

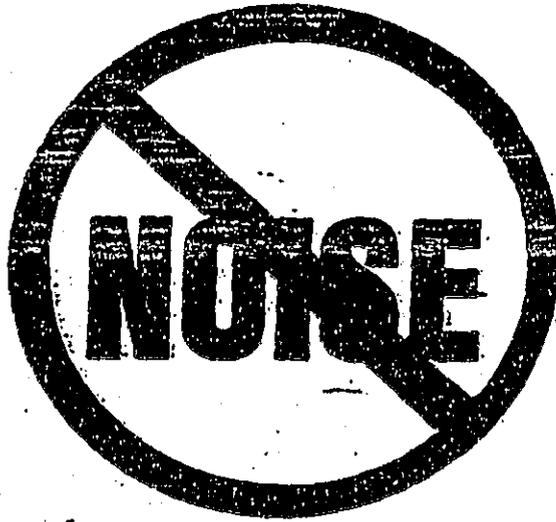
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United States  
Environmental Protection  
Agency

EPA 550/9-82-429

GUIDANCE MANUAL FOR POLICE IN STATE AND LOCAL NOISE  
ENFORCEMENT PROCEDURES



U.S. ENVIRONMENTAL PROTECTION AGENCY  
OFFICE OF NOISE ABATEMENT AND CONTROL  
WASHINGTON D.C. 20460

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PREFACE

This guidance manual for state and local police officers and law enforcement personnel was prepared for the Office of Noise Abatement and Control of the United States Environmental Protection Agency as part of its mandate under the Noise Control Act (P.L. 92-574, 42 U.S.C. 4901 et seq. Supp. 1978). The purpose of the manual is to provide law enforcement personnel with the necessary technical skills to enforce State and Local Motor Vehicle Noise Laws.

The proper enforcement of motor vehicle noise violations requires the noise enforcement officer to develop specific technical skills, both in the use of noise measuring equipment as well as in the application of police practice to noise enforcement. The importance of training is critical where the enforcement officer is utilizing a sound level meter to measure the violation.<sup>1</sup>

<sup>1</sup>See State v. Aquilera, Fla. Supp. 979; No. 711-1015 (County Court Traffic Division, Dade County Florida, May 7, 1978) where the Court decided that the reliability of a radar reading would not be accepted as evidence that a violation occurred beyond a reasonable doubt. The Court held that the equipment must be improved and that training methods for enforcement officers must include an intensive course of study in both the classroom and the field with a written examination for proof of the qualifications of the officer who operates the equipment.

This manual has been written for use both by the police officer who is charged with enforcement responsibilities as well as his supervisor. Each section of the manual corresponds to the modules of the Police Noise Enforcement Program as developed by the International Brotherhood of Police Officers. An Instructor's guide is provided for each module.

The manual may be used in its entirety or section by section, depending on local needs.

MODULE I:  
The Physics of Sound

I. A. Basics of Sound and Sound Measurement

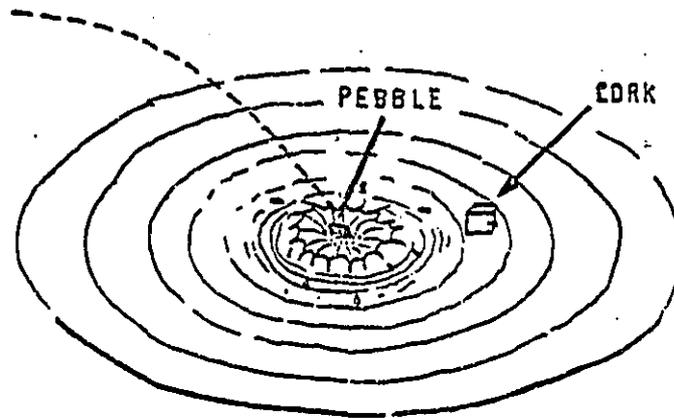
I. A. I. Sound and Noise

SOUND IS PRODUCED BY VIBRATING OBJECTS. Common examples which easily demonstrate this concept are drums, tuning forks, guitar strings, musical reeds, and vocal chords. The vibrating object causes air particles to move with it. As the vibrating object moves back and forth it causes the air around it to carry these vibrations away from it in the form of waves.

Sound is a series of disturbances which travel in the form of waves, similar to waves in the ocean. Sound waves are given off in all directions as when a pebble is gently dropped into a pond and small ripples, or waves, travel outward from the point where the pebble struck the water's surface.

WAVES IN A POND

GRAPHIC I.



For example, if there is a cork floating on the surface of a pond, the cork will bob up and down at a point as the waves pass by. When sound waves pass through the air, the air molecules oscillate in a similar manner about their undisturbed position.

The motion of the cork illustrates three important characteristics of waves: magnitude, frequency, and variation with time.

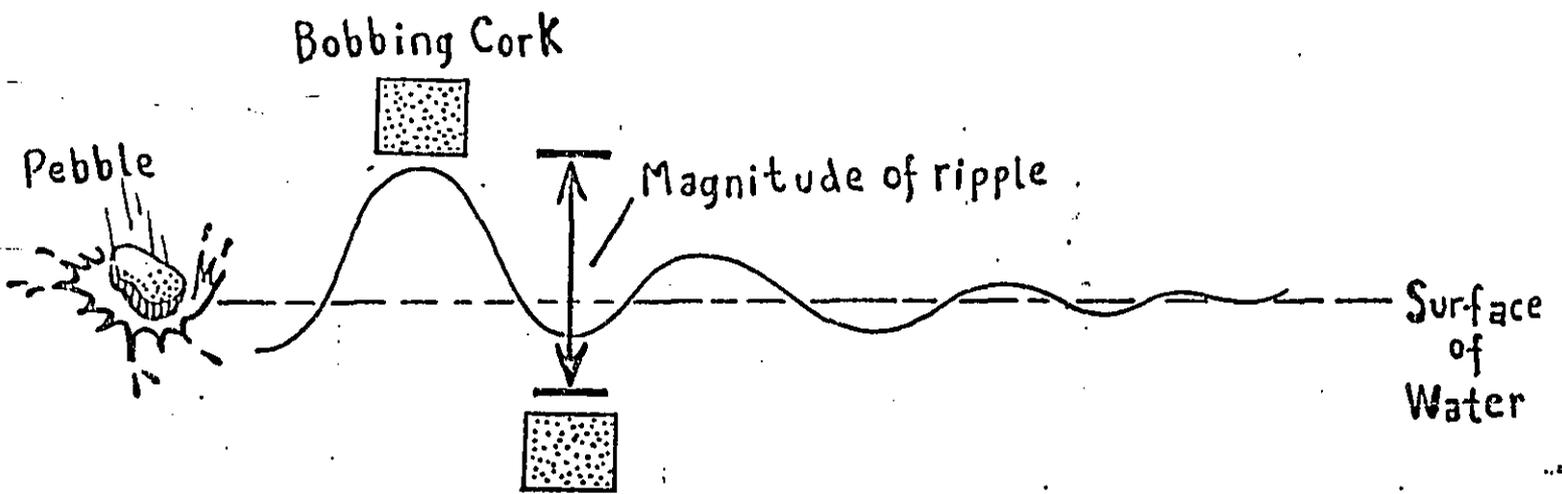
The magnitude of the wave is the vertical displacement of the cork from the still water surface.

The number of times the cork oscillates up and down per unit of time represents the frequency of the wave motion.

GRAPHIC 2.

Enlarged cross-sectional view of ripple:

GRAPHIC 2.



... as distance from disturbance (pebble) increases,  
magnitude of wave or ripple decreases.

— If you drop only a few pebbles in the pond, the ripples would disappear after a short time. But if you constantly stir the water in phase with the waves, the ripples would continue.

I. A. 2. How Sound Travels

Sound cannot travel in a vacuum; it requires a medium, or substance, in which the molecules can "bump" against each other. Air, water and solids provide the medium.

Sound waves in air are actually pressure waves. The vibrating sound source creates regions of high pressure (compression) as it moves out and low pressure regions (rarefactions) as it moves back in. These high and low pressure waves move out from the sound source in all directions.

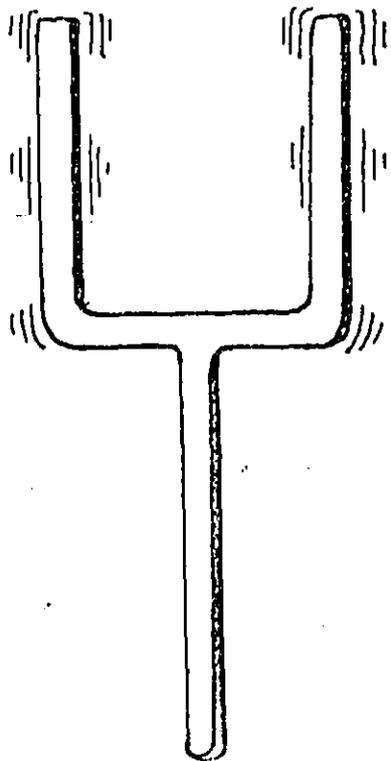
GRAPHIC NO. 3

Sound travels at a rate known as the speed of sound. These "sound waves" travel at 770 miles per hour (1128 feet/sec.) at sea level and "standard conditions". Naturally, as you move away from the sound source, the vibration energy that gets transmitted to the air gets weaker because all this energy is spreading to larger and larger circles around the source. Therefore, the further away you are from the sound source, the lower the sound level. This is called the attenuation of level with distance.

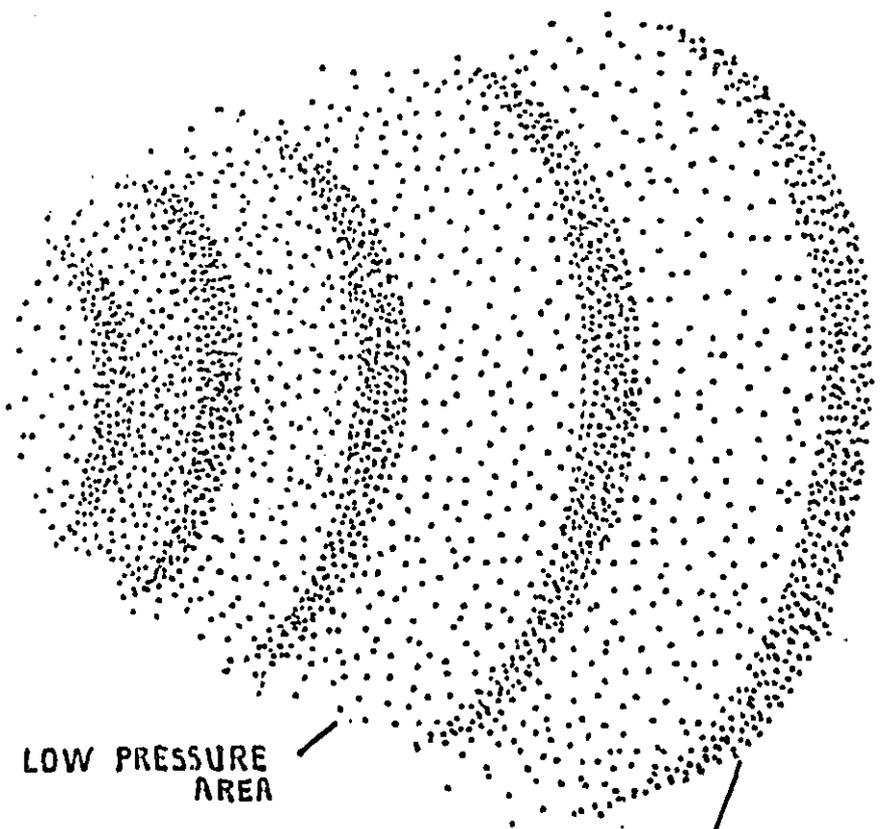
I. A. 3. Frequency

So far, we have only considered the magnitude or level of sound. But sounds have other properties. The "character" of a sound depends on the frequency or pitch of a sound.

# How Sound Travels:



Vibrating Source  
(TUNING FORK)



LOW PRESSURE  
AREA

HIGH PRESSURE  
AREA

GRAPHIC 3.

Consider the example of a loudspeaker. When the diaphragm of the loudspeaker moves back and forth, fluctuations in the air are generated in the form of sound waves. The number of complete to-and-fro vibrations that the sound source, and hence the particles in the medium, make in one second is called the frequency.

GRAPHIC 4.

The frequency of the sound is the same as the frequency at which the diaphragm moves back and forth. Frequency is expressed in cycles per second, also called Hertz (Hz). For example, if the loudspeaker diaphragm moves back and forth 75 times every second continuously, the frequency of sound waves generated will be 75 cycles per second or 75 Hz.

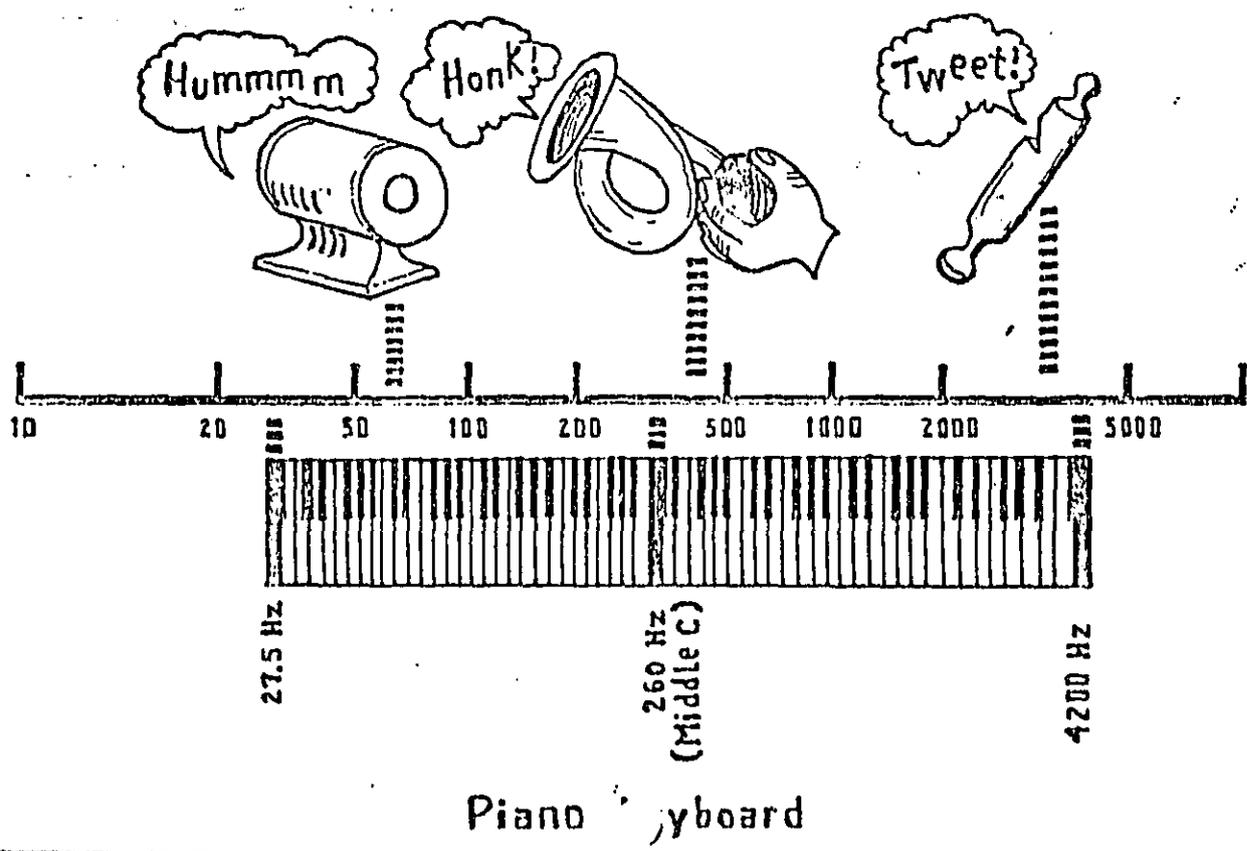
Frequency is important because the ear does not respond to low and high frequency sounds equally well.

GRAPHIC 5.

It is important to know how the ear responds to different frequencies if we are to make a sound level meter respond in a similar way.

GRAPHIC 4.

# Single Frequency Sounds



# Sound Intensity

Intensity decreases with distance from source because sound spreads out...



I. A. 4. Decibels

Sound measurement is characterized by (1) intensity, (2) frequency and (3) duration. The decibel (dB) is a unit for measuring the magnitude of sound.

A decibel is not a fixed value. It is simply a ratio, indicating the proportion by which one value is greater or less than another. For example, a sound of 10 decibels transmits 10 times as much energy as a 0 decibel sound, a sound of 20 decibels transmits 100 times as much energy as a 0 decibel sound, a sound of 30 decibels transmits 1,000 times as much, and so on.

Sound level meters read directly in decibels. However, the officer must know something about the way several sound sources may interact and affect the decibel reading registered on the sound level meter. Consider two sources that, when measured alone, each register 80 dB. Now, if these two sources are on simultaneously, the meter would register 83 dB. Three 80 dB sources, all on at once, register 85 dB, and 10 sources at once would register 90 dB.

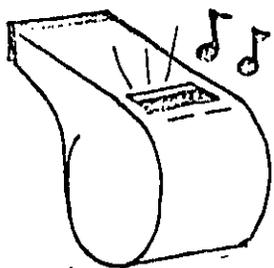
GRAPHIC 6.

Table I. 1. Outlines this example.

Table I. 1

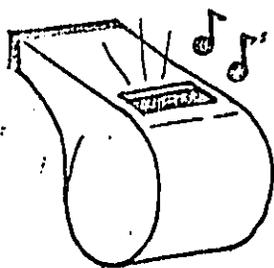
| Increase in Acoustic Power | Increase in Decibels |
|----------------------------|----------------------|
| 2 times                    | 3 dB                 |
| 3 times                    | 5 dB                 |
| 10 times                   | 10 dB                |

# Combining Sound Pressure Levels :



each Source individually  
Produces :

← 80 dBA



← 80 dBA

Together they  
Produce :

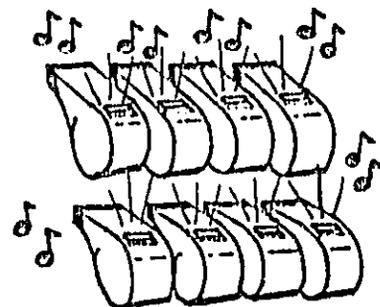
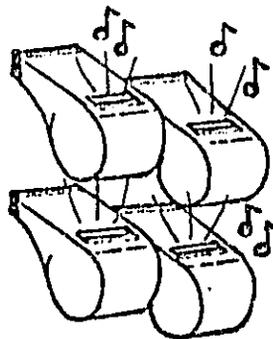
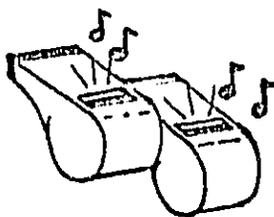
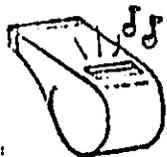
83 dBA

1 SOURCE (80 dBA)

2 SOURCES  
(83 dBA)

4 SOURCES  
(86 dBA)

8 SOURCES  
(89 dBA)



The problem of how adding noise sources together affects the total sound level in decibels has just been answered. However, the next question is how are such changes in sound level perceived in terms of changes in loudness? Not as you might think! For example, a 3 dB increase is barely detectable, a 5 dB increase is clearly detectable, and a 10 dB increase is judged subjectively as TWICE as loud!! Summarizing:

|       |   |                    |
|-------|---|--------------------|
| + 1dB | : | not detectable     |
| + 3dB | : | just detectable    |
| + 5dB | : | clearly detectable |
| +10dB | : | twice (2) as loud  |

Therefore, IF A VEHICLE IS OBVIOUSLY NOISIER THAN OTHERS IN TRAFFIC IT'S AT LEAST 5 dB ABOVE THE REST. A vehicle judged as much louder than the rest, say twice as loud, is around 10 dB noisier.

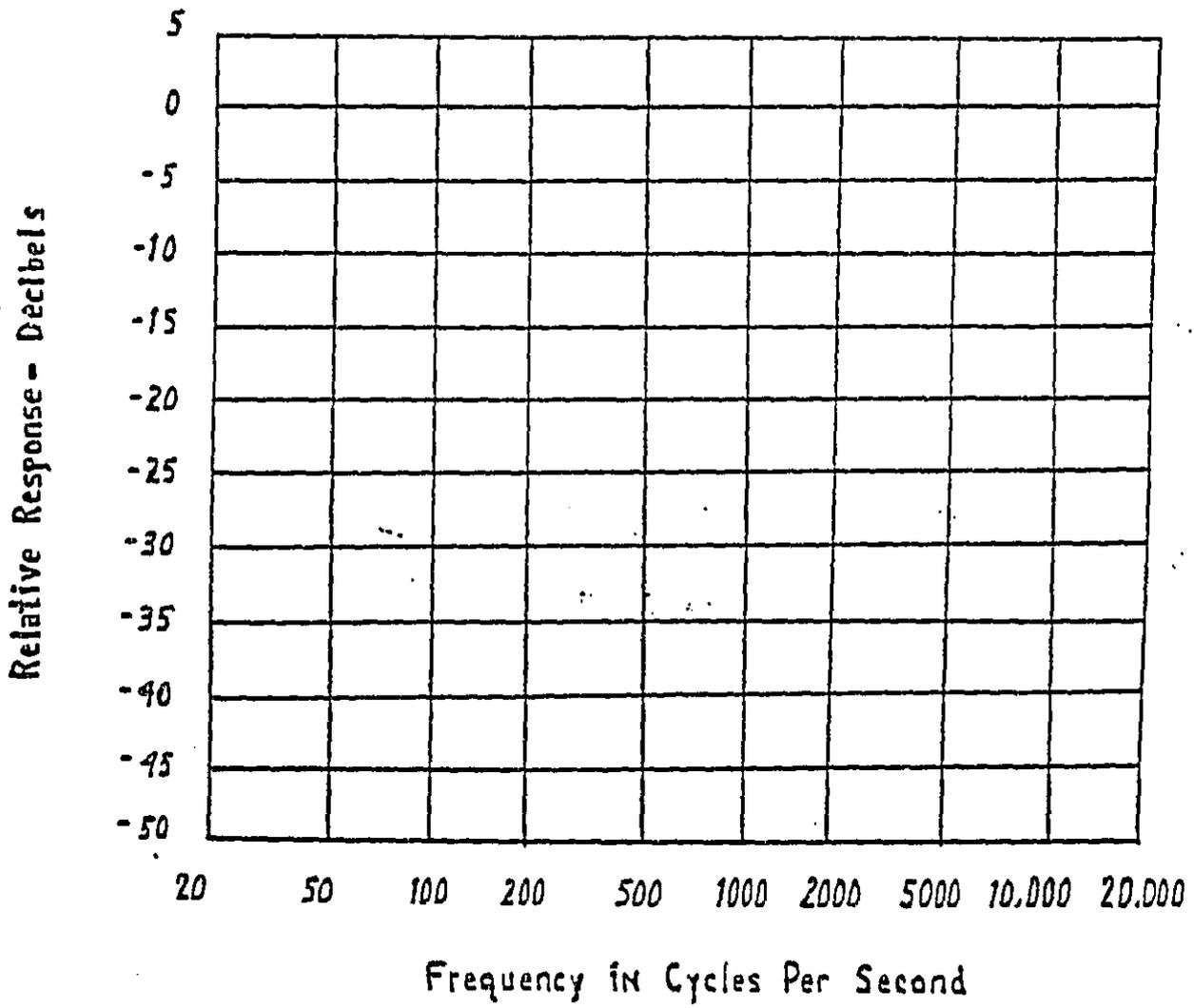
Decibel addition and subtraction as related to actual enforcement methodology is discussed in greater detail in subsequent sections of this manual.

The ear does not respond equally to all frequencies, but is less efficient at low and high frequencies than at medium or speech range frequencies. For this reason, different scales or weightings are applied to the decibel level.

Several weighting scales exist, but most EPA noise criteria are based on the A-weighted decibel scale, abbreviated dB(A). The dB(A) scale shows sound magnitude levels approximating what the human ear would hear because it adjusts for the fact that the ear does not respond equally to low, medium and high range frequency.

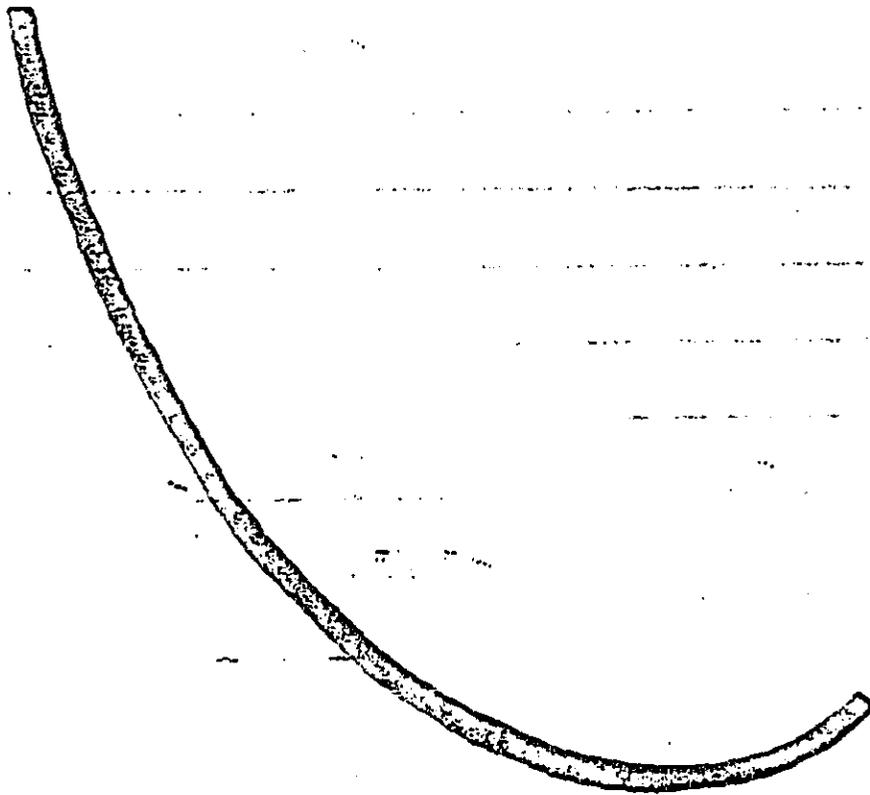
GRAPHIC 7-10

GRAPHIC 7.



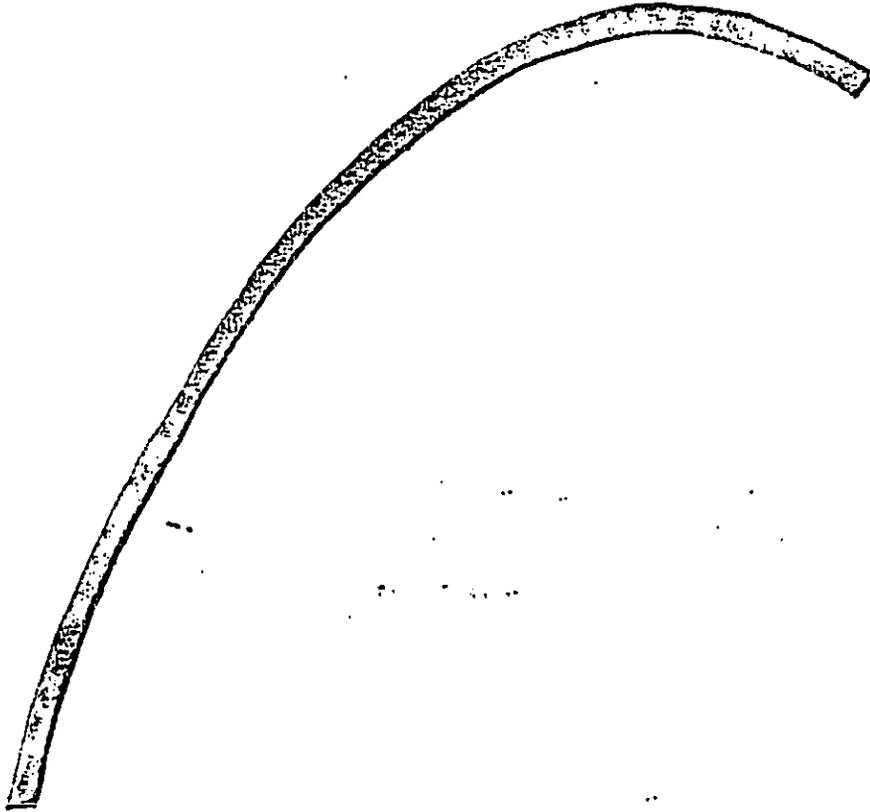
GRAPHIC 8.

Threshold of Hearing :



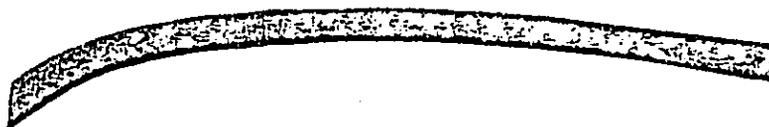
GRAPHIC 9.

"A" Weighted Frequency-Response  
Characteristics :



"C" Weighted Frequency-  
Response

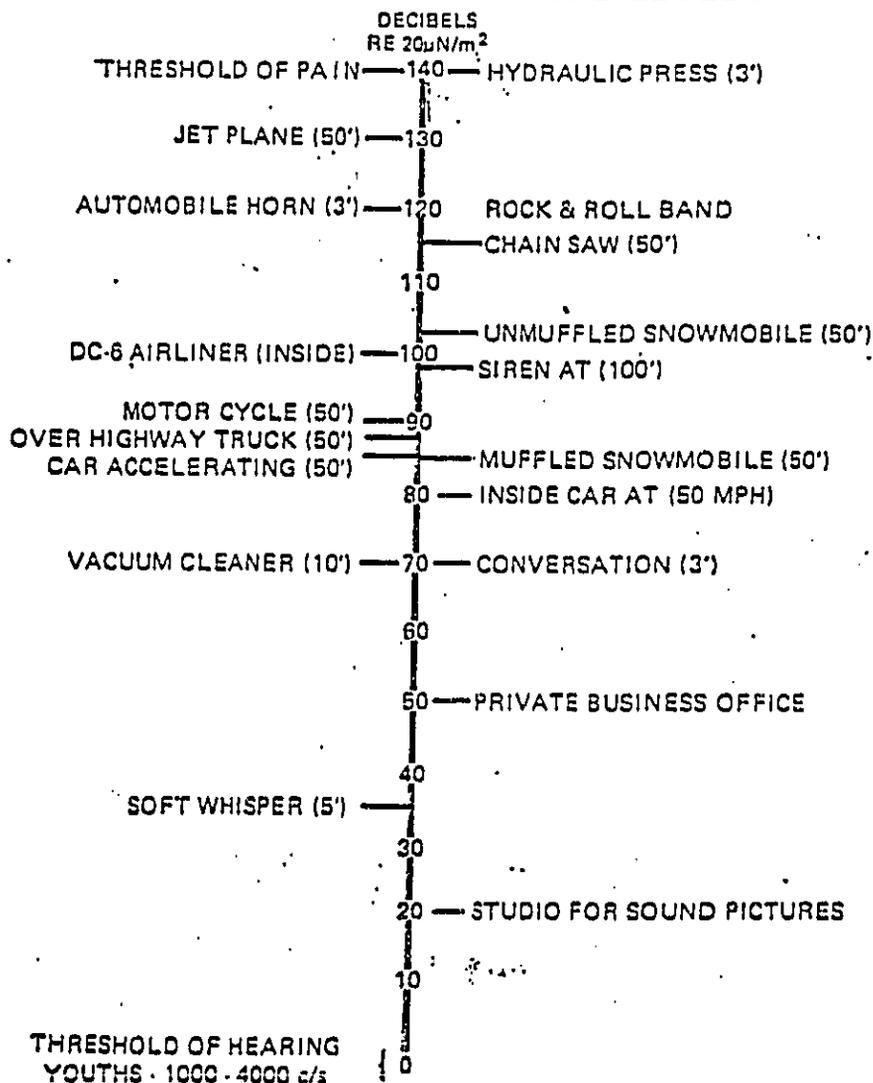
Characteristics :



The A-weighted scale is used in all traffic enforcement work. Table I.2 indicates the typical range of common sounds on an A-weighted scale.

Table I.2

### TYPICAL A-WEIGHTED SOUND LEVELS



I. A. 5 Loudness

The words loudness and magnitude are often used as if they mean the same thing, though they have different meanings. The magnitude of sound refers to the amount of energy flowing in the sound waves. The loudness of sound is the strength of the sensation received by the eardrum and interpreted by the brain.

Therefore, loudness is a subjective response to noise levels. But for any individual, both the magnitude and loudness of a sound depend on four factors: (1) the distance from the source of the sound, (2) the amplitude of vibration, (3) the density of the medium through which the sound travels, and (4) the area of the vibrating object.

The magnitude and loudness of a sound are dissipated as it travels. As the distance increases between the source of the sound and the person or sound measuring device, the energy flowing in the sound waves decreases as it spreads over a greater area.

The loudness and magnitude of a sound decrease as the density of the medium decreases. Thick fabrics, such as fiberglass, cork, acoustic tiles all serve to "soak up" sound by reflecting spaces between the fibers until they dissipate their energy. For example, a car muffler serves to break up the sound waves and lengthen their travel distance to the outside.

The area, or size, of a vibrating object also affects the loudness and magnitude of a sound. The greater the area of vibration, the greater the loudness and magnitude.

The following table show Typical Sound Levels and Relative Loudness.

Table I.3

Typical Sound Levels and Relative Loudness

|       |                                  |                    |
|-------|----------------------------------|--------------------|
| 110   | Rock-Roll Band (15 Ft)           |                    |
| 105   | Jet Takeoff (200 Ft)             | Uncomfortably Loud |
| 100   | Air Compressor (10 Ft)           |                    |
| 98    | Motorcycle (50 Ft)               |                    |
| 98    | Snowmobile (50 Ft)               |                    |
| 95    | Commercial Jet Flyover (500 Ft)  |                    |
| 95    | Auto Horn (25 Ft)                |                    |
| 95    | Power Mower                      |                    |
| 90    | Jackhammer (25 Ft)               | Very Loud          |
| 85    | Garbage Truck (30 Ft)            |                    |
| 80    | Helicopter Flyover (200 Ft)      |                    |
| 75    | Commercial Jet Flyover (3000 Ft) |                    |
| 75    | Dishwasher (5 Ft)                |                    |
| 70    | Electric Can Opener (3 Ft)       | Loud               |
| 70    | Loud TY (10 Ft)                  |                    |
| 60    | Bedroom Air-Conditioner (3 Ft)   |                    |
|       | Speech Communication             |                    |
| 50    | Large Transformer (100 Ft)       |                    |
|       |                                  | Quiet              |
| 40    | Ideal Residential                |                    |
| 30    |                                  |                    |
| dB(A) |                                  |                    |

MODULE I  
The Physics of Sound

1. Sound is a series of disturbances which travels in the form of:
  - a) straight lines
  - b) waves
  - c) circles
  - d) molecules
2. The greater the distance from the sound source:
  - a) the lower the sound level
  - b) the greater the sound level
  - c) does not affect the sound level
  - d) the higher the pitch
3. Frequency is the number of complete to-and-fro cycles that the sound source, and hence the particles in the medium, make in one second:
  - a) true
  - b) false
4. Frequency is expressed in cycles per second or:
  - a) amperes
  - b) miles per hour
  - c) decibels
  - d) hertz
5. Two sound sources, when measured alone, each register 80 dB on the sound level meter. Both sources measured together would register:
  - a) 80 dB
  - b) 160 dB
  - c) 83 dB
  - d) 90 dB
6. If a vehicle is obviously noisier than others in traffic it's at least 5 dB above the rest:
  - a) true
  - b) false
7. The \_\_\_\_\_ decibel scale is used in all traffic enforcement work.
  - a) A-weighted
  - b) B-weighted
  - c) C-weighted
  - d) all of the above
  - e) none of the above

MODULE II:

Instrumentation and Noise Measurement

## II. INSTRUMENTATION AND NOISE MEASUREMENT

### II. A. The Sound Level Meter - Components and Operation

The sound level meter is the basic instrument for measuring overall motor vehicle noise or exhaust system noise (see Table II-1). It consists of a microphone, calibrated amplifier-attenuator circuits, frequency weighting networks, and an indicating meter. The microphone (which may be mounted directly to the SLM or attached by a cable) transforms the acoustic pressure signal received at its diaphragm to an equivalent electrical signal which is then amplified and filtered. The A-weighting filter that is used for vehicle noise measurement causes the meter to essentially respond to the sound in the same fashion as the human ear. The sound pressure signal is then displayed in decibels on the indicating meter face (both digital and standard analog displays may be used).

GRAPHIC 11.

GRAPHIC 11.

# Sound Level Meter Features:

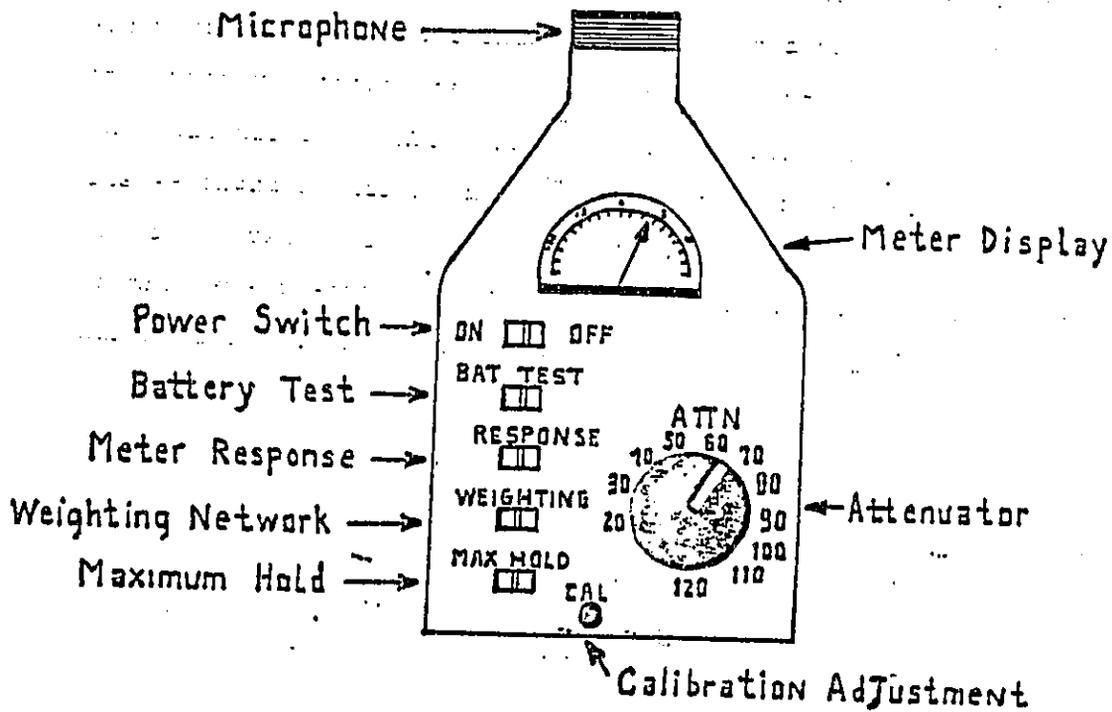


Table II.1

Operating the Sound Level Meter (SLM)

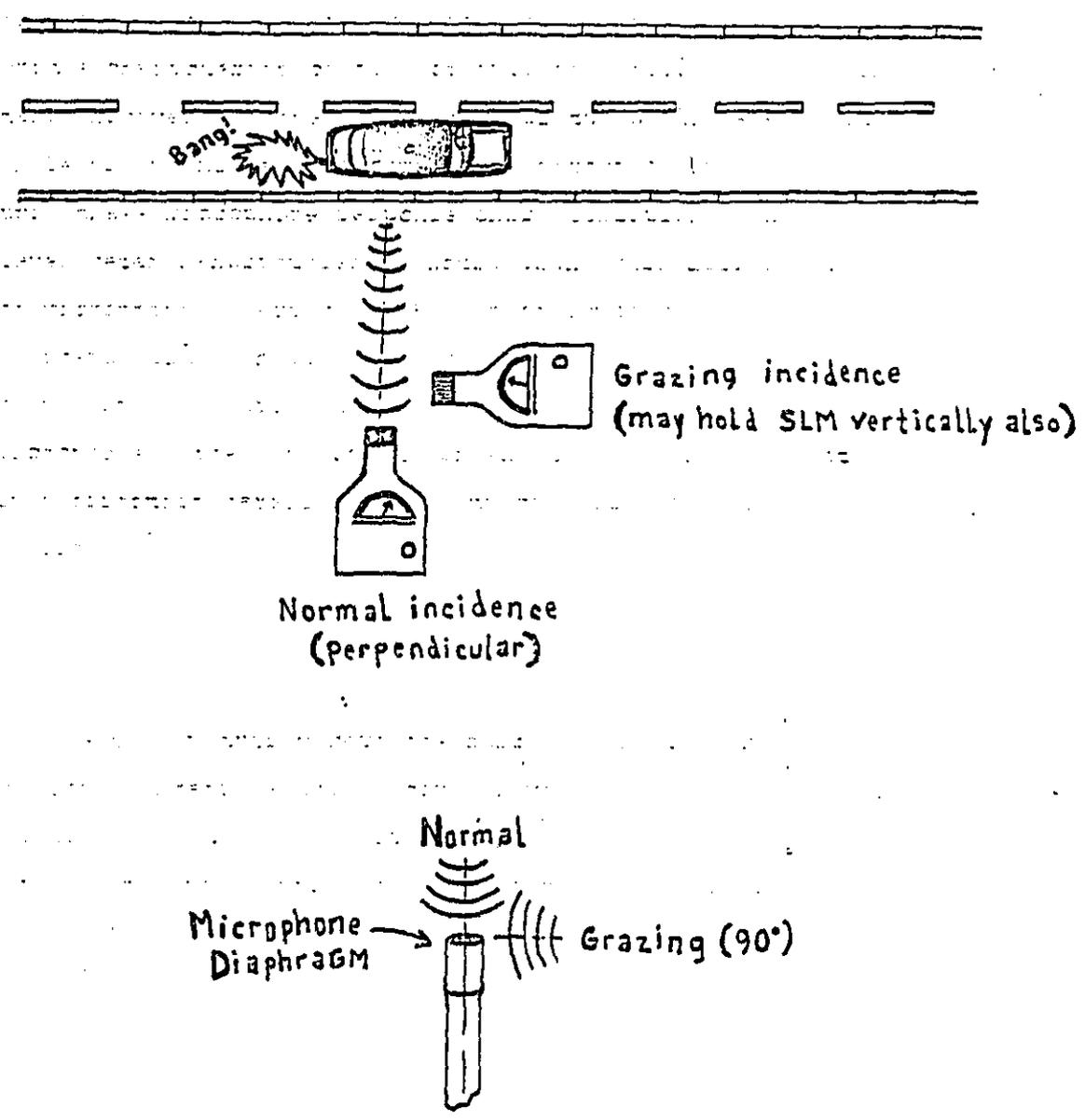
1. Check that the microphone is firmly screwed in and remove the protective dust cover (if one exists).
2. Press the "ON" switch.
3. Press the "BAT. CHECK" switch and note that the pointer lies within the range on the dial marked "BAT." If it does not, DO NOT USE THE METER until the batteries have been replaced and the battery check is satisfactory.
4. Calibrate the Meter (see Calibration check list).
5. Measure Sound Level as follows:
  - (a) Set "Range Switch" to a value which will indicate levels exceeding the maximum permitted limit.
  - (b) Set meter response position to "FAST".
  - (c) Check that the "A" button is depressed (if SLM is designed to measure more than one weighting).
  - (d) Orient meter to the noise source.
  - (e) The meter scale reading is then the SOUND LEVEL in dBA.

Sound level meters are supplied with microphones that have either normal (perpendicular) incidence or grazing incidence response characteristics. The details of these response characteristics are not important here. What is important, however, is the orientation of the sound-level meter while taking noise measurements. Correct orientation depends upon these microphone response characteristics. The sound level meter manufacturer's instructions will define which type of microphone a particular SLM is equipped with. For normal (perpendicular) incidence microphones, the SLM is pointed directly at the source being measured. For grazing incidence microphones, the correct SLM orientation is either pointing in a direction parallel to the traffic lane or pointing up vertically.

#### GRAPHIC 12

Several manufacturers are currently in the process of developing special-purpose sound level meters (typically with digital read-out) with automatic operation features specifically for use in motor vehicle noise enforcement. Regardless of the type of meter purchased, manufacturer's instructions for microphone orientation, meter operation, and calibration must be followed carefully.

GRAPHIC 12.



B. Equipment Needs for Enforcement

The measurement of motor vehicle sound levels requires the following basic equipment:

1. Sound Level Meter (SLM)
2. Microphone Windscreen
3. Acoustical Calibrator

1. Sound Level Meter

The components and operation of the sound level meter have been discussed in the section above.

Equipment needs will vary depending upon the type of enforcement which is carried out. Table IV-2 summarizes the types of equipment needed for a variety of enforcement approaches.

TABLE II.2

## Instrumentation User's Guide

| SOUND LEVEL METER REQUIREMENTS |                                | ENFORCEMENT APPROACHES              |                            |                              |                                                     |            |
|--------------------------------|--------------------------------|-------------------------------------|----------------------------|------------------------------|-----------------------------------------------------|------------|
|                                |                                | New Vehicle Certification (Pass-By) | Pass-By Compliance Testing | Pass-By Observer & Chase Car | Pass-By Single Officer Chase Car (on board monitor) | Short Test |
| ANSI Grade                     | Type 1, Precision              | ***                                 | ***                        | **                           | **                                                  | **         |
|                                | Type 2, Gen. Purpose           | *                                   | *                          | **                           | **                                                  | ***        |
|                                | Type 3, Survey                 | 0                                   | 0                          | 0                            | 0                                                   | 0          |
| Configuration                  | Hand Held                      | **                                  | **                         | **                           | 0                                                   | **         |
|                                | Tripod Mount-Remote Mic.       | ***                                 | ***                        | ***                          | 0                                                   | **         |
|                                | Car Boom Mic. Mount SLM Remote | 0                                   | 0                          |                              | ***                                                 | **         |
| Dynamic Range (dB)             |                                | 60-100                              | 60-100                     | 60-100                       | 60-100                                              | 80-120     |
| Meter Response F/S             |                                | F                                   | F                          | F                            | F                                                   | S          |
| Filtering                      | A                              | ***                                 | ***                        | ***                          | ***                                                 | ***        |
|                                | C                              | **                                  | **                         | **                           | **                                                  |            |
| Power                          | Int. Battery                   | ***                                 | ***                        | ***                          | **                                                  |            |
|                                | RV AMX                         | **                                  | **                         | *                            | ***                                                 |            |

## Key

- \*\*\* Best
- \*\* Acceptable
- \* Marginally Acceptable
- 0 Not Acceptable

Generally, a Type 2 Sound Level Meter will satisfy the needs for traffic vehicle enforcement. All sound level meters used for vehicle noise enforcement must comply with ANSI (American National Standards Institute) S1.4 requirements for sound level meters as amended from time to time. The compliance should be on the equipment or at the least on the shipping carton or provided with the literature and operational instructions.

For specific circumstances, a Type 1 (Precision) sound level meter may be required. If so, it should also comply with the applicable ANSI standard.

As part of the sound level measurement equipment for both Type 1 and Type 2 meters, a Sound Level Calibrator adaptable to the particular meter must be obtained.

In addition to the sound level meter and calibrator, certain other equipment will be required for specific applications, such as:

11.B 2(a) On Highway Measurement - Remote Microphone

(1) A CABLE equal in length to the maximum radius permitted from the microphone location point to permit enforcement personnel and vehicle to remain outside the measurement site.

(2) When using the microphone in a remote operation, a PREAMPLIFIER, either built into the microphone or a type to be attached to the meter, is necessary to prevent signal loss through the cable.

(3) A TRIPOD, to mount the microphone in the remote area.

The tripod must have the capabilities of adjustment to mount the microphone within the height parameters of the law or regulation. Usually a photographer's heavy duty light stand will be more than adequate to provide the height ranges and in most instances will be more sturdy and economical than those offered by the sound level meter manufacturer.

(4) All remote on highway measurement operations also prohibit the measurement of vehicle noise during certain atmospheric or climatic conditions, particularly during high winds. Therefore, AN ANEMOMETER IS REQUIRED. This piece of equipment can be the hand held type or the remote type. Each type has benefits and liabilities. (1) The hand held type is least expensive but requires the operator to exit the vehicle or at least hold the device outside the vehicle to determine wind speed. (2) The remote is considerably more expensive but the operator can determine wind speed by merely observing the remote scale which is usually in the vehicle. The wind speed measured is that at the microphone and not at the vehicle some 50 to 100 feet from the microphone. However, with the remote device, an additional tripod for mounting the anemometer is required.

- (5) A CARRYING CASE to prevent damage to the sound level meter and other equipment. A case capable of containing all the equipment, should be provided.

II B. 2b. ON HIGHWAY - VEHICLE MOUNTED MICROPHONE.

- (1) A CABLE sufficient in length to mount the microphone as required.
- (2) A PREAMPLIFIER is usually not required unless the microphone is more than 10 feet (3m) from the sound level meter.
- (3) MICROPHONE MOUNTING DEVICE to securely mount the microphone on the vehicle within the applicable height requirements.
- (4) ANEMOMETER - in this mode of operation, the hand held anemometer is the best suited type.
- (5) A CARRYING CASE to prevent damage to the sound meter and other equipment. A case capable of containing all the equipment should be provided.

II B. 2c. Subjective Screening and Stationary Measurement.

- (1) A CABLE of sufficient length to mount the microphone near the exhaust outlet of the vehicle and have the sound level meter at the driver's side of the vehicle.
- (2) A PREAMPLIFIER is usually not required unless the microphone is more than 10 feet (3m) from the sound level meter.
- (3) MICROPHONE MOUNTING DEVICE to mount the microphone near the exhaust outlet of the vehicle and within height and distance requirements.

- (4) ANEMOMETER - in this mode of operation, an anemometer is usually not required. However, it is recommended that at least a hand held type be available to determine wind speed if it is questionable.
- (5) A solid state TACHOMETER preferably inductive pickup with a guaranteed accuracy of plus or minus 100 revolutions per minute. It must have the capabilities of measuring two and four stroke cycle ignition spark engines or 2,3,4,5,6 or 8 cylinder design equipped with breaker point, breakerless or magnetto ignition.
- (6) A CARRYING CASE to prevent damage to the sound level meter and other equipment. A case capable of containing all equipment should be provided.

II B. 2d.

New Vehicle Measurement and Product Verification.

This method of enforcement would require a sound level meter equal to the type used by the vehicle manufacturer and is in all instances a Type 1 (Precision) meter.

- (1) A CABLE at least 100 feet in length.
- (2) A PREAMPLIFIER built into the microphone to prevent signal loss through the cable.
- (3) A TRIPOD to mount the microphone away from meter and within height requirements.
- (4) A REMOTE operation ANEMOMETER to measure wind speed with accuracy of plus or minus 10 percent.
- (5) A CARRYING CASE to prevent damage to the sound level meter and other equipment. A case capable of containing all the equipment should be provided.

II.B. 3. Microphone Windscreen

Rapid air movement over a microphone causes turbulence, which in turn generates outside noise and can affect SLM accuracy. This noise can cause erroneous high level readings. The use of headphones connected to the SLM output jack (consult manufacturer's recommendation) often will enable the operator to detect wind-generated noise. Therefore, it is good practice to always use a microphone windscreen for all vehicle noise measurements.

The windscreen, which is an open cell foam ball, also protects the sensitive microphone diaphragm from dust, dirt or serious damage should the SLM be dropped. The effectiveness of the windscreen is limited, however. Measurements of wind noise alone at velocities of 25 mph yield readings of approximately 80 dB (A). A proper windscreen is capable of reducing wind noise by approximately 25 dB (A). Therefore, measurements should never be made under high wind conditions (wind velocity over 15 mph).

II.B. 4. Acoustical Calibrator

Sound level meters should never be used unless properly calibrated. An acoustical calibrator provides a means for conducting an overall system check as well as calibration of the sound level meter.

The meter reading is adjusted to match the specified calibrator output sound pressure level. Calibrators are specifically matched to individual microphones; therefore, it is important that only the proper calibrator be used. Otherwise, errors may result and/or the microphone may be permanently damaged.

Calibrator output level is affected by changes in atmospheric (barometric) pressure. Therefore, care must be taken when using the calibrator at atmospheric pressures other than standard (altitudes other than sea level). Calibrator manufacturers provide correction curves for calibrator use under various atmospheric conditions (i.e., for use at higher altitudes).

II.B. 4(a). Field Calibration (external)

(1) This calibration is performed at the measurement site by the operator.

(a) Once the site is established and set up, the sound level meter is field calibrated by use of the calibrator provided with the equipment. This is done initially and at 15 minute intervals until meter drift has stabilized. A drift of  $\frac{1}{2}$  dB or less is considered insignificant.

(b) Field calibration is then performed at approximately  $\frac{1}{2}$  hour intervals unless the meter has been moved or some other operation such as battery replacement is performed.

(c) It may be advisable to check field calibration after each enforcement action is taken.

II.B 4(b) Factory Calibration (internal)

(1) This calibration is performed by the manufacturer or a laboratory and must be traceable to the National Bureau of Standards.

(2) The calibrator should be calibrated at least annually and written certification provided by the person or facility performing the calibration.

(3) The sound level meter should also be calibrated at least annually, however, depending upon experience, this could be extended to 2 or 3 years. Any malfunction in the meter will be detected during field calibration.

Table II.3

SLM Calibration Checklist

1. Check that the calibrator has the appropriate adaptor the microphone in use.
2. Switch SLM "ON" and allow 30 seconds for warm up.
3. Place calibrator over microphone and insure proper alignment.
4. Set the "Range Switch" to read a decibel inclusive of the calibrator's output level (i.e., for 94 output, use 90-100; for 114 output, use 110-120; etc.).
5. Depress the "A" button (A-weight).
6. Turn calibrator "ON".
7. Adjust calibration adjustment on the SLM to read the value indicated on the calibrator.
8. Switch calibrator "OFF".
9. Repeat calibration
  - (a) after each citation (optional)
  - (b) whenever site changes are made
  - (c) at least every hour and at the end of the day

N.B.: Check that calibration labels on SLM and calibrator indicate current manufacturer's calibrations. (Annual factory calibration required.)

II.C. Measurement Methodology

II.C. 1. Measurement Site Selection

Proper vehicle noise measurement site selection is a crucial element in insuring that reported noise levels are accurate and defensible. Ideally, the vehicle measurement site should be a large clear area, allowing the full 50 foot distance between microphone and center of the travel lane with no large sound reflecting surfaces within a 50 foot radius of either the microphone or the vehicle being measured.

GRAPHIC 13

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## Measurement Methodology Checklist

Table II.4

1. Do Not Measure When:
  - (a) Raining or Snowing
  - (b) Street is wet
  - (c) Temperature is less than SLM manufacturer's recommendations
  - (d) Wind velocity is greater than 15 mph
2. Battery check: follow the "Calibration Checklist", previously cited.
3. Set up Sound Level Meter (SLM) per checklist.
4. Calculate measurement site adjustment factors from checklist.
5. Determine noise limit (per statute or ordinance).
6. Check for wind noise/meter overload
  - (a) Observe c-weighted level
  - (b) Listen through head phones
7. Measure and record Ambient Sound Level, dBA
  - (a) Set SLM attenuator to a high value
  - (b) Turn attenuator down until needle registers on meter face
  - (c) Observe needle movement for about 30 seconds
  - (d) Observe needle central tendency
  - (e) Ambient should be at least 10dB below enforcement level
8. Set attenuator so that enforcement level is readable on meter.
9. Observe maximum A-weighted values of Passing Traffic.
  - (a) Meter needle must rise and fall at least 6 dB between pass-by "peaks" to obtain a valid reading. (10 dB rise and fall is preferred.)
10. Determine Violation
  - (a) Violation has occurred when the observed level exceeds the noise limit. Observed levels equal to the maximum level would not be in violation unless local law or regulation provides for such.
11. Issue Citation
12. Recalibrate SLM after each citation.

II.D. Recommended Enforcement Procedures

II.D. 1. Enforcement Approach

Each jurisdiction has the power to regulate and enforce vehicle noise levels to protect the public and provide a safe and quiet environment. Depending upon the legislated authority, established requirements and resources, there are several means to accomplish this responsibility.

Depending upon the authority, requirements and resources, the jurisdiction may control vehicle noise in one or several ways. Once the statutory authority has been established, the requirements set forth, the equipment acquired and the personnel properly trained, active enforcement actions can be begun.

If the jurisdiction is implementing a totally new program, it may be extremely advisable to have a period of perhaps six months for a public education and awareness program. This could conceivably result in a greater degree of public acceptance and voluntary compliance.

There are basically two techniques by which vehicle noise measurement and enforcement are performed: (1) on highway remote mounted microphone and (2) on highway vehicle mounted microphone.

On Highway Remote Mounted Microphone.

This procedure requires two persons, a monitor or technician and the stopping officer. The monitor or technician does not necessarily have to be an officer with enforcement powers. However, he must be properly trained in the use of the equipment, the

site requirement and ability to describe the violating vehicle. It may be advisable to have both the monitor and stopping officer have full enforcement powers and have them alternate duties to reduce monotony. Additionally, if one is required to be absent, any other enforcement officer may be called upon to assume the duties of a stopping officer even though he may not be thoroughly trained in all aspects of vehicle noise enforcement. It may also be advisable to train the supervisors of those persons responsible for noise enforcement. This way they would be more aware of the duties and responsibilities of noise enforcement personnel.

For this means of enforcement, the microphone is mounted on a tripod at a prescribed distance from the center of the nearest lane of travel. Where the microphone is located is referred to as the microphone location point and the center of the nearest lane of travel is referred to as the microphone target point. A clear area, free of reflective surfaces with a radius equal to the distance between the microphone location point and the microphone target point, must be maintained around both the microphone location point to the ends of the radii from the microphone target point. Within this triangular area there cannot be any vehicles other than the one being measured.

The police officer must also be outside the entire test site. If he is standing while monitoring the meter, he may be within the site but not closer than 2 feet from it and be directly behind it.

The on highway remote mounted microphone method of enforcement is probably the most prevalent in use at this time. The result of this type of enforcement is the identification of gross violators when a vehicle is operated in a cruise or power mode. Since the majority of vehicle operation is in this mode, it could be said this method of enforcement is the most appropriate.

However, there are certain limitations in the application of this method. (1) An area of considerable size is required, thus limiting the scope of enforcement. (2) When the remote microphone is used, either tripod mounted or hand held, two people are required. Depending upon climatic conditions, two vehicles may also be required. (3) Additional equipment is required. A preamplifier in the microphone, additional cable, and a tripod is necessary. (4) Extreme care must be taken to insure no other vehicles or reflective surfaces are within the site. (5) And, this method may be the least cost-effective. To aid in off-setting costs, a concentrated public awareness and information program should be conducted during both the initial and on-going phases of the program.

#### On Highway Vehicle Mounted Microphone

This method has the microphone mounted on the monitoring vehicle behind the operator and at a pre-determined height above the roof line of the vehicle (usually 16 inches). The sound level meter is inside the vehicle, where the operator observes the meter and the vehicle being monitored.

The microphone should be mounted on the tripod at a prescribed height above the plane of the roadway. If the microphone is hand held, it also must be held within the prescribed height parameters.

A standard test site requires a distance of 50 feet between the microphone location point and the microphone target point. This distance may be adjusted from 35 feet to 83 feet, and, if adjusted, the then becomes a non-standard site. In either a standard or non-standard site, the radius used to determine the clear area around the microphone location point and the microphone target point is equal to the distance between the microphone location point and the microphone target point.

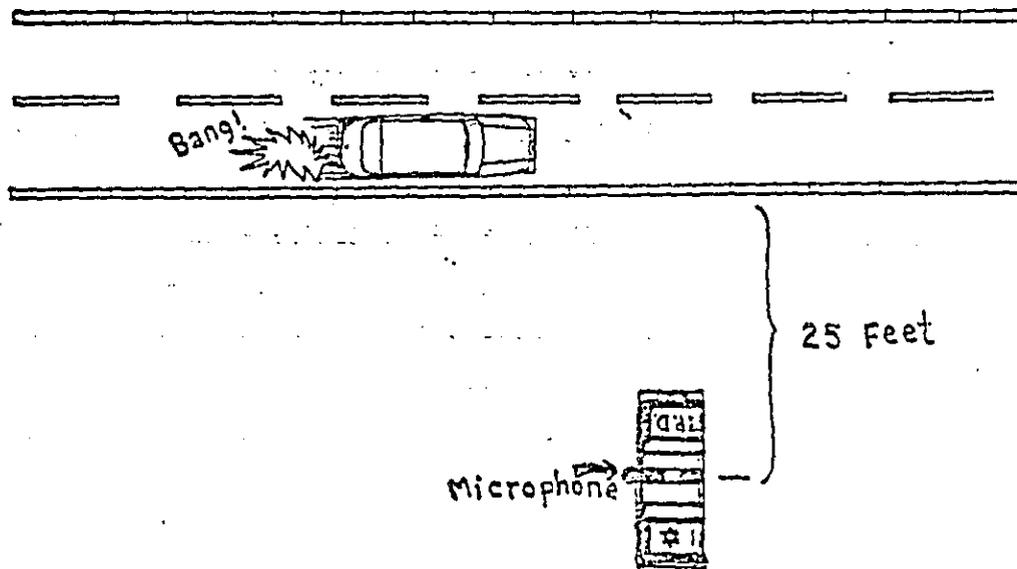
Both a standard and non-standard site require the microphone to be mounted or held between 3 feet and 6 feet above the plane of the roadway on which the vehicle is traveling. The preferred height is 3½ feet.

Basically all noise levels are established by using a standard test site. If a non-standard site is used or additional lanes are to be monitored, these limits must be adjusted to compensate for the increase or decrease in distance between the microphone location point and the microphone target point. This adjustment is usually in the range of adding 1 dB for each 12 feet of decrease in distance and subtracting 1 dB for each 12 feet of increase in distance.

To insure no other vehicles are within the triangular site, there must be a 6 dB rise and fall from the maximum level obtained from the vehicle being monitored.

The monitoring vehicle is located a pre-determined distance from the center of the nearest lane of travel (usually 25 feet). It may be parked either parallel or perpendicular to the highway.

Graphic 14



If the vehicle is parked parallel to the highway, 1 dB must be added to the limit. The area within a 25 feet radius of the vehicle and the center of the nearest lane of travel must be free of reflective surfaces. If additional lanes of travel are to be monitored, the limits must be adjusted as required by local law or ordinance. However, in no instance should the vehicle be located closer than 25 feet from the highway. This procedure can only be applied to those vehicles not regulated by the Bureau of Motor Carrier Safety and the Environmental Protection Agency. Those vehicles regulated by BMCS and EPA for noise levels can

only be enforced by a means identical to that required by those agencies of the federal government.

This method is used by some jurisdictions with favorable results and would be best suited to municipal or suburban areas where large clear areas are limited. The system is a one person operation, using one vehicle, and is also aimed towards the gross violator. It can be employed against vehicles in the cruise or power mode of operation as well as an urban acceleration mode (vehicles accelerating from a stop sign, traffic light or other traffic control devices).

Consideration must be given to the possible loss and damage of equipment. This would especially apply to the microphone and the windscreen.

#### II. D. 2. Decibel Addition and Subtraction

In many situations, however, it is difficult to locate sufficient sites that satisfy the aforementioned requirements. Hence, correction factors have been provided to account for measurement distances other than 50 feet (31-118 feet are allowed) and for the presence of reflecting surfaces; either in the vicinity of the microphone, the moving vehicle being measured, or both. It is important, however, that in selecting a measurement site, that every effort be made to utilize areas that require minimum correction factors.

When actual enforcement procedure does not allow measurement at 50 feet, the following decibel correction scale may be used.

Table II.5

| Distance Increase Factors | Sound Level Decrease | Distance Decrease Factor | Sound Level Increase |
|---------------------------|----------------------|--------------------------|----------------------|
| 1                         | 0.0                  | 1                        | 0                    |
| 1 1/2                     | - 3.5                | 2/3                      | + 3.5                |
| 2                         | - 6.0                | 1/2                      | + 6.0                |
| 2 1/2                     | - 8.0                | 2/5                      | + 8.0                |
| 3                         | - 9.5                | 1/3                      | + 9.5                |
| 3 1/2                     | - 10.9               | 2/7                      | + 10.9               |
| 4                         | - 12.0               | 1/4                      | + 12.0               |
| 4 1/2                     | - 13                 | 2/9                      | + 13.0               |
| 5                         | - 14                 | 1/5                      | + 14.0               |
| 5 1/2                     | - 14.8               | 2/11                     | + 14.8               |
| 6                         | - 15.6               | 1/6                      | + 15.6               |
| 6 1/2                     | - 16.3               | 2/13                     | + 16.3               |
| 7                         | - 16.9               | 1/7                      | + 16.9               |
| 7 1/2                     | - 16.5               | 2/15                     | + 17.5               |
| 8                         | - 18                 | 1/8                      | + 18                 |

**Example:**

At 50 feet the sound level is 87 dBA.

What is the sound level at 100 feet? The distance increase factor from 50 feet is 2, so  $87 - 6 = 81$  dBA.

What is the sound level at 300 feet? The distance increase factor from 50 feet is 6, so  $87 - 15.6 = 71.4$  dBA.

What is the sound level at 20 feet? The distance decrease factor from 50 feet is 2/5 so,  $87 + 8 = 95$  dBA.

What is the sound level at 25 feet? The distance decrease factor from 50 feet is 1/2, so  $87 + 6 = 93$  dBA.

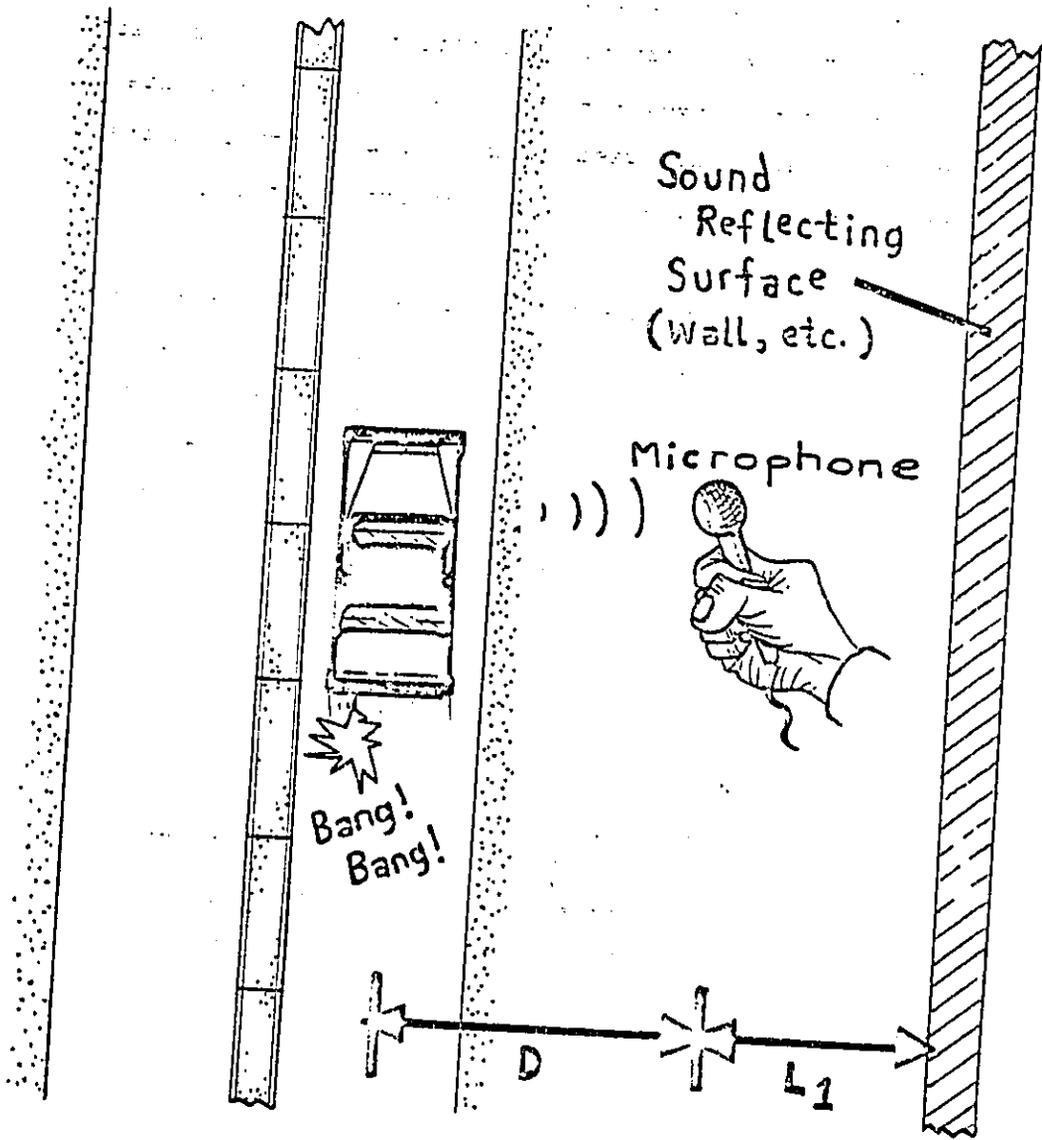
II. D. 2. (a) Corrections for Sound Reflecting Surfaces

Measure the distance between the microphone and its nearest sound reflecting surface (L1) and between the center line of the vehicle lane of travel and its nearest sound reflecting surface (L2). Locate these distances on the correction factor chart on their respective axes, and connect the two marks by a straight line. The point on the central axis that is intersected by the straight line indicates the dB correction factor to be added to the measured sound level for each vehicle passing through the site. (The dotted line in the correction factor chart illustrates a +2 dB correction for sound reflecting surfaces at L2=52 feet from the center of the lane of travel and L1=25 feet from the microphone.)

1. The correction factors determined by the correction factor chart should be used only for sound reflecting surfaces that are parallel to the lane of travel.
2. Basically parallel surfaces may have irregularities or projections of not more than 2 feet, measured perpendicular to the lane of travel, with the distances illustrated on the correction factor chart measured from the nearest projecting surface.
3. Sound reflecting surfaces not basically parallel to the lane of travel should be 100 feet or more from the microphone. This restriction does not apply to surfaces that are perpendicular to the lane of travel and behind the parallel surface for which corrections are made, such as a fence or the side walls of a building.

GRAPHIC 15

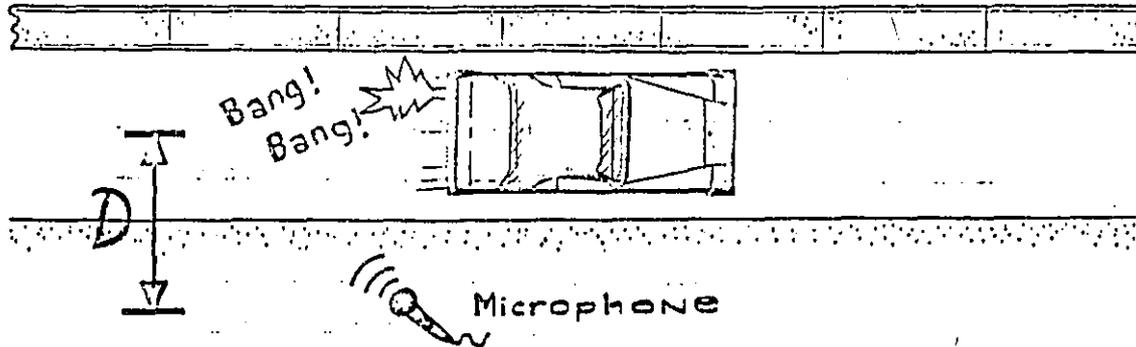
GRAPHIC 15.



For in-city measurements of traffic noise, it is often difficult (if not impossible) to locate measurement sites that comply with the Reference Site clear area requirements (particularly within residential areas). There is often a fence or a building within the specified clear area. Use of the decibel correction chart will permit measurement at otherwise "unusable" locations.

GRAPHIC 16

GRAPHIC 16



| Distance<br>in feet (D) | Sound Level Limits (dBA): |                      |                           |                           |                      |                           |      |
|-------------------------|---------------------------|----------------------|---------------------------|---------------------------|----------------------|---------------------------|------|
|                         | ON HIGHWAY M/C'S          |                      |                           | AUTOS & LT. TRUCKS        |                      |                           |      |
|                         | POSTED SPEED ZONE         |                      |                           | POSTED SPEED ZONE         |                      |                           |      |
|                         | ≤ 35 mph<br>Level<br>Road | 45 mph<br>or<br>Less | Greater<br>Than<br>45 mph | ≤ 35 mph<br>Level<br>Road | 45 mph<br>or<br>Less | Greater<br>Than<br>45 mph |      |
| 21 - 29                 | 81                        | 85                   | 89                        | 77                        | 79                   | 85                        | (+7) |
| 29 - 32                 | 80                        | 84                   | 88                        | 76                        | 78                   | 84                        | (+6) |
| 32 - 35                 | 79                        | 83                   | 87                        | 75                        | 77                   | 83                        | (+5) |
| 35 - 39                 | 77                        | 81                   | 85                        | 73                        | 75                   | 81                        | (+3) |
| 39 - 43                 | 76                        | 80                   | 84                        | 72                        | 74                   | 80                        | (+2) |
| 43 - 48                 | 75                        | 79                   | 83                        | 71                        | 73                   | 79                        | (+1) |
| 48 - 58                 | 74                        | 78                   | 82                        | 70                        | 72                   | 78                        |      |
| 58 - 70                 | 73                        | 77                   | 81                        | 69                        | 71                   | 77                        | (-1) |
| 70 - 83                 | 72                        | 76                   | 80                        | 68                        | 70                   | 76                        | (-2) |
| 83 - 99                 | 71                        | 75                   | 79                        | 67                        | 69                   | 75                        | (-3) |
| 99 - 118                | 70                        | 74                   | 78                        | 66                        | 68                   | 74                        | (-4) |

## II. D. 3. Vehicle Pass-By Noise Measurement

As discussed in earlier sections of this manual, measurements cannot be conducted in the presence of precipitation, wet streets, or wind velocities greater than 15 mph.

Prior to actual vehicle measurement, it is necessary to check for wind noise effects, even though the wind screen is in place. Wind velocity can be easily measured with a small hand held device. It consists of a small plastic tube with holes in the bottom and a graduated scale along its length. A small foam ball is contained inside the tube. To measure wind velocity, the tube is held vertically and the wind causes the ball to rise inside the tube. Wind velocity is read off the scale opposite the ball.

Next, if your measurement system is so equipped, listen to the sound the meter is receiving through a set of headphones attached to the meter output socket.

The sounds of the passing traffic should be clear and well defined. The presence of static and crackling and popping in the headset may indicate excessive low frequency wind noise which is overloading the amplifier circuitry in the SLM.

Another check for excess wind noise is to observe both the C-weighted and A-weighted sound levels (some meters may not be equipped with a C-weighting filter) in the absence of passing traffic. A C-weighted reading of 10 or more dB above the A-weighted reading indicates the presence of a strong low frequency source of noise (typically wind). If switching to

C-weighting causes the meter needle to go off scale (without changing the attenuator setting from when the A-weighted reading was taken), this again suggests that wind noise may be overloading the meter.

The final prerequisite before actually measuring vehicle noise involves measuring the ambient noise at the site selected. The ambient noise level, which may consist of people noise, other traffic, etc. must be at least 10 dB below the level at which enforcement is planned.

In order to have a valid reading of a passing vehicle's noise level, the meter needle must rise 6 dB or more to the maximum observed level and then must fall at least 6 dB as the vehicle passes to insure no other sound source has influenced the reading. (Digital SLM's built especially for vehicle noise enforcement incorporate this 6 dB rise and fall requirement into their circuitry such that a maximum level will not be held unless this requirement is met.) A 10 dB rise and fall is actually preferred. This 6 dB rise and fall requirement suggests that in heavy traffic, accurate noise measurements will be difficult to obtain. However, the gross noise offenders may still be apprehended.

II. D. 4. Vehicle Inspection

The following checklist may be useful when inspecting a vehicle for compliance with the local noise statute or ordinance.

VEHICLE INSPECTION CHECKLIST

1. Determine the year of manufacture of the vehicle
  - (a) was the vehicle manufactured prior to the effective date of state/local statute/ordinance
  - (b) was the vehicle manufactured after the effective date of the state/local statute/ordinance
2. Establish the vehicle category
  - (a) registered on-highway
  - (b) off-road
  - (c) competition
  - (d) export only.
3. Determine if the equipment is original or replacement equipment
  - (a) question operator
  - (b) check appearance
    - presence of cross-over pipe
    - standard markings or manufacturer's V.I.N.
    - thin wall or heavy wall construction
    - inseparable components

For label match-up inspection, check the vehicle for the following:

1. Original or replacement equipment
2. Exhaust system components
3. Competition vehicle only
4. Export only

For exhaust system deterioration inspection, check the vehicle for the following:

1. Holes or rusted portions
2. Parts missing or loose
3. Baffels or insets missing (in mufflers)
4. Glass - paks "blown out"

II. D. 5. Motor Vehicle Citation Procedure

The following citation procedure is recommended for the police officer:

1. Curb Vehicle (Standard Police Procedure)
2. Record All Pertinent Information
  - Fill out violation form (sample attached)
3. Advise Motorist of Violation
  - Cite ordinance provisions
  - Present information "fact sheet" (see CHP example 6 attached)
  - Explain options/legal rights
  - Explain compliance procedure(s)/penalty for noncompliance
4. Conduct Vehicle Inspection - Re: Checklist
  - Obtain necessary motorist consent
5. Establish "Probable Cause" of Violation
  - Faulty/improper exhaust equipment
    - Tampering - Deterioration
  - Vehicle Operation:
    - excessive rate of acceleration
    - squealing tires
    - overrevving engine
    - backfiring, out-of-time
  - Both (separate factual observations from officer's opinion)
6. Issue Summons

Samples of Summonses and Citation forms utilized by the Maryland State Police are attached in the Appendix. The samples are enclosed as suggested forms which may be adopted by a state or local police agency.

II. D. 6. Compliance Testing.

While many forms of compliance test procedures are currently in use in vehicle noise control programs around the country, it is felt that these procedures need to be standardized and yield test results that correlate directly with the maximum new motorcycle noise emission limits established by the U.S. EPA. The test procedure recommended in this manual is the procedure known as the "Short Test". This procedure requires the owner/operator of the vehicle, after being cited for a violation of the established noise level limits, to submit the vehicle for noise testing at a predetermined site on a particular date. If the vehicle, upon testing, is found to exceed the established limits, the owner/operator is given a time period in which to correct the vehicle and submit it for further testing and certification. On the other hand, if the vehicle is in compliance, no further action is taken.

A more detailed discussion of the Short Test, particularly as it applies to motorcycles, is contained in subsequent modules.

II. E. Required Technical Skills

The method of enforcement and the type of local ordinance will determine the kind of technical skills a police officer will need to effectively enforce the local noise law. For example, if the state/local law limits the maximum level of sound in decibels emitted from a motor vehicle, the police officer will need technical skills in the operation of the sound level meter, a skill which is not as necessary if the officer is enforcing a "label match-up" statute.

Table II.6 summarizes the necessary technical skills for a variety of motor vehicle noise enforcement measures.

MODULE II

Instrumentation and Measurement

1. The measurement of motor-vehicle sound levels requires the following basic equipment:
  - a) Sound Level Meter
  - b) Microphone Windscreen
  - c) Acoustical Calibrator
  - d) all-of-the-above
  - e) none of the above
2. High wind conditions (velocity over 15 mph) have no effect on the accuracy of SLM readings.
  - a) true
  - b) false
3. To obtain a valid reading, the meter must rise and fall at least \_\_\_\_\_ between pass-by "peaks":
  - a) 1 dB
  - b) 6 dB
  - c) 25 dB
  - d) 83 dB
4. The SLM should be calibrated after each citation:
  - a) true
  - b) false
5. In either standard or non-standard site, the radius used to determine the clear area around the microphone location point and the microphone target point is equal to:
  - a) the distance between the microphone location point and the microphone target point
  - b) 50 feet
  - c) 35 feet to 85 feet
  - d) all of the above
  - e) none of the above
6. The On Highway Vehicle Mounted Microphone method requires the microphone to be mounted or held \_\_\_\_\_ above the plane of the roadway on which the vehicle is traveling:
  - a) 0-3 feet
  - b) 3-6 feet
  - c) 6-9 feet
  - d) Height of the microphone does not matter
7. The ambient noise level at the site selected must be at least \_\_\_\_\_ the level at which enforcement is planned:
  - a) equal to
  - b) 3 dB below
  - c) 10 dB below
  - d) 6 dB above
8. Once the meter is calibrated by the manufacturer it need not be calibrated again:
  - a) true
  - b) false

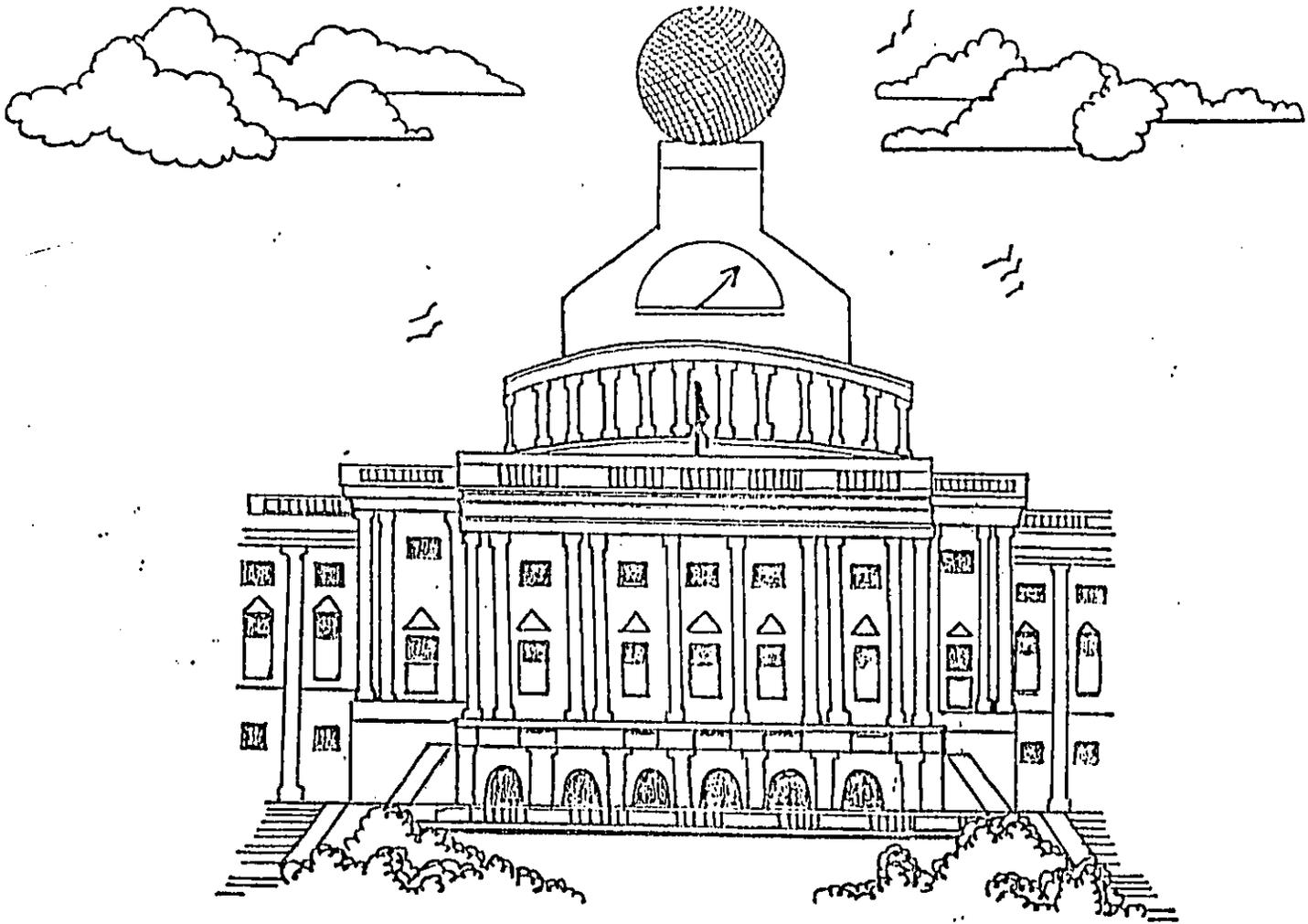
TABLE II.6  
Required Technical Skills - Guide

| KEY |                            |
|-----|----------------------------|
| X   | Required                   |
| *   | Helpful, but not necessary |

| SUBJECT MATTER                      | MOTOR VEHICLE NOISE ORDINANCE PROVISION |                                   |                               |                                  |                                      |                |
|-------------------------------------|-----------------------------------------|-----------------------------------|-------------------------------|----------------------------------|--------------------------------------|----------------|
|                                     | Equipment Deterioration                 | Non-Quantified Operational Limits | Quantified Operational Limits | Restricted Areas of Use/ Curfews | Label Match-Label Match-Up & Control | Label Match-Up |
| Acoustics Fundamentals              | *                                       | X                                 | *                             |                                  |                                      | *              |
| Motorcycle Noise Characteristics    | X                                       | X                                 | X                             | *                                | *                                    | X              |
| Vehicle Noise Laws                  | X                                       | X                                 | X                             | X                                | X                                    | X              |
| Legal Issues                        | X                                       | X                                 | X                             | X                                | X                                    | X              |
| Instrumentation Functionality & Use | *                                       | *                                 | X                             |                                  |                                      |                |
| Enforcement Procedures              | X                                       | X                                 | X                             |                                  |                                      | X              |
| Vehicle Inspection Procedures       | X                                       | X                                 | X                             |                                  | *                                    | X              |
| Citation Procedures                 | X                                       | X                                 | X                             | X                                | X                                    | X              |
| Compliance Certification            | X                                       | *                                 | *                             |                                  | X                                    | X              |
| Courtroom Testimony                 | X                                       | X                                 | X                             | X                                | X                                    | X              |

MODULE III:

Statutory Basis of Noise Enforcement



Noise Control Act of 1972

III. A. Introduction to Noise Control

In a 1977 survey, the Environmental Protection Agency (EPA) identified vehicles such as motorcycles, trucks, and cars and construction activity of various kinds as major noise sources. The survey ranked annoying noise sources as illustrated in Table III.1 and III.2

TABLE III.1

NOISE SOURCES RANKED BY PERCENT  
OF URBAN POPULATION HIGHLY ANNOYED

| RANK | SOURCE                 | % Highly Annoyed |
|------|------------------------|------------------|
| 1    | Motorcycles            | 11.7             |
| 2    | Large Trucks           | 6.9              |
| 3    | Autos                  | 3.5              |
| 4    | Construction           | 5.8              |
| 5    | Sports Cars            | 5.4              |
| 6    | Helicopters            | 4.0              |
| 7    | Constant Traffic       | 3.9              |
| 8    | Airplanes              | 3.4              |
| 9    | Small Trucks           | 3.1              |
| 10   | Buses                  | 2.8              |
| 11   | Power Garden Equipment | 1.9              |

TABLE III.2

## OTHER SOURCES RATED HIGHLY ANNOYING

| RANK | SOURCE                 | Number of Sites | Number of Mentions |
|------|------------------------|-----------------|--------------------|
| 1    | Sirens                 | 8               | 14                 |
| 2    | Fire Trucks            | 7               | 12                 |
| 3    | Ice Cream Trucks       | 5               | 6                  |
| 4    | Trash Pickup           | 4               | 4                  |
| 5    | Gun Shots              | 4               | 4                  |
| 6    | Trains                 | 4               | 4                  |
| 7    | Burglar Alarms         | 2               | 4                  |
| 8    | Auto Horns             | 3               | 3                  |
| 9    | Chain Saws             | 3               | 3                  |
| 10   | Hot Rods - Drag Racing | 2               | 2                  |
| 11   | Defective mufflers     | 1               | 1                  |
|      | Defective Pump         | 1               | 1                  |
|      | Refrigerator Truck     | 1               | 1                  |
|      | Air Conditioner        | 1               | 1                  |
|      | Model Airplanes        | 1               | 1                  |
|      | Cement Mix Truck       | 1               | 1                  |
|      | Welding Equipment      | 1               | 1                  |

### III. B. Health and Environmental Effects of Noise

According to recent EPA reports, over 90 million Americans are currently exposed to traffic noise which has been determined to be in excess of safe levels.

Although many of the health effects of noise are not yet clearly understood, there is little doubt that noise can cause a range of physical and psychological injuries. Even noises with no permanent physical health repercussions may still cause annoyance, sleep loss and other forms of mental stress.

#### Physiological Impacts

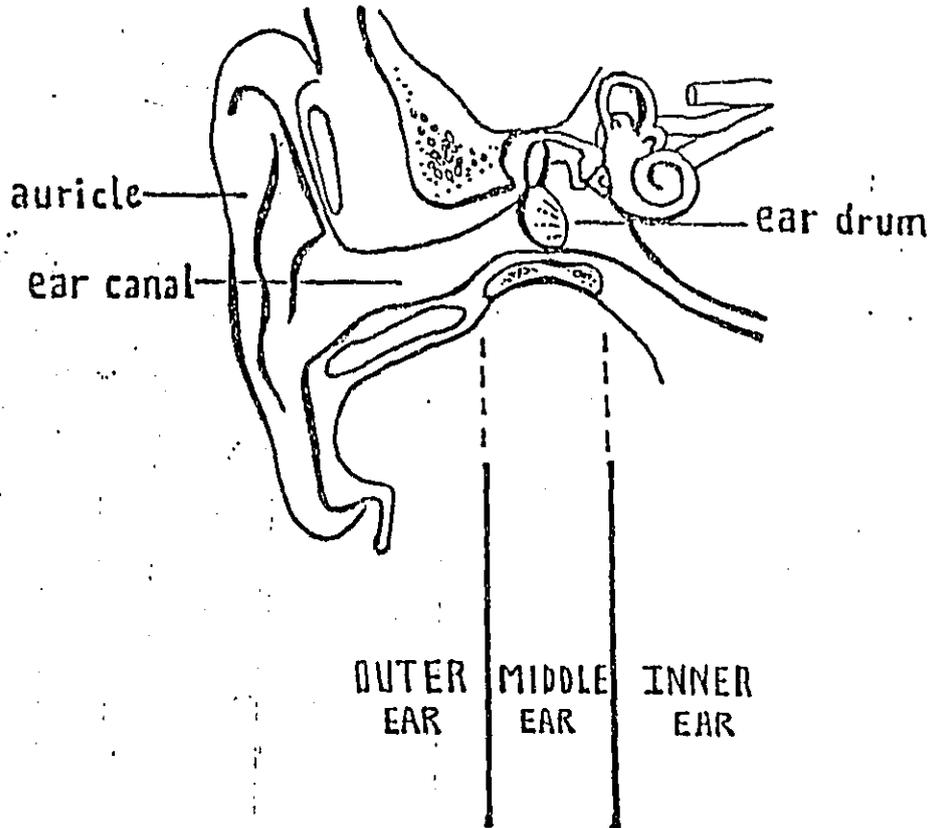
Noise may cause serious physiological effects on the human body ranging from deafness to enhanced risk of heart disease to adverse effects on fetal nervous systems. Clearly, the most common health effect is damage to the human ear.

#### GRAPHIC NO. 17

The body interprets noise as stress. At approximately the 75-80 decibel (dB) range, a number of physical reactions take place. Heart rhythm and blood pressure changes occur, blood cholesterol levels rise, pupils of the eye dilate, and stomach acid secretion may change leading to gastrointestinal malfunctions. Some automatic physical reactions such as blood vessel constriction may continue for some period even after the noise stops.<sup>1</sup>

A recent medical discovery has linked noise and prenatal development. Physicians now believe that external noises can trigger changes in fetuses.<sup>2</sup>

# The Human Ear :



### Psychological Impact

Noise, by itself or in conjunction with physical fatigue, can trigger unpredictable psychological behavior. There is evidence to indicate that noise may cause irritability, anxiety, nervousness, and general aggressive tendencies.<sup>3</sup>

Sounds that convey distress or alarm, such as a police car siren or a fire engine bell, may have greater psychological effects than sound associated with a necessity.

Although a direct link between noise and mental illness has not been established, experts do note that noise may act to aggravate a preexisting mental condition. However, one study indicated higher rates of admission to psychiatric hospitals among people living close to airports.<sup>4</sup>

### Secondary Human Impacts

Sound loud enough to interfere with conversation or mental concentration may have adverse secondary effects in the educational or work environment. For example, reading and language development in school children may be impaired by a noisy environment if a child is unable to distinguish certain sounds or if the noise distorts sounds. Distractive noise may reduce worker productivity and even become a workplace safety hazard where noise prevents a worker from hearing warnings of potential danger. Disturbing noise levels may also reduce the enjoyment of recreational opportunities.

### Environmental Impacts

The psychological reaction of animals to noise is very similar

to that of humans. Hearing loss or damage to the auditory system is the best documented physiological effect of noise on test animals. Experiments also show evidence of change in the urinary, adrenal, and reproductive functions of animals under certain noise conditions. Animals may even experience disruption of breeding, nesting, and migratory habits.

Noise and accompanying noise vibrations can adversely affect structural materials. Cracked plaster and broken windows and dishes left in the wake of a sonic boom are the best known examples of damage from excessive noise levels, but they are not the only examples. Heavy construction equipment operation may cause damage to neighboring structures. Noise and vibrations can also damage delicate scientific and health care instruments.

III. C. Objective Noise Control Measures

Specific noise statutes and ordinances are legislative responses to noise problems at the state and local levels which deal exclusively and comprehensively with noise and are tailored to the specific needs of the jurisdiction. These statutes and ordinances can be objective or subjective in nature, depending upon whether sound violations are defined in terms of quantitative or qualitative standards.

The objective nature or quantitative standards arises from the use of measures of noise magnitudes in terms of decibel levels. These noise control regulations usually prescribe maximum permissible decibel levels for a given area or for specific noise sources.

The use of quantitative standards in noise ordinances involves unique enforcement considerations. For example, decibel measurement requires special equipment and expertise. Consequently, quantitative measurements require additional enforcement costs for a community in purchasing equipment and training. Moreover, decibel measurements alone do not provide for variations in the frequency of the noise occurrence -- a factor which greatly affects the annoyance level of a given noise. To compensate for frequency variations, multiple readings of the noise source must be made, increasing the time and expertise necessary for measurement.

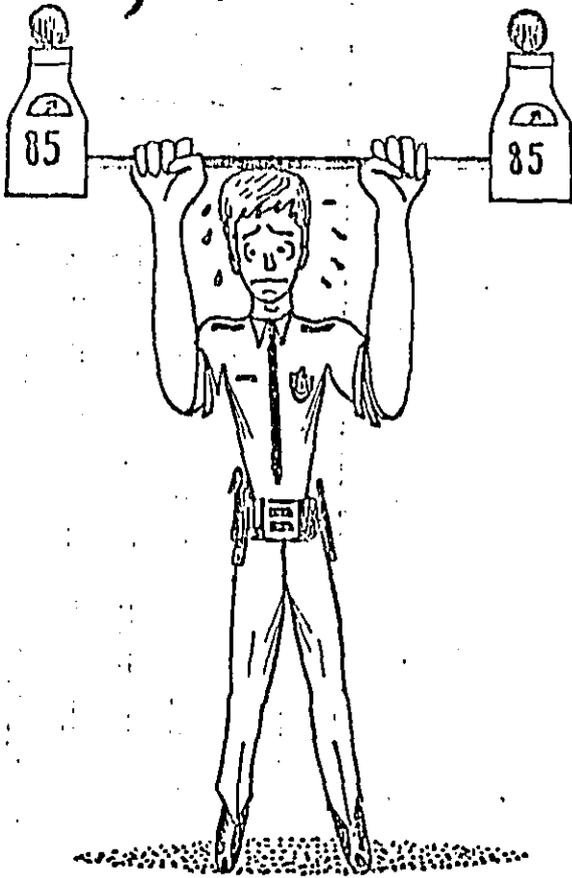
The major benefits of quantitative measurements are specificity and reliability. The specificity of quantitative standards also

enables these ordinances to survive Constitutional challenges on the basis of the First Amendment Freedom of Speech and Fifth Amendment Due Process Vagueness. In addition, reliability of permanent records of noise incidents is greatly increased with quantitative measurement. Recording the sound emitted from a noise source provides concrete evidence to prove violations or noise regulations. Thus there is no dependence upon subjective definitions and subjective testimony of noise enforcement agents, police or witnesses to prove that noise violations have occurred.

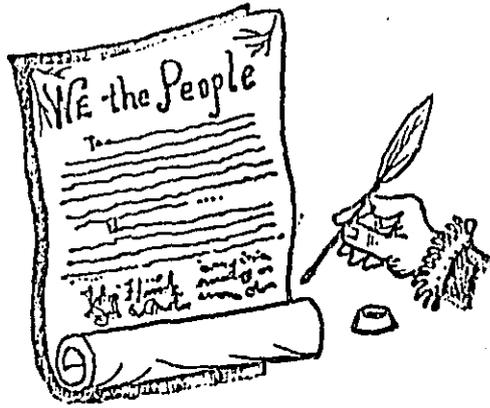
# Sources of State & Local Authority to Control NOISE:

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1.) Police Power



2.) U.S. Constitution



3.) Local Provisions



III. D. Sources of State and Local Authority to Control Noise

The authority to regulate noise is within the powers of the states under a variety of sources.

III. D. 1. Police Power

The police power of the states is the broadest grant of power. Essentially, it allows a state to pass laws to regulate the health and welfare of citizens and to provide for the public convenience and the public good. The only limitation upon police power is that state laws and regulations may not be inconsistent with state or federal constitutions.

III. D. 2. Tenth Amendment

The Tenth Amendment of the United States Constitution states: "The powers not delegated to the United States by the Constitution, nor prohibited by it to the States, are reserved to the States respectively or to the people." It is through this grant of authority that many states assume the responsibility of regulating noise levels.

III. D. 3. Individual State Constitutions

A more specific method of regulating noise is the state constitution. Such constitutional provisions allow a state to provide for the general welfare or protect the environment. For example:

The people shall have the right to clean air and water, freedom from excessive and unnecessary noise, and the natural, scenic, historic and aesthetic qualities of their environment; and the protection of the people in their right to conservation, development and utilization of the agriculture, mineral, forest, water, air and other natural resources is hereby declared to be a public

purpose.  
The general court shall have the power  
to enact legislation necessary or expedient  
to protect such rights.

MASS. CONST. art. 49 (1972)

States may, in turn, give local governments the authority to enact or enforce local programs and policies. For example, a substantial majority of state constitutions include home rule provisions which allow for generous local powers. Following are the two basic types of home rule provisions.

- (1) home rule flows directly from the constitution:

Municipalities shall have authority to exercise all powers of local self-government and to adopt and enforce within their limits such local police, not in conflict with general law.

OHIO CONST. art. XVIII 3 (1912)

- (2) the state legislature is granted the power to grant home rule to local government:

. . . The legislative assembly shall provide by law for the establishment of home rule in cities and villages.

N.D. CONST. art. VI (1966)

#### III.D. 4 Enabling Legislation

Even in the absence of broad home rule authority, local governments may have power to control noise through authority granted in specific enabling legislation. Many states presently use this method to grant local authorities power to enact and enforce noise provisions. The Oregon Revised Statute 467.100 (1974) is an example of enabling legislation.

Pursuant to this chapter, in order to protect the health, safety and welfare of its citizens, a city or county may adopt and enforce noise ordinances or noise standards otherwise permitted by law.

Thus, a state may adopt a "State Noise Control Act" as a response to a variety of noise problems.

A Model State "Noise Control Act" is provided in the appendix.

States may, in turn, give local governments the authority to exact or enforce local programs or policies. For example, many state constitutions include "home rule" provisions, which allow a generous local power.

A Model Community "Noise Control Ordinance" is provided in the Appendix.

A further discussion of the statutory basis of noise enforcement is also contained in Module V, where model legislation with respect to motorcycle noise is presented.

III. Endnotes

1. See generally, EPA, Public Health and Welfare Criteria for Noise, (1973); EPA, Report to the President and Congress on Noise, (1971); EPA, Noise: A HEALTH PROBLEM (1978).
2. EPA, NOW HEAR THIS (1974).
3. Donnerstien and Wilson, "Effects of Noise on Perceived Control on Ongoing and Subsequent Aggressive Behavior," 34 Journal of Personality and Social Psychology 774 (1976).
4. I. Abey-Wicherama, M. A'Brook, F. Gattoni, and C. Herridge, "Mental Hospital Admissions and Aircraft Noise, "Lancet 1275, December 13, 1968.

### MODULE III

#### Statutory Basis of Noise Enforcement\*

1. Noise may cause serious physiological effects on the human body. The most common health effect is:
  - a) gastrointestinal malfunctions
  - b) damage to the human ear
  - c) changes in fetal development
  - d) enhanced risk of heart disease
2. The psychological impact of excessive noise may cause:
  - a) irritability
  - b) anxiety
  - c) nervousness
  - d) aggressiveness
  - e) all of the above
3. Sound loud enough to interfere with conversation or mental concentration may have adverse secondary effects in the educational or work environment:
  - a) true
  - b) false
4. \_\_\_\_\_ as/are among some of the environmental impacts of noise:
  - a) damage to delicate scientific and health care instruments
  - b) disruption of breeding habits of animals
  - c) change in urinary function of animals
  - d) all of the above
  - e) none of the above
5. The major benefits of quantitative measurements are:
  - a) specificity and reliability
  - b) cost-effectiveness
  - c) no need for special equipment
  - d) all of the above
  - e) none of the above
6. The authority to regulate noise is within the powers of the states under the following sources:
  - a) Police power
  - b) Tenth Amendment
  - c) Individual State Constitutions
  - d) all of the above
  - e) none of the above
7. Many states use authority granted in specific Enabling Legislation to grant local authorities power to enact and enforce noise provisions.
  - a) true
  - b) false

\*Questions on the local law/ordinance may be added

MODULE IV

The Law and Its Application

#### IV. THE LAW AND ITS APPLICATION

##### IV. A. Introduction

Noise enforcement statutes or ordinances<sup>1</sup> may be categorized into two distinct groups. The first group are those ordinances which prohibit noise that exceeds specific decibel levels, (i.e., any noise that exceeds 82 dBA is prohibited). Throughout this section, these ordinances will be referred to as "Objective Noise Ordinances."

The second category is an ordinance which prohibits an individual from creating or operating an instrumentality which creates unreasonably loud or excessive noise. (i.e., no person shall operate any vehicle in such a manner as to create unreasonably loud or excessive noise). These will be referred to as "Subjective Noise Ordinances."

This manual does not advocate one type of ordinance over another. However, since there are distinct differences between the two types of ordinances, the manual will consider them separately. In the next sections, the two types of ordinances will be discussed along with the ancillary legal problems which arise when an individual is stopped or arrested.<sup>2</sup>

##### IV. B. Two Kinds of Ordinances.

###### IV. B. 1. Objective Ordinances.

As mentioned previously, this manual will categorize noise

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The author would like to express his appreciation to the authors of a draft report, Legal-Enforcement Issues in Community Noise Control: Summary, from which much of this section is taken.

ordinances into two groups -- objective and subjective. An objective ordinance is one that defines the noise violation in specific terms, usually in decibel levels. Since the violation level is set out in the ordinance, the Fifth Amendment problem of vagueness is usually averted.

One characteristic of the objective ordinance is that the enforcement officer must utilize a device to measure the dBA level. Such device is the sound level meter which enables the officer to determine the dBA level of a specific noise or instrumentality. Some meters create a permanent record of the violations and some record the violation on tape. The officer then can play the tape in Court to provide the violation. These objective pieces of evidence are far superior to prove the existence of a noise violation than the testimony of a noise enforcement officer that he believed the noise he heard violated the ordinance.

An example of an objective ordinance is as follows:

Sec. 17.3-5. Maximum nighttime sound levels in residential zones.

No person shall operate or cause any source of sound in such a manner as to create a sound level in a residential zone during the hours between 10:00 p.m. and 6:00 a.m. in excess of 65 dBA when measured at the property boundary of the receiving land.

Sec. 17.3-6 Motor vehicle maximum sound levels.

(a) No person shall operate or cause to be operated a public or private motor vehicle or motorcycle on a public right-of-way at any time in such a manner that the sound level emitted by the motor vehicle or motorcycle when measured at a distance of fifty (50) feet or more, exceeds the level set forth in the following table:

| <u>Vehicle Class</u>                                                              | <u>Sound level in dBA</u>            |                                   |
|-----------------------------------------------------------------------------------|--------------------------------------|-----------------------------------|
|                                                                                   | <u>Speed limit<br/>35mph or less</u> | <u>Speed limit<br/>over 35mph</u> |
| All motor vehicles of GVWR or GCWR or 6,000 lbs. or more                          | 86                                   | 90                                |
| Any motorcycle                                                                    | 82                                   | 86                                |
| Any other motor vehicle or any combination of vehicles towed by any motor vehicle | 76                                   | 82                                |

(b) The foregoing provision shall not apply to any motor vehicle engaged in interstate commerce, as defined in Sec. 17.3-2(f).

Sec. 17.3-9. Penalties.

(a) Any person who violates any provision of this chapter shall be deemed to be guilty of a Class IV misdemeanor.

(b) Each day of violation of any provision of this chapter shall constitute a separate offense.

Fredericksburg Virginia, City Code, Chapter 17-3.

IV. B. 2. Subjective Ordinance.

A subjective ordinance utilizes qualitative standards rather than quantitative ones to designate a violation. Ordinances which prohibit "excessive" or "loud or raucous" noise fall into this category. Unlike the objective ordinance which uses a specific dBA level to determine the violation, these ordinances rely on the enforcement officer's discretion to determine whether a particular noise violates the statute.

An example of a subjective ordinance is as follows:

835.040 Excessive Noise --

No person shall operate any vehicle constructed or so out of repair, or loaded in such a manner as to create unreasonably loud or excessive noise.

St. Louis, Mo. Traffic Code, sec. 836.040

The manual does not advocate one type of ordinance over another. Both have their own problems. However, it is clear that there are significant differences between them. In the Fredericksburg ordinance, the violation is clearly set out whereas in the St. Louis ordinance, the violation is not so clear. The clarity of the violation and the ability of the enforcement officer to determine if a violation occurred raise secondary problems in the enforcement of the ordinance. Some of these problems will be discussed in the next sections.

IV. C. Problems Which Go To The Validity Of The Noise Violation.

The noise enforcement official faces two distinctly different types of problems when he stops a person for a noise violation. First, are the problems which go to the essence of the noise violation. Setting aside for the moment the question of whether the officer can prove his case, the noise violation may be dismissed because the ordinance is too vague or because the procedures used by the officer to stop a motor vehicle were unconstitutional.

IV. C. 1. Fifth Amendment - Vagueness Doctrine.

One problem with a subjective ordinance is that the Courts may refuse to enforce it because it is too vague.

ISSUE: Are noise control provisions, such as those prohibiting "loud", "excessive" or "unreasonable" noise, unconstitutionally vague under the Fifth Amendment?

BRIEF ANSWER: Case law is divided concerning whether qualitative noise provisions violate the due process clause of the Fifth Amendment. Provisions are generally upheld as constitutional if the terms used to define violations are within common knowledge and usage.

DISCUSSION: The Fifth Amendment provides that no person shall "be deprived of life, liberty, or property without due process of law." The Courts have interpreted the Fifth Amendment due process clause to require that laws be sufficiently definite to put a reasonable person on notice of what conduct constitutes a violation of a given law. Herndon v. Lowry, 301 U.S. 242 (1937). Because the Fifth Amendment protection has been extended to the state level through the Fourteenth Amendment, state and local governments must comply with the Fifth Amendment due process requirements in drafting and enforcing noise control regulations.

The Supreme Court considered the following provision of the Rockford, Illinois noise ordinance:

- No person, while on public or private grounds adjacent to any building in which a school or any class thereof is in session, shall willfully make or assist in the making of any noise or diversion which disturbs or tends to disrupt the peace or good order of such school session or class thereof. Grayned v. City of Rockford, 408 U.S. 104 (1972).

Although the court upheld this ordinance, it listed three reasons for the Fifth Amendment requirement that a law must be sufficiently precise:

- (First) Vague laws may trap the innocent by not providing fair warning. Second, if arbitrary and discriminatory enforcement is to be prevented, laws must provide explicit standards for those who apply them. Third, where a vague statute abut(s) upon sensitive areas of basic First Amendment freedoms, it operates to inhibit the exercise of (those) freedoms. Id. at 108-109.

State courts have upheld noise control regulations which use language falling within "common usage". For example, the California Vehicle Code, which provides that motor vehicles:

. . . shall at all times be equipped with an adequate muffler in constant operation and properly maintained to prevent any excessive or unusual noise . . . Smith v. Peterson, 280 P.2d 522 (Cal. 1955).

has been upheld by the California Appeals Court.

Additionally, the California Court described the "common usage" test as follows:

It is not required that a statute have the degree of exactness which inheres in a mathematical theorem . . . The requirement of reasonable certainty does not preclude the use of ordinary terms to express ideas which find adequate interpretation in common usage and understanding. Id. at 525.

Therefore, subjective standards in noise control regulations may withstand a Fifth Amendment challenge if the language is sufficiently specific and falls within the scope of common understanding so as to put a reasonable person on notice of what conduct is prohibited.

Noise ordinances which have been challenged as vague usually identify the prohibited noise by its general character or nature rather than by specific standards. The following provision of the Muskegon, Michigan noise ordinance was held unconstitutionally vague:

It shall be unlawful for any person to make, continue, or cause to be made or continued any noise which either annoys, disturbs, injures or endangers the comfort, repose, health, peace or safety of others, within the limits of the city. United Pentacostal v. Steenham, 412 N.W. 2d 866 (Mich. App. 1979).

The Michigan Court of Appeals stated that the danger of such vague language was the apparently unlimited discretionary power involved in identifying persons who were violating the ordinance.

**SUMMARY:** Subjective ordinances may be subject to a constitutional challenge of vagueness, whereas objective ordinances for noise control, which are sufficiently specific to provide notice of what conduct

constitutes the violation, should survive constitutional challenge on the basis of vagueness.

IV. C. 2. Fourth Amendment: Stopping Motor Vehicle

The Fourth Amendment poses another problem which goes to the essence of the noise violation conviction.

ISSUE: Does the stopping of a motor vehicle for a noise violation violate the Fourth Amendment of the U.S. Constitution?

BRIEF ANSWER: The Fourth Amendment of the United States Constitution permits reasonable searches and seizures which are based upon probable cause, pursuant to consent, a proper warrant or fall within one of the exceptions to the warrant requirement. The Supreme Court has decided that a stop of a motor vehicle is within the ambit of the Fourth Amendment. If noise enforcement officials do not have probable cause to stop a vehicle, then the noise violation will not be upheld in the Courts.

Recently, the Supreme Court of the United States decided the case of Delaware v. Prouse, 99 S.Ct. 1391 (1979).

In the Prouse decision, the Supreme Court affirmed that, within the meaning of the Fourth Amendment, stopping a motor vehicle and detaining its occupants constitutes a seizure even though the purpose of the stop is limited and the resulting detention is quiet brief. Under the Fourth Amendment, any seizure based on the discretion of an enforcement officer must be based on a reasonableness standard. The reasonableness of the law enforcement practice is judged by balancing the person's Fourth Amendment rights with legitimate governmental interests.

In Prouse, the Court held that spot checking for license and registration was a physical and psychological intrusion on the

occupants of the motor vehicle. These stops were found to be inconvenient, to consume time, and also to create a substantial anxiety. The Court also found that the use of spotchecks to aid in highway safety was minimal at best.

Therefore, in balancing the reasonableness of the enforcement method utilized, with the governmental interest, the Court concluded that the stopping of a vehicle purely at the discretion of the enforcement officer was intrusive and unjustifiable under constitutional standards. An officer must have a factual basis for suspicion directed at a particular vehicle or have some other substantial and objective standard to govern the exercise of his discretion in stopping a motor vehicle.

The enforcement of a noise ordinance which prohibits loud or excessive noise or which sets a maximum dBA level which may not be exceeded, is patently different from the situation in the Prouse case. In Prouse, the law enforcement officer acted entirely within his own discretion -- he had no probable cause to believe that the driver of the vehicle was violating a traffic regulation nor did he have any other articulable basis amounting to reasonable suspicion that the driver was unlicensed or his vehicle unregistered. The probable cause or reasonable suspicion in an objective ordinance is that the vehicle exceeded the dBA level as measured by the sound level meter. In a subjective ordinance, the probable cause or reasonable suspicion is the officer's own observation or those of others that the vehicle was creating loud or excessive noise.

Although a subjective ordinance is not affected by Prouse, it is still subject to the vagueness test of the Fifth Amendment.

Legal Problems That Noise Enforcement Officer May Encounter When Enforcing The Ordinance Which Do Not Affect The Validity Of The Noise Violation.

Noise enforcement officers when issuing a noise violation may encounter incidents of other criminal activity. Although this other activity may not involve the noise violation, the enforcement officer may have a duty to report the incidents or even to seize the materials or arrest the violator.

Most problems involve searches and seizures under the Fourth Amendment to the U.S. Constitution. Basically, the Fourth Amendment requires a law enforcement officer to obtain a warrant before searching or seizing anything. The warrant requirement recognizes that people have a reasonable expectation of privacy in their homes, automobiles and for articles contained in their homes or automobile. The Supreme Court has held that "searches conducted outside the judicial process, without prior approval by a judge or a magistrate, are per se unreasonable -- subject to only a few specifically established and well-delineated exceptions." Katz v. United States, 389 U.S. 347 (1967).

IV. C. 3. Exceptions to the Warrant Requirement.

IV. C. 3. (a) Search incident to a valid arrest.

This exception permits law enforcement officers to search an individual that they have arrested. In United States v. Robinson, 414 U.S. 218, (1973), the Supreme Court upheld a warrantless search of an individual who had been arrested for operating a motor vehicle after revocation of his license. However, to qualify as an exception to the warrant requirement, the search must not be too far removed from the time and place of the arrest.

This exception would permit a noise enforcement officer who validly arrested a person for violating a noise ordinance to then search the person without a warrant. In U.S. v. Edwards, 415 U.S. 800 (1974), the Court held that the search of an arrested person's possessions at the place of detention was sufficiently related to the arrest to qualify under the search incident to lawful arrest warrant exception. (Emphasis added).

The right to search incident to a lawful arrest without a warrant is contingent upon some requirements:

1. The arrest must be lawful; that is, all legal requirements for a valid arrest must be met. If the arrest is unlawful, so is the search.
2. The search must be made immediately upon arrest or at a time sufficiently related to the arrest in order to suffice under the rationale that the search is conducted to protect the police officer and to deprive the suspect of an escape.
3. The arrest must be in good faith and must not only be a means to conduct the search.

IV. C. 3. (b) Valid Consent.

A warrant is not required where the individual gives his consent to the search. Schneckloth v. Bustamonte, 412 U.S. 218, (1973). However, consent to a warrantless search must be voluntary. Voluntariness is tested by the totality of the circumstances surrounding the consent; for example, the age and intelligence of the consenting party, the words and actions of the officer, coercion, if any, and the setting where the consent was given, are factors which the Court considers in determining whether the person who gave the consent had the authority to consent to a warrantless search. For example, a person with possessory rights to the area being searched generally has

authority to consent to a warrantless search.

In some cases, a person may not have the authority to give consent to a warrantless search. In U.S. v. Matlock, 415 U.S. 164 (1974), the Court upheld the search of a bedroom that was occupied by two people. One of the persons consented to the search -- the other was not home at the time of the search. The Court found that the consent of one who possesses common authority over premises or effects is valid as against the absent nonconsenting person with whom that authority is shared.

IV. C. 3. (c) Exigent Circumstances.

This is another exception to the warrant requirement under the Fourth Amendment. This exception permits warrantless searches where the exigencies of the circumstances make that course imperative. McDonald v. U.S., 335 U.S. 451 (1948). In Warden v. Hayden, 387 U.S. 294 (1967), the Court upheld a search of a private home without a warrant by law enforcement officers. The Court found that the officers were informed that an armed robbery had occurred less than five minutes before they arrived and that the suspect had entered a certain address. The Court upheld the arrest of the robber and the seizure of two weapons and the clothes the robber was identified as wearing because of the exigent circumstances of the case. Speed here was essential, and only a thorough search of the house for persons and weapons which could be used against them or to effect and escape, Id.

IV. C. 3. (d.) Automobile Exception.

The Supreme Court has also permitted an exception to the warrant requirement of the Fourth Amendment for the seizure of automobiles. Carroll v. U.S., 267 U.S. 132 (1925). Its rationale for this exception

is twofold:

- (1) the inherent mobility of the automobile often makes it impracticable to obtain a warrant; and
- (2) the configuration, use and regulation of automobiles often may dilute the reasonable expectation of privacy that exists with respect to other situated property. Arkansas v. Sanders, 442 U.S. 753 (1969), (citations omitted).

However, the automobile search does not apply in all circumstances. The exception is only justified when there is a situation where the automobile may be moved or its contents removed. In Coolidge v. New Hampshire, 403 U.S. 91 (1971), the Court invalidated a warrantless search and seizure of an automobile because there was no evidence that it was impractical to obtain a warrant. There was not present a criminal bent on flight, contraband or stolen goods, a fleeting opportunity on a highway after a high speed chase or confederates waiting to move the evidence.

Noise enforcement officials should be very wary of this exception. If they arrest a person and impound his car, they should obtain a warrant before they search the car.

IV. C. 3. (c) Plain view.

This exception is one which the noise enforcement officer may encounter very frequently. If the officer has validly stopped a car for a noise violation, then he may seize any contraband in plain view. For example, if an officer who has stopped a car for a noise violation, sees marijuana or other contraband in the back seat, then he may seize it. The basis for the plain view exception is that the officer had prior justification for the intrusion in the course of

which he came inadvertently across the contraband. Coolidge v. New Hampshire, 403 U.S. 91 (1971).

Recently, there have been a number of cases decided by the Court on the issue of searching luggage or clothing which has been seized pursuant to the plain view exception or the exigent circumstances exception. Arkansas v. Sanders, 442 U.S. 753 (1979); Robbins v. California, 101 U.S. S.Ct. 2841 (1981); and New York v. Belton, 101 S.Ct. 2860 (1981). In these three cases, the Court found that the seizure of the items was proper, but in Sanders and Robbins, the warrantless search of the luggage was invalid. In Belton, the Court held that the search of a jacket in plain view in the passenger compartment of the car was a lawful search. However, in Sanders, the Court invalidated a search of a suitcase found in the trunk of the car and in Robbins, it invalidated the search of a sealed, wrapped container in the rear compartment of the station wagon. These cases may indicate that the law on warrantless searches is unclear and is constantly changing. Robbins and Belton were decided on the same day and the difference in the treatment of the search seems to fall on the fact that in Robbins, the police searched a container, but in Belton, they searched a jacket - not a very clear distinction!

Noise enforcement officers should be very wary of the Fourth Amendment and procure a warrant if possible prior to any search or seizure.

#### IV. D. Evidentiary issues.

Evidentiary issues are very important to everyone who is involved in law enforcement. The evidence that a judge will admit and the weight

that he will place on that evidence is central in obtaining a conviction. An officer who is aware of the evidentiary issues involved in the enforcement of motor vehicle noise violations is able to collect, pocket, and present admissible evidence which will enhance the prosecution of the noise violation.

IV. D. 1. Evidence.

Evidence is facts or other proof introduced at a trial or other legal proceeding for the purpose of proving a certain fact in dispute. As mentioned previously, the judge has the discretion to admit or exclude evidence at trial. This section will discuss the introduction of certain types of evidence, (i.e., the noise and speed of motor vehicles), which is central to noise violation cases.

IV. D. 2. Prima Facie Evidence.

Prima facie evidence is evidence which is sufficient to establish a fact unless contradicted or overcome by other evidence. For example, a noise ordinance may state that the measurement of noise exceeding a specified noise level is prima facie evidence of a violation of that ordinance. For example, Ashland, Ohio has an ordinance which provides:

The creation of noise by the squealing of tires, or the creation of tire marks on the roadway shall be prima facie evidence of a violation of this section.  
Ashland, Ohio, Codified Ordinances, Sec. 333.06 (1969).

Under this ordinance, a noise officer who testifies that he heard or saw a person operate a car by squealing its tires or creating tire marks on the roadway, and can identify the operator and the car, has made out a prima facie violation of the Statute.

One definition of prima facie evidence of a noise violation is evidence which, if explained or uncontradicted, is sufficient to

establish that a noise violation occurred but which may be contradicted by other evidence. However, this definition implies that a prima facie case, if unrebutted, requires a judgment in favor of the person who introduced the evidence and this fact is not always true.

A more cautious definition of prima facie evidence is:

(W)here the proponent, having the first duty of producing some evidence in order to pass from the judge to the jury, has fulfilled that duty, satisfied the judge, and may properly claim that the jury be allowed to consider his case. 9 J. Wigmore, Evidence Sec. 2494 at 293-294 (3d ed. 1940).

An objective noise ordinance which contains specific references to mechanical measuring devices and which delineates the permissible limits beyond which a violation occurs, will best assure that a prima facie case is established. However, even though an officer presents a prima facie case which is unrebutted, under the second definition, there is no guarantee that the jury or trier of fact will find a violation.

#### IV. D. 3. Sound Level Meter as Evidence.

During the 1940's, increasing auto speeds and resulting traffic injuries led to increased concern for enforcement of highway speed limits. This concern, along with the uncertainties of opinion testimony as to vehicle speed, led to the development and widespread use of the radar speed meter.<sup>3</sup> Similarly, the continual increase of motor vehicle noise control regulations had led to the development and use of the sound level meter<sup>4</sup> -- an electronic instrument calibrated to read sound levels directly in decibels -- for motor vehicle noise enforcement.

The sound level meter (SLM) is similar to the radar speed meter.

Therefore, a look at the historical development of radar speed meter readings as admissible evidence in court may prove helpful in predicting the development of case law involving the use of sound level meter readings as evidence.

The use of radar as a means of enforcing speed limits was first tested in Delaware Court in the case of State v. Moffit, 110 A.2d 778 (1953). In this case, two highway patrolmen introduced into evidence the electronic radar speed meter readings to prove the speed of the defendant's car. The defendant objected to the State's attempt to introduce the speed meter reading into evidence on two grounds:

(1) the speed meter had never been recognized as being a reliable instrument to record the speed of vehicles on the highway; and

(2) even if admitted, the speed meter reading should not constitute conclusive evidence of the defendant's speed. Id. at 779.

In Moffit, the State produced an expert witness who testified to the construction, operation and purpose, margin of error if properly functioning, and the manner of testing the accuracy of the speed meter which the officers had actually used to determine the speed of the defendant's car. Based on this testimony, the judge admitted the radar speed meter evidence subject to the jury's determination as to its accuracy in measuring the speed of the defendant's car. The court gave the following instructions to the jury:

The mere fact that the test in the present case was made by a person not skilled in electronics is not of sufficient import to render the Speed Meter inadmissible in evidence . . .

In the present case, however, before you can return a verdict of guilty under this contention - that is, a finding by reason only of the Speed Meter - you must be satisfied beyond a reasonable (sic) doubt that the Speed Meter used in the present case was functioning properly, was properly operated at the time, and was in fact an accurate recorder of speed; further, that its accuracy had been properly tested within a reasonable time from the date of its use . . . Id.

The content of this jury instruction is very important to the noise enforcement officer who utilizes a SLM. Although the Court admitted the evidence, it left to the jury to decide whether the speed meter produced such a reading as to find the defendant guilty. The factors which the judge charged the jury to consider: the proper use of the speed meter, its proper operation, its accuracy and the testing of its accuracy all involve the training of the operator and in some cases testimony of an expert witness. If SLM's can be analogized to radar speed meters, it is imperative that the operator undergo a vigorous training program on the operation of the SLM prior to his operation of it on the highway.

Today, many jurisdictions take judicial notice that radar, when properly functioning and properly operated, is a reliable device for measuring the speed of a moving vehicle. Judicial notice means that the Court will recognize the results of radar without requiring expert testimony on the nature, function and scientific principles which underly it. However, when a prosecutor begins to introduce evidence from an SLM, in a noise violation case, he must be prepared to present testimony about its operation, how it works and the competency of the operator.

Recently, a lower court in Florida decided not to accept the reliability of radar to prove the speed of automobiles, State v. Aquilera,

supra.

In Aquilera, the court did not hold that the scientific principles underlying radar are faulty. It merely held that, before it would accept the reliability of radar beyond a reasonable doubt, the manufacturers of the equipment and the state and local governments entities in Florida must work together to improve the equipment and the competency and qualifications of the operators of the equipment.

It is important to note that this decision was based on speed measuring equipment and operator training methods utilized by the State of Florida and therefore, its scope is restricted to Florida. Most courts still take judicial notice of the general accuracy of the radar speed measuring device, provided that it has been proven that the particular speed meter is accurate, that the operator is qualified, and that the device was properly operated in the case before the court. State v. Reading, 389 A.2d 512 (1978).

IV. D. 4. Burden of Proof.

In a case which involves a violation of an ordinance which prohibits the operation of motor vehicles and motorcycles on public streets, over a certain dBA level, the burden of proof is on the prosecution to show that the defendant was in fact operating a vehicle on a public street and that the vehicle emitted noise in excess of proscribed dBA level. Depending on how a motor vehicle noise violation is defined by the ordinance, either the civil (preponderance of the evidence) or the criminal (beyond a reasonable doubt) standard of proof will apply.

In order to successfully prosecute a motor vehicle operator, the prosecutor must be able to show that:

1. The defendant operated or caused to be operated a motor vehicle or motorcycle on a public street;
2. The motor vehicle or motorcycle was operated in such a manner that the sound level emitted exceeded the limits established in the ordinance;
3. The use of the sound measuring device was proper and that the sound measuring device was in good working order; and
4. The operator was qualified to use the sound measuring device.

### Endnotes

<sup>1</sup>Throughout this section, the terms "statute" and "ordinance" are used interchangeably. Generally, a statute is the enactment of the legislature of a state and an ordinance is an enactment of municipal corporation.

<sup>2</sup>For example, searches and seizures under the Fourth Amendment.

<sup>3</sup>The radar (an abbreviated form for "radio detection and ranging") speedmeter is essentially a high frequency radio transmitter and receiver. It transmits a radio beam down the road, then picks up its reflected beam on a receiver.

<sup>4</sup>The sound level meter has a microphone that converts a sound pressure variation in the air into an electrical signal, an amplifier powered by a battery to raise the signal level enough to operate an indicator needle, and an attenuator to adjust the signal level within the range of the meter's scale. Raymond D. Berendt, et al., Quitting: A Practical Guide to Noise Control (Washington, D.C. 1976) at 3.

MODULE IV

The Law and Its Application

Please answer the following with a brief essay:

1. Explain the difference between an objective and a subjective ordinance.

2. State the reason why a court would hold that an ordinance is too vague to enforce.

3. Define prima facie evidence.

4. What are the three requirements for the search incident to a valid arrest exception to the 4th Amendment warrant requirement?

MODULE V:  
Enforcement of Motorcycle Noise

V. ENFORCEMENT OF MOTORCYCLE NOISE

V.A. State and Local Enforcement Responsibility

The Noise Control Act of 1972, as amended by the Quiet Communities Act of 1978<sup>1</sup>, envisions joint enforcement responsibilities for the Federal and state governments. With some exceptions, Federal noise control efforts center on identifying noise sources in commerce and on establishing product performance standards for manufacturers. In contrast, state and local efforts and local noise ordinances usually have focused on the control of environmental noise through zoning, operational restrictions, and other prohibitions (both subjective and objective) against excessive noise rather than on setting specific requirements for new articles in commerce. The enforcement responsibility of state/local noise regulations, particularly motor vehicle regulations, often falls on police personnel either as primary enforcers or implementing the enforcement efforts of local health officials.<sup>2</sup>

V.B. Impact of Current Motorcycle Operation

V.B.1. Street Motorcycles

Although the acceleration sound levels of new street motorcycles are lower than those of current medium and heavy trucks, they are higher than automobile sound levels, operating under similar conditions. In addition, as the sound levels of medium and heavy trucks decrease significantly, motorcycle noise will remain a significant problem.

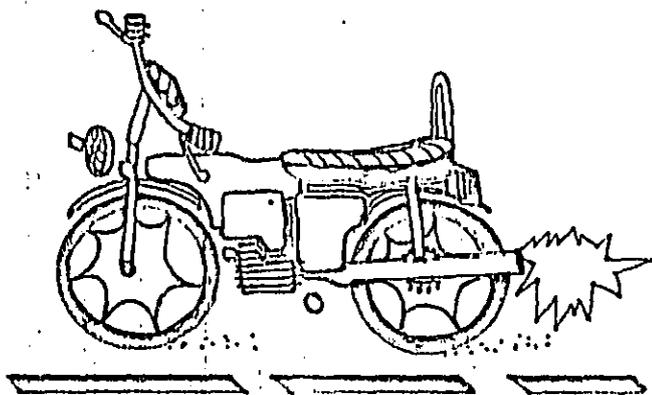
When operated in a stream of traffic dominated by other vehicles, unmodified motorcycles do not contribute greatly to over-all traffic noise impact. However, as other vehicles are quieted, the unmodified motorcycle sound will contribute significantly to the traffic noise impact. The impact of street motorcycle noise is perhaps greatest in residential areas. Since the noise of the individual motorcycle, in this environment, is not absorbed as part of general traffic noise, the disruption caused by the motorcycle impacts an individual's daily activities. Speech disruptions and sleep interferences are among the daily disturbances directly related to motorcycle noise<sup>3</sup>. It is clear from available analyses of street motorcycles that both modified and unmodified motorcycles cause significant noise impact on the population. Although exhaust system modifications do account for a larger portion of motorcycle noise impact, unmodified motorcycles are also substantial contributors to the problem.

#### V.B.2. Off-Road Motorcycles

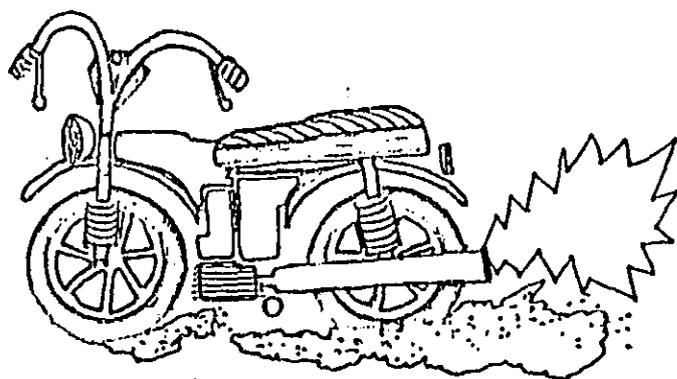
Sound levels of off-road motorcycles average several decibels higher than those of street motorcycles. To a large extent, the sound levels of these machines are dependent upon the size of the vehicle. Small machines of 170cc or less have an average acceleration sound level of about 80dB(A), while the sound levels of off-road motorcycles over 170cc displacement range from 86-95dB(A).

# Impact of current Motorcycle Operation...

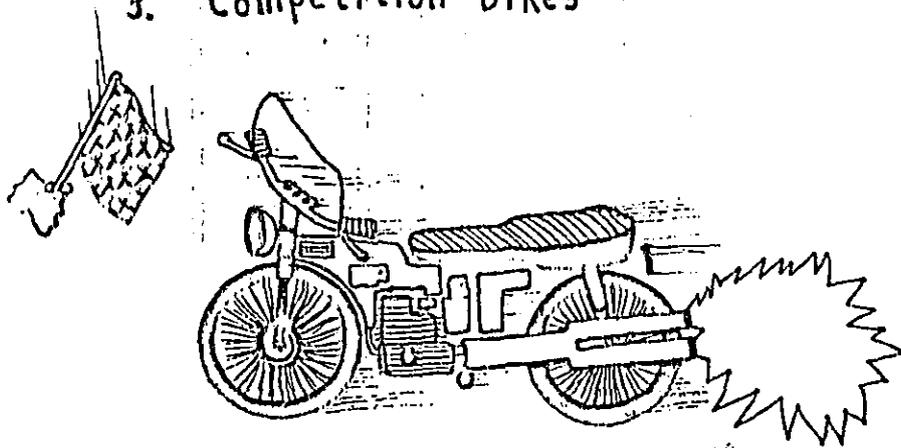
## 1. Street Bikes



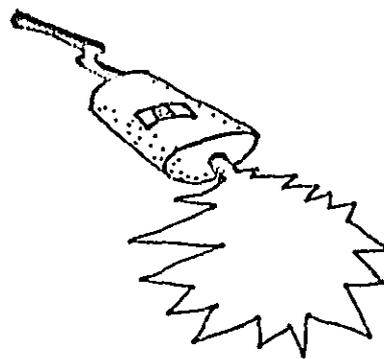
## 2. Off-Road Bikes



## 3. Competition Bikes



## 4. Exhaust System Modifications



In addition, off-road motorcycle operations often occur in areas with otherwise low ambient levels, near quiet suburban areas or more remote areas. In such environments, motorcycle noise is perceived by the listener as being disturbing.

#### V.B.3. Competition Motorcycles

Motorcycles which are designed and intended for competition use typically produce very high sound levels, often in excess of 100dB(A) when measured by standard acceleration-type tests. Although operation of competition motorcycles on streets is very limited, their use in off-road environments is considered to be a widespread problem. Further, the noise from motorcycle raceways is also reported as a significant problem in some localities. Most reports seem to indicate that the most effective method of enforcement for competition motorcycles is the "label match-up" approach.<sup>4</sup>

#### V.B.4. Exhaust System Modifications

Available studies confirm that controlling exhaust system modifications is a vital part of an enforcement strategy designed to lessen the impact of motorcycle noise.<sup>5</sup> The modification problem consists of two parts: (1) owner modification to the original equipment exhaust system (i.e., tampering) and (2) the availability of replacement system with mufflers with increased sound levels. Motorcycles which are modified by either method are by as much as 20dB (A) louder than unmodified motorcycles.

EPA has estimated that 12% of the street motorcycles and 26%, of off-road motorcycles have exhaust systems which have been modified by one method or another.

EPA has estimated that a combination of new product regulation, labeling and eliminating the availability of loud, ineffective systems will reduce significantly the overall impact of motorcycle noise.

V.C. Required Technical Skills

V.C.1. The Short Test Procedure

The enforcement of motorcycle noise emission standards will be made easier with the adoption of the "Short Test Procedure", which is sometimes called "subjective screening and stationary measurement".

The Short Test Procedure involves a citation, based on probable cause, of a violation of the established noise level limits. The citation requires the owner/operator of the vehicle to submit the vehicle for noise testing at a pre-determined site on a particular date to determine whether the vehicle is within established limits, no further action is taken. If the vehicle is not in compliance, the owner/operator is given a period of time to correct the vehicle and submit it for further testing and certification.

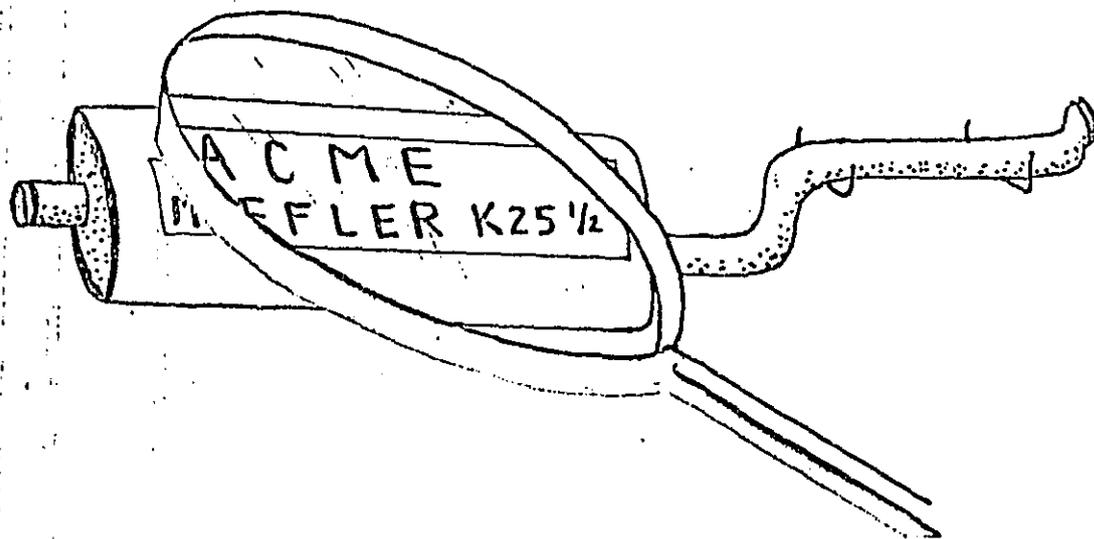
The Short Test requires an area with a 10 feet radius around the center of the vehicle which must be free of reflective surfaces.

The microphone is placed  $\frac{1}{2}$  meter (20 inches) from the exhaust outlet and 8 inches above the surface on which the vehicle stands. The engine is revved to a specified tachometer reading, and the noise level measurement is made.

A similar method may be employed utilizing the same site dimensions and microphone location requirements, but requiring an "engine kill" device is attached to the engine and shorts out the ignition at a pre-determined speed and the noise level measurement is then taken.

Either method appears to be highly suitable to municipal or suburban situations and can be applied to a state-wide program. The Short Test seems to be most cost-effective in the area of manpower utilization because: (1) a single officer can conduct the tests; and (2) any traffic enforcement officer, with a minimum of additional training, can cite for probable noise violations. If the vehicle is determined to be in violation of the noise ordinance, the owner/operator may be subject to suspension of vehicle registration for non-compliance. Either a court appearance or a form of administrative adjudication can be employed. The Short Test may also be applied to initial and renewal registrations or as a part of a vehicle inspection program. Other methods of enforcement (as discussed in Module II.D) require a working knowledge of sound level instrumentation, legal issues and a knowledge of the mechanical make-up of the motorcycle.

Label Match-up / Removal:



V.C.2. Label Match-Up/Removal

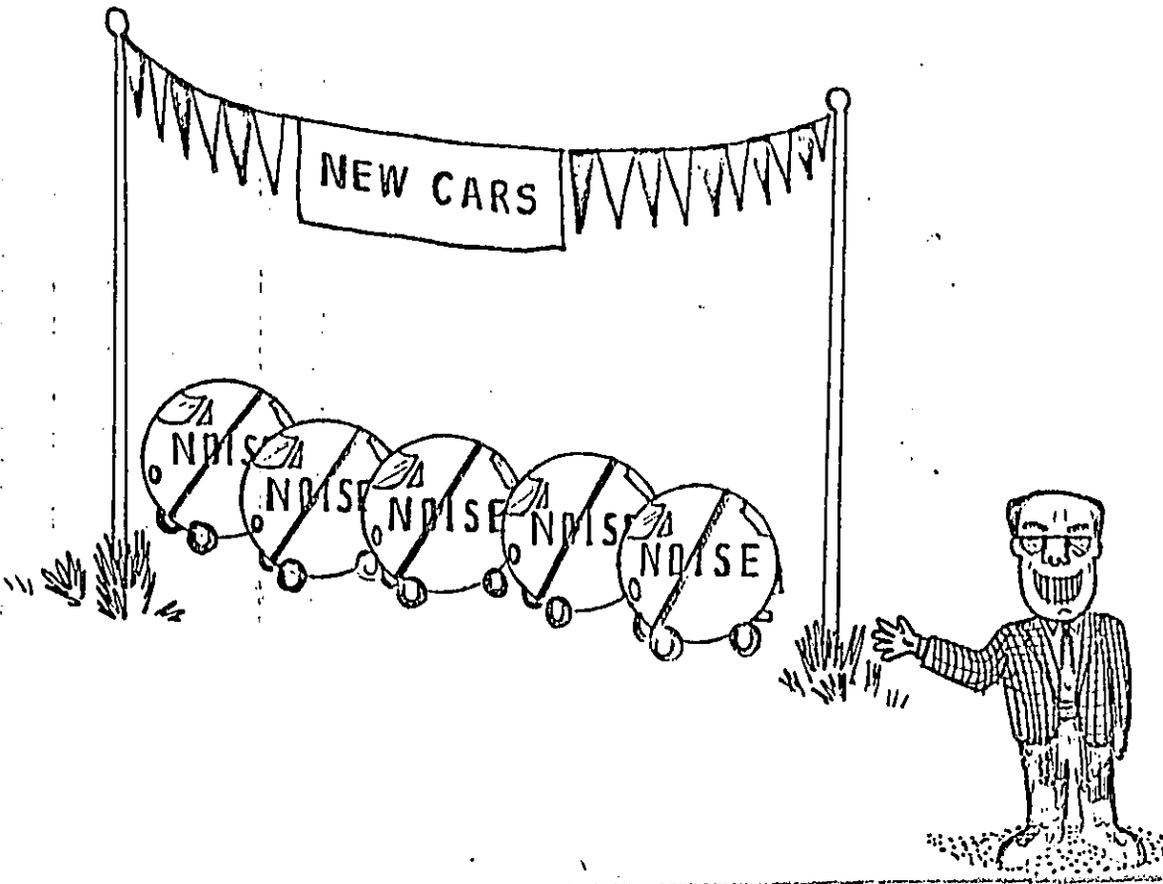
This program basically entails a visual examination of the vehicle or replacement equipment to determine whether or not labels are in place or if replacement equipment is properly labeled and designed for the vehicle on which it is installed.

A data base of vehicle labeling, engine sized, date of manufacture for both the vehicle and replacement equipment is necessary and must be readily available to the enforcement officer. Perhaps the most feasible means would be a computer data base; however, this may be more costly than desired by the enforcement agency. An alternative would be to catalogue the information to be maintained either at a readily accessible location or by the officer in the patrol vehicle.

Before implementation of such a program, certain legal issues must be resolved. Does the examination of vehicles for proper labeling and equipment require legal authority or is probable cause sufficient? Is mandatory submission of the vehicle for examination on a periodic basis required? (See Module IV.) Any or all of the aforementioned questions must be addressed in a technology transfer.

This type of program may be the least effective, may require the least resources, and possibly be used to implement an initial program and then be used to augment a more comprehensive program.

# New Vehicle Sound Level Limits and Product Verification:



V.C.3. New Vehicle Sound Level Limits and Product Verification

This method could very easily be coupled with any or all of the previously mentioned methods if the establishment of new vehicle limits is not pre-empted by some other statute. It would basically establish limits and testing procedures with which all vehicle manufacturers must comply before vehicles could be sold or titled and registered in a jurisdiction. Product verification or testing by the jurisdiction would have to duplicate that utilized by the vehicle manufacturer.

The testing area would require a site with a microphone located 50 feet from the center of the lane of travel of the vehicle being tested. A radius of 100 feet around both the microphone and the center of the lane of travel free of reflective surfaces must be established. A hard surface testing area with sufficient distance for acceleration and deceleration of the vehicle must be provided. The sound level meter must be a precision meter, a Type I or Type S-I.

## V.D. MODEL LEGISLATION

### History/Preamble

It has been determined that motorcycles (motor vehicles) are a significant source of excessive traffic noise. The noise source is often the exhaust and particularly that of modified motorcycles. Therefore, to preserve public health and welfare, it is the policy of name of jurisdiction to prevent such noise.

### V.D.1. SHORT TITLE

This chapter, ordinance, statute, section may be cited as the Motorcycle (Motor Vehicle) Noise Control Act.

### V.D.2. DEFINITIONS:

All terms and words not hereinafter defined in the Model Legislation shall be in conformance with the applicable terms and definitions as contained in the state or local law or publications of the American National Standards Institute.

(a) ANSI - the American National Standards Institute.

(b) "A-Weighted Sound Level" - the sound pressure level in decibels as measured on a sound level meter using the A-weighting network. The level so read is designated as dB(A) or dBA.

(c) "Decibel" (dB) - a unit for measuring the volume of a sound equal to 20 times the logarithm to the base 10 or the ratio of pressure of the sound measured to the reference pressure which is 20 micropascals (20 micronewtons per square meter).

(d) "Excessive or Unusual Noise" - noise which tends to interfere with health, welfare, safety or quality of life and can be identified as such by the normal human ear or with a sound level meter.

(e) "Exhaust System" - the components or combination of components which provide for the enclosed flow of exhaust gases or an internal combustion engine from the exhaust port or ports of the engine to the atmosphere, excluding brackets, clamps,

or mounting hardware.

(f) "Motor Vehicle" - as defined in the state or local code or any vehicle which is self propelled, but does not include vehicles which obtain power from overhead wires. This includes, but is not limited to, passenger cars, multi-purpose passenger vehicles, trucks, truck-tractors, motor homes, go-carts, snow-mobiles, amphibious craft on land, dune buggies or racing vehicles but excludes motorcycles.

(g) "Motorcycle" - as defined in the state or local code; as defined in The Code of Federal Regulations; or any motor vehicle other than a tractor that has two or three wheels; has a curb weight (mass) not more than 1499 lbs. (680 kg.); and with a 176 lb. (80kg.) operator that is capable of achieving a maximum speed of at least 15 mph (24 km/hr) on a level paved surface.

(h) "Muffler or Sound Dissipative Device" - a device designed and used for the flow of exhaust gases and effective in reducing the exhaust noise from an internal combustion engine.

(i) "Noise" - any unwanted sound.

(j) "Off-Road Motorcycle" - any motorcycle that is not a street or competition motorcycle.

(k) "Person" - any individual, association, partnership, or corporation and also includes any officer, employee, department, agency or instrumentality of a state or any political subdivision thereof.

(l) "Sound" - a series of disturbances which travel in the form of waves and having characteristics such as duration, frequency, and intensity..

(m) "Sound Level Meter" - an instrument which includes a microphone, amplifier, RMS detector, integrator or time averager, output meter, and weighting networks used to measure sound pressure levels, designed to meet ANSI requirements.

(n) "Tampering" - the removal or rendering inoperable, except for maintenance, repair, or replacement, of any device or element of design incorporated into any new vehicle for the purpose of noise control.

### V.D.3. OPERATION OF MOTORCYCLES (MOTOR VEHICLES)

(a) A person shall not drive on a highway, street or public

way \_\_\_\_\_ in \_\_\_\_\_ name of state, county or city and the owner or lessee shall not permit to be driven on a highway, street, or public way in \_\_\_\_\_ name of state, county or city \_\_\_\_\_ any motor vehicle or combination of motor vehicles of a type required to be registered under \_\_\_\_\_ cite local statute \_\_\_\_\_ in a manner that, at any time, at any speed, or under any condition of grade, load, acceleration, or deceleration, exceeds the sound level limits established under Section V.D.4. of this \_\_\_\_\_ law or ordinance \_\_\_\_\_ for the operation of that type of motor vehicle or combination of vehicles.

(b) If a police officer has reason to believe the exhaust noise of a vehicle registered in this state is exceeding the maximum sound level limits established under Section V.D.4. of this \_\_\_\_\_ law or ordinance \_\_\_\_\_, the officer may stop the vehicle and issue to the driver a noise inspection order.

(c) This section does not limit or supercede any other provision of law concerning vehicle equipment, vehicle noise levels, or the means of enforcing the laws relating to the vehicle equipment or noise levels.

V.D.4. IN USE VEHICLE NOISE LEVEL LIMITS

(a) No person shall operate a motorcycle (motor vehicle) on a highway, street, or public way in a manner as to exceed the noise limits for the class of motor vehicle as set forth in Table I.

TABLE V.1  
ON-HIGHWAY MOTOR VEHICLES

| Class of Vehicle                                       | Posted or Advisory Speed     |                   |             |
|--------------------------------------------------------|------------------------------|-------------------|-------------|
|                                                        | 35 mph or less<br>level road | 45 mph or<br>less | over 45 mph |
| Motorcycles                                            | 74                           | 78                | 82          |
| Passenger cars and trucks<br>less than 10,000 lbs. GVW | 70                           | 72                | 78          |
| Trucks and buses 10,000<br>lbs. and over GVW           | Optional                     | Optional          | Optional    |

(b) All noise limits set forth in Table I shall be based on a measurement distance at 50 feet from the center of the nearest lane of travel within the speed zone specified. Measurements may be taken at distances other than those specified in Table I and the distance correction factors set forth in Table II shall be applied.

TABLE V. 2.

| Sound Level Limits in dBA |                           |                      |                           |                           |                      |                           |
|---------------------------|---------------------------|----------------------|---------------------------|---------------------------|----------------------|---------------------------|
| Distance; D<br>in Feet    | On-Highway Motorcycles    |                      |                           | Autos and Light Trucks    |                      |                           |
|                           | Posted Speed Zone         |                      |                           | Posted Speed Zone         |                      |                           |
|                           | ≤ 35 mph<br>Level<br>Road | 45 mph<br>or<br>Less | Greater<br>than<br>45 mph | ≤ 35 mph<br>Level<br>Road | 45 mph<br>or<br>Less | Greater<br>than<br>45 mph |
| 21 - 29                   | 81                        | 85                   | 89                        | 77                        | 79                   | 85                        |
| 29 - 32                   | 80                        | 84                   | 88                        | 76                        | 78                   | 84                        |
| 32 - 35                   | 79                        | 83                   | 87                        | 75                        | 77                   | 83                        |
| 35 - 39                   | 77                        | 81                   | 85                        | 73                        | 75                   | 81                        |
| 39 - 43                   | 76                        | 80                   | 84                        | 72                        | 74                   | 80                        |
| 43 - 48                   | 75                        | 79                   | 83                        | 71                        | 73                   | 79                        |
| 48 - 58                   | 74                        | 78                   | 82                        | 70                        | 72                   | 78                        |
| 58 - 70                   | 73                        | 77                   | 81                        | 69                        | 71                   | 77                        |
| 70 - 83                   | 72                        | 76                   | 80                        | 68                        | 70                   | 76                        |
| 83 - 99                   | 71                        | 75                   | 79                        | 67                        | 69                   | 75                        |
| 99 - 118                  | 70                        | 74                   | 78                        | 66                        | 68                   | 74                        |

V.D.5. STATIONARY VEHICLE NOISE LEVEL LIMITS

(a) A vehicle, when tested in a stationary mode, shall not exceed the following sound level limits:

Motorcycles-----95 dBA

Passenger cars and  
light trucks less  
than 10,000 pounds GVW

Front Engine-----90 dBA

Rear Engine-----92 dBA

(b) All stationary noise level limits shall be based on the microphone of a sound level meter located 20 inches (.5 meter) and within 45 degrees of the exhaust outlet. The test shall be performed with the transmission in neutral and the engine accelerated to 3,000 rpm for passenger cars and light trucks and 50 per cent of rated horsepower for motorcycles.

V.D.6. MOROCYCLE (MOTOR VEHICLE) TO BE EQUIPPED WITH AN EXHAUST SYSTEM MAINTAINED IN GOOD WORKING ORDER.

(a) Every motorcycle (motor vehicle) operated on a highway, street, or public way shall, at all times, be equipped with an exhaust system free of defects and maintained in good working order to prevent excessive or unusual noise.

V.D.7. TAMPERING MODIFICATION TO EXHAUST SYSTEM AND NOISE ABATEMENT EQUIPMENT.

(a) No person shall modify any exhaust system or other noise abatement equipment in any manner which would amplify or increase the sound of the motorcycle (motor vehicle) above that as originally manufactured.

(b) No person shall remove or render inoperative or cause or permit to be removed or rendered inoperative any component, device or equipment which was installed by the manufacturer of the motorcycle (motor vehicle) for the purpose of noise control except for the purpose of maintenance, repair or replacement.

V.D.8. OPERATION OF MOTORCYCLE (MOTOR VEHICLE) WITH MODIFIED OR TAMPERED EXHAUST SYSTEM OR NOISE ABATEMENT EQUIPMENT.

(a) No person shall operate on a highway, street or public way or any restricted off-road operation a motorcycle (motor vehicle) with a modified or tampered exhaust system or noise abatement equipment if such modification or tampering amplifies or increases the sound of the motorcycle (motor vehicle) above that as originally manufactured.

V.D.9. (OPTIONAL) NEW MOTORCYCLE (MOTOR VEHICLE) SOUND LEVEL LIMITS.

(a) Every new motorcycle (motor vehicle) sold or offered for sale in this state, county or city and required to be registered shall meet the limits set forth in Table III.

TABLE V.3

New Motor Vehicle Sound Level Limits

|                                                       |        |
|-------------------------------------------------------|--------|
| Motorcycles                                           | 83 dBA |
| Passenger Cars and trucks less than 10,000 pounds GVW | 80 dBA |
| Trucks and buses 10,000 pounds and over               | 83 dBA |

(b) New motorcycle (motor vehicle) sound level limits shall be determined by application of the appropriate SAE test procedure for the class of vehicle being tested.

(c) Each manufacturer of a motorcycle (motor vehicle) of a type required to be registered in this state, county or city shall certify to the name of appropriate official, agency or department by specify time or dates in a manner prescribed by the name of appropriate official, agency or department the motorcycles (motor vehicles) which meet the sound level limits set forth in Table III and may be offered for sale in state, county or city.

(d) The manufacturer shall, upon request, provide either through factory outlets, dealers or other means, motorcycles (motor vehicles) for testing by the name of appropriate official, agency or department.

V.D.10. OFF-ROAD OPERATION - RESTRICTED AREAS

(a) No person shall operate any off-road motorcycle within the boundaries of           specify areas with jurisdiction           during           specify times          .

V.D.11. ENFORCEMENT

(a) The           name of appropriate official, agency or department           may specify the methods of enforcement, training and certification of enforcement personnel and those acts which constitute a violation of this           statute, law, ordinance, etc.           which includes but is not limited to           as specified by local authorities          .

V.D.12. SEVERABILITY

(a) Any provision or application of this           statute, law, section, etc.           is held to be invalid shall not cause the remainder of the           statute, law, section, etc.           to be invalid.

APPENDIX

Procedure to Enforce Section V.D.3.

- (1) The noise inspection order shall direct the owner of the vehicle to have the vehicle tested at a designated site within 10 days.
- (2) If after testing, it is determined the exhaust noise of the vehicle exceeds the sound levels established under Section V.D.4., a noise repair order shall be issued.
- (3) The noise repair order shall direct the owner of the vehicle:
  - (i) To have the exhaust system corrected as necessary at a place of the owner's choice within 10 days from the issuance of the noise repair order.
  - (ii) To send to name of appropriate agency or department to a noise repair order certification dated subsequent to the issuance of the order.
- (4) The name of appropriate department or agency shall prepare and provide the necessary forms for the enforcement and administration of this law, ordinance, or section.
- (5) The name or appropriate department or agency may adopt rules and regulations to carry out the provisions of this section.

(OPTIONAL)

- (i) THESE RULES AND REGULATIONS MAY INCLUDE THE SUSPENSION OF REGISTRATION IF PERMITTED BY LOCAL LAW AND/OR THE ISSUANCE OF A CITATION REQUIRING COURT ADJUDICATION.
- (ii) IF SUSPENSION OF REGISTRATION IS PERMITTED, THE RULES AND REGULATIONS MUST ALSO INCLUDE PROVISIONS FOR THE REINSTATEMENT SUSPENDED REGISTRATION.

REGULATIONS  
GOVERNING THE MODEL ENFORCEMENT OF (MOTOR CYCLE) NOISE

A. (Cite local chapter, section or title)

.01 Promulgation of Regulations for Maximum Sound Level Limits

The following sections of the Motorcycle (Motor Vehicle) Noise Control Act authorize the (title of individual or name of department or agency) to adopt certain regulations:

- A. Section V-D.2 - establish maximum sound level limits for motorcycles (motor vehicles) operated on the (highways, streets or public ways) of this (state, county, city or town).
- B. Section V-D.4 - with the (name of police department), develop procedures for the administration and enforcement of the maximum sound level limits for motorcycles (motor vehicles) operated on the (highways, streets, or public ways) of this (state, county, city or town).
- C. Section V-D.6 - establish maximum sound level limits for new motorcycles (motor vehicles) sold, offered for sale, distributed or leased in this (state, county, city or town).
- D. Section V-D.8 - develop procedures for the administration and enforcement of the maximum sound level limits for new motorcycles (motor vehicles).
- E. Section V-D.9 - develop procedures for the certification of new motorcycles (motor vehicles) to be sold, offered for sale, distributed or leased in this (state, county, city or town).
- F. Section V-D.11 - develop procedures for the certification of exhaust muffler, intake mufflers and other noise abatement devices sold in this (state, county, city or town).

.02 Applicability

- A. Regulations .04 through .12 apply to the measurement of the sound level of:
1. Any motorcycle (motor vehicle) when in motion; or
  2. Any stationary motorcycle (motor vehicle) whether or not it is equipped with an engine speed governor.
- B. Regulations .04 through .12 do not apply to:
1. The sound generated by a horn or other warning device when used under the provisions of     (cite local traffic or motor vehicle code)    ; or
  2. The sound generated by an emergency motor vehicle when operating under the provisions of     (cite local traffic or motor vehicle code)    .

.03 Definitions

- A. ANSI means the American National Standards Institute or its successor bodies.
- B. A-Weighted Sound Level means the sound pressure level in decibels as measured on a sound level meter using the A-weighted network.
- C. dBA means the accepted standard abbreviation for the A-weighted sound level in decibels.
- D. Decibel means a unit for measuring the volume of a sound equal to 20 times the logarithm to the base 10 or the ratio of pressure of sound measured to the reference pressure which is 20 micropascals (20 micro-newtons per square meter).
- E. GCWR means the value specified by the manufacturer as the loaded weight of a combination vehicle.
- F. GVWR means the value specified by the manufacturer as the loaded weight of a single vehicle.
- G. Ground Cover means any of various low dense growing plants such as ivy, myrtle, low weeds or brush.
- H. SAE means the Society of Automotive Engineers, Inc. or its successor bodies.

.03 Definitions - Continued

- I. Sound Level means the A-weighted sound level obtained by the use of a sound level meter set on the A-weighted network or characteristic as specified in American National Standard S1.4-1971, "Specifications for Sound Level Meters".
- J. Sound Level Meter means an instrument which includes a microphone, amplifier, RMS detector, integrator or time averager, output meter, and weighting networks used to measure sound pressure levels and designed to meet ANSI requirements.

.04 Maximum sound level limits for in-use motorcycles (motor vehicles)

- A. A motorcycle (motor vehicle) shall not be operated or permitted to be operated at any time, speed, or under any conditions of grade, load, acceleration or deceleration or in any manner which would cause the sound level of the motorcycle (motor vehicle) to exceed the limits specified in Tables 1 or 3 for the type of vehicle and posted or advisory speed.
  - 1. All sound level limits for (highway, street or public way) operation shall be based on a distance of 50 feet between the microphone location and the center of the lane of travel of the vehicle and using the A-weighted network and fast meter response mode of the sound level meter.
    - a. Measurements made at other distances shall be adjusted by the factors specified in Table 2.
  - 2. All sound level limits for stationary vehicle measurements shall be:
    - a. Motorcycles (Motor Vehicles) with engine speed governors ---- based on a 50 feet distance between the microphone location and the longitudinal centerline of the vehicle and using the A-weighted network and slow meter response mode of the sound level meter.
    - b. Motorcycles (Motor Vehicles) without engine speed governors ---- based on a 20 inches distance between the microphone location and the exhaust outlet of the vehicle using the A-weighted

.04 Maximum Sound Level Limits for In-Use Motorcycles (Motor Vehicles) - Continued

2.

b. network and slow response mode of the sound level meter.

TABLE 1

MAXIMUM SOUND LEVELS - (HIGHWAY, STREET OR PUBLIC WAY OPERATION)

| <u>Type of vehicle</u>                                                                                                                                                  | <u>Posted or advisory speed limit</u> |                       |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|-----------------------|
|                                                                                                                                                                         | <u>45 mph or less</u>                 | <u>Over 45 mph</u>    |
| Any motorcycle                                                                                                                                                          | 82 dBA                                | 86 dBA                |
| <u>After (Date of further reduction)</u>                                                                                                                                | <u>(Further reduced limits)</u>       |                       |
| Passenger cars and light trucks less than 10,000 pounds GVWR                                                                                                            | 76 dBA                                | 82 dBA                |
| <u>After (Date of further reduction)</u>                                                                                                                                | <u>(Further reduced limits)</u>       |                       |
| Trucks, buses and combination vehicles over 10,000 pounds GVWR or GCWR                                                                                                  | 35 mph or less<br>86 dBA              | Over 35 mph<br>90 dBA |
| (Any further reductions or dates would have to affect intrastate vehicles only because EPA and BMCS limits are preemptive of local requirements for regulated carriers) |                                       |                       |

TABLE 2

DISTANCE CORRECTION FACTORS

| <u>Distance in feet between microphone location and center of lane of travel</u> | <u>dBa correction factor added to or subtracted from limit</u> |
|----------------------------------------------------------------------------------|----------------------------------------------------------------|
| 21-29                                                                            | + 7                                                            |
| 29-32                                                                            | + 6                                                            |

TABLE 2  
DISTANCE CORRECTION FACTORS - Continued

|        |     |
|--------|-----|
| 32-35  | + 5 |
| 35-39  | + 3 |
| 39-43  | + 2 |
| 43-48  | + 1 |
| 48-58  | + 0 |
| 58-70  | - 1 |
| 70-83  | - 2 |
| 83-99  | - 3 |
| 99-118 | - 4 |

.05 Maximum Sound Level Limits for Stationary Motorcycles  
(Motor Vehicles)

- A. A vehicle when tested in a stationary mode, shall not exceed the limits specified in Table 3.

TABLE 3  
MAXIMUM SOUND LEVELS - STATIONARY MODE

| <u>Type of vehicle</u>                                                       | <u>Maximum level in dBA</u>    |
|------------------------------------------------------------------------------|--------------------------------|
| Any motorcycle                                                               | 95                             |
| After <u>(Date of further reduction)</u>                                     | <u>(Further reduced limit)</u> |
| Passenger cars and light trucks<br>less than 10,000 pounds GVWR              |                                |
| Front engine                                                                 | 90                             |
| Rear engine                                                                  | 92                             |
| After <u>(Date of further reduction)</u>                                     | <u>(Further reduced limit)</u> |
| Trucks, buses and combination<br>vehicles over 10,000 pounds<br>GVWR or GCWR | 88 *                           |

\* Stationary test is applicable to motor vehicles equipped with an engine speed governor and is based on a 50 feet distance between the microphone location point and the longitudinal centerline of the motor vehicle.

.06 Standard Measurement Site For (Highway, Street or Public Way) Operation of All Motorcycles (Motor Vehicles) and Stationary Measurements of Motor Vehicles over 10,000 pounds GVWR and GCWR Equipped With an Engine Speed Governor.

A. Moving Motorcycle (Motor Vehicle) Measurement Procedures. (See Figure 1)

1. Measurements shall be made at a measurement site which is adjacent to and includes a portion of a traveled lane of a (highway, street or public way). A microphone target point shall be established on the centerline of the traveled lane of of the (highway, street or public way) and a microphone location point shall be established on the ground surface 50 feet from the microphone target point and on a line that is perpendicular to the centerline of the traveled lane of the (highway, street or public way) and passes through the microphone target point.
2. The measurement site shall have a clear area with a radius of 50 feet around both the microphone location and target points. There shall be no sound reflecting surfaces within the clear areas.
3. Within the measurement site is a triangular area which is determined by connecting the microphone location point and the points where the centerline of the lane of travel intersects the outer edges of the clear area around the microphone target point. There shall be no other vehicles within the triangular area when a vehicle is within the measurement site.
4. The sound level of the motorcycle (motor vehicle) is the highest reading observed on the sound level meter as it passes through the measurement site.
5. The sound level of the motorcycle (motor vehicle) being measured must be observed to rise and fall at least 6 dBA before and after the maximum sound level occurs.

B. Stationary Motor Vehicle Measurement Procedures for Motor Vehicles Over 10,000 pounds GVWR and GCWR and equipped With an Engine Speed Governor. (See Figure 2)

11.14.05 Noise Abatement Program

.05 Standard Test Site Highway Operations All Vehicles

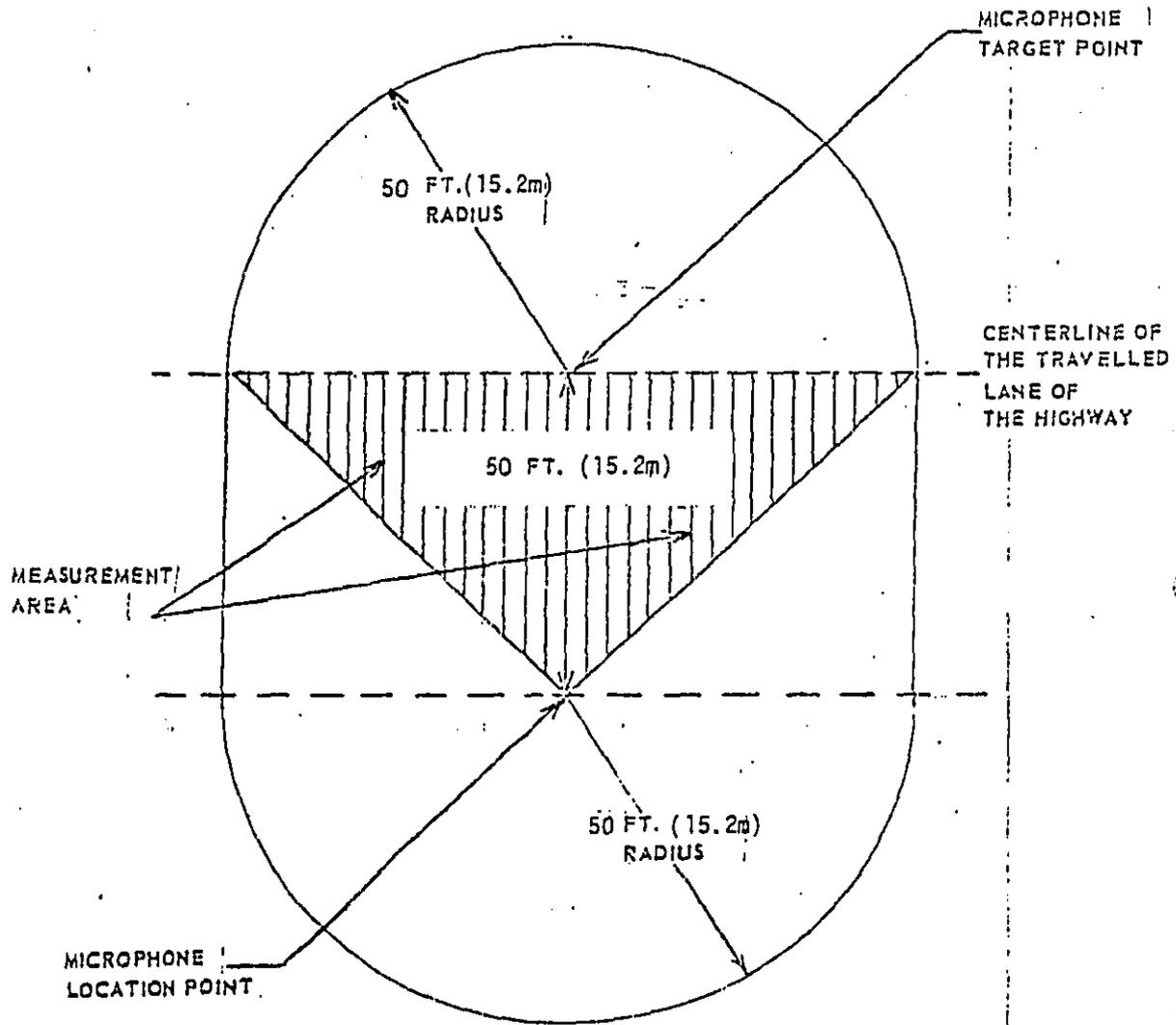


FIGURE 1

STANDARD TEST SITE  
HIGHWAY OPERATIONS

11.14.05 Noise Abatement Program

.05 Stationary Operation Vehicles Over 10,000 Lbs. GCWR and GVWR

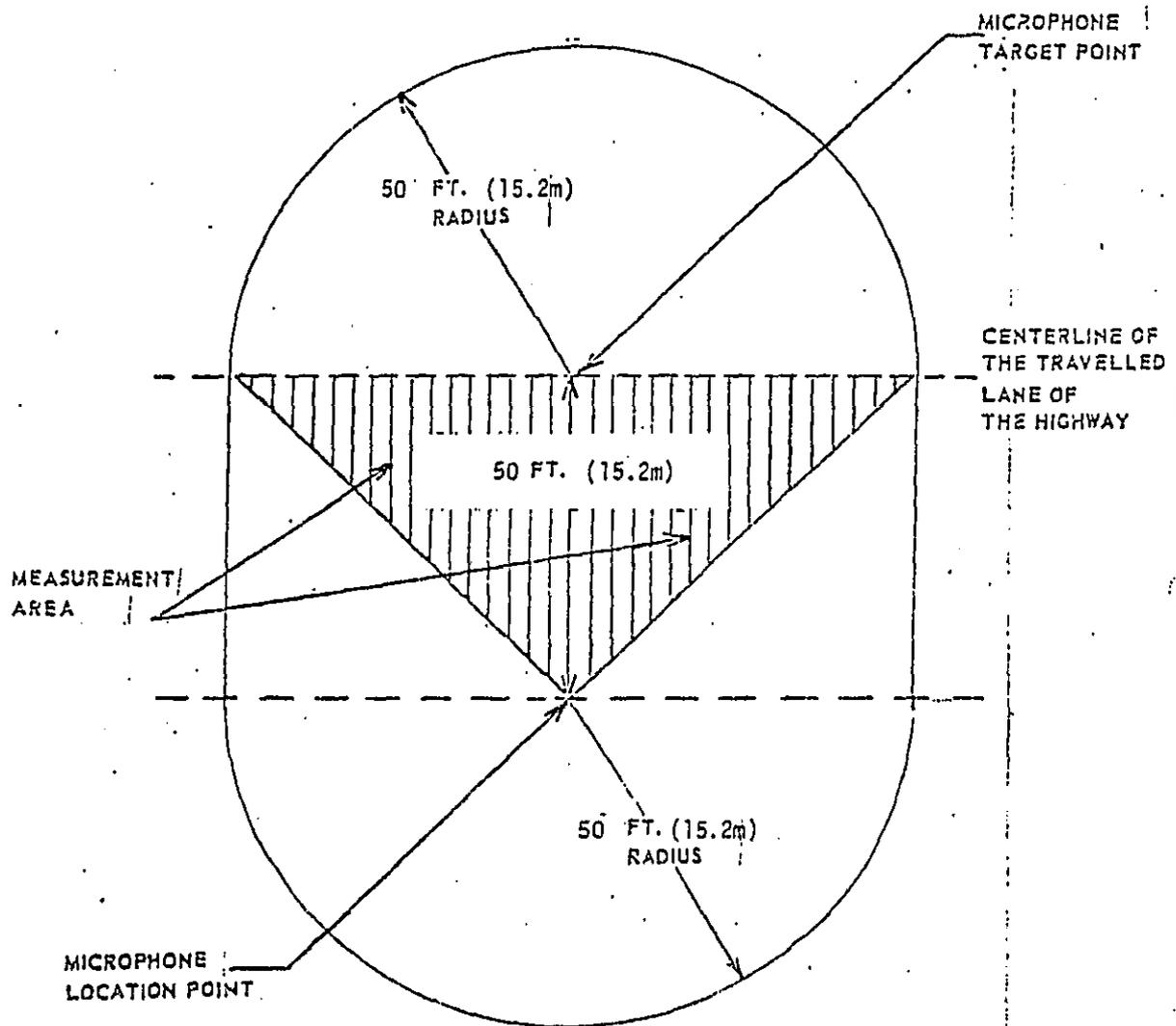


FIGURE 2  
STANDARD TEST SITE  
STATIONARY OPERATIONS

## .06 B Stationary Motor Vehicle Measurement Procedures Cont'd

1. The motor vehicle to be tested shall be parked within the measurement site. A microphone target point shall be established on the ground surface of the site on the centerline of the lane in which the motor vehicle is parked at a point that is within 3 feet of the longitudinal position of the vehicle exhaust outlet or outlets.
  - a. If the motor vehicle is a combination vehicle, they shall be parked so the longitudinal centerlines of all vehicles are in substantial alignment.
2. A microphone location point shall be established on the ground surface 50 feet from the microphone target point and on a line that is perpendicular to the centerline of the lane where the vehicle is parked and passes through the microphone target point.
3. The measurement site shall have a clear area with a radius of 50 feet around both the microphone location and target points. There shall be no sound reflecting surfaces within the clear areas.
4. All auxiliary equipment such as cranes, asphalt spreaders, liquid or slurry pumps, auxiliary air compressors, welders or trash compactors which are installed on the motor vehicle and which are designed to operate under normal conditions only when the vehicle is operating at a speed of 5 miles per hour or less shall be turned off.
5. If the motor vehicle engine fan is equipped with a clutch or similar device that automatically either reduces or disengages the rotational speed of the fan from its power source in response to reduced engine cooling loads, park the vehicle before testing, with the engine running at high idle speed or any other speed the operator may choose, for sufficient time but not more than 10 minutes, to permit the radiator fan to automatically disengage.
6. The motor vehicle transmission shall be in neutral and the clutch engaged.
7. Rapidly accelerate the engine from idle to maximum governed speed with wide open throttle and return to idle speed and observe the maximum reading on the sound level meter. Repeat these procedures until the first two maximum sound level readings observed are within 2 dBA of each other. Numerically average the readings to obtain the maximum sound level of the motor vehicle.

.06 B. Stationary Motor Vehicle Measurement Procedures Cont'd

- a. If the motor vehicle is equipped with dual exhausts, these procedures will be applied to both sides of the motor vehicle and the numerical averages for each side will be numerically averaged to obtain the maximum sound level generated by the motor vehicle.

.07 Measurement Site for Stationary Measurements for Motorcycles (and Motor Vehicles Less than 10,000 pounds GVWR).

- A. Measurements shall be made at a site that contains 10 feet radius around the centerline of the vehicle of clear area free of reflecting surfaces.
- B. The microphone shall be located 20 inches away from the exhaust outlet; 8 inches above the ground level on which the vehicle stands; and within a 45 degree angle of the exhaust outlet.
- C. The transmission of the motorcycle (motor vehicle) shall be placed in neutral and the engine speed gradually increased to:
  1. Motorcycle, 50 percent of rated horsepower;
  2. Motor vehicles less than 10,000 pounds GVWR, 3,000 revolutions per minute.
- D. The sound level of the motorcycle (motor vehicle) shall be the maximum level observed on the sound level meter when the engine speed of the motorcycle (motor vehicle) listed in Section .07 C is attained.

.08 Non-Standard Measurement Site For (Highway, Street or Public Way) Operation of All Motorcycles (Motor Vehicles).  
See Figure 3

- A. Measurements may be made at a site that meets all the requirements of Section .06 A except the distance between the microphone location and target points.
  1. If the distance between the microphone location and target points is less than 50 feet, the clear area around the microphone location and target points shall have a radius equal to the distance between the microphone location and target points.
    - a. If the distance between the microphone location and target points is less than 50 feet, the sound level limits shall be adjusted as specified in Table 2.

11.14.05 Noise Abatement Program

.05 Non-standard Test Site Highway Operations All Vehicles

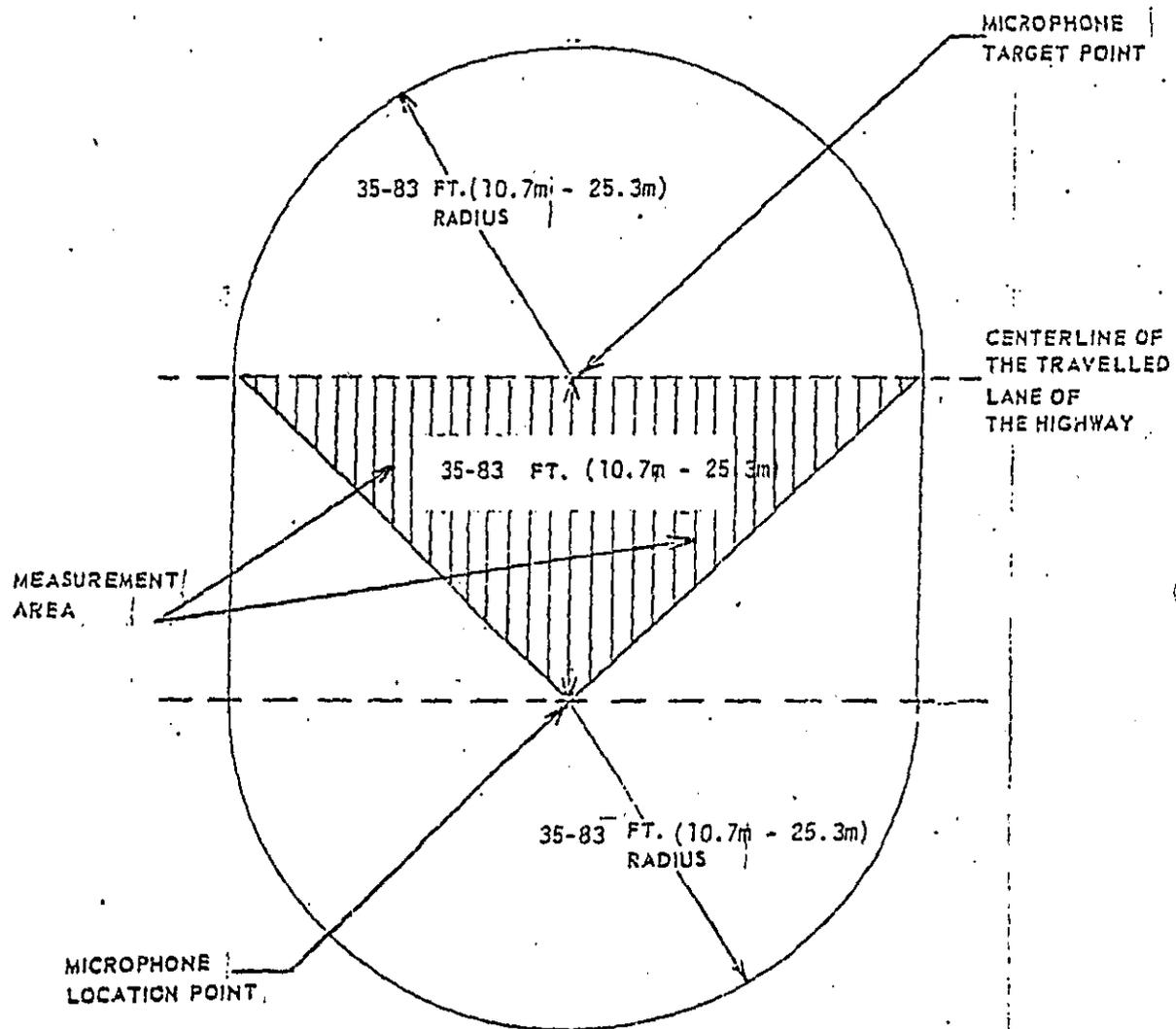


FIGURE 3  
NON STANDARD TEST SITE  
STATIONARY OR HIGHWAY OPERATIONS

## .08 Non-Standard Measurement Site Cont'd

## A.

2. If the distance between the microphone location and target points is greater than 50 feet, the clear area around the microphone location and target points shall have a radius of 50 feet.
  - a. If the distance between the microphone location and target points is greater than 50 feet, the sound level limits shall be adjusted as specified in Table 2.

.09 Site Requirements For (Highway, Street or Public Way)  
 Operation of Motorcycles (All Motor Vehicles) and Stationary Testing of Motor Vehicles Over 10,000 Pounds GVWR and GCWR Equipped With an Engine Speed Governor.

- A. The measurement site shall be an open site, essentially free of large sound reflecting objects or surfaces and no closer than 200 feet between the microphone target point and a tunnel or overpass. However, the following objects may be within the measurement site, including the triangular measurement area but not between the microphone location and target points:
  1. Small cylindrical or vertical objects less than 14 inches in diameter regardless of length, such as fire hydrants, lampposts or utility poles.
  2. Guardrails or traffic railings less than 14 inches in height regardless of length except solid concrete barriers commonly referred to as "Jersey Barriers".
  3. Rural mailboxes.
  4. One or more curbs or surfaces having a vertical height or 1 foot or less
- B. The following objects may be within the measurement site if they are outside the triangular measurement area of the site:
  1. Any vertical surface, such as billboards or traffic signs, regardless of size, having a lower edge more than 15 feet higher than the surface of the lane of travel of the (highway, street or public way) provided the face of the object is angled upward from the lane of travel.
  2. Any uniformly sloping surface sloping upward from from the lane of travel, such as a rise in grade

## .09 Site Requirements Cont'd

## B.

2. alongside a (highway, street or public way) with a slope that is less than 45 degrees above the horizontal plane of the lane of travel. See Figure 4
3. Any surface sloping downward from the lane of travel that is more than 45 degrees but not more than 90 degrees provided the surface on which the microphone stands is not more than 10 feet below the plane of the lane of travel. See Figure 5
4. Any standing water.
5. The operator, a witness or trainee. The operator, witness or trainee must be positioned behind the microphone but no closer than 2 feet from the microphone.

## C. (Highway, Street or Public Way) Surface Requirements.

1. The traveled lane of the (highway, street or public way) shall be dry, paved with relatively smooth concrete or asphalt and substantially free from:
  - a. Holes or other defects which would cause a vehicle to emit irregular tire, body or chassis impact noise; and
  - b. Loose material such as gravel or sand.

## D. Ambient Conditions.

1. Sound - The ambient A-weighted sound level at the microphone shall be measured, in the absence of motorcycle (motor vehicle) sound emanating from within the clear zone, with fast meter response selection on a sound level meter which conforms to Section 11.
  - a. The measured ambient sound level shall be at least 10 dBA below the maximum levels to be enforced.
2. Wind - The wind speed at the microphone location point shall be measured at the beginning of each series of sound measurements and at intervals of 5 to 15 minutes thereafter until it has been established the wind speed is essentially constant. After it has been determined the wind speed is constant, future wind speed measurements may be made at intervals of once each hour or whenever wind speed increases. Sound measurements may

11.14.05 Noise Abatement Program

.05 Standard Measurement Site for Vehicles Over 10,000 GVWR or GCWR

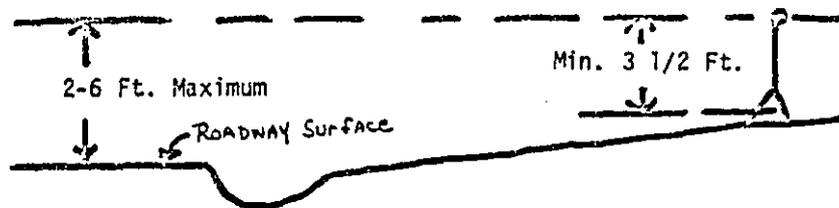


FIGURE 4

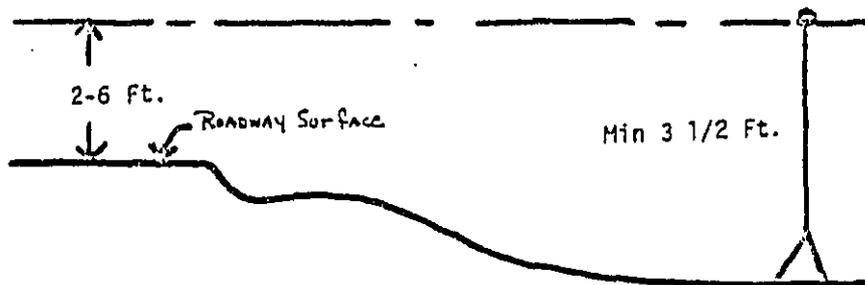


FIGURE 5

## .09 Site Requirements Cont'd

## D.

2. only be made if the measured wind speed is 12 miles per hour or less. Occasional wind speed gusts up to 20 miles per hour are permitted.
3. Precipitation - Measurements are prohibited under any condition of precipitation, however, measurements may be made with snow on the ground. The ground surface within the measurement area shall be free from standing water.

## E. Reflecting Surfaces Within Measurement Sites for Motorcycles (and Motor Vehicles Less Than 10,000 pounds GVWR).

1. Measurements made in sites with sound reflecting surfaces behind the microphone location point or beyond the vehicle fore and aft centerline and outside the triangular measurement area shall be adjusted by the factors in Table 4. If the reflecting surface are behind the microphone location point and beyond the vehicle fore and aft centerline, they are additive. Measurements shall not be made when a sound reflecting surface is less than 25 feet from the microphone location point or the fore and aft centerline of the vehicle or when there are more than two reflecting surfaces within a site.

TABLE 4

| Distance between reflecting surface and microphone location or target point | dBA adjustment added to limit |
|-----------------------------------------------------------------------------|-------------------------------|
| More than 25 feet but not more than 35 feet                                 | 1 dBA                         |

## 10 Site Requirements for Stationary Testing of Motorcycles (Motor Vehicles Over 10,000 Pounds GVWR).

- A. The measurement site shall have a relatively hard smooth concrete or saphalt surface free of loose materials.
- B. There shall be no reflecting surfaces within the 10 feet radius of the motorcycle (motor vehicle) being tested.
- C. The measurement site shall be free of standing water

.10 Site Requirements, Stationary Testing Cont'd

- C. however the measurement site does not have to be completely dry

.11 Sound Level Measurement Equipment.

A. Sound level meter

1. A (Type 1 or Type 2) sound level meter meeting the requirements of American National Standards Specification for Sound Level Meters ANSI 1.4-1971 or ANSI S1.4-1971 or later revision shall be used.
  - a. The sound level meter shall be calibrated and certified (specify time interval) with a method traceable to the U.S. National Bureau of Standards to verify its performance within design tolerances.
2. Auxiliary Equipment - (Specify any additional equipment such as tripod, cable etc. which may be necessary for use and enforcement).

B. Acoustical Calibrator.

1. An acoustical calibrator of the microphone coupler type shall be used for calibration of the sound level meter during field operation and use. The frequency of the calibration signal shall be 1000 Hz,  $\pm 5$  percent
  - a. The calibrator shall be calibrated and certified annually with a method traceable to the U.S. National Bureau of Standards to verify its performance within design tolerances.

C. Microphone Windscreen.

1. A windscreen shall be used for all measurements to protect the microphone from wind noise. Installation of the windscreen may not cause a change in the sensitivity or more than  $\pm 5$  dB in the frequency range from 50 Hz to 5 kHz or more than  $\pm 2$  dB in the frequency range from 5 kHz. It is sufficient that this compliance be demonstrated only at the required sound level meter calibration and certification.

D. Anemometer

1. Specify the type required for local enforcement purposes. (Usually a hand held type would be sufficient)

## .11 Sound Level Measurement Equipment Cont'd

## D. Anemometer

1. (If new vehicle testing or certification is a part of the noise program, the anemometer should be a remote operation type with a steady-state accuracy of  $\pm 10$  percent of any reading above 10 miles per hour.

## E. Tachometer

1. The tachometer shall be solid state with an inductive pick up and be capable of measuring engine speed of ignition spark engines of 2 or 4 stroke cycle or rotary design. It shall also have the capabilities of being used on 2,4,6, or 8 cylinder engines. The tachometer shall have a solid-state accuracy of  $\pm 100$  revolutions per minute readings throughout a range of 2,000 through 12,000 revolutions per minute.

## .12 Sound Level Equipment Operation for Measuring Motorcycle (Motor Vehicle) Sound.

## A. Microphone Location.

1. All moving motorcycle (motor vehicle) and stationary measurements for vehicles over 10,000 pounds GVWR and GCWR equipped with an engine speed governor.
  - a. The microphone shall be located at a height of not less than 2 feet or more than 6 feet above the plane of the lane of travel or the surface on which the vehicle is parked. The microphone shall not be less than  $3\frac{1}{2}$  feet above the surface on which it stands. The preferred microphone height is 4 feet above the surface on which it stands.
2. Stationary measurements for motorcycle and other vehicles with less than 10,000 pounds GVWR.
  - a. The microphone shall be located at a height of 8 inches above the surface on which the microphone and vehicle stand. It shall be 20 inches from the exhaust outlet of the vehicle and within 45 degrees of the exhaust outlet.

## B. Microphone Orientation

1. Unless specified otherwise by the manufacturer, the

.12 Sound Level Equipment Operation Cont'd

B. Microphone Orientation

microphone shall be approximately, but not more than 70 degrees from being perpendicular to the (highway, street or public way) so the sound from the vehicle reaching the microphone from any point in the measurement site strikes the microphone at a grazing incidence (parallel to the microphone diaphragm).

C. Meter Operation

1. The sound level meter shall be operated in accordance with the manufacturer's instructions and as follows:
  - a. The meter shall be set for the A-weighting network and fast response.
    - (1) For stationary vehicle measurements, the meter shall be set on the slow response.
2. The sound level meter shall be calibrated with the acoustic calibrator immediately before and after a period of use, and at approximately  $\frac{1}{2}$  to 1 hour intervals when in use.
  - a. When the meter is initially calibrated, it shall be checked at 15 minute intervals until it has stabilized (less than .5 dB drift).
3. The operator may not stand at any point in the measurement site that lies on a line passing through the microphone location and target points. An operator, witness or trainee may be positioned behind the microphone but no closer than 2 feet of the microphone.
4. The ambient (background) sound level, including that of other vehicles, wind effects and all other sources except the sound of the vehicles being measured, shall be at least 10 dBA less than the maximum sound level of the vehicle being measured.
5. The sound level reading of a moving vehicle or stationary vehicle shall be the highest reading observed as the vehicle passes through the site or the engine speed is attained when the requirements of Sections .06 and .07 are met.

.13 Records.

A. The operator shall keep written and signed records, on prescribed forms, which shall include at least the following:

1. Location of measurement site and posted or advisory speed, if applicable.
2. Date and times of measurements.
3. A sketch of the site, noting the location of any sound reflecting surfaces if any are present.
4. Name of operator making the measurements.
5. Identifying numbers of sound measurement equipment.
6. Site correction factors, if any.
7. Distance correction factors for the different lanes of travel to be used.
8. Distance correction factor, if any, for the distance between the microphone and fore and aft centerline of the stationary vehicle being measured.
9. For each violation observed, a description of the vehicle, lane of operation (except for stationary vehicle measurements), the sound level reading as set forth in Sections .06 and .07, the maximum permitted sound level, the time, enforcement action taken, if any, wind speed, calibration times, calibration adjustments if made, and any other information deemed necessary.

Module V

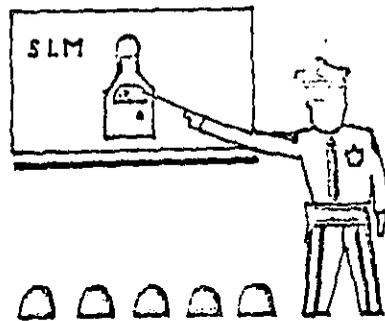
Enforcement of Motorcycle Noise

1. The impact of street motorcycle noise is greatest in business districts:
  - a) true
  - b) false
2. Sound levels of off-road motorcycles average \_\_\_\_\_ than street motorcycles.
  - a) several decibels lower
  - b) several decibels higher
  - c) equal decibel level
3. Motorcycles which are designed and intended for competition use, produce very high sound levels, often in excess of 100 dB (A):
  - a) true
  - b) false
4. Owner modification to the original exhaust system equipment is called:
  - a) the Short Test
  - b) label match-up
  - c) engine kill
  - d) tampering
5. Essay: Briefly describe the Short Test Procedure.

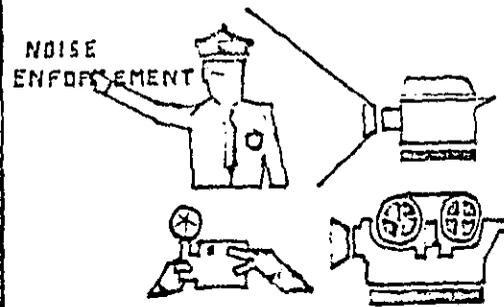
Module VI  
Field Experience

# Field Experience...

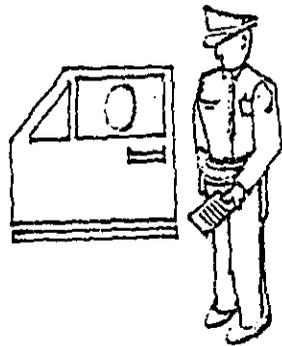
## 1. Training



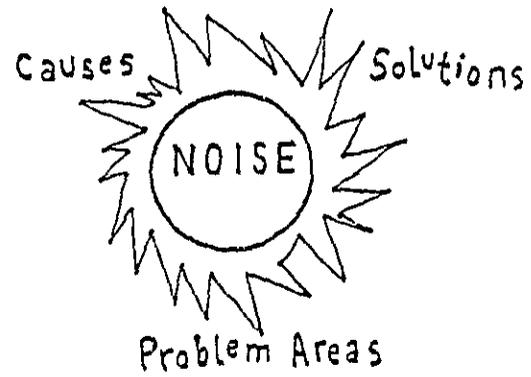
## 2. Implementation



## 3. Enforcement



## 4. What to Look for:



VI. Field Experience

Field Experience provides the practical application of noise enforcement skills and techniques learned in the classroom portions of the training program. The following describes the three phases of Field Experience: Training, Program Implementation, and Active Enforcement.

VI.A. Training

The initial experience in the Training phase provides the foundation for future noise enforcement experiences. Field Experience in the Training mode will:

1. Demonstrate to the trainee the site selection and establishment process via a practical application of classroom theory.
2. Enable the trainee to select and establish sites for actual future enforcement. This process, however, is dependent upon the locale in which the training is given.
3. Provide the trainee with practical diagnosis of vehicle noise sources and develop expertise in the identification of a vehicle in violation before it passes through a site.

When the training phase has been completed, the basic knowledge and expertise acquired can be applied to the Program Implementation and Active Enforcement phases of Field Experience.

VI.B. Program Implementation

Extensive local or statewide press coverage, public awareness, as well as development of the enforcement personnel's self-confidence should both precede and accompany the Program Implementation phase. A public relations effort has been shown to effectively promote public acceptance of and

voluntary compliance with a new enforcement program. For example, increased public awareness resulted when noise enforcement officers met with civic and community organizers during the Implementation period. Additionally, the courts, prosecutors and defense attorneys should be made aware of the enforcement program during this phase.

The initial implementation of a noise enforcement program would first involve a policy where only warnings, either verbal or written, are issued to violators. This initial period of time, of perhaps six months, will provide the enforcement officer with additional practical experience. Moreover, the officer will develop a greater degree of self-confidence at this time as personal one-on-one public contact with violators, without actual enforcement action, is put into practice. The Implementation period can also be used to locate and establish additional sites and to determine, by monitoring traffic, whether such sites would in fact be worthwhile.

#### VI.C. Active Enforcement

Following the Training and Program Implementation stages, noise enforcement personnel and the public are ready for the Active Enforcement phase. The period of Active Enforcement focuses on these three major areas: public awareness, establishment of sites, and preparation for the first court case.

VI.C.1. Public Awareness

Again, extensive press coverage, local or state-wide, should be employed to announce the commencement of active noise enforcement.

VI.C.2. Establishment of Sites

During the Active Enforcement stage, pre-established sites are used. However, additional sites could be established at this time. The location of these additional sites could be based on noise patterns and trends, citizen complaints, or any other means appropriate or necessary to local enforcement concerns.

(a) Citizen Complaints

When complaints are received from the public, personal contact should be made with the complaintant. If action is not possible at the scene of the complaint, the complaintant should be advised of the results of the investigation, so that this citizen is at least aware that some enforcement action has been attempted.

VI.C.3. Preparation of the First Case

It is during the Active Enforcement phase that the first court case is being developed. This test case will usually be the determinant of the success of the noise enforcement program and future court cases. Therefore, the utmost care should be taken in the preparation of this case.

(a) All avenues of attack by the defense should be addressed.

1. There should be no doubt as to the measured limit of the violator.

2. There should be no doubt that the defendant's vehicle was in violation.
  3. The credentials of the officer will be documented by the training received.
- (b) As much information as possible should be documented.
- (1) The date and time of violation.
  - (2) The location of the site.
  - (3) The type of site - standard or non-standard.
  - (4) Direction of travel of traffic monitored.
  - (5) Equipment used - include identifying numbers.
  - (6) Personnel involved.
  - (7) Any adjustments for distance or reflective surfaces.
  - (8) Identify any reflective surfaces.
  - (9) Ambient noise level.
  - (10) Wind speed.
  - (11) Calibration - field and factory.
  - (12) Identification of noise source (vehicle).
  - (13) Noise level recorded.
  - (14) Maximum noise level permitted.
  - (15) Rise and fall of noise level (if vehicle involved).
  - (16) Description of vehicle or noise source.
  - (17) Identification of defendant (operator of vehicle).

Forms should be developed to document the above information so that uniformity will be maintained throughout the agency.

(Sample forms are included in the Appendix.)

Through experience, enforcement personnel develop greater expertise that is accepted by the courts. The officer will develop a "calibrated ear" - the ability to determine a possible violation even before the vehicle enters the measurement site.

VI.D. Common Issues

1. Areas of noise problems or complaints.
2. Causes of noise.
  - (a) Vehicle operation.
  - (b) Traffic flow.
  - (c) Vehicle modification.
  - (d) Vehicle defects.

VI.E. Common Solutions

1. Alter driving habits by enforcing other laws.  
Example: spinning wheels, careless or negligent driving, speeding, etc.
2. Re-route or employ one-way traffic during peak periods.
3. Enforce vehicle equipment modification laws.  
Example: motor vehicle inspection, spot checks, etc.
4. Enforce defective equipment laws.  
Example: citing for defective equipment and requiring certification of repairs.

VI.F. Special Problems and Solutions

The use of CB radios presents a problem in rural enforcement and may or may not be an issue in municipal settings. A solution to the use of CB's to announce police noise enforcement activities is the development of subjective screening and stationary testing of vehicles. Such a program requires the adoption of officer authority to issue a directive to the vehicle operator, based on probable cause, for exceeding the established noise level limits.

The directive requires the operator to submit the vehicle for stationary testing of exhaust noise. Failure to comply would result in suspension of the vehicle registration, issuance of a citation or summons for a court appearance. There may be situations where the operator is cited and the case is adjudicated, but because the vehicle is not owned by the operator, the owner may fail or refuse to correct the vehicle. In such cases, it may be necessary to cite the owner rather than the operator.

VI.G. Retesting

Retesting is a viable and successful approach only if the noise enforcement program includes a subjective screening and stationary testing provision. Because retesting requires only limited space, the police or municipal building parking lot would be an adequate site. A tachometer or "engine kill" device is the only additional equipment needed.

However, if the noise enforcement program entails only pass-by enforcement, retesting would be practically impossible. To retest would require site space equal to the highway measurement site as well as an area for deceleration.

The development of retesting and certification of compliance, by promoting correction of the vehicle in violation, could mean that court action may not be necessary.

A new vehicle certification program is another means of aiding noise reduction efforts.

The primary objective of a noise program should be the correction of the noise source and, ultimately, a high degree of voluntary compliance.

APPENDIX

NOISE ENFORCEMENT LOG

Site No./ County \_\_\_\_\_ Date/Time: \_\_\_\_\_  
 Operator: \_\_\_\_\_ Equipment Serial Nos. \_\_\_\_\_  
 Interceptor: \_\_\_\_\_ Sound Level Meter: \_\_\_\_\_  
 \_\_\_\_\_ Calibrator: \_\_\_\_\_  
 Posted Speed: \_\_\_\_\_ Microphone: \_\_\_\_\_  
 Site Adjustment: \_\_\_\_\_ Preamplifier: \_\_\_\_\_

1. Site Adjustment

|             | A<br>Maximum<br>Allowable | B<br>Site<br>Adjustment | C<br>Corrected Level<br>(A+B) |
|-------------|---------------------------|-------------------------|-------------------------------|
| Trucks      |                           |                         |                               |
| Motorcycles |                           |                         |                               |
| Autos       |                           |                         |                               |

2. Lane Corrections

(Nearest Lane is Lane 1)

|              | A<br>Lane 1 | B<br>Lane 2 | C<br>Lane 3 | D<br>Lane 4 |
|--------------|-------------|-------------|-------------|-------------|
| Corrections: |             |             |             |             |

3. Maximum Allowable Adjusted Noise Levels with Lane Corrections

| Corrected Level<br>(Item 1, Column C) | Maximum Allowable Adjusted Noise Levels<br>(Use Correction from Item 2) |        |        |        |
|---------------------------------------|-------------------------------------------------------------------------|--------|--------|--------|
|                                       | Lane 1                                                                  | Lane 2 | Lane 3 | Lane 4 |
| Trucks                                |                                                                         |        |        |        |
| Motorcycles                           |                                                                         |        |        |        |
| Autos                                 |                                                                         |        |        |        |

Operator's Signature: \_\_\_\_\_



NOISE ENFORCEMENT SCHEDULE

|  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|
|  |  |  |  |  |  |  |
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27-76 (2) 703



#4

VEHICLE NOISE  
COMPLAINT

DATE COMPLAINT RECEIVED

FILE NUMBER

COMPLAINANT

ADDRESS

PHONE

LOCATION OF COMPLAINT AND TIME

REMARKS:

RECEIVED BY

ASSIGNED TO

DATE

ASED Form 55

NOISE COMPLAINT INVESTIGATION

#5

FILE NUMBER

DATE COMPLAINT RECEIVED

COMPLAINANT                      ADDRESS                      PHONE-- WORK                      HOME

LOCATION OF COMPLAINT AND TIME

INITIAL                       SUPPLEMENT

ATTEMPTS TO NOTIFY:

ACTION TAKEN:

SUPPLEMENT DUE:    Yes     No

TOTAL MAN HOURS \_\_\_\_\_ DATE OF REPORT \_\_\_\_\_ SIGNATURE \_\_\_\_\_

MSP 23-39 (10-78)

#6



HARRY HUGHES  
GOVERNOR

GORDON G. KAMKA  
SECRETARY  
PUBLIC SAFETY AND  
CORRECTIONAL SERVICES

STATE OF MARYLAND  
DEPARTMENT OF  
PUBLIC SAFETY AND CORRECTIONAL SERVICES

MARYLAND STATE POLICE  
PIKESVILLE, MARYLAND 21208  
AREA CODE 301 486-3101

EDWIN R. TULLY  
DEPUTY SECRETARY  
FOR PUBLIC SAFETY

COLONEL THOMAS S. SMITH  
SUPERINTENDENT  
MARYLAND STATE POLICE

Captain B. E. Diehl, Commander,  
Automotive Safety Enforcement Division  
Maryland State Police  
Pikesville, Maryland 21208

Dear Captain Diehl:

I, \_\_\_\_\_  
(Name) (Address)

hereby grant permission to the Maryland State Police, to place noise abatement  
monitoring equipment on my property located on \_\_\_\_\_.

This permission may be withdrawn by me at any time, I so desire.

\_\_\_\_\_  
(Signature) (Date)

\_\_\_\_\_  
(Witness) (Date)

\_\_\_\_\_  
(Witness) (Date)

23-40 (3/78)

**INSTRUCTIONS**

**To be completed in original and two copies**

**Noise Team Retain-Original Copy**

**Noise File-Carbon Copy**

**Property Owner-Carbon Copy**

GLOSSARY

- 
- A-Weighting -- A-weighting refers to a particular processing of sound signals in which low frequencies are de-emphasized. This weighting has been found to correspond fairly well to subjective human response to sound signals. See also  $L_A$ .
- Absorption -- Absorption is the removal of a portion of the original sound energy when sound is reflected from a surface.
- Absorption Coefficient -- The absorption coefficient of a given surface is the ratio of the sound energy absorbed by the surface to the sound energy incident upon the surface.
- Accelerometer -- An accelerometer is a device used to measure acceleration.
- Acoustics -- Acoustics is the name of the scientific study of sound.
- Acoustic Trauma -- Acoustic trauma refers to a permanent elevation in hearing threshold which follows a one-time exposure to high level sound.
- Ambient Noise -- The ambient noise of an environment is the average sound level due to the combined effect of all the sound sources in that environment. It is sometimes identified as the sound level that is exceeded 90% of the time ( $L_{90}$ ).
- Amplitude -- The amplitude of a sound is a measure of the amount of energy (i.e., pressure, power, intensity) of that sound.
- Anvil -- The anvil is one of the three bones of the middle ear. See Ossicles.
- Attenuation -- Attenuation is the loss of a portion of sound energy as a result of passing through matter (through a wall, for example).
- Attitude Survey -- An attitude survey is a process that seeks to determine how people feel about any matter of interest by asking them about it.
- Audiogram -- An audiogram is a record of hearing threshold levels of a particular individual at various frequencies. These threshold levels are referenced to statistically normal hearing levels.
- Audiometer -- An audiometer is a device for measuring hearing threshold levels.
- Audition -- Audition is the process of hearing.
- Auditory Nerve -- The auditory nerve carries neural impulses from the hair cells of the inner ear toward the brain, and from the brain to the inner ear.
- Auditory Sensitivity -- Auditory sensitivity is a term that describes the ability of the human ear to respond to sounds.

--  
Auricle -- See Pinna.

B-Weighting -- B-weighting is an infrequently used processing of sound signals in which there is a slight de-emphasis of the low frequencies.

C-Weighting -- C-weighting is a processing of sound signals that treats all frequencies from about 30 Hz to about 8000 Hz with equal emphasis.

Calibration -- Calibration is the process by which the accuracy of a measuring instrument is certified.

Calibrator -- A calibrator is any standard device used to calibrate other devices; in acoustics this commonly refers to a device used to certify the accuracy of sound level meters.

Community -- As used in this manual, a community is any jurisdiction that is smaller than a state (usually a city or a county).

Compression -- A compression is that portion of a cycle during which, or the portion of space within which, the molecules are crowded closer together than normal.

Continuous -- A continuous signal is a signal that is always present over the interval of observation although the level of the signal may vary considerably over this interval.

Cycle -- A cycle of a periodic occurrence is the complete sequence of values that occur during a period.

Decibel -- The decibel (abbreviated dB) is a convenient unit used to express the magnitude of sound as a logarithmic ratio of variables. The level of an acoustical quantity is usually expressed in decibels. (See Level,  $L_A$ , and also Chapter 1, Section 1.3.2.)

Decrement -- A decrement is a decrease in a quantity.

Demographic -- Demographic is a term referring to any characteristic of a person or population that may be relevant to behavior and attitudes.

Descriptor -- A descriptor is any number used to describe a situation. Some descriptors used to describe sound level are  $L_A$ ,  $L_{eq}$ ,  $L_{dn}$ , etc.

Diffraction -- Diffraction is the bending of waves when they encounter an obstacle.

Direct Interview -- A direct interview is one in which the respondent is aware of the central concern of the interview.

Eardrum -- The eardrum is a membrane which separates the outer ear and the middle ear, and which vibrates in response to sound pressure.

Etiology -- The etiology of a process is the set of related events leading to it.

Fast Response -- A setting of one of the controls of a sound level meter that allows the indicator to follow the variations in sound level as closely as possible.

Fixed-Alternative Questions -- Fixed-alternative questions are those for which the respondent must choose from the responses provided by the survey instrument.

Fluctuating -- A fluctuating sound is one that varies in pressure level during the period of observation, but remains above the ambient noise level most of the time (it may descend to the ambient level no more than once during the period of observation).

Frequency -- The frequency of a sound is the number of complete cycles of that sound occurring in one second. Most sound sources produce more than one frequency at a given moment.

Frequency Band -- A frequency band is a range of frequencies. Examples of frequency bands are octave bands, broad bands, critical bands, etc.

Frequency Spectrum -- The frequency spectrum of a sound is a representation of the frequencies present and their amplitudes.

Hair Cell -- A hair cell is one of the sensory cells in the inner ear that can respond to sound by initiating neural impulses in the auditory nerve.

Hammer -- The hammer is one of the three bones of the middle ear.  
See Ossicles.

Hearing Handicap -- Hearing handicap is defined as the existence of an average hearing threshold level of more than 25 dB in the better ear; this average is based on measurements at 500, 1000, and 2000 Hz.

Hearing Loss -- Hearing loss is any measureable difference for which the hearing of the subject is poorer than that of the population used to define normal hearing.

Hearing Threshold -- Hearing threshold is the minimum signal level (in dB) that can be detected by a subject during a hearing test. This level may be different at different frequencies.

Hearing Threshold Level -- Hearing threshold level is a scale for reporting the level of a sound (in dB) referred to average, normal hearing thresholds (see above). The zero level for this scale is based upon a statistically determined normal hearing population. This is the scale generally used for reporting hearing threshold results in the clinical audiogram.

Intermittent -- An intermittent sound is one that switches off and on two or more times during the period of observation.

Incus -- See Anvil.

Impedance -- Impedance is that property of a medium which determines the extent of its response to an external force and how well it will transfer energy to another medium.

Impedance Matching -- When the impedances of two media are equal, a condition of impedance matching exists, and maximum energy can be transferred from one medium to the other. The more the ratio of the impedances differs from one, the smaller is the fraction of energy transferred.

Infrasonic -- Infrasonic sounds are those with frequencies smaller than can be detected by persons of normal hearing.

LA -- LA is the A-weighted sound pressure level. It is the most commonly used descriptor of instantaneous sound pressure level. Many earlier documents state this level in units of dB(A).

L<sub>dn</sub> -- L<sub>dn</sub> is equivalent to the L<sub>eq</sub> measured over a 24-hour period with a 10 dB penalty added for the nighttime hours.

$$L_{dn} = 10 \log_{10} \left[ \frac{1}{24} \left( \sum_{7 \text{ am}}^{10 \text{ pm}} 10^{\frac{L_{eq}}{10}} + \sum_{10 \text{ pm}}^{7 \text{ am}} 10^{\frac{L_{eq} + 10}{10}} \right) \right]$$

L<sub>eq</sub> -- L<sub>eq</sub> is a descriptor of the total noise exposure during a finite time interval. The equivalent sound level, L<sub>eq</sub>, has the same total sound energy as the actual time varying A-weighted sound during the specified period.

$$L_{eq} = 10 \log_{10} \left[ \frac{1}{T} \int_0^T \frac{p^2}{p_{ref}^2} dt \right] \text{ where } T \text{ is normally 1 to 24 hours}$$

Level -- The level of any quantity, described in decibels (dB) is proportional to the logarithm (base 10) of the ratio of that quantity to a reference value of the same quantity. Both the value and the reference value should be stated in the same units.

L<sub>10</sub> -- L<sub>10</sub> is that sound level that is exceeded in 10% of a set of observations. L<sub>10</sub> is frequently close in numerical value to L<sub>eq</sub>.

L<sub>50</sub> -- L<sub>50</sub> is that sound level that is exceeded in 50% of a set of observations.

L<sub>90</sub> -- L<sub>90</sub> is that sound level that is exceeded in 90% of a set of observations. This descriptor is often taken as the ambient sound level.

Loudness -- Loudness is that aspect of human perception of sound that corresponds most closely with the amplitude of the sound.

Malleus -- See Hammer.

Manual Sampling -- Manual sampling requires the presence of a human observer, usually to record the data.

Masking -- Masking is the obscuring (partial or total) of one or more sound signals by the presence of other sound signals.

Neural Impulse -- A neural impulse is a signal within the nervous system.

Noise -- Noise is any unwanted sound. Objective measurements of noise are made with instruments, most often with a sound level meter.

Noise Abatement -- Noise abatement is the reduction of existing noise through corrective measures.

Noise Control -- Noise control is the reduction of noise through preventive measures.

Noise Dose -- A noise dose is the ratio of the duration of exposure to the duration permitted for exposure at a specific sound level based on a damage risk criterion. The total noise dose is the sum of the individual noise doses at each exposure level.

Noise Emission Standard -- A noise emission standard is a limit, set by government regulations, on the output of sound measured at a specified distance from regulated operating devices.

Noise Exposure Limit -- The noise exposure limit is a figure established by the OSHA Act. It is designed to limit the hearing loss associated with work.

Noise-Induced Hearing Loss -- Noise-induced hearing loss is the hearing loss that results from exposure to noise. The total hearing loss is the result of noise plus other factors such as aging and disease.

Noise-Induced Permanent Threshold Shift (NIPTS, also PTS) -- Noise-induced permanent threshold shift is the irreversible elevation in the threshold of hearing (quietest sound a person can hear) which follows chronic immersion in high level noise.

Noise-Induced Temporary Threshold Shift (NITTS, also TTS) -- Noise-induced temporary threshold shift is a reversible elevation in the threshold of hearing (quietest sound a person can hear) which follows immersion in high level noise. In cases of TTS, the hearing threshold of the exposed listener will return to pre-noise-exposure levels if the listener is placed in a quiet environment for a period of time. Subscript numbers following "TTS" indicate the duration in minutes between noise cessation and hearing threshold testing (e.g., TTS<sub>2</sub> = hearing test 2 minutes after noise cessation).

Noise Map -- A noise map is a set of contours of equal noise exposure (such as equal  $L_{eq}$ ) based upon measurements of noise in the region of interest.

Noise Survey -- A noise survey is a set of measurements of the sound levels or sound exposures in an environment of interest. In some surveys octave band (or even narrower band) analysis may be included.

Octave Band -- An octave band is a frequency band with its upper band edge equal to twice its lower band edge. Octave bands are usually named by their center frequencies. An example of an octave band is the one that has a center frequency of 1000 Hz: its lower band edge is at 707 Hz and its upper band edge at 1414 Hz.

Ordinance -- An ordinance is a municipal regulation set forth by a government authority.

Ossicles -- The ossicles are the three bones located in the middle ear. The hammer (or malleus) is attached directly to the eardrum at one end and to the anvil (or incus) at the other. The stirrup (or stapes) is attached to the anvil at one end and to the oval window (entrance to the inner ear) at the other.

Performance Standard -- A performance standard is a quantitative statement of the requirements that a particular product must meet to be acceptable.

Permanent Threshold Shift -- See Noise-Induced Permanent Threshold Shift.

Pink Noise -- Pink noise is a form of broad band sound in which each octave band has the same total energy.

Pinna -- The pinna (or auricle) is that portion of the ear that extends outward from the head.

Pitch -- Pitch is that aspect of an observer's perception of sound that corresponds most closely to the frequency of the sound.

Presbycusis -- Presbycusis is the loss of hearing that is associated with the aging process.

Pressure -- Pressure is force per unit area. In acoustics the variation in pressure associated with a sound signal, called the sound pressure, is the variable of primary interest.

Probability Sample -- A probability sample is one for which the individuals sampled are accurately representative of the population being studied.

Propagation -- Propagation is the passage of a signal from its source to a receiver. Some of the processes involved in propagation are absorption, reflection, and transmission.

- 
- Psychosocial -- Psychosocial refers to the interactive combination of psychological and social factors in the situation under consideration.
- PTS -- See Noise-Induced Permanent Threshold Shift.
- Pure Tone -- A pure tone is a sound signal whose instantaneous sound pressure can be represented by a simple sine wave. A pure tone has a single frequency.
- Quality -- Quality is that aspect of an observer's perception of sound that corresponds most closely to the frequency spectrum of the sound.
- Random Sample -- A random sample is one for which every member of the population under study has an equal chance of being selected.
- Rarefaction -- A rarefaction is that portion of a cycle during which, or the region of space in which, the molecules are spread further apart than normal.
- Reflection -- Reflection is the process in which some portion of an incident wave, upon encountering a barrier, is returned back into the medium from which it came.
- Regulation -- A regulation is a statement issued by a governmental agency specifying some required condition or behavior.
- Resonance -- A resonance is a condition for which the response of a system to a stimulus is unusually large. In acoustics, resonance is associated with increased response at certain frequencies, which are therefore called resonance frequencies.
- Sensor -- A sensor is any physical device or physiological structure that responds to stimuli. The term is most often applied to certain structures of the human sense organs and to certain devices that respond to same types of stimuli as do the human senses.
- Slow Response -- Slow response is a setting of one of the controls of a sound level meter that slows the movement of the level indicator (usually a meter movement) so that rms pressure variations occurring more rapidly than 0.5 seconds can be observed as a relatively steady value.
- Socioculus -- Socioculus refers to those hearing losses associated with non-work exposures to noise.
- Sound -- Sound, as used in this manual, refers to oscillations in pressure, particle position, and particle velocity.
- Sound Analyzer -- A sound analyzer is a device that measures the sound pressure level in narrow bands (usually in octave or 1/3-octave bands).

Sound Intensity -- The sound intensity at a particular location is the average rate at which sound energy is transmitted through a unit area perpendicular to the direction of propagation.

Sound Level Meter -- A sound level meter is a device for measuring rms sound pressure level. Such meters fall into three types, called types 1, 2, and 3. Type 1 meters are the most accurate; Type 3 are the least accurate. Type 1 and Type 2 meters normally are used for measurement of community noise.

Sound Pressure -- Sound pressure is the variation in pressure that occurs when a sound signal is propagated through a medium. Sound pressure is expressed mathematically as:  $p = p(t)$  where pressure changes as a function of time. It is the instantaneous difference between the actual pressure and the static or barometric pressure at a given time. The value that is usually measured is the root-mean-square (rms) sound pressure. The rms sound pressure at a measurement point is the square root of the mean-square value of the instantaneous sound pressure over a time interval. Expressed mathematically;

$$P_{rms} = \sqrt{p^2} = \sqrt{\frac{1}{T} \int_0^T p^2(t) dt.}$$

Sound Pressure Level -- The sound pressure level,  $L_p$ , expressed in decibels (dB) is 20 times the logarithm to the base 10 of the ratio of the rms sound pressure to the rms reference pressure of 20 micropascals (newtons per square meter), or 20  $\mu$ Pa. The mathematical expression for sound pressure level is:

$$L_p = 10 \log_{10} \left[ \frac{p^2}{p_{ref}^2} \right] = 20 \log_{10} \left[ \frac{p_{rms}}{p_{ref}} \right]$$

Sound Wave -- A sound wave is a variation in sound pressure associated with the propagation of a periodic sound signal.

Standard -- A standard is a set of specifications drawn up by a professional body that describes the required performance of a system, process, or device.

Stapes -- See Stirrup.

Stationary Source -- A stationary source is a source that remains within a pre-determined boundary line (for example, a property line) throughout a noise measurement.

Steady-State -- A steady-state noise is one whose sound pressure level is essentially constant throughout the period of observation.

Stirrup -- The stirrup is one of the three bones of the middle ear. See Ossicles.

Stratified Random Sample -- A stratified random sample is one for which two or more aspects of a population are sampled in proportion to their representation in the total population being studied.

Stressor -- A stressor is any stimulus that produces a condition of stress in the human body. Noise is an example of a stressor.

Structure-Borne Vibration -- Structure-borne vibration is any vibration propagated from a source at one location in a building to other locations through the structural elements (framework, floors, walls, etc.) of that building.

Structured Interview -- A structured interview is one in which the questions to be asked have been completely determined prior to the interview.

Survey -- A survey is any study of some aspect of a population or an environment that utilizes sampling techniques to obtain data.

Survey Instrument -- A survey instrument, as used in connection with social surveys, is a technique (such as an interview or questionnaire) for obtaining information.

Temporal Pattern -- The temporal pattern of a sound is the variation of sound pressure level with time.

Temporary Threshold Shift -- See Noise-Induced Temporary Threshold Shift.

Transducer -- A transducer is any device that receives an input signal in one form (e.g., mechanical) and puts out a signal in a different form (e.g., electrical).

Transmission -- Transmission is the passage of energy through a medium. The term often is used in connection with the sound energy that passes through a barrier.

Transmission Loss -- The transmission loss (TL) of a sound barrier is obtained by taking ten times the logarithm (base 10) of the ratio of the incident acoustic energy to the acoustic energy transmitted through the barrier.

TTS -- See Noise-Induced Temporary Threshold Shift.

Ultrasonic -- Ultrasonic sounds are those with frequencies greater than can be detected by persons of normal hearing.

Vibration -- Vibration is a back and forth motion of a system. The frequency of vibration can be either infrasonic, audible, or ultrasonic.

Vibration Perception Threshold -- The vibration perception threshold is reached when the vibrations can either be seen or felt by touch.

Wavelength -- One wavelength of a wave is the distance between two consecutive crests of the wave (more generally, the distance between any two consecutive points of identical phase).

White Noise -- White noise describes a sound source that has equal energy per unit frequency over a specified frequency range.

CURRICULUM

DAY ONE

- 8:30-8:45      Welcome and Introduction  
1. Purpose of Workshop  
    a. Training  
    b. Test Manual and Training Techniques  
2. Outline of Curriculum  
3. Introduce Staff/Instructors  
4. Registration
- 8:45-10:00    Basics of Sound and Sound Measurement  
1. Concepts and Definitions  
    a. Sound and Noise  
    b. How Sound Travels  
    c. Frequency  
    d. Decibels  
    e. Loudness
- 10:00-10:15   Break
- 10:15-12:00   Introduction to the Sound Level Meter  
1. Components of SLM  
2. Types of SLM's  
3. Reading a SLM  
4. Acoustical Calibrators  
5. On-Hand Experience
- 12:00-1:15    Lunch
- 1:15-2:30     Instrumentation and Measurement  
1. Equipment Needs for Enforcement  
2. Measurement Methodology  
3. Basic Measurement Conditions  
4. Site Selection
- 2:30-2:45     Break
- 2:45-4:00     Statutory Basis of Noise Enforcement  
1. Sources of State and Local Authority to Control Noise  
    a. Police Power  
    b. Tenth Amendment  
    c. Individual State Constitutions  
2. Statute/Ordinance  
    a. Background  
    b. Specific Provisions  
    c. Objective v. Subjective Control Measures
- 4:00-4:30     Test and Evaluation

CURRICULUM

DAY TWO

|             |                                                                                                          |
|-------------|----------------------------------------------------------------------------------------------------------|
| 9:00-10:15  | <u>Stationary Noise</u><br>1. Monitoring Stationary Noise<br>2. Recommended Enforcement Procedures       |
| 10:15-10:30 | <u>Break</u>                                                                                             |
| 10:30-12:00 | <u>Stationary Noise (cont'd)</u><br>1. Field Experience                                                  |
| 12:00-1:15  | <u>Lunch</u>                                                                                             |
| 1:15-2:15   | <u>Motor Vehicle Noise</u><br>1. Monitoring Motor Vehicle Noise<br>2. Recommended Enforcement Procedures |
| 2:15-2:30   | <u>Break</u>                                                                                             |
| 2:30-4:00   | <u>Motor Vehicle Noise (cont'd)</u><br>1. Field Experience                                               |
| 4:00-4:30   | <u>Test and Evaluation</u>                                                                               |

CURRICULUM

DAY THREE

- |             |                                                                                                                                                                                                                                                                            |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 8:30-10:15  | <u>The Law and Its Application</u> <ol style="list-style-type: none"><li>1. Police Role in Noise Enforcement</li><li>2. Legal Issues<ol style="list-style-type: none"><li>a. Fourth Amendment</li><li>b. Fifth Amendment</li></ol></li><li>3. Evidentiary Issues</li></ol> |
| 10:15-10:30 | <u>Break</u>                                                                                                                                                                                                                                                               |
| 10:30-12:30 | <u>The Law and Its Application (cont'd)</u> <ol style="list-style-type: none"><li>1. Preparing for Court</li><li>2. Mock Trial</li></ol>                                                                                                                                   |
| 12:30-1:00  | <u>Test and Evaluation</u>                                                                                                                                                                                                                                                 |



Public Law 92-574  
92nd Congress, H. R. 11021  
October 27, 1972

### Statute

86 STAT. 1334

To control the emission of noise detrimental to the human environment, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

Noise Control  
Act of 1972.

#### SHORT TITLE

SECTION 1. This Act may be cited as the "Noise Control Act of 1972".

#### FINDINGS AND POLICY

Sec. 2. (a) The Congress finds—

(1) that inadequately controlled noise presents a growing danger to the health and welfare of the Nation's population, particularly in urban areas;

(2) that the major sources of noise include transportation vehicles and equipment, machinery, appliances, and other products in commerce; and

(3) that, while primary responsibility for control of noise rests with State and local governments, Federal action is essential to deal with major noise sources in commerce control of which require national uniformity of treatment.

(b) The Congress declares that it is the policy of the United States to promote an environment for all Americans free from noise that jeopardizes their health or welfare. To that end, it is the purpose of this Act to establish a means for effective coordination of Federal research and activities in noise control, to authorize the establishment of Federal noise emission standards for products distributed in commerce, and to provide information to the public respecting the noise emission and noise reduction characteristics of such products.

#### DEFINITIONS

Sec. 3. For purposes of this Act:

(1) The term "Administrator" means the Administrator of the Environmental Protection Agency.

(2) The term "person" means an individual, corporation, partnership, or association, and (except as provided in sections 11(e) and 12(a)) includes any officer, employee, department, agency, or instrumentality of the United States, a State, or any political subdivision of a State.

(3) The term "product" means any manufactured article or goods or component thereof; except that such term does not include—

(A) any aircraft, aircraft engine, propeller, or appliance, as such terms are defined in section 101 of the Federal Aviation Act of 1958; or

(B) (i) any military weapons or equipment which are designed for combat use; (ii) any rockets or equipment which are designed for research, experimental, or developmental work to be performed by the National Aeronautics and Space Administration; or (iii) to the extent provided by regulations of the Administrator, any other machinery or equipment designed for use in experimental work done by or for the Federal Government.

(4) The term "ultimate purchaser" means the first person who in good faith purchases a product for purposes other than resale.

72 Stat. 737.  
49 USC 1301.

89-108 O

(5) The term "new product" means (A) a product the equitable or legal title of which has never been transferred to an ultimate purchaser, or (B) a product which is imported or offered for importation into the United States and which is manufactured after the effective date of a regulation under section 5 or section 8 which would have been applicable to such product had it been manufactured in the United States.

(6) The term "manufacturer" means any person engaged in the manufacturing or assembling of new products, or the importing of new products for resale, or who acts for, and is controlled by, any such person in connection with the distribution of such products.

(7) The term "commerce" means trade, traffic, commerce, or transportation—

(A) between a place in a State and any place outside thereof, or

(B) which affects trade, traffic, commerce, or transportation described in subparagraph (A).

(8) The term "distribute in commerce" means sell in, offer for sale in, or introduce or deliver for introduction into, commerce.

(9) The term "State" includes the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, American Samoa, Guam, and the Trust Territory of the Pacific Islands.

80 Stat. 379.

(10) The term "Federal agency" means an executive agency (as defined in section 105 of title 5, United States Code) and includes the United States Postal Service.

(11) The term "environmental noise" means the intensity, duration, and the character of sounds from all sources.

## FEDERAL PROGRAMS

Sec. 4. (a) The Congress authorizes and directs that Federal agencies shall, to the fullest extent consistent with their authority under Federal laws administered by them, carry out the programs within their control in such a manner as to further the policy declared in section 2(b).

(b) Each department, agency, or instrumentality of the executive, legislative, and judicial branches of the Federal Government—

(1) having jurisdiction over any property or facility, or

(2) engaged in any activity resulting, or which may result, in the emission of noise,

shall comply with Federal, State, interstate, and local requirements respecting control and abatement of environmental noise to the same extent that any person is subject to such requirements. The President may exempt any single activity or facility, including noise emission sources or classes thereof, of any department, agency, or instrumentality in the executive branch from compliance with any such requirement if he determines it to be in the paramount interest of the United States to do so; except that no exemption, other than for those products referred to in section 3(3)(B) of this Act, may be granted from the requirements of sections 8, 17, and 18 of this Act. No such exemption shall be granted due to lack of appropriation unless the President shall have specifically requested such appropriation as a part of the budgetary process and the Congress shall have failed to make available such requested appropriation. Any exemption shall be for a period not in excess of one year, but additional exemptions may be granted for periods of not to exceed one year upon the President's making a new determination. The President shall report each January to the Congress all exemptions from the requirements

Compliance  
exemption,  
Presidential  
authority.

Report to  
Congress.

of this section granted during the preceding calendar year, together with his reason for granting such exemption.

(c) (1) The Administrator shall coordinate the programs of all Federal agencies relating to noise research and noise control. Each Federal agency shall, upon request, furnish to the Administrator such information as he may reasonably require to determine the nature, scope, and results of the noise-research and noise-control programs of the agency.

(2) Each Federal agency shall consult with the Administrator in prescribing standards or regulations respecting noise. If at any time the Administrator has reason to believe that a standard or regulation, or any proposed standard or regulation, of any Federal agency respecting noise does not protect the public health and welfare to the extent he believes to be required and feasible, he may request such agency to review and report to him on the advisability of revising such standard or regulation to provide such protection. Any such request may be published in the Federal Register and shall be accompanied by a detailed statement of the information on which it is based. Such agency shall complete the requested review and report to the Administrator within such time as the Administrator specifies in the request, but such time specified may not be less than ninety days from the date the request was made. The report shall be published in the Federal Register and shall be accompanied by a detailed statement of the findings and conclusions of the agency respecting the revision of its standard or regulation. With respect to the Federal Aviation Administration, section 811 of the Federal Aviation Act of 1958 (as amended by section 7 of this Act) shall apply in lieu of this paragraph.

(3) On the basis of regular consultation with appropriate Federal agencies, the Administrator shall compile and publish, from time to time, a report on the status and progress of Federal activities relating to noise research and noise control. This report shall describe the noise-control programs of each Federal agency and assess the contributions of those programs to the Federal Government's overall efforts to control noise.

Standards or regulations.

Revision report request, publication in Federal Register.

Report, publication in Federal Register.

Status report.

IDENTIFICATION OF MAJOR NOISE SOURCES; NOISE CRITERIA AND CONTROL TECHNOLOGY

Sec. 5. (a) (1) The Administrator shall, after consultation with appropriate Federal agencies and within nine months of the date of the enactment of this Act, develop and publish criteria with respect to noise. Such criteria shall reflect the scientific knowledge most useful in indicating the kind and extent of all identifiable effects on the public health or welfare which may be expected from differing quantities and qualities of noise.

(2) The Administrator shall, after consultation with appropriate Federal agencies and within twelve months of the date of the enactment of this Act, publish information on the levels of environmental noise the attainment and maintenance of which in defined areas under various conditions are requisite to protect the public health and welfare with an adequate margin of safety.

(b) The Administrator shall, after consultation with appropriate Federal agencies, compile and publish a report or series of reports (1) identifying products (or classes of products) which in his judgment are major sources of noise, and (2) giving information on techniques for control of noise from such products, including available data on the technology, costs, and alternative methods of noise control. The first such report shall be published not later than eighteen months after the date of enactment of this Act.

Reports.

Review.

(c) The Administrator shall from time to time review and, as appropriate, revise or supplement any criteria or reports published under this section.

Reports, publication in Federal Register.

(d) Any report (or revision thereof) under subsection (b) (1) identifying major noise sources shall be published in the Federal Register. The publication or revision under this section of any criteria or information on control techniques shall be announced in the Federal Register, and copies shall be made available to the general public.

## NOISE EMISSION STANDARDS FOR PRODUCTS DISTRIBUTED IN COMMERCE

Sec. 6. (a) (1) The Administrator shall publish proposed regulations, meeting the requirements of subsection (c), for each product—

(A) which is identified (or is part of a class identified) in any report published under section 5(b) (1) as a major source of noise, (B) for which, in his judgment, noise emission standards are feasible, and

(C) which falls in one of the following categories:

(i) Construction equipment.

(ii) Transportation equipment (including recreational vehicles and related equipment).

(iii) Any motor or engine (including any equipment of which an engine or motor is an integral part).

(iv) Electrical or electronic equipment.

Proposed regulations, effective date.

(2) (A) Initial proposed regulations under paragraph (1) shall be published not later than eighteen months after the date of enactment of this Act, and shall apply to any product described in paragraph (1) which is identified (or is a part of a class identified) as a major source of noise in any report published under section 5(b) (1) on or before the date of publication of such initial proposed regulations.

(B) In the case of any product described in paragraph (1) which is identified (or is part of a class identified) as a major source of noise in a report published under section 5(b) (1) after publication of the initial proposed regulations under subparagraph (A) of this paragraph, regulations under paragraph (1) for such product shall be proposed and published by the Administrator not later than eighteen months after such report is published.

(3) After proposed regulations respecting a product have been published under paragraph (2), the Administrator shall, unless in his judgment noise emission standards are not feasible for such product, prescribe regulations, meeting the requirements of subsection (c), for such product—

(A) not earlier than six months after publication of such proposed regulations, and

(B) not later than—

(i) twenty-four months after the date of enactment of this Act, in the case of a product subject to proposed regulations published under paragraph (2) (A), or

(ii) in the case of any other product, twenty-four months after the publication of the report under section 5(b) (1) identifying it (or a class of products of which it is a part) as a major source of noise.

(b) The Administrator may publish proposed regulations, meeting the requirements of subsection (c), for any product for which he is not required by subsection (a) to prescribe regulations but for which, in his judgment, noise emission standards are feasible and are requisite to protect the public health and welfare. Not earlier than six months after the date of publication of such proposed regulations respecting such product, he may prescribe regulations, meeting the requirements of subsection (c), for such product.

(c)(1) Any regulation prescribed under subsection (a) or (b) of this section (and any revision thereof) respecting a product shall include a noise emission standard which shall set limits on noise emissions from such product and shall be a standard which in the Administrator's judgment, based on criteria published under section 5, is requisite to protect the public health and welfare, taking into account the magnitude and conditions of use of such product (alone or in combination with other noise sources), the degree of noise reduction achievable through the application of the best available technology, and the cost of compliance. In establishing such a standard for any product, the Administrator shall give appropriate consideration to standards under other laws designed to safeguard the health and welfare of persons, including any standards under the National Traffic and Motor Vehicle Safety Act of 1966, the Clean Air Act, and the Federal Water Pollution Control Act. Any such noise emission standards shall be a performance standard. In addition, any regulation under subsection (a) or (b) (and any revision thereof) may contain testing procedures necessary to assure compliance with the emission standard in such regulation, and may contain provisions respecting instructions of the manufacturer for the maintenance, use, or repair of the product.

80 Stat. 719.  
15 USC 1381  
note.  
81 Stat. 485.  
42 USC 1857  
note.  
Ante, p. 916.

(2) After publication of any proposed regulations under this section, the Administrator shall allow interested persons an opportunity to participate in rulemaking in accordance with the first sentence of section 553(c) of title 5, United States Code.

80 Stat. 383.

(3) The Administrator may revise any regulation prescribed by him under this section by (A) publication of proposed revised regulations, and (B) the promulgation, not earlier than six months after the date of such publication, of regulations making the revision; except that a revision which makes only technical or clerical corrections in a regulation under this section may be promulgated earlier than six months after such date if the Administrator finds that such earlier promulgation is in the public interest.

(d)(1) On and after the effective date of any regulation prescribed under subsection (a) or (b) of this section, the manufacturer of each new product to which such regulation applies shall warrant to the ultimate purchaser and each subsequent purchaser that such product is designed, built, and equipped so as to conform at the time of sale with such regulation.

(2) Any cost obligation of any dealer incurred as a result of any requirement imposed by paragraph (1) of this subsection shall be borne by the manufacturer. The transfer of any such cost obligation from a manufacturer to any dealer through franchise or other agreement is prohibited.

Cost obligations, transfer prohibitions.

(3) If a manufacturer includes in any advertisement a statement respecting the cost or value of noise emission control devices or systems, such manufacturer shall set forth in such statement the cost or value attributed to such devices or systems by the Secretary of Labor (through the Bureau of Labor Statistics). The Secretary of Labor, and his representatives, shall have the same access for this purpose to the books, documents, papers, and records of a manufacturer as the Comptroller General has to those of a recipient of assistance for purposes of section 311 of the Clean Air Act.

81 Stat. 505;  
84 Stat. 1705.  
42 USC 1857j.  
Prohibitions.

(e)(1) No State or political subdivision thereof may adopt or enforce—

(A) with respect to any new product for which a regulation has been prescribed by the Administrator under this section, any law or regulation which sets a limit on noise emissions from such

new product and which is not identical to such regulation of the Administrator; or

(B) with respect to any component incorporated into such new product by the manufacturer of such product, any law or regulation setting a limit on noise emissions from such component when so incorporated.

(2) Subject to sections 17 and 18, nothing in this section precludes or denies the right of any State or political subdivision thereof to establish and enforce controls on environmental noise (or one or more sources thereof) through the licensing, regulation, or restriction of the use, operation, or movement of any product or combination of products.

AIRCRAFT NOISE STANDARDS

Sec. 7. (a) The Administrator, after consultation with appropriate Federal, State, and local agencies and interested persons, shall conduct a study of the (1) adequacy of Federal Aviation Administration flight and operational noise controls; (2) adequacy of noise emission standards on new and existing aircraft, together with recommendations on the retrofitting and phaseout of existing aircraft; (3) implications of identifying and achieving levels of cumulative noise exposure around airports; and (4) additional measures available to airport operators and local governments to control aircraft noise. He shall report on such study to the Committee on Interstate and Foreign Commerce of the House of Representatives and the Committees on Commerce and Public Works of the Senate within nine months after the date of the enactment of this Act.

82 Stat. 395. (b) Section 411 of the Federal Aviation Act of 1958 (49 U.S.C. 1431) is amended to read as follows:

"CONTROL AND ABATEMENT OF AIRCRAFT NOISE AND SONIC BOOM

"SEC. 611. (a) For purposes of this section:

"FAA." "(1) The term 'FAA' means Administrator of the Federal Aviation Administration.

"EPA." "(2) The term 'EPA' means the Administrator of the Environmental Protection Agency.

Standards and regulations. "(b) (1) In order to afford present and future relief and protection to the public health and welfare from aircraft noise and sonic boom, the FAA, after consultation with the Secretary of Transportation and with EPA, shall prescribe and amend standards for the measurement of aircraft noise and sonic boom and shall prescribe and amend such regulations as the FAA may find necessary to provide for the control and abatement of aircraft noise and sonic boom, including the application of such standards and regulations in the issuance, amendment, modification, suspension, or revocation of any certificate authorized by this title. No exemption with respect to any standard or regulation under this section may be granted under any provision of this Act unless the FAA shall have consulted with EPA before such exemption is granted, except that if the FAA determines that safety in air commerce or air transportation requires that such an exemption be granted before EPA can be consulted, the FAA shall consult with EPA as soon as practicable after the exemption is granted.

72 Stat. 776. 49 USC. 1423. "(2) The FAA shall not issue an original type certificate under section 603(a) of this Act for any aircraft for which substantial noise abatement can be achieved by prescribing standards and regulations in accordance with this section, unless he shall have prescribed standards and regulations in accordance with this section which apply to such aircraft and which protect the public from aircraft noise and sonic boom, consistent with the considerations listed in subsection (d).

"(c)(1) Not earlier than the date of submission of the report required by section 7(a) of the Noise Control Act of 1972, EPA shall submit to the FAA proposed regulations to provide such control and abatement of aircraft noise and sonic boom (including control and abatement through the exercise of any of the FAA's regulatory authority over air commerce or transportation or over aircraft or airport operations) as EPA determines is necessary to protect the public health and welfare. The FAA shall consider such proposed regulations submitted by EPA under this paragraph and shall, within thirty days of the date of its submission to the FAA, publish the proposed regulations in a notice of proposed rulemaking. Within sixty days after such publication, the FAA shall commence a hearing at which interested persons shall be afforded an opportunity for oral (as well as written) presentations of data, views, and arguments. Within a reasonable time after the conclusion of such hearing and after consultation with EPA, the FAA shall—

Proposed regulations, submittal to FAA.

Publication.

Hearing.

"(A) in accordance with subsection (b), prescribe regulations (i) substantially as they were submitted by EPA, or (ii) which are a modification of the proposed regulations submitted by EPA, or

"(B) publish in the Federal Register a notice that it is not prescribing any regulation in response to EPA's submission of proposed regulations, together with a detailed explanation providing reasons for the decision not to prescribe such regulations.

Publication in Federal Register.

"(2) If EPA has reason to believe that the FAA's action with respect to a regulation proposed by EPA under paragraph (1)(A)(ii) or (1)(B) of this subsection does not protect the public health and welfare from aircraft noise or sonic boom, consistent with the considerations listed in subsection (d) of this section, EPA shall consult with the FAA and may request the FAA to review, and report to EPA on, the advisability of prescribing the regulation originally proposed by EPA. Any such request shall be published in the Federal Register and shall include a detailed statement of the information on which it is based. The FAA shall complete the review requested and shall report to EPA within such time as EPA specifies in the request, but such time specified may not be less than ninety days from the date the request was made. The FAA's report shall be accompanied by a detailed statement of the FAA's findings and the reasons for the FAA's conclusions; shall identify any statement filed pursuant to section 102(2)(C) of the National Environmental Policy Act of 1969 with respect to such action of the FAA under paragraph (1) of this subsection; and shall specify whether (and where) such statements are available for public inspection. The FAA's report shall be published in the Federal Register, except in a case in which EPA's request proposed specific action to be taken by the FAA, and the FAA's report indicates such action will be taken.

Report request, publication in Federal Register.

93 Stat. 853, 42 USC 4332.

Report, publication in Federal Register.

"(3) If, in the case of a matter described in paragraph (2) of this subsection with respect to which no statement is required to be filed under such section 102(2)(C), the report of the FAA indicates that the proposed regulation originally submitted by EPA should not be made, then EPA may request the FAA to file a supplemental report, which shall be published in the Federal Register within such a period as EPA may specify (but such time specified shall not be less than ninety days from the date the request was made), and which shall contain a comparison of (A) the environmental effects (including those which cannot be avoided) of the action actually taken by the FAA in response to EPA's proposed regulations, and (B) EPA's proposed regulations.

Supplemental report, publication in Federal Register.

October 27, 1972

"(d) In prescribing and amending standards and regulations under this section, the FAA shall—

"(1) consider relevant available data relating to aircraft noise and sonic boom, including the results of research, development, testing, and evaluation activities conducted pursuant to this Act and the Department of Transportation Act;

"(2) consult with such Federal, State, and interstate agencies as he deems appropriate;

"(3) consider whether any proposed standard or regulation is consistent with the highest degree of safety in air commerce or air transportation in the public interest;

"(4) consider whether any proposed standard or regulation is economically reasonable, technologically practicable, and appropriate for the particular type of aircraft, aircraft engine, appliance, or certificate to which it will apply; and

"(5) consider the extent to which such standard or regulation will contribute to carrying out the purposes of this section.

"(e) In any action to amend, modify, suspend, or revoke a certificate in which violation of aircraft noise or sonic boom standards or regulations is at issue, the certificate holder shall have the same notice and appeal rights as are contained in section 609, and in any appeal to the National Transportation Safety Board, the Board may amend, modify, or reverse the order of the FAA if it finds that control or abatement of aircraft noise or sonic boom and the public health and welfare do not require the affirmation of such order, or that such order is not consistent with safety in air commerce or air transportation."

(c) All—  
(1) standards, rules, and regulations prescribed under section 611 of the Federal Aviation Act of 1958, and  
(2) exemptions, granted under any provision of the Federal Aviation Act of 1958, with respect to such standards, rules, and regulations,

which are in effect on the date of the enactment of this Act, shall continue in effect according to their terms until modified, terminated, superseded, set aside, or repealed by the Administrator of the Federal Aviation Administration in the exercise of any authority vested in him, by a court of competent jurisdiction, or by operation of law.

LABELING

Sec. 8. (a) The Administrator shall by regulation designate any product (or class thereof)—

(1) which emits noise capable of adversely affecting the public health or welfare; or  
(2) which is sold wholly or in part on the basis of its effectiveness in reducing noise.

(b) For each product (or class thereof) designated under subsection (a) the Administrator shall by regulation require that notice be given to the prospective user of the level of the noise the product emits, or of its effectiveness in reducing noise, as the case may be. Such regulations shall specify (1) whether such notice shall be affixed to the product or to the outside of its container, or to both, at the time of its sale to the ultimate purchaser or whether such notice shall be given to the prospective user in some other manner, (2) the form of the notice, and (3) the methods and units of measurement to be used. Sections 8(c)(2) shall apply to the prescribing of any regulation under this section.

(c) This section does not prevent any State or political subdivision thereof from regulating product labeling or information respecting products in any way not in conflict with regulations prescribed by the Administrator under this section.

80 Stat. 931.  
49 USC 1651  
note.

Notice and  
appeal.

72 Stat. 779;  
85 Stat. 461.  
49 USC 1429.

72 Stat. 731.  
49 USC 1301  
note.

Regulations.

## IMPORTS

Sec. 9. The Secretary of the Treasury shall, in consultation with the Administrator, issue regulations to carry out the provisions of this Act with respect to new products imported or offered for importation. Regulations.

## PROHIBITED ACTS

Sec. 10. (a) Except as otherwise provided in subsection (b), the following acts or the causing thereof are prohibited:

(1) In the case of a manufacturer, to distribute in commerce any new product manufactured after the effective date of a regulation prescribed under section 6 which is applicable to such product, except in conformity with such regulation.

(2) (A) The removal or rendering inoperative by any person, other than for purposes of maintenance, repair, or replacement, of any device or element of design incorporated into any product in compliance with regulations under section 6, prior to its sale or delivery to the ultimate purchaser or while it is in use, or (B) the use of a product after such device or element of design has been removed or rendered inoperative by any person.

(3) In the case of a manufacturer, to distribute in commerce any new product manufactured after the effective date of a regulation prescribed under section 8(b) (requiring information respecting noise) which is applicable to such product, except in conformity with such regulation.

(4) The removal by any person of any notice affixed to a product or container pursuant to regulations prescribed under section 8(b), prior to sale of the product to the ultimate purchaser.

(5) The importation into the United States by any person of any new product in violation of a regulation prescribed under section 9 which is applicable to such product.

(6) The failure or refusal by any person to comply with any requirement of section 11(d) or 13(a) or regulations prescribed under section 13(a), 17, or 18.

(b) (1) For the purpose of research, investigations, studies, demonstrations, or training, or for reasons of national security, the Administrator may exempt for a specified period of time any product, or class thereof, from paragraphs (1), (2), (3), and (5) of subsection (a), upon such terms and conditions as he may find necessary to protect the public health or welfare. Exemptions.

(2) Paragraphs (1), (2), (3), and (4) of subsection (a) shall not apply with respect to any product which is manufactured solely for use outside any State and which (and the container of which) is labeled or otherwise marked to show that it is manufactured solely for use outside any State; except that such paragraphs shall apply to such product if it is in fact distributed in commerce for use in any State.

## ENFORCEMENT

Sec. 11. (a) Any person who willfully or knowingly violates paragraph (1), (3), (5), or (6) of subsection (a) of section 10 of this Act shall be punished by a fine of not more than \$25,000 per day of violation, or by imprisonment for not more than one year, or by both. If the conviction is for a violation committed after a first conviction of such person under this subsection, punishment shall be by a fine of not more than \$50,000 per day of violation, or by imprisonment for not more than two years, or by both. Penalty.

(b) For the purpose of this section, each day of violation of any paragraph of section 10(a) shall constitute a separate violation of that section.

**Jurisdiction.** (c) The district courts of the United States shall have jurisdiction of actions brought by and in the name of the United States to restrain any violations of section 10(a) of this Act.

(d) (1) Whenever any person is in violation of section 10(a) of this Act, the Administrator may issue an order specifying such relief as he determines is necessary to protect the public health and welfare.

(2) Any order under this subsection shall be issued only after notice and opportunity for a hearing in accordance with section 554 of title 5 of the United States Code.

80 Stat. 284. "Person."  
(e) The term "person," as used in this section, does not include a department, agency, or instrumentality of the United States.

CITIZEN SUITS

SEC. 12. (a) Except as provided in subsection (b), any person (other than the United States) may commence a civil action on his own behalf—

(1) against any person (including (A) the United States, and (B) any other governmental instrumentality or agency to the extent permitted by the eleventh amendment to the Constitution) who is alleged to be in violation of any noise control requirement (as defined in subsection (e)), or

(2) against—

(A) the Administrator of the Environmental Protection Agency where there is alleged a failure of such Administrator to perform any act or duty under this Act which is not discretionary with such Administrator, or

(B) the Administrator of the Federal Aviation Administration where there is alleged a failure of such Administrator to perform any act or duty under section 811 of the Federal Aviation Act of 1958 which is not discretionary with such Administrator.

USC prec. title 1.  
Ante, p.

**Jurisdiction.** The district courts of the United States shall have jurisdiction, without regard to the amount in controversy, to restrain such person from violating such noise control requirement or to order such Administrator to perform such act or duty, as the case may be.

(b) No action may be commenced—

(1) under subsection (a) (1)—

(A) prior to sixty days after the plaintiff has given notice of the violation (i) to the Administrator of the Environmental Protection Agency (and to the Federal Aviation Administrator in the case of a violation of a noise control requirement under such section 811) and (ii) to any alleged violator of such requirement, or

(B) if an Administrator has commenced and is diligently prosecuting a civil action to require compliance with the noise control requirement, but in any such action in a court of the United States any person may intervene as a matter of right, or

(2) under subsection (a) (2) prior to sixty days after the plaintiff has given notice to the defendant that he will commence such action.

Notice.

Notice under this subsection shall be given in such manner as the Administrator of the Environmental Protection Agency shall prescribe by regulation.

**Intervention.** (c) In an action under this section, the Administrator of the Environmental Protection Agency, if not a party, may intervene as a matter of right. In an action under this section respecting a noise control requirement under section 811 of the Federal Aviation Act of 1958,

the Administrator of the Federal Aviation Administration, if not a party, may also intervene as a matter of right.

(d) The court, in issuing any final order in any action brought pursuant to subsection (a) of this section, may award costs of litigation (including reasonable attorney and expert witness fees) to any party, whenever the court determines such an award is appropriate.

Litigation costs.

(e) Nothing in this section shall restrict any right which any person (or class of persons) may have under any statute or common law to seek enforcement of any noise control requirement or to seek any other relief (including relief against an Administrator).

(f) For purposes of this section, the term "noise control requirement" means paragraph (1), (2), (3), (4), or (5) of section 10(a), or a standard, rule, or regulation issued under section 17 or 18 of this Act or under section 611 of the Federal Aviation Act of 1958.

"Noise control requirement."

Ante, p.

RECORDS, REPORTS, AND INFORMATION

Sec. 13. (a) Each manufacturer of a product to which regulations under section 6 or section 8 apply shall—

(1) establish and maintain such records, make such reports, provide such information, and make such tests, as the Administrator may reasonably require to enable him to determine whether such manufacturer has acted or is acting in compliance with this Act.

(2) upon request of an officer or employee duly designated by the Administrator, permit such officer or employee at reasonable times to have access to such information and the results of such tests and to copy such records, and

(3) to the extent required by regulations of the Administrator, make products coming off the assembly line or otherwise in the hands of the manufacturer available for testing by the Administrator.

(b) (1) All information obtained by the Administrator or his representatives pursuant to subsection (a) of this section, which information contains or relates to a trade secret or other matter referred to in section 1905 of title 18 of the United States Code, shall be considered confidential for the purpose of that section, except that such information may be disclosed to other Federal officers or employees, in whose possession it shall remain confidential, or when relevant to the matter in controversy in any proceeding under this Act.

Confidential information.  
52 Stat. 791.  
Disclosure.

(2) Nothing in this subsection shall authorize the withholding of information by the Administrator, or by any officers or employees under his control, from the duly authorized committees of the Congress.

(c) Any person who knowingly makes any false statement, representation, or certification in any application, record, report, plan, or other document filed or required to be maintained under this Act or who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this Act, shall upon conviction be punished by a fine of not more than \$10,000, or by imprisonment for not more than six months, or by both.

Violations and penalties.

RESEARCH, TECHNICAL ASSISTANCE, AND PUBLIC INFORMATION

Sec. 14. In furtherance of his responsibilities under this Act and to complement, as necessary, the noise-research programs of other Federal agencies, the Administrator is authorized to:

(1) Conduct research, and finance research by contract with any person, on the effects, measurement, and control of noise, including but not limited to—

(A) investigation of the psychological and physiological effects of noise on humans and the effects of noise on domestic animals, wildlife, and property, and determination of acceptable levels of noise on the basis of such effects;

(B) development of improved methods and standards for measurement and monitoring of noise, in cooperation with the National Bureau of Standards, Department of Commerce; and

(C) determination of the most effective and practicable means of controlling noise emission.

(2) Provide technical assistance to State and local governments to facilitate their development and enforcement of ambient noise standards, including but not limited to—

(A) advice on training of noise-control personnel and on selection and operation of noise-abatement equipment; and

(B) preparation of model State or local legislation for noise control.

(3) Disseminate to the public information on the effects of noise, acceptable noise levels, and techniques for noise measurement and control.

DEVELOPMENT OF LOW-NOISE-EMISSION PRODUCTS

Definitions.

SEC. 13. (a) For the purpose of this section:

(1) The term "Committee" means the Low-Noise-Emission Product Advisory Committee.

(2) The term "Federal Government" includes the legislative, executive, and judicial branches of the Government of the United States, and the government of the District of Columbia.

(3) The term "low-noise-emission product" means any product which emits noise in amounts significantly below the levels specified in noise emission standards under regulations applicable under section 6 at the time of procurement to that type of product.

(4) The term "retail price" means (A) the maximum statutory price applicable to any type of product; or (B) in any case where there is no applicable maximum statutory price, the most recent procurement price paid for any type of product.

(b) (1) The Administrator shall determine which products qualify as low-noise-emission products in accordance with the provisions of this section.

Certification.

(2) The Administrator shall certify any product—

(A) for which a certification application has been filed in accordance with paragraph (3)(A) of this subsection;

(B) which is a low-noise-emission product as determined by the Administrator; and

(C) which he determines is suitable for use as a substitute for a type of product at that time in use by agencies of the Federal Government.

Low-Noise-Emission Product Advisory Committee, establishment, Membership.

(3) The Administrator may establish a Low-Noise-Emission Product Advisory Committee to assist him in determining which products qualify as low-noise-emission products for purposes of this section. The Committee shall include the Administrator or his designee, a representative of the National Bureau of Standards, and representatives of such other Federal agencies and private individuals as the Administrator may deem necessary from time to time. Any member of the Committee not employed on a full-time basis by the United States may receive the daily equivalent of the annual rate of basic pay in effect for grade GS-18 of the General Schedule for each day such

5 USC 5332 note.

member is engaged upon work of the Committee. Each member of the Committee shall be reimbursed for travel expenses, including per diem in lieu of subsistence as authorized by section 3703 of title 5, United States Code, for persons in the Government service employed intermittently.

Travel expenses.

80 Stat. 499;  
83 Stat. 190.

(4) Certification under this section shall be effective for a period of one year from the date of issuance.

(5)(A) Any person seeking to have a class or model of product certified under this section shall file a certification application in accordance with regulations prescribed by the Administrator.

(B) The Administrator shall publish in the Federal Register a notice of each application received.

Publication in  
Federal Regis-  
ter.

(C) The Administrator shall make determinations for the purpose of this section in accordance with procedures prescribed by him by regulation.

(D) The Administrator shall conduct whatever investigation is necessary, including actual inspection of the product at a place designated in regulations prescribed under subparagraph (A).

(E) The Administrator shall receive and evaluate written comments and documents from interested persons in support of, or in opposition to, certification of the class or model of product under consideration.

(F) Within ninety days after the receipt of a properly filed certification application the Administrator shall determine whether such product is a low-noise-emission product for purposes of this section. If the Administrator determines that such product is a low-noise-emission product, then within one hundred and eighty days of such determination the Administrator shall reach a decision as to whether such product is a suitable substitute for any class or classes of products presently being purchased by the Federal Government for use by its agencies.

(G) Immediately upon making any determination or decision under subparagraph (F), the Administrator shall publish in the Federal Register notice of such determination or decision, including reasons therefor.

Publication in  
Federal Regis-  
ter.

(c)(1) Certified low-noise-emission products shall be acquired by purchase or lease by the Federal Government for use by the Federal Government in lieu of other products if the Administrator of General Services determines that such certified products have procurement costs which are no more than 125 per centum of the retail price of the least expensive type of product for which they are certified substitutes.

(2) Data relied upon by the Administrator in determining that a product is a certified low-noise-emission product shall be incorporated in any contract for the procurement of such product.

(d) The procuring agency shall be required to purchase available certified low-noise-emission products which are eligible for purchase to the extent they are available before purchasing any other products for which any low-noise-emission product is a certified substitute. In making purchasing selections between competing eligible certified low-noise-emission products, the procuring agency shall give priority to any class or model which does not require extensive periodic maintenance to retain its low-noise-emission qualities or which does not involve operating costs significantly in excess of those products for which it is a certified substitute.

(e) For the purpose of procuring certified low-noise-emission products any statutory price limitations shall be waived.

Statutory price  
limitations,  
waiver.

(f) The Administrator shall, from time to time as he deems appropriate, test the emissions of noise from certified low-noise-emission products purchased by the Federal Government. If at any time he finds that the noise-emission levels exceed the levels on which certifi-

action under this section was based, the Administrator shall give the supplier of such product written notice of this finding, issue public notice of it, and give the supplier an opportunity to make necessary repairs, adjustments, or replacements. If no such repairs, adjustments, or replacements are made within a period to be set by the Administrator, he may order the supplier to show cause why the product involved should be eligible for recertification.

Appropriation.

(g) There are authorized to be appropriated for paying additional amounts for products pursuant to, and for carrying out the provisions of, this section, \$1,000,000 for the fiscal year ending June 30, 1973, and \$2,000,000 for each of the two succeeding fiscal years.

(h) The Administrator shall promulgate the procedures required to implement this section within one hundred and eighty days after the date of enactment of this Act.

#### JUDICIAL REVIEW: WITNESSES

Sec. 16. (a) A petition for review of action of the Administrator of the Environmental Protection Agency in promulgating any standard or regulation under section 6, 17, or 18 of this Act or any labeling regulation under section 8 of this Act may be filed only in the United States Court of Appeals for the District of Columbia Circuit, and a petition for review of action of the Administrator of the Federal Aviation Administration in promulgating any standard or regulation under section 611 of the Federal Aviation Act of 1958 may be filed only in such court. Any such petition shall be filed within ninety days from the date of such promulgation, or after such date if such petition is based solely on grounds arising after such ninetieth day. Action of either Administrator with respect to which review could have been obtained under this subsection shall not be subject to judicial review in civil or criminal proceedings for enforcement.

Ante, p. 1239.

(b) If a party seeking review under this Act applies to the court for leave to adduce additional evidence, and shows to the satisfaction of the court that the information is material and was not available at the time of the proceeding before the Administrator of such Agency or Administration (as the case may be), the court may order such additional evidence (and evidence in rebuttal thereof) to be taken before such Administrator, and to be adduced upon the hearing, in such manner and upon such terms and conditions as the court may deem proper. Such Administrator may modify his findings as to the facts, or make new findings, by reason of the additional evidence so taken, and he shall file with the court such modified or new findings, and his recommendation, if any, for the modification or setting aside of his original order, with the return of such additional evidence.

(c) With respect to relief pending review of an action by either Administrator, no stay of an agency action may be granted unless the reviewing court determines that the party seeking such stay is (1) likely to prevail on the merits in the review proceeding and (2) will suffer irreparable harm pending such proceeding.

Subpenas.

(d) For the purpose of obtaining information to carry out this Act, the Administrator of the Environmental Protection Agency may issue subpoenas for the attendance and testimony of witnesses and the production of relevant papers, books, and documents, and he may administer oaths. Witnesses summoned shall be paid the same fees and mileage that are paid witnesses in the courts of the United States. In cases of contumacy or refusal to obey a subpoena served upon any person under this subsection, the district court of the United States for any district in which such person is found or resides or transacts business, upon application by the United States and after notice to such person,

shall have jurisdiction to issue an order requiring such person to appear and give testimony before the Administrator, to appear and produce papers, books, and documents before the Administrator, or both, and any failure to obey such order of the court may be punished by such court as a contempt thereof.

#### RAILROAD NOISE EMISSION STANDARDS

SEC. 17. (a) (1) Within nine months after the date of enactment of this Act, the Administrator shall publish proposed noise emission regulations for surface carriers engaged in interstate commerce by railroad. Such proposed regulations shall include noise emission standards setting such limits on noise emissions resulting from operation of the equipment and facilities of surface carriers engaged in interstate commerce by railroad which reflect the degree of noise reduction achievable through the application of the best available technology, taking into account the cost of compliance. These regulations shall be in addition to any regulations that may be proposed under section 6 of this Act. Regulations.

(2) Within ninety days after the publication of such regulations as may be proposed under paragraph (1) of this subsection, and subject to the provisions of section 16 of this Act, the Administrator shall promulgate final regulations. Such regulations may be revised, from time to time, in accordance with this subsection.

(3) Any standard or regulation, or revision thereof, proposed under this subsection shall be promulgated only after consultation with the Secretary of Transportation in order to assure appropriate consideration for safety and technological availability.

(4) Any regulation or revision thereof promulgated under this subsection shall take effect after such period as the Administrator finds necessary, after consultation with the Secretary of Transportation, to permit the development and application of the requisite technology, giving appropriate consideration to the cost of compliance within such period.

(b) The Secretary of Transportation, after consultation with the Administrator, shall promulgate regulations to insure compliance with all standards promulgated by the Administrator under this section. The Secretary of Transportation shall carry out such regulations through the use of his powers and duties of enforcement and inspection authorized by the Safety Appliance Acts, the Interstate Commerce Act, and the Department of Transportation Act. Regulations promulgated under this section shall be subject to the provisions of sections 10, 11, 12, and 16 of this Act.

(c) (1) Subject to paragraph (2) but notwithstanding any other provision of this Act, after the effective date of a regulation under this section applicable to noise emissions resulting from the operation of any equipment or facility of a surface carrier engaged in interstate commerce by railroad, no State or political subdivision thereof may adopt or enforce any standard applicable to noise emissions resulting from the operation of the same equipment or facility of such carrier unless such standard is identical to a standard applicable to noise emissions resulting from such operation prescribed by any regulation under this section.

(2) Nothing in this section shall diminish or enhance the rights of any State or political subdivision thereof to establish and enforce standards or controls on levels of environmental noise, or to control, license, regulate, or restrict the use, operation, or movement of any product if the Administrator, after consultation with the Secretary of Transportation, determines that such standard, control, license, regulation, or restriction is necessitated by special local conditions and is not in conflict with regulations promulgated under this section.

27 Stat. 531.  
45 USC 1.  
24 Stat. 379.  
49 USC prec. 1  
note.  
80 Stat. 931.  
49 USC 1651 note.

36 Stat. 913;  
43 Stat. 659.

(d) The terms "carrier" and "railroad" as used in this section shall have the same meaning as such terms have under the first section of the Act of February 17, 1911 (45 U.S.C. 22).

MOTOR CARRIER NOISE EMISSION STANDARDS

Regulations.

Sec. 18. (a) (1) Within nine months after the date of enactment of this Act, the Administrator shall publish proposed noise emission regulations for motor carriers engaged in interstate commerce. Such proposed regulations shall include noise emission standards setting such limits on noise emissions resulting from operation of motor carriers engaged in interstate commerce which reflect the degree of noise reduction achievable through the application of the best available technology, taking into account the cost of compliance. These regulations shall be in addition to any regulations that may be proposed under section 6 of this Act.

(2) Within ninety days after the publication of such regulations as may be proposed under paragraph (1) of this subsection, and subject to the provisions of section 16 of this Act, the Administrator shall promulgate final regulations. Such regulations may be revised from time to time, in accordance with this subsection.

(3) Any standard or regulation, or revision thereof, proposed under this subsection shall be promulgated only after consultation with the Secretary of Transportation in order to assure appropriate consideration for safety and technological availability.

(4) Any regulation or revision thereof promulgated under this subsection shall take effect after such period as the Administrator finds necessary, after consultation with the Secretary of Transportation, to permit the development and application of the requisite technology, giving appropriate consideration to the cost of compliance within such period.

(b) The Secretary of Transportation, after consultation with the Administrator shall promulgate regulations to insure compliance with all standards promulgated by the Administrator under this section. The Secretary of Transportation shall carry out such regulations through the use of his powers and duties of enforcement and inspection authorized by the Interstate Commerce Act and the Department of Transportation Act. Regulations promulgated under this section shall be subject to the provisions of sections 10, 11, 12, and 16 of this Act.

24 Stat. 379.  
49 USC prec.  
1 note.  
80 Stat. 931.  
49 USC 1651  
note.

(c) ( ) subject to paragraph (2) of this subsection but notwithstanding any other provision of this Act, after the effective date of a regulation under this section applicable to noise emissions resulting from the operation of any motor carrier engaged in interstate commerce, no State or political subdivision thereof may adopt or enforce any standard applicable to the same operation of such motor carrier, unless such standard is identical to a standard applicable to noise emissions resulting from such operation prescribed by any regulation under this section.

(2) Nothing in this section shall diminish or enhance the rights of any State or political subdivision thereof to establish and enforce standards or controls on levels of environmental noise, or to control, license, regulate, or restrict the use, operation, or movement of any product if the Administrator, after consultation with the Secretary of Transportation, determines that such standard, control, license, regulation, or restriction is necessitated by special local conditions and is not in conflict with regulations promulgated under this section.

(d) For purposes of this section, the term "motor carrier" includes a common carrier by motor vehicle, a contract carrier by motor vehicle,

October 27, 1972

- 17 -

Pub. Law 92-574

46 STAT. 1250

and a private carrier of property by motor vehicle as those terms are defined by paragraphs (14), (15), and (17) of section 203(a) of the Interstate Commerce Act (49 U.S.C. 303(a)).

49 Stat. 545;  
54 Stat. 920;  
71 Stat. 411.

**AUTHORIZATION OF APPROPRIATIONS**

Sec. 19. There is authorized to be appropriated to carry out this Act (other than section 15) \$3,000,000 for the fiscal year ending June 30, 1973; \$8,000,000 for the fiscal year ending June 30, 1974; and \$12,000,000 for the fiscal year ending June 30, 1975.

Approved October 27, 1972.

**LEGISLATIVE HISTORY:**

HOUSE REPORT No. 92-642 (Comm. on Interstate and Foreign Commerce).  
SENATE REPORT No. 92-1160 accompanying S. 1342 (Comm. on Public Works).  
CONGRESSIONAL RECORD, Vol. 118 (1972):  
Feb. 29, considered and passed House.  
Oct. 12, 11, considered and passed Senate, amended, in lieu of S. 1342.  
Oct. 13, House concurred in Senate amendment, with an amendment;  
Senate concurred in House amendment.  
WEEKLY COMPILATION OF PRESIDENTIAL DOCUMENTS, Vol. 8, No. 44:  
Oct. 28, Presidential statement.

Public Law 95-609  
95th Congress

## An Act

To extend provisions of the Noise Control Act of 1972 for one year, and for other purposes.

Nov. 8, 1978  
[S. 3083]

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,* That this Act may be cited as the "Quiet Communities Act of 1978".

Sec. 2. Section 14 of the Noise Control Act of 1972 is amended to read as follows:

Quiet  
Communities Act  
of 1978.  
42 USC 4901  
note.  
42 USC 4913.

## "QUIET COMMUNITIES, RESEARCH, PUBLIC INFORMATION

"Sec. 14. To promote the development of effective State and local noise control programs, to provide an adequate Federal noise control research program designed to meet the objectives of this Act, and to otherwise carry out the policy of this Act, the Administrator shall, in cooperation with other Federal agencies and through the use of grants, contracts, and direct Federal actions—

"(a) develop and disseminate information and educational materials to all segments of the public on the public health and other effects of noise and the most effective means for noise control, through the use of materials for school curricula, volunteer organizations, radio and television programs, publication, and other means;

"(b) conduct or finance research directly or with any public or private organization or any person on the effects, measurement, and control of noise, including but not limited to—

"(1) investigation of the psychological and physiological effects of noise on humans and the effects of noise on domestic animals, wildlife, and property, and the determination of dose/response relationships suitable for use in decision-making, with special emphasis on the nonauditory effects of noise;

"(2) investigation, development, and demonstration of noise control technology for products subject to possible regulation under sections 6, 7, and 8 of this Act;

"(3) investigation, development, and demonstration of monitoring equipment and other technology especially suited for use by State and local noise control programs;

"(4) investigation of the economic impact of noise on property and human activities; and

"(5) investigation and demonstration of the use of economic incentives (including emission charges) in the control of noise;

"(c) administer a nationwide Quiet Communities Program which shall include, but not be limited to—

"(1) grants to States, local governments, and authorized regional planning agencies for the purpose of—

"(A) identifying and determining the nature and extent of the noise problem within the subject jurisdiction;

"(B) planning, developing, and establishing a noise control capacity in such jurisdiction, including purchasing initial equipment;

"(C) developing abatement plans for areas around major transportation facilities (including airports, highways, and rail yards) and other major stationary sources of noise, and, where appropriate, for the facility or source itself; and,

"(D) evaluating techniques for controlling noise (including institutional arrangements) and demonstrating the best available techniques in such jurisdiction;

"(2) purchase of monitoring and other equipment for loan to State and local noise control programs to meet special needs or assist in the beginning implementation of a noise control program or project;

"(3) development and implementation of a quality assurance program for equipment and monitoring procedures of State and local noise control programs to help communities assure that their data collection activities are accurate;

"(4) conduct of studies and demonstrations to determine the resource and personnel needs of States and local governments required for the establishment and implementation of effective noise abatement and control programs; and

"(5) development of educational and training materials and programs, including national and regional workshops, to support State and local noise abatement and control programs;

except that no actions, plans or programs hereunder shall be inconsistent with existing Federal authority under this Act to regulate sources of noise in interstate commerce;

"(d) develop and implement a national noise environmental assessment program to identify trends in noise exposure and response, ambient levels, and compliance data and to determine otherwise the effectiveness of noise abatement actions through the collection of physical, social, and human response data;

"(e) establish regional technical assistance centers which use the capabilities of university and private organizations to assist State and local noise control programs;

"(f) provide technical assistance to State and local governments to facilitate their development and enforcement of noise control, including direct onsite assistance of agency or other personnel with technical expertise, and preparation of model State or local legislation for noise control; and

"(g) provide for the maximum use in programs assisted under this section of senior citizens and persons eligible for participation in programs under the Older Americans Act."

SEC. 3. The fourth sentence of section 611(c)(1) of the Federal Aviation Act, as amended by section 7 of the Noise Control Act of 1972, is amended by striking "a reasonable time" and inserting in lieu thereof "ninety days", and by adding before the period "and a detailed analysis of and response to all documentation or other information submitted by the Environmental Protection Agency with such proposed regulations".

42 USC 3001  
note.

49 USC 1431.

Sec. 4. Section 11(a) of the Noise Control Act of 1972 is amended by inserting "(1)" after "(a)" and by adding the following new paragraph:

"(2) Any person who violates paragraph (1), (3), (5), or (6) of subsection (a) of section 10 of this Act shall be subject to a civil penalty not to exceed \$10,000 per day of such violation".

Sec. 5. Section 6 of the Noise Control Act of 1972 is amended by adding the following subsection:

"(f) At any time after the promulgation of regulations respecting a product under this section, a State or political subdivision thereof may petition the Administrator to revise such standard on the grounds that a more stringent standard under subsection (e) of this section is necessary to protect the public health and welfare. The Administration shall publish notice of receipt of such petition in the Federal Register and shall within ninety days of receipt of such petition respond by (1) publication of proposed revised regulations in accordance with subsection (e)(3) of this section, or (2) publication in the Federal Register of a decision not to publish such proposed revised regulations at that time, together with a detailed explanation for such decision."

Sec. 6. Section 19 of the Noise Control Act of 1972 is amended to read as follows:

"AUTHORIZATION OF APPROPRIATIONS

"Sec. 19. There are authorized to be appropriated to carry out this Act (other than for research and development) \$15,000,000 for the fiscal year ending September 30, 1979."

Sec. 7. (a) Section 1002(a)(4) of the Solid Waste Disposal Act is amended by deleting the hyphen between the words "solid" and "waste" in the last line.

(b) Section 1004 of the Solid Waste Disposal Act is amended by—

(1) revising paragraph (5) by striking out everything after "improvement of land";

(2) revising paragraph (10) by striking out "disposal" and inserting in lieu thereof "management";

(3) by revising paragraph (29) to read as follows:

"(29) The term 'solid waste management facility' includes—

"(A) any resource recovery system or component thereof,

"(B) any system, program, or facility for resource conservation, and

"(C) any facility for the collection, source separation, storage, transportation, transfer, processing, treatment or disposal of solid wastes, including hazardous wastes, whether such facility is associated with facilities generating such wastes or otherwise."

(c) Section 1008(a)(3) of the Solid Waste Disposal Act is amended by striking out "title IV" and inserting in lieu thereof "subtitle D".

(d) Section 1008(b) of the Solid Waste Disposal Act is amended by striking "pursuant to this section" and by inserting after "suggested guidelines" each time it appears the phrase "or proposed regulations under this Act".

(e) Section 2003 of the Solid Waste Disposal Act is amended by inserting "Federal agencies." after "to provide".

- 42 USC 6922. (f) Section 3002 of the Solid Waste Disposal Act is amended by—  
 (1) revising paragraph (5) by striking out the semicolon after "subtitle" and substituting a comma, and by striking out "and" and inserting in lieu thereof "or pursuant to title I of the Marine Protection, Research, and Sanctuaries Act (86 Stat. 1052); and"; and  
 (2) revising paragraph (6) by adding a close parenthesis after "subtitle" the first time it appears.
- 33 USC 1411. (g) Section 3003 of the Solid Waste Disposal Act is amended by—  
 (1) revising subsection (a)(4) by striking out the period after "subtitle" and substituting a comma, and by adding at the end thereof "or pursuant to title I of the Marine Protection, Research, and Sanctuaries Act (86 Stat. 1052)."; and  
 (2) revising subsection (b) by striking out "subtitle" after "the regulations promulgated by the Administrator under this" and inserting in lieu thereof "section".
- 42 USC 6923. (h) Section 3003(a) of the Solid Waste Disposal Act is amended by inserting "treatment, storage, or" after "and upon and after such date the".
- 42 USC 6925. (i) Section 3006(e) of the Solid Waste Disposal Act is amended by—  
 (1) striking out "required for" wherever it appears in the subsection and inserting in lieu thereof "of"; and  
 (2) inserting the word "may" immediately after "3005," and before "submit".
- 42 USC 6926. (j) Section 3007(a)(1) of the Solid Waste Disposal Act is amended by striking out "or disposed of" and inserting in lieu thereof "disposed of, or transported from".
- 42 USC 6927. (k) Section 3005 of the Solid Waste Disposal Act is amended by—  
 (1) revising subsection (d)(1) to read as follows:  
 "(1) transports any hazardous waste identified or listed under this subtitle to a facility which does not have a permit under section 3005 (or 3006 in the case of a State program), or pursuant to title I of the Marine Protection, Research, and Sanctuaries Act (86 Stat. 1052)."; and  
 (2) revising subsection (d)(2) to read as follows:  
 "(2) treats, stores, or disposes of any hazardous waste identified or listed under this subtitle without having obtained a permit under section 3005 (or 3006 in the case of a State program) or pursuant to title I of the Marine Protection, Research, and Sanctuaries Act (86 Stat. 1052)."
- 42 USC 6928. (l) Section 4007(C) of the Solid Waste Disposal Act is amended by redesignating subsection "(C)" as "(e)".
- 42 USC 6947. (m) Section 8001 of the Solid Waste Disposal Act is amended by inserting "or management" between "disposal" and "of solid waste".
- 42 USC 6961. (n) Section 6002 of the Solid Waste Disposal Act is amended by—  
 (1) deleting "(A)" after "(1)" in subsection (c) and changing "(B)" and "(C)" to "(2)" and "(3)", respectively; and changing "(i)", "(ii)", and "(iii)" to "(A)", "(B)", and "(C)", respectively;  
 (2) in subsection (c)(3) as redesignated, striking "Contracting" and inserting in lieu thereof "After the date specified in any applicable guidelines prepared pursuant to subsection (e) of this section, contracting"; and
- 42 USC 6962.

- (3) inserting in the second sentence of subsection (e) after "containing such materials" the phrase "and with respect to certification by vendors of the percentage of recovered materials used,".
- (o) Section 6004 of the Solid Waste Disposal Act is amended 42 USC 6964.  
by--
- (1) revising subsection (a)(1)(A) by striking out "disposal" and inserting in lieu thereof "management";
  - (2) revising subsection (a)(1)(B) by striking out "disposal" and inserting in lieu thereof "management"; and
  - (3) revising subsection (b) by striking out "Secretary" and inserting in lieu thereof "Administrator".
- (p) Section 7002 of the Solid Waste Disposal Act is amended 42 USC 6972.  
by--
- (1) revising subsection (c) by striking out "section 212" and inserting in lieu thereof "subtitle C"; and
  - (2) revising subsection (e) by striking out "requiring" and inserting in lieu thereof "require".
- (q) Section 7003 of the Solid Waste Disposal Act is amended 42 USC 6973.  
by striking out "for" before "contributing to the alleged disposal".
- (r) Section 7007 of the Solid Waste Disposal Act is amended 42 USC 6977.  
by--
- (1) revising subsection (b)(1)(A) by striking out "disposal" and inserting "management"; and by striking out "resources" and inserting "resource";
  - (2) revising subsection (b)(1)(B) by striking out "disposal" and inserting "management"; and
  - (3) revising subsection (c)(3) by striking out "disposal" and inserting "management" in lieu thereof.
- (s) Section 8001(a) of the Solid Waste Disposal Act is amended 42 USC 6981.  
by--
- (1) revising paragraph (2) by striking out "disposal" and inserting "management" in lieu thereof; and
  - (2) revising paragraph (3) by inserting "treatment." after "for purpose of".
- (t) Section 8002 of the Solid Waste Disposal Act is amended 42 USC 6982.  
by--
- (1) revising paragraph (1) of subsection (g) by inserting a comma between "shale" and "liquefaction";
  - (2) revising paragraph (1) of subsection (j) by inserting "the Secretary of Energy, the Chairman of the Council of Economic Advisors," before "and a representative of the Office of Management and Budget";
  - (3) revising paragraph (2) of subsection (j) by striking "(2)(D)" and inserting "(1)(D)" in lieu thereof;
  - (4) revising paragraph (3) of subsection (j) by striking "(2)(D)" and inserting "(1)" in lieu thereof; and
  - (5) revising subsection (1) by striking out "required under subsection (a), (b), (i) and (j)" and inserting in lieu thereof "required under subsections (a), (b), and (i)".
- (u) Section 8003(a)(3) of the Solid Waste Disposal Act is amended 42 USC 6983.  
by striking out "discarded materials" and inserting "solid waste" in lieu thereof.

42 USC 6084.

Aircraft noise  
effects, joint  
study.  
49 USC 1431  
note.

(v) Section 8004(a)(1) of the Solid Waste Disposal Act is amended by striking out "discarded material" and inserting "solid waste" in lieu thereof.

SEC. 5. (a) The Secretary of Transportation and the Administrator of the Environmental Protection Agency shall jointly study the aircraft noise effects from an airport on communities located in a State other than the State in which the airport is located. The criteria to be used in selecting the airport to be studied shall include:

(1) the airport shall be operated by a State, a unit of general purpose local government of a State, or a special purpose entity constituted for the purpose of operating an airport, and

(2) the airport shall have a point on the airport boundary within one nautical mile from a State boundary, and

(3) the airport shall have had in excess of sixty thousand scheduled air carrier departures during the preceding calendar year.

(b) The study shall be conducted in cooperation with the airport operator, appropriate Federal, State, and local officials, and the appropriate Metropolitan Planning Organization.

(c) The Secretary and the Administrator shall prepare and submit to Congress a report within nine months of the conclusion of the study, but no later than twenty-four months after enactment of this section.

Report to  
Congress.

Approved November 8, 1978.

LEGISLATIVE HISTORY:

HOUSE REPORT No. 95-1171, accompanying H.R. 12647 (Comm. on Interstate and Foreign Commerce).

SENATE REPORT No. 95-875 (Comm. on Environment and Public Works), CONGRESSIONAL RECORD, Vol. 124 (1978):

July 19, considered and passed Senate.

Oct. 10, H.R. 12647 considered and passed House, passage vacated, and S. 3083, amended, passed in lieu.

Oct. 13, Senate concurred in House amendments.

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# Preamble to Model Community Noise Control Ordinance

This model noise control ordinance was drafted by the U.S. Environmental Protection Agency and the National Institute of Municipal Law Officers.

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## INTRODUCTION

### Purpose

The Model Community Noise Control Ordinance (model ordinance) is intended to be a basic tool which communities, both large and small, can use to construct noise control ordinances suited to local needs and conditions. The complete model ordinance, including optional provisions, is perhaps most suitable for larger communities, with populations of about 100,000 or more. Smaller communities and large communities with limited resources may wish to adopt only those provisions which address their most pressing noise problems. It is important that the community ensure that all provisions adopted are realistic in relation to local needs and conditions; that all provisions are consistent with one another, with other local law, and with State and Federal law; and, finally, that all provisions are clear and otherwise well drafted so that enforcement problems will be minimized.

### Background

This model ordinance is an outgrowth of the Federal Noise Control Act of 1972 (49 U.S.C. §§ 4901 *et seq.*) and the tremendous increase in interest regarding noise abatement and control which the Act has precipitated. Many existing community noise ordinances are based on outmoded model ordinances and/or the common law approach to noise control which relies exclusively on difficult to enforce nuisance provisions. While the model ordinance preserves common law with Article VI provisions prohibiting noise disturbances, it also contains definitive performance standards for motor vehicles and other sources of community noise. The increase in reliable monitoring equipment available to local governments, coupled with definitive standards incorporated into local noise control ordinances, should result in ordinances which are more easily enforceable than many have been in the past.

It is anticipated that an analogous model ordinance will form part of a workbook on community noise abatement and control to be published by the U.S. Environmental Protection Agency during late 1977. In addition to containing the model ordinance (perhaps with discussions of a number of alternative provisions), the workbook may contain chapters on the legal basis of noise control, the health effects of noise and various enforcement approaches.

Although the model ordinance will stand alone as a legal document, for proper enforcement the City/County must additionally have a code of recommended practices or rules and regulations which give general specifications for sound measuring equip-

ment and measurement methodology. This document should also provide detailed procedures for measurements to be taken for certain provisions of the ordinance, such as motor vehicles and stationary sources. To assist communities in the development of a code of recommended practices, EPA is preparing a model code which, when completed, will be sent to recipients of the model ordinance.

### Interrelationship of Various Provisions

An overview of the model ordinance can most readily be obtained by reading the List of Provisions. When a community determines which activities it wishes to regulate, the appropriate model provision or provisions can be located by referring to this list.

A glance through the List of Provisions suggests that certain acts may be prohibited by more than one provision. For example, use of a noisy go-cart could violate Section 9.2 ("Recreational Vehicles Operating Off Public Rights-Of-Way"), as well as Section 6.1 (Noise Disturbances). It may be that a community desires such multiple coverage. In this case, enforcement against the owner or operator of a noisy go-cart would probably come under the provision more easily enforced, but could come under both provisions violated, at the discretion of the enforcement agency. If a community does not desire such multiple coverage, it can either omit certain provisions or it can exempt acts covered by other provisions from multiple coverage. Such modifications deserve careful consideration, however, so that they do not modify the ordinance more than desired or otherwise jeopardize enforcement.

## GENERAL PROVISIONS

### Policy Regarding Levels

In this model ordinance, recommended values for sound levels in the performance standards have been omitted in most cases. Suggested times for the curfews on the hours of the conduct of activities or the operation of equipment have also generally been omitted. The reason for these omissions is that the drafters of the ordinance feel that there is no single number that can be chosen for each provision that would be appropriate for all types of communities. Each community has its own set of environmental, health, economic and other goals it wishes to attain. Each community also has its own configuration of noise sources and their impact which it wishes to control. The level and extent of such control is fully within the purview of local decision. Of course, localities will wish to consider the

technical practicality and economic reasonableness of sound levels chosen. However, in the regulation of noise pollution, the protection of public health and welfare is the major legal basis for control and must be carefully considered in the determination of performance standard noise levels and hours of curfew. For a specification of national maximum noise exposure guidelines, consult *Information on the Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety* (U.S. Environmental Protection Agency, March 1974).

### Pre-Emption

Under the Noise Control Act of 1972 (49 U.S.C. §§ 4901 *et seq.*), certain areas of local authority will become pre-empted on the effective date of regulations developed by the U.S. Environmental Protection Agency pursuant to Sections 6, 17 and 18 of this Act. In this discussion, we will present the scope of Federal pre-emption and indicate the provisions of the model ordinance which were drafted wholly or partially to respond to the issue of pre-emption.

An over-all requirement to monitor Federal pre-emptive regulations and to respond to them in the local noise ordinance is contained in Section 4.3.6(b). This subsection provides that, at such time as Federal regulations become effective which are by law pre-emptive of the laws of State and local governments, the Environmental Protection Officer(r)/Noise Control Office(r) (EPO/NCO) shall review the provisions of the local ordinance which may be affected and make appropriate recommendations for changes to the city council/legislative body.

The purposes of including such a provision in this ordinance are to facilitate the coordination of the local noise control efforts with the Federal noise program and to reduce the possibility of defendants raising Federal pre-emption as a defense to charges of local law violations.

With regard to the scope of pre-emption, the pre-emptive provision of Section 6 of the Noise Control Act differs considerably from those of Sections 17 and 18. The Section 6 provision is relatively narrow, pre-empting local laws covering new product noise emission levels which are directed at the manufacture or sale of such products. The preemptive provisions of Sections 17 and 18 are very broad, pre-empting local noise laws which affect the operation of interstate motor and rail carrier vehicles.

In Section 6, subsection 6(e)(1) provides that, after the effective date of an EPA regulation prescribing noise emission levels for a specific new product or component, no State or political subdivision thereof may adopt or enforce with respect to that particular new product or component any law

or regulation which sets a noise emission limit on such product (or component) enforceable against the manufacturer of the product, applicable at the time of sale, unless such law or regulation is identical to the Federal regulation. Thus, the pre-emption is against State and local laws which regulate the noise levels of a new product (i.e., a product which has not yet been sold to the first retail purchaser) and which, at any time, impact the manufacturer of the product.

State and local governments, under subsection 6(e)(2), retain authority to control products by all other available means. This subsection states that nothing in this section precludes or denies the right of State or local governments to establish and enforce controls on environmental noise and sources thereof through the licensing, regulation, or restriction of the use, operation or movement of any product or combination of products.

Thus, although a local government may not enforce a non-identical local law regarding the noise level of an EPA-regulated new product which affects the manufacture or sale of such product, the local government may regulate the product noise impact through regulations enforceable against the owner or operator of the product by providing, for example, maximum noise levels for operation, curfews on operation, prohibition of use in a residential neighborhood or hospital zone, or requirements for periodic inspection and licensing of the product.

Broader pre-emptive coverage is found in Sections 17(c)(1) and 18(c)(1). These sections provide that, after the effective date of an EPA regulation applicable to noise emissions from interstate rail or motor carriers, no State or political subdivision thereof may adopt or enforce any standard applicable to the same noise source unless such standard is identical to the Federal standard. However, Sections 17(c)(2) and 18(c)(2) provide that nothing in these sections shall diminish or enhance the right of State and local governments to establish and enforce standards or controls on levels of environmental noise or to control, license, regulate or restrict the use, operation or movement of any regulated product if two conditions occur:

- 1) the EPA Administrator, after consultation with the Secretary of the Department of Transportation, determines that such local law is necessitated by special local conditions, and

- 2) if he determines that such local law is not in conflict with the EPA regulations.

Thus, on the effective date of the EPA regulations under Section 18 (October 15,

1975) and Section 17 (undetermined as yet), local governments should review any ordinance provisions applicable to noise emissions resulting from the use or operation of motor vehicles with a gross vehicle or combination weight rating of greater than 10,000 lbs. operated by an interstate motor carrier and of interstate surface railroad locomotives and cars. Local regulations providing standards on noise emissions resulting from operations subject to Federal regulations must be identical to the Federal regulation. Such identity applies not only to the standard but also to the core measurement methodology which defines the standard. Non-identical standards may not be enforced, and should be declared ineffective, as of the effective date of the Federal regulation. For this reason, Section 18 standards have been incorporated into Table II of Section 9.1 in the model ordinance. The appropriate measurement methodology should be incorporated into the community code of recommended practices.

In general, we can classify the pre-emptive effect of these sections on local law into three categories. First, any local law which sets noise emission levels for interstate motor vehicles and rail locomotives and cars must be identical to the Federal standard. No special local condition or other factor can exempt this requirement. Second, local laws which regulate or restrict the use, operation, or movement of interstate motor rail carriers by such means as curfews and truck routes (see Section 4.3.4, Truck Routes and Transportation Planning) will not be subject to pre-emption if (1) the principal purpose of such regulation is not to control noise, or (2) the principal purpose is to control noise but the regulation has been approved by the EPA as necessitated by special local conditions and not in conflict with Federal regulations. For example, truck routes designated solely on the basis of noise must be submitted to EPA for determination of a special local condition. Truck routes based on additional factors, such as the safety of children, maximum load on street surfaces, etc., will not need EPA approval. Third, general noise regulations, such as the property line noise emission standards of Article VIII, will not be affected by these pre-emption provisions except in rare cases. Thus, the property line levels may be applied to noise emissions caused by interstate motor carrier vehicles at a loading terminal so long as means of abatement are possible which do not require controlling the noise emission level of the motor vehicle itself. Such other means of abatement can include, for example, installation of noise barriers at the perimeter of the terminal and creation of buffer zones of land between the terminal and the noise-impacted areas.

## Hearing Board and Advisory Council

A City/County with a large EPO/NCO may prefer to utilize a Hearing Board (or an administrative court) to hear cases regarding ordinance violations. Under this approach, the Hearing Board would decide the case and determine the penalty. Local courts would be utilized in appeals of the decisions of the board. This approach avoids overburdening existing courts.

The City/County may also wish to use a Hearing Board to make determinations on Special Variances (Section 7.2) and Variances for Time to Comply (Section 7.3). This would free EPO/NCO personnel to perform other tasks under the ordinance. However, the EPO/NCO could still be consulted on technical matters.

If the City/County decides to have a Hearing Board, the terms of existence and operation of the Board should be specified in the ordinance.

A Noise Control Advisory Council should also be considered by the City/County. The functions of this council could include providing (1) advice on development of the noise control program; (2) recommendations on which provisions of the model ordinance should be included in the City/County ordinance; (3) recommendations on sound level values and curfew periods for the various provisions; and (4) stimulation of public interest on noise abatement. This Council could also be responsible for writing the periodic reports, specified in Section 4.3.9, concerning the progress of the local noise control program.

## SPECIFIC PROVISIONS

### Article III—Definitions

#### 1. Section 3.2.15, Definition of "Motorboat"

A community which serves as an international port may wish to explicitly exclude vessels in international commerce from the definition of motorboat, since many such vessels would be effectively prohibited from using the port (under Section 6.2.15, Motorboats).

#### 2. Section 3.2.29, Definition of "Sound"

The term "sound" is generally used as the operative word in this ordinance rather than the term "noise." This is to avoid the problem of associating "noise" with a sound that is "disturbing" or "unwanted", with the attendant possibility that in order to prove a violation of the ordinance, proof must be given that the sound had indeed been "disturbing" or "unwanted." Because the substantive provisions of the ordinance have been narrowly drawn and often contain objective criteria, proof of an additional subjective element is unnecessary.

### 3. Section 3.2.23, Definition of "Person"

The definition of person does not include Federal agencies and departments. This is because legal decisions have not yet determined the extent of a locality's authority to bring action against the Federal government for noise control violations.

Section 4 of the Noise Control Act of 1972 requires that all departments, agencies, and instrumentalities of the executive, legislative, and judicial branches of the Federal Government comply with Federal, State, interstate, and local requirements respecting control and abatement of environmental noise to the same extent that any person is subject to such requirements. The Federal Courts of Appeals, deciding cases under identical language in the Clean Air Act, have disagreed as to whether this language extends to administrative as well as substantive requirements. See *State of Alabama v. Seiber*, 502 F. 2d 1233 (5 Cir. 1974); *Commonwealth of Kentucky v. Ruckelshaus*, 497 F. 2d 1172, (6 Cir. 1974). *Kentucky v. Ruckelshaus* is pending before the Supreme Court, and a resolution of the issue is likely. Further questions exist as to whether a State or local government can bring an action against the Federal Government for violations of their noise control laws, regulations and ordinances. Accordingly, the key definition of "person" in the model ordinance, which serves as an applicability section, does not include the Federal Government.

In the absence of such specificity, Section 4 of the Noise Control Act continues to require that the Federal Government comply with the local ordinance. However, it is left to each community to determine the position it will take with respect to the relevant issues, such as whether the Federal Government must comply with administrative provisions, and whether penalties, orders, and enforcement actions will be directed at the Federal Government under Article XI (Enforcement).

## Article IV—Powers and Duties of The (Environmental Protection)/(Noise Control) Office(r)

### Resolving Inter-Departmental Conflicts

Section 4.2.4 (Review of Actions of Other Departments); Section 4.2.5 (Review of Public and Private Projects), Section 4.3.4 (Truck Routes and Transportation Planning) and Article V (Duties and Responsibilities of other Departments) have the potential of causing inter-departmental conflicts since there is shared responsibility. The community may wish to specify in the ordinance a method for resolving such conflicts, perhaps by authorizing the city council, county board of supervisors, mayor, etc.,

to negotiate differences and make a final decision.

### Education

Section 4.2.2 authorizes the Environmental Protection (Noise Control) Office(r) to educate the public on methods of controlling noise and on the provisions of the ordinance. The EPO may wish to exercise caution, however, in providing specific advice on solving a particular noise problem. For instance, if the EPO were to advise a commercial establishment on a method of reducing noise from its air conditioning unit and this method failed to be effective, the commercial establishment may try to use this fact as a defense in any action brought against it by the EPO. The EPO officer should use his discretion in handling matters of this type.

### Review of Public and Private Projects

Section 4.2.5 grants the EPO the power to review public and private projects over which another department has authority in order to determine whether they will comply with the ordinance. This applies to such matters as licensing a race track, approving a housing project, or granting a permit for a construction site, if required to be approved by a department other than that of the EPO/NCO and if likely to create sound levels or sound exposures in violation of the ordinance.

Some communities may wish to expand this section to authorize the EPO to recommend to other departments appropriate modifications to projects if the EPO believes such projects will violate the ordinance or to allow him veto power over projects significantly impacting the noise environment.

This provision does not set criteria for determining whether a proposed project must be reviewed by the EPO/NCO. If the City/County wishes the EPO/NCO to review every proposed project, such criteria are not necessary, but this policy may create an unnecessarily large burden on the EPO/NCO. If the City/County wishes to limit situations where the proposed project is subject to noise impact review, criteria can be either included in the language of this provision, or the EPO/NCO can develop criteria in consultation with affected departments. Such criteria may include, for example, minimum monetary or time limits for the review of activities or specification of the types of activities which are likely to produce sound in violation of the ordinance.

### Inspections

Section 4.2.6 concerns inspections. To be constitutionally permissible, administrative searches or inspections conducted by municipal inspectors on private property must be made using a warrant procedure (*Camara v. Municipal Court*, 387 U.S. 523 (1967));

*See v. Seattle*, 387 U.S. 511 (1967)). Thus, if a private property holder refuses to allow his premises to be inspected by a City/County official, the official must obtain a search warrant for the premises before he may inspect them. The Court in *See* also held that there is no distinction between the rights of a residential property holder and those of a commercial property holder concerning searches or inspections. Both types of property are thus treated the same in Section 4.2.6(a).

Violations of Article VIII (Noise Levels by Receiving Land Use) and most Article VI (Prohibited Acts) violations can be determined without an inspection on the premises on which the sound source is situated, so a search warrant is not needed in these situations.

#### Article VIII—Sound Levels by Receiving Land Use (Defining Land Use Districts)

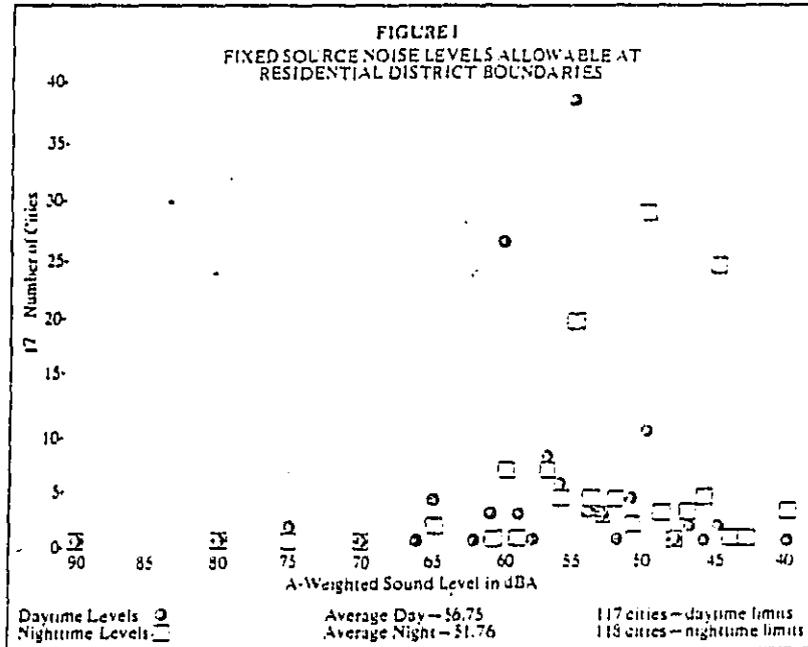
Article VIII sets property line sound limits for the broad receiving land use categories of residential, commercial and industrial. Many communities are employing this type of quantitative limit to provide stronger legal control over undesirable sound levels

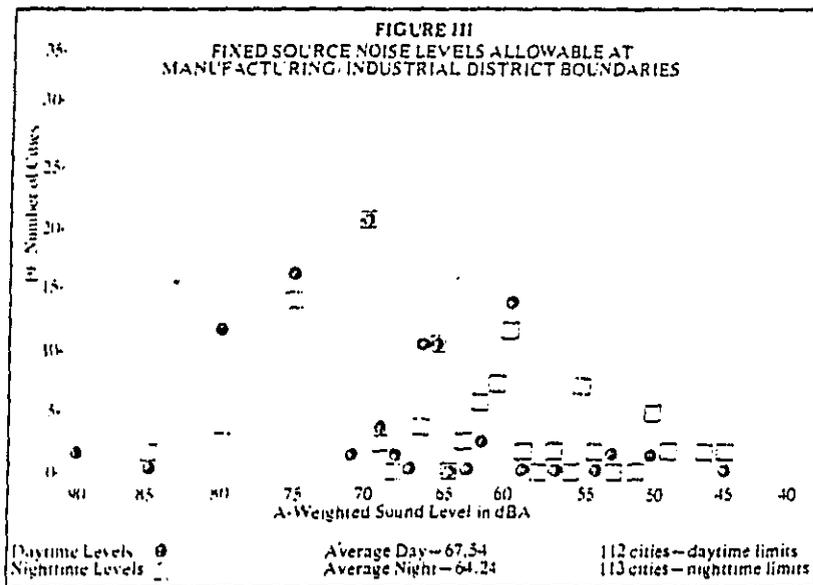
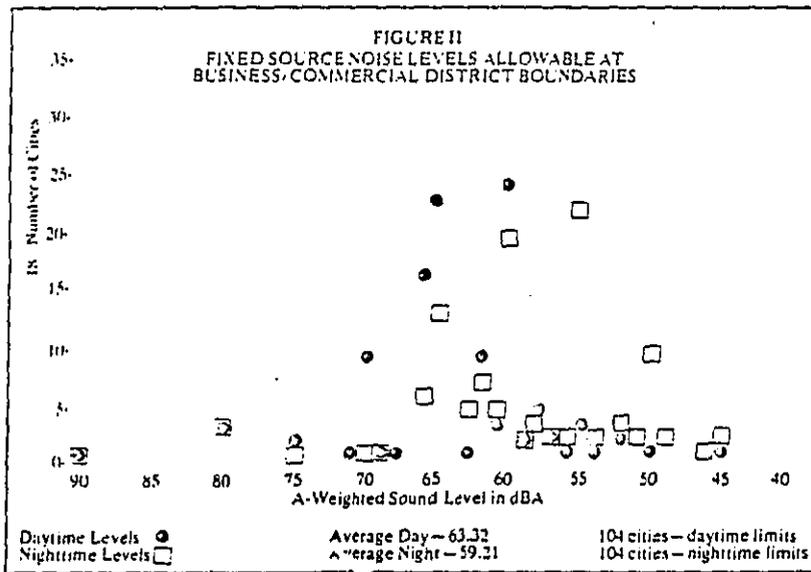
than is attainable with an ordinance containing only nuisance provisions.

If the community land use zoning code accurately reflects the actual use of the land, then the designations used by the city for zoning categories may effectively be plugged into the three Article VIII categories (with the corresponding definitions placed in Article III). On the other hand, if there are numerous discrepancies between the way the land is zoned and the way it is actually used (e.g., commercial establishments in a residential zone), or if there are large tracts of unzoned land, the community may prefer to base property line limits on the actual use of the land. This would provide greater protection for impacted properties.

A related matter to be considered in controlling property line noise is that of the occasional non-conforming land use. An example is the case of a single residence located in an industrial area. It may not be possible for several manufacturers impacting the residence to lower their noise levels to meet the limit specified for residential areas. Situations of this type will require some discretion in enforcement.

Figures I, II, and III summarize graphically the property line levels set by current municipal noise ordinances.





**Article X—Land Use**

The basic purpose of the Article X land use planning provisions is to ensure that no new residences, institutions or recreational

areas are constructed in high noise areas, as determined by the appropriate sections. Although the Article was drafted to stand independently from the existing community land use planning or zoning systems, it is

important for a community considering enactment of this Article to study the interaction of Article X with the land use planning and/or zoning laws and to reconcile them where necessary. It may be better, for example, to enact Article X as an amendment to an existing land use law rather than as a part of the noise control ordinance. Furthermore, because this Article effectively rezones land subject to its provisions, the community may want or need to take special measures before enactment of this Article. These may include a general identification of the areas that will be affected by these provisions.

### Article XI—Enforcement

Provisions in this Article are more likely to need revision to conform with local law than other provisions of the model ordinance. For example, the City/County may wish to make violations of the ordinance "infractions," similar to minor traffic violations, rather than misdemeanors, due to the stigma attached to such violations.

The City/County may wish to ensure that the public is reasonably well-informed of activities prohibited by the ordinance before fully effectuating its enforcement program. For example, the City/County may utilize a discretionary policy of issuing an abatement order for a first violation, followed by a citation for the original violation, if the abatement order is not complied with. This approach is provided for in Section 11.2 (Abatement Order), and would be used for violations that are presumed to be unintentional. The EPO/NCO may wish to establish guidelines for use of the abatement order, indicating, for example, appropriate types of violations for which an order may be issued and maximum time period of an order.

The enforcement scheme contained in this ordinance also includes a provision for citizen suits (Section 11.5). The advantage of the citizen suit approach is that many violations of the ordinance which the EPO/NCO has insufficient resources to prosecute can be legally dealt with by persons affected by the violation. Provisions under which one citizen can sue another are limited to those listed in Table VI, to minimize the possibility of "harassment" suits.

Section 11.3 (Notice of Violation) is incomplete in several respects for easy adaptation to the local law of the particular City/County.

Section 11.4 (Immediate Threats to Health and Welfare) provides the EPO/NCO with the authority to force immediate abatement of sources producing sound intensities that not only violate the ordinance but are also unquestionably harmful to the health of the public exposed to them. The sound levels regulated (see Tables IV and

V) are deliberately set high, because there is no procedure in this provision for balancing public health with economic or other considerations; public health is the sole determinant. The health and welfare criterion for the levels set is a temporary threshold shift of 30 dB at 4 kHz.

Subsection (b) limits the applicability of this provision to impacts on members of the general public who are involuntarily exposed to the sound. Employee exposures at their workplace are exempted because employee sound exposure levels are regulated under the Occupational Safety and Health Act (29 U.S.C. §§ 669 *et seq.* (1970)).

Severe sanctions for noncompliance with the order are provided for in subsection (d), so that the sound will not continue to be a detriment to public health. If the order is unjustified, a court can invalidate or suspend it soon after the order is issued, in a mandamus type proceeding. This remedy is contained in subsection (c), which may need to be modified to conform with local procedure.

Under Section 11.6 (Other Remedies), common law and statutory remedies previously used to regulate excessive sound will still remain available. It is desirable to retain such remedies to allow private persons the possibility of recovering damages or other remedies for the effects of excessive sound since private recovery is not provided for under the ordinance. The ordinance is intended to expand existing sound control law, not to limit it.

### FORMAT

In reading the model ordinance, it is essential that certain typographical symbols and format be understood. Several brief rules have been followed in drafting. These are:

- The material contained in square brackets [ ] is optional, depending on the needs and conditions of a given community. (Of course, communities developing ordinances may decide that any given provision should be deleted.)
- Parenthesis ( ) are generally used to designate alternative choices, but in some cases contain explanatory information, depending on the context.
- Blanks — must be filled in by the community with appropriate information.
- Wherever the term EPO/NCO appears, the title of the community's lead noise enforcement agency or official should be inserted.

# Model Community Noise Control Ordinance

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**ARTICLE I Short Title**

This ordinance may be cited as the "Noise Control Ordinance of the (City/County) of . . . . ."

**ARTICLE II Declaration of Findings and Policy; Scope**

**2.1 Declaration of Findings and Policy**

WHEREAS excessive sound and vibration are a serious hazard to the public health and welfare, safety, and the quality of life; and WHEREAS a substantial body of science and technology exists by which excessive sound and vibration may be substantially abated; and, WHEREAS the people have a right to and should be ensured an environment free from excessive sound and vibration that may jeopardize their health or welfare or safety or degrade the quality of life; and, NOW, THEREFORE, it is the policy of the (City/County) of . . . . . to prevent excessive sound and vibration which may jeopardize the health and welfare or safety of its citizens or degrade the quality of life.

**2.2 Scope**

This ordinance shall apply to the control of all sound and vibration originating within the limits of the (City/County) of . . . . .

**ARTICLE III Definitions**

**3.1 Terminology**

All terminology used in this ordinance, not defined below, shall be in conformance with applicable publications of the American National Standards Institute (ANSI) or its successor body:

**3.2.1 "A-Weighted Sound Level" Means**

The sound pressure level in decibels as measured on a sound level meter using the A-weighting network. The level so read is designated dB(A) or dBA.

**3.2.2 "Commercial Area" Means**

((As defined in the community (comprehensive plan)/(zoning ordinance)).

**3.2.3 "Construction" Means**

Any site preparation, assembly, erection, substantial repair, alteration, or similar action, but excluding demolition, for or of public or private rights-of-way, structures, utilities or similar property.

**3.2.4 "Day-Night Average Sound Level (L<sub>dn</sub>)" Means**

The 24-hour energy average of the

A-weighted sound pressure level, with the levels during the period 10:00 p.m. to 7:00 a.m. the following day increased by 10 dBA before averaging.

**3.2.5 "Decibel (dB)" Means**

A unit for measuring the volume of a sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micronewtons per square meter).

**3.2.6 "Demolition" Means**

Any dismantling, intentional destruction or removal of structures, utilities, public or private right-of-way surfaces, or similar property.

**3.2.7 "Emergency" Means**

Any occurrence or set of circumstances involving actual or imminent physical trauma or property damage which demands immediate action.

**3.2.8 "Emergency Work" Means**

Any work performed for the purpose of preventing or alleviating the physical trauma or property damage threatened or caused by an emergency.

**3.2.9 "Environmental Protection Office(r)/ Noise Control Office(r) (EPO/NCO)" Means**

The municipal agency or department having lead responsibility for this ordinance. (If no such agency is designated, the term shall mean the municipal official having lead responsibility for this ordinance.)

**3.2.10 "Equivalent A-Weighted Sound Level (L<sub>eq</sub>)" Means**

The constant sound level that, in a given situation and time period, conveys the same sound energy as the actual time-varying A-weighted sound. [For the purposes of this ordinance, a time period of 24 hours shall be used, unless otherwise specified.]

**3.2.11 "Gross Vehicle Weight Rating (GVWR)" Means**

The value specified by the manufacturer as the recommended maximum loaded weight of a single motor vehicle. In cases where trailers and tractors are separable, the gross combination weight rating (GCWR), which is the value specified by the manufacturer as the recommended maximum loaded weight of the combination vehicle, shall be used.

**3.2.12 "Impulsive Sound" Means**

Sound of short duration, usually less

- than one second, with an abrupt onset and rapid decay. Examples of sources of impulsive sound include explosions, drop forge impacts, and the discharge of firearms.
- 3.2.13 "Industrial Area" Means**  
((As defined in the community (comprehensive plan)/(zoning ordinance)).
- 3.2.14 "Motor Carrier Vehicle Engaged in Interstate Commerce" Means**  
Any vehicle for which regulations apply pursuant to Section 18 of the Federal Noise Control Act of 1972 (P.L. 92-574), as amended, pertaining to motor carriers engaged in interstate commerce.
- 3.2.15 "Motor Vehicle" Means**  
(As defined in the motor vehicle code of the State)/(Any vehicle which is propelled or drawn on land by a motor, such as, but not limited to, passenger cars, trucks, truck-trailers, semi-trailers, campers, go-carts, snowmobiles, amphibious craft on land, dune buggies, or racing vehicles, but not including motorcycles.)
- 3.2.16 "Motorboat" Means**  
Any vessel which operates on water and which is propelled by a motor, including, but not limited to, boats, barges, amphibious craft, water ski towing devices and hover craft.
- 3.2.17 "Motorcycle" Means**  
(As defined in the motor vehicle code of the State)/(An unenclosed motor vehicle having a saddle for the use of the operator and two or three wheels in contact with the ground, including, but not limited to, motor scooters and minibikes.)
- 3.2.18 "Muffler or Sound Dissipative Device" Means**  
A device for abating the sound of escaping gases of an internal combustion engine.
- 3.2.19 "Noise" Means**  
Any sound which annoys or disturbs humans or which causes or tends to cause an adverse psychological or physiological effect on humans.
- 3.2.20 "Noise Disturbance" Means**  
Any sound which (a) endangers or injures the safety or health of humans or animals, or (b) annoys or disturbs a reasonable person of normal sensitivities, or (c) endangers or injures personal or real property.
- 3.2.21 "Noise Sensitive Zone" Means**  
Any area designated pursuant to Section 4.2.10 of this ordinance for the purpose of ensuring exceptional quiet.
- 3.2.22 "Person" Means**  
Any individual, association, partnership, or corporation, and includes any officer, employee, department, agency or instrumentality of a State or any political subdivision of a State.
- 3.2.23 "Powered Model Vehicle" Means**  
Any self-propelled airborne, waterborne, or landborne plane, vessel, or vehicle, which is not designed to carry persons, including, but not limited to, any model airplane, boat, car, or rocket.
- 3.2.24 "Public Right-of-Way" Means**  
Any street, avenue, boulevard, highway, sidewalk or alley or similar place which is owned or controlled by a governmental entity.
- 3.2.25 "Public Space" Means**  
Any real property or structures thereon which are owned or controlled by a governmental entity.
- 3.2.26 "Pure Tone" Means**  
Any sound which can be distinctly heard as a single pitch or a set of single pitches. For the purposes of this ordinance, a pure tone shall exist if the one-third octave band sound pressure level in the band with the tone exceeds the arithmetic average of the sound pressure levels of the two contiguous one-third octave bands by 5 dB for center frequencies of 500 Hz and above and by 3 dB for center frequencies between 160 and 400 Hz and by 15 dB for center frequencies less than or equal to 125 Hz.
- 3.2.27 "Real Property Boundary" Means**  
An imaginary line along the ground surface, and its vertical extension, which separates the real property owned by one person from that owned by another person, but not including intra-building real property divisions.
- 3.2.28 "Residential Area" Means**  
((As defined in the community (comprehensive plan)/(zoning ordinance)).
- 3.2.29 "RMS Sound Pressure" Means**  
The square root of the time averaged square of the sound pressure, denoted  $P_{rms}$ .
- 3.2.30 "Sound" Means**  
An oscillation in pressure, particle displacement, particle velocity or other physical parameter, in a medium with internal forces that causes compression and rarefaction of that medium. The description of sound may include any characteristic of such sound, including duration, intensity and frequency.

**3.2.31 "Sound Level" Means**

The weighted sound pressure level obtained by the use of a sound level meter and frequency weighting network, such as A, B, or C as specified in American National Standards Institute specifications for sound level meters (ANSI S1.4-1971, or the latest approved revision thereof). If the frequency weighting employed is not indicated, the A-weighting shall apply.

**3.2.32 "Sound Level Meter" Means**

An instrument which includes a microphone, amplifier, RMS detector, integrator or time averager, output meter, and weighting networks used to measure sound pressure levels.

**3.2.33 "Sound Pressure" Means**

The instantaneous difference between the actual pressure and the average or barometric pressure at a given point in space, as produced by sound energy.

**3.2.34 "Sound Pressure Level" Means**

20 times the logarithm to the base 10 of the ratio of the RMS sound pressure to the reference pressure of 20 micropascals ( $20 \times 10^{-6}$  N/m<sup>2</sup>). The sound pressure level is denoted L<sub>p</sub> or SPL and is expressed in decibels.

**3.2.35 "Vibration" Means**

An oscillatory motion of solid bodies of deterministic or random nature described by displacement, velocity, or acceleration with respect to a given reference point.

**3.2.36 "Weekday" Means**

Any day Monday through Friday which is not a legal holiday.

**ARTICLE IV Powers and Duties of the (Environmental Protection)/(Noise Control) Officer(s)**

**4.1 Lead (Agency/Official)**

The noise control program established by this ordinance shall be administered by (title of municipal agency or lead official).

**4.2 Powers of The (Environmental Protection)/(Noise Control Officer(s))**

In order to implement and enforce this ordinance and for the general purpose of sound and vibration abatement and control, the EPO/NCO shall have, in addition to any other authority vested in it, the power to:

**4.2.1 Studies**

Conduct, or cause to be conducted, research, monitoring, and other studies related to sound and vibration.

**4.2.2 Education**

(a) Conduct programs of public education regarding:

(1) the causes, effects and general methods of abatement and control of noise and vibration; and,

(2) the actions prohibited by this ordinance and the procedures for reporting violations; and

(b) Encourage the participation of public interest groups in related public information efforts.

**4.2.3 Coordination and Cooperation**

(a) Coordinate the noise and vibration control activities of all municipal departments;

(b) Cooperate to the extent practicable with all appropriate State and Federal agencies;

(c) Cooperate or combine to the extent practicable with appropriate county and municipal agencies; and,

(d) Enter into contracts [with the approval of the (appropriate authority)] for the provision of technical and enforcement services.

**4.2.4 Review of Actions of Other Departments**

Request any other department or agency responsible for any proposed or final standard, regulation or similar action to consult on the advisability of revising the action, if there is reason to believe that the action is not consistent with this ordinance.

**4.2.5 Review of Public and Private Projects**

Review public and private projects, subject to mandatory review or approval by other departments, for compliance with this ordinance, if such projects are likely to cause sound or vibration in violation of this ordinance.

**4.2.6 Inspections**

(a) Upon presentation of proper credentials, enter and inspect any private property or place, and inspect any report or records at any reasonable time when granted permission by the owner, or by some other person with apparent authority to act for the owner. When permission is refused or cannot be obtained, a search warrant may be obtained from a court of competent jurisdiction upon showing of probable cause to believe that a violation of this ordinance may exist. Such inspection may include administration of any necessary tests.

(b) Stop any motor vehicle, motorcycle, or motorboat operated on a

public right-of-way, public space, or public waterway reasonably suspected of violating any provision of this ordinance, and issue a notice of violation or abatement order which may require the motor vehicle, motorcycle or motorboat to be inspected or tested as the EPO/NCO may reasonably require.]

**4.2.7 Records**

Require the owner or operator of any commercial or industrial activity to establish and maintain records and make such reports as the EPO/NCO may reasonably prescribe.

**4.2.8 Measurements by The Owner or Operator**

Require the owner or operator of any commercial or industrial activity to measure the sound level of or the vibration from any source in accordance with the methods and procedures and at such locations and times as the EPO/NCO may reasonably prescribe and to furnish reports of the results of such measurements to the EPO/NCO. The EPO/NCO may require the measurements to be conducted in the presence of its enforcement officials.

**4.2.9 Product Performance Standard Recommendations**

(a) Develop and recommend for promulgation (to the appropriate authority) provisions regulating the use and operation of any product, including the specification of maximum allowable sound emission levels of such product.

(b) Develop and recommend for promulgation (to the appropriate authority) provisions prohibiting the sale of products which do not meet specified sound emission levels, where the sound level of the product is not regulated by the United States Environmental Protection Agency under Section 6 of the Noise Control Act of 1972.]

**4.2.10 Noise Sensitive Zone Recommendations**

Prepare recommendations, to be approved by (the appropriate authority), for the designation of noise sensitive zones which contain noise sensitive activities. Existing quiet zones shall be considered noise sensitive zones until otherwise designated. Noise sensitive activities include, but are not limited to, operations of schools, libraries open to the public, churches, hospitals, and nursing homes.

**4.3 Duties of (Environmental Protection)/ (Noise Control) Officer(s)**

In order to implement and enforce this ordinance effectively, the EPO/NCO shall within a reasonable time after the effective date of the ordinance:

**4.3.1 Standards, Testing Methods, and Procedures**

Develop, [recommend to the appropriate authority.] and promulgate standards, testing methods and procedures.

**4.3.2 Investigate and Pursue Violations**

In consonance with Section 4.2.6, Article XI, and other provisions of this ordinance, investigate and pursue possible violations of this ordinance

**4.3.3 Delegation of Authority**

Delegate functions, where appropriate under this ordinance, to personnel within the EPO NCO and to other agencies or departments, [subject to approval of .....].

**4.3.4 Truck Routes and Transportation Planning**

(a) Study the existing transportation systems, such as truck routes within the community; determine areas with sensitivity to sound and vibration caused by transportation; recommend changes or modifications to transportation systems to minimize the sound and vibration impact on residential areas and noise sensitive zones.  
(b) Assist in or review the total transportation planning of the community, including planning for new roads and highways, bus routes, airports, and other systems for public transportation, to ensure that the impact of sound and vibration receives adequate consideration.

**4.3.5 Capital Improvement Guidelines**

Establish noise assessment guidelines for the evaluation of proposed improvements for the capital improvements budget and program pursuant to Section 5.5. These guidelines shall assist in the determination of the relative priority of each improvement in terms of noise impact.

**4.3.6 State and Federal Laws and Regulations**

(a) Prepare and publish [with the approval of .....] a list of those products manufactured to meet specified noise emission limits under Federal, State, or community law for which "tampering" enforcement will be conducted; and,

(b) Make recommendations for modi-

fications or amendments to this ordinance to ensure consistency with all State and Federal laws and regulations.

**[4.3.7] Planning to Achieve Long Term Noise Goals**

[Develop a generalized sound level map of the (city/county), a long term plan for achieving quiet in the (city/county), and [with the approval of .....] integrate this plan into the planning process of the (city/county).]

**4.3.8 Administer Grants, Funds and Gifts**

Administer noise program grants and other funds and gifts from public and private sources, including the State and Federal governments.

**[4.3.9] Periodic Report**

[Evaluate and report, every ..... year(s) following the effective date of this ordinance, on the effectiveness of the (city/county) noise control program and make recommendations for any legislative or budgetary changes necessary to improve the program. This report shall be made to the (Noise Control Advisory Board)/ (appropriate authority) which may amend it after consultation with the EPO/NCO, and then submit it to the (appropriate authority), for approval.]

**ARTICLE V Duties and Responsibilities of Other Departments**

**5.1 Departmental Actions**

All departments and agencies shall, to the fullest extent consistent with other law, carry out their programs in such a manner as to further the policy of this ordinance.

**5.2 Departmental Cooperation**

All departments and agencies shall cooperate with the EPO/NCO to the fullest extent in enforcing this ordinance.

**5.3 Departmental Compliance with Other Laws**

All departments and agencies shall comply with Federal and State laws and regulations and the provisions and intent of this ordinance respecting the control and abatement of noise to the same extent that any person is subject to such laws and regulations.

**5.4 Project Approval**

All departments whose duty it is to review and approve new projects or changes to existing projects, that result, or may result, in the production of sound or vibration shall consult

with the EPO/NCO prior to any such approval.

**5.5 Contracts**

Any written contract, agreement, purchase order, or other instrument whereby the (city/county) is committed to the expenditure of ..... dollars or more in return for goods or services shall contain provisions requiring compliance with this ordinance.

**5.6 Low Noise Emission Products**

Any product which has been certified by the Administrator of the United States Environmental Protection Agency pursuant to Section 15 of the Noise Control Act as a low noise emission product and which he determines is suitable for use as a substitute, shall be procured by the city/county and used in preference to any other product, provided that such certified product is reasonably available and has a procurement cost which is not more than (125) percentum of the least expensive type of product for which it is certified as a substitute.

**5.7 Capital Improvement Program**

All departments responsible for a capital improvements budget and program shall prepare an analysis of the noise impact of any proposed improvements in accordance with noise assessment guidelines established by the EPO/NCO pursuant to Section 4.3.5. Proposed capital improvements include land acquisition, building construction, highway improvements, and utilities and fixed equipment installation.

**ARTICLE VI Prohibited Acts**

**6.1 Noise Disturbances Prohibited**

No person shall unreasonably make, continue, or cause to be made or continued, any noise disturbance. Non-commercial public speaking and public assembly activities conducted on any public space or public right-of-way shall be exempt from the operation of this Section.

**6.2 Specific Prohibitions**

The following acts, and the causing thereof, are declared to be in violation of this ordinance:

**6.2.1 Radios, Television Sets, Musical Instruments and Similar Devices**

Operating, playing or permitting the operation or playing of any radio, television, phonograph, drum, musical instrument, sound amplifier, or

similar device which produces, reproduces, or amplifies sound;

(a) Between the hours of ..... p.m. and ..... a.m. the following day in such a manner as to create a noise disturbance across a real property boundary or within a noise sensitive zone, [except for activities open to the public and for which a permit has been issued by (appropriate authority) according to criteria set forth in .....];

(b) In such a manner as to create a noise disturbance at 50 feet (15 meters) from such device, when operated in or on a motor vehicle on a public right-of-way or public space, or in a boat on public waters; or,

(c) In such a manner as to create a noise disturbance to any person other than the operator of the device, when operated by any passenger on a common carrier;

(d) This section shall not apply to non-commercial spoken language covered under Section 6.2.2.

#### 6.2.2 Loudspeakers/Public Address Systems

(a) Using or operating for any non-commercial purpose any loudspeaker, public address system, or similar device between the hours of 10:00 p.m. and 8:00 a.m. the following day, such that the sound therefrom creates a noise disturbance across a residential real property boundary or within a noise sensitive zone.

(b) Using or operating for any commercial purpose any loudspeaker, public address system, or similar device (1) such that the sound therefrom creates a noise disturbance across a real property boundary or within a noise sensitive zone; or (2) between the hours of ..... p.m. and ..... a.m. the following day on a public right-of-way or public space.

#### 6.2.3 Street Sales

Offering for sale or selling anything by shouting or outcry within any residential or commercial area of the (city/county [except by permit issued by (appropriate authority) according to criteria set forth in ..... and/or except between the hours of ..... a.m. and ..... p.m.].

#### 6.2.4 Animals and Birds

Owning, possessing or harboring any animal or bird which frequently or for continued duration, howls, barks, meows, squawks, or makes other sounds which create a noise disturbance across a residential real property

boundary or within a noise sensitive zone. [This provision shall not apply to public zoos.]

#### 6.2.5 Loading and Unloading

Loading, unloading, opening, closing or other handling of boxes, crates, containers, building materials, garbage cans, or similar objects between the hours of ..... p.m. and ..... a.m. the following day in such a manner as to cause a noise disturbance across a residential real property boundary or within a noise sensitive zone.

#### 6.2.6 Construction

Operating or permitting the operation of any tools or equipment used in construction, drilling, or demolition work:

(a) Between the hours of ..... p.m. and ..... a.m. the following day on weekdays or at any time on (Sundays, weekends) or holidays, such that the sound therefrom creates a noise disturbance across a residential real property boundary or within a noise sensitive zone, except for emergency work of public service utilities or by special variance issued pursuant to Section 7.2;

(b) At any other time such that the sound level at or across a real property boundary exceeds an L<sub>90</sub> of ..... dBA for the daily period of operation.

(c) This section shall not apply to the use of domestic power tools subject to Section 6.2.17.

#### 6.2.7 Vehicle or Motorboat Repairs and Testing

Repairing, rebuilding, modifying, or testing any motor vehicle, motorcycle, or motorboat in such a manner as to cause a noise disturbance across a residential real property boundary or within a noise sensitive zone.

#### 6.2.8 Airport and Aircraft Operations

(a) The EPO/NCO shall consult with the airport proprietor to recommend changes in airport operations to minimize any noise disturbance which the airport owner may have authority to control in its capacity as proprietor.

(b) Nothing in this section shall be construed to prohibit, restrict, penalize, enjoin, or in any manner regulate the movement of aircraft which are in all respects conducted in accordance with, or pursuant to, applicable Federal laws or regulations.

#### 6.2.9 Places of Public Entertainment

Operating, playing or permitting the operation or playing of any radio, television, phonograph, drum, musical instrument, sound amplifier, or

similar device which produces, reproduces, or amplifies sound in any place of public entertainment at a sound level greater than .....dBA as read by the slow response on a sound level meter at any point that is normally occupied by a customer, unless a conspicuous and legible sign is located outside such place, near each public entrance, stating "WARNING: SOUND LEVELS WITHIN MAY CAUSE PERMANENT HEARING IMPAIRMENT."

**6.2.10 Explosives, Firearms, and Similar Devices**

The use or firing of explosives, firearms, or similar devices which create impulsive sound so as to cause a noise disturbance across a real property boundary or on a public space or right-of-way, without first obtaining a special variance issued pursuant to Section 7.2. [Such permit need not be obtained for licensed game-hunting activities on property where such activities are authorized.]

**6.2.11 Powered Model Vehicles**

Operating or permitting the operation of powered model vehicles so as to create a noise disturbance across a residential real property boundary, in a public space or within a noise sensitive zone between the hours of ..... p.m. and ..... a.m. the following day. Maximum sound levels in a public space during the permitted period of operation shall conform to those set forth for residential land use in Table 1 of Section 3.1 and shall be measured at a distance of ..... feet (meters) from any point on the path of the vehicle. Maximum sound levels for residential property and noise sensitive zones, during the permitted period of operation, shall be governed by Section 3.1 and Section 6.2.16, respectively.

**6.2.12 Vibration**

Operating or permitting the operation of any device that creates vibration which is above the vibration perception threshold of an individual at or beyond the property of the source if on private property or at ..... feet (meters) from the source if on a public space or public right-of-way. For the purposes of this section, "vibration perception threshold" means the minimum ground- or structure-borne vibrational motion necessary to cause a normal person to be aware of the vibration by such direct means as, but not limited to, sensation by touch or visual observation of moving objects.

**6.2.13 Stationary Non-Emergency Signaling Devices**

(a) Sounding or permitting the sounding of any [electronically-amplified] signal from any stationary bell, chime, siren, whistle, or similar device, intended primarily for non-emergency purposes, from any place, [for more than ..... minutes in any hourly period.]

[(b) Devices used in conjunction with places of religious worship shall be exempt from the operation of this provision.]

[(c) Sound sources covered by this provision and not exempted under subsection (b) shall be exempted by (appropriate authority) using criteria set forth in Section 7.2.]

**6.2.14 Emergency Signaling Devices**

(a) The intentional sounding or permitting the sounding outdoors of any fire, burglar, or civil defense alarm, siren, whistle or similar stationary emergency signaling device, except for emergency purposes or for testing, as provided in Subsection (b).

(b) (i) Testing of a stationary emergency signaling device shall occur at the same time of day each time such a test is performed, but not before ..... a.m. or after ..... p.m. Any such testing shall use only the minimum cycle test time. In no case shall such test time exceed ..... seconds.

(ii) Testing of the complete emergency signaling system, including the functioning of the signaling device and the personnel response to the signaling device, shall not occur more than once in each calendar month. Such testing shall not occur before ..... a.m. or after ..... p.m. The time limit specified in subsection (i) shall not apply to such complete system testing.

[[ (c) Sounding or permitting the sounding of any exterior burglar [or fire] alarm or any motor vehicle burglar alarm unless such alarm is automatically terminated within .... minutes of activation. [This section shall not be interpreted to apply to ..... alarms.]]

**6.2.15 Motorboats**

Operating or permitting the operation of any motorboat in any lake, river, stream, or other waterway in such manner as to exceed a sound level of ..... dBA at 50 feet (15 meters) or the nearest shoreline, whichever distance is less.

**6.2.16 Noise Sensitive Zones**

(a) Creating or causing the creation

of any sound within any noise sensitive zone designated pursuant to Section 4.2.10, so as to disrupt the activities normally conducted within the zone, provided that conspicuous signs are displayed indicating the presence of the zone; or

(b) Creating or causing the creation of any sound within any noise sensitive zone, designated pursuant to Section 4.2.10, containing a hospital, nursing home, or similar activity, so as to interfere with the functions of such activity or disturb or annoy the patients in the activity, provided that conspicuous signs are displayed indicating the presence of the zone.

#### 6.2.17 Domestic Power Tools

Operating or permitting the operation of any mechanically powered saw, sander, drill, grinder, lawn or garden tool, snowblower, or similar device used outdoors in residential areas between the hours of . . . .p.m. and . . . .a.m. the following day so as to cause a noise disturbance across a residential real property boundary.

#### 6.2.18 Tampering

The following acts or the causing thereof are prohibited:

(a) The removal or rendering inoperative by any person other than for purposes of maintenance, repair, or replacement, of any noise control device or element of design or noise label of any product identified under Section 4.3.6. The EPO/NCO may, by regulation, list those acts which constitute violation of this provision.

(b) The (intentional) moving or rendering inaccurate or inoperative of any sound monitoring instrument or device positioned by or for the EPO/NCO, provided such device or the immediate area is clearly labeled, in accordance with EPO/NCO regulations, to warn of the potential illegality.]

(c) The use of a product, identified under Section 4.3.6, which has had a noise control device or element of design or noise label removed or rendered inoperative, with knowledge that such action has occurred.

### ARTICLE VII Exceptions and Variances

#### 7.1 Emergency Exception

The provisions of this ordinance shall not apply to (a) the emission of sound for the purpose of alerting persons to the existence of an emergency, or (b) the emission of sound in the performance of emergency work.

#### 7.2 Special Variances

(a) The (EPO/NCO)/(Hearing Board) shall have the authority, consistent with this section, to grant special variances which may be requested pursuant to Sections 6.2.6 (Construction) and 6.2.10 (Explosives, Firearms, and Similar Devices).

(b) Any person seeking a special variance pursuant to this section shall file an application with the (EPO/NCO)/(Hearing Board). The application shall contain information which demonstrates that bringing the source of sound or activity for which the special variance is sought into compliance with this ordinance would constitute an unreasonable hardship on the applicant, on the community, or on other persons. [Notice of an application for a special variance shall be published according to (jurisdictional procedure).] Any individual who claims to be adversely affected by allowance of the special variance may file a statement with the (EPO/NCO)/(Hearing Board) containing any information to support his claim. If the (EPO/NCO)/(Hearing Board) finds that a sufficient controversy exists regarding an application, a public hearing may be held.

(c) In determining whether to grant or deny the application, the (EPO/NCO)/(Hearing Board) shall balance the hardship to the applicant, the community, and other persons of not granting the special variance against the adverse impact on the health, safety, and welfare of persons affected, the adverse impact on property affected, and any other adverse impacts of granting the special variance. Applicants for special variances and persons contesting special variances may be required to submit any information the (EPO/NCO)/(Hearing Board) may reasonably require. In granting or denying an application, the (EPO/NCO)/(Hearing Board) shall place on public file a copy of the decision and the reasons for denying or granting the special variance.

(d) Special variances shall be granted by notice to the applicant containing all necessary conditions, including a time limit on the permitted activity. The special variance shall not become effective until all conditions are agreed to by the applicant. Noncompliance with any condition of the special variance shall terminate it and subject the person holding it to those provisions of this ordinance regulating the source of sound or activity for

which the special variance was granted.

(e) Application for extension of time limits specified in special variances or for modification of other substantial conditions shall be treated like applications for initial special variances under subsection (b).

(f) The (EPO/NCO)/(Hearing Board) may issue guidelines [approved by .....] defining the procedures to be followed in applying for a special variance and the criteria to be considered in deciding whether to grant a special variance.

#### 7.3 Variances for Time to Comply

(a) Within ..... days following the effective date of this ordinance, the owner of any commercial or industrial source of sound may apply to the (EPO/NCO)/(Hearing Board) for a variance in time to comply with Section 6.2.12 (Vibration) or Article VIII. The (EPO/NCO)/(Hearing Board) shall have the authority, consistent with this section, to grant a variance, not to exceed ..... days from the effective date of this ordinance.

(b) Any person seeking a variance in time to comply shall file an application with the (EPO/NCO)/(Hearing Board). The application shall contain information which demonstrates that bringing the source of sound or activity for which the variance is sought into compliance with this ordinance prior to the date requested in the application would constitute an unreasonable hardship on the applicant, on the community, or on other persons. [Notice of an application for a variance in time to comply shall be published according to (jurisdictional procedure).] Any individual who claims to be adversely affected by allowance of the variance in time to comply may file a statement with the (EPO/NCO)/(Hearing Board) containing any information to support his claim. If the (EPO/NCO)/(Hearing Board) finds that a sufficient controversy exists regarding an application, a public hearing may be held.

(c) In determining whether to grant or deny the application, the (EPO/NCO)/(Hearing Board) shall balance the hardship to the applicant, the community, and other persons of not granting the variance in time to comply against the adverse impact on health, safety, and welfare of persons affected, the adverse impact on property affected, and any other adverse

impacts of granting the variance. Applicants for variances in time to comply and persons contesting variances may be required to submit any information the (EPO/NCO)/(Hearing Board) may reasonably require. In granting or denying an application, the (EPO/NCO)/(Hearing Board) shall place on public file a copy of the decision and the reasons for denying or granting the variance in time to comply.

(d) Variances in time to comply shall be granted to the applicant containing all necessary conditions, including a schedule for achieving compliance. The variance in time to comply shall not become effective until all conditions are agreed to by the applicant. Noncompliance with any condition of the variance shall terminate the variance and subject the person holding it to those provisions of this ordinance for which the variance was granted.

(e) Application for extension of time limits specified in variances in time to comply or for modification of other substantial conditions shall be treated like applications for initial variances under subsection (b), except that the (EPO/NCO)/(Hearing Board) must find that the need for the extension or modification clearly outweighs any adverse impacts of granting the extension or modification.

(f) The (EPO/NCO)/(Hearing Board) may issue guidelines [approved by .....] defining the procedures to be followed in applying for a variance in time to comply and the criteria to be considered in deciding whether to grant a variance.

#### 7.4 Appeals

Appeals of an adverse decision of the (EPO/NCO)/(Hearing Board) shall be made to the (appropriate court of law). Review of the court shall be (*de novo*)/(limited to whether the decision is supported by substantial evidence)/(as specified by the ....).

### ARTICLE VIII Sound Levels by Receiving Land Use

#### 8.1 Maximum Permissible Sound Levels by Receiving Land Use

No person shall operate or cause to be operated on private property any source of sound in such a manner as to create a sound level which exceeds the limits set forth for the receiving land use category in Table I when measured at or within the property boundary of the receiving land use.

**TABLE I. SOUND LEVELS BY RECEIVING LAND USE**

| Receiving Land Use Category                                             | Time                  | Sound Level Limit, dBA |
|-------------------------------------------------------------------------|-----------------------|------------------------|
| R-1, R-2, etc.                                                          | (A) a.m.—<br>(B) p.m. | L <sub>1</sub>         |
| (Residential), Public Space, Open Space, Agricultural or Institutional) | (B) p.m.—<br>(A) a.m. | L <sub>1</sub>         |
| C-1, C-2, etc.<br>B-1, B-2, etc.<br>(Commercial or Business)            | At All Times          | L <sub>1</sub>         |
| M-1, M-2, etc.<br>(Industrial)                                          | At All Times          | L <sub>1</sub>         |

**TABLE II MOTOR VEHICLE AND MOTORCYCLE SOUND LIMITS (MEASURED AT 50 FEET OR 15 METERS)**

| Vehicle Class                                                                               | Sound Level in dBA         |                         |                   |
|---------------------------------------------------------------------------------------------|----------------------------|-------------------------|-------------------|
|                                                                                             | Speed Limit 35 MPH or Less | Speed Limit Over 35 MPH | Stationary Run-up |
| Motor Carrier Vehicle engaged in interstate commerce of GVWR or GCWR of 10,000 lbs. or more | 86                         | 90                      | 88                |
| All other motor vehicles of GVWR or GCWR of 10,000 lbs. or more                             | A                          | B                       | —                 |
| Any motorcycle                                                                              | C                          | D                       | —                 |
| Any other motor vehicle or any combination of vehicles towed by any motor vehicle           | E                          | F                       | —                 |

**8.2 Correction for Character of Sound**  
For any source of sound which emits a pure tone or impulsive sound, the maximum sound level limits set forth in Section 8.1 shall be reduced by .....dBA.

**8.3 Exemptions**  
The provisions of this article shall not apply to:  
(a) Activities covered by the following Sections: 6.2.6 (Construction), 6.2.8 (Aircraft and Airport Operations), 6.2.10 (Explosives, Firearms, and Similar Devices), 6.2.13 (Stationary Nonemergency Signaling Devices), 6.2.14 (Emergency Signaling Devices), 6.2.15 (Motorboats), 6.2.17 (Domestic Power Tools), 9.1.3 (Refuse Collection Vehicles), 9.2 (Recreational Motorized Vehicles Operating Off Public Rights-Of-Way);  
(b) the unamplified human voice;  
(c) interstate railway locomotives and cars; and  
[(d) (non-stationary farming equipment)/(all agricultural activities)]

**ARTICLE IX Motor Vehicle Maximum Sound Levels**

**9.1 Motor Vehicles and Motorcycles on Public Rights-of-way**  
No person shall operate or cause to be operated a public or private motor vehicle or motorcycle on a public right-of-way at any time in such a manner that the sound level emitted by the motor vehicle or motorcycle exceeds the level set forth in Table II.

**9.1.1 Adequate Mufflers or Sound Dissipative Devices**  
(a) No person shall operate or cause to be operated any motor vehicle or motorcycle not equipped with a muffler or other sound dissipative device in good working order and in constant operation;  
(b) No person shall remove or render inoperative, or cause to be removed or rendered inoperative, other than for purposes of maintenance, repair, or replacement, any muffler or sound dissipative device on a motor vehicle or motorcycle;  
(c) The EPO/NCO may, by (guidelines) (regulations subject to approval by .....), list those acts which constitute violation of this section.

**9.1.2 Motor Vehicle Horns and Signaling Devices**  
The following acts and the causing thereof are declared to be in violation of this ordinance:  
(a) The sounding of any horn or other auditory signaling device on or

in any motor vehicle on any public right-of-way or public space, except (as a warning of danger)/(as provided in the vehicle code)

(b) The sounding of any horn or other auditory signaling device which produces a sound level in excess of ..... dBA at ..... feet (meters).]

#### 9.1.3 Refuse Collection Vehicles

No person shall:

(a) On or after (2 years) following the effective date of this ordinance, operate or permit the operation of the compacting mechanism of any motor vehicle which compacts refuse and which creates, during the compacting cycle, a sound level in excess of .... dBA when measured at ..... feet (meters) from any point on the vehicle; or

(b) Operate or permit the operation of the compacting mechanism of any motor vehicle which compacts refuse, between the hours of ..... p.m. and ..... a.m. the following day in a residential area or noise sensitive zone; or

(c) Collect refuse with a refuse collection vehicle between the hours of ..... p.m. and ..... a.m. the following day in a residential area or noise sensitive zone.

#### 9.1.4 Standing Motor Vehicles

No person shall operate or permit the operation of any motor vehicle with a gross vehicle weight rating (GVWR) in excess of ten thousand (10,000) pounds, or any auxiliary equipment attached to such a vehicle, for a period longer than ..... minutes in any hour while the vehicle is stationary, for reasons other than traffic congestion, on a public right-of-way or public space within 150 feet (46 meters) of a residential area or designated noise sensitive zone, between the hours of ..... p.m. and ..... a.m. the following day.

#### 9.2 Recreation Motorized Vehicles Operating Off Public Rights-of-way

(a) [Except as permitted in subsection (b) or (c).] no person shall operate or cause to be operated any recreational motorized vehicle off a public right-of-way in such a manner that the sound level emitted therefrom exceeds the limits set forth in Table III at a distance of 30 feet (15 meters) or more from the path of the vehicle when operated on a public space or at or across the boundary of private property when operated on private property. This section shall apply to all recreational motorized

vehicles, whether or not duly licensed and registered, including, but not limited to, commercial or non-commercial racing vehicles, motorcycles, go-carts, snowmobiles, amphibious craft, campers and dune buggies, but not including motorboats.

(b) Permits for motor vehicle racing events may be obtained from (appropriate authority) according to procedures and criteria set forth in .....

(c) Special variances for.....may be obtained from (appropriate authority) according to procedure and criteria set forth in .....

TABLE III.  
RECREATIONAL MOTORIZED  
VEHICLE SOUND LIMITS  
(MEASURED AT 30 FEET  
OR 15 METERS)

| Vehicle Type      | Sound Level, dBA |
|-------------------|------------------|
| Snowmobile        | A                |
| Motorcycle        | B                |
| Any Other Vehicle | C                |

#### ARTICLE X Land Use

##### 10.1 General Provisions

(a) No owner of any land shall commence or cause to be commenced construction of any structure covered by Sections 10.2, 10.3, 10.5 or 10.6 unless approved by the EPO/NCO as provided in this Article.

(b) Any application for approval required by this Article shall be submitted in writing to the EPO/NCO, with a copy to the (Buildings Department) (Appropriate Department), by the owner of the land on which the structure is proposed to be constructed and shall contain the following information:

- (1) identification of the land on which the construction is proposed;
- (2) the section of this Article under which approval is requested;
- (3) information and data supporting the claim that the appropriate requirements will be met; and,
- (4) any other information which the EPO/NCO may reasonably require.

##### 10.2 Construction Restrictions for Habitable and Institutional Structures

(a) Except as provided in subsection (c), no new single family residential structure shall be approved for construction (excluding substantial re-

pair or alteration) if the exterior day-night average sound level ( $L_{dn}$ ) anywhere on the site of the proposed structure is projected to be in excess of ..... dBA within ..... years following the estimated completion date of the structure.

(D) Except as provided in subsection (c), no new multiple-family residence, dormitory, mobile home park, transient lodging, school, hospital, nursing home or similar structure, or substantial modification of such existing structure, shall be approved for construction if the exterior day-night average sound level ( $L_{dn}$ ) anywhere on the site of the proposed structure is projected to be in excess of ..... dBA within ..... years following the estimated completion date of the structure or modification.

(c) Construction otherwise prohibited pursuant to subsections (a) or (b) shall be allowed if the exterior day-night average sound level ( $L_{dn}$ ) on the site of the proposed structure is projected not to be in excess of ..... dBA for ..... years following construction, provided that there is incorporated into the design and construction of the structure such sound attenuation measures as are necessary to reduce the maximum interior day-night average sound level ( $L_{in}$ ) to ..... dBA. Subsections (a) and (b) shall not apply to any site development plan or its equivalent on which four or fewer dwelling units are to be constructed.

(d) Prior to issuance of any occupancy permit for any structure regulated pursuant to subsection (c), the owner of the structure shall submit for EPO/NCO review the report of an independent testing agency [approved by the EPO/NCO] certifying that sound attenuation measures have been properly incorporated into the design and construction of the structure and that the interior  $L_{in}$  meets the criterion specified in subsection (c). Such report shall contain the results of simultaneous measurements of the exterior and interior day-night average sound levels for a representative sample of locations.

(e) The EPO/NCO may conduct such inspections and measurements as are necessary to ensure the accuracy of any report submitted pursuant to subsection (d) and to ascertain compliance with this section. These may include on-site inspections by a certified independent testing agency during specified periods of construction.

### 10.3 Recreational Area Restrictions

(a) Except as provided in subsections (b), (c), and (d) no land shall be designated or approved for construction or use as a public or private exterior recreational area, including, but not limited to, childrens' playgrounds, outdoor theaters and amphitheatres, picnic grounds, tennis courts and swimming pools, if the exterior day-night average sound level ( $L_{dn}$ ) anywhere on the site of the proposed recreational area is projected to be in the excess of ..... dBA within ..... years following the construction or designation of the site.

(b) This section shall not apply to the designation or approval of any green belt or open space in any area in which the  $L_{dn}$  exceeds the level specified in subsection (a) regardless of whether such green belt or open space is open to public use, provided that no recreational improvement or facility is constructed thereon.

(c) Designation or approval of exterior recreational areas otherwise prohibited under subsection (a) shall be allowed if the  $L_{dn}$  specified in that subsection can be achieved by appropriate means of sound attenuation, such as berms, barriers, or buildings, at the perimeter of or elsewhere on the site.

(d) No new interior recreational facility, including, but not limited to, gymnasiums, ice or roller skating rinks, indoor swimming pools, and tennis courts, shall be approved for construction if the exterior day-night average sound level anywhere on the site is projected to be in excess of ..... dBA within ..... years following the estimated date of completion of the structure unless there is incorporated into the design and construction of the structure such sound attenuation measures as are necessary to reduce the maximum interior day-night average sound level ( $L_{in}$ ) to ..... dBA.

### 10.4 Site Study Requirement

(a) If the EPO/NCO has reason to believe that a full report is necessary to determine whether a proposed project is prohibited under Section 10.1, such report shall be made by the applicant prior to approval of any subdivision, zoning, or building permit application. (If a full report has not been made and the applicant believes the project was wrongfully prohibited under Section 10.1, he may file a full report within ..... days of the EPO/NCO decision and re-

quest reconsideration by the EPO/NCO. A full report shall contain the following information and any other information which the EPO/NCO may reasonably require:

(1) the existing day-night average sound levels ( $L_{dn}$ ), including identification of the major sources of sound, for a representative sample of locations, measured in accordance with guidelines published by the EPO/NCO;

(2) any projected or proposed new or expanded sources of sound which may affect exposure of the site during ..... years following completion of the project and the projected future  $L_{dn}$  at the site resulting from these new or expanded sources; and,

(3) where applicable, plans for sound attenuation measures on the site and/or of the structure proposed to be built and the amount of sound attenuation anticipated as a result of these measures.

(b) In determining whether an applicant should be required to submit a full report pursuant to subsection (a), the EPO/NCO shall consider Circular 1390.2 (Noise Abatement and Control) and other publications of the U.S. Department of Housing and Urban Development.

#### 10.5 Commercial and Industrial Construction

No new or substantially modified structure on land used or zoned as commercial or industrial shall be approved for construction unless the owner or developer of such land has demonstrated, in accordance with guidelines published by the EPO/NCO that the completed structure and the activities associated with and on the same property as the structure, will comply with the provisions of Article VIII at the time for initial full-scale operation of such activities.

#### 10.6 Sound From New Transportation Systems in Residential Areas or Noise Sensitive Zones

No plans for construction of new transportation systems or expansion of the capacity of existing transportation systems will be approved for location in or near residential areas or noise sensitive zones, regardless of the source of project funds, unless such plan includes all control measures necessary to ensure that the projected day-night average sound level ( $L_{dn}$ ) due to the operation of the transportation system does not exceed ..... dBA at any point on

residential property within ..... years after the expected completion of the project.

#### 10.7 Equivalent Measurement Systems

For the purposes of this Article, all measurements and designations of sound levels shall be expressed in day-night average sound levels ( $L_{dn}$ ) or in any other equivalent measurement system the EPO/NCO may reasonably approve.

#### 10.8 Zoning Ordinance or Comprehensive Plan

(a) No proposed zoning ordinance or comprehensive plan shall be approved unless such plan includes a sound analysis which (1) identifies existing and projected noise sources and associated sound levels for ..... years in and around the area under consideration, and (2) ensures usage of adequate measures to avoid violation of any provision of this ordinance.

(b) No zoning change application shall be approved unless the site feasibility study submitted, as required by the (Zoning Board of Appeals)/ (Planning Commission), contains an analysis which shows (1) the impact of existing and projected noise sources for ..... years on the intended use, and (2) the projected noise impact of the intended use, when completed, on surrounding areas. Such sites study shall ensure the use of adequate measures to avoid violation of any provision of this ordinance.

#### 10.9 Truth in Selling or Renting

No person shall sell or rent, or cause to be sold or rented, any structure or property to be used for human habitation, where the structure or property is exposed to sound levels regularly in excess of (an  $L_{dn}$  in any hour of ..... dBA)/(an  $L_{dn}$  of ..... dBA), without making full written disclosure to all potential buyers or renters of the existence of such sound levels and of the nature of the sources. The EPO/NCO shall develop a standard format for written disclosures, which shall include information on the effects of noise on human health and welfare.

#### 10.10 Appeals

Any applicant may appeal an adverse decision by the EPO/NCO under this Article, in the (appropriate court of law), on the grounds that the EPO/NCO disapproval was arbitrary, capricious, or unreasonable.

**ARTICLE XI Enforcement**

**11.1 Penalties**

(a) Any person who violates any provision of this ordinance shall be fined for each offense not more than ..... dollars.

(b) Any person who willfully or knowingly violates any provision of this ordinance shall be fined for each offense a sum of not less than .... dollars and not more than .... dollars.

(c) Each day of violation of any provision of this ordinance shall constitute a separate offense.

**11.2 Abatement Orders**

(a) Except as provided in subsection (b), in lieu of issuing a notice of violation as provided for in Section 11.3, the EPO/NCO or other (agency/official) responsible for enforcement of any provision of this ordinance may issue an order requiring abatement of any source of sound or vibration alleged to be in violation of this ordinance within a reasonable time period and according to guidelines [to be approved by appropriate authority] which the EPO/NCO may prescribe.

(b) An abatement order shall not be issued: (1) for any violation covered by Section 11.1 (b); (2) for any violation of .....; or, (3) when the EPO/NCO or other enforcement (agency) / (official) has reason to believe that there will not be compliance with the abatement order.]

**11.3 Notice of Violation**

[Except where a person is acting in good faith to comply with an abatement order issued pursuant to Section 11.2 (a)], violation of any provision of this ordinance shall be cause for a (notice of violation)/(summons)/(complaint)/(information or indictment) to be issued by the EPO/NCO or other responsible enforcement (agency official) according to procedures (which the EPO/NCO may prescribe)/(set forth in .....).

**11.4 Immediate Threats to Health and Welfare**

(a) The EPO/NCO shall order an immediate halt to any sound which exposes any person, except those excluded pursuant to subsection (b), to continuous sound levels in excess of those shown in Table IV or to impulsive sound levels in excess of those shown in Table V. Within ..... days following issuance of

such an order, the EPO/NCO shall apply to the appropriate court for an injunction to replace the order

(b) No order pursuant to subsection (a) shall be issued if the only persons exposed to sound levels in excess of those listed in Tables IV and V are exposed as a result of (1) trespass; (2) invitation upon private property by the person causing or permitting the sound; (3) employment by the person or a contractor of the person causing or permitting the sound.

(c) Any person subject to an order issued pursuant to subsection (a) shall comply with such order until (1) the sound is brought into compliance with the order, as determined by the EPO/NCO; or (2) a judicial order has superseded the EPO/NCO order

(d) Any person who violates an order issued pursuant to this section shall, for each day of violation, be fined not less than ..... dollars nor more than ..... dollars

**TABLE IV  
CONTINUOUS SOUND LEVELS  
WHICH POSE AN IMMEDIATE  
THREAT TO HEALTH AND  
WELFARE**

(Measured at 50 Feet or 15 Meters)\*

| Sound Level<br>Limit--(dBA) | Duration   |
|-----------------------------|------------|
| 90                          | 24 hours   |
| 93                          | 12 hours   |
| 96                          | 6 hours    |
| 99                          | 3 hours    |
| 102                         | 1.5 hours  |
| 105                         | 45 minutes |
| 108                         | 22 minutes |

\* Use equal energy time-intensity trade-off if level varies; and energy equivalent over 24 hours

**TABLE V  
IMPULSIVE SOUND LEVELS WHICH  
POSE AN IMMEDIATE THREAT TO  
HEALTH AND WELFARE**

(Measured at 50 Feet or 15 Meters)

| Sound Level<br>Limit (dB) | Number of<br>Repetitions per<br>24 Hour Period |
|---------------------------|------------------------------------------------|
| 145                       | 1                                              |
| 135                       | 10                                             |
| 125                       | 100                                            |

11.5 Citizen Suits

(a) Any person, other than persons responsible for enforcement of this ordinance, may commence a civil action on his own behalf (1) against any person who is alleged to be in violation of any provision of this ordinance set forth in Table VI below or (2) against the EPO/NCO where there is alleged a failure of the EPO/NCO to perform any act

under this ordinance which is not discretionary. The ..... court shall have jurisdiction, without regard to the amount in controversy, to grant such relief as it deems necessary.

(b) No action may be commenced (1) under subsection (a)(1)

(A) prior to ..... days after the plaintiff has given notice of the alleged violation to the EPO/NCO [and to the alleged violator] of such violation, or

(B) if the EPO/NCO has commenced and is diligently prosecuting an action against the alleged violator with respect to such violation, [but in such action any affected person may intervene as a matter of right], or

(2) under subsection (a)(2), prior to ..... days after the plaintiff has given notice to the EPO/NCO that he will commence such action. Notice under this subsection shall be given in a manner prescribed by the EPO/NCO.

(c) In any action under this section, the EPO/NCO, if not a party, may intervene as a matter of right.

(d) The court, in issuing any final order in any action brought pursuant to subsection (a), may at its discretion award the costs of litigation to any party.

TABLE VI  
Provisions Under Which Civil Actions  
May Be Commenced

- 6.2.1(a) (Radios, Television Sets, Musical Instruments and Similar Devices)
- 6.2.2 (Loudspeakers/Public Address Systems)
- 6.2.3 (Street Sales)
- 6.2.5 (Loading and Unloading)
- 6.2.6 (Construction)
- 6.2.7 (Vehicle or Motorboat Repairs and Testing)
- 6.2.9 (Places of Public Entertainment)
- 6.2.10 (Explosives, Firearms, and Similar Devices)
- 6.2.11 (Powered Model Vehicles)
- 6.2.12 (Vibration)
- [6.2.13] (Stationary, Non-Emergency Signaling Devices)
- 6.2.14 (Emergency Signaling Devices)
- 6.2.15 (Motorboats)
- 6.2.17 (Domestic Power Tools)
- 6.2.18 (Tampering)
- 8.1 (Maximum Permissible Sound Levels by Receiving Land Use)
- 9.1.3 (Refuse Collection Vehicles)
- 9.1.4 (Standing Motor Vehicles)
- 9.2(b) (Motor Vehicle Racing Events)
- 9.2.1(b) (Motor Vehicle Horns and Signaling Devices)
- 10.9 (Truth in Selling or Renting)

11.6 Other Remedies

No provision of this ordinance shall be construed to impair any common law or statutory cause of action, or legal remedy therefrom, of any person for injury or damage arising from any violation of this ordinance or from other law.

11.7 Severability

If any provision of this ordinance is held to be unconstitutional or otherwise invalid by any court of competent jurisdiction, the remaining provisions of the ordinance shall not be invalidated.

11.8 Effective Date

This law/ordinance shall take the effect on .....