1. NCAT Test Track Site

Through mutual agreement with the National Center for Asphalt Technology (NCAT) at Auburn University, CAIT will have access to comprehensive truck fuel and oil consumption data and on-site climatological data at the NCAT highway test track site. The major research area being conducted at the NCAT Pavement Test Track is related to improving performance of Hot Mix Asphalt (HMA).

The test track is located on 309-acre site in Opelika, Alabama, about 30 minutes from the campus of Auburn University, as shown in Figure 1. This facility supports many supplemental research activities on pavement performance on a full-scaled, accelerated basis. The primary purpose is to evaluate highway performance in accelerated time frame by applying 5-year truck traffic in one-year time. Research activities done at the NCAT Pavement Test Track are sponsored by several State DOTs and many private companies in various industries.

The NCAT Test Track is an oval-shaped road divided into forty-six different asphalt pavement sections, each with a length of 200 feet. The layout of pavement sections on the NCAT Test Track site is shown in Figure 2. The truck axle loadings can be precisely monitored and environmental effects are identical for every section. Pavement surface parameters (smoothness, rutting, cracking, etc.) are monitored regularly as truck traffic accumulates to facilitate the objective performance analyses. Detailed climatological data are being monitored using the on-site weather station. In addition, detailed fuel and oil consumption data are being collected.

2. Traffic Applications

Truck traffic of 10 million standard axle load (ESAL) applications, designed over a lifetime period, is to be applied in about two years, starting from the first run on September 18, 2000. This traffic application program is scheduled to be completed by November of 2002. Until now,
6.1 million ESAL (61% of the 10 million ESAL goal) have been achieved. According to this amount of ESAL be applied, the measured rutting on pavement surface ranges from 0.25 to 6.15 mm, with an overall average of 2.53 mm [1].

Several issues are addressed during the traffic operation, which are [1]:

- Shifting forward of fifth-wheel hitch points to put more weight on the steer axles
- Development of alignment schedule to counter the effect of perpetually right-directed tangential accelerations
- Development of rotation scheme to counter the effect of running unidirectionally on the closed oval
- Double of the tractor’s frame to prolong service life causing gross vehicle weights to be approximately 152,000 lbs (roughly twice the limit allowed on most public roadways)

3. Climatological Data

Climatological data are being collected at the NCAT Test Track site. These data will be provided to CAIT. The summary of monthly and yearly temperature data have been obtained from the Internet site of the National Climate Data Center (NCDC) for nearby NOAA station in Opelika, Alabama [2]. The data include maximum air temperature, minimum air temperature, and average air temperature on both daily and monthly basis. Example of monthly and yearly temperature data are shown in Figure 3 and 4, respectively. These temperature data are currently being added into the AQMAN Database.

4. References

Figure 1. Location of NCAT asphalt highway pavement test track

Figure 2. Layout of NCAT highway test sections
Figure 3. Monthly air temperature data

Figure 4. Yearly air temperature data