

# ROADWAY SAFETY INSTITUTE

Advancing roadway safety with user-centered solutions

UTC Project Information	
Project Title	Development and Demonstration of a Cost Effective In-Vehicle Lane Departure and Advanced Curve Speed Warning System
University	University of Minnesota
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Funding Source(s) and Amounts Provided (by each agency or organization)	Minnesota Local Road Research Board: \$124,704
Total Project Cost	\$124,704
Agency ID or Contract Number	UTC Grant Number: DTRT13-G-UTC35 MnDOT contract 99008 work order 230 CTS# 2017002
Start and End Dates	5/3/2016 – 2/28/2019
Brief Description of Research Project	<p><i>Final report abstract:</i></p> <p>A Lane-Departure Warning System (LDWS) and Advance Curve-Warning System (ACWS) are critical among several Advanced Driver-Assistance Systems (ADAS) functions, having significant potential to reduce crashes. Generally, LDWS use different image processing or optical scanning techniques to detect a lane departure. Such LDWS have some limitations such as harsh weather or irregular lane markings can influence their performance. Other LDWS use a GPS receiver with access to digital maps with lane-level resolution to improve the system's efficiency but make the overall system more complex and expensive. In this report, a lane-departure detection method is proposed, which uses a standard GPS receiver to determine the lateral shift of a vehicle by comparing a vehicle's trajectory to a reference road direction without the need of any digital maps with lane-level resolution. This method only needs road-level information from a standard digital mapping database. Furthermore, the system estimates the road curvature and provides advisory speed for a given curve simultaneously. The field test results show that the proposed system can detect a true lane departure with an accuracy of almost 100%. Although no true lane departure was left undetected, occasional false lane departures were detected about 10% of the time when the vehicle did not actually depart its lane. Furthermore, system always issues the curve warning with an advisory speed at a safe distance well ahead of time.</p>

Last updated (9/30/2019)



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Describe Implementation of Research Outcomes (or why not implemented)  Place Any Photos Here	Nothing to report.
Impacts/Benefits of Implementation (actual, not anticipated)	Nothing to report.
Web Links <ul style="list-style-type: none"><li>• Reports</li><li>• Project website</li></ul>	<a href="http://www.cts.umn.edu/Research/ProjectDetail.html?id=2017002">http://www.cts.umn.edu/Research/ProjectDetail.html?id=2017002</a> <a href="http://www.roadwaysafety.umn.edu/publications/researchreports/reportdetail.html?id=2730">http://www.roadwaysafety.umn.edu/publications/researchreports/reportdetail.html?id=2730</a>