Editor's Corner

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Accelerated Pavement Testing and Florida's Experience

Bouzid Choubane
Florida Department of Transportation
State Materials Office
5007 NE 39th Avenue, Gainesville, FL 32609, USA
E-mail: bouzid.choubane@dot.state.fl.us
http://www.dot.state.fl.us/statematerialsoffice/

The evaluation and validation of new/emerging pavement technologies and innovative concepts require assessing their in-service long-term performance. In-service assessment requires the consideration of the interaction between factors such as traffic loading, materials properties, and environmental conditions. The primary disadvantage of such an evaluation approach is the extensive time period required to obtain potentially meaningful results. Additionally, it is often difficult, impractical, and/or expensive to obtain or account for all the data and information required from in-service experimental set ups. Thus, the need for faster and more practical evaluation methods under closely simulated in-service conditions prompted a number of transportation agencies and research institutions worldwide to consider accelerated pavement testing (APT). APT is generally defined as a controlled application of a realistic wheel loading to a pavement system simulating long-term, in-service loading conditions. This allows the monitoring of a pavement system's performance and response to accumulation of damage within a much shorter time frame. APT can produce early, reliable and beneficial results including better understanding and prediction of pavement systems performance.

Since the early full-scale test track in Detroit in 1909, the APT has experienced many evolutionary milestones. Major investments have been and continue to be committed worldwide. At least three new programs have recently been initiated in Asia, one in Costa Rica, and another at the Pavement Test Facility of the US Federal Aviation Administration in New Jersey.

The Florida Department of Transportation (FDOT) APT program was initiated in 2000. The accelerated loading is performed using a Heavy Vehicle Simulator (HVS), Mark IV model. The APT facility is housed within the State Materials Research Park in Gainesville, Florida. This APT has become a critical component of FDOT's pavement research program providing engineers with insight into new pavement technology, design methods, and construction practices. The success of the program can be attributed to the careful selection of research projects that address critical pavement performance issues and prolong the life of Florida's roadways and the subsequent implementation of research findings. While a specific economic benefit cannot be quantified for each project, significant savings can be directly attributed to the implementation of results from APT research projects. For illustrative purposes, it is conservatively estimated that over $4 million is saved annually as a result of APT research on polymer modified asphalt binders and fine-graded asphalt mixtures and the subsequent implementation of the findings.

In conclusion, APT activities have, undoubtedly, resulted in significant innovations and advances in pavement engineering knowledge and practices worldwide. Specific economic benefits have been reported both in tangible and non-tangible less-quantifiable terms. Although APT continues to grow and mature, the associated programs are still ultimately about enhancing the performance and prolonging the longevity of the transportation infrastructure.