



Innovation and traffic safety: analysis of the relationship between traffic safety innovations, safety culture and accident risk in Norwegian county authorities

Tor-Olav Nævestad^{1*}, Jenny Blom¹, Vibeke Milch¹, Rune Elvik¹

*lead presenter: ton@toi.no

¹ Institute of Transport Economics, Norway

Keywords: Keywords: innovation culture, traffic safety innovations, accident risk

Introduction

Innovation has proven to be highly important in the field of traffic safety (Belin et al., 2012). Fagerberg (2005) defines innovation as an idea for a new product or a process that is implemented in a specific context. Innovation is also crucial in the traffic safety management of public entities. Previous studies show that Vision Zero, which is a radical innovation in traffic safety, has contributed to Norway and Sweden having the lowest number of traffic fatalities in the world (Belin et al., 2012; Craens et al., 2021). Innovation is a crucial component of Vision Zero and Safe System (Elvik et al 2023).

International and Norwegian studies also demonstrate that the regional governance level is fundamental in traffic safety work in countries with high levels of traffic safety (Belin et al., 2012; Krogstad, 2020; Craens et al., 2021; ITF-OECD, 2022). In Norway, county authorities play a key role in the national traffic safety work, because they serve as the organizational intermediary between the state and municipalities. County authorities are responsible for recommending and coordinating traffic safety measures within the county. Through the regional reform, which came into effect on January 1, 2020, county authorities took over the administrative responsibility for all county roads, which accounts for approximately half of the public road network in Norway, previously managed by the national public roads administration (NPRA). This responsibility includes planning, construction, management, operation, maintenance, and traffic safety work. This responsibility is significant for traffic safety, as contributing accident factors related to road conditions or the road environment were identified in 43% of fatal accidents during the period 2017-2020 (Hesjevoll et al., 2022). Additionally, the county road network has the highest accident risk among the road networks (Statens vegvesen 2022) and faces significant maintenance backlog. Through the regional reform, the number of counties in Norway was also reduced from 19 to 11. This involved reorganization and merging processes of old structures, groups, and personnel in 13 of the original county authorities. On the one hand, these processes provided the opportunity for innovation in traffic safety work. On the other hand, these processes also involved major disturbances in the traffic safety work of the county authorities (Nævestad et al 2024). However, county authorities with positive safety cultures and high levels of top management commitment to traffic safety experienced lower levels of disturbances (Nævestad et al 2024).



International Co-operation on Theories and Concepts in Traffic Safety

In this study, we examine how these factors are related to the risk of traffic accidents in the county authorities, and other indicators of traffic safety (e.g. the safety performance indicators (SPIs) like over speeding and other traffic offences). The focus is on four different county authorities with different levels of reform and size.

The aims of the present study are to examine the following in the four county authorities:

- 1) Traffic safety innovations in after 2020.
- 2) Whether the county authorities were able to establish new systems and maintain their key traffic safety functions after 2020.
- 3) Safety culture and management commitment to traffic safety after 2020.
- 4) The quality of the reform processes after 2020
- 5) The risk of traffic accidents and development for SPIs for years before and four years after the region reform in 2020.

We analyse the relationship between the risk of traffic accidents and development for SPIs with the factors examined in aim 1-3, including other relevant factors (traffic volumes, types of roads etc).

Research methodology

The study is based on qualitative interviews (N=42) and a quantitative survey (n=392) among people who work with traffic safety and/or mobility in the county authorities. The survey was conducted between November 2022 and February 2023, targeting all employees working in four county authorities' departments for transport or mobility. We conducted new surveys in 2024. When we recruited the county authorities, we wanted to include county authorities that were different with respect to size, level of reorganization and part of the country. The most important thing is the extent of reform, in addition to the variables that we measure in the survey (e.g. perceived resources required by the reorganization, safety culture, innovation climate). We develop estimates of risk for key groups of road users, e.g. vulnerable road users, car and HGV drivers, based on statistics on personal injury accidents in traffic.

Results

The extent to which the four county authorities have managed to implement living safety management systems and maintain their key road safety roles differs substantially. Multivariate analyses show that the most important factors influencing whether county authorities have been able to implement living systems are the safety cultures in the county authorities, and the extent to which respondents believe that the reorganizations related to the structural reform have required a lot of time and energy.

The qualitative results show in particular that the respondents have gained new perspectives on traffic safety as a result of being co-organised with new professional groups. Additionally, we see examples of new methods and new forms of collaboration in traffic safety being implemented. The survey results show statistically significant differences between the county authorities' scores on an index for traffic safety innovations. We find statistically significant differences between county authorities with respect to how demanding the organizational changes related to the regional reform have been for the county authorities studied.

Discussion and conclusions



**International Co-operation on Theories and
Concepts in Traffic Safety**

The quantitative results reveal significant differences between the county authorities concerning the degree of traffic safety innovations after 2020, the extent to which the organizational changes associated with the region reform have influenced the studied county authorities negatively, safety culture and living safety management systems. It will be interesting to see whether these factors have influenced the accident risk in the four studied county authorities. This will be studied in the spring of 2024 and reported at the conference.