



Did You Know? Congestion and Crashes



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According to recent research from the Texas Transportation Institute, congestion in most of the United States' major urban areas is on the rise (1). The average driver spent 19 hours stuck in traffic in 1982, but 33 hours stuck in traffic in 1993. The study examined congestion levels in fifty major urban areas from 1982-1993. In 1993 alone, the total cost of congestion for the fifty urban areas studied was \$51 billion, costing the average driver \$470. On average, each major urban area would need to build 48 lane-kilometers of freeways and principal arterial streets each year simply to maintain current levels of congestion (a demand that is unlikely to be met), unless alternative modes of transportation become more prominent.

But what about the impact of congestion on traffic crash rates? Congestion crash rates are not what you might expect. A recent study by researchers from the Michigan Department of Transportation and Michigan State University looked at a sixteen mile segment of Interstate in the Detroit area over two years to examine relationships between different levels of congestion, measured by volume to capacity (v/c) ratios, and crash rates, measured by crashes per 100 million vehicle miles traveled (VMT) (2). The results indicated that crash rates are very high at low levels of congestion but rapidly decrease with increasing v/c ratios, before gradually increasing again at peak levels of congestion. This U-shaped model holds true for overall weekday and weekend crashes, multi-vehicle crashes, rear-end crashes, and property-damage-only crashes. On the other hand, injury and fatal crashes tend to decrease steadily as v/c ratios increase.

Why are overall crash-rates higher when congestion is lowest? First, low traffic levels permit higher speeds. Single-car fixed-object and rollover crashes are more prevalent. Also, lower v/c ratios typically occur late at night and in the early morning, when drinking and drowsy drivers are prevalent. The authors attributed the increase in general crashes at very high v/c ratios to increased traffic conflict. Interestingly, this increase appears to limit the number of fatal and injury crashes.

(1) Schrank, David L. and Timothy J. Lomax, Urban Roadway Congestion - 1982 to 1993 Volume 1: Annual Report Texas Transportation Institute, Research Report 1131-8, August 1996, College Station, TX.

(2) Zhou, Min and Virginia P. Sisiopiku, "On the Relationship Between Volume to Capacity Ratios and Accident Rates," Presented at the TRB Annual Meeting January 12-16, 1997. Sponsored by the Michigan Department of Transportation and the Michigan State University Department of Civil and Environmental Engineering.

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AAA Foundation for Traffic Safety

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