

WIM TESTING AND CALIBRATION

Testing and Calibration of Weigh-in-Motion (WIM) Stations

Acceptance Testing

Acceptance testing is done in three stages: the system component operation test, the initial calibration process and the fourteen-day continuous operation test.

System Component Operation

The inductance of each loop shall be within a range consistent with four turns of loop detector wire. The ratio of loop detector inductance to detector lead inductance shall meet electronic system vendor requirements.

Each piezoelectric axle sensor shall produce a signal in conformance with manufacturer and electronics system vendor specifications.

All roadway sensors shall be sending signals to the on-site controller and the on-site controller shall be converting those signals into useable data. This shall be verified through observation on site using the real time review capabilities of the system. The loops and weight sensor combination shall be recording correct vehicle classification and axle counts.

Signal from in-pavement temperature sensor shall be accurately received by the system electronics in accordance with electronics system vendor specifications.

Initial Calibration

The Contractor shall provide a five-axle tractor-trailer combination (three axle tractor and two-axle semi-trailer) and driver for calibration of the WIM system. The truck shall have an air-ride suspension and be in good mechanical condition. The trailer shall be a dry van type and loaded with a non-shifting load so that the gross weight of the tractor-trailer combination is between 75,000 and 80,000 pounds. Axle-loads shall not exceed New Jersey Title 39 limits, nor shall they violate the Federal Bridge Formula.

The calibration truck shall be weighed on a certified, multi-draft public scale and weights of the steering axle, drive tandem axles, and trailer tandem axles recorded, as well as the total gross weight of the combination.

The calibration truck shall be driven over each lane a minimum of five (5) times and the axle and gross weights as determined by the WIM system shall be recorded **by each sensor** for each pass. Average values among the five passes shall be used to calculate a calibration factor **for each sensor**.

Following adjustment of the system by entering calibration factors for each sensor, the calibration truck shall be driven over each lane a minimum of another five (5) times and the axle and gross weights as determined by the WIM system shall be recorded **by each sensor** for each pass. Average values among the five passes shall be used to confirm calibration factor **for each sensor**. After calibration, the average values recorded by the WIM system shall be within ten (10) percent of each axle weight (average axle weight of each axle group); and within five (5) percent of the gross weight of the combination of the weights recorded at the public scale. If either value is not within these tolerances, the calibration factors shall be recalculated, entered into the WIM system, and the validation procedure as described above shall be repeated.

If the system cannot be properly calibrated after two iterations of calibration factor updates, it can be an indication of defective weigh sensors, WIM electronics or pavement condition. Corrective action shall be done and the validation procedure as described above shall be repeated.

Fourteen Days Continuous Operation

During the third stage of the acceptance test, the WIM system is monitored for fourteen (14) consecutive days. The data produced during this period is reviewed in accordance with the LTPP QA program. Once it is determined that data is recorded properly and the system components are working on a continuous basis within the required specifications, the system is accepted.

All costs of the testing and calibration procedures, including the hiring of the calibration truck and driver, shall be included in the Item “WIM ROADWAY DEVICES TESTING AND CALIBRATION FOR # LANES”.