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15. SUPPLEMENTARY NOTES			
16. ABSTRACT <p>The Radar Innovations Lab in the University of Oklahoma collaborated with the P&R Division of OK-DOT on an innovative technology for traffic speed monitoring and control in high-way workzones, called Smart Barrel Systems. The smart barrel system appears as a group of normal traffic control barrels, but they are equipped with advanced and low-cost Doppler radar sensor and wireless radio nodes. The traffic speeds are monitored by a sensor node at the workzone entrance in real-time, and then all the nodes in the network coordinate among each other to determine the warning message to motorists, which in this case is the flashing LED lights on top of the barrel drums. There are six tasks in this one-year project: (1) Requirement analysis and specifications, (2) Simulation/Modeling, (3) Design and test a Doppler radar sensor, (4) ZigBee radio testbed platforms, (5) Prototype smart barrels, (6) Meetings and reports.</p> <p>As an extension of the originally planned task 5, a small-scale (10-node) smart barrel system is integrated and deployed at an actual workzone site at I-40, during the period of Aug- Dec 2011. Significant speed reduction has been observed by comparing the traffic speed profile entering the "smart workzone" to the speed profile leaving the zone. A series of improvements have been made for better synchronization of the nodes/lights, longer battery life, and lower costs.</p>			
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