

**Paving the Way for STEM in History Museums  
Writing About Science for a History Museum Audience (When You're Not a Scientist)**

**New Technology for Building Bridges (view it [here](#))**

**Video Transcript**

Today you can hop in your car and drive straight across the Great Lone Star State. From El Paso to Beaumont, Laredo to Amarillo and every wonderful city in between. But it wasn't always this way.

In the years immediately after World War II, Texas's transportation system was a patchwork of winding country roads and small bridges. And it wasn't always a smooth ride. The Texas Highway Department, now TxDOT, turned to Texas bridge engineers for a solution.

We needed bigger, stronger, safer bridges to connect people across the rivers, creeks, railroads, and lakes of Texas. Bridge engineers used innovative technologies, like all welded construction, and new materials, like pre-stressed concrete and neoprene pads, to build the bridges that serve as the backbone of Texas's transportation system today. Bridges are expensive and Texas had a lot of bridges to build.

Engineer Percy Pennybacker, the namesake of the famous Pennybacker bridge in Austin, had a plan. He championed all welded construction as a way to build strong bridges without expensive rivets. All welded construction uses only welding to attach bridge pieces together instead of rivets, which used pins to hold the parts together. And Texas was lucky. Workers learned how to weld during the war. Suddenly we had an army of skilled welders to build the next generation of bridges.

Those engineers didn't stop problem-solving with welding. They faced a new concern. Steel was getting more expensive and harder to get as the war effort took most of it. That's when bridge engineer James Graves, true to the independent nature of Texans, began using pre-stressed concrete instead. He didn't want to wait for new steel.

“By the mid 50's you design a steel bridge and the steel's delivery date was two years after the job was bid but you could get pre-stressed girders and pre-stressed beams a lot quicker and everything. And that really started the pre-stress industry.” --Dick Casbeer, Ron Koester, and Frank Leos

This new material took concrete and put it under compression, making it stronger to carry heavier trucks and bridge builders could make it whenever they wanted. These bridges could be built fast, but driving on a concrete roadway supported by concrete piers made for a bumpy ride. If you've driven over a concrete bridge like the Blanco River bridge in Hays County, you can thank neoprene pads for the gentle ride. A neoprene pad is a sheet of dense rubber that absorbs noise and vibration between concrete pieces. Engineers paired neoprene pads with pre-stressed concrete to build strong, stable bridges across Texas to move more and more people and goods across the state.

Texas's problem solving paved the way for the interstate system we have today. Next time you take a road trip across this great state, remember the smooth journey is due to all-welded construction, pre-stressed concrete, neoprene pads, and the engineers at the Texas Highway Department, now TxDOT.

