



Florida Department of Transportation

RICK SCOTT
GOVERNOR

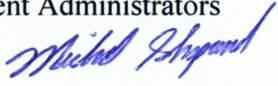
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ANANTH PRASAD
SECRETARY

ROADWAY DESIGN BULLETIN 14-09

DATE: May 29, 2014

TO: District Directors of Operations, District Directors of Transportation Development, District Design Engineers, District Construction Engineers, District Structures Design Engineers, Program Management Administrators

FROM: Michael Shepard, P. E., State Roadway Design Engineer 

COPIES: Brian Blanchard, Tom Byron, Duane Brautigam, David Sadler, Tim Lattner, Mark Wilson, Bruce Dana, John Krause, Greg Schiess, Robert Robertson, Nick Finch (FHWA), Chad Thompson (FHWA), Jeffrey Ger (FHWA) and Felix Delgado (FHWA), Phillip Bello (FHWA)

SUBJECT: Hydroplaning Analysis and Guidance for Wide-Lane Section Roadway Design

REQUIREMENTS

Add the following new section to the *Plans Preparation Manual, Volume 1, Chapter 2, Section 2.1.5.1*:

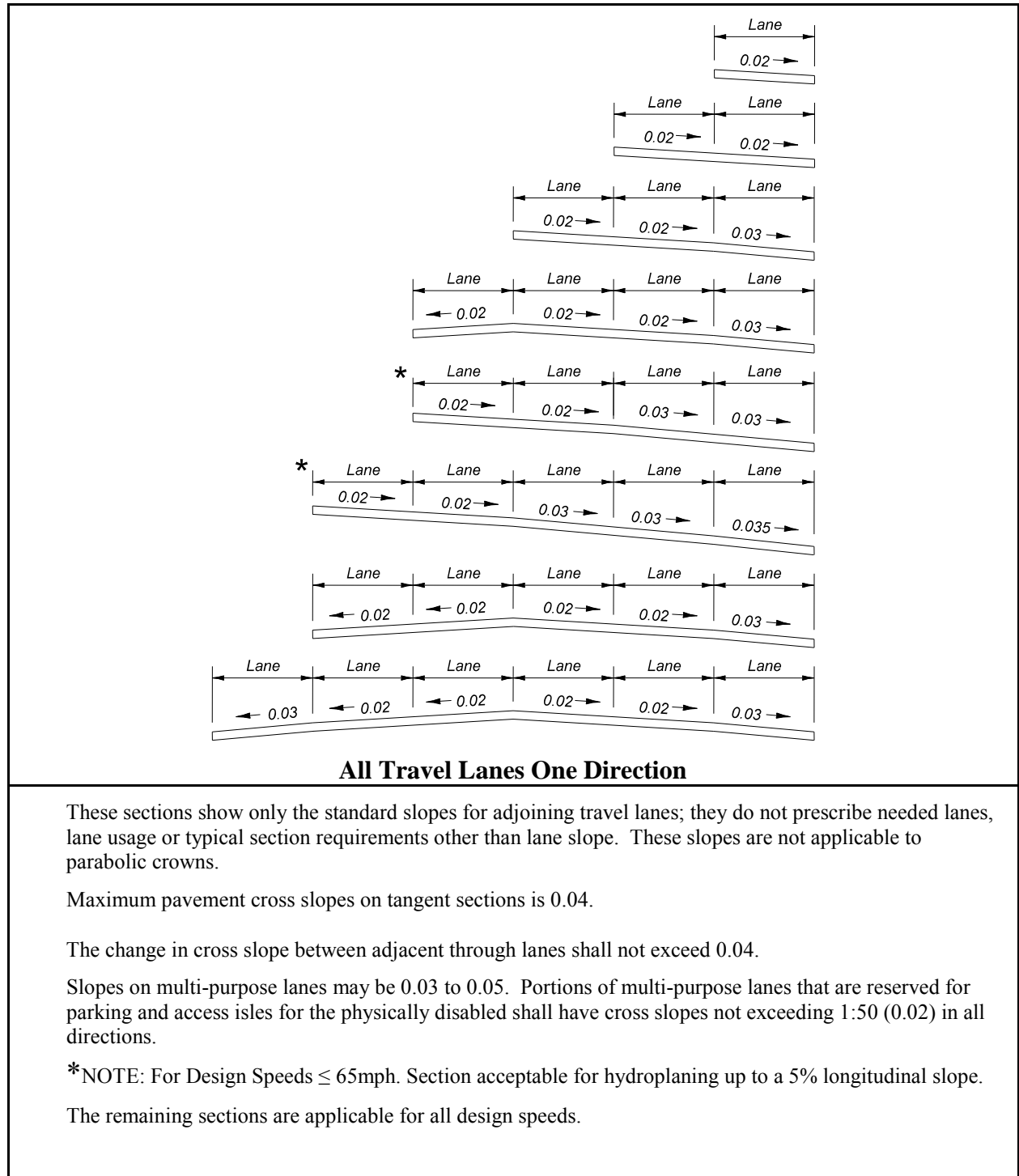
2.1.5.1 Hydroplaning Analysis

Figure 2.1.1 shows standard pavement cross slopes. Existing or proposed roadways exceeding the maximum allowable travel lanes with cross slope in one direction require that a Design Variation must be approved. At the discretion of the District, the Design Variation should include an analysis of the hydroplaning risk, including contributing shoulders, and document the expected cost savings utilizing the existing or proposed section. This analysis is intended for new construction and widening projects, and may be used for resurfacing or RRR projects.

Hydroplaning potential will be assessed by the HP program and the document, Design Guidance: Hydroplaning Risk Analysis, which can be downloaded at:

<http://www.dot.state.fl.us/rddesign/Drainage/ManualsandHandbooks.shtm>.

Replace **Figure 2.1.1** with the following new figure:



COMMENTARY

In 2012, FDOT and University of South Florida developed HP, a hydroplaning assessment tool, to better predict hydroplaning potential using the roadway parameters such as pavement type, pavement temperature, lane width, cross slope and longitudinal slope. The program has two components: (1) a methodology to predict water film thickness (WFT) on the pavement being analyzed; and (2) a methodology to predict potential hydroplaning speed given the WFT determined.

HP offers different formulas for calculating the WFT and the potential hydroplaning speed. The default HP options (the Gallaway formula for WFT together with the PAVDRN formula for hydroplaning speed prediction) produce what has been found to be the most accurate model combination with respect to Florida's wet weather crash data.

BACKGROUND

A cost effective design preference for widening roadway sections is to slope all lanes in the same direction to minimize drainage infrastructure. Currently, designers may implement any of the eight (8) standard pavement cross slopes shown on Figure 2.1.1 in Section 2.2 of the Plans Preparation Manual. If the widening design results in a differing pavement cross slope section, then a Design Variation is required and a hydroplaning analysis should be performed.

IMPLEMENTATION

These requirements are effective immediately on all Design-Bid-Build projects in Design Phase I, and on all applicable projects still in the Design Phase where implementation will not adversely impact production schedules.

These requirements are effective immediately on all Non-conventional projects for which the final RFP has not been released. Non-conventional projects for which the final RFP has been released are exempt from these requirements unless otherwise directed by the District.

CONTACT

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