

Project Title:	Wood Sign Supports MASH Compliance
Project Synopsis:	<p><i>Please describe the proposed project synopsis within 200 words.</i></p> Develop criteria for single and multiple wood post sign supports for small to medium sign sizes used for permanent and temporary installations. The project will review existing literature, determine applicable wood species and grades, determine installation details, and perform MASH crash testing.
Project Goal(s):	<p>Identify and evaluate the crash performance of breakaway wood sign supports. The evaluation should address in-service safety performance, previous crash testing, potential failure modes, and the likelihood of wood supports to comply with the MASH crash test criteria.</p> <p>Evaluate wood post species, grades, and drilled weakening holes for 4"x4", 4"x6", 6"x6", and 6"x8" post sizes. Consider Douglas Fir, Western Hemlock, or other wood species that can be acceptable alternatives to Southern Yellow Pine. Design modifications that address failure modes.</p> <p>Identify installation criteria for direct burial wood posts that accounts for acceptable breakaway performance and adequate soil resistance to support the full bending strength of the post. The details shall include post dimensions, drilled weakening hole sizes, location of drilled weakening holes, minimum post embedment's, number of posts allowed within a 7-foot swath, upper hinge details for multi-post installations, and ranges of sign heights and widths for each post size.</p>
Project Background:	<p><i>Please describe the problem you would like to address.</i></p> Wood sign support 4"x4", 4"x6", 6"x6", and 6"x8" posts have been successfully used for many years that include drilled weakening holes to promote controlled fracture on impact. Wood posts were successfully tested under NCHRP 350 conditions in 1991 (FHWA Eligibility Letter SS-25). <p>Wood posts are a useful non-proprietary alternative to steel posts and are used for temporary sign supports in work zones and for permanent installations. States prefer to retain the option of using wood posts that satisfy MASH crash testing criteria.</p> <p>Recent MASH testing of single 4"x4" signpost and closely-spaced multiple 4"x4" sign posts failed due to penetration of the occupant compartment by the sign or post fragments. Evaluation of 4"x4" wood posts with drilled weakening holes or the use of different wood species and grades has not been performed.</p> <p>Evaluation of larger 4"x6", 6"x6", and 6"x8" wood posts using alternative wood species and grades is necessary to provide states information for MASH compliance. Successful testing of larger dimension wood posts with drilled weakening holes will provide states an option to install wood posts in a variety of signing conditions.</p>

<p>Proposed Work Plan:</p>	<p><i>Please describe what work or test will be done and what the result will be.</i></p> <p>The proposed work plan includes the following tasks:</p> <ul style="list-style-type: none"> • Literature Review • Engineering analysis of post options • Pendulum Testing • MASH TL-3 Crash Testing • Final Report
<p>Deliverables:</p>	<p>Summary table of successful results, including post dimension, drilled hole dimension/placement, wood species, wood grades, minimum embedment requirements, number of posts allowed in a 7-foot swath, min/max sign height.</p> <p>Crash test report, photos, videos, summary of results and performance evaluation summary, support for submitting completed results/materials to FHWA for eligibility letter.</p>
<p>Urgency and Expected Benefit:</p>	<p><i>Please describe the expected benefits of the research.</i></p> <p>MASH implementation milestone for sign supports is December 31, 2019. To date, information is not available whether wood post sign supports are being evaluated by NCHRP 3-119.</p> <p>Wood post material is a common, available material for sign supports. Maintenance crews can replace damaged wood sign posts with minimal engineering support. Cost of wood posts is competitive with other sign post options for small to medium-sized signs.</p>
<p>Problem Funding and Research Period:</p>	<p><i>Please describe what are the estimated costs and time to complete the project</i></p> <p>The estimated costs to complete the proposed project is \$240,000. Estimated time to complete the project is 18 months.</p>
<p>Developer(s) of the Problem Statement:</p>	<p>Name: Scott Jollo, Oregon DOT Email: scott.u.jollo@odot.state.or.us Phone: (503)-986-3069</p> <p>Name: Jeff. Jeffers, Alaska DOT&PF Email: jeff.jeffers@alaska.gov Phone: (907)-465-8962</p> <p>Name: Rodney Wynn, Maryland DOT Email: rwynn@mdot.maryland.gov Phone: (410)-787-7662</p>