

# CRS Report for Congress

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## Noise Abatement and Control: An Overview of Federal Standards and Regulations

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### Summary

Constant or repeated exposure to sounds of 90 decibels or higher can lead to hearing loss, and noise exposure is responsible for hearing impairment in about 10 million people in the United States. To limit the public's exposure to potentially harmful sound levels, the federal government sets and enforces uniform noise control standards for aircraft and airports, interstate motor carriers and railroads, workplace activities, medium and heavy-duty trucks, motorcycles and mopeds, portable air compressors, federal highway projects, and federal housing projects. State and local governments determine the extent to which other sources of noise are controlled, including commercial, industrial, and residential activities. In the 107<sup>th</sup> Congress, at least 27 bills have been introduced which address noise exposure. Nineteen bills, H.R. 299, H.R. 1288, H.R. 1741, H.R. 2299, H.R. 2429, H.R. 2430, H.R. 2477, H.R. 2746, H.R. 3479, H.R. 3886, H.R. 4481, H.R. 4653, H.R. 5142, H.R. 5143, S. 633, S. 688, S. 1786, S. 2039, and S. 2808 address aircraft noise. Four bills, S. 365, S. 712, S. 1136, and S. 1151, address noise in national parks and on public lands. Two bills, H.R. 2811 and H.R. 4761, would address railway noise. Other legislation, H.R. 1130, would authorize grants for examining the effects of noise and other environmental aspects on student achievement in elementary and secondary schools, and H.R. 1116 would reestablish EPA's former Office of Noise Abatement and Control. This report will be updated as legislative activity and other relevant developments occur.

### Introduction

According to the National Institute on Deafness and Other Communication Disorders, exposure to loud sounds is responsible for hearing impairment in 10 million of the nearly 30 million people with hearing loss in the United States, and an additional 30 million people are exposed to dangerous noise levels on a daily basis. Several federal laws require the federal government to provide uniform noise control standards which limit the public's exposure to potentially harmful sound levels, and the responsibility for setting and enforcing them is divided among multiple federal agencies. In the past, the Environmental Protection Agency (EPA) coordinated all federal noise control activities

through its Office of Noise Abatement and Control. However, Congress phased out the office's funding in FY1983 as part of a shift in federal noise control policy to transfer the primary responsibility of regulating noise to state and local governments. While EPA no longer plays a prominent role in controlling noise, its past standards and regulations remain in effect, and other federal agencies continue to set and enforce noise control standards for sources within their regulatory jurisdiction.

This report explains how noise is measured, identifies the sources of noise that are currently regulated by the federal government, describes the extent to which the federal standards limit noise, explains the role of state and local governments, and discusses legislative activity in the 107<sup>th</sup> Congress.

## How Loud Is Too Loud?

Sound is measured in units of decibels (dbA), and an increase of 10 dbA represents sounds that are perceived to be twice as loud. While sound levels of 65 dbA are annoying to most individuals, constant or repeated exposure to levels of 90 dbA or higher can lead to hearing loss.<sup>1</sup> The table below provides examples of various sound levels.

### Sound Levels Generated by Various Sources of Noise

Sound Level	dbA
Quiet library, soft whispers	30
Living room, refrigerator	40
Light traffic, normal conversation, quiet office	50
Air conditioner at 20 feet, sewing machine	60
Vacuum cleaner, hair dryer, noisy restaurant	70
Average city traffic, garbage disposals, alarm clock at 2 feet	80
Subway, motorcycle, truck traffic, lawn mower	90
Garbage truck, chain saw, pneumatic drill	100
Rock band concert in front of speakers, thunderclap	120
Gunshot blast, jet plane	140
Rocket launching pad	180

Source: Deafness Research Foundation.

## What Sources of Noise Are Subject to Federal Regulation?

The Noise Control Act of 1972 (P.L. 92-574) and several other federal laws require the federal government to set and enforce uniform noise control standards for aircraft and airports, interstate motor carriers and railroads, workplace activities, medium and heavy-duty trucks, motorcycles and mopeds, portable air compressors, federal highway projects, and federal housing projects. The Noise Control Act also requires federal agencies to comply with all federal, state, and local noise control laws and regulations. Most federal

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<sup>1</sup> For more information, see the National Institutes of Health web site [<http://www.nidcd.nih.gov>].

noise standards focus on preventing hearing loss by limiting the public's exposure to sounds of 90 dbA and higher. However, some are stricter and prohibit quieter levels that are annoying and can diminish one's quality of life. Federal noise standards and the agencies that set and enforce them are discussed below.

**Aircraft and Airports.**<sup>2</sup> The Aircraft Noise Abatement Act of 1968 (P.L. 90-411) requires the Federal Aviation Administration (FAA) to develop and enforce safe standards for aircraft noise.<sup>3</sup> In developing these standards, the FAA generally follows the noise restrictions established by the International Civil Aviation Organization (ICAO). Federal noise control regulations define aircraft according to three classes: Stage 1, Stage 2, and Stage 3. Stage 1 aircraft are the loudest, and Stage 3 are the quietest. All Stage 1 aircraft have been phased out of commercial operation, and all unmodified Stage 2 aircraft over 75,000 pounds were phased out by December 31, 1999, as required by the Airport Noise and Capacity Act of 1990 (P.L. 101-508, Subtitle D).<sup>4</sup> Stage 3 aircraft must meet separate standards for runway takeoffs, landings, and sidelines, ranging from 89 to 106 dbA depending on the aircraft's weight and its number of engines.<sup>5</sup> The ICAO has adopted stricter Stage 4 (referred to as Chapter 4 in ICAO parlance) aircraft noise standards, which are quieter by 10 dbA than the current Stage 3 standards.<sup>6</sup> However, the Stage 4 standards must go through the federal rulemaking process before they could be applied in the United States, and the FAA has not proposed such standards to date. The Airport and Airway Improvement Act of 1982 (P.L. 97-248) established the Airport Improvement Program (AIP) to provide federal assistance for airport construction projects and award grants for noise mitigation. Airport operators applying for such grants must design noise exposure maps and develop mitigation programs to ensure that noise levels are compatible with relevant land uses.<sup>7</sup>

**Interstate Motor Carriers.** The Noise Control Act required EPA to develop noise control standards for motor carriers engaged in interstate commerce, and it authorized the Federal Highway Administration to enforce them.<sup>8</sup> All commercial vehicles over 10,000 pounds are subject to standards for highway travel and stationary operation, but the standards do not apply to sound levels generated by horns or sirens when operated as warning devices for safety purposes.<sup>9</sup> For highway travel, the standards range from 81 to 93 dbA, depending on the speed of the vehicle and the distance from which the sound is measured. The standards for stationary operation are similar and range from 83 to 91 dbA, depending on the distance from the vehicle. The standards apply at any time or condition of highway grade, vehicle load, acceleration, or deceleration.

**Interstate Railroads.** The Noise Control Act also required EPA to establish noise control standards for trains and railway stations engaged in interstate commerce, and it

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<sup>2</sup> For more information on aircraft noise, see the FAA's web site [<http://www.aee.faa.gov>].

<sup>3</sup> 49 U.S.C. 44715

<sup>4</sup> 49 U.S.C. 47528

<sup>5</sup> 14 C.F.R. 36

<sup>6</sup> For more information on the new standards, see the ICAO's web site [<http://www.icao.org>].

<sup>7</sup> 14 C.F.R. 150

<sup>8</sup> 42 U.S.C. 4917

<sup>9</sup> 49 C.F.R. 325

authorized the Federal Railroad Administration to enforce them.<sup>10</sup> The standards do not apply to sound levels generated by horns, whistles, or bells, when operated as warning devices for safety purposes. There are separate standards for locomotives, railway cars, and railway station activities such as car coupling.<sup>11</sup> For locomotives built before 1980, the level of noise is limited to 73 dbA in stationary operation and at idle speeds, and is limited to 96 dbA at cruising speeds. The standards for locomotives built after 1979 are more stringent and limit noise in stationary operation and at idle speeds to 70 dbA and at cruising speeds to 90 dbA. Noise from railway cars must not exceed 88 dbA at speeds of 45 miles per hour (mph) or less and must not surpass 93 dbA at speeds greater than 45 mph. Noise from car coupling activities at railway stations is limited to 92 dbA.

**Workplace Activities.** The Occupational Safety and Health Act of 1970 (P.L. 91-596) required the Occupational Safety and Health Administration (OSHA) to develop and enforce safety and health standards for workplace activities.<sup>12</sup> To protect workers, OSHA established standards which specify the duration of time that employees can safely be exposed to specific sound levels.<sup>13</sup> At a minimum, constant noise exposure must not exceed 90 dbA over 8 hours. The highest sound level to which workers can constantly be exposed is 115 dbA, and exposure to this level must not exceed 15 minutes within an 8-hour period. The standards limit instantaneous exposure, such as impact noise, to 140 dbA. If noise levels exceed these standards, employers are required to provide hearing protection equipment that will reduce sound levels to acceptable limits.

**Other Regulated Sources of Noise.** The Noise Control Act directed EPA to set and enforce noise control standards for certain commercial products, including transportation equipment, motors and engines, and construction equipment.<sup>14</sup> Under this authority, EPA set noise control standards for motorcycles and mopeds, medium and heavy-duty trucks over 10,000 pounds, and portable air compressors. The standards for motorcycles only apply to those manufactured after 1982 and range from 80 to 86 dbA depending on the model year and whether the motorcycle is designed for street or off-road use.<sup>15</sup> Noise from mopeds is limited to 70 dbA. The standards for trucks over 10,000 pounds only apply to those manufactured after 1978 and range from 80 to 83 dbA depending on the model year.<sup>16</sup> These standards are separate from those for interstate motor carriers. Noise from portable air compressors is limited to 76 dbA.<sup>17</sup> The Noise Control Act also authorized EPA to require labels for products which reduce noise.<sup>18</sup> Under this authority, EPA established *Noise Reduction Ratings* for hearing protection

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<sup>10</sup> 42 U.S.C. 4916

<sup>11</sup> 49 C.F.R. 210

<sup>12</sup> 29 U.S.C. 655

<sup>13</sup> 29 C.F.R. 1910.95

<sup>14</sup> 42 U.S.C. 4905

<sup>15</sup> 40 C.F.R. 205, Subparts D and E

<sup>16</sup> 40 C.F.R. 205, Subpart B

<sup>17</sup> 40 C.F.R. 204

<sup>18</sup> 42 U.S.C. 4907

devices which require manufacturers to identify the level of sound from which the device protects the user.<sup>19</sup>

There also are noise control standards for federal highway construction projects and federal housing projects. The Federal-Aid Highway Act of 1970 (P.L. 91-605) required the Federal Highway Administration to develop standards for highway noise levels that are compatible with different land uses.<sup>20</sup> The law prohibits the approval of federal funding for highway projects that do not incorporate mitigation measures to meet these standards, which range from 52 to 75 dbA depending on land use.<sup>21</sup> Under general authorities provided by the Housing and Urban Development Act of 1968 (P.L. 90-448), there also are standards for federal housing projects located in noise exposed areas.<sup>22</sup> The standards are designed to protect occupants from annoying and potentially harmful sound levels by limiting interior noise to a daily average of 65 dbA.<sup>23</sup>

## What Is the State and Local Role in Controlling Noise?

As discussed above, the federal role in regulating noise is mostly limited to transportation, workplace activities, and certain types of machinery. State and local governments determine the extent to which other sources of noise are controlled, and regulations for such sources can vary widely among localities. Further, some states do not specifically regulate noise, but instead, allow local governments to play the primary role. Sources of noise commonly regulated at the state and local level include commercial, industrial, and residential activities. Regulations for such sources typically control the public's exposure to irritating or potentially harmful noise levels by limiting the activity concerned to specific times of the day, such as the operation of domestic power tools or gasoline-powered lawn equipment in residential areas.

## Legislative Activity in the 107th Congress

In the 107<sup>th</sup> Congress, at least 27 bills have been introduced which address noise exposure. Nineteen bills address aircraft noise, five of which propose operation restrictions. As introduced, H.R. 299 would prohibit the operation of civil *subsonic* turbojets that exceed Stage 3 noise levels to or from airports in the 20 most populated areas in the United States. As introduced, H.R. 1741 would prohibit the operation of civil *supersonic* transport category aircraft that exceed Stage 3 noise levels to or from airports in the United States. H.R. 1288 and S. 688, as introduced, would preserve certain local noise and access restrictions established prior to 1985. H.R. 2746, as introduced, would form a commission to recommend operating curfews for civilian aircraft over populated areas during "normal sleeping hours". Seven other bills would address noise at specific airports. As introduced, H.R. 2429, H.R. 2430, H.R. 5142, and H.R. 5143 would address exposure to noise from Los Angeles International Airport. H.R. 3479 as passed, S. 2039 as reported, and S. 1786 as introduced would direct the FAA to facilitate the expansion

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<sup>19</sup> 40 C.F.R. 211

<sup>20</sup> 23 U.S.C. 109(i)

<sup>21</sup> 23 C.F.R. 772

<sup>22</sup> 42 U.S.C. 3535(d)

<sup>23</sup> 24 C.F.R. 51, Subpart B

of runway capacity at O'Hare International Airport, subject to the condition that the noise impacts of such expansion would be less than exposure levels that occurred in 2000.

Other aircraft noise bills are broader in scope. As introduced, H.R. 2477 would prohibit capacity expansion projects at airports in areas with a population of 9 million or more that serve 80 million or more passengers annually. Limiting capacity might slow the rise in airline traffic and help control overall noise levels. As introduced, H.R. 3886 would require EPA to study the feasibility of collectively regulating sources of noise and other pollution around airports within a specific radius. As passed, H.R. 4481 would require the Secretary of Transportation to streamline the environmental review process for airport expansion projects, and would address noise mitigation. As reported, S. 633 includes similar streamlining provisions and would increase the amount of annual discretionary funding set aside under the AIP for noise mitigation grants from 34% to 35%. As introduced, H.R. 4653 would establish an Office of Aeronautics within the National Aeronautics and Space Administration (NASA) to develop technologies that would reduce noise and improve the performance of commercial aircraft and helicopters. As reported, S. 2808 would provide \$296 million for AIP noise mitigation grants in FY2003. The Administration had requested \$274 million for these grants, and P.L. 107-87 (H.R. 2299) provided \$271 million in FY2002. S. 2808 also would encourage the FAA to consider noise impacts in redesigning the airspace in the metropolitan areas of New York/New Jersey and Philadelphia. In addition to addressing aircraft noise, S. 2808 would approve the construction of two highway noise barriers in the State of Georgia.

Four bills address noise in national parks and on public lands. As introduced, S. 365 would require EPA to develop national emission standards for snowmobiles. Considering the noise reductions achieved as a result of these standards, the bill would require the National Park Service to develop noise standards for the recreational use of snowmobiles on park lands. As introduced, S. 712 would prohibit the operation of commercial air tours in the airspace over Yellowstone National Park and Grand Teton National Park. As introduced, S. 1136 would authorize \$65 million annually from FY2002 to FY2007 to establish a Federal Land Transit Program within the Department of Transportation. This program would provide planning, research, and technical assistance to the federal land management agencies in developing cleaner and quieter modes of transportation for use in national parks and on public lands. As introduced, S. 1151 would establish alternatives to "quiet aircraft technologies" that could satisfy noise restrictions for commercial air tours over Grand Canyon National Park.

Four other bills also address noise exposure. As introduced, H.R. 2811 would require new regulations to reduce noise from railroad operations and facilities, and H.R. 4761 would focus on reducing noise from high-speed railways that operate in excess of 150 miles per hour. As introduced, H.R. 1130 would authorize \$2 million annually from FY2002 to FY2004 to award competitive grants for examining the effects of noise and other aspects of the physical environment in elementary and secondary schools. As introduced, H.R. 1116 would reestablish EPA's former Office of Noise Abatement and Control and authorize \$21 million annually from FY2002 to FY2006 for its activities. The office's primary functions would be to provide states with technical assistance and grants to develop noise control programs, and to conduct research and disseminate information on the effects of noise on human health. H.R. 1116 also would direct EPA to study the FAA's airport noise regulations and recommend new measures that would reduce the impacts of such noise on surrounding communities.