An ongoing research effort sponsored jointly by the AISI, FHWA and the US Navy introduced high-performance steel (HPS) to the steel bridge community in the United States. The initial research focused on higher strength HPS with grades 70 and 100 (minimum specified yield strength of 70 and 100 ksi [485 and 690 MPa], respectively) being investigated. High-performance steel is comparable to the traditional bridge steels of American Society for Testing and Materials (ASTM) A709 but with several significant enhancements. First, all HPS steels are weathering steel grades but with slightly enhanced weathering characteristics. More importantly however, the HPS steels exhibit greater weldability in the higher strength grades and greater toughness for all potential grades. These advances were achieved through lower levels of carbon, and certain other elements, in conjunction with advanced steel-making practices. For the most part, the strength and deformational properties of the HPS steels are comparable to traditional steels.

The use of HPS70W is now widespread throughout the United States with new bridges with HPS70W entering service monthly. The first HPS bridges in the United States were constructed by the States of Nebraska and Tennessee. The State of Pennsylvania followed closely behind with some HPS innovations.

Herein, the design practices which make HPS bridges cost-effective in the United States are reviewed. Also, ongoing and future developments better utilizing the enhanced properties of HPS for highway bridges are discussed.