



LTPP (Long-Term Pavement Performance) Program



Case Study: IRD's Role in the Collection of Research Quality Traffic Data

The primary goal of the North American Long-Term Pavement Performance (LTPP) program is to understand how and why pavements perform as they do in order to provide data and products that extend pavement life at a reasonable cost. Given the strong national interest in analyzing the pavement performance data collected at the Specific Pavement Study (SPS) sites, Federal Highway Administration (FHWA) established a national pooled fund study to increase the quantity and improve the quality of traffic data needed to support analysis projects. The FHWA Office of Infrastructure Research and Development administers the Nation's LTPP program in cooperation with the American Association of State Highway and Transportation Officials (AASHTO), the National Academy of Science, and State Highway Agencies.

A requirement to understanding pavement performance is to have accurate and reliable traffic monitoring data – specifically classification and weight data. The Weigh-in-Motion (WIM) equipment used to collect this data must be of high quality, installed properly, continuously monitored, and routinely maintained. This requires in-depth knowledge of the various WIM equipment available that can provide research quality data, and the necessary resources to ensure long-term, reliable operation and data quality.

IRD has been involved with the LTPP program since it officially began under the Strategic Highway Research Program (SHRP) in 1987. In 2004, International Road Dynamics (IRD) was selected as the Phase II contractor tasked with the provision, installation, maintenance, and service of high quality WIM equipment for the LTPP program. In addition, IRD also assumed responsibility for data collection, quality control, and weekly submission of the traffic data from the Phase II sites to the LTPP regional support contractors for further quality assurance and processing.

The initial project involved WIM installations at Specific Pavement

Studies SPS-1 (structural factors for flexible pavements), SPS-2 (structural factors for rigid pavements), SPS-5 (rehabilitation of Asphalt Concrete pavements), and SPS-6 (rehabilitation of jointed Portland Cement Concrete Pavements).

The first IRD Phase II contractor WIM site was installed at the SPS-6 site in Illinois, and went online collecting research quality traffic and weight data August 15, 2005.



By July 18, 2008, IRD completed installations at 18 additional locations throughout the United States.

On October 25, 2010, IRD worked with LTPP to pilot overview image capture at the SPS-5 WIM site in Maryland to enrich the research quality data already being collected at this location. IRD provided the iANALYZE software package to process this data and allow for correlation with these images. This proved beneficial for advanced diagnostics and troubleshooting, vehicle class scheme modification and enhancements, confirmation of lane discipline of traffic, validation

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of system performance, studying the reaction of traffic during severe weather conditions, and making additional data available for future research and study.

By 2012, overview image capture was added to two additional WIM site locations under this study.

In 2015, IRD started working with LTPP on plans to collect WIM traffic data at select SPS-10: Warm Mix Asphalt (WMA) Overlay of Asphalt Pavement site locations throughout the United States.

The first IRD WMA WIM site was installed at the Texas SPS-10 location and went on-line collecting research quality traffic and weight data as of June 27, 2016.

By the end of December 31, 2017, IRD completed installations at three additional WMA site locations. IRD has been contracted to install two more sites in 2018.

IRD continues to provide LTPP ongoing support through installations, maintenance, data collection, quality control, and weekly submission of the traffic data to the Contracting Officers Technical Representative (COTR) for further quality assurance and processing. Many of the sites installed by IRD continue to be in service and have provided over ten years of research quality data for LTPP. This data is available through LTPP InfoPave. This web-based system offers a gateway to data from the LTPP test sections, as well as findings from data analyses and extensive documentation for the many aspects of LTPP experiment design, data acquisition, quality control, and data dissemination.

The LTPP program collects information of tremendous value to pavement engineers, who will translate this information into strategies and procedures for building better, safer, more cost-effective roads. The FHWA estimates that billions of dollars have been saved due to the increased pavement design life made possible by information collected and disseminated by the program.

IRD is proud to be part of the LTPP team, and to have the opportunity to work closely with FHWA's Office of Infrastructure Research and Development, administrator of the LTPP program, in cooperation with AASHTO, the State Highway Agencies, and National Academy of Science.

LTPP WIM System Calibration Tolerances

Pavement Study Specification	95% Confidence Limit of Error
Loaded Single Axles	±20 percent
Loaded Tandem Axles	±15 percent
Gross Vehicle Weights	±10 percent
Vehicle Speed	±1 mph (2 km/hr)
Axle Spacing Length	±0.5 ft

IRD Phase II Site Installations

Site Location	Installation Date	Site Location	Installation Date
Illinois SPS-6	15-Aug-05	Wisconsin SPS-1	24-Oct-07
Maryland SPS-5	1-Mar-06	Louisiana SPS-1	24-Jan-08
Colorado SPS-2	29-Apr-06	California SPS-2	31-Jan-08
Kansas SPS-2	10-Jun-06	New Mexico SPS-1	15-May-08
Minnesota SPS-5	2-Nov-06	New Mexico SPS-5	16-May-08
Virginia SPS-1	9-Jan-07	Indiana SPS-6	18-Jul-08
Arkansas SPS-2	11-Jan-07	Texas SPS-10	27-Jun-16
Arizona SPS-2	2-May-07	New Mexico SPS-10	8-Aug-16
Arizona SPS-1	5-May-07	Oklahoma SPS-10	14-Nov-16
Pennsylvania SPS-6	31-May-07	Missouri SPS-10	23-Oct-17
Tennessee SPS-6	1-Jun-07	Oregon, SPS-10	Spring 2018
Delaware SPS-1	20-Jul-07	Arizona, SPS-10	Spring 2018
Maine SPS-5	25-Jul-07		



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PRINTED IN CANADA

