Background:

The NTSB, in a Safety Recommendation dated September 2, 2011, recommends that the FHWA work with AASHTO to develop and implement best practices to assist state transportation agencies in identifying existing locations where cross-slope breaks pose a rollover hazard, placing an emphasis on those roadways having high volumes of heavy truck traffic, and develop appropriate strategies for mitigating the hazard. The NTSB further recommends that, until these best practices have been developed and disseminated, the FHWA provide information to state transportation agencies about the safety risks associated with cross-slope breaks and their potential for increasing the rollover propensity of commercial vehicles that have a high center of gravity.

The Department's criteria for Highside Shoulder Rollover is that the algebraic difference between the shoulder and the travelway cross slopes shall not exceed 8%. Inroads, the HDG and AASHTO, all have methods that allow the highside rollover to be at maximum allowable once the Superelvation reaches +4%. The shoulder cross slope is currently calculated by the formula:

\[ \text{Shoulder Cross Slope} = 8\% - e \] (\(e\) = travelway cross slope) or 4%, whichever is less.

Guidance:

For horizontal curves that require a full Superelevation section of greater than or equal to +4%, the maximum associated shoulder cross slope in the fully superelevated curve shall be -2%. The transition from normal shoulder cross slope of -4% to -2% must be completed as the superelevated section reaches +4%. This approach will ensure that the maximum rollover will only be utilized at the maximum superelevation of +6%. The transition for shoulder cross slope shall not exceed a grade change of greater than 2% in 50’. Those roadways that have shoulders/ curb offsets of less than 4’ may be straight graded for constructability reasons, but care should be given to drainage issues for highside shoulders.
1. Maximum high side shoulder rollover (8%) only used with 6% superelevation.
2. Full superelevation sections greater than or equal to 4% shall have a high side shoulder cross slope of 2%.
3. Guidelines noted here also apply to a 3% travelway/6% shoulder normal crown combination.
4. Guidelines noted here apply to both divided and undivided highways.
5. When altering the cross slope is impractical or outside the scope of work, the high side shoulder rollover should be reduced to the minimum extent practical. Surface drainage should be considered.