Texas A&M Engineering
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Lone Star Roads™

Local Technical Assistance Program • Texas Engineering Extension Service • Sponsored by the Texas Department of Transportation and the Federal Highway Administration

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LOCAL TECHNICAL ASSISTANCE PROGRAM ★ LTAP ★

CENTRAL MISSION

"Foster a safe, efficient, and environmentally sound surface transportation system by improving skills and increasing knowledge of the transportation workforce and decision-makers."

LONE STAR LTAP CENTER OF TEEX

- ★ Operated by the Texas A&M Engineering Extension Service (TEEX), a Member of The Texas A&M University System.
- ★ Funded by the Texas Department of Transportation (TxDOT), TEEX, and the Federal Highway Administration (FHWA).
- ★ Provides custom training and technical assistance to local road agencies.
- ★ Provides training and technical assistance at local facilities.

CITY/COUNTY ROAD ADMINISTRATORS

- ★ Maintain over 220,000 miles of streets and roads, and more than12,000 span-type bridges in Texas.
- ★ Face serious financial limitations.
- ★ Appropriate training and assistance from skilled and technical experts.
- ★ Need training to be brought to them.

THE LONE STAR LTAP CENTER CAN HELP WITH

- ★ Road maintenance
- ★ Bridge maintenance
- ★ Culvert operations
- ★ TMUTCD update training
- ★ Preventive maintenance on asphalt roads
- ★ Motor grader proficiency training
- ★ Transportation safety and tort liability
- ★ Local government project procedures qualification for TxDOT
- ★ Work zone traffic control
- ★ Flaggers in work zones
- ★ Installation and maintenance of signs
- ★ Installation and maintenance of pavement markers
- ★ Traffic signal technician training
- ★ Planning level cost estimating for roadway improvements

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To Schedule Training or Techinical Assistance 800-SAFE-811 (800-723-3811) itsi@teex.tamu.edu.

Lone Star Roads

The Local Technical Assistance Program (LTAP) is a nationwide effort financed by the Federal Highway Administration and individual state departments of transportation. Its purpose is to translate into understandable terms the best available technology for roadways, bridges, bicycle and pedestrian facilities, and public transportation for city and county roadway and transportation personnel.

The Lone Star LTAP center, operated by the Texas A&M Engineering Extension Service, is sponsored by the Texas Department of Transportation (TxDOT) and the Federal Highway Administration. This newsletter is designed to keep you informed about new publications, techniques, and training opportunities that may be helpful to you and your community.

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Steel Truss Bridges

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As you travel across this great state and venture off the beaten path on to county roads, byways and rural areas, there is no doubt you will cross a bridge or two. Once an old standby and common sight on highways, roads, and streets across the State of Texas in the 1930s, a great number of these over the road connections were described as steel truss bridges which were considered cutting edge at the time. Although many have now been removed or replaced with updated versions of themselves, Texas A&M Engineering Extension Service bridge construction industry experts report a significant number of steel truss bridges still serve the transportation needs of the citizens of Texas today. Although these bridges still play an essential role when it comes to traversing the state, proper maintenance and repair considerations remain a priority.

"Basic bridge types" consisting of beam, rigid frame, suspension, arch and movable types, the "truss bridge" is usually considered to be a sub-type of the

"beam basic bridge type" in that the assembled truss structure acts as a large "beam" across the feature externally supporting load by bending resistance. Of course, within the truss structure, itself, interior members further support the loads through axial tension and compression resistance.

Typically, a steel truss bridge was constructed using a series of triangular shaped sections of steel which had been riveted, bolted, or welded together. The superstructure consisted of two parallel trusses; one on each side of the roadway. Each typically consisted of a chord extending longitudinally along the top of the truss and another chord extending along the bottom of the truss. While many top chords on truss bridges were seen in a "flat" vertical alignment, other truss bridges had a "polygonal" shape vertical alignment. In between the top and bottom chords were vertical and/or diagonal members. The point where the diagonal members intersected along the bottom chord was called a "panel point".

Proper identification of the location of the roadway deck, usually constructed with concrete or timber, is crucial. If the roadway is physically located in the space between the two trusses, the structure is referred to as a "through or part-through", with the distinction being whether or not there is overhead bracing between the two trusses. If overhead bracing was used, the structure was called a "through-truss." If not, the structure is considered a "part-through" or "pony" truss. If the roadway and its floor system was located between and atop the trusses, the structure was referred to as a "deck truss" type. The floor system of a truss bridge typically consisted of a system of parallel stringers and transverse floor beams. The ends of the parallel stringers usually connected to these floor beams. The end of each floor beam connected to truss chords at the panel points.

Typical concerns specific to the truss bridge surround unprotected steel. If affected by the weather elements, the unprotected steel will corrode. The continued presence of moist debris, such as soil, gravel, and vegetable matter can eventually cause the bridge to lose a steel section possibly resulting in the overall structural weakness of the bridge. Although it is true such corrosion can occur in any unprotected area on any steel structure, such an event is more likely to occur on steel truss bridges due to their characteristics. This is especially true of the top-bottom chord intersections, vertical-diagonal member intersections, floor beam to truss chord connections, and the bottom chords. The collection of such moist debris also tends to occur around and within the bearing assemblies specifically where the span ends "bear" on the substructure supports.

In order to prevent such bridge damage from occurring, it is essential state and county authorities with responsibility for these aging bridges pay frequent attention to the critical areas of these bridges to ensure each is clear of debris and free from the dangers associated with the buildup of moisture. Additional importance surrounding the proper upkeep of these bridges should also be placed on a more comprehensive cleaning as well as a follow up application of coating protection to bridge elements. Doing our part to ensure these steel giants remain a viable part of the Texas transportation landscape will not only help protect our citizens but assure communities statewide are never faced with the high cost of comprehensive bridge repairs. ★

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