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## Summary

# Use of Mobile Phones by Bus Drivers

## A sociotechnical approach

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*The results from a survey on bus drivers in two Norwegian counties revealed that just less than 20 percent of the bus drivers occasionally use mobile phones while operating a bus even though this contravenes the employer's guidelines on mobile use. The bus drivers assume that one out of two bus drivers use mobile phones while driving within the duration of a week. The problem may be increasing, as the amount of customer complaints on use of mobile phones among bus drivers is reaching an all-time high. The scope and causes of mobile use among bus drivers was investigated with a survey of 689 bus drivers, and through interviews that formed the basis of a sociotechnical system analysis. In the analysis, the interaction between four factors was identified as contributors to mobile use among bus drivers: (1) Technology in society, (2) bus driver culture, (3) conflicting goals, and (4) lack of belief in consequences. Technological progress and innovation have increased the magnitude of mobile use and changed the way we use mobile phones today. This has made it easier for bus drivers to communicate with groups outside of work instead of their colleagues, which in turn can have affected the break room and bus lounge culture. Further influence on this culture could have been caused by the management's lenience of mobile phone use in terminals and bus stops, as well as the company's use of systems that encourage the use of mobile phones in service. A combination of inconsistent guidelines on mobile phone use from the administrator and among different bus companies, a perceived low risk of discovery and the companies' prioritization of punctuality while driving, could reduce the belief among bus drivers that mobile use while driving has serious consequences.*

## Background and methodological approach

An administrative public transport company in two counties in Norway has received an increasing number of customer complaints on mobile use among bus drivers during the recent years. From 2016 to 2017, the numbers of customer complaints for bus drivers' use of mobile phone increased by 58 percent. As of August 2018, the amount of complaints is higher than the 2016 figures. The increasing number of customer complaints combined with contracts that discourage mobile use while driving was the basis for investigating the extent of and the causes of mobile use by bus drivers. The purpose of this study was to map the scope and causes of bus drivers' use of phones while driving so that the problem can be addressed.

## Sociotechnical approach

Mobile phone bus among drivers can be affected by the interaction of a range of individual and organizational factors. Methods rooted in sociotechnical theory are appropriate to study the interactive relationships between the factors of people, procedures, goals, technology, culture and infrastructure. The theoretical framework that forms the basis of this report can be seen in Figure 1.

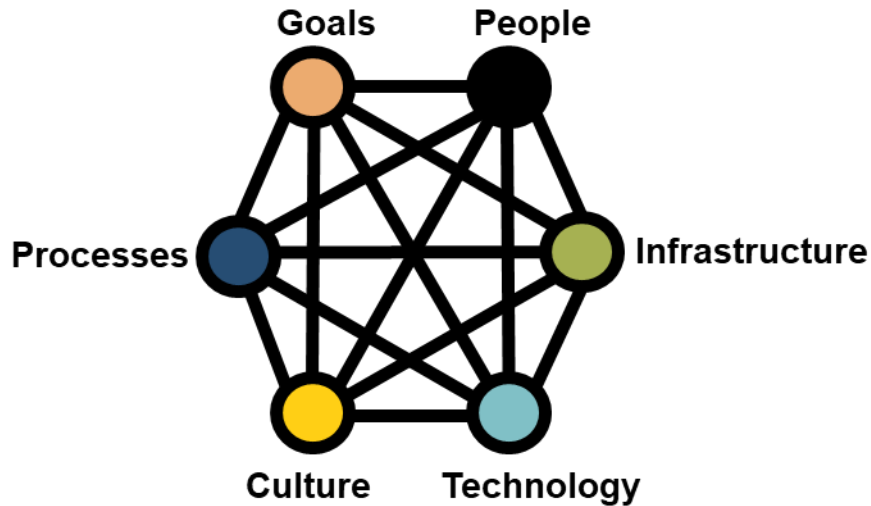


Figure 1. The six dimensions of sociotechnical systems. Adapted from Davis et al. (2014).

The factors in Figure 1 constitute the framework for understanding and assessing behavior such as mobile use among bus drivers. A fundamental principle when seeking to understand the dynamics of sociotechnical systems is that relationships within and among dimensions are important as well as the actual dimensions themselves. Studying behavior through a sociotechnical perspective may result in a more comprehensive picture of what facilitates and influences behavior. This understanding may in turn provide a better basis for behavioral interventions on mobile use among bus drivers, at an individual, group and organizational level.

## Method and limitations

Three methods were used to map the scope and causes of mobile use among bus drivers: (1) A literature review of previous studies that address the extent and causes of bus drivers' mobile use while driving, (2) informal interviews about mobile use on two occasions with management, elected representatives and bus drivers at the garage of one out of four companies in the study area, and (3) a questionnaire sent to bus drivers employed by three of the four bus companies. The interviews formed the basis of a questionnaire on the scope and causes of use of mobile by bus drivers.

This study has some limitations. The contractor discourages use of mobile as a formal communication channel while driving, and in some contracts it stipulates that use of handheld mobile or earplugs is forbidden. However, two of the three bus companies in this study were informed by writing that use of mobile as a formal communication channel was allowed in certain situations during the period of investigation, as long use was in line with traffic regulations. This became clear after the data collection was concluded, and it affected 13 percent of the bus lines at Company B and 92 percent of the bus lines at Company C. Our analyses on use of mobile phone by bus drivers are therefore based on data from Company A, who had no exemption from the ban on the use of mobile as main communication channel and, moreover, were not allowed to use mobile phone at any time according to company documentation. Data from Company B and C are presented for comparative purposes.

## **Mobile use by bus drivers**

To investigate the extent of mobile use among bus drivers, bus drivers in two Norwegian counties were surveyed on their assumption of other bus drivers' phone use while driving and whether they use their phone while operating the bus themselves. The survey data showed that just less than 20 percent of all bus drivers use their phone while operating a bus, even though this was against company guidelines. This usage is however generally sporadic i.e. less than once a week. The bus drivers surveyed reported that they assumed one out of two colleagues uses a mobile while driving bus during the timespan of a week. Any form of mobile use among bus drivers who drove for companies that could use mobile on some lines was 63 percent. This might indicate the extent of mobile use by bus drivers if there is no documentation preventing the use of mobile phone while driving.

Even though most bus drivers do not use their phones while operating a bus, 81 percent reported that they do bring their mobile phone with them when driving. Of these bus drivers, 41 percent reported that they set their phone to receiving notifications of incoming calls and text messages while driving. There is therefore reason to believe that although the bus drivers did not explicitly use their mobile while operating the bus, they may still have been distracted by notifications from their mobile phones. The reason why so many of the bus drivers do not silence their phone while working may be because bus drivers, like many others today, are accustomed to the constant connectivity of smart phones.

## **Causes of mobile use**

During a workday, bus drivers face various complex situations with conflicting goals. Some situations require communication with the operative center, the traffic manager or other factions outside the bus and away from the intercom. In these cases, the mobile phone is a viable solution as there are no other means of communication, which warrants the need to bring mobile phones along the bus during the workday. Occasionally, the bus drivers are contacted by the traffic manager via intercom or by text messages, encouraging them to call back using their phones. In such a situation, there might not be enough time to make a call while at a bus stop due to rush traffic or other traffic events causing delays, and the driver is left faced with conflicting goals. They must choose between maintaining safety and create further delays by standing still to call the traffic manager, or if they should meet the service requirements by being punctual, which could prevent the bus company being charged fees for delays. Using the mobile phone while driving may in these cases appear as a practical solution to a difficult situation.

Previous research has shown that the need for communication with family and colleagues is a large contributor to use of mobile phones while operating a heavy vehicle. Similar findings are reflected in the present study; most bus drivers who use their phone while driving reported the main reason was to receive incoming calls or to place calls themselves. In bus companies allowed to use mobiles for communication on certain lines, the bus drivers reported that they mostly received incoming calls – mainly from colleagues. Use was more varied among drivers working for the company with a ban on mobile use, and here drivers said they most commonly talked to family instead of colleagues on the phone while working. The sociotechnical analysis showed that cultural impact on mobile usage among bus drivers is related to the need for social interaction. Increased recruitment and linguistic challenges can in some cases cause cliques and affect the social climate as it gets harder for coworkers to get acquainted. In combination with an increased focus on punctuality by management and less time for breaks in the garage, this could affect the collegial relationships among bus drivers. Seeking social interaction and comradeship through

the phone might become easier in such situations. In some cases, mobile use can further reinforce this alienating effect, as some bus drivers stop using the driver lounge or common rooms during their breaks, thus decreasing the interaction with fellow colleagues.

## **Documentation and risk**

Our survey data showed that the clear majority, 93 percent of all bus drivers on average, are familiar with the administrator's policy on mobile use. Nevertheless, only half of the bus drivers think that the risk of being reported for mobile use as high or very high. Bus drivers who use their phones while operating a bus consider the likelihood of being reported as less than bus drivers that do not use their phone while driving. These results may be related to inconsistent reporting processes and use of sanctions within the bus companies. In most cases, phone usage has no repercussions when reported, according to the drivers. Inconsistent procedures and rules about mobile use and little belief among bus drivers that talking on a handsfree phone while driving increases the likelihood of a safety critical event or an accident, can contribute to increase the probability of using a mobile while operating a bus.

## **Conclusion**

By using a sociotechnical approach, this report has investigated the scope and extent of mobile use among bus drivers in three bus companies in two Norwegian counties. Our survey showed that just less than 20 percent of bus drivers use mobile phones while operating a bus, even though this appears to contravene company rules. There are four main contributors to mobile use among bus drivers: (1) Technology in society, (2) bus driver culture, (3) conflicting goals, and (4) lack of belief in consequences. Mobile use is explained as a result of the interaction among these four factors. Mobile technology has had a tremendous development in modern society, and most of us depend on and use a mobile phone on a regular basis. Societal and technological progress has made it easier for bus drivers to communicate with groups other than colleagues while at work, which in turn has affected the culture of the bus lounge and break rooms. Moreover, the bus driver culture is influenced by the management's leniency regarding mobile use at terminals and garages. Combined with a few of the bus companies being exempt from the regulatory phone ban, as well as a low risk of discovery and the companies' prioritization of punctuality while driving, this may result in diminishing the belief among bus drivers that mobile use while driving has serious consequences. In other words, mobile phone use among bus drivers can be explained by the interaction of factors in a comprehensive system.

To conduct a behavioral change in mobile use among bus drivers, the parallel measures taken must affect several or all factors in the system. We propose measures aimed at reviewing and elaborating clear and consistent procedures regarding mobile use while operating a bus. Additionally, our recommendations include measures to be taken to improve communications between the administrator, the bus companies and the bus drivers. This can be achieved through a participatory process involving all parties, which could result in an increased understanding and better knowledge about counteracting mobile use among bus drivers, and therefore also improve the chances of conducting a lasting behavioral change where the goal is to reduce the use of mobile phones while operating a bus.