



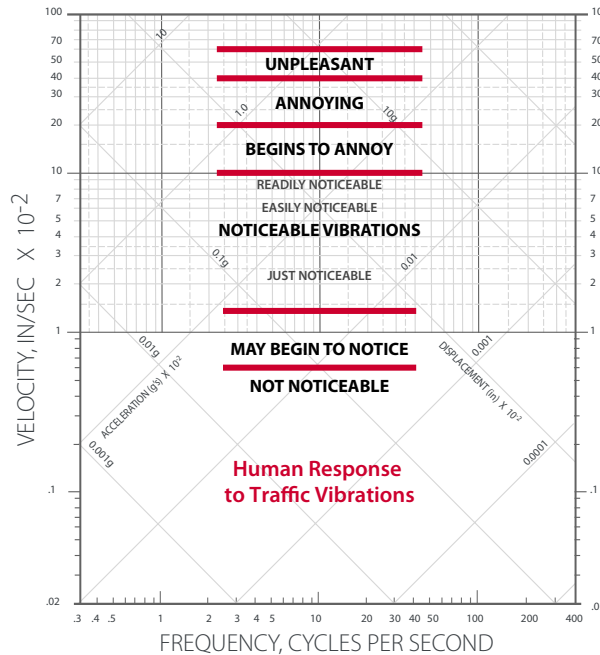
How We Measure Traffic Vibrations

| Peak Particle Velocity (mm/s) | Peak Particle Velocity (in/s) | Human Reaction |
|-------------------------------|-------------------------------|---|
| 0 – 0.15 | 0 – 0.006 | Not noticeable |
| 0.15 – 0.3 | 0.006 – 0.012 | May begin to notice |
| 0.3 – 0.9 | 0.012 – 0.035 | Just noticeable |
| 0.9 – 2 | 0.035 – 0.08 | Easily noticeable |
| 2 – 2.5 | 0.08 – 0.1 | Readily noticeable |
| 2.5 | 0.1 | Continued vibrations at this level may begin to annoy |
| 5 | 0.2 | Vibrations can be felt and become an annoyance to people in buildings |
| 10 – 15 | 0.4 – 0.6 | Continuous vibrations become unpleasant |

Traffic vibrations felt in buildings close to heavily trafficked roads rarely reach 2 mm/s and often register lower than things like closing a door or operating household appliances. In certain situations it may be necessary to measure traffic-induced vibration levels in your home using a seismograph. The highest measurement recorded will be plotted on both the City of Calgary Roads Human Response to Vibrations scale and the USBM/OSMRE (The United States Bureau of Mines/Office of Surface Mining Reclamation & Enforcement) drywall and plaster analysis.

It's important to note that vibrations caused by traffic rarely measure high enough on these scales to cause structural damage to your home. It is also unlikely for traffic vibrations to be the sole cause of any drywall or plaster damage.

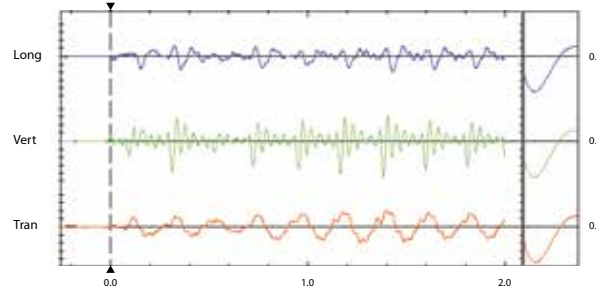
After measurement the Roads inspector will review the results and go over any recommendations and next steps with you. Any required road repairs will only be completed on a severity basis.



The Human Response to Traffic Vibrations Scale

After measuring traffic induced vibrations a Roads inspector will plot the results on the Human Response to Traffic Vibrations scale developed by The City of Calgary Roads above and review them with you. Humans tend to be sensitive to particle velocities in the range of 8-80 Hz. Ground borne traffic vibrations typically occur in the range of 5-25 Hz.

(Adapted from Barneich, J. 1985; Whiffen, A.C. 1971; Reiher & Meister 1931)



For more information on traffic vibrations or to report a significant traffic vibration felt in your residence please visit calgary.ca/roads or contact 311.



What are Traffic Vibrations





What are Traffic Vibrations?

On certain roads traffic vibrations are to be expected as part of our daily lives. Traffic vibrations are typically caused by large, heavy vehicles, like buses, driving over irregularities in the road surface. They are often more a problem of annoyance than a health or safety concern and tolerance levels vary from person to person.

As Calgary continues to grow and expand, our infrastructure will be affected as well. Things like new housing developments, including infill housing, and the construction of new utility connections will have an effect on road smoothness. New noticeable traffic induced vibrations may form particularly on a busy street with bus and truck traffic.

If you're noticing traffic vibrations in your home, it could be due to:

- The proximity of your residence to a major or collector road.
- The proximity of your residence to a bus or truck route.
- The weight, load and suspension system of passing vehicles.
- How your residence is constructed.
- The structural condition of your residence.
- The type and condition of the soil in your area.
- The proximity of your residence to new developments, including infill housing.
- The ground water level.
- Freeze/thaw cycles.
- The condition of the road.
- In the winter noticeable traffic vibrations can be less than half the level of other seasons. A quiet winter period may make vibrations seem more noticeable during the spring thawing period.

What to Do if You Feel Traffic Vibrations in Your House

Residents can report significant traffic vibrations through 311. An agent will ask some questions about the vibrations, their probable cause, when they began, and when and where they are most noticeable.

If required, a condition survey of nearby roads will be conducted by a Roads inspector. Most of the time the Roads inspector will be able to determine the cause of the traffic vibration and make a recommendation for road repairs to be completed on a severity basis.

In certain situations where no apparent cause for vibrations can be found it may be necessary to measure traffic-induced vibrations in your home using a seismograph. Often times traffic vibrations will measure lower than most normal uses of the building like closing doors or walking on suspended wooden floors.

If further action is required and practical the Roads inspector will inform you and make recommendations.

Vibrations Through the Air or the Ground

Traffic vibrations can be transmitted through the air or the ground, but sometimes what is bothering a resident is actually a loud noise causing a small vibration. For information regarding transportation noise issues, please visit The City of Calgary's website at calgary.ca/transportation and search Transportation Noise Information.

What You Can do About Traffic Vibrations

If you live along a busy road, you are more likely to notice rattling caused by vibrations from traffic.

You can minimize annoyance and reduce rattling by:

- Separating items in china cabinets and other displays.
- Placing tissue paper between inseparable items like cups and saucers.
- Installing window guides or seals.
- Adjusting pictures and ornament mounts.
- Moving furniture away from walls.
- Using pads under ornaments or furniture supports.
- Use isolating dampeners on fixtures such as hanging lights or chandeliers.

To better understand the effects of traffic vibrations in buildings, the National Research Council of Canada has published an update titled Traffic Vibrations in Buildings. Simply visit the website at nrc-cnrc.gc.ca and enter the title in the search field.

