Shelbyville, Tennessee is nationally known as “Walking Horse Country”; the National Walking Horse Celebration has been held there since the mid-1900s. Breeders and trainers from all over make their way to Shelbyville each August to show and compete for the coveted title of “Grand Champion.” Due to the success of the Celebration, as locals call it, the local airport sees its fair share of travelers. It’s not a surprise that traffic in and out of Shelbyville Municipal Airport (Bomar Field) is heavy in August/September, but there is also has a steady flow of horse breeders coming into town throughout the year.

Shelbyville Municipal Airport, like many airports, started out as a grass strip runway in 1945 and was paved with asphalt in 1957. “Since then, the airport has continued to expand and improve its infrastructure over a span of 60 years and now consists of a 5,503’ x 100’ runway with corresponding 50’ wide full-length parallel taxiway as well as several new corporate and T-hangars,” said Daniel Deegan, PE of Garver.

The parallel taxiway along with a large apron expansion was reconstructed in 2013 using Full-Depth Reclamation with Cement (FDR). At that time, the runway was maintained with crack seal and seal coat as it didn’t show signs of subgrade failure. "Failure was imminent as there was extensive cracking and delamination of the asphalt which allowed for subgrade saturation," said Deegan. In 2017, Garver and Terracon performed a number of tests including Dynamic Cone Penetrometer (DCP), California Bearing Ratio (CBR) and Falling Weight Deflectometer (FWD) tests. The information showed an average of 4 inches of asphalt pavement over 6-9 inches of stone base with a subgrade consisting of both lean and fat clays. The CBR value varied from 2 to 10 (6 recommended) for the pavement design. The preliminary engineering report also had to evaluate the runway’s geometry as the FAA’s guidelines have changed thus requiring many runways to need a “re-design”. Shelbyville Municipal Airport’s evaluation found both the runway and the runway safety area were out of compliance with the current FAA design guidelines. “In addition, the report pointed out two of the existing taxiway connectors mid-field were also noncompliant due to the fact they did not provide 90-degree turning movements from the taxiway and the apron,” said Deegan.

Three pavement options were considered using the FAARFIELD design method. The first option was a mill and overlay, but was not recommended as it didn’t address the deficiencies in the runway’s profile nor the cross-sectional transverse grades. The second option was a full-depth replacement, but was not recommended due to the excessive cost of hauling off the waste and replacing with new material. The third and overall best option was FDR, which involved pulverizing the existing asphalt and crushed stone base material, setting it aside, grading the subgrade to the proper profile and then replacing the pulverized material with a cement treatment. The pavement design chosen by Garver was a 12-inch P-301 cement treated base using the materials from the runway and a 5-inch P-403 HMA surface.

“This method was not only cost effective but reduced construction time which was highly important to the Shelbyville Municipal Airport as it had to reopen in time for the Walking Horse Celebration in August,” said Deegan.

Wright Paving of Fayetteville, TN was awarded the project. The civil work was subcontracted to Rawso Constructors of Murfreesboro, TN, and the FDR was performed by RoadWorx of Knoxville, TN. The runway was closed on April 29, 2019. Even though there were weather delays and sections of poor subgrade had to be quickly treated with 5% hydrated lime, everyone worked together to have the runway open for operation on August 19, 2019 just in time for Celebration traffic. “FDR couldn’t have been a better fit for this project. With its complexity in grade reconstruction and quick construction turnaround, there really wouldn’t have been a better option,” said RoadWorx President Barry Wilder.