General Noise Level Information

A noise analysis for the Kalispell Bypass was conducted in accordance with Montana Department of Transportation (MDT) noise guidelines and is consistent with national guidelines established by the Federal Highway Administration (FHWA). The noise analysis is summarized in the *2006 Re-Evaluation of the US 93 Somers to Whitefish West Final Environmental Impact Statement (Kalispell Bypass Only)* and the complete analysis is contained in the *2006 Final Traffic Noise Technical Study for the Kalispell Bypass.* Key terms used in the analysis of noise are defined in the text box to the right.

The MDT guidelines specify the criteria for determining traffic noise impacts to various land uses. When an impact is identified, mitigation measures such as noise walls must be considered.

Land uses where traffic noise is typically in conflict include parks, schools, and residential areas with frequent outdoor use. According to the MDT guidelines for these land uses, an impact occurs when traffic noise levels reach 66 dBA or increase 13 dBA or more over existing levels. Examples of different noise levels are provided in **Figure 1.**

If the Bypass causes traffic noise levels to meet or exceed 66 dBA, or increase 13 dBA over existing levels at residential locations which were in existence or planned during the environmental phase of the project, additional analysis must be done to determine if noise mitigation would be feasible and reasonable.

A noise barrier must be both feasible and reasonable if it is to be constructed with a highway project. This is determined by criteria which are quantifiable, but still allow for some flexibility. As a result, noise mitigation is not always provided where noise impacts have been identified.

Noise Terminology – Key Definitions

Decibel (dB) - Sound is the fluctuation of pressure in the air, and the human ear is capable of detecting a very large range of pressure fluctuations. Sound is expressed on the decibel scale, which is logarithmic. On this scale, a doubling of pressure (or sound) is equal to a 3-dB increase, which is a barely perceptible change to most people. A ten-fold increase in pressure is equal to a 10 dB increase, which is perceived as a doubling of loudness by most people.

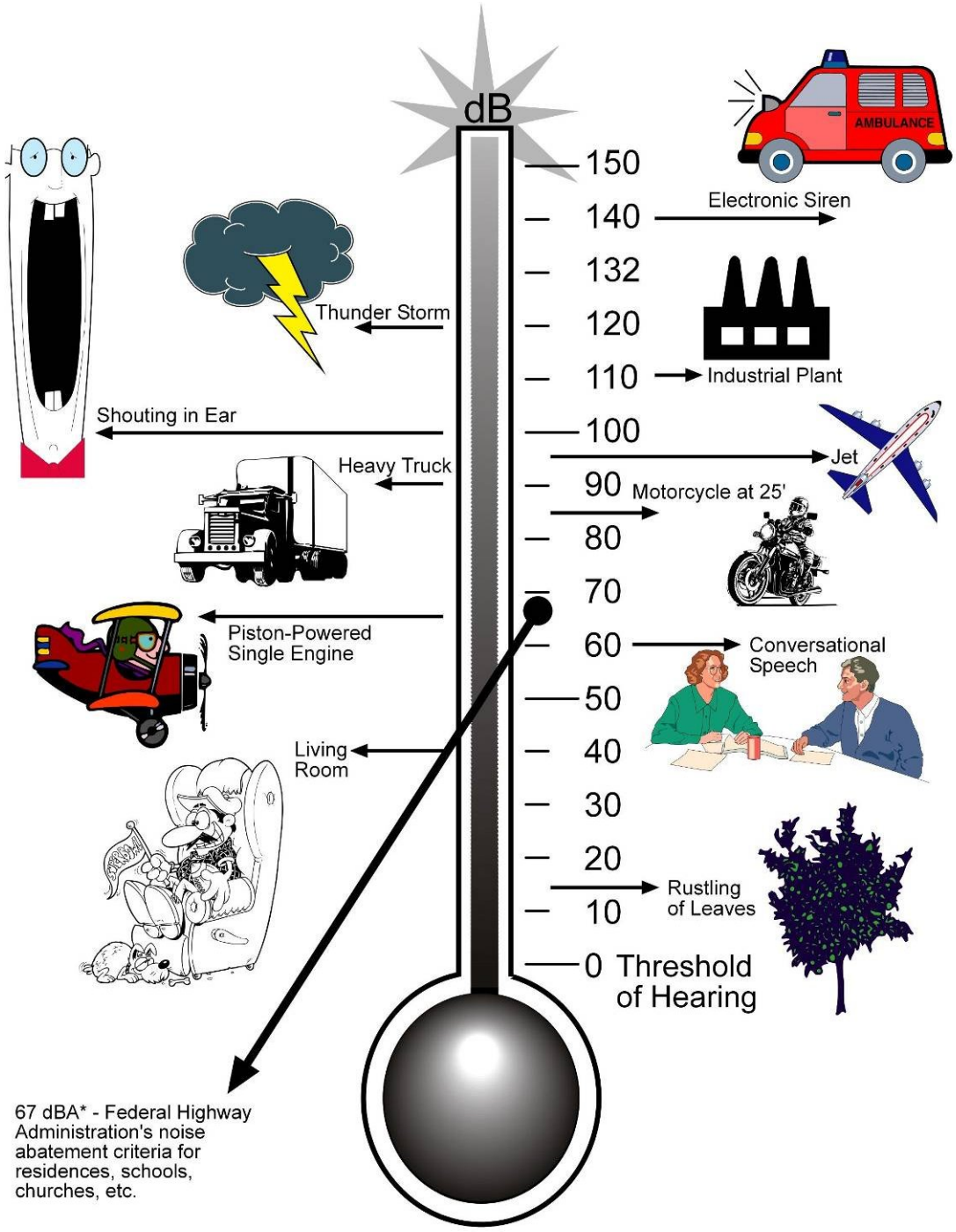
dBA - The human ear does not detect certain, low-pitched and high-pitched frequencies equally. Mathematical adjustments can be made to measure sounds to reflect the way that the average person hears them. The adjusted measurements are called A-weighted decibels, abbreviated dBA. The sound of normal conversation at a distance of six feet is in the range of 55 to 65 dBA.

Receptor/Receiver - Locations where noise is modeled and/or measured are referred to as receptors. Noise receptors are defined as places where people are typically located, such as residences, hotels, commercial buildings, parks, etc. Usually, one noise receptor location is used to analyze an area unless the area is quite large and covers varying terrain and distances from the roadway. Primary consideration for the location of noise receptors is in exterior areas of frequent human use. For residential and other structures, this typically would be in the exterior area of frequent human use closest to the proposed highway project.

A barrier is feasible if it can be constructed without major engineering, maintenance or safety issues and if it provides a substantial noise reduction of 6 dBA or more to the impacted residences. Examples of safety issues are roadway icing caused by the noise wall shadow or line of sight restrictions at corners.

Reasonableness deals with the cost-effectiveness of the barrier construction, the percentage of residential-type development, overall highest noise levels and amount of noise level increase, and the desires of the impacted community.

Figure 1: Example Noise Levels



Sound Level Comparisons

* The Federal Highway Administration's noise abatement criteria are listed as dBA. dBA is a time weighted value for noise. dB represents an individual noise event. dBA for a noise source is generally less than dB.

Often residences located far apart or those that are isolated require a very long barrier to effectively reduce noise. Noise barriers work best for closely spaced homes located within 200 feet of the barrier. To adequately protect all homes behind the barrier, it must extend beyond the last homes a considerable distance. There can be no gaps in the barrier for driveways, streets or walkways. Such a barrier can be very expensive.

To evaluate cost, MDT uses the Cost Effectiveness Index or CEI, which ensures that barriers will not only reduce noise effectively, but will benefit the greatest number of residents with the most reduction in noise. This federally approved formula divides the total cost of the noise barrier by the number of benefited residences and the amount of noise reduction for each of those homes. A benefited residence is any impacted front row receptor that receives a 6 dBA reduction, or impacted second row residence that receives a 4 dBA reduction due to the noise barrier.

Federal highway dollars are available for construction of a noise barrier (a wall), as part of the Kalispell Bypass construction. These highway dollars are from gas tax revenues and will not use local tax dollars or increase local taxes. However, if the walls are not constructed with the roadway, there will not be federal funds available for future installation of a noise wall, if future owners seek relief from traffic noise.

Additional information regarding MDT's noise policy can be found at MDT's website at:

www.mdt.mt.gov/business/contracting/air_noise.shtml