4391 Buyers of Road Transport Services: Sustainability and Safety Responsibility?

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This study takes the buyers of road transport services as its point of entry. While the literature on sustainability has grown, the situation is different regarding literature that discusses sustainability in the context of buyers of road transport services. This study contributes to the field by discussing how buyers of road transport services can contribute to sustainability and safety in the chain of transport and to the Vision-Zero Ideology.

Thus, the research question is: *How can buyers of road transport services contribute to sustainability and safety in the chain of transport and to the "Vision Zero" – ideology?* A qualitative approach was selected for this study. The study sought to get in-depth knowledge about how buyers of road transport services could contribute to sustainability and safety in the chain of transport. Data collection was therefore conducted through 16 semi-structured interviews. Thematic analysis was used. Findings indicate that buyers of road transport services have impact on both sustainability and safety in the chain of road transport by influencing through pricing and delivery demands.

Keywords: Sustainability, safety, road transport, heavy-duty vehicles, Vision Zero ideology.

1. Introduction

Norway's road safety network is controlled by a vision that there shall be no fatalities or severe injuries on the roads – *The Vision Zero Ideology*. As a sub-goal, the government has stated that the number of fatalities and severe injuries due to road accidents, should be maximum 350 cases by the year 2030 (Ministry of Transport and Communications, 2017). To achieve this aim, it is stated that accidents involving heavy duty vehicles (HDV) must be reduced. Several researchers point out that more research on the HDV business has a high safety potential (Njå et al., 2010; Nævestad et al., 2015; Grytnes et al., 2016; Nævestad et al., 2017; Nævestad et al., 2018). However, most research on this field focuses on transport companies as the point of entry.

Differently from the above-mentioned studies, this study focuses on the buyers of road transport services. In our time, all companies are expected to take social responsibility especially for safety and environmental concerns (United Nations, 2015), and the pressure on business to incorporate sustainability principles and objectives into policies and activities is mounting (Aarseth et al., 2017). In this study, sustainability is seen in connection with safety in road transport, and a sustainable transport is seen as transport that has not led to near misses and accidents. Further, procurement in the transport industry is also obliged to consider sustainability.

While the literature on sustainability has grown (Aarseth et al., 2017) and is relatively widely known, the situation is different regarding literature that discusses sustainability in a safety context. Especially the role of buyers of road transport services, and how these can contribute to more sustainable and safe transport in general. This study contributes to the field by discussing how buyers of road transport services can contribute to sustainability and safety in the chain of transport and to the Vision-Zero Ideology.

Thus, the research question is: *How can buyers of road transport services contribute to sustainability and safety in the chain of transport and to the "Vision Zero" – ideology?*

Further in this paper a short presentation of sustainability theory, safety in the chain of transport and a short description of the Vision Zero Ideology will be given before the method and result are presented. Thereafter there is a

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discussion linking the findings and the related theoretical framework, and a conclusion.

1.1. Sustainability

The modern use of the term *sustainability* is broad, and a precise definition may be challenging. However, most definitions of the term include the relationship between humans and the resources they use (Voinov, 2007). The widely used definition of the Brundtland Commission defines sustainable development as; "Sustainable development is development that meets the need of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987). Most scholars agree that sustainable development includes the need to simultaneously balance social, environmental and economic goals (Aarseth et al., 2017).

The pressure on organizations to incorporate sustainability principles and objectives into policies and activities is mounting, and research on sustainability strategies for organizations suggest that sustainability is a salient issue that needs to be thoroughly considered (Aarseth et al., 2017). Developing sustainable supplier practices and supporting suppliers in implementing sustainability was found to be one of the main strategies for buyers of goods and services (Jaillon and Poon, 2008; Liu et al., 2010; Ross et al., 2010; Shi et al., 2012; Eriksson et al., 2013)

Sustainable development is seen in a relationship with buying road transport services. In the chain of transport, there are different stakeholders which all need to be profitable. This drive for profit may interfere with organizations' contribution to sustainable development, hereby, the role of the stakeholders in shaping sustainable practices (Aarseth et al., 2017). Therefore, sustainability also includes development of practices that reduce accidents by increasing the focus on safety by all stakeholders in the chain of transport, including the buyers of transport services. An accident is resource-demanding for society. First, in the short term at the scene of the accident by resources like paramedics, ambulance, firefighters, police, closed roads, detours, crashed vehicles, broken goods and so forth. Secondly, in longer terms with hospital and rehabilitation expenses, loss of work capacity and death, to mention some (Bezerra, 2020). Consequently, increased focus on safety can contribute to a more sustainable transport chain because an accident can be seen as an imbalance of social, environmental and economic goals (Bezerra, 2020).

1.2 Vision zero Ideology in Norway

Norway's road safety network is controlled by a vision that there shall be no fatalities or severe injuries on the roads (Vision Zero ideology). The original Vision Zero was developed by the Swedish Road Administration to serve as an ethical foundation and a basis for road safety work in the mid-1990s (Elvebakk et al., 2009). A modified version of this vision was introduced in Norway with the National Transport Plan 2002–2011 (Ministry of Transport and Communications, 2000), and has become an important guideline for the Norwegian road safety work, and has established that it is morally and ethically unacceptable that people are killed or severely injured in road accidents. In 1970, 570 persons were killed in road accidents in Norway, and in 2015 this number was reduced to 117. This is despite the fact that road traffic has increased by approximately four times as many vehicles (Ministry of Transport and Communications, 2017).

The Vision Zero is not stated to be an absolute target, as it is difficult to imagine that it is possible not to experience a single accident where there are fatalities or severely injured persons involved. Nevertheless, as a sub-goal, the government has stated that the number of fatalities and severe injuries, due to road accidents, should be maximum 350 cases by the year 2030 (Ministry of Transport and Communications, 2017). In order to achieve this goal, the effort is concentrated on different areas, whereas one area is heavy vehicles.

Prognoses for the years 2015–2030 indicate a 25% growth in traffic along Norwegian roads. It is expected that the growth of heavy-duty vehicles will be significantly higher than for small cars. If new measures are not implemented, an increase of 175 people involved in deaths and severe injuries is calculated in 2030, compared to 2015 (Ministry of Transport and Communications, 2017). In order to counteract this presumed development, The Ministry of Transport and Communications (2017) has highlighted some concrete measures directed towards heavy-duty vehicles, but a complicating factor in Norway's traffic safety

plans is our membership in the EEA and Schengen agreement. The EEA agreement guarantees equal rights and obligations within the internal market for individuals and economic operators in the EEA. It states that there shall be free movement of goods, services, persons and capital throughout the 31 EEA States (European Free Trade Organization [EFTA]). The Schengen Agreement was signed in 1985 and led most of the European countries towards abolition of their national borders, to build a Europe without borders (Schengen Visa Info, 2018). This has resulted in a huge increase of road users with another traffic culture and traffic understanding entering Norway. A specific challenge is foreign road users who are not competent to drive on Norwegian winter roads. Road safety measures must therefore also involve the buyers of road transport services who give these organizations commissions in Norway. They are the stakeholders who set the standard for profitability and sustainability and have the opportunity to facilitate Vision Zero work.

1.2.1 "Swiss Cheese Model"

The well-known so-called "Swiss Cheese" model is used as a theoretical framework to explain accident causation (Reason, 1990). The model can also be used to identify how actions and decisions made by buyers of road transport services can influence safety in transport.

The Swiss cheese theory is illustrated by slices of cheese with holes in them where each slice is equivalent to a barrier. As no barrier is one hundred percent tight, the holes show weaknesses in the barrier layer. The holes thus represent errors or failures. An accident is therefore a result of an incident that hits all the holes in the layers of barriers, according to this theory (Reason, 1990).

In his model, Reason (1990) distinguishes between *active* and *latent failure,* where active failures might be results of latent ones. Active failures are errors where the consequences are instantly visible, and where there is a clear relationship between cause and effect (Sætren et al., 2016): for example, when an HDV-driver is involved in a road accident. Latent failures refer to errors that may occur because of actions and decisions made by management or others who are removed from the direct control interface. These actions and decisions can have been taken long before the actual incident, and therefore be harder to identify as a latent cause of an accident. The "Swiss Cheese" model illustrates this concept by showing that latent conditions in combination with active failures could lead to a breach in the layers of defense and lead to errors and accidents (Reason, 1990).

As shown above, there is little research on the role of buyers of road transport services in general, and specifically how this group might affect safe and sustainable transport. Thus, this study will contribute to the field by setting focus on the buyers of road transport services 'role in this matter.

2. Method

A qualitative approach was selected for this study. The study seeks to get in-depth knowledge about how buyers of road transport services can contribute to sustainability and safety in the chain of transport. To achieve such knowledge, it is essential to get the participants' experience and opinions about the topic (Langridge, 2004). Data collection was therefore conducted through semi-structured interviews.

The interviewees were recruited through a member organization for owners of road transport organizations in Norway. All participation was voluntary, and all the interviewees agreed on participating after being told about the project and that they were able to withdraw at any time. The study was approved by the Norwegian Centre for Research Data (NSD). Nine semi-structured interviews were conducted with leaders of road transport organizations situated in the middle part of Norway. Further, 7 semi-structured interviews were conducted with "experts in the field". These experts were mainly employed by the Norwegian government, Norwegian Police, organizations with high credibility in the road transport sector and/or as authors of literature regarding road transport. All interviewees were chosen because of their relevance to the road transport sector (Kvale, 1996).

The total of 16 interviews were mainly carried out by two or three researchers and in a face-to-face setting. All the interviews were recorded and transcribed. All interviewees agreed on interviews being recorded. Each interview lasted approximately 45 minutes. A semi-structured interview guide (Kvale, 1996) was used so the

researchers were able to cover similar themes across the interviewees. The semi-structured interview guide included different topics, but in this study only topics dealing with the contribution by buyers of road transport services to sustainability and safety were included. As an example, questions like; *"How do you experience that those who buy transport service from you set demands for how you carry out the transport?"* and *"How do you set demands to those that buy your transport services?"* were asked.

Data analysis was conducted according to Braun and Clarke's (2006) thematic analysis. Quotations that appeared in the dataset that were related in some way to the research question were coded. The different codes were sorted into potential themes. The "keyness" of the themes was whether they captured something important in relation to the research question. The themes were identified through a theoretical (deductive) way, meaning that the analysis was driven by the researcher's theoretical interest in the field: here, the interest in gaining knowledge about buyers of road transport services contributions to sustainability and safety in the chain of transport.

2.1 Validity

In every qualitative study, a discussion about validity is important. (Yardley, 2000). Yardley highlights the importance of being sensible to context. In this study, a presentation of theory was given in order to set the context and make it possible for the reader to get an understanding of the theoretical framework. Further, the theoretical framework sets a direction for what has been studied.

Further, Yardley emphasizes the importance of rigour and refers to rigour as the resulting completeness of the data collection and analysis. In this study interviews were conducted with managers of transport organizations and "experts in the field". Some of the mangers also had a role as buyers of road transport services, but there is a weakness in the study that no interview was conducted with large bodies of buyers such as buyers in the salmon industry, grocery industry, building industry etc. It may be possible that the lack of interviewees in these industries have affected the results of this study because their point of view is missing.

Transparency is also an important factor for qualitative research (Yardley, 2000). In this study, transparency has been shown by giving a detailed explanation of the data collection and analysis process.

3. Results

The research question for this study was; *How can buyers of road transport services contribute to sustainability and safety in the chain of transport and to the "Vision Zero" – ideology?*

The empirics show that there are some main factors (themes) that affect the way buyers of transport services can contribute to sustainability and safety in the chain of transport. These factors are (1) setting demands for transport they order, (2) willingness to pay market price for transport and (3) delivery demands.

Table 1. Factors related to the way buyers of transport services can contribute to sustainability and safety

Themes	Explanation
1 Setting demands for transport they order	*Buyers of road transport services must make demands to the transport organization. Hereby, driver competence, that they follow laws and regulations, use approved vehicles and equipment*
2 Willingness to pay market price for transport	*Buyers of road transport services must pay for quality in transport and avoid using disreputable sub-contractors who push prices to the minimum*
3 Delivery demands	*Buyers of road transport services must be understanding about factors that can delay transport.*

1 Setting demands for transport they order.
There is consensus amongst the interviewees about the importance that buyers of road transport

set demand to transport organizations they hire. Especially demands like (1) driver competence, (2) following laws and regulations, (3) using appropriate vehicles and equipment. **Driver competence** is highlighted because of the importance that drivers have competence and skills to execute a safe transport. Some of the interviewees mentioned the challenge with hiring foreign road transport organizations on Norwegian winter roads because of the lack of winter driving competence of the drivers. Interviewees highlighted that by choosing a transport organization that prioritizes educating their drivers on the specific transport they carry out will increase the level of quality of the transport. This can be illustrated by the following quote: *"Driver skills are important. We observe that even if the equipment and vehicles are the same, many foreign drivers are involved in accidents and near-misses because skills in winter-driving are lacking"* (Interviewee M).

Further, the interviewees highlighted the importance of buyers of road transport services hiring transport organizations that **follow laws and regulations**. This too ensures that drivers are getting the right salary and have good working conditions as this is of importance for safe transport. Transport organizations that fail to follow laws and regulation are a major safety concern. They set themselves and other road users at risk by for example overloading their vehicles and driving too many hours. Some interviewees address this as a big challenge as shown by this quote; *"Drivers are being pushed to carry out illegal transport in order to earn more money for the company. The chance of being caught is small, but the earnings are big".* (Interviewee K).

Finally, the interviewees highlighted the importance of buyers of road transport services hiring transport organizations that **use appropriate vehicles and equipment**. It was said by the interviewees that vehicles and equipment must be adjusted to the kind of transport they carry out in order for the transport to be safe. Examples that were given was challenges with securing the cargo if the vehicle or equipment is not fitted to transport the cargo. Another example that has been given is driving on icy roads without proper winter tires.

A quote that illustrates the importance of setting demands is; *"Transport buyers can contribute to safer roads by demanding that transport organizations employ drivers with the right competence, that they have the right equipment and that they educate their employees"* (Interviewee L).

Several interviewees highlighted the importance of *"Fair Transport".* This is a certification for transport organizations and buyers of road transport services, which makes them solely responsible for safe road transport. It is argued that buyers of road transport services lack knowledge about this responsibility.

2 willingness to pay market price for transport. The interviewees pointed out that the transport industry is a low-earning industry, and that the average financial result for a transport organization is between 2–5 %. This leads to hard prioritization of assets. By constantly pushing prices, the buyers of road transport services, influence the ability of the transport organizations to prioritize safety work. One quote illustrates this; *"When the margins are small, assets are not being invested in safety work"* (Interviewee K). It was argued by the interviewees that buyers of road transport services can contribute to sustainable and safe transport by paying market price for the transport they order. In this context, a challenge with several subcontractors is mentioned by the interviewees. Using many subcontractors for transport commissions will result in a smaller margin for all parties. This is illustrated by the following quote: *"Norwegian transport organizations hire subcontractors even when they understand that the price they pay is less than needed to conduct the transport according to laws and regulations"* (Interviewee K)

3 delivery demands set by the buyers of transport services. According to the interviewees a challenge for sustainable and safe transport is delivery demands regardless of the cause of a possible delay. In many circumstances the cause of delay is outside the control of the transport organization and driver. However, the buyers of road transport services still give warnings to and/or fine the transport organization for the delayed transport. This could lead the transport organization and driver to take unnecessary risks: for example, driving when the

weather conditions are bad or bending laws and regulations for driving time. An illustrative quote was *"We have delivery demands on everything we do. If we are more than 1 hour late, we will get a fine"* (Interviewee E)

Overall, the interviewees argue that buyers of road transport services can be the tool for making all parties in the chain of transport responsible for sustainable and safe transport; meaning that leaders and decision makers within the group of buyers of road transport services must prioritize sustainability and safety when they order transport services.

4. Discussion

The aim of this study was to examine how buyers of transport services can contribute to sustainability and safety in the chain of transport and to the "Vision Zero" – ideology.

Our findings were the categories: (1) setting demands for road transport they order, (2) willingness to pay market price for transport and (3) delivery demands set by the buyers of transport services. There was agreement between interviewees on these topics and they were mentioned directly or indirectly by all.

Setting demands for transport they order was one of the three most important factors in how transport buyers can contribute to sustainability and safety. Especially hiring transport organizations which focus on educating their drivers, following laws and regulations and using appropriate vehicles and equipment were highlighted as important factors. These findings could contribute to filling in some possible holes or errors in the Swiss cheese model. Reason (1990) distinguishes between active and latent failures in his model, and the above-mentioned factors is possible latent failures, meaning that accidents and near misses can occur because these factors are not prioritized by the management of the transport organizations.

The study's findings could also contribute to implementing one of the main strategies found from the systematic literature review of sustainability (Jaillon and Poon, 2008; Liu et al., 2010; Ross et al., 2010; Shi et al., 2012; Eriksson et al., 2013, Aarseth et al., 2017;). Developing sustainable supplier practices and supporting suppliers were found to be highly important in gaining sustainable development. By setting demands for transport they order, transport buyers can support suppliers in implementing sustainable practices which contribute directly or indirectly to safety and Vision-Zero ideology.

A second important factor is the willingness of the buyers of road transport service to pay market price for road transport. For transport organizations to work with and prioritize safety, the organizations must be profitable. A quote from one of the study's interviewees illustrate this; *"in competition with money, safety always loses".* Meaning that if the transport organization is struggling with economic survival, they will do what it takes to be profitable: overload their vehicles, use inappropriate vehicles and equipment, drive too many hours, bend laws and regulations and so forth. Buyers of road transport services can contribute to a more profitable, and thereby a more sustainable and safe transport industry by paying market price for the service they order. By doing so, they acknowledge that safe road transport is resource-demanding and facilitate opportunities for transport organizations to prioritize safety. Consequently, buyers of road transport services contribute to a more sustainable transport by hiring transport organizations that can secure their long-term economic performance by avoiding short-term behaviors such which are socially detrimental or environmentally wasteful (Porter and Kramer, 2006).

A third important factor is delivery demands that buyers of road transport services make of transport organizations. By setting delivery demands independent of weather conditions and other conditions, they put safe transport at a risk. This might lead transport organizations and their drivers to push safety limits. In this way, buyers of road transport services will contribute to these unsafe organizational and driver decisions which could end in near misses or accidents.

A common challenge for all the above-mentioned factors is the practice that buyers of road transport services and transport organizations use subcontractors to carry out their transport commissions. This practice can make it difficult for buyers of road transport services to know who is transporting their goods. So even if the buyers are concerned that their transport should be sustainable and safe, it might not be the case. Many of these subcontractors are foreign transport organizations with different views and culture on road safety. Consequently, these organizations are involved in more near misses

and accidents than domestic organizations. In order to achieve a more sustainable and safe transport and thereby, the aim of the Vision Zero ideology, more regulation on subcontractors allowed in transport commissions is therefore necessary.

This study's findings indicate that buyers of road transport services have impact on both sustainability and safety in the chain of road transport because they influence transport through their pricing and demands. By hiring transport organizations that prioritize safety and quality it is suggested that the contribution to the Vision Zero ideology will be of importance. Also, by their pricing and delivery demands, buyers of road transport services can contribute to more sustainable and safe transport.

4.1 Implications and Further Research

This study can be useful for governments that set regulations for the transport industry. This study suggests that more responsibility must be put on buyers of transport services in order to get more sustainable and safer transport. These are both important factors in order to achieving sub-goals in the Vision Zero ideology. Further, this study could be of value for buyers of transport services by making them more aware of the possibilities they have to contribute to sustainable and safe transport.

There is little research regarding buyers of transport services' and their possibility to contribute to more sustainable and safer transport. Further research should focus on these aspects and more studies should be conducted, especially studies where the aim is to get in-depth knowledge from buyers of transport services and decision makers in these organizations. Moreover, future research should examine which criteria buyers of road transport services use when deciding on a transport order, and how these criteria can affect safety outcomes.

5. Conclusion

The research question for this study was; *How can buyers of road transport services contribute to sustainability and safety in the chain of transport and to the "Vision Zero" – ideology?* Our findings were the categories: (1) setting demands for road transport they order, (2) willingness to pay market price for transport and (3) delivery demands set by the buyers of transport services. This study suggest that buyers of road transport services can contribute to a more sustainable and safe transport by focusing on these three factors. By doing so, one consequence is assumed to be fewer near misses and accidents with heavy duty vehicles, thereby taking our society a step closer to the aim of the Vision Zero ideology.

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