

# Driver Distraction: The Impact of Secondary Tasks on a Touch Display Steering Wheel

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## ABSTRACT

Driver distraction from new in-vehicle devices becomes an increasingly critical issue. The research presented explores driver distraction from the primary task when performing secondary tasks using a touch display steering wheel (TDSW) interface. A simulator experiment was conducted to measure the driver distraction and to discriminate between the tasks. Results of the study show intensified driver distraction using a TDSW.

## Categories and Subject Descriptors

H.5.2 [Information Interfaces and presentation]: User Interfaces - Input devices and strategies

## Keywords

Touch Display Steering Wheel, Simulator, Distraction, Car

## 1. INTRODUCTION

The usage of a touch display interaction device on a steering wheel has been researched amongst others focusing on text input and gesture interaction [2]. An initial study is presented that investigates the distraction impact of secondary tasks performed on TDSWs. The overall goal is to classify the distraction of ten different standard secondary tasks to discuss design challenges based on initial user feedback.

## 2. APPROACH

As a standardized methodology to assess driver interaction demand, the Lane Change Test (LCT) provides a metric for secondary task comparison. Therefore the lane change performance while driving and using the system is computed against a normative model of single task performance. The extent to which the dual task performance results in increased distraction is reflected in the mean deviation in lane change path (Mdev) [1].

## 3. RESULTS AND CONCLUSION

The mean duration for each participants task completion varied widely from 2.7s to 87.3s. The participants showed a greater mean deviation when performing two tasks at once (Mdev=0.75), than when performing the baseline condition (Mdev=0.39). The LCT performance values show great differences between medium demand (Mdev=0.66) and high demand tasks (Mdev=1.03). According to the verbal responses of the participants, they liked the touch interaction afforded by the TDSW interface, but often recognized a high distraction level. They preferred simple tasks and desired combination with speech and pushing a button. The

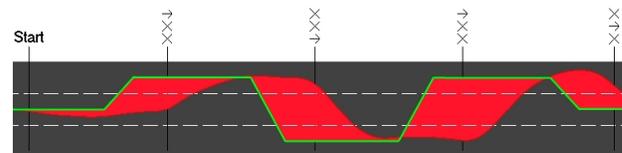


Figure 1: graphical representation of the lateral deviation between the normative model and the driven path

quantitative findings have shown a intensified distraction of secondary tasks on a TDSW and demonstrate the need of intuitive, low demand interaction. Overall the results show the utility of the approach and that a touch display steering wheel is a viable option for secondary task interaction.

## 4. ACKNOWLEDGMENTS

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