

Road Facts

Why Bridges Sway and Bounce

We often think of bridges as being solid and rigid structures that shouldn't move at all. However, bridges are designed to move, which helps prevent snapping and breaking.

Bridges sway from side-to-side due to wind blowing across them, and they bounce up and down as traffic or people pass over. Bridges address this swaying and bouncing in much the same manner as trees. When a tree is still a sapling and is hit by strong winds, its elastic nature allows it to bend without cracking. A mature tree hit by the wind will do one of two things — stay in place or crack and eventually fall. Bridges are designed to sway, bounce, expand, and contract, reacting much like saplings; a rigid bridge would act more like a mature tree.

Bridges also have expansion joints built in to address the expansion and contraction due to changes in temperature. Materials expand and contract with change in temperature the same way the air pressure in car tires change. When it is hot outside, material expands, and when it is cold, the material contracts. The expansion joints on large bridges look like interlocking teeth. The joints on smaller bridges are made of a plastic material and you may notice a slight bump when entering or exiting a bridge. The bump is due to leaving the ground and entering the “floating” bridge deck.

So, the next time you are sitting in traffic on, or driving across a bridge, and the bridge feels like it is bouncing, just remember, this regular movement is part of the bridge design and is not a sign that the bridge is going to collapse.



WV LTAP Photo. Old Cheat Lake Bridge.