



THE UNIVERSITY OF TEXAS AT AUSTIN  
**CENTER FOR TRANSPORTATION RESEARCH**

**5-6005-01-P2**

## **UPDATES TO RDD CONTROL SYSTEMS AND ROLLING SENSORS**

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*TxDOT Project 5-6005-01: Statewide Implementation of Total Pavement Acceptance Device (TPAD)*

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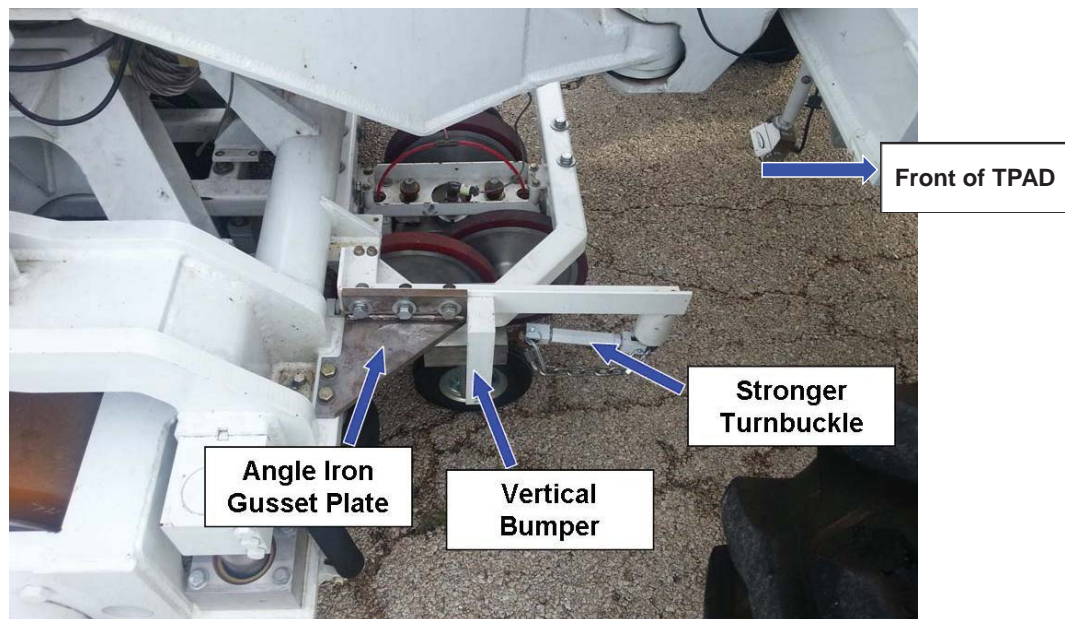
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TxDOT Project No. 5-6005-01, *Statewide Implementation of Total Pavement Acceptance Device (TPAD)*, was completed on August 31, 2014. This deliverable discusses the improvements made to the RDD system on the TPAD. This work was performed from January 2013 to August 2014.

The first improvement involved the air pressure control system on the rolling sensors. Each rolling sensor has two air bladders to apply a hold-down force. During testing, air pressure needs to be applied to the air bladders to maintain contact between the rolling sensors and the pavement. Originally, one air-pressure control system was used to regulate the hold-down force. The CTR team replaced this single air-pressure regulating system with three separate pressure control systems, one for each of the three rolling sensors, to achieve more stable air pressure regulation. Subsequent deflection measurements taken as part of real-world highway projects showed that the rolling sensors performed well.

The second improvement involved modifications to the towing frame used to position and raise/lower the rolling sensors. When the TPAD was moved from TTI to CTR in April 2014, the CTR team found scratches on the loading frame, which were caused by contact between the loading frame and the sensor towing frame during testing. In addition, the left towing arm was bent downward, one of four turnbuckles was broken, and two were bent. The CTR team decided to work together with the Center for Electromechanics at UT to make improvements to the towing frame that would more securely position the towing frame with respect to the loading frame. These improvements included the following: (1) reinforcement of the towing arms with angle iron gusset plates, (2) stronger turnbuckles, and (3) vertical rubber bumpers on all four corners of the loading frame to prevent the towing frame from rubbing the loading frame. Much of this work was paid for by Prof. Kenneth H. Stokoe II out of his UT funds (not TxDOT funds). The gusset plate, stronger turnbuckle, and vertical bumper installed on the right front side of the towing frame are shown in Figure 1.



*Figure 1: Improvements Made to TPAD Towing Frame on Right Front Side: (1) Angle Iron Gusset, (2) Stronger Turnbuckle, and (3) Vertical Bumper*