# Estimating Sound Levels With the Inverse Square Law

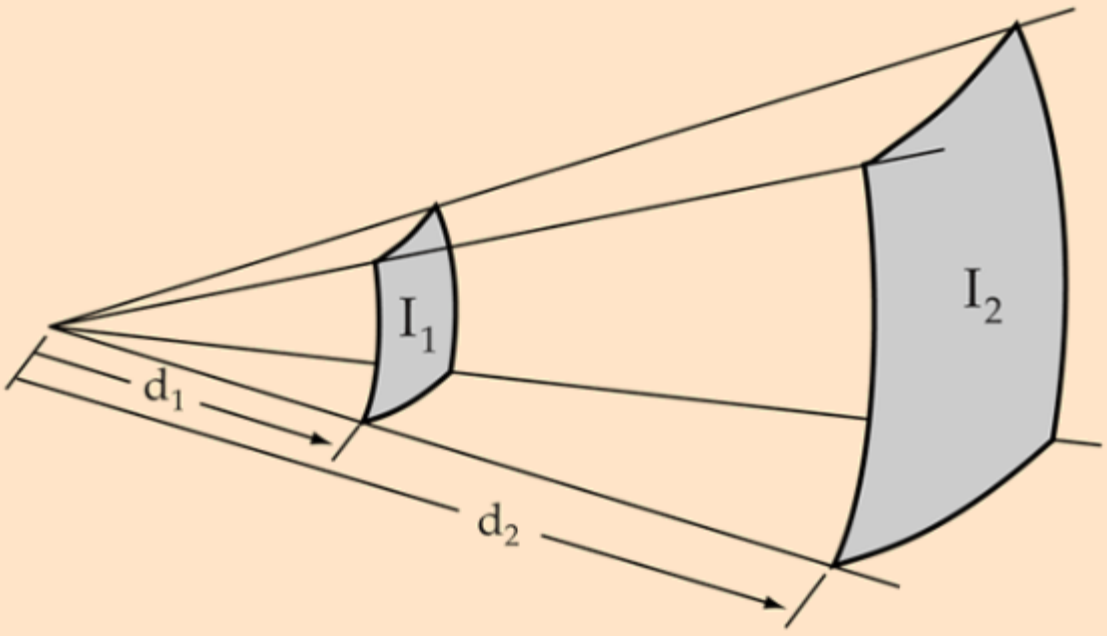
In the real world, the inverse square law is always an idealization because it assumes exactly equal sound propagation in all directions. If there are reflective surfaces in the sound field, then reflected sounds will add to the directed sound and you will get more sound at a field location than the inverse square law predicts. If there are barriers between the source and the point of measurement, you may get less than the inverse square law predicts. Nevertheless, the inverse square law is the logical first estimate of the sound you would get at a distant point in a reasonably open area.

$$\frac{I_2}{I_1} = \left[\frac{d_1}{d_2}\right]^2$$

If you measure a sound level $I_1$ = 95 dB
at distance
$d_1$ = 2 m = 6.561679 ft

then at distance
$d_2$ = 365.76 m = 1200 ft

the inverse square law predicts a sound level
$I_2$ = 49.75667 dB




http://hyperphysics.phy-astr.gsu.edu/hbase/acoustic/isprob2.html