III

A-96-01
II-A-1093

DOCKET ANALYSIS

80 dB NOISE EMISSION STANDARD FOR
NEWLY MANUFACTURED MEDIUM AND HEAVY TRUCKS

DOCKET 81-02

File: NOISE FRL-1931-2 Recd 2/22/82 PIRU

TABLE OF CONTENTS

E. Miscellaneous Issues

1. Other Vehicle Noise
2. Alternative Strategies for Reducing Community Noise Level
3. Time Allowed for Comment on Deferral Notice
4. Carrier-Mounted Hydraulic Cranes
5. Trucks as a Major Source of Noise
6. Tire Noise Contribution to Noise Impacts
7. Compliance Management

F. Issues Concerning Truck-Mounted Solid Waste Compactor Regulation

1. Validity of Regulation
2. Deferral or Rescission of Regulation
3. Data Base on Chassis Noise

I. INTRODUCTION

On January 27, 1981, the Environmental Protection Agency (EPA) announced that the 80 decibel (dB) noise emission standard for newly manufactured medium and heavy trucks was being deferred from January 1, 1982 to January 1, 1983 in order to provide economic relief to the truck industry. In the Federal Register notice for this deferral (46 FR 8497), the Agency invited public comment as to whether the one year deferral was too long or too short. On March 19, 1981 (46 FR 17558), the Agency expanded the scope of requested comment to include whether or not the 80 dB standard should be rescinded. The formal public comment period for both of these requests closed on April 24, 1981. This docket analysis represents the Agency's formal review, analysis, and response to those comments received from the public on the 80 dB noise emission standard. A list of specific contributors is provided in Section II of this document. For reference purposes, each contributor has been given an identification number.

Section III provides a summary of the issues raised in the comments raised by the public, State and local governments and industry, and the Agency's response to these issues. The issues have been grouped into the following general categories: Statutory Authority and Preemption, Noise Control Technology, Public Health and Welfare Benefits, Cost and Economic Impact, Miscellaneous Issues, and Issues Concerning the Trash Compactor Regulation. Comments received in each category in Section III are cross-referenced with the contributors listed in Section II.

Only submissions made to EPA during the formal docket period are specifically identified in this analysis. However, submissions to EPA concerning the 80 dB standard that were received after the closing date of the public comment period have also received full consideration by the Agency in its responses to the issues, but are not formally identified as submissions to the docket.

II. LIST OF CONTRIBUTORS

Category Index Code

A. Statutory Authority and Preemption

B. Noise Control Technology/Noise Measurement Methodologies

C. Public Health and Welfare Benefits

D. Miscellaneous Issues

E. Issues Concerning Truck-Mounted Solid Waste Compactor Regulation

Contributors

(1) American Trucking Association, Inc.
1616 P Street, NW
Washington, D.C. 20036

Comments: B-2, D-1, D-3, D-5, D-11, D-12, D-13, D-14

(2) Motor Vehicle Manufacturers Association
1909 K Street, NW
Suite 300
Washington, D.C. 20006

Comments: A-2, C-1, D-2

(3) David Coleman
Overdrive Magazine
(Information Request for Status of 80 dB standard)

(4) Chrysler Corporation
PO Box 1919
Detroit, Michigan 48288
(Acknowledgement of Notification of One-Year Deferral)

(5) Office of the Governor
State of New York
Executive Chambers
Albany, New York 12224
(Acknowledgement of Notification of One-Year Deferral)

(6) Freightliner Corporation
4747 North Channel Avenue
Portland, Oregon 97208

Comments: C-1, C-2, C-4, C-5, D-1, D-5, D-6, D-7, D-8, D-12, E-5, E-6

(7) Memorandum from Mike Walsh to Charles E. Elkins
(Concerning International Harvester on Regulatory Relief)

Comments: C-1, C-2, D-2, D-4, D-8

(8) State of California
Department of Transportation
Sacramento, California 95814

Comments: D-5, E-5

(9) Cover Letter from Henry E. Thomas and March 9, 1981 Federal Register notice expanding the scope of the original Federal Register notice.

(10) Letter to Freightliner Corporation from Charles E. Elkins

Comments: D-3

(11) Mr. Galligan
Commercial Car Journal
(Information Request for Status of 80 dB Standard)

(12) Letter to Motor Vehicle Manufacturers Association from Charles. E. Elkins

(13) Louis F. Cohn
Associate Professor of Civil Engineering
Vanderbilt University
Nashville, Tennessee 37235

Comments: C-1, D-2, D-5, D-8, D-11, D-12, E-5

(14) City of Des Plaines
Environmental Control
1420 Miner Street
Des Plaines, Illinois 60016

Comments: D-5

(15) Eaton Corporation
100 Erieview Plaza
Cleveland, Ohio 44114

Comments: D-5

(16) General Motors Corporation
Environmental Activities Staff
General Motors Technical Center
Warren, Michigan 48090

Comments: D-2, D-3, D-5, D-11, D-12, D-13

(17) Paccar Incorporated
PO Box 1518
Bellevue, Washington 98009

Comments: A-1, A-2, C-3, C-6, D-1, D-2, D-3, D-5, D-8, D-11, E-1, E-2, E-6

(18) IVECO - Trucks of North America, Inc.
1730 Walton Road
PO Box 1102
Blue Bell, Pennsylvania 19422

Comments: A-2, D-2, D-5

(19) DuPage County
DuPage Center
421 North County Farm Road
Wheaton, Illinois 60187

Comments: C-1, E-5

(20) Department of Health Services
State of California
714/744 P Street
Sacramento, California 95814

Comments: E-5

(21) Department of Environmental Quality
State of Oregon
522 SW 5th Avenue
PO Box 1760
Portland, Oregon 97207

Comments: A-2, C-1, D-5, E-2, E-5, F-2

(22) Department of Natural Resources and
Environmental Control
State of Delaware
Edward Tatnell Building
PO Box 1401
Dover, Delaware 19901

Comments: A-2, E-5

(23) National Automobile Dealers Association
8400 Westpark Drive
McLean, Virginia 22101

Comments: D-4, D-5, E-2, F-2

(24) Department of Environmental Protection
State of Connecticut
State Office Building
Hartford, Connecticut 06115

Comments: A-2

(25) Motor Vehicle Manufacturers Association
1909 K Street NW
Washington, D.C. 20006

Comments: A-2, C-1, C-2, C-3, D-1, D-4, D-5, D-6, D-8
D-9, D-11, E-2, E-6

(26) International Harvester
2911 Meyer Road
Fort Wayne, Indiana 46803

Comments: C-1, C-2, C-3, D-1, D-3, D-4, D-5, D-6, D-8,
D-10, D-12, D-13, E-6

(27) Environmental Protection Agency
State of Ohio
PO Box 1049
361 East Broad Street
Columbus, Ohio 43216

Comments: D-5

(28) Ford Motor Company
The American Road
Dearborn, Michigan 40121

Comments: C-2, D-1, D-2, D-4, D-5, D-11

(29) Donaldson Company, Inc.
1400 West 94th Street
Minneapolis, Minnesota 55440

Comments: C-1, D-2, D-5, D-12

(30) KHD Deutz
4660 Hickmore
Montreal, Quebec

Comments: D-8

(31) National Solid Wastes Management Association
(NSWMA)
1120 Connecticut Avenue, NW
Suite 930
Washington, D.C. 20036

Comments: D-1, D-5, D-12, F-1, F-3

(32) Chrysler Corporation
PO Box 1919
Detroit, Michigan 48288

Comments: C-1, D-1, D-5

(33) Grove Manufacturing Company
PO Box 21
Shady Grove, Pennsylvania 17256

Comments: D-1, E-4

(34) American Trucking Association, Inc.
1616 P Street, NW
Washington, D.C. 20036

Comments: D-11

(35) Alexander-Tagg Industries, Inc.
395 Jacksonville Road
Warminster, Pennsylvania 18971

Comments: A-4, B-1, D-1

(36) National Association of Noise Control Officials
PO Box 2618
Fort Walton Beach, Florida 32549

Comments: A-3, C-1, D-8, D-12

(37) Oshkosh Truck Corporation
PO Box 2566
Oshkosh, Wisconsin 54903

Comments: C-2, D-1, D-4, D-5, D-12, F-3

(38) Mack Trucks, Inc.
PO Box 1761
Allentown, Pennsylvania 18105

Comments: D-4, D-5, E-7

(39) The Heil Company
PO Box 8676
Chattanooga, Tennessee 37411

Comments: D-1, F-2

(40) Jesse O. Borthwick
343 Marie Circle
Fort Walton Beach, Florida 32548

Comments: A-2, A-3, D-5, E-3

(41) Akron Community Service Center
470 Wooster Avenue
Akron, Ohio 44307

Comments: C-1

(42) Stephen E. Saunders
1335 Grant Avenue
White Plains, New York 10604

Comments: D-1, D-5

III. COMMENTS AND RESPONSES

A. Statutory Authority and Preemption

Issue 1: Scope of Authority

One truck manufacturer (17) contended that the Environmental Protection Agency (EPA) is operating beyond the scope of authority granted to it by the Noise Control Act because a nationally uniform truck standard is not necessary to achieve further reductions in overall community noise levels.

Response:

The Agency does not agree that its actions are beyond the scope of its authority under the Noise Control Act. There are two key aspects to Federal regulation of a major source of noise under the Act; one is the establishment of a uniform national standard (based on preemption of non-identical State and local standards) in order to protect industry from having to meet diverse standards in different localities; the other is the requirement that the noise standard set by the regulation be at a level requisite to protect the public health and welfare taking into account usage of the products, cost of compliance, and best available technology.

The Agency recognizes that there are approaches other than regulation of source noise levels that can, in principle, be used to reduce community noise levels due to trucks, which are the primary source of traffic noise. Construction of highway noise barriers and sound insulation of dwellings are well-known examples. As detailed later (see Response to Issue 8 under Cost and Economic Impact) these approaches have been studied by EPA and have been found to be considerably less cost-effective than the 80 dB regulation nor are they as widely applicable in reducing impacts from traffic noise.

(43) League of Minnesota Cities
480 Cedar Street
St. Paul, Minnesota 55101

Comments: A-2, A-3, C-1

(44) American Trucking Association Inc.
1616 P Street, N.W.
Washington, D.C. 20036

Comments: B-2, D-5, D-11, D-13, D-14, D-15

(45) FWD Corporation
Clintonville, Wisconsin 34929

Comments: D-15

(46) Dempster Systems
P.O. Box 3127
Knoxville, Tennessee 39947

Comments: D-1

(47) Freightliner Corporation
4747 North Channel Avenue
Portland, Oregon 97217

Comments: D-2, D-3, D-5, D-12, E-5, E-6

(48) Department of Transportation
State of California
N Street
Sacramento, California 95614

Comments: D-5, E-5

(49) National Automobile Dealers Association
8400 Westpark Drive
McLean, Virginia 22102
(NADA Submittal of Data)

(50) Freightliner Corporation
4747 North Channel Avenue
Portland, Oregon 97217

Comments: D-2

(51) International Harvester
2911 Meyer Road
Fort Wayne, Indiana 46801

Comments: D-2

(52) Eaton Corporation
P.O. Box 4013
Kalamazoo, Michigan 49003

Comments: D-3

Further, the existing Federal noise regulations, which include both the (in-use) Interstate Motor Carrier regulation and the (new-product) truck noise regulation, preempt any differing standards set by State and local governments. Consequently, reduced regulatory impacts on the trucking industry are achieved only by Federal regulation.

Noise control technology is readily available to achieve an 80 decibel standard, and such a standard would provide a 44% increase in benefits relative to the current 83-decibel standard at 41% of its cost. (See responses to Issues C-2, D-2 and D-5 for details). In the light of the above factors, the Agency is required to set an 80-decibel standard.

Issue 2: Preemption

Six submittals, two from manufacturers (18, 29), two from State governments (22, 24) and two from a trade association (2, 25), commented in favor of Federal preemption. Four commenters, one manufacturer (17), one State government (21), one association of municipal governments (43), and one environmental group (40), expressed opposition to preemption. Those in favor supported the avoidance of confusion due to different State and local noise standards and the contention that a uniform national standard made a positive contribution to lowering environmental noise. Those opposed felt that Federal preemption prevents States from setting desired lower noise limits and from effectively controlling truck noise.

Response:

Since the Agency promulgated the truck noise regulation under the authority of the Noise Control Act, as discussed under Issue 1, above, preemption is both appropriate and required under the Act.

Issue 3: Effect of closing the EPA's Office of Noise Abatement on Regulations Four commenters - one State (24) and three associations of noise control professionals (36, 40, and 43) - commented that if the Office of Noise Abatement and Control (ONAC) were to close, then the truck noise regulation should be rescinded or the preemption provision revoked; otherwise progress toward the reduction of noise would be hampered.

Response:

The ultimate fate of ONAC and the Federal noise regulations is subject to the decisions of Congress. At present, the Congress is considering revisions to the Noise Control Act that would retain the truck noise regulation. In the latter event, the 80 dB standard, representing progress in noise reduction, would become effective in 1986 in accordance with the notice published most recently in the Federal Register.

Issue 4: The Department of Transportation as a Truck Noise Regulator

An industrial firm (35) commented that the Department of Transportation is a more logical choice than EPA as a single-source regulator (at the Federal level) of truck noise, and that enforcement at the user level is beyond the practical scope of the present regulation.

Response:

With respect to the question of a single-source regulator of truck noise, the Noise Control Act manifests the clear intent of Congress that the Environmental Protection Agency was to be the single-source noise regulator for all products distributed in commerce (as defined in Section 2(a)(3) of the Act).

As regards enforcement at the user level, the truck noise regulation does not provide for such enforcement by the Federal government; enforcement of Federal noise regulations for new products under Section 6 of the Act is at the manufacturer level. Under Section 18 of the Act, the Agency has promulgated the noise regulation for Interstate Motor Carriers, which is an in-use regulation and is enforced by the Department of Transportation's Bureau of Motor Carrier Safety.

B. Noise Control Technology/Noise Measurement Methodology

Issue 1: Consistency of Test Results

One industrial firm (35) commented that the EPA test procedure produces inconsistent results and is therefore a poor basis for noise abatement decisions.

Response:

This contention is not in agreement with Agency findings. The test method employed is basically the SAE J366b which has been slightly modified and fine-tuned to take into account recommendations by manufacturers and the National Bureau of Standards. Data available to the Agency showed that the standard deviation of emission levels obtained from 30 nominally identical

trucks measured at the same site with the same equipment was approximately 0.5 decibel. This was judged by the Agency to be an acceptable level of consistency.

The outdoor test procedure required by the truck regulation was developed through the voluntary standards process in which industry groups participated, and it is a uniform procedure used by industry. To the extent practical, the Agency endeavors to incorporate in its regulations, existing test methods that were developed by voluntary standards groups that include manufacturers. However, the test method must produce a measure of noise emissions that can be related to community noise exposures. The test method employed in the truck regulation was developed by the Society of Automotive Engineers (SAE) and provides a measurement of noise emission levels that correlates with the noise produced by trucks during operations in communities. It is a simple test that yields reproducible results. On the basis of these features, the Agency adopted this test method.

While the costs associated with this test method are felt to be reasonable, the Agency is unaware of any alternate, less costly procedures that are simple and reliable, and produce results that correlate well with measures of truck noise environmental impact. EPA is aware that the Motor Vehicle Manufacturers Association (MVMA) has been developing an indoor test method. The factors of simplicity, reproducibility, correlation, and costs are unknown at this time by EPA. Should MVMA wish to submit the indoor test method to EPA as an alternate to the current SAE J366b test method, the

Agency would review the new procedure on its merits against the criteria mentioned above. If the method proved to be suitable, the Agency would then authorize it as an alternative to the SAE J366b procedure.

Issue 2: Effects of Delay on Cost of Testing

A trade association in two submittals (01 and 44) commented that delaying the implementation of the 80 dB standard would decrease the cost of testing because a less costly all weather indoor testing procedure will be available.

Response:

The fact that EPA has deferred the effective date of the 80 dB regulation will allow additional time to develop potential alternate test methods. However, there is no assurance that a "less costly all weather" indoor testing procedure will be available in time for the new 1986 effective date (see Response to previous issue). Until there is general agreement on a practical and economical indoor testing procedure that is equivalent in results to the existing drive-by procedure, the latter will continue to be the required test method.

C. Public Health and Welfare Benefits

Issue 1: Definition of Health Problem

Three manufacturers (06, 07, 26 and 32), and a trade association (02 and 25) commented with respect to public health and welfare benefits. Their position is that there is no conclusive evidence that the 80 dB standard provides any health and welfare benefits other than relief from annoyance and that annoyance is not a health problem.

Conversely, in support of the 80 dB standard, seven commenters representing professional organizations in the environmental area, municipal local government representatives, a State government and one manufacturer (13, 19, 21, 29, 36, 41, 43) assert that the 80 dB regulation provides needed health and welfare benefits.

Response:

EPA has adopted the World Health Organization definition of "health," and has outlined its views in several publications, notably the report entitled "Information on Levels of Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety" (EPA 550/9-74-009, commonly referred to as the "levels document"). EPA's view is that the phrase "health and welfare" means complete physical, mental and social well-being and not merely the absence of disease and infirmity. EPA does not expect that noise regulations will or can bring about "complete well-being" for all; the objective of such regulations is to help reduce, within the limitations of technology and available resources, those noise exposures of the public which tend to degrade the public health and welfare.

The available data have demonstrated that the most widely recognized clinical health and welfare effect caused by noise is impairment of the ability to hear. However, the phrase "health and welfare" also includes personal comfort and well-being and the absence of mental anguish and annoyance. As pointed out in the Levels Document, noise can interfere with social activities such as conversation, classroom learning, and

radio and TV listening. It can also cause sleep disruption. Noise also is widely recognized as causing stress which may lead to clinical cardiovascular symptoms. The medium and heavy truck noise emission regulation is intended to provide benefits beyond that of reducing annoyance. Annoyance to a great extent simply reflects the reality of the many perceived adverse effects of noise.

Issue 2: Level of Health and Welfare Benefits

Four manufacturers and a trade association (06, 07, 25, 26, 28 and 37) comment that the health and welfare benefits from the 80 dB standard as compared to the 83 dB are marginal and have been overstated by EPA.

Response:

The Agency has developed a comprehensive computer model to augment the original assessment procedures employed during development of the regulation. The Agency has carefully reviewed its analysis of health and welfare benefits in the light of the most recent available data. The results show that the benefits of the 80 dB regulation are stated properly and are not overstated. Indeed, the original estimate of the benefits understates the benefits now expected.

Through the use of the computer model, which permits assessment of traffic noise impacts by considering the nation's roadway system and attendant population distribution, the Agency estimates that in the absence of any regulations or controls, in excess of 95 million persons would currently be exposed to levels of noise from traffic that can jeopardize their health and welfare; and by the year 2000, in excess of 157 million would be so exposed.

In order to quantitatively assess the potentially adverse impact of truck noise and the effectiveness of possible noise emission regulations, the EPA employs the Level-Weighted Population (LWP) descriptor as a measure of noise impacts. LWP expresses in a single number both the extent and severity of noise impact. The extent of impact refers to the number of people who are adversely affected, while the severity represents the degree to which each person is affected. Therefore, LWP provides a simple method to compare benefits of different noise reduction options. This method is recommended by the National Academy of Sciences for use in noise impact assessments.

In 1973, pursuant to a directive from Congress and based on a large body of evidence, the EPA determined that a day-night sound level (L_{dn}) value of 55 dB represents the lower threshold of noise that can jeopardize the health and welfare of people. Above this level, noise may be a cause of adverse physiological and psychological effects. These effects also often result in personal annoyance and community reaction. Above an L_{dn} value of 75 dB, noise can cause hearing loss. Although studies indicate a link between noise and cardiovascular disease, research has not yet reached the point where we can determine a quantitative dose-response relationship, i.e., what cardiovascular effects occur at what levels of noise. Consequently, these effects are not considered in this analysis.

Computation of the LWP is based on combining the number of people exposed to noise levels above L_{dn} of 55 dB with the degree of impact at

different noise levels. For day-night sound levels below 55 dB, it is assumed that no adverse impact occurs. "Full" impact is assumed to occur at a 75 dB day-night sound level. Figure 1 is a pictorial representation of the LWP principle. The circle represents a source which emits noise to a populated area represented by the figures. The partial shading represents degrees of partial impact from the noise source. Those people closest to the noise source are more severely impacted than those at greater distances. The partial impacts are then summed to give the equivalent population that is fully impacted by noise. In this example, six real people are adversely affected, to varying degrees (partially shaded) by the noise. The sum of these partial impacts is equated to a Level-Weighted Population that is represented by the two totally shaded figures.

The potentially adverse impacts of surface transportation noise and the potential benefits from noise emission regulations are assessed through the use of the computer model mentioned earlier. The model allows the determination of noise impacts (in terms of LWP) by vehicle type (i.e., automobiles, medium and heavy trucks, buses, and motorcycles), as a function of time, taking into account the location of people in the vicinity of these roads, and the anticipated growth in both the nation's population and new vehicle sales. Computations based on this model enable us to determine the potential reductions in LWP (the benefits) for selected regulatory options.

In the absence of noise emission regulations to control surface transportation noise, the number of people exposed to day-night sound levels above L_{dn} of 55 dB (the level above which people are adversely affected

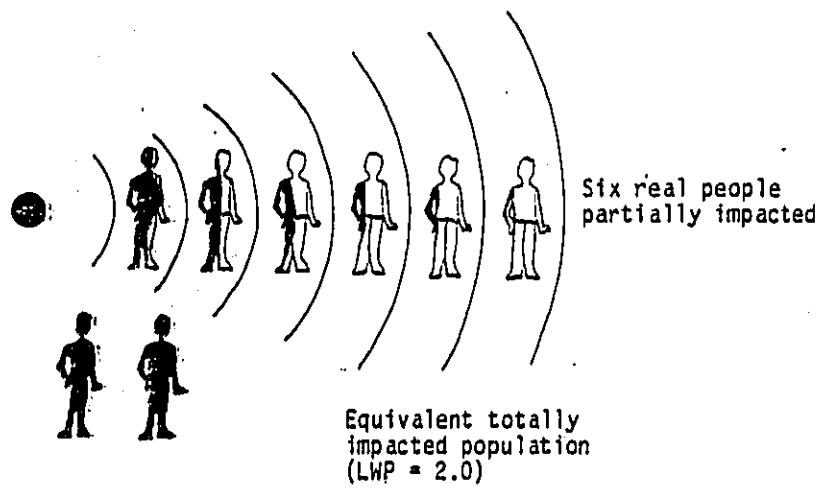


Figure 1. LEVEL-WEIGHTED POPULATION: A METHOD TO ACCOUNT FOR THE EXTENT AND SEVERITY OF NOISE IMPACT

by noise) is expected to grow dramatically with time. By the year 2000, the nation's population is anticipated to increase by 22.5%. Because of the concurrent expected growth in traffic, the population exposed to levels in excess of 55 dB would be expected to increase by 65% over those similarly exposed in 1980; the corresponding increase in LWP would be 73.1%. Thus, without controls on the noise emission of vehicles or an increased application of noise attenuating devices i.e., highway noise barriers and improved noise insulation of personal dwellings, it is clearly evident that the surface transportation noise impact would continually worsen.

Within the fleet of vehicles operating on the nation's roadways, medium and heavy trucks (trucks over 10,000 lbs. Gross Vehicle Weight Rating, GVWR) constitute the primary source of traffic noise. Today, noise from trucks account for approximately 73% of those people exposed to day-night sound levels above 55 dB. The large contribution that trucks make to the national noise impact results from their high noise emissions compared to those of other vehicles. For example, Federal Highway Administration data show that under cruising conditions a medium truck is equivalent in noise intensity to approximately 10 automobiles while a heavy truck is equivalent to roughly 32 automobiles. Under low speed acceleration conditions, a medium truck can be equivalent in noise intensity to 35 automobiles, while a heavy truck can be equivalent to 200 automobiles.

To control the growth of the surface transportation noise problem, the Agency, in 1975, promulgated a two-phase noise emission regulation for medium and heavy trucks. The first phase limited truck noise emis-

TABLE Ia AND Ib
BENEFITS OF THE 83 AND 80 dB
TRUCK NOISE EMISSION REGULATIONS

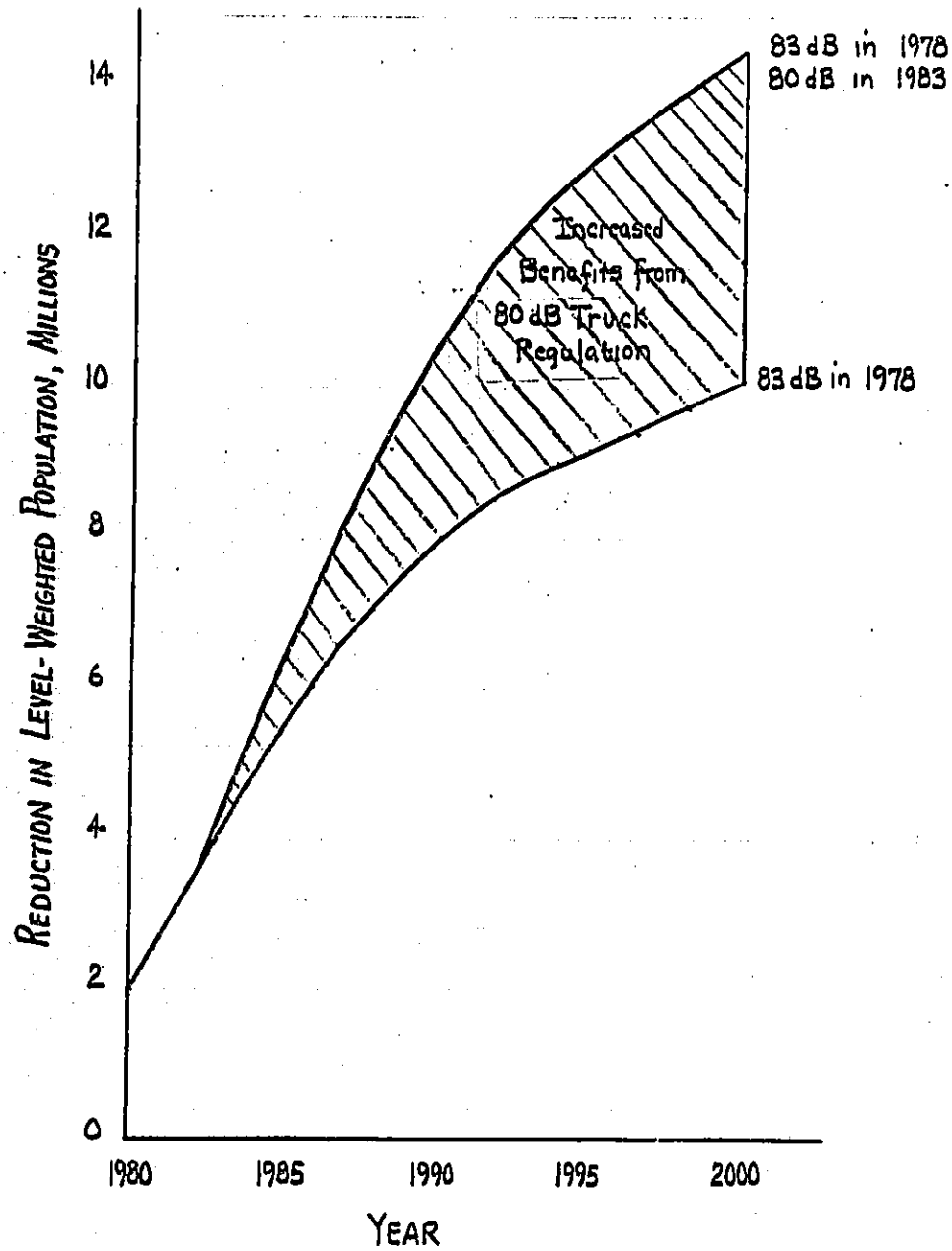
Ia. Population Exposed to L_{dn} > 55 dB

Regulation	Population Exposed L_{dn} > 55, Millions in year 2000	Reduction in Population Exposed, Millions from No Regulation	% Reduction	Incremental % Reduction in Population Exposed
Unregulated	157.48	-	-	-
83 dB	135.93	21.55	13.7%	-
80 dB	126.68	30.80	19.6%	42.9%

Ib. Level-Weighted Population

Regulation	LWP, Millions in year 2000	Reduction in LWP, Millions	% Reduction from no regulation	Incremental % Reduction in LWP
Unregulated	52.76	-	-	-
83 dB	42.76	10.04	19.0%	-
80 dB	38.37	14.43	27.3%	43.7%

FIGURE 2. COMPARISON OF THE BENEFITS, MEASURED IN TERMS OF REDUCTION IN THE LEVEL-WEIGHTED POPULATION FOR THE 83 AND 80 dB TRUCK NOISE EMISSION REGULATIONS



sions to 83 dB and became effective January 1, 1978. The second phase, originally scheduled to become effective January 1, 1982 but recently deferred to January 1, 1983, (and now deferred to January 1, 1986) limits truck noise emissions to 80 dB. Because decibels are logarithmic in nature, a seemingly small decrease of 3 dB actually is equivalent to a halving of the total intensity from the noise source.

In the year 2000, EPA estimates that 157.5 million people would have been exposed to day-night average sound levels (L_{dn}) above 55 decibels in the absence of a regulation. The 83 dB regulation is expected to reduce the number of people so impacted by 21.6 million, to 135.9 million, a reduction of 13.7%. With an 80 dB regulation in place, the number of people exposed to L_{dn} above 55 is estimated to be 126 million, a reduction of an additional 9.3 million impacted people, or 43% improvement in reduction obtained with the 83 dB standard. These results are summarized in Table Ia.

In terms of Level-Weighted Population, the baseline LWP in 2000 in the absence of a regulation is estimated to be 52 million. The 83 dB regulation is expected to reduce the LWP in 2000 by 10.0 million, a reduction of 19.0%. With an 80 dB standard, the Level-Weighted Population is expected to decrease an additional 4.4 million, or 43.7% as much reduction in LWP as the 83 dB regulation provides; see Table Ib.

Figure 2 shows how the effectiveness of the truck noise regulation will increase with time. The area between the 83/80 dB and 83 dB benefit curves represents the marginal or incremental benefits that would accrue from the 80 dB regulation.

In the light of the foregoing results of our analysis, EPA believes that the health and welfare benefits of the 80 dB standard have been evaluated properly.

Issue 3: Safe Minimum Noise Levels

Two manufacturers and a trade association (17, 25, 26) commented that the considerable difference of opinion regarding safe maximum noise levels does not support EPA's chosen maximum limit.

Response:

These commenters based their objections mainly on the maximum allowable daily noise dose of 90 decibels for eight hours of industrial exposure prescribed by the Occupational Safety and Health Administration (OSHA). The Agency has developed position on the basis of a substantial amount of data available in the technical literature and obtained in the Agency's own studies. There is a clear distinction between the requirements set by OSHA and the criteria established by EPA. The OSHA limit of 90 decibels is aimed at preventing excessive hearing loss due to occupational noise exposure, while at the same time not imposing an onerous economic burden on industry in reducing noise in the workplace. EPA, on the other hand, has the mission under the Noise Control Act, to protect the public health and welfare from environmental noise in general. EPA's approach to this responsibility is detailed in the responses to issues 1 and 2. Consequently, the fact that there is a difference between OSHA's allowable noise exposure in the workplace and EPA's criteria for protection of public health and welfare from environmental noise does not imply that either Agency has an invalid approach; the objectives of each as mandated by Congress are different.

Issue 4: Computer Modeling of Highway Noise

One commenter (06) criticized the computer model used by EPA in analyzing highway noise impact. The commenter suggested that field studies should be conducted to verify the accuracy of the computer model and that EPA should reexamine modeling assumptions and cost data since those used in the 1976 background document appeared to be invalid or inaccurate.

Response:

In assessing the health and welfare benefits expected to accrue from the 80 dB regulation, the EPA did not use a computer model in preparing the estimates presented for the 1976 Background Document (Background Document for Medium and Heavy Truck Noise Emission Regulations," EPA-550/9-76-008). Rather, the benefits were projected through a series of simplified calculations using the best data available at that time.

However, since the promulgation of the truck regulation, the EPA has developed a sophisticated computer model to assess health and welfare benefits of surface transportation vehicle noise emission regulations. In developing this model, the assumptions used in the older procedures were critically examined and retained or discarded as appropriate. The EPA believes the computer model to be more reliable and accurate than the older, hand calculation procedures since parameters like population growth, roadway type, propagation losses, operational mode, population density, and operating speed by roadway type are now taken into account. EPA believes that the model is based on sound, accepted acoustic principles and that in calibrating the model, we have incorporated the best available data using reliable sources. EPA has reassessed the benefits from the 80 dB truck

regulation using this computer model and now projects a greater degree of protection to the public as compared to those earlier estimates on which the regulation, in part, was justified. (See the response to Issue C-2 for detailed results).

Issue 5: Interior Cab Noise

A commenter (06) asserted that EPA falsely claims a reduction in interior cab noise as a benefit of the 80 dB standard.

Response:

In the Background Document for the regulation, EPA did mention reduced interior cab noise as an offshoot of reduced exterior noise. However, this point was never claimed as a benefit in the analysis of health and welfare effects or economic impacts.

The commenter has pointed out one example in which a truck that received certain quieting treatments to reduce exterior noise actually experienced an increase in interior cab noise. The Agency's view is that that particular example was due to the nature of the treatment, which resulted in more of the engine noise being transmitted to the cab. In general, however, experience has shown and it is common sense that most actions intended to reduce the exterior radiated noise of the truck will also result in reduced cab noise.

Issue 6: Noise Levels in Residential Areas

One commenter, a truck manufacturer (17), commented that the 80 dB standard is an inappropriate response to the goal of reducing overall community noise levels because stricter standards for heavy duty trucks would not reduce levels in residential areas.

Response:

As pointed out previously, EPA has had underway a wide ranging program for reducing community noise levels of which the noise regulation for trucks is simply one facet. The Agency's analysis shows that the 80 dB standard indeed will result in lower noise exposures in urban as well as suburban areas, and consequently the Agency does not agree with the comment. (See response to Issue 2 for detailed discussion). As pointed out below, under Issue E-6, EPA's analysis shows that 92 percent of traffic noise impacts occur in the urban environment and that 95 percent of the benefits of the regulation is expected to accrue in urban residential areas.

D. Cost and Economic Impact

Issue 1: Effect of Regulation on Inflation and Economic State of Industry

Twelve commenters commented on the effect of the regulation on inflation. These consisted of 3 trade associations (01, 25, 31, 44), seven truck manufacturers (06, 17, 26, 28, 32, 37, 46), 3 other manufacturers (33, 35, 39), and 1 private citizen (42). They contended that the 80 dB regulation would produce a higher level of inflation and lower productivity, and that, given the present economic state of the industry, higher costs cannot be easily passed on to the consumer.

Response:

The EPA recognizes that there are economic costs associated with the 80 dB standard. The Agency does not believe that these costs are inflationary for the following reasons. An inflationary price increase is a

price increase which provides no additional utility to the consumer or the public. In the case of the noise regulation, there is a utility or benefit provided to the general public in the form of reduced noise exposure. This is the benefit which accounts for the increase in price and, taking this benefit into account, the increase in vehicle cost associated with the 80 dB standard cannot be considered inflationary.

The EPA also recognizes that in the light of the current economic situation, additional costs may not be readily passed on to the consumer. This is one of the reasons that the effective date of the 80 dB standard has been deferred from 1982 to 1986. The belief is that the economic status of the industry will improve sufficiently between the present and the effective date of the standard that the industry will be able to pass on most of the cost as is its general practice.

Issue 2: EPA Cost Analysis

A number of submitters to the docket commented on the cost figures of EPA. The submitters included two trade associations (02, 44), six truck manufacturers (07, 16, 17, 18, 28, 47), a University Professor (13) and a non-truck manufacturer (29). Generally, manufacturers expressed their view that EPA's cost were either underestimated or in any event were simply too high in the light of the benefits to be expected from the regulation. One commenter (13) who had made a detailed financial study provided data in general indicating somewhat lower cost than the EPA estimates.

Response:

The manufacturing cost figures provided by EPA are based to a great extent on those that were submitted to EPA by truck manufacturers. Some modifications of these manufacturers' cost estimates were introduced based on either more detailed data that the Agency had available or on what EPA considered to be more realistic estimates. Nevertheless, the discrepancy between EPA estimates and the manufacturers' estimates, on an average sales-weighted basis, is $28 per vehicle, which represents a difference of only 10 percent in unit quieting costs.

The increase in operating costs due to the noise control features was estimated by EPA with the aid of contract consultants, using "real-world" data obtained in EPA's Quiet Truck Demonstration Program (see response to Issues D-8 and D-11).

For the purpose of determining quieting costs and performing economic impact assessments for truck emission regulations, the Agency groups trucks by gross vehicle weight rating (GVWR) into medium trucks (10,000 - 26,000 lbs. GVWR) and heavy trucks (>26,000 lbs. GVWR). Each weight group is then further subdivided by engine type into either gasoline - or diesel-powered trucks. The objective of classifying trucks by weight and engine type is to form truck groups that perform similar in-use functions, require similar noise control technology and thus have similar quieting costs.

Table II presents truck price increases that manufacturers have stated they expect to result from compliance with the 80 dB regulation. Based on these costs and 1979 new vehicle sales, a sales-weighted price

increase was determined for each truck category except heavy gasoline. Lacking specific data from manufacturers on quieting costs for heavy gasoline trucks, the $269 cost figure reported in Table II was developed by updating the 1975 Agency cost estimate as reported in the Agency's Background Document which presents the regulatory analysis attendant to the regulation.

In computing the sales-weighted price increase from the manufacturer's data, the Ford estimate of $1130 for the heavy diesel was not included. The Ford estimate is clearly out-of-line with other industry data. Ford has communicated to the Agency that these costs represent a worst-case estimate and are not representative of their anticipated typical price increase across their full line of heavy diesel trucks.

The Agency estimates a sales-weighted price increase of $345 per heavy diesel truck to meet an 80 dB regulation. This estimate is derived from the costs required to quiet the four heavy diesel trucks in our Quiet Truck Demonstration Program. These trucks were selected for their diverse configurations. The techniques used to quiet these trucks to their target level of 72 dB (to meet a 75 dB regulation) are similar to, but more extensive than, those needed for the truck that will meet the 80 dB regulation. We have used a straight-line interpolation of dollars per decibel reduction and have sales-weighted these costs to estimate the 80 dB quieting costs. We believe this is an appropriate and conservative approach since it apportions higher costs to quiet across all trucks, not just a select few; nor does it take credit for the relatively large number

TABLE II. COMPARISON OF MANUFACTURER'S [5] AND EPA TRUCK PRICE INCREASES TO COMPLY WITH THE 80 dB NOISE EMISSION REGULATION

Estimated Price Increases for New Trucks: Data Submitted to EPA by Truck Manufacturers

Truck Category	International Harvester	Mack	GMC	Freightliner	Peterbilt	Ford	Volvo	Sales-Weighted Average Based on Manufacturer's Data	EPA Revised Estimates $1980
Medium Gasoline	$142	-	$ 50	-	-	$ 166	-	$105	$105
Heavy Gasoline	-	-	-	-	-	-	-	-	$269
Medium Diesel	$387	-	$300	-	-	$ 517	$240	$409	$409
Heavy Diesel	$379	$400 to $500	$415	$546 to $563	$540	$1130	$150	$405	$345
Sales-Weighted Price Increase, all trucks	-	-	$365	-	-	-	-	$308	$280

Note: A blank space (-) indicates that information was not supplied by the manufacturer

of heavy diesel trucks that can meet the 80 dB level with very minor changes. Our $345 estimate includes both manufacturer and dealer mark-ups but does not include any reductions that could be anticipated as the result of production efficiencies. We believe the EPA revised estimate for heavy diesel trucks to be an accurate representation of the price increase that can be anticipated due to the 80 dB regulation since it is based on our "hands-on" experience. We view the industry estimates as more representative of their upper price limit and thus not typical of the fleet average. In estimating the potential economic effects of the 80 dB regulation, we have used our estimated price increases as presented in the last column of Table II.

Table III presents the new estimated truck price increase in relation to the average truck sale price for each of the truck categories. Potential price increases range from 0.6% for heavy diesels to 2.9% for the medium diesel truck. For all trucks, compliance with the 80 dB regulation could result in an average increase in truck prices of approximately 0.9%.

TABLE III. ESTIMATED INCREASE IN TRUCK PRICES DUE TO COMPLIANCE WITH 80 dB NOISE EMISSION REGULATION (1980 dollars)

Vehicle Category	Average Price	Price Increase due to 80 dB Regulation	Percentage Price Increase
Medium Gasoline	$12,083	$105	0.87%
Heavy Gasoline	$24,157	$269	1.11%
Medium Diesel	$16,024	$409	2.55%
Heavy Diesel	$53,434	$345	0.61%
Sales-Weighted Average, all Trucks	$32,343	$280	0.87%

Issue 3: Effects of Transmission Redesign and Turbocharging on Cost

Five truck manufacturers (10 and 47, 16, 17, 18, 26), a trade association (1) and a component manufacturer (52) submitted comments to the effect that EPA's cost estimate and analysis is inaccurate because it does not include the cost of transmission redesign or turbocharging and in some instances puts together inappropriate data. In a closely related comment, one of the manufacturers (26) asserts that contrary to EPA statements transmissions were redesigned to meet the 80 dB noise standard.

Response:

The Agency's position is that the analysis of the costs, as indicated in the previous response; is based largely on data submitted by the truck manufacturers and therefore should be reasonably accurate. It is entirely possible that in particular instances manufacturers may incur certain costs which have not been taken into consideration by the Agency; on the other hand, there may be as many or more instances in which the trucks already are sufficiently quiet that very little additional quieting costs will be entailed in meeting the 80 dB standard.

The Agency believes that overall the error in the cost calculation estimates is very modest indeed. The sales-weighted average cost by industry estimates is $308, compared to $280 for the EPA estimate - a difference of 10%.

With respect to the comment in docket submittal (26) which contends that transmissions were redesigned solely to meet the new noise regulations, the Agency has a copy of an article in a trade magazine and an advertisement by the transmission manufacturer which clearly imply that the transmissions were redesigned for improved efficiency, increased torque capacity, longer gear life and longer bearing life, and that the features provided to meet those objectives were also instrumental in quieting the transmissions. It is quite clear from these marketing publications that the transmission redesign is not solely chargeable to noise control and in fact may not be so chargeable to any degree because of the major objective of the transmission manufacturer in redesigning the unit.

Nevertheless, the Agency has elected to use in its analysis industry figures, which presumably include allocated costs of the new transmissions.

Issue 4: Sales Impact of Buyer Resistance to Higher Cost

Five truck manufacturers (18, 28, 37, 7, 26 and 38) and two trade associations (23 and 25) commented that the 80 dB standard will have a high cost in terms of its impact on industry sales because there is significant buyer resistance to increased cost.

Response:

The Agency recognizes the possibility that increased costs would affect sales, particularly in a period of recession and abnormally high interest rates. This is one of the considerations that the Agency took into account when it decided to defer the effective date of the 80 dB standard from 1982 to 1986.

Issue 5: Cost-Effectiveness of 80 dB and 83 dB Standards

Five truck manufacturers (06, 16, 17, 26 and 37), three trade associations (23, 25, and 44), one state government (27, 47), and one private citizen (42) commented that the 80 dB standard is not cost-effective, and that the benefits do not merit the substantial cost of the regulation.

As a related issue, a trade association and two manufacturers (25, 28 and 38) asserted that the 83 dB standard is more cost-effective than the 80 dB standard.

Similarly, a number of commenters contended that the 83 dB standard is sufficient and that, in view of either the minimal benefits, or the high cost, or both, of the 80 dB standard, the 80 dB standard should be withdrawn and the 83 dB standard left in place. Those include the following: three trade associations (01, 23, and 25), seven truck manufacturers (06, 17, 18, 26, 28, 38, and 32), a muffler manufacturer (29), a solid waste compactor manufacturer (39) and a trade association for the solid waste compactor industry (31). On the other side of this issue, eight submittals contended that in lieu of the 83 dB standard, more stringent standards should be put in place. These included three state agencies and two local government agencies (08, 14, 19, 20, 21), a university representative (13), a civic association (41) and an association of noise control professionals (40).

Response:

The Agency's position is that it has conducted a thorough analysis of the costs and of the benefits in terms of health and welfare improvement of reduced noise exposure resulting from the regulation (for details, see responses to Issue 2 under Health and Welfare and also Issue 2 under Cost and Economic Impact).

Since it is clear from their submittals that industry supports the 83 dB standard in terms of both cost and benefits, the Agency, in its updated analysis, has used the benefits of the 83 dB regulation as a standard for comparison with the 80 dB regulation.

The Agency's analysis shows that the cost-effectiveness of the 83 dB standard indeed is slightly better than that of the 80 dB standard. However, the difference in cost-effectiveness is modest, as the 80 dB standard is almost 80 percent as effective as the 83 dB standard in terms of population removed from noise exposure per dollar of expenditure.

To provide perspective on the issue, it is instructive to see how the cost-effectiveness of the regulations compares with that of various alternatives to traffic noise control .

For example, construction of highway noise barriers is a common response by States and localities to complaints or fears of highway noise. Based on typical barrier costs and noise reduction effectiveness, a barrier costs about $140 to effectuate a reduction of one unit of LWP (see response to Issue C-2 for the definition of LWP). Another possible way to protect against traffic noise is to improve the sound insulation of dwellings. Using data from the National Bureau of Standards, EPA estimates that insulating a house against noise using conventional techniques would cost about $160 to reduce LWP by one unit. By contrast, we estimate that the 80 dB standard results in a reduction of one unit of LWP for a societal cost of $57 (all costs are given in terms of uniform annualized cost per unit of annual average reduction in LWP).

With respect to the question of a more stringent standard, the Agency believes that a more stringent standard would indeed provide additional health and welfare benefits but would also entail costs increasing at a greater rate than the benefits; the resultant cost-effectiveness would be degraded.

Issue 6: Cost-Benefit Analysis

A trade association (25) and two truck manufacturers (06 and 26) commented that the EPA's cost-benefit analysis is flawed, in that the analysis of benefits is deficient.

Response:

Generally there are three kinds of benefits: (1) benefits that can be quantized and monetized, (2) benefits that can be quantified, but not monetized, and (3) descriptive benefits that can neither be quantified nor monetized. The Agency believes that the benefits from the truck regulation fall into the second category.

Attempts to place a dollar value on the benefits from reductions in traffic noise have been generally unsuccessful, partly because the isolation of that value, due to reductions in noise, is often masked by other environmental or social variables. Studies examining peoples willingness to pay in terms of traffic noise barrier costs, property values (real estate prices), insulation of public and private buildings, including schools (where traffic noise is believed to be capable of seriously inhibiting young children's abilities to learn), traffic use controls, etc., have produced such a wide range of values associated with the benefits of traffic noise reductions that a reasonable value is difficult to identify.

In view of the fact that it has not been possible to quantify in dollar terms the health and welfare benefits due to reduced noise exposure resulting from the regulation, the EPA recognizes that indeed it

has not conducted a true cost-benefit analysis. Instead, the Agency has conducted what is commonly termed a cost-effectiveness analysis. This cost-effectiveness analysis which determines cost per unit of (non-monetized) benefit, was the only reasonable kind of analysis that could be performed under the circumstances. (See also response to Issue 5.)

Issue 7: Economic Analysis of Benefits

One commenter (06) asserted that EPA has never made an economic evaluation of any other alternative to the 80 dB standard or determine what other options are available.

Response:

This assertion does not take account of the fact that the Agency conducted an extensive study of various options available under the Noise Control Act, including various programs of assistance to State and local governments. The Agency has determined that the present revision of the regulation with the 80 dB standard becoming effective in 1986 is, in light of the most recent economic data, a reasonable and appropriate decision. (See response to Issue D-5 regarding cost-effectiveness of non-regulatory options.)

Issue 8: Fuel Efficiency

A number of submittals dealt with the question of the effect of the 80 dB standard on fuel efficiency (06, 07, 13, 17, 25, 26, 30 and 36). Not all of these commenters raised issues that require a response.

However, one truck manufacturer (26) and one trade association (25) commented that the EPA provided misleading information by reporting the fuel costs attributable to the 80 dB standard in terms of unit cost per truck rather than total cost for the fleet.

Response:

This issue is based largely on the assumption that the 80 dB standard will necessarily cause increased fuel consumption. Based on the Agency's Quiet Truck Demonstration Program, which has operated three heavy diesel trucks in line haul service for 150,000 miles, the Agency is not convinced that the noise treatments incorporated to comply with the 80 dB regulation will necessarily result in a degradation of fuel economy. EPA believes that prudent engineering design of noise treatments may yield an 80 dB truck with little or no fuel penalty. However, to be on the safe side EPA has included a fuel penalty in its economic assessment of the costs of the regulation. The average increment in annual fuel cost per vehicle due to the 80 dB regulation was estimated to be $23, representing less than 1/20 of one percent of average annual operating cost.

With respect to the question of unit cost per vehicle versus total cost for the fleet, both costs were taken into consideration by the Agency. Further, the Agency believes that reporting costs in terms of unit vehicle costs for fuel is appropriate since that kind of figure gives the user a basis for determining the cost for his vehicle and for his fleet. Reporting

the total fuel costs for the entire fleet is also meaningful in terms of societal costs, and the Agency took those costs into consideration in the economic analysis. The estimate for the total fuel costs is relatively large because of the large size of the U.S. truck fleet, and because of the relatively high increment in fuel costs assumed in the Agency's analysis in order to avoid underestimation of the costs.

Issue 9: Fuel Consumption

One trade association (25) commented that the regulation has a negative impact on fuel consumption thereby conflicting with the Department of Transportation's (DOT) voluntary fuel conservation program.

Response:

The Agency recognizes that certain of the noise control features that may be utilized to meet the 80 dB level may slightly increase fuel usage on some trucks. However, certain noise control features, such as improved exhaust mufflers with reduced back pressure may tend to reduce fuel consumption. Therefore, EPA believes the net effect on total fuel consumption due to the 80 dB standard will be very minimal. (See also response to Issue 8)

Issue 10: Effect of Turbocharging on Fuel Efficiency

A truck manufacturer (26) also asserted that the EPA assumption regarding the effect of turbocharging on fuel efficiency was erroneous - the point being made was that turbocharging improves fuel efficiency at one setting of the engine at which it normally is expected to be used most, but not necessarily at other settings of the engine.

Response:

The Agency does not dispute this description of the effects of turbocharging; however, the Agency contends that the economic analysis including incremental fuel cost took all significant factors into consideration.

Issue 11: Cost of Vehicle Maintenance and Operation

Two trade associations (01, 25, 34, and 44) and three manufacturers (16, 17 and 28) commented that the 80 dB standard significantly increased the cost of vehicle maintenance and operation and will make servicing vehicles more difficult with the alleged possibility, in some cases, of a corresponding decrease in truck safety. One commenter from a university (13) acknowledged the increased operational costs but contended that the cost increases were relatively modest in magnitude.

Response:

The Agency concurs that there will be increased cost of operation and maintenance due to the additional noise control features required to meet the 80 dB standard. Our analysis, based largely on industry figures and results of the Quiet Truck program, indicated an estimated increase in average annual operating costs per vehicle of about $42 (including a "worst case" allowance of $23 for increased fuel costs) which is about 7 hundredths of one percent of the average annual operating costs per vehicle of $62,747.

With regard to the question of reduced safety, the Agency believes that this is a misleading issue because it believes that truck operators will perform the necessary maintenance to insure safe operations as a matter of self-interest.

Issue 12: Economic Burden of Applying Noise Control Technology

A number of organizations submitted comments to the effect that the state of the art in noise reduction technique is not adequate for implementation of the 80 dB standard without undue economic burden. These included two trade associations (01 and 44), seven truck manufacturers (06, 16, 18, 26, 28, and 37, 47) and a trade association for the solid waste compactor industry (31). On the other hand, three commenters, one a muffler manufacturer (29), an association of noise control officials (36) and a representative of a university (13) contended that the technology to control truck noise at an 80 dB level is readily available.

Response:

None of the commenters questioned the availability of technology for controlling noise at an 80 dB standard. However, one group believed that the cost is too high for the benefits received. This subject has been addressed in several of the earlier responses. The Quiet Truck Demonstration Program being conducted by the Agency has provided considerable data and experience to substantiate the practicality and durability of the noise control treatments used, which achieved noise levels well below the 80 dB standard, providing a firm basis for the cost estimates which resulted from our analysis.

The critical commenters do not believe that the benefits to be derived from the 80 dB standard merit its societal costs. Although the most recent cost data available to EPA leads to a significant reduction in estimated compliance costs compared to previous estimates, the Agency recognizes that, taken in aggregate, these costs could impose a near term economic burden on the truck industry during a period in which the industry will be concentrating its efforts on econmic recovery. EPA believes that the deferral of the effective date of the 80 dB standard by three years to 1986 is of sufficient length, making it unnecessary for the Agency to decide at this time whether the standard should be withdrawn on the basis of excessive cost.

Issue 13: Air Pollution Controls

A trade association (01 and 44), and two manufacturers (16 and 26) commented that new air pollution controls scheduled to go into effect in 1986 could alter the noise characteristics of truck engines resulting in costly testing and recertification and higher costs for mechanic training and servicing if the 80 dB regulation goes into effect in 1982.

Response:

The Agency recognizes that there may be some some additional costs associated with multiple out-of-phase regulations, due primarily to the costs of engine recertification. One of the results of deferring the effective date of the 80 dB regulation will be to permit coordination with the anticipated 1986 air pollution control regulations in a time-phased fashion.

Issue 14: Loss of Engine Configurations

Two trade associations (01 and 44) commented that the additional redesign to meet the 80 dB standard and to meet non-coordinated air pollution standards will also result in the reduction of available vehicle and engine configurations.

Response:

EPA is aware that some models of diesel engines may be more difficult to quiet to meet the 80 dB regulation than other models. The industry has been aware of this for a number of years. Quieting the noisier models may impose certain cost and weight penalties not encountered by competing models, potentially reducing the attractiveness of the noisier designs. Such models may encounter reduced demand, and some lost sales may result.

EPA has received information that alternative uses for some of these engines are available, for example, in marine applications. Thus, the Agency anticipates that truck-application engine sales losses due to the 80 dB noise regulation will be recovered, in large part, through alternative applications. Furthermore, a number of manufacturers have announced that several new and redesigned medium duty diesel engines will be introduced for sale in the 1982 timeframe. These engines are being designed to concurrently achieve greater power, lower weight, higher fuel economy, reduced air emissions, and less noise. EPA expects that these new engines will substantially offset any losses of specific model lines due to possible engine obsolescence resulting from the 80 dB regulation.

Issue 15: Excessive Quieting Costs for Customized Vehicles

One manufacturer (45) commented that highly customized vehicles require more complex and expensive noise control treatment and relatively more testing which will result in higher than anticipated vehicle costs.

Response:

EPA recognizes that some vehicle configurations may be more difficult and costly to quiet than others; however, projected noise abatement costs to meet the 80 dB standard supplied to EPA by several manufacturers presumably include these more costly configurations. Since these noise abatement cost estimates to comply with the 80 dB standard have been found to be in substantial agreement with those projected by EPA, we conclude that while these highly customized vehicles may fail in the upper reaches of each manufacturer's noise abatement cost range, the average costs to meet the 80 dB regulation for manufacturers' overall product lines are not significantly different than those projected by EPA.

Several additional points are pertinent:

1. Since highly customized vehicles generally are more costly than the more conventional vehicles, the cost of noise control treatments may not be significantly higher in terms of the percentage increase in vehicle price than those for the more standardized vehicles.

2. Generally, as manufacturers acquire more experience with the design and installation of noise quieting treatments, they gain greater

confidence in their ability to achieve target values for noise emissions. Consequently, manufacturers seem to be able to reduce the amount of production verification (PV) testing by relying on their ability to discriminate between the noisier configurations which require testing and the quieter configurations for which production verification testing may be unnecessary, based on engineering judgment that relies on similarity of configuration. The history of PV reports received by EPA appears to confirm this view as the number of reports submitted by each manufacturer shows a consistent pattern of decrease from year to year.

3. Even if a custom vehicle manufacturer were to encounter a relatively greater economic impact than the "production line" manufacturer, the remedy is not to deprive the public of the benefit of a noise standard that can be met by the vast majority of vehicles manufactured, but rather to seek a remedy specific to the small number of specialized vehicles.

E. Miscellaneous Issues:

Issue 1: Other Vehicle Noise

One truck manufacturer (17) asserts that aiming regulatory activity at truck manufacturers inhibits funding of efforts to reduce other vehicle related noise.

Response:

In the sense that resources are finite, the application of any resources to a given problem reduces the potential for applying resources to some other problem. Since, in the Agency's view, trucks are the primary source of traffic noise, it makes sense to apply an adequate portion of

noise control resources to the control truck noise; in addition, since the Noise Control Act envisaged noise regulations as one of the major tools for noise control, it is appropriate to devote resources to truck noise regulation - which, under the Act is effectuated at the manufacturer's level, but also serves, by preemption, to protect manufacturers against diverse State and local regulatory standards. As delineated in several of the responses to related issues, the Federal noise regulation for trucks appers to be the most cost-effective approach for reducing the noise impact of these vehicles.

Nevertheless, the Agency would like to point out that it has devoted considerable resources to studying other sources of noise in terms of potential or actual regulatory action and in addition has devoted substantial resources to other approaches toward reduction of environmental noise. In particular, the Agency has devoted considerable resources to support of State and local governments in their noise control activities.

Issue 2: Alternative Strategies for Reducing Community Noise Levels

Closely related to the foregoing issue is the comment made by a truck manufacturer and two vehicle trade associations (17, 23, and 25) that EPA should consider alternative strategies for reducing community noise levels and not focus only on regulation of vehicle noise emission levels.

Response:

As pointed out above, EPA has considered a wide variety of strategies for reducing community noise (for example, see response to Issue

D-5). Nevertheless, the regulation of vehicle noise emission levels, in the opinion of the Agency, is one of the more important facets of the overall program to reduce environmental noise and is carried out under the authority of Section 6 of the Noise Control Act. It also merits pointing out again that Section 6 authority is intended not only to aid in reducing community noise but also to protect manufacturers from a diverse array of noise regulations and ordinances promulgated by State and local governments by establishing a uniform national standard which preempts State and local noise codes for the product regulated.

Issue 3: Time Allowed for Comment on Deferral Notice

One commenter (40) representing a professional organization, stated that EPA should have allowed more time for review and comment on the deferral of the 80 dB standard.

Response:

In an effort to ensure that the majority of interested parties were made aware of the deferral of the 80 dB standard, an advance copy of the January Federal Register Notice was mailed to over 500 persons one week prior to the January 27 publication date. Included in the mailing were State and local governments, truck manufacturers, trade organizations, environmental groups, and the trade and environmental press. This advance mailing was followed, in the first week of February, by another mailing distribution copies of the published Federal Register Notice. While the Agency could not have possibly contacted directly all parties interested parties in the action, EPA did endeavor to notify all those who were believed to have an immediate interest.

In the notice of deferral (48 FR 8497, January 27, 1981) the Agency allowed almost three months for submittal of comments. The Agency recognizes that not all persons and organizations who are interested in regulations are able to submit their comments during the stated open period for the docket. However, the Agency actually has accepted all comments received until very recently and has considered them in making the changes that have been incorporated in the present version of the regulation.

Issue 4: Carrier-Mounted Hydraulic Crane

One manufacturer (33) suggested that carrier-mounted hydraulic cranes be exempted from the 80 dB standard because of product type.

Response:

In Harnischfeger Corporation v. EPA (E.D. Wis. 79-C-179, June 9, 1981), the Agency has been directed by the Courts that the regulation is not applicable to the crane-carrier type of truck. Consequently, these vehicles indeed are exempt not only from the 80 dB standard, but from the 83 dB standard as well.

Issue 5: Trucks as a Major Source of Noise

One commenter, a truck manufacturer (06) states that EPA has erred in identifying trucks as a major source of noise unless EPA can provide sound scientific data that is widely accepted. On the other hand, five commenters comprised of four State agencies concerned with environmental quality and a university professor (08, 13, 20, 21, 22, 24, 47) assert

that trucks are a major source of noise. One State government (47) added that with lower noise emission levels the cost of erecting noise barriers would be reduced.

Response:

EPA has identified trucks as the number one source of surface transportation noise. This finding is based on a careful detailed analysis by EPA of vehicles operating on the nation's roadway system, and consideration of social surveys and field studies conducted by State and other Federal agencies.

EPA's analysis considered all categories of vehicles involved in surface transportation, their noise emission levels as determined through field studies by both the EPA and the Federal Highway Administration, vehicle operational characteristics, typical traffic conditions, and the distribution of the population relative to the nation's streets and highways. The time phasing of regulated vehicles into the vehicle fleet and the contribution from tire noise under high speed conditions were taken into account. Deviant vehicles (i.e., poorly maintained, jouncing body components, etc.) were explicitly excluded from EPA's analysis. By excluding these deviant vehicles, EPA believes its projections of truck noise health and welfare impacts are conservative.

The EPA analysis of the extent and severity of traffic noise impacts as functions of where they occur (i.e., local roads and streets, collectors, major and minor arterials, freeways, and interstates) shows trucks clearly to be the dominant source of traffic noise impacts. Currently, in excess of 73 percent of the impacts from traffic noise are from medium

and heavy trucks. EPA knows of no studies which contradict its findings or which indicate that trucks will not continue to be the major source, even when the preponderance of medium and heavy trucks meet the 80 dB level.

Issue 6: Tire Noise Contribution to Noise Impacts

Three truck manufacturers and a trade association (06, 17, 25, 47, and 26) commented that tire noise is a significant contributor to noise impacts in the urban environment and has been underestimated by EPA.

Response:

As indicated in the response to the previous issue, EPA conducted a careful, detailed analysis of the surface transportation noise problem. EPA's analysis clearly distinguished between benefits that accrue to persons exposed to urban traffic noise (low speed) where tire noise is only a very minor contributor, and to those exposed to freeway traffic noise (high speed) where tire noise is a significant contributor. This analysis shows that approximately 92 percent of traffic noise impacts occur in the urban environment where tire noise is a relatively insignificant contributor.

EPA believes that 95 percent of the benefits from the 80 dB truck regulation will accrue to those who live in an urban environment. The focus of the medium and heavy truck noise emission regulation is not primarily aimed at the control of vehicles when they are operating in excess of 35 mph. This latter impact is controlled by an existing Federal regulation (40 CFR 202) which specifies maximum high speed (greater than 35 mph) noise levels for vehicles over 10,000 lbs. GVWR operated by carriers in interstate commerce.

Issue 7: Compliance Management

One manufacturer (38) commented that compliance with the noise emission control regulations should be managed in a way similar to the method used by the National Highway Traffic Safety Administration (NHTSA) in administering the Federal Motor Vehicle Safety Standards.

Response:

Generally, NHTSA depends on manufacturers' "self-certification" for compliance, and enforcement is based frequently on letters of complaint submitted by the competitors of manufacturers who the complainants believe are not complying with the regulations.

The EPA approach to enforcement is based on considerable experience in dealing with environmental regulations. The EPA enforcement strategy assigns to the manufacturers a major share of the responsibility for presale testing to determine compliance of the product with the regulatory standards.

The enforcement approach consists of three parts: (1) Production verification (by the manufacturer); (2) Selective enforcement auditing (by the manufacturer at the request of the Agency); and (3) In-use compliance (with emphasis mainly on proper maintenance of the product and prohibition of tampering).

The Agency believes, based on its experience in enforcing regulations, that its approach provides reasonable assurance of compliance by the vast majority of manufacturers with a minimum of direct Federal involvement.

F. Issues Concerning Truck-Mounted Solid Waste Compactor Regulation

Issue 1: Validity of Regulation

A trade association (31) commented that the acoustical assurance period provision of the regulation is invalid, that the regulation itself is invalid because the regulatory scheme is arbitrary and capricious by imposing vicarious liability, and that the regulation does not in reality provide preemptive protection to the manufacturer against conflicting State and local regulations.

Response:

The first two issues are now in litigation and it therefore is not now appropriate for the Agency to comment publicly on these questions.

With respect to the question of preemptive protection, the Agency's view is that, under the Noise Control Act, a Federal noise regulation preempts not only State and local standards that are directly in conflict with the Federal standard, but as well any State or local rule that represents an attempt to establish indirectly a de facto new-product standard that conflicts with the Federal standard.

Issue 2: Deferral or Rescission of Regulation

Three commenters, a State government (21), a trade association (23), and a compactor manufacturer (39) commented that the regulation for truck-mounted solid waste compactors should be deferred or rescinded. The State government contended that the standard is not sufficiently stringent to provide adequate protection to the public, and the trade association suggested deferral along with the 80 dB truck standard. The manufacturer contended that there is no direct relationship of reduced noise level of trucks to compactor noise levels.

Response:

The present regulatory action defers the second stage of the compactor noise regulation in concert with deferral of the 80 dB truck standard to 1986, in recognition of the principle that the two regulations should be coordinated. The available data suggests strongly that a quieted chassis serves as a basis for a quieter compactor.

With respect to stringency of the 76 dB standard for garbage trucks, the Agency recognizes that a lower noise limit would further reduce the noise impact. The target noise limit of 60 dB, as suggested by the comments, may be needed to completely eliminate noise impact due to garbage trucks. The Agency believes, however, that taking into account available noise control technology and costs of compliance, the additional benefits to be gained by a noise limit below 76 dB may be excessively costly.

Issue 3: Data Base on Chassis Noise

Three commenters, a trade association (31) and two manufacturers (37 and 45) commented that solid waste compactor body manufacturers will require extensive acoustical testing in order to develop a meaningful statistical data base (of chassis noise as a function of engine speed).

Response:

The Agency has been in contact with manufacturers of both truck chassis and compactor machinery in order to help compile a data base that would serve as a useful guide to manufacturers in both categories with respect to design of quieter truck-mounted solid waste compactors. The Agency also is encouraging dialogue between both categories of manufacturers in order to institute a free flow of noise data between them.

Based on chassis noise data acquired by the Agency during pre-regulatory studies on compactor noise, and published in the Regulatory Analysis (EPA 550/9-79-257) that accompanied publication of the regulation, it is evident that a number of the major chassis available on the market have sufficiently low noise emissions at suitable engine speeds to be usable for quieted compactor vehicles.

In addition, the Agency has solicited additional data on chassis noise at various engine speeds from both chassis manufacturers and compactor body manufacturers. In February 1981, a leading trade association in the compactor industry (one of the commenters on this agreed to collect such noise data from its members and submit the data to the Agency for use in modifying and simplifying the compliance procedures of the compactor regulation. Subsequently, that association expressed the view that collection of the data was no longer needed, and withdrew from its commitment to supply the data. The reason given for this action was the imminent expected rescission of the Agency's regulatory authority under the Noise Control Act. If the regulatory authority is not rescinded, the Agency intends to continue its efforts to assist the two industries to share the noise data to the benefit of both.