.9	0.0
84.0- 84.4	11.1
83.5- 83.9	22.2
83.0- 83.4	22.2
82.5- 82.9	22.2
82.0- 82.4	22.2
81.5- 81.9	22.2
81.0- 81.4	22.2
80.5- 80.9	22.2
80.0- 80.4	33.3
79.5- 79.9	33.3
79.0- 79.4	33.3
78.5- 78.9	33.3

78.0- 78.4	44.4
77.5- 77.9	44.4
77.0- 77.4	55.6
76.5- 76.9	55.6
76.0- 76.4	55.6
75.5- 75.9	66.7
75.0- 75.4	66.7
74.5- 74.9	66.7
74.0- 74.4	66.7
73.5- 73.9	77.8
73.0- 73.4	88.9
72.5- 72.9	88.9
72.0- 72.4	100.0
71.5- 71.9	100.0
71.0- 71.4	100.0
70.5- 70.9	100.0
70.0- 70.4	100.0
69.5- 69.9	100.0
69.0- 69.4	100.0
68.5- 68.9	100.0
68.0- 68.4	100.0
67.5- 67.9	100.0
67.0- 67.4	100.0
66.5- 66.9	100.0
66.0- 66.4	100.0
65.5- 65.9	100.0
65.0- 65.4	100.0
64.5- 64.9	100.0
64.0- 64.4	100.0
63.5- 63.9	100.0
63.0- 63.4	100.0
62.5- 62.9	100.0
62.0- 62.4	100.0
61.5- 61.9	100.0
61.0- 61.4	100.0
60.5- 60.9	100.0
60.0- 60.4	100.0
59.5- 59.9	100.0
59.0- 59.4	100.0
58.5- 58.9	100.0
58.0- 58.4	100.0
57.5- 57.9	100.0
57.0- 57.4	100.0
56.5- 56.9	100.0
56.0- 56.4	100.0
55.5- 55.9	100.0
55.0- 55.4	100.0

SAMPLE SIZE	9
MEAN L(A)	77.5
STD. DEV.	4.1
LEQ	79.6

EUGENE,OR SITES 1/3 40MPH

PERCENTAGE OF VEHICLES WITHIN OR ABOVE A GIVEN SOUND LEVEL INTERVAL

L(A)	B&6AL	B&6 A&B	B&6 N&V	IMP ALL	IMP A&B	IMP N&V	PNT ALL	BUG ALL
99.5- 99.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
99.0- 99.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
98.5- 98.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
98.0- 98.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
97.5- 97.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
97.0- 97.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
96.5- 96.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
96.0- 96.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
95.5- 95.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
95.0- 95.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
94.5- 94.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
94.0- 94.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
93.5- 93.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
93.0- 93.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
92.5- 92.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
92.0- 92.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
91.5- 91.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
91.0- 91.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
90.5- 90.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
90.0- 90.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
89.5- 89.9	0.2	2.2	0.0	0.0	0.0	0.0	0.0	0.0
89.0- 89.4	0.4	4.3	0.0	0.0	0.0	0.0	2.3	5.3
88.5- 88.9	0.4	4.3	0.0	0.0	0.0	0.0	2.3	5.3
88.0- 88.4	0.4	4.3	0.0	0.0	0.0	0.0	2.3	5.3
87.5- 87.9	0.4	4.3	0.0	0.4	0.0	0.5	2.3	5.3
87.0- 87.4	0.4	4.3	0.0	0.4	0.0	0.5	2.3	5.3
86.5- 86.9	0.4	4.3	0.0	0.4	0.0	0.5	2.3	7.9
86.0- 86.4	1.1	10.9	0.2	1.3	22.2	0.5	2.3	7.9
85.5- 85.9	1.1	10.9	0.2	1.3	22.2	0.5	2.3	7.9
85.0- 85.4	1.7	15.2	0.4	1.3	22.2	0.5	2.3	12.5
84.5- 84.9	2.0	19.6	0.4	2.2	33.3	0.9	2.3	12.5
84.0- 84.4	2.4	21.7	0.6	2.7	44.4	0.9	2.3	15.8
83.5- 83.9	2.8	26.1	0.6	2.7	44.4	0.9	2.3	21.1
83.0- 83.4	3.1	28.3	0.8	2.7	44.4	0.9	2.3	21.1
82.5- 82.9	3.3	30.4	0.8	2.7	44.4	0.9	2.3	23.7
82.0- 82.4	3.9	34.8	1.0	2.7	44.4	0.9	4.5	28.9
81.5- 81.9	4.4	39.1	1.2	3.1	55.6	0.9	6.8	28.9
81.0- 81.4	4.6	41.3	1.2	3.1	55.6	0.9	6.8	28.9
80.5- 80.9	5.0	43.5	1.4	3.1	55.6	0.9	6.8	28.9
80.0- 80.4	5.5	50.0	1.4	3.1	55.6	0.9	6.8	31.6
79.5- 79.9	6.3	56.5	2.2	4.9	66.7	2.3	9.1	31.6
79.0- 79.4	7.6	56.5	3.0	5.4	66.7	2.8	9.1	31.6
78.5- 78.9	8.3	60.9	3.4	5.8	66.7	3.3	11.4	39.5

78.0-	78.4	9.4	65.2	4.2	3.1	66.7	5.6	11.4	42.1
77.5-	77.9	10.2	65.2	5.1	9.4	66.7	7.0	13.6	47.4
77.0-	77.4	11.3	67.4	6.1	12.1	77.8	9.3	15.9	47.4
76.5-	76.9	12.6	69.6	7.3	13.9	77.8	11.2	15.9	57.9
76.0-	76.4	13.7	69.6	8.5	15.2	88.9	12.1	18.2	50.5
75.5-	75.9	15.0	71.7	9.7	17.0	88.9	14.0	29.5	63.2
75.0-	75.4	17.9	78.3	12.3	20.6	88.9	17.8	29.5	63.2
74.5-	74.9	20.0	82.6	14.1	23.8	88.9	21.0	31.8	65.8
74.0-	74.4	22.2	84.8	16.4	26.9	88.9	24.3	36.4	73.7
73.5-	73.9	25.7	84.8	20.2	29.6	88.9	27.1	36.4	76.3
73.0-	73.4	29.2	87.0	23.8	32.3	88.9	29.9	40.9	78.9
72.5-	72.9	33.3	87.0	28.3	34.5	88.9	32.2	43.2	84.2
72.0-	72.4	36.2	87.0	31.5	41.3	88.9	39.3	52.3	89.5
71.5-	71.9	40.3	87.0	36.0	49.3	88.9	47.7	59.1	89.5
71.0-	71.4	47.0	89.1	43.0	55.2	88.9	53.7	61.4	89.5
70.5-	70.9	52.7	91.3	49.1	60.1	88.9	58.9	61.4	89.5
70.0-	70.4	59.1	93.5	56.0	65.3	88.9	65.9	61.4	89.5
69.5-	69.9	65.1	95.7	62.2	73.1	88.9	72.4	65.9	92.1
69.0-	69.4	70.2	95.7	67.9	78.0	88.9	77.6	70.5	97.4
68.5-	68.9	76.7	97.8	74.7	83.0	100.0	82.2	75.0	100.0
68.0-	68.4	81.3	97.8	79.4	85.5	100.0	86.0	79.5	100.0
67.5-	67.9	86.3	97.8	85.3	91.9	100.0	91.6	84.1	100.0
67.0-	67.4	90.2	100.0	89.3	94.2	100.0	93.9	90.9	100.0
66.5-	66.9	93.0	100.0	92.3	96.4	100.0	96.3	90.9	100.0
66.0-	66.4	95.9	100.0	95.6	97.8	100.0	97.7	95.5	100.0
65.5-	65.9	97.6	100.0	97.4	97.8	100.0	97.7	97.7	100.0
65.0-	65.4	98.5	100.0	98.4	98.2	100.0	98.1	100.0	100.0
64.5-	64.9	99.3	100.0	99.2	98.7	100.0	98.6	100.0	100.0
64.0-	64.4	99.4	100.0	99.4	99.6	100.0	99.5	100.0	100.0
63.5-	63.9	99.6	100.0	99.6	99.6	100.0	99.5	100.0	100.0
63.0-	63.4	100.0	100.0	100.0	99.6	100.0	99.5	100.0	100.0
62.5-	62.9	100.0	100.0	100.0	99.6	100.0	99.5	100.0	100.0
62.0-	62.4	100.0	100.0	100.0	99.6	100.0	99.5	100.0	100.0
61.5-	61.9	100.0	100.0	100.0	99.6	100.0	99.5	100.0	100.0
61.0-	61.4	100.0	100.0	100.0	99.6	100.0	99.5	100.0	100.0
60.5-	60.9	100.0	100.0	100.0	99.6	100.0	99.5	100.0	100.0
60.0-	60.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
59.5-	59.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
59.0-	59.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
58.5-	58.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
58.0-	58.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
57.5-	57.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
57.0-	57.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
56.5-	56.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
56.0-	56.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
55.5-	55.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
55.0-	55.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
SAMPLE SIZE		541	46	495	223	9	214	44	38
MEAN L(A)		71.6	79.3	70.9	72.0	80.6	71.5	72.5	77.7
STD. DEV.		4.4	5.4	3.5	4.1	5.4	3.7	5.0	5.4
LEQ		75.0	82.2	72.3	74.3	82.9	73.5	76.6	81.2

EUGENE,OR SITES 1/3 40MPH (CONT)

PERCENTAGE OF VEHICLES WITHIN OR ABOVE A GIVEN SOUND LEVEL INTERVAL

L(A)	M/C ALL
99.5- 99.9	0.0
99.0- 99.4	0.0
98.5- 98.9	0.0
98.0- 98.4	0.0
97.5- 97.9	0.0
97.0- 97.4	0.0
96.5- 96.9	0.0
96.0- 96.4	0.0
95.5- 95.9	0.0
95.0- 95.4	0.0
94.5- 94.9	0.0
94.0- 94.4	0.0
93.5- 93.9	0.0
93.0- 93.4	0.0
92.5- 92.9	0.0
92.0- 92.4	0.0
91.5- 91.9	0.0
91.0- 91.4	0.0
90.5- 90.9	0.0
90.0- 90.4	4.0
89.5- 89.9	4.0
89.0- 89.4	4.0
88.5- 88.9	4.0
88.0- 88.4	4.0
87.5- 87.9	4.0
87.0- 87.4	4.0
86.5- 86.9	4.0
86.0- 86.4	4.0
85.5- 85.9	4.0
85.0- 85.4	4.0
84.5- 84.9	4.0
84.0- 84.4	8.0
83.5- 83.9	12.0
83.0- 83.4	12.0
82.5- 82.9	12.0
82.0- 82.4	16.0
81.5- 81.9	16.0
81.0- 81.4	20.0
80.5- 80.9	24.0
80.0- 80.4	24.0
79.5- 79.9	36.0
79.0- 79.4	40.0
78.5- 78.9	44.0

78.0- 78.4	44.0
77.5- 77.9	48.0
77.0- 77.4	48.0
76.5- 76.9	68.0
76.0- 76.4	72.0
75.5- 75.9	72.0
75.0- 75.4	80.0
74.5- 74.9	88.0
74.0- 74.4	88.0
73.5- 73.9	88.0
73.0- 73.4	88.0
72.5- 72.9	92.0
72.0- 72.4	92.0
71.5- 71.9	92.0
71.0- 71.4	92.0
70.5- 70.9	92.0
70.0- 70.4	96.0
69.5- 69.9	96.0
69.0- 69.4	96.0
68.5- 68.9	96.0
68.0- 68.4	96.0
67.5- 67.9	96.0
67.0- 67.4	96.0
66.5- 66.9	96.0
66.0- 66.4	96.0
65.5- 65.9	96.0
65.0- 65.4	96.0
64.5- 64.9	96.0
64.0- 64.4	96.0
63.5- 63.9	96.0
63.0- 63.4	96.0
62.5- 62.9	96.0
62.0- 62.4	96.0
61.5- 61.9	96.0
61.0- 61.4	96.0
60.5- 60.9	96.0
60.0- 60.4	96.0
59.5- 59.9	100.0
59.0- 59.4	100.0
58.5- 58.9	100.0
58.0- 58.4	100.0
57.5- 57.9	100.0
57.0- 57.4	100.0
56.5- 56.9	100.0
56.0- 56.4	100.0
55.5- 55.9	100.0
55.0- 55.4	100.0

SAMPLE SIZE	25
MEAN L(A)	77.6
STD. DEV.	5.4
LEQ	80.7

KANSAS CITY, MO SITE 2 45 MPH

PERCENTAGE OF VEHICLES WITHIN OR ABOVE A GIVEN SOUND LEVEL INTERVAL

L(A)	3&6 ALL	3&6 A&B	3&6 N&V	IMP ALL	IMP A&B	VOID	IMP N&V	PNT ALL	BUG ALL
99.5- 99.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
99.0- 99.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
98.5- 98.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
98.0- 98.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
97.5- 97.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
97.0- 97.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
96.5- 96.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
96.0- 96.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
95.5- 95.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
95.0- 95.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
94.5- 94.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
94.0- 94.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
93.5- 93.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
93.0- 93.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
92.5- 92.9	0.4	5.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
92.0- 92.4	0.4	5.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
91.5- 91.9	0.7	10.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
91.0- 91.4	0.7	10.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
90.5- 90.9	0.7	10.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
90.0- 90.4	0.7	10.5	0.0	0.0	0.0	0.0	0.0	0.0	5.6
89.5- 89.9	0.7	10.5	0.0	0.0	0.0	0.0	0.0	0.0	5.6
89.0- 89.4	0.7	10.5	0.0	0.0	0.0	0.0	0.0	0.0	5.6
88.5- 88.9	0.7	10.5	0.0	0.0	0.0	0.0	0.0	0.0	5.6
88.0- 88.4	0.7	10.5	0.0	0.0	0.0	0.0	0.0	0.0	5.6
87.5- 87.9	0.7	10.5	0.0	0.0	0.0	0.0	0.0	0.0	5.6
87.0- 87.4	0.7	10.5	0.0	0.0	0.0	0.0	0.0	0.0	5.6
86.5- 86.9	1.4	21.1	0.0	0.0	0.0	0.0	0.0	0.0	5.6
86.0- 86.4	1.4	21.1	0.0	0.0	0.0	0.0	0.0	0.0	5.6
85.5- 85.9	1.4	21.1	0.0	0.0	0.0	0.0	0.0	0.0	5.6
85.0- 85.4	2.1	31.6	0.0	0.0	0.0	0.0	0.0	0.0	5.6
84.5- 84.9	2.1	31.6	0.0	0.0	0.0	0.0	0.0	0.0	5.6
84.0- 84.4	2.1	31.6	0.0	0.0	0.0	0.0	0.0	0.0	5.6
83.5- 83.9	2.5	36.8	0.0	0.0	0.0	0.0	0.0	0.0	5.6
83.0- 83.4	2.8	42.1	0.0	0.0	0.0	0.0	0.0	0.0	5.6
82.5- 82.9	3.2	42.1	0.4	0.0	0.0	0.0	0.0	0.0	5.6
82.0- 82.4	3.2	42.1	0.4	0.0	0.0	0.0	0.0	0.0	5.6
81.5- 81.9	3.5	42.1	0.8	0.0	0.0	0.0	0.0	0.0	11.1
81.0- 81.4	3.5	42.1	0.8	2.1	33.3	33.3	0.0	0.0	11.1
80.5- 80.9	3.9	42.1	1.1	2.1	33.3	33.3	0.0	0.0	11.1
80.0- 80.4	3.9	42.1	1.1	2.1	33.3	33.3	0.0	0.0	22.2
79.5- 79.9	4.6	47.4	1.5	2.1	33.3	33.3	0.0	0.0	22.2
79.0- 79.4	5.3	52.6	1.9	4.2	66.7	66.7	0.0	4.3	22.2
78.5- 78.9	5.3	52.6	1.9	4.2	66.7	66.7	0.0	4.3	33.3

78.0- 78.4	6.0	63.2	1.9	4.2	66.7	66.7	0.0	4.3	38.9
77.5- 77.9	6.7	63.2	2.7	4.2	66.7	66.7	0.0	4.3	44.4
77.0- 77.4	8.1	73.7	3.4	4.2	66.7	66.7	0.0	4.3	44.4
76.5- 76.9	9.2	78.9	4.2	4.2	66.7	66.7	0.0	4.3	44.4
76.0- 76.4	10.2	78.9	5.3	4.2	66.7	66.7	0.0	4.3	50.0
75.5- 75.9	13.6	78.9	9.1	4.2	66.7	66.7	0.0	4.3	66.7
75.0- 75.4	14.5	84.2	9.5	4.2	66.7	66.7	0.0	4.3	66.7
74.5- 74.9	15.9	84.2	11.0	6.3	100.0	100.0	0.0	26.1	66.7
74.0- 74.4	18.7	84.2	14.0	6.3	100.0	100.0	0.0	30.4	77.3
73.5- 73.9	20.5	84.2	15.9	16.7	100.0	100.0	11.1	39.1	77.8
73.0- 73.4	23.3	84.2	18.9	18.8	100.0	100.0	13.3	43.5	77.8
72.5- 72.9	26.5	84.2	22.3	27.1	100.0	100.0	22.2	47.8	77.8
72.0- 72.4	28.6	84.2	24.6	35.4	100.0	100.0	31.1	52.2	88.9
71.5- 71.9	33.9	89.5	29.9	45.8	100.0	100.0	42.2	69.6	94.4
71.0- 71.4	39.2	94.7	35.2	52.1	100.0	100.0	48.9	78.3	94.4
70.5- 70.9	46.6	94.7	43.2	54.2	100.0	100.0	51.1	82.6	100.0
70.0- 70.4	52.7	94.7	49.6	60.4	100.0	100.0	57.8	87.0	100.0
69.5- 69.9	58.3	94.7	55.7	66.7	100.0	100.0	64.4	91.3	100.0
69.0- 69.4	66.1	94.7	64.0	72.9	100.0	100.0	71.1	91.3	100.0
68.5- 68.9	73.9	100.0	72.0	81.3	100.0	100.0	80.0	91.3	100.0
68.0- 68.4	78.4	100.0	76.9	83.3	100.0	100.0	82.2	91.3	100.0
67.5- 67.9	83.7	100.0	82.6	85.4	100.0	100.0	84.4	95.7	100.0
67.0- 67.4	88.0	100.0	87.1	85.4	100.0	100.0	84.4	95.7	100.0
66.5- 66.9	90.3	100.0	89.8	89.6	100.0	100.0	88.9	100.0	100.0
66.0- 66.4	91.9	100.0	91.3	95.8	100.0	100.0	95.6	100.0	100.0
65.5- 65.9	92.9	100.0	92.4	95.8	100.0	100.0	95.6	100.0	100.0
65.0- 65.4	94.3	100.0	93.9	95.8	100.0	100.0	95.6	100.0	100.0
64.5- 64.9	95.1	100.0	95.8	97.9	100.0	100.0	97.8	100.0	100.0
64.0- 64.4	97.2	100.0	97.0	100.0	100.0	100.0	100.0	100.0	100.0
63.5- 63.9	97.9	100.0	97.7	100.0	100.0	100.0	100.0	100.0	100.0
63.0- 63.4	98.6	100.0	98.5	100.0	100.0	100.0	100.0	100.0	100.0
62.5- 62.9	98.9	100.0	98.9	100.0	100.0	100.0	100.0	100.0	100.0
62.0- 62.4	99.6	100.0	99.6	100.0	100.0	100.0	100.0	100.0	100.0
61.5- 61.9	99.6	100.0	99.6	100.0	100.0	100.0	100.0	100.0	100.0
61.0- 61.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
60.5- 60.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
60.0- 60.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
59.5- 59.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
59.0- 59.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
58.5- 58.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
58.0- 58.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
57.5- 57.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
57.0- 57.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
56.5- 56.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
56.0- 56.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
55.5- 55.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
55.0- 55.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
SAMPLE SIZE	283	19	264	48	3	3	45	23	18
MEAN L(A)	70.9	80.4	70.2	73.8	79.5	78.5	72.3	72.5	77.0
STD. DEV.	4.5	6.5	3.4	3.2	2.8	2.8	2.5	2.6	4.5
LEQ	75.5	85.0	71.6	72.3	79.3	79.3	73.9	73.3	80.0

S. CALIFORNIA SITE 1 40 MPH

PERCENTAGE OF VEHICLES WITHIN OR ABOVE A GIVEN SOUND LEVEL INTERVAL

L(A)	S&6 ALL	8&6 A&B	3&6 N&V	IMP	VOID	IMP A&B	IMP N&V	PNT ALL	BUG ALL
99.5- 99.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
99.0- 99.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
98.5- 98.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
98.0- 98.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
97.5- 97.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
97.0- 97.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
96.5- 96.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
96.0- 96.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
95.5- 95.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
95.0- 95.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
94.5- 94.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
94.0- 94.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
93.5- 93.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
93.0- 93.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
92.5- 92.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
92.0- 92.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
91.5- 91.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
91.0- 91.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2
90.5- 90.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2
90.0- 90.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2
89.5- 89.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2
89.0- 89.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2
88.5- 88.9	0.1	1.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2
88.0- 88.4	0.3	2.1	0.0	0.0	0.0	0.0	0.0	0.0	1.2
87.5- 87.9	0.3	2.1	0.0	0.0	0.0	0.0	0.0	0.0	2.4
87.0- 87.4	0.3	2.1	0.0	0.0	0.0	0.0	0.0	0.0	2.4
86.5- 86.9	0.3	2.1	0.0	0.0	0.0	0.0	0.0	0.0	3.5
86.0- 86.4	0.3	2.1	0.0	0.0	0.0	0.0	0.0	0.0	3.5
85.5- 85.9	0.3	2.1	0.0	0.0	0.0	0.0	0.0	0.0	3.5
85.0- 85.4	0.3	2.1	0.0	0.0	0.0	0.0	0.0	0.0	4.7
84.5- 84.9	0.3	2.1	0.0	0.0	0.0	0.0	0.0	0.0	4.7
84.0- 84.4	0.3	2.1	0.0	0.0	0.0	0.0	0.0	0.0	4.7
83.5- 83.9	0.4	3.1	0.0	0.0	0.0	0.0	0.0	0.0	5.9
83.0- 83.4	0.4	3.1	0.0	0.0	0.0	0.0	0.0	0.0	5.9
82.5- 82.9	0.5	3.1	0.1	0.0	0.0	0.0	0.0	0.0	5.9
82.0- 82.4	0.5	4.1	0.1	0.0	0.0	0.0	0.0	0.0	8.2
81.5- 81.9	0.6	4.1	0.1	0.7	6.7	5.7	0.4	0.0	9.4
81.0- 81.4	0.9	6.2	0.1	0.7	6.7	6.7	0.4	0.0	10.6
80.5- 80.9	1.1	8.2	0.1	0.7	6.7	6.7	0.4	1.3	11.8
80.0- 80.4	1.1	8.2	0.1	0.7	6.7	6.7	0.4	1.3	12.9
79.5- 79.9	1.3	9.3	0.1	1.1	13.3	13.3	0.4	2.5	15.3
79.0- 79.4	1.6	12.4	0.1	1.4	13.3	13.3	0.7	2.5	15.5
78.5- 78.9	2.3	16.5	0.3	1.8	20.0	20.0	0.7	2.5	21.2

78.0- 78.4	2.4	17.5	0.3	2.1	20.0	20.0	1.1	3.8	27.1
77.5- 77.9	2.9	21.6	0.3	2.3	20.0	20.0	1.9	5.0	30.5
77.0- 77.4	3.8	24.7	0.9	2.8	20.0	20.0	1.9	5.0	38.3
76.5- 76.9	4.1	27.8	0.9	3.2	20.0	20.0	2.2	7.5	43.5
76.0- 76.4	4.6	28.9	1.3	3.9	26.7	26.7	2.6	10.0	47.1
75.5- 75.9	5.0	30.9	1.4	6.7	46.7	46.7	4.5	11.3	51.8
75.0- 75.4	6.6	37.1	2.4	9.2	53.3	53.3	6.7	13.8	60.0
74.5- 74.9	7.5	39.2	3.1	12.0	60.0	60.0	9.3	13.8	62.4
74.0- 74.4	8.9	44.3	4.0	14.1	66.7	66.7	11.2	16.3	65.9
73.5- 73.9	10.4	46.4	5.4	16.2	73.3	73.3	13.0	18.8	72.9
73.0- 73.4	12.5	51.5	7.1	19.7	80.0	80.0	16.4	25.0	76.5
72.5- 72.9	14.5	56.7	9.0	23.2	85.7	86.7	19.7	31.3	80.0
72.0- 72.4	18.5	59.8	12.8	27.5	93.3	93.3	23.8	33.8	82.4
71.5- 71.9	22.3	63.9	16.5	31.0	93.3	93.3	27.5	41.3	87.1
71.0- 71.4	26.3	72.2	19.9	37.7	93.3	93.3	34.6	50.0	90.6
70.5- 70.9	29.9	73.2	23.9	41.2	93.3	93.3	38.3	53.8	94.1
70.0- 70.4	36.2	81.4	29.9	45.4	100.0	100.0	42.4	57.5	96.5
69.5- 69.9	43.3	85.6	37.5	52.1	100.0	100.0	49.4	50.0	98.8
69.0- 69.4	50.2	87.6	45.0	60.6	100.0	100.0	58.4	67.5	98.8
68.5- 68.9	56.6	88.7	52.1	65.8	100.0	100.0	63.9	73.8	100.0
68.0- 68.4	64.8	93.8	60.3	70.4	100.0	100.0	68.8	76.3	100.0
67.5- 67.9	70.7	94.8	67.4	76.8	100.0	100.0	75.5	78.8	100.0
67.0- 67.4	77.7	96.9	75.1	81.7	100.0	100.0	80.7	82.5	100.0
66.5- 66.9	82.5	97.9	80.3	87.3	100.0	100.0	86.6	87.5	100.0
66.0- 66.4	86.4	97.9	84.8	90.1	100.0	100.0	89.6	91.3	100.0
65.5- 65.9	91.4	100.0	90.2	91.5	100.0	100.0	91.1	95.0	100.0
65.0- 65.4	94.1	100.0	93.3	93.3	100.0	100.0	92.9	96.3	100.0
64.5- 64.9	95.6	100.0	95.0	96.1	100.0	100.0	95.9	96.3	100.0
64.0- 64.4	96.9	100.0	96.4	97.2	100.0	100.0	97.0	96.3	100.0
63.5- 63.9	98.4	100.0	98.1	98.2	100.0	100.0	98.1	97.5	100.0
63.0- 63.4	99.0	100.0	98.9	98.6	100.0	100.0	98.5	97.5	100.0
62.5- 62.9	99.5	100.0	99.4	98.9	100.0	100.0	98.9	98.8	100.0
62.0- 62.4	99.5	100.0	99.6	99.3	100.0	100.0	99.3	100.0	100.0
61.5- 61.9	99.6	100.0	99.8	99.6	100.0	100.0	99.6	100.0	100.0
61.0- 61.4	99.7	100.0	99.7	100.0	100.0	100.0	100.0	100.0	100.0
60.5- 60.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
60.0- 60.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
59.5- 59.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
59.0- 59.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
58.5- 58.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
58.0- 58.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
57.5- 57.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
57.0- 57.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
56.5- 56.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
56.0- 56.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
55.5- 55.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
55.0- 55.4	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
SAMPLE SIZE	799	97	702	234	15	15	269	80	85
MEAN L(A)	69.4	73.8	68.3	70.8	75.2	75.2	69.7	70.7	75.0
STD. DEV.	3.5	4.5	2.8	3.5	2.9	2.9	3.3	3.7	4.2
LEQ	71.5	76.9	69.8	71.6	76.3	76.3	71.1	72.4	78.5

S. CALIFORNIA SITE 1 40MPH (CONT)

PERCENTAGE OF VEHICLES WITHIN OR ABOVE A GIVEN SOUND LEVEL INTERVAL

L(A)	M/C ALL
99.5- 99.9	0.0
99.0- 99.4	0.0
98.5- 98.9	0.0
98.0- 98.4	0.0
97.5- 97.9	0.0
97.0- 97.4	0.0
96.5- 96.9	0.0
96.0- 96.4	0.0
95.5- 95.9	0.0
95.0- 95.4	0.0
94.5- 94.9	4.8
94.0- 94.4	4.8
93.5- 93.9	4.8
93.0- 93.4	4.8
92.5- 92.9	4.8
92.0- 92.4	9.5
91.5- 91.9	19.0
91.0- 91.4	19.0
90.5- 90.9	23.8
90.0- 90.4	23.8
89.5- 89.9	23.8
89.0- 89.4	23.8
88.5- 88.9	23.8
88.0- 88.4	23.8
87.5- 87.9	23.8
87.0- 87.4	23.8
86.5- 86.9	23.8
86.0- 86.4	28.6
85.5- 85.9	28.6
85.0- 85.4	28.6
84.5- 84.9	33.3
84.0- 84.4	33.3
83.5- 83.9	38.1
83.0- 83.4	42.9
82.5- 82.9	42.9
82.0- 82.4	47.6
81.5- 81.9	47.6
81.0- 81.4	52.4
80.5- 80.9	61.9
80.0- 80.4	61.9
79.5- 79.9	61.9
79.0- 79.4	61.9
78.5- 78.9	61.9

78.0- 78.4	66.7
77.5- 77.9	66.7
77.0- 77.4	66.7
76.5- 76.9	66.7
76.0- 76.4	71.4
75.5- 75.9	71.4
75.0- 75.4	76.2
74.5- 74.9	76.2
74.0- 74.4	81.0
73.5- 73.9	85.7
73.0- 73.4	85.7
72.5- 72.9	90.5
72.0- 72.4	90.5
71.5- 71.9	90.5
71.0- 71.4	90.5
70.5- 70.9	90.5
70.0- 70.4	95.2
69.5- 69.9	95.2
69.0- 69.4	95.2
68.5- 68.9	100.0
68.0- 68.4	100.0
67.5- 67.9	100.0
67.0- 67.4	100.0
66.5- 66.9	100.0
66.0- 66.4	100.0
65.5- 65.9	100.0
65.0- 65.4	100.0
64.5- 64.9	100.0
64.0- 64.4	100.0
63.5- 63.9	100.0
63.0- 63.4	100.0
62.5- 62.9	100.0
62.0- 62.4	100.0
61.5- 61.9	100.0
61.0- 61.4	100.0
60.5- 60.9	100.0
60.0- 60.4	100.0
59.5- 59.9	100.0
59.0- 59.4	100.0
58.5- 58.9	100.0
58.0- 58.4	100.0
57.5- 57.9	100.0
57.0- 57.4	100.0
56.5- 56.9	100.0
56.0- 56.4	100.0
55.5- 55.9	100.0
55.0- 55.4	100.0

SAMPLE SIZE	21
MEAN L(A)	81.5
STD. DEV.	7.5
LEQ	87.0

APPENDIX D. MOTOR VEHICLE NOISE ASSESSMENT WORKSHEET.

Site Description: ____________________

Vehicle Category: ____________________

1. Nondefective/Modified L_{50} = L_{50} (NON) = [ ]

2. Values Needed for Fig. 14 or 16:

   2.1 L_{ave} of audibly defective/modified vehicles = L_{ave} (D/M) = ____________

   2.2 L_{ave} of audibly nondefective/modified vehicles = L_{ave} (NON) = ____________

   2.3 L_{ave} (D/M) - L_{ave} (NON) = [ ]

3. Values Needed for Fig. 15 or 17:

   3.1 L_{ave} of all vehicles = L_{ave} (ALL) = ____________

   3.2 L_{ave} of audibly nondefective/modified vehicles = L_{ave} (NON) = ____________

   3.3 L_{ave} (ALL) - L_{ave} (NON) = [ ]