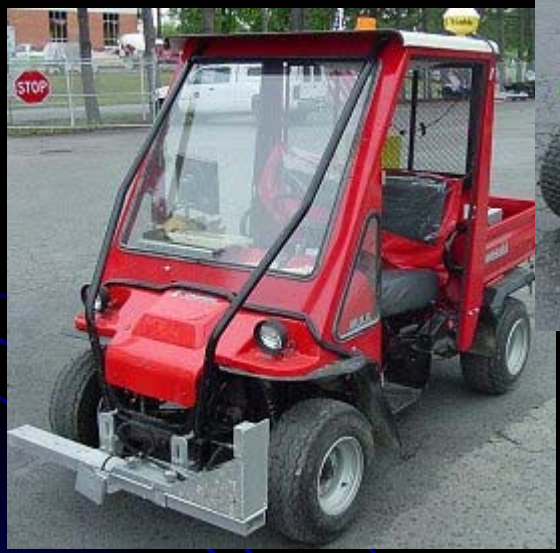
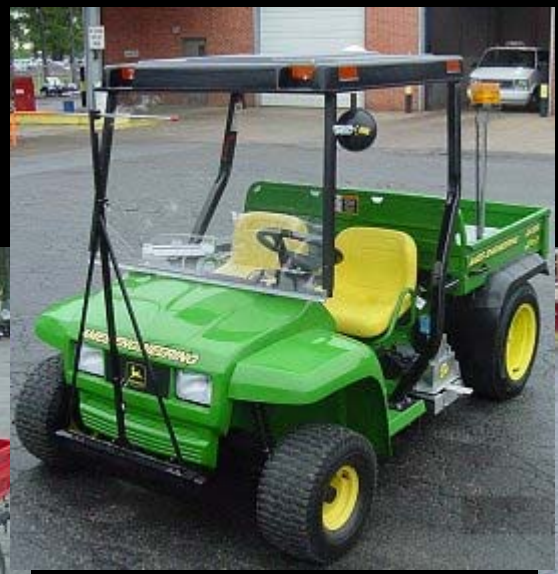
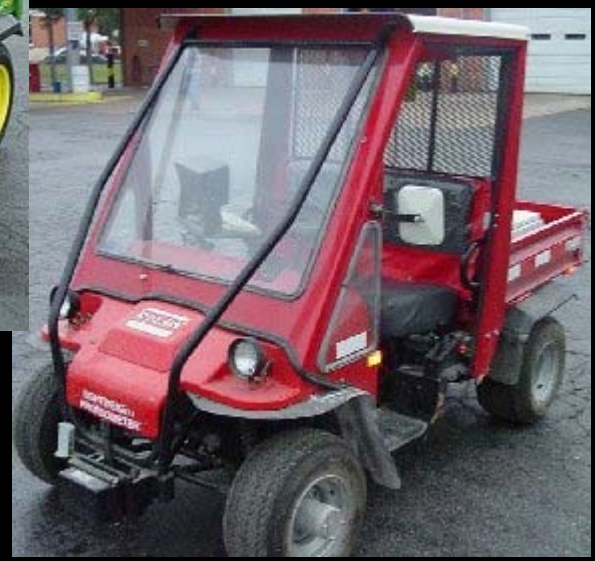
# Lightweight Profiler Certification





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# What is a Lightweight Profiler?

"A system of data collection devices mounted to a vehicle that measures the contour elevations of the roadway"

# 3 Main Types of Surface Profilers

- Lightweight (LWP) – Components mounted to a lightweight vehicle such as Kawasaki “Mule” or a John Deere “Gator”
  - Collection speeds from 8 to 22 mph
- High-Speed – Components mounted to cargo van or truck
  - Collection speeds from 50 to 60 mph
- Walk-Behind – Components mounted to a hand pushed device

# Department's Lightweight Profilers

AHTD currently owns three Lightweight Profilers (LWP):

- International Cybernetics Corporation (ICC)
- Dynatest (formally KJ Law)
- Ames "Lisa" (Ames Engineering)
- A new surface profiler commonly referred to as a "walk-behind" profiler will be purchased through one of the Department's current research projects

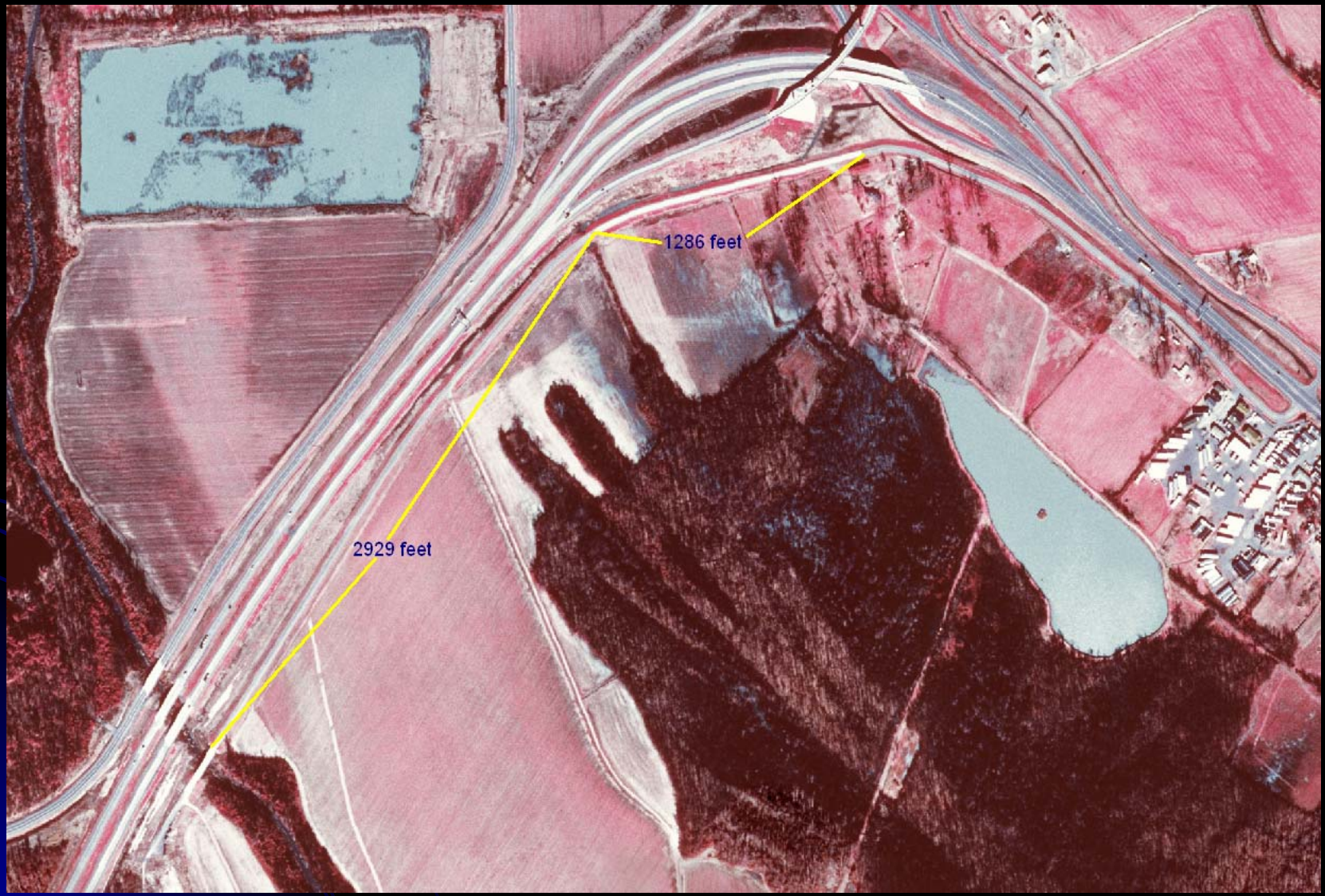
# Main Data Collection Devices

- Distance Measuring Instrument (DMI)
  - Sensor that measures distance traveled by the profiler
- Accelerometer
  - Records vehicle acceleration
- Laser Height Sensor
  - Non-contact height sensor that measures the distance from vehicle to pavement

# Certification Objectives

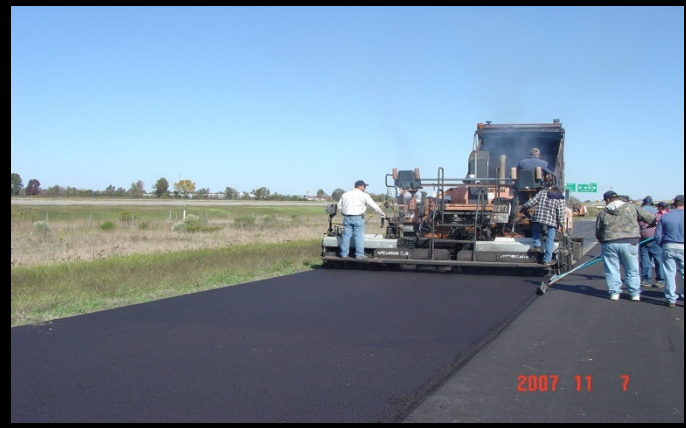
- Establish accurate and precise through a series of trial runs
- Establish a certification criteria as well as an acceptable deviation between profile measurements
- Develop assessment criteria for profile operators regarding profiler calibration and operation
- Create a standard method of operation for data collection that would maintain a common calibration area
- Use of PROVAL to analyze profile data

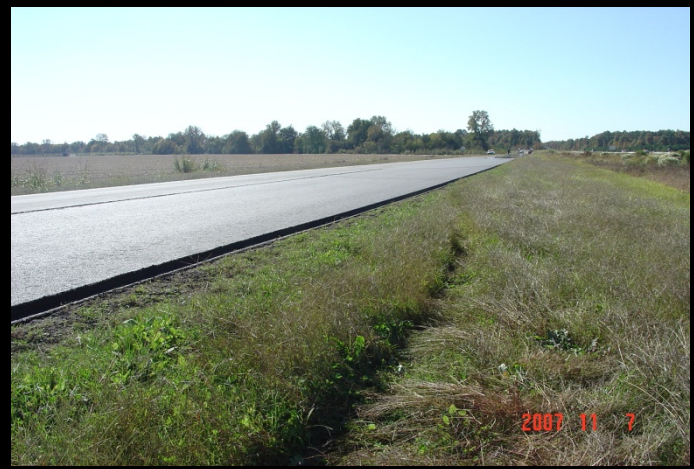
# Test Track Site



# Asphalt Test Track Construction

- Contains both asphalt and concrete sections
- ADT is approximately 10 vehicles per day
- Effects of the weather would supersede traffic volume in regards to the life of the pavement



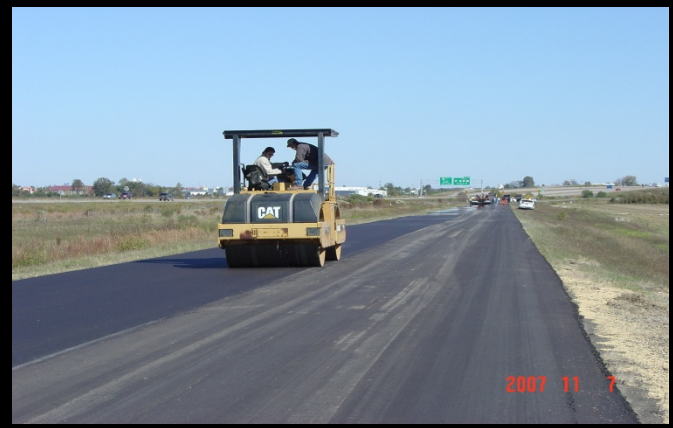



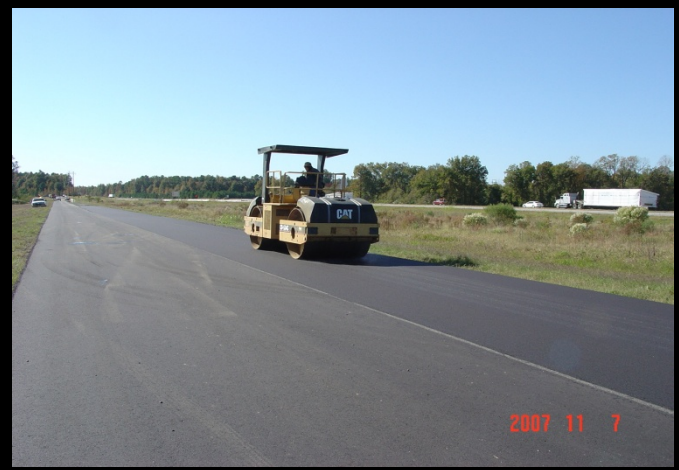
# Asphalt Test Track Construction (Cont.)

6/10 of lane mile section milled and overlaid with 2 inches of HMAC

- 12.5 mm, PG 64-22

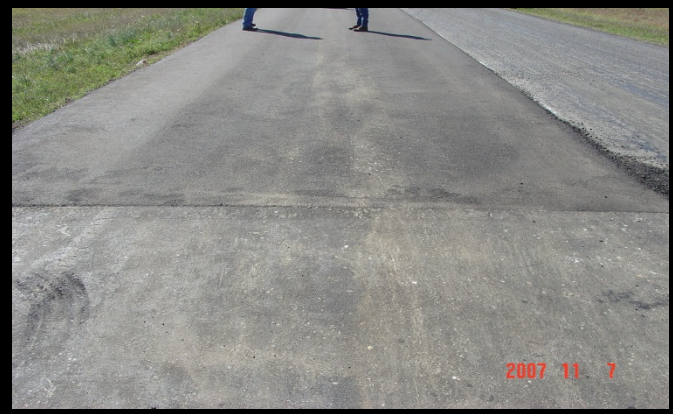
- 2/10 of a mile to be utilized
  - Smooth section – 9.0 in/mile per 1/10 mile section
  - Rough section – 15.0 in/mile per 1/10 mile section

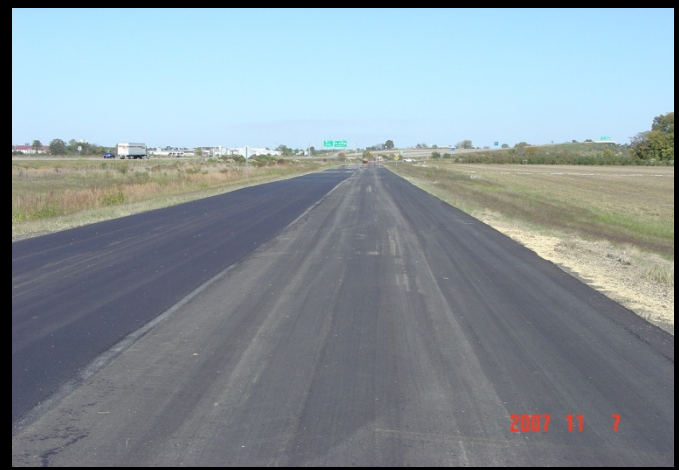


# Asphalt Test Track Construction (Cont.)

- 12 foot lanes and 3 foot shoulders
- 500 foot approach for acceleration to desired speed
- Delineated path will be set, signed and marked accordingly



# Concrete Test Track Section

- 1/10 of a mile section
  - PI approximately 15 in/mile
- Plenty of approach for acceleration to achieve desired speed
- New sensor purchased to take into account tined concrete surfaces
  - 4” ROLINE Sensor – “footprint” of the roadway surface
- Tined concrete surfaces could display false readings when using a single point sensor

# AHTD's Profiler Certification Deliverables

Scope of project will consist of 2 phases:

- Profiler Operator Certification thru U of A CTTP
- Profiler Equipment Certification thru U of A CTTP

- Profiler operator cert. ready by Fall/Winter 2008
- Profiler equipment certification ready by Spring 2009
  - AHTD personnel included
- The Department will purchase a Walk-Behind Profiler
- Blanking Band elimination under consideration
  - Currently reviewing national and other state's standards

# What Are Other States Doing?

- Many states currently have certification programs in place
- States are using profiler outputs to correlate to “Walk-Behind” surface profilers and/or digital survey data
  - Incorporate data into PROVAL
- Many states have smoothness specifications in place as well
- Speaking of smoothness specifications…

# Current AHTD Special Provision

- Includes use of the (10') straight-edge
- Max PI of 5"/mile/tenth mile section for mainlanes
- Max PI of 8"/mile/tenth mile section for ramps
- 0.2" blanking band (+/-0.1" tolerance)
- Profiler used must be calibrated to the California-Style Profilograph scale
  - ASTM E 1274
  - ASTM E 950
- Minimum of 10% of the pavement profiled for verification
- Grinding for corrective action by each tenth mile section

# Proposed Specification

- Use of (10’) straight-edge only for transverse profiles and shoulders
- Use of a certified High-Speed or Lightweight (LWP) Profiler for travel lanes
- Minimum of 25% of the pavement profiled for verification
- Referee testing to be conducted by the AHTD
  - Certified California-Style Profilograph to be the standard
- A table based on a percent (%) reduction in addition to a specified PI will be in the specification
- Specification will be in the next volume of the AHTD’s Construction Specifications

# AASHTO & ASTM Designations

- AASHTO MP11 - Equipment Specification for Inertial Profiler
- AASHTO MP17 - Pvmt. Ride Quality when Meas. Using Inertial Profiling Sys.
- AASHTO PP49 - Certification of Inertial Profiling Systems
- AASHTO PP50 - Operating Inertial Profilers and Evaluating Pavement Profiles
- ASTM E 950 - Measured the Longitudinal Profile of Traveled Surfaces with an Accelerometer Established Inertial Profiling Reference
- ASTM E 2560 - Data Format for Pavement Profile
- Among others..

# ¿QUESTIONS?