



# TECHNICAL ADVISORY

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## **FAQ's - Network-Level Falling Weight Deflectometer (FWD) Data Collection**

### **➔ HOW IS NETWORK-LEVEL FALLING WEIGHT DEFLECTOMETER (FWD) DATA USED?**

Network-level FWD data provides information about the structural load-carrying capacity of the pavement network. It describes base and surface strength, as well as subgrade strength.

This information can be essential in determining whether a candidate project needs sub-surface rehabilitation or if a less expensive (surface) preventive maintenance treatment can be used instead.

### **➔ WHAT IS THE PROCEDURE FOR COLLECTING NETWORK-LEVEL FWD?**

Network-level FWD data is collected every 0.5 mile. The traffic control required is a moving operation with a lead vehicle and a crash cushion.

The FWD data collection procedure at each location involves two drops: a seating drop, followed by a drop at the 9,000-pound load level. The second drop is stored in the Pavement Management Information System (PMIS) database, along with the drop location and the pavement temperature measurement.

PMIS summarizes the FWD measurements into a structural strength index (SSI) score that ranges from 1 (very weak) to 100 (very strong).

### **➔ WHAT TYPE OF INFORMATION DOES THE NETWORK-LEVEL FWD PROVIDE?**

The PMIS MapZapper has a tool that will provide subgrade modulus, remaining life and layer stiffness for flexible pavement structures with asphalt surfaces less than five and a half inches thick. The tool can also plot the SSI scores from network-level testing.

### **➔ HOW IS THE INFORMATION FROM THE NETWORK-LEVEL FWD USED?**

The information about remaining life can be used to assist district personnel in prioritizing preventive maintenance and rehabilitation projects.

### **➔ HOW IS NETWORK-LEVEL FWD DATA USED TO ASSIST WITH SUPER HEAVY LOADS?**

District personnel may want to consider avoiding routing super heavy loads where the network-level FWD indicates very weak pavement structure.

Network-level FWD testing can also identify sections that have been used for super heavy routes, which appear structurally sound on the surface, but are actually in danger of failing in the near future.

**➔ WHEN CAN NETWORK-LEVEL FWD MEASUREMENTS BE TAKEN?**

Network-level FWD data can be collected and stored at any time during the fiscal year. For comparison purposes, measurements should be taken at the same time each year (for example, during spring or summer).

**➔ IN A YEAR, ON WHAT PERCENTAGE OF THE AREA HIGHWAYS SHOULD NETWORK-LEVEL FWD DATA BE COLLECTED?**

A 25 percent sample of the network is a reasonable amount. Another approach would be to test one or more entire counties in a year and then rotate through the remaining counties until all counties have been tested (for example, in a district with 12 counties, test three per year to make a four-year cycle for any given county).

**➔ IS NETWORK-LEVEL FWD DATA COLLECTION REQUIRED?**

The collection of network-level FWD data is optional and can be collected on a portion of the network system each year.

**➔ SHOULD NETWORK-LEVEL FWD DATA BE COLLECTED ON THE MAINLANES OF THE INTERSTATE AND U.S. HIGHWAYS?**

The mainlanes for interstate and U.S. highways are typically structurally sound; it may not be necessary to collect network-level FWD data on these types of pavements. However, if there are specific portions of concern—because of heavy traffic or other issues—those sections can be tested.

**➔ WHAT TYPES OF ROADWAYS SHOULD THE NETWORK-LEVEL FWD DATA COLLECTION BE FOCUSED?**

The network-level FWD data collection should be focused on the low volume FM and RM roads with limited structural capacity or other highways that are experiencing higher than expected loading.

**➔ WHAT IS THE SSI SCORE IN PMIS?**

The structural strength index (SSI) score summarizes the FWD test results, assuming a 9,000-pound load.

SSI varies from 1 (very weak) to 100 (very strong). SSI values below 80 typically indicate structurally weak pavement sections or sections that might fail rapidly, even if it appears structurally sound on the surface.

**➔ CAN PROJECT-LEVEL FWD DATA BE STORED IN PMIS?**

Yes. Project-level FWD data can be stored in PMIS and used for network-level analysis. The “Raw Deflection Data” report in PMIS will show FWD geophone readings for each test point. This report comes in two versions: a “Normalized” version, which shows deflection data converted to 9,000-pound load for comparison of locations; and a “Non-Normalized” version, which shows the actual deflection data for use in back-calculating layer moduli for pavement design.

**➔ CONTACT INFORMATION**

If you have any questions regarding network-level FWD data collection and analysis, please contact the Construction Division, Materials and Pavements Section:

- Magdy Mikhail, P.E., at 512/465-3686 or
- Bryan Stampley, P.E., at 512/465-3676.

If you have any questions regarding FWD repairs and calibrations, please contact the Construction Division, Materials and Pavements Section, Randy Beck at 512/465-3064.