



To: Region Traffic Engineers and Region Outdoor Advertising Inspectors  
From: Neil Lacey, Branch Manager  
Subject: Interpretation of Rule 7.00(D)(2)(b) for Signs Adjacent to Long Auxiliary Lanes Between Two Interchanges  
Date: September 17, 2018

---

**MEMORANDUM**

---

**Background**

Since 1971 CDOT has been subject to an agreement with the United States Department of Transportation. The agreement sets forth the State of Colorado’s terms for size, spacing and lighting of signs, as well as customary use related to Outdoor Advertising. Among these rules is a prohibition of billboards along ramps and areas of pavement widening at interchanges, rest stops and intersections at-grade. This restriction is intended to minimize distraction for drivers undertaking complex merge and diverge maneuvers as well as reduce “competition” for drivers’ attention between roadside advertising and more important regulatory, warning, and guide signs typically present in the vicinity of entrance and exit ramps. This prohibition is codified, nearly verbatim, at Rule 7.00(D)(2)(b), 2 CCR 601-3.

In 1996, CDOT asked FHWA for a clarification of the language in the agreement related to signs installed adjacent to auxiliary lanes. The auxiliary lane is considered pavement widening for entering traffic and also for exiting traffic. FHWA concurred that signs should not be installed adjacent to auxiliary lanes and CDOT is staying with that ruling except for those locations where there are long auxiliary lanes.

The purpose of this Memorandum is that CDOT is re-interpreting the Rule 7.00(D)(2)(b), 2 CCR 601-3 for those instances where there are long auxiliary lanes between interchanges where the pavement widening is sometimes used for purposes of lane balancing in addition to ingress and egress movements from the highway. CDOT is defining long auxiliary lanes to be those auxiliary lanes that include pavement widening that begins at the end of the on ramp of one interchange connecting to the exit ramp (or slightly beyond) of the following interchange. In the cases of long auxiliary lanes, CDOT may allow a sign as long as the location is not within the limits where CDOT believes the location would interfere with the decision distances defined later in this Memorandum that are consistent with highway design, capacity, and principles of traffic engineering.

**Purpose**

Highway design and construction has changed much since 1971. Notably, modern design often utilizes auxiliary lanes to maintain the flow of traffic while connecting ramps and intersections—even ramps and intersections that are spaced far apart. In areas where auxiliary lane traffic can merge into the main-travelled way, and vice versa, over long stretches of roadway, the safety concerns Rule 7.00(D)(2)(b) seeks to address are mitigated. Moreover,

questions emerge concerning how to consistently apply the Rule. Namely, there is confusion concerning where the beginning and ending of pavement widening occurs when an auxiliary lane connects two intersections at-grade or two interchanges.

CDOT was recently confronted with determining how to apply Rule 7.00(D) (2) (b) along a long auxiliary lane that connected two interchanges. The applicant raised concerns about the justification of applying Rule 7.00(D)(2)(b) to its proposed sign location, raised concerns about the measurement standard in the Rule, and referred CDOT to an Office of Administrative Courts case where an administrative law judge ruled it was arbitrary for CDOT to apply the prohibition in an area near the center of a long auxiliary lane.

In light of these concerns, CDOT engaged its engineers to consider the safety implications of Rule 7.00(D)(2)(b)—and more specifically, to ascertain whether Rule 7.00(D)(2)(b) and its counterpart in the Federal-State Agreement can be interpreted in a way that maintains the safety concerns it seeks to implement while not unnecessarily restricting billboards.

CDOT’s engineers recognized the following:

- 1) Auxiliary lanes provide valuable improvements to capacity by providing lane balance between adjacent interchanges and extending the distance over which weaving maneuvers can be undertaken. Auxiliary lanes between ramps that are spaced greater than 3,500 feet may be assumed to function with three discrete segments consisting of A) entrance ramp merge, B) general travel lane for lane balance, and C) exit ramp diverge. In addition, investigative studies have recognized that the “cognitive demands on drivers is greatest when they must position themselves to take an exit, enter a freeway, reduce or drop lanes, merge with other traffic, change route etc.”<sup>1</sup>
- 2) Freeways in Colorado are normally designed with a 75-mph design speed while curves on entrance and exit ramps are most often designed with a 45-mph design speed.<sup>2</sup>
- 3) Using these design speeds, the effective minimum length needed for safe and efficient operation of the merge and diverge areas can be determined using AASHTO standards<sup>3</sup>; it is within these zones that outdoor advertising devices must be discouraged because these devices can divert drivers’ attention from the merging and diverging tasks.
- 4) In the interest of maintaining a standardized, fixed reference point from which to measure for those locations where long auxiliary lanes (longer than 1,500 feet) exist, the physical gore comprising the point where mainline and ramp pavements meet within an interchange will be used for the point of beginning and point of ending for the following calculations.

---

<sup>1</sup> *Safety Impacts of the Emerging Digital Display Technology for Outdoor Advertising Signs, Final Report* (Submitted under NCHRP Project 20-7 (256)), p. 159, April 2009.

<sup>2</sup> Colorado Department of Transportation. *CDOT Roadway Design Guide 2005*. [https://www.codot.gov/business/designsupport/bulletins\\_manuals/roadway-design-guide](https://www.codot.gov/business/designsupport/bulletins_manuals/roadway-design-guide). July 20, 2017.

<sup>3</sup> American Association of State Highway and Transportation Officials. *A Policy on Geometric Design of Streets and Highways*. AASHTO, 2011, p. 10-110.

- 5) Unlike the painted nose (theoretical gore) which can be altered by restriping to achieve operational and safety benefits, the location of the physical gore is set by agreement with the Federal Highway Administration and is not normally altered outside the context of a major infrastructure project. The distance between this point (physical gore) and the painted nose (theoretical gore) varies in practice and is a function of the departure angle of the subject ramp but is generally not longer than 400 feet for most ramp designs.

Accordingly, after consultation with the Region Traffic Engineers, CDOT's interpretation of Rule 7.00(D)(2)(b) is henceforth limited by the following principle:

For those locations along interstates or freeways and outside of incorporated areas where there is a continuous long auxiliary lane (longer than 1,500 feet) that extends from the entrance ramp/lane of one interchange/intersection at-grade and connects to the exit ramp/lane of another interchange/intersection at-grade, such that there is no clear "beginning or ending of pavement widening at the exit from or entrance to the main-traveled way," Rule 7.00(D)(2)(b) prohibits signs located: (A) **within 2,250 feet\* from the physical gore of entrance ramps**, and (B) **within 1,600 feet\*\* from the physical gore of exit ramps**.

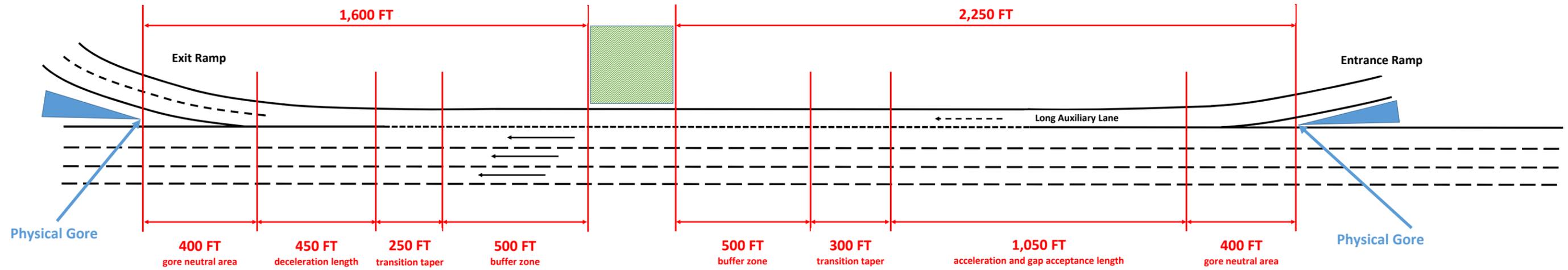
In conjunction with these geometric considerations, a review of freeway crash data will be conducted to determine if a crash pattern involving rear-end or sideswipe (same direction) crashes is present in the vicinity of these points. In the event a crash pattern is evident, the driver decision zone of roadside advertising exclusion will be extended at 500-foot increments from the aforementioned points along the auxiliary lane to a point at which no crash pattern exists which then could impact other eligibility criteria related to the location of the sign.

This interpretation applies only to interchanges and intersections at-grade which are connected by long auxiliary lanes. These long auxiliary lanes do not implicate the same safety concerns sought to be effectuated by Rule 7.00(D)(2)(b). Accordingly, this new interpretation will only serve to allow additional signage in areas which have sufficiently long auxiliary lanes that are designed for lane balance.

[Note: This Memorandum pertains to new signs that are not yet installed or where permits are not finalized. In the past CDOT has allowed static signs to remain in locations where the interchange ramp locations were revised causing the sign to be adjacent to an auxiliary lane due to highway lane modifications. In those cases the static billboards have been re-classified to be non-conforming and allowed to remain.]

*\* Calculated by adding a 400' gore neutral area, a 1,050' acceleration and gap acceptance length, a 300' transition taper, and the 500' buffer zone required by Rule 7.00(D)(2)(b).*

*\*\* Calculated by adding the 500' buffer zone required by Rule 7.00(D)(2)(b), a 250' transition taper, a 450' deceleration length, and a 400' gore neutral area.*



 Sign may be allowed in this area. This area may be decreased in 500 FT increments depending on crash data.

The AASHTO Policy on Geometric Design of Highways and Streets (Green Book, 2011 edition) was consulted to determine the acceleration, deceleration, transition taper, and gore neutral area lengths, which were based on mainline and ramp designs speeds of 75 MPH and 45 MPH, respectively. (see pages 10-106)

The 500 FT buffer zone for interchanges, intersections at grade, and safety Rest Areas along interstate highways and freeways (outside of incorporated villages and cities) was established in the 1971 Federal-State Agreement and codified in 2 CCR 601-3, Section 7.00(D)(2)(b).