

# ROADWAY SAFETY INSTITUTE

Advancing roadway safety with user-centered solutions

UTC Project Information	
Project Title	Robotic Roadway Message and Symbol Painter Implementation
University	University of Minnesota Duluth
Principal Investigator	Ryan Rosandich
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Funding Source(s) and Amounts Provided (by each agency or organization)	Minnesota Department of Transportation: \$95,000
Total Project Cost	\$95,000
Agency ID or Contract Number	UTC Grant Number: DTRT13-G-UTC35 MnDOT contract 99008 work order 32 CTS# 2012032
Start and End Dates	12/08/2011 – 11/30/2015
Brief Description of Research Project	<p><i>Final report abstract:</i></p> <p>The goals of this project were to develop a large-scale vehicle-mounted robotic roadway message painter that could be run by a single operator, and to develop software to enable the device to automatically paint various messages and symbols on roadways. A completely new articulated robot arm was design and constructed, complete with a control system, operator interface, paint delivery system, truck mount, and mobile power supply. The system was thoroughly tested, and programs were written to allow the robot to paint several symbols and messages on a roadway. The programs were tested and fine-tuned indoors, and then tested outdoors once the robot was mounted on a truck. An important finding of this research is that the traditional markings used by MnDOT are not ideal for robot application. Robotic painting can be better accommodated by altering the outlines of the markings somewhat, and by using directional hash lines to fill in the symbols rather than solid paint. These machine-made markings are faster to apply and use less paint, and in the end may be more effective for motorists than the traditional markings. The robotic roadway painter developed during this project has the potential to completely change the way in which markings are painted on roadways. The device has demonstrated the ability to paint roadway markings using an articulated robot arm mounted on the front of a vehicle. Expected benefits of the deployment of such a device include improved operator safety, improved productivity, and improved flexibility in roadway marking operations.</p>

Last updated (9/30/2019)



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<p>Describe Implementation of Research Outcomes (or why not implemented)</p> <p>Place Any Photos Here</p>	<p>The technology has been licensed to Epic Solutions, Inc. of Fargo, ND. They have obtained the robot from MnDOT and are currently evaluating the technology.</p>
<p>Impacts/Benefits of Implementation (actual, not anticipated)</p>	
<p>Web Links</p> <ul style="list-style-type: none"><li>• Reports</li><li>• Project website</li></ul>	<p><a href="http://www.cts.umn.edu/Research/ProjectDetail.html?id=2012032">http://www.cts.umn.edu/Research/ProjectDetail.html?id=2012032</a> <a href="http://www.cts.umn.edu/Publications/ResearchReports/reportdetail.html?id=2546">http://www.cts.umn.edu/Publications/ResearchReports/reportdetail.html?id=2546</a></p>

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