



Project Summary

Texas Department of Transportation

0-5860: Guidelines for Ramp Terminal Spacing for Freeways

Background

Existing geometric design guidance related to interchange ramp spacing in the Texas *Roadway Design Manual* and the AASHTO publication *A Policy on Geometric Design of Highways and Streets* is not speed-dependent even though intuition indicates spacing and speed are related. The objectives of this project were to investigate relationships between weaving length, speed, and overall vehicle operations on Texas freeways; and to propose updates to current Texas Department of Transportation (TxDOT) guidance on recommended distances between ramps.

What the Researchers Did

Several methods were explored as part of this TxDOT project to assist in developing guidance on ramp spacing. The methods or resources used to generate potential lengths included:

- guidance provided in *Design Manual for Roads and Bridges* published by the Highways Agency in England,
- minimum deceleration and acceleration length for freeway conditions,
- decision sight distance,
- sign spacing needs,
- findings from the National Cooperative Highway Research Program project 3-75,
- findings from field studies at seven sites,
- findings based on simulation conducted as part of this research, and
- safety relationships identified in the literature.

What They Found

Historically the minimum weaving length with an auxiliary lane has been 1500 ft. The literature on safety identifies trends that indicate longer spacing is associated with fewer crashes. Values identified from the evaluation of the field data collected in this study along with values calculated using minimum acceleration and deceleration values were suggested as spacing dimensions. Both sets of these values provide a range of lengths for the range of design speeds. Also suggested for consideration by TxDOT is a weaving length based on preliminary findings from safety investigations along with the value being used in England for rural motorways.

The amount of information on a guide sign is a key limiting factor for maintaining the legibility of signs on higher speed roadways. Previous work recommended using more redundancy of signs which will allow the use of fewer units of information per sign. The tradeoff is that a greater distance will be needed in advance of the ramp to adequately sign for the exit.

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What This Means

The main product of this research was new material for consideration in ramp spacing. The suggested values (see Figure 1) were determined based on evaluations of operations with consideration of findings in the literature with regards to safety.

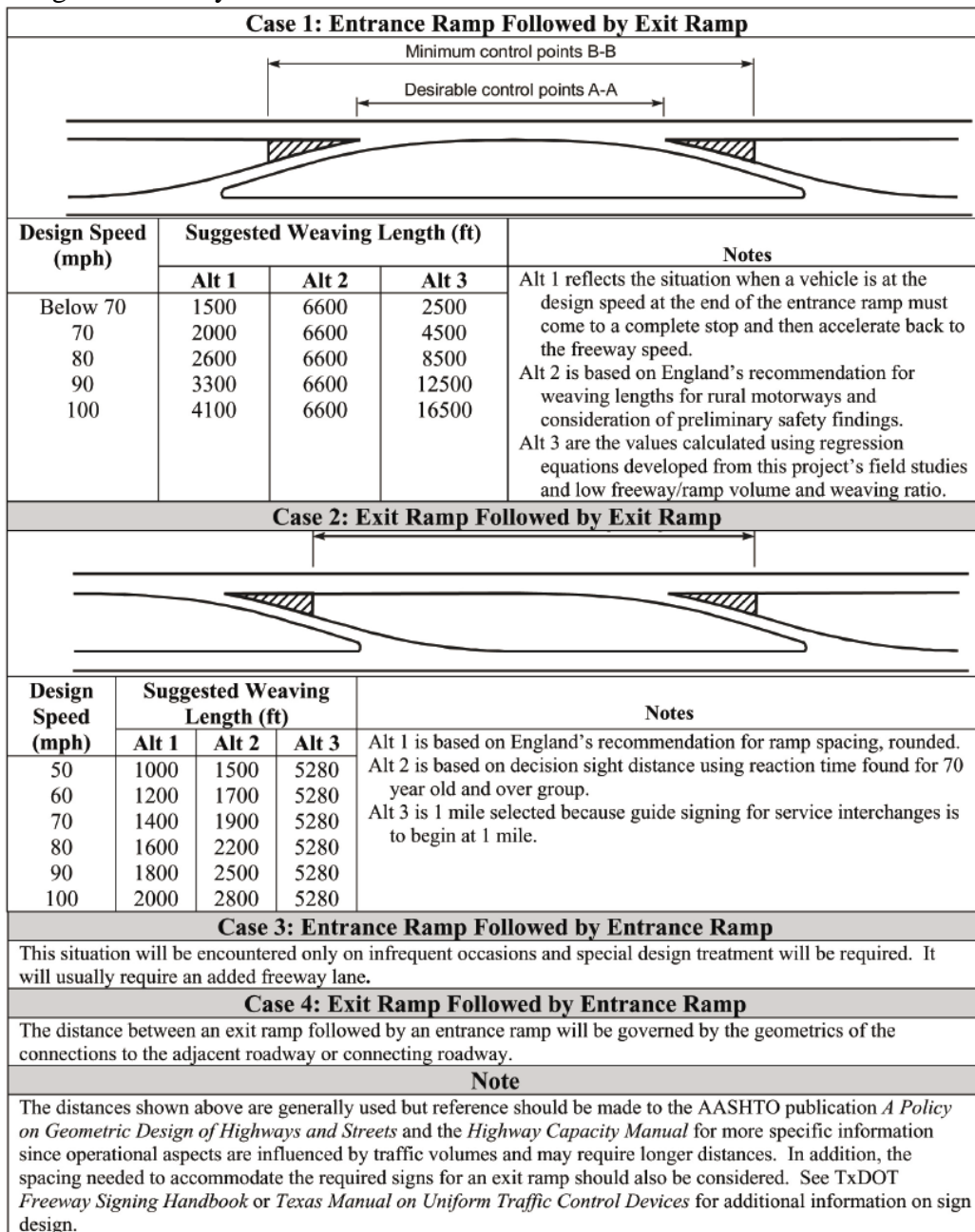


Figure 1. Suggested Successive Ramp Dimensions from Research Project 0-5860.

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