

Summary:

How can authorities support safety management in small transport businesses?

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The main objective of the present report is to provide input on how authorities (primarily the Norwegian Labour Inspection Authority and the Norwegian Public Roads Administration) can help small goods transport businesses get into the mind-set of EN ISO39001:2012 “Management systems for road safety”, without necessarily aspiring to full certification. We note that non-state actors such as business associations, transport buyers and the transport companies themselves can facilitate improved transport safety in the small goods transport companies. We propose an approach we have termed “the safety ladder” as a potential way forward in this work. We also suggest to use the safety ladder as a basis for developing a web tool with which goods transport companies can measure and evaluate their safety culture and safety management. The web tool should generate a customized programme for self-development based on businesses’ own scores in measurements and assessments.

Heavy goods vehicles are the dominant means of transport

An analysis of the structure and trends of the goods market shows that transport with heavy goods vehicles (HGVs) is the dominant mode of transport in Norway (Hovi, Caspersen and Brevik Wangsness 2014). HGVs transport a higher share of the total tonnes and tonne-kilometres, compared with goods by sea and rail. HGVs are especially dominant for distances under 300 km (Hovi et al 2014). The limitations of the other transport modes and features of the infrastructure, geography and production make it unlikely that short transports could be provided by other modes of transport (Askildsen and Gjerdåker 2007). HGV transport therefore appears to be a prerequisite for population and economic activity in rural areas in Norway.

1490 persons are injured in accidents involving drivers at work every year

The extensive traffic of HGVs on roads of varying quality around the country throughout the year affects the Norwegian accident statistics. The mass of the HGVs means that accidents involving HGVs are often severe. In other words, there is significant road safety potential in improving safety organisation in transport companies.

A conservative estimate based on Statistics Norway’s (SSB) database of police reported accidents with injuries from 2007 to 2012, indicates that 287 drivers at work are injured on Norwegian roads annually. These figures include light and serious injuries. We refer to our figures as conservative estimates, since the results indicate that there is about 30 % underreporting of travelling with “work” as purpose. Our figures therefore appears to cover 70 % only of the total amount of travelling for

work purposes. According to data from the NPRA's accident analysis groups (AAG), an average of 11 working drivers are killed on Norwegian roads every year.

An average of 1.490 people are injured (lightly or seriously) in these accidents each year (287 of these are, as we have noted, working drivers) (Nævestad et al 2015). Thus, the majority (81 %) of those injured in accidents involving drivers at work are other road users, and drivers working are injured to a lesser extent than other road users in the accidents in which they are involved. This means that measures to improve transport safety in businesses with working drivers will not only reduce the number of injuries among drivers at work, but particularly among other road users.

The Safety Ladder for Safety Management in Goods Transport

We conclude that four measures seem to be most realistic for regular goods transport businesses, and that these measures also seem to have the greatest safety potential. These four measures can be arranged on a ladder, where businesses start at the lowest level, before proceeding to the next step. This is shown in Figure S.1

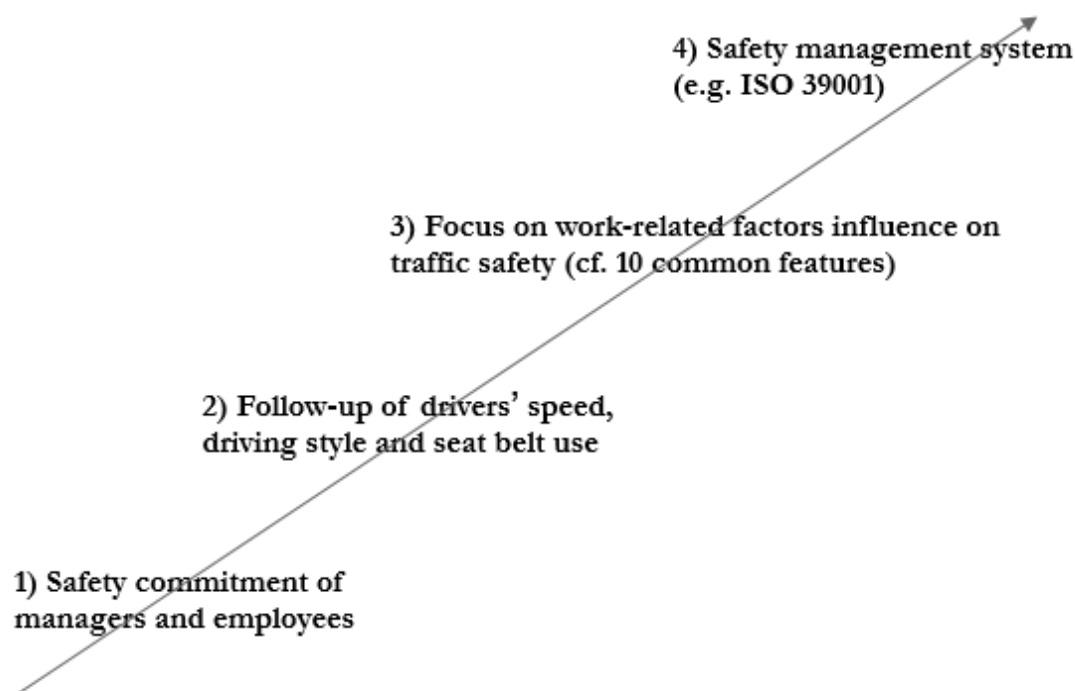


Figure S.1 Safety ladder for safety management in goods transport.

The idea behind the safety ladder is that companies start at the bottom of the ladder if they do not have any measures targeting work-related risk factors in the company. Based on previous research, we assume that the lowest levels are most attainable, and have the greatest impact.

The safety ladder for goods transport is based on two important premises. The first is that goods transport companies often have little focus on the significance of work-related risk factors for transport safety (Nævestad and Phillips 2013).

The second premise is that Norwegian goods transport companies are small (86% <5 employees). We can therefore assume that most of them have limited resources available for developing comprehensive safety management systems. On this background, we suggest that firms with limited time, competence on road safety and financial resources can start by focusing on the most fundamental issues, rather than moving straight ahead to ISO 39001.

Managers' and employees' commitment to safety

Managers' and employees' commitment to safety is the most fundamental step of the safety ladder, because research shows that this is often a prerequisite for companies' safety work to succeed (Flin et al 2000). If managers do not wholeheartedly support measures adopted by the company, indirectly communicating that "it is not very important", it is likely that the staff that is to turn the measure into everyday practice will not consider the measure important (cf. Schein 2004).

A possible way to develop commitment to road safety in businesses without much awareness of the issues, could be to focus on costs associated with major and minor incidents and accidents, and the economic benefits of working systematically with safety management.

Follow-up of drivers' speed, driving style and use of seat belts

The second step in the safety ladder is "Follow-up of drivers' speed, driving style and use of seat belts". This addresses the key risk factors associated with the driver, as identified in analyses of fatal accidents involving drivers at work (Nævestad and Phillips 2013; Nævestad, Phillips and Elvebakk 2015).

Companies wanting to do something about these key risk factors can learn from Company A-C in Nævestad and Bjørnskau's (2014) study. These three companies have speed limiters in their vehicles and a policy for their drivers' speed and driving style. The companies follow up drivers' speed and driving style through collecting data on drivers' driving styles, safety discussions with drivers about speed and driving style and they sanction unsafe driving. Company A has speed limiter at 80 km/h and management has personal conversations with drivers, focusing on driving style. Drivers must sign a form every month in which they declare that they will not drive faster than 80 km/h, they will wear seat belts, and they will not use a mobile phone while driving. Company B has speed limiter of 84 km/h, and all drivers must sign declarations regarding speed and driving style when they first employed. In addition, the manager conducts safety discussions with drivers about adapting speed and driving style. Company C has speed limiters in new cars of 85 km/h.

These three companies (A-C) require drivers to wear seat belts. Seat belt use is also discussed in the conversations about safety and driving style, and it is an item in the monthly declaration form. Company A also makes use of red seat belts, so as to render them visible. Companies reported good experiences with speed limited in the cars: drivers experienced less stress in traffic and fuel consumption decreased. At the same time, this probably improves safety.

Drivers' speeding may be a symptom of stress and time pressure, which perhaps can be traced to work related risk factors (e.g. organization of transport, drivers' customer contact, commission pay). It is therefore important that managers and employees in transport companies also discuss aspects that may influence drivers' choice of speed and driving style and implement measures to deal with these. We

expand on this below, where we suggest that focusing on “Perceived stress and time pressure among drivers” and “organization of transport” is the most relevant specification of the third step in the safety ladder.

Focus on work-related factors’ influence on road safety

The third step in the safety ladder is “Focus on work-related factors’ influence on transport safety”. This refers to 10 features of good safety management in goods transport companies that we identified in a previous study. In addition to the first two steps in the safety ladder these are 1) Predictability in terms of contracts, assignments, etc.; 2) Organisation of transport, 3) Payment systems, 4) Control of drivers’ compliance with driving and resting time regulations, 5) Training/education in safety thinking, 6) Arenas for communication about safety, 7) Reporting culture and systems for reporting and 8) System for safety management.

Rather than recommending any one of these organisational measures (except for the first two steps in safety ladder), we emphasize that the most important thing is for companies to develop an awareness of how work-related factors to a greater or lesser extent facilitate transport safety. It is particularly important that this awareness also applies to factors that are not usually associated with transport safety (e.g. the organisation of transport or drivers’ contact with customers). Given that some transport companies focus little on work-related factors’ influence on transport safety (Nævestad and Phillips 2013), this may be a good place to start before going ahead to establish a system for safety management..

Goods transport companies should choose to focus particularly on some of the 10 work-related factors on the basis of a joint manager and employee assessment of the company’s most important safety challenges. For the above work-related conditions, there is most evidence that “drivers’ perceived stress and time pressure” and “organisation of transport” (and possibly piecework) affect transport safety. Prior research shows that stress and time pressure is a key risk factor in accidents involving drivers at work (Nævestad and Phillips 2013). Research also shows that the organisation of transport has significant impact on drivers’ perceived stress and time pressure (Nævestad and Bjørnskau 2014). Focusing on “Drivers’ perceived stress and time pressure and organisation of transport” is therefore the most relevant specification of the third step in the safety ladder.

Implementation of a safety management system

The fourth step in the safety ladder is to implement a “safety management system”, such as ISO 39001 or similar alternatives. The main thing is to work systematically to 1) identify risk, 2) implement measures, including procedures and training, and to 3) assess the status regularly and update measures as needed.

Implementing a safety management system is largely about improving awareness of the central risk factors the companies relate to, to carry out risk assessments and introduce measures (such as training and procedures) related to these and to document the process. Companies may have many good and well-planned safety measures, but those who have implemented safety management systems regularly document what they do and why they do it (i.e. risk analyses).

Safety management in small goods transport businesses

The tiered safety ladder approach can also be applied to safety work in medium and large goods companies. The approach builds on research-based assumptions about what measures seem to be a prerequisite for further safety work, and what appears to be the main risk factors in goods transport. This applies to all goods transport companies.

Safety management in small goods businesses is often characterised by informal personal relationships and short communication lines. In interviews, sector experts often claim that many small goods businesses start with a self-employed driver who eventually buys more HGVs and employs one or more drivers, maybe a relative or a neighbour. A typical formulation in the descriptions of these firms is that the managers of these companies are managers because they liked to drive the truck, and not necessarily because they wanted to be managers. We have no way of knowing how widespread these organisational forms are, but they were often mentioned in interviews with sector experts. This can be examined in future research.

Larger companies are less able to manage employees through direct personal contact, and they therefore depend more on formal systems, procedures and standardised training to control and coordinate employees. For these large companies, already dependent on extensive formal systems, the transition to formal safety management systems such as ISO 39001 may not be so big.

We suggest that the most basic steps in the safety ladder might be the most important one in the small goods transport companies. For small businesses, with informal personal relationships, short communication lines and perhaps undocumented practices and procedures, formal safety management systems could conceivably be perceived as less relevant. If the manager can control and coordinate through direct daily contact with a handful of drivers, one might not see a need to create extensive formal procedures to instruct them. Professionalising safety work and focusing on the risk factors uncovered in research, however, is no less important in the small goods transport companies. We hope that the safety ladder can point out the factors they should focus on in this work.

Evaluation of the safety ladder approach

The measures proposed in the safety ladder are based on previous research on risk factors related to accidents involving drivers at work and safety management in transport companies with good safety culture and high levels of safety. However, it is important to point out that we have not evaluated the effectiveness of the measures in the safety ladder. This could be done through an experimental study, which compares an experiment group to a control group.

Such a design may involve that roughly half of the companies are measured before and after the implementation of the measures (“experiment group”), while the other half is measured before and after but measures are not implemented (“control group”). The control group will not be informed about of the results from the before-measurement until after the after-measurement, to minimise the likelihood that firms in the control group implement measures based on the results of the measurements. Before and after measurements can focus on the companies’ actual level of safety, include interviews with managers and employee representatives to map their work with safety culture and safety management, and a survey to measure

companies' safety culture and scores on indexes of work-related factors relevant to transport safety

Communicating the Safety ladder through a web tool

We suggest to use the safety ladder as the basis for the development of a web tool that companies can use to 1) measure and assess their safety culture and safety management, and 2) generate a customized programme of self-development based on their own scores in measurements and assessments.

We have previously developed such a tool for businesses across industries and sectors in Sweden on behalf of the Work Environment Authority in Sweden (Nævestad and Bjørnskau 2012). This tool is not industry-specific, and is based on a universal questionnaire for safety culture. A web tool targeting road goods transport will be industry-specific and contain questions and topics that focus on known risk factors in goods transport (such as speeding, seat belt, organisation of transport, stress, fatigue).

The web tool, which is practice is a website, is managed by a responsible group in the companies consisting of both managers and employee representatives (minimum 2 persons). They feed employees' e-mail addresses into the web tool, to distribute a questionnaire. Since we focus on small goods businesses (for example, <5 employees), an internal survey is less relevant. Such a web tool can still be used for self-development in the companies.

This can be arranged if the web tool first generates short texts that provide simple research based presentations of the most relevant topics. The texts explain why the topics measured by the indexes are important, and the topics' effects on safety. Secondly, the web tool generates proposals for joint discussion and examples of best practices, tailored to specific topics. The tool is designed to facilitate group discussion on the companies' current working practices, their possible causes, and the consequences of these practices for safety, and measures that could be implemented to change the practice.