Pavement Condition and Planning Statistics Data Collection

Russ Scovil and Peter Jager

International Roughness Index (Profiler)

Purpose: Collect, Process and Publish surface smoothness, pavement rutting and concrete joint faulting for all State Routes and NHS system on an annual cycle.

Products: Average IRI, Half Car Simulation for annual condition report, and Average IRI report for HPMS submittal. Project level condition for smoothness bonuses.

Resources: One vendor owned instrumented High Speed Profiling Van. One UDOT owned High Speed Profiling Van. One office engineer to process, manage and publish data.

Customers: The primary customers include all Pavement Management Engineers in both the Central and Regional offices, Region Material Engineers, all Pavement Condition System (PCS) users, all Data Warehouse and Blue Book users, HPMS annual submittal, and UDOT Research and university studies. Secondary customers include the balance of UDOT employee’s

Schedule and Duration: Vendor collection (April 1 – June 30, 12 wks), vendor post processing and QA/QC (July 1 – August 30, 12 wks), delivered to Central for Regional transfer (September 1). Calibration (Spring, 1 wk)

Pavement Deflection (Falling Weight Deflectometer)

Purpose: Collect, Process and Publish pavement deflection for all State Routes on a 3, 4, 5 year cycle (system level), as well as for special request (project level). Three years for Interstate asphalt, four years for all other asphalt and five years for non-doweled concrete pavements. Note: A BYU FWD study is pending and possible changes in scheduling will be under advisement.

Products: Network level data is added to an archived data base (Pavement Condition System) which dates back to 1993. Project level data for project design and research.

Resources: Calibrated FWD Truck and Traffic Control Vehicles. One FWD vehicle operator and 2 additional traffic control vehicle operators, which operate an attenuator and a message board pickup. One office engineer to post process, manage and publish data.
Customers: The primary customers include all Pavement Management Engineers in both the Central and Regional offices, Region Material Engineers, all Pavement Condition System (PCS) users, all Data Warehouse and Blue Book users, HPMS annual submittal, and UDOT Research and university studies. Secondary customers include Federal Highway Administration (Long Term Pavement Performance) and the balance of UDOT employee’s.

Schedule and Duration: Network level collection and processing (July 1 – Oct 31, 16 wks), post processing and QA/QC (Nov 1 – Dec. 31, 8 wks). Project level collection, processing and delivery (within two weeks of request). Calibration (Fall, 1 wk)

Pavement Skid Resistance (Skid Truck)

Purpose: Collect, Process and Publish surface friction for State Routes on a 2-year cycle, as well as for special requests (Forest Roadways and Airports).


Resources: Calibrated Lock Wheel Trailer and Instrumented Vehicle. One vehicle operator (seasonal) and one data collector (Frank Bernardo). One office engineer to process, manage and publish data.

Customers: The primary customers include all Pavement Management Engineers in both the Central and Regional offices, Region Material Engineers, all Pavement Condition System (PCS) users, all Data Warehouse and Blue Book users, HPMS annual submittal, and UDOT Research and university studies. Secondary customers include State Aeronautics, Federal Highway Administration (Long Term Pavement Performance) and the balance of UDOT employee’s.

Schedule and Duration: Collection and processing (Apr 1 - June 30, 12 wks), post processing and QA/QC (July 1 – July 31, 4 wks), skid index deficient reports processing (Aug. 1 - Sept. 31, 8 wks), calibration (Fall, 1 wk).

Pavement Distress

Purpose: Process and publish vendor collected pavement surface distress for State Routes annually. Coordinate Region data transfer efforts. Provide Regional training and quality control.

Products: Annual report for condition. This report is both directions on all Interstate routes and one direction on non-Interstate routes.
**Resources:** One vendor owned instrumented High Speed Profiling Van. One office engineer to process, manage and publish data.

**Customers:** The primary customers include all Pavement Management Engineers in the Central and Regional offices, Region Material Engineers, all Pavement Condition System (PCS) users, all Data Warehouse and Blue Book users, and UDOT Research. Secondary customers include the balance of UDOT employee’s.

**Schedule and Duration:** Vendor collection (April 1 – June 30, 12 wks), vendor post processing and QA/QC (July 1 – August 30, 12 wks), delivered to Central for Regional transfer (September 1).

---

**Traffic Data**

**Purpose:** Raw traffic data is collected statewide on both state and federal aid highways to meet FHWA requirements.

**Products:** Automated Traffic Recorders: (ATR) record raw traffic volume & vehicle classification continuously. There are 95 locations strategically placed around the state. Data is downloaded daily and reported monthly. Short-time / 48-hr counts and Seasonal Counts. Traffic volume is collected by portable machines on all the state and federal-aid routes on a three-year cycle.

**Resources:** ATR network (95 locations), portable equipment, and a staff of six, each with their own vehicle. The ATRs consist of either inductive loops in the pavement or pole-mounted Wavetronix radar counters. Both are connected to a PEEK brand ADR (Automated Data Recorder), modem, and phone line which collect the data and transmit it back to the Complex. Current equipment includes PEEK ADR with pneumatic hoses, Nu-Metrics magnetic counters, and portable Wavetronix radar-based counters.

**Customers:** The raw data is only used within the department, typically only by the Traffic Data group. It may be shared with the Traffic Management Group at the Traffic Operations Center through data sharing agreements.

**Schedule and Duration:** Collected on a calendar year cycle, counting year-round.

---

**Post-Processed Traffic Data**

**Purpose:** Provide accurate traffic volume data on highways throughout the state.

**Products:** Produce traffic data in both map and tabular form to show the Average Annual Daily Traffic (AADT), Average Weekend Traffic, and Average Weekday Traffic, and Percent Trucks. Raw data is processed with historical factors for the day-of-week and month of the year to reach a statistically valid traffic volume.
Resources: Staff of four working with a central traffic database (TRADAS).

Customers: Nearly all groups inside FHWA and UDOT, plus the data is published for public use on the UDOT website. Some specific uses include: long range planning, project prioritization and finance, statistical reporting, safety analysis, pavement design, and resource allocation for maintenance and pavement management.

Schedule and Duration: Data processed on a calendar year cycle, reporting the previous year’s data approximately June of the following year.

HPMS:

Purpose: A federally-mandated report of annual highway statistics.

Products: An electronic database is submitted to FHWA each June. The Post-Processed Traffic Data is used to fill requirements in the HPMS data model. Many items are collected by the HPMS team and entered directly into the database, with the remaining ones provided by other groups within UDOT or FHWA.

Resources: A staff of two, data collection done by a single field technician and vehicle, either by computer or paper.

Customers: The FHWA is the primary customer, but information is extracted for use in statistical reports by state agencies and MPOs. Fiscal analysts at both state and local levels use the data for their projections and reports to congress.

Schedule and Duration: Data processed on a calendar year cycle. The report is due to FHWA by June 15 of the following year.

Photolog:

Purpose: The photolog is a video archive of the state assets collected annually.

Product: A web-based interface allows users to view photo footage of any state route. Additional data can be extracted including: geo-coordinate location, horizontal curve and grade data.

Resources: A staff of two operating a specially equipped van and one office workstation.

Customers: Primary customers are Traffic and Safety engineers (both Central and Region offices), project designers, Region permit officers, and state attorneys.

Schedule and Duration: Photo collection 4 months (May – August) and processing and Q/A takes place the remainder of the year.
Road inventory and reference:

**Purpose:** The physical location and length of all state and federal-aid routes is inventoried and stored in a database.

**Product:** Highway Reference Manual.

**Resources:** Two technicians and one vehicle equipped with GPS and DMI and a specialized laptop computer for data recording.

**Customers:** Primary customers are Traffic and Safety engineers (both Central and Region offices), project designers, Central Maintenance, and Region permit officers.

**Schedule and Duration:** Continuous effort. New routes are measured as construction is completed.

Local Road Inventory for Cities and Counties:

**Purpose:** The physical location of new local roads under city and county jurisdiction is verified and centerline data is collected via GPS to store in a geodatabase.

**Product:** Updated county maps and correct mileage detailing city (Class C) and county (Class B) ownership of roads. The B&C report is provided to the Comptroller for disbursement of fuel tax revenues.

**Resources:** Two teams of two technicians with GPS equipped vehicles.

**Customers:** Comptroller’s office and local governments.

**Schedule and Duration:** Continuous effort. Governments can submit new data each year.