

A VALIDATION EXPERIMENT FOR ANGLE OF ATTACK LIMITS ON OBTUSE CROSSINGS

Investigations into small wheels have raised the question of the effect of angle of attack on the likelihood of any sized wheel derailing at an obtuse crossing. Of particular concern is the performance of long-wheelbase vehicles generating large angles of attack at obtuse crossings on curves.

The report describes an experiment to measure the path of a wheelset with an angle of attack over an obtuse crossing. It concludes that a wheelset with an angle of attack rolls across the gap of an obtuse crossing at its angle of attack relative to the rail. For a 9m wheelbase vehicle on the minimum allowable radius of 1 in 6 or 1 in 5.5 obtuse crossing, the resulting lateral movement would cause a severe impact on the crossing nose. If the crossing is wide to gauge, the severity of the impact could be increased. This is unlikely to cause derailment of a vehicle, but should be avoided to prevent damage to the crossing.