Understanding IRI

When a road is rough, drivers feel it. Pavement roughness (or conversely, smoothness) has a significant effect on driver comfort, vehicle maintenance, roadway maintenance, and vehicle fuel efficiency. In fact, pavement smoothness is the key factor used to determine road user satisfaction, according to the Federal Highway Administration (FHWA).

To help quantify a pavement’s smoothness, road owners typically use the International Roughness Index (IRI). IRI measures cumulative deviation from perfect flatness along a road in inches per mile or meters per kilometer, determined by vehicle vibrations. Simply put, a lower IRI value equals a smoother pavement — meaning owners can count on more satisfied driving public.

Until 2002, FHWA classified roads into five broad categories (from very good to poor) based on IRI. Since 2002, FHWA has used IRI to not only quantify smoothness, but also as a proxy to measure ride quality. The table below breaks out the IRI ranges for both classification systems. State departments of transportation and other agencies may use different IRI ranges to classify the condition or ride quality of their pavements. Although all roads increase in roughness over time, asphalt roads tend to start smoother and can be maintained smoother more easily.

IRI values for state-funded roads are collected annually by departments of transportation. Those pavements with higher IRIs are analyzed and assessed, and when required, rehabilitated. In addition, if an unexpected rate of change in pavement roughness is noted, preventative maintenance can be scheduled to ensure a certain level of smoothness, extending the life expectancy of the pavement.

By constructing smooth asphalt pavements, pavement specifiers can ensure a higher level of drivability and comfort for drivers and passengers, reduce vehicle maintenance costs for drivers, and reduce the maintenance needs on a pavement over its life, ultimately saving the road owner money.

For more information, visit www.DriveAsphalt.org/Smoothness.

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