Los Angeles County
Metropolitan Transportation Authority

Appendix L
Noise and Vibration

LA RIVER PATH

Metro

APPENDIX L, NOISE AND VIBRATION

L.1 Equation: Calculation of Noise From Equipment at Specified Distance

As described by the Federal Transit Administration (FTA), the average noise level from each piece of equipment is determined by the following formula for geometric spreading.

> Typical Noise Level at 50 feet + 10 × log(Adj_{usage})—20 × log(distance to receptor/50)—10 × G × log(distance to receptor/50)

Because specific construction methods or daily schedules for the Proposed Project have not yet been determined, and construction is by nature a dynamic activity, the following typical values were used:

- Usage factor (Adj_{usage}) is 1 (such as equipment is operating continuously)
- Ground effect factor (G) is 0, representing hard ground (such as a ground condition that does not result in additional attenuation)

The total noise level then becomes solely a function of the type of equipment operating and the distance from the equipment to the noise receptor.

L.2 Equation: Calculation of Vibration From Equipment at Specified Distance

The peak particle velocity (PPV) level at any location from a piece of equipment can be determined by the following equation:

$$PPV_{equip} = PPV_{ref} \times \left(\frac{25}{D}\right)^{1.5}$$

where:

> PPV_{equip} = the peak particle velocity of the equipment adjusted for distance, inches per second
>
> PPV_{ref} = the source reference vibration level at 25 feet, inches per second
>
> D = distance from the equipment to the receiver, feet

This equation can be solved to determine the distance at which the construction vibration damage criteria is met for each building damage criteria for each piece of equipment.