ABSTRACT
Surface polishing is one of the few functional failures that occur in portland cement concrete (PCC) pavements. An increase in surface polishing leads to higher incidences of skid-related accidents on highways. This type of failure is often associated with the usage of softer fine aggregate such as limestone sands.

To identify polish resistance aggregates, state agencies like TxDOT have adopted tests such as the acid insoluble residue test (AI). Because dolomite or limestone aggregates are soluble in acid they cannot pass the AI test. Some districts such as the Dallas and Fort Worth have few local sources of sands that meet the current specifications and are forced to haul aggregates from distant sources (which increases cost).

The goal of this research is to develop laboratory tests that can reasonably predict performance of concrete pavements made with different types of sand. For this purpose concrete slabs made with different sands are being evaluated for friction and texture using a circular texture meter, a dynamic friction tester, and a concrete surface polisher. To ensure that the values obtained at the lab relate to field performance, test sections constructed with 100% limestone sand and blended sands are being evaluated. Laboratory and field test results for skid will be used to identify the aggregate test that best correlates with concrete performance. Results show that some of the sands that fail the AI test have performed as well as the control siliceous sand that pass the AI test. Aggregate tests such as the micro-Deval have shown to relate more closely to the concrete performance tests performed under laboratory conditions.
PCC pavement made with 100% limestone sand showing polishing in wheel paths

**Note:** The presentation will include results, photos (lab and field), and a short video. Concrete samples made with different sands will also be distributed to the audience so that they can have a better feel for the type of failure being discussed in the presentation.