SPARTAN PREMIER™

Spartan Premier, LLC – Executive Biographies and Major Past Experiences

Sana Moran, *CEO/Co-Founder*

Sana Moran is a highly skilled entrepreneur and researcher who has started three successful companies in the engineering and construction fields after working nearly a decade at Texas A&M Transportation Institute (TTI) as a Transportation Researcher. While at TTI, Mr. Moran worked with some of the most prominent engineers in the world while designing, testing, and analyzing roadside safety infrastructure and perimeter security systems. During his time at TTI, Mr. Moran authored and co-authored over fifty research reports and journal articles. This experience has given him in-depth knowledge of the AASHTO MASH standards for assessing roadside safety hardware. Following his time at TTI, Mr. Moran started a company named Safe Stop Barrier Systems as the Vice President. During his time at this company, Mr. Moran led the design and development of innovative roadside safety and infrastructure protection products. He invented or co-invented nearly ten roadside safety or perimeter security products. Mr. Moran holds BS and MS degrees in Civil Engineering from Texas A&M University.

Tyler Skinner, *President/Co-Founder*

Tyler Skinner is a very experienced researcher and construction manager that has a multitude of experience leading large-scale projects. Mr. Skinner spent several years with Texas A&M Transportation Institute (TTI) as an Assistant Researcher. Mr. Skinner worked with Mr. Moran and other prominent roadside safety researchers at TTI where his main responsibilities were to analyze, design, and provide support for testing roadside safety and perimeter security hardware. While at TTI, Mr. Skinner specialized in developing 3D computer models and drawings of roadside safety hardware and analyzing/designing these systems to meet MASH criteria. Following his time at TTI, Mr. Skinner spent several years as a county civil engineer along the Texas coast where he became an expert in the design of hydrology, erosion control, and roadway systems. Mr. Skinner then rejoined Mr. Moran at Safe Stop Barrier Systems, where he helped further advance the company with his broad engineering skillset. He holds a BS degree in Civil Engineering from Lamar University.

Major Past Experiences

Project Name: *PennDOT MASH-E03657-Compliance with FHWA/AASHTO MASH Joint Implementation Agreement*
Client**:** Pennsylvania DOT (PennDOT)
Project Summary: Mr. Moran was a lead TTI researcher for this project where he successfully led numerous phases to provide PennDOT with MASH compliant roadside safety barriers and hardware. Mr. Moran designed, analyzed, and supervised the full-scale crash testing of various roadside median barriers, bridge rail systems, guardrails, guardrail and concrete barrier transitions, and other roadside safety devices. Mr. Skinner was also part of the research team for several phases of this project. Mr. Skinner provided essential drafting and analysis support that helped lead to the design of numerous roadside safety hardware. Many of the roadside safety systems designed by Mr. Moran and Mr. Skinner were crash tested and are now considered MASH TL-3, TL-4, or TL-5 compliant. This project led to the design of nearly fifty (50) roadside safety barriers and devices that are currently in use throughout the state of Pennsylvania and various other states.

Project Name: *Review and Assessment of Past MnDOT Bridge Barrier Type* (Final Report no. MN 2020-24)
Client**:** Minnesota DOT (MnDOT)
Project Summary: As part of this project, Mr. Moran and Mr. Skinner developed an analysis methodology with respect to the current MASH strength and performance criteria to evaluate all bridge barriers currently installed in Minnesota. A total of 1,721,892 lineal feet of barrier exists on MnDOT bridges, and many of these barriers were constructed in the late 1960's and early 70's. Therefore, a thorough assessment of these barriers was requested by MnDOT. Altogether, roughly 60 bridge barrier designs were evaluated under this project. The results of the analyses were used to determine which barriers can be considered MASH compliant and which would require further analysis or crash testing to establish MASH compliance. For the bridge barriers that were found unsatisfactory based on this analysis procedure, retrofit designs were established to enhance these barriers so they could be considered MASH compliant without performing full-scale crash testing. By performing these analyses, new barrier designs were developed to greatly

improve roadside safety on critical roadways leading to the implementation throughout the state of Minnesota.

Project Name: *MASH Evaluation of TxDOT Roadside Safety Features: Phases I - III*
Client**:** Texas DOT (TxDOT)
Project Summary**:** Mr. Moran and Mr. Skinner were part of the TTI research team for Phases I-III of the "MASH Evaluation of TxDOT Roadside Safety Features" project. Mr. Moran successfully led numerous project tasks in each phase to provide TxDOT with MASH compliant roadside safety barriers and hardware. All barriers designed by Mr. Moran successfully passed MASH TL-4 or TL-3 crash testing criteria. Mr. Moran and Mr. Skinner designed, analyzed, and/or supervised the full-scale crash testing of numerous bridge rail systems, concrete barriers, guardrails for numerous applications, and other roadside safety devices under this project. Altogether, 38 roadside safety barriers and hardware were designed, analyzed, and crash tested as part of this project. The roadside safety barriers and hardware designed and evaluated by Mr. Moran and Mr. Skinner are currently in use, or will be in the near future, throughout the state of Texas and numerous other states.

Project Name: *MASH Evaluation of Oregon Bridge Rail Systems*
Client**:** Oregon DOT
Project Summary: Mr. Moran was a lead TTI researcher on the Oregon DOT sponsored "MASH Evaluation of the Oregon Bridge Rail Systems" project. As part of this project, Mr. Moran designed a bridge rail system for Oregon DOT and then used data acquired from strain gauges placed on rebar in the deck of the bridge rail to predict the loads that the deck experiences during MASH Test 4-12. This data was used to aid in the design and evaluation of other barrier designs used by Oregon DOT. In addition, Mr. Moran established a design procedure under this project that allows DOT engineers the ability to efficiently design their bridge deck overhangs to withstand impact from errant vehicles.

Project Name: *NCHRP 20-07/Task 395-MASH Equivalency of NCHRP Report 350-Approved Bridge Railing*
Client: National Cooperative Highway Research Program (NCHRP)
Project Summary: Mr. Moran and Mr. Skinner were part of the research team for the "NCHRP 20-07/Task 395-MASH Equivalency of NCHRP Report 350-Approved Bridge Railings" project.

Mr. Moran's most prominent contribution to this project was the creation of the bridge railing evaluation spreadsheets which were used to perform analyses of the bridge rail systems chosen for review under this project. Mr. Moran and Mr. Skinner used these evaluation spreadsheets to analyze 25 of the most utilized bridge rail systems in the United States. The results of the analyses were used to determine which bridge rails can be considered MASH compliant and which would require further analysis or crash testing to establish MASH compliance. In fact, the evaluation spreadsheets developed under this project are currently being utilized by many DOT bridge engineers across the country to design and analyze their state's bridge rail systems.

Project Name: *NCHRP Project 22-35 - Evaluation of Bridge Rail Systems to Confirm AASHTO MASH Compliance*
Client: National Cooperative Highway Research Program (NCHRP)
Project Summary: Mr. Moran was part of the TTI research team for the "NCHRP 22-35 - Evaluation of Bridge Rail Systems to Confirm AASHTO MASH Compliance"
project. Mr. Moran's primary contribution to this project was to analyze various bridge rail system design configurations by performing computer simulations of MASH crash tests. The purpose of this evaluation was to update the bridge rail geometric design for AASHTO MASH criteria in the "AASHTO LRFD Bridge Design Specifications" and the "AASHTO Roadside Design Guide". The results of this study are still under review by the NCHRP research panel. Once finalized, the analysis results will provide engineers with updated bridge rail design specifications under MASH criteria.