

**WET PAVEMENT CRASH STUDY  
OF LONGITUDINALLY TINED PCC PAVEMENTS  
TRANSVERSELY TINED PCC PAVEMENTS  
AND  
ASPHALT PAVEMENTS**

A research effort expanding on a comparison of  
Longitudinally and Transversely tined PCC Pavements

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This report represents the findings and opinions of the authors. It does not reflect official views of any private or public organization. The assumptions, data and analysis methodology used herein are presented in detail in the appendices of this document, so the reader can form an educated opinion about the validity of this effort.

## ABSTRACT

This report provides crash statistics for Longitudinally Tined (LT) Portland Cement Concrete (PCC), Transversely Tined (TT) PCC and asphalt pavement surfaces. The statistics were compiled for urban and rural freeways, classified in two Average Daily Traffic (ADT) categories: pavements carrying less than 60,000 vehicles per day (VPD) and those carrying an ADT in excess of 60,000 VPD.

In California LT had a consistently lower crash rate than asphalt (although the difference was trivial on urban freeways with less than 60,000 ADT). This finding was based on very extensive data and is reliable. A direct comparison between TT (present only on bridge decks) and LT surfaces for urban freeways carrying more than 60,000 VPD indicated that TT had a lower crash rate than LT which, in turn, had a lower crash rate than asphalt pavements (95 crashes per 100 million vehicle miles of travel vs. 100, vs.108, respectively).

For Wisconsin rural freeways with an ADT less than 60,000 VPD the critical safety issue was not wet pavement performance, but pavement performance when snow or ice were present on the pavement. Although TT had a lower ratio of crashes on wet pavement divided by crashes on dry pavement (wet-to-dry ratio) than asphalt (0.16 and 0.23, respectively), the (wet + snow/ice)-to-dry ratio was in favor of asphalt pavements (1.50 for TT vs. 1.26 for asphalt). When the percent of time that frozen precipitation was present on pavements was taken into account, asphalt was still outperforming TT: the risk of being involved in a crash on snow- or ice- covered pavement compared to the risk of a crash on dry pavement was 20.30 times higher for TT vs. 15.09 times higher for asphalt.

Although urban and rural Wisconsin freeways demonstrated relatively small differences in terms of wet-to-dry ratios, the ice/snow-to-dry ratio for urban freeways was dramatically smaller than that for rural freeways, and smaller than the wet-to-dry ratio both for TT and asphalt surfaces. Based on this finding, it was hypothesized that the identified safety problem when frozen precipitation was present on rural pavements was not so much a function of pavement texture, as it was a function of winter maintenance operations (or any number of factors that differentiate rural from urban freeways when snow is present on the pavement).

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