Effects of Short-Term Lane Closures on Traffic Flow of Freeways

Abstract:
One of the main causes of congestion on freeways are lane closures due to short-term construction works or accidents. To avoid congestion due to these events, this study aims at analyzing traffic flow at such bottlenecks. The focus was to determine the effect of different traffic guidance measures on the capacity and take a closer look at the driven speeds and the traffic volumes on each lane. For the execution of this study, traffic data of the section control system on the German freeway A99 between interchange Munich-North and interchange Munich-South from 2012 and data of all lane closures in that period were available. Due to the amount of data, the field of this study was limited to closures of one out of three lanes. For those situations, it turned out that the capacity ranged between 2800 and 3000veh/h in case of closures of the right lane and between 3100 and 3300veh/h in case of closures of the left lane. Thus, the capacity is 10% lower for closures of the right lane. Furthermore, larger speed differences were determined in case of closures of the right lane than of the left lane. This may be caused by the high percentage of heavy vehicles on the right lane. Heavy vehicles changing from the right to the middle lane apparently affect the traffic flow more than
cars changing from the left to the middle lane.