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Vision Zero – Is it irrational?

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Abstract

Vision Zero, the Swedish road safety policy goal, states that in the long run, no person should be killed or seriously injured as a consequence of road traffic. Since its adoption in 1997, the goal has been seriously criticised. In 2007, performance of the first interim target will be evaluated and a new interim target will be set. In this paper, we summarise the experiences from working with the goal and analyse the criticism that has been put forward against it. The most common criticism is that Vision Zero is an irrational goal. In order to evaluate this criticism, we compare Vision Zero with an independently developed list of adequacy criteria for rational goal-setting. We conclude that according to these criteria, Vision Zero is not irrational.

Keywords: Vision Zero; Traffic accidents; Rationality; Precision; Evaluability

1. Introduction

In October 1997, the Swedish Parliament adopted Vision Zero as a national transport policy (Government Bill, 1996/97:137; Committee Report, 1997/98:TU4; Riksdag Communication, 1997/98:11). Vision Zero states that the long-term goal for Swedish road safety policy is that nobody should be killed or seriously injured in the transport system. In 1998, the goal was supplemented by an interim target (Government Bill, 1997/98:56; Committee Report 1997/98:TU10; Riksdag Communication, 1997/98:266), stating that in 2007 the number of killed people on roads should be reduced by at least 50 percent from the 1997 level, i.e., from 540 to a maximum of 270 people per year (SIKA, 2000). Similar targets to vision zero have been adopted elsewhere. In September 2000, the Norwegian Parliament adopted a vision of zero killed and seriously injured (Steinset et al., 2002). The Danish government has formulated its vision in the slogan "every accident is one too many" (Færdselssikkerhedskommissionen, 2000). On an international level, the European commission has adopted a target aiming at reducing the annual traffic fatalities in the European Union by at least 50 percent from the 2000 level before 2010 (Peden et al., 2004). However, the long-term vision of a transport system in which no people at all are killed on the roads is limited to a national level.

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The appropriateness of Vision Zero as a platform for political action is much debated (Nelson, 1996; Ekelund, 1999; Elvik, 1999a,b). In the on-going debate it is frequently claimed that Vision Zero is utopian and illusory, as well as populistic or even dictatorial (Lind and Schmidt, 1999). While proponents are accused of being rhetorical, critics are accused of being cynical. In this paper, we analyse the criticism that has been mounted against Vision Zero by comparing it to an independently developed list of rationality criteria for goals. In Section 2, we give a brief account of the main elements of Vision Zero and the motives behind its adoption. In Section 3 the major criticism against Vision Zero is described. It emerges that the most serious criticism concerns the rationality of the goal. In Section 4, we assess the rationality of Vision Zero by using a set of rationality criteria for individual goals, namely precision, evaluability, approachability, and motivity. In Section 5, we sum up the available evidence on the practical effects of Vision Zero, and in Section 6 we summarize our conclusions.

2. Background

The contents of Vision Zero are fairly straightforward. The 1996/1997 Bill states that "the long-term goal of traffic safety is that nobody shall be killed or seriously injured as a consequence of traffic accidents" and that "the design and function of the transport system shall be adapted accordingly" (Government Bill, 1996/97:137). In the Bill, the government makes it clear that Vision Zero is not intended to eliminate every traffic accident that gives rise property damages or minor personal injuries. Instead, traffic safety measures should aim to prevent the most serious threats to public health, namely fatalities and serious injuries. We will return to the definitions of "fatalities" and "serious injuries" in Section 4.1.

From the Bill it is clear that there is an ethical dimension to the goal. The government explicitly states that "from an ethical standpoint, it is not acceptable that *any* people die or are seriously injured when utilizing the road transportation system" (Government Bill, 1996/97:137, p. 15). Hence, accidents with such outcomes should not be considered as unavoidable side effects of the transport system that have to be accepted. The Swedish Road Administration has operationalized this ethical stance through five principles (Lind and Schmidt, 1999):

1. If it is possible to prevent someone from being killed or seriously injured, then appropriate measures must be taken; human lives may not be traded for some other good.
2. Every project shall be done right from the start, i.e., every decision should be supported by scientific and empirical knowledge.
3. The best known solution should always be applied to any problem; time schedules or convenience may not excuse bad solutions when a better solution is known.
4. Both risk and the nature of damage should be taken into account in decisions whether to implement changes in any situation.
5. It should always be assumed that the responsibility for each loss of human life and health rests with those who design and implement the transport system.

These five principles summarize the main ethical assumptions behind Vision Zero. They also make it clear that the goal was intended to cause a shift of attitudes among transport system designers and implementers.

It should be noted that Vision Zero is not the only goal for Swedish transport policy. Swedish transport policy consists of one overall goal and six sub-goals. The overall goal is to provide a transport system that is both economically efficient and sustainable in the long-term. The six sub-goals are (1) an accessible transport system, (2) a high standard of transport quality, (3) traffic safety, (4) a good environment, (5) positive regional development, and (6) equal opportunities (Government Bill, 1997/98:56; Government Bill, 2001/02:20).[1]

[1] The last goal, "a transport system providing equal opportunities" (for men and women), was not included in the 1997/98 Bill, but was added in a supplementary Bill in 2001 (Government Bill, 2001/02:20). Vision Zero is identical to the safety goal (3). This goal not only applies to road traffic, but also to rail traffic and other modes of transportation. However, the significance of the goal is much greater and more controversial for road traffic than for other modes of transportation, partly because the latter have relatively low accident frequencies.

Compared to the other five sub-goals, the traffic safety goal presents a relatively clear vision; there is an end-state, a transport system without fatalities and serious injuries, which the goal aspires to achieve. In contrast, the goals of accessibility and quality present directions for improvement. It is unclear how conflicts between traffic safety and other transport policy goals are intended to be managed. The Parliament and the Road Administration have explicitly stated that cost-benefit approaches to such conflict resolutions are not desirable, and that economic analyses should not be performed in order to identify an ''optimal number of road traffic fatalities'' (Government Bill, 1996/97:137, p. 15). However, economic efficiency is included in the overall goal and cost-benefit approaches remain important in most transport policy decisions. The majority of the key decision makers in Swedish transport policy interpret the overall goal such that sustainability and efficiency are to be principles to guide trade-off procedures between the six sub-goals (Holmberg and Nylander, 2005).

3. Critique against Vision Zero

The idea that all fatal road traffic accidents, as well as those resulting in serious injury, should be eliminated seems unquestionable at first sight, at least from an ethical point of view. So do the ethical principles behind Vision Zero. Nevertheless, the road safety goal has been subject to criticism.

Elvik (1999b) interprets Vision Zero as implying a lexicographical priority to s in traffic. Although the issue of priority is not explicitly mentioned in the formulation of the road safety goal, the notion that traffic deaths are ''unacceptable'' is generally considered to be an absolute constraint. An objective of eliminating traffic deaths can be interpreted as an application of a general principle of minimising mortality (Elvik, 2003). Elvik points out that there are probably other, more cost-efficient, ways to minimise mortality. In order to minimize mortality, money should be spent where the marginal rate of life-saving is highest. Rather than imposing absolute priority to road safety, those who design and implement the transport system should focus on removing sources of inefficiency (Elvik, 2003). This is, of course, a critique against inappropriate priorities that may be associated with Vision Zero, rather than a critique against the vision itself.

Ekelund (1999) maintains that there should be no goals at all for public health in traffic. Since Vision Zero states that road traffic fatalities are unacceptable, Ekelund argues that the national goal should be to eliminate all such risks. But everyone has her own attitude towards risk and some people are willing to take more risks than others. For example, in order to achieve Vision Zero everyone ought to use seatbelts and bicycle helmets. But many people prefer not to wear seatbelts and bicycle helmets, and are quite willing to take the extra risks involved. Others enjoy motorcycling, even though motorcyclists run a higher risk of death and serious injury. As long as no one else is harmed, Ekelund argues that everyone should be free to act as she pleases and take the risks she wants to take. Forcing people to be more cautious than they actually want to be is paternalistic, or even dictatorial.

It may also be argued that Vision Zero is not a real goal, in the sense that there is a clear intention to reach it. In fact, many key actors perceive it as an unrealistic vision of a mainly inspirational and motivating nature (Lind and Schmidt, 1999). It has sometimes been pointed out that the interim target for 2007 would already have been achieved if all drivers used safety belts and if there were no drunk driving. This may be true, but such statements seem ill fit with the basic assumption that those who design and implement the transport system should be responsible for every fatality and serious injury. The point here is that since the goal is not perceived as a genuine goal, and since it is not always taken seriously, it could just as well be abolished.

From a perspective of rationality, these objections pose interesting problems. First, a categorical unwillingness to make compromises may itself be considered irrational, and goals that require such attitudes should then also be regarded irrational. Second, there seems to be little point in imposing a goal that is not desired by those whom it should benefit. Third, one might ask whether there is any substantial content in a goal that is not intended to be achieved. Specific as these questions may be to Vision Zero, they relate to a more general question: When is a goal rational?

In our view, previous discussions on the rationality or irrationality of Vision Zero are unnecessarily imprecise, since no reference is made to independently developed criteria of rational goal-setting. In the following section, we present a model that has already been applied in a previous analysis of the Swedish environmental objectives (Edvardsson, 2004), and use it as an analytical tool for investigating the appropriateness of Vision Zero.

4. Is Vision Zero rational?

In a theory of rational goal-setting recently proposed by two of us, the starting point is that goals are typically set in order to better achieve the desired outcome to which they refer (Edvardsson and Hansson, 2005). When this is successful the goal is achievement-inducing. In what follows, we will call a goal rational if and only if it is achievement-inducing. Admittedly, in addition to this typical function goals can also be set for other reasons. It has, for instance, been argued that the Swedish Vision Zero was adopted in order to cover up the embarrassing lack of political measures that would redress the traffic safety problem (Ekelund, 1999). In what follows, we will disregard such atypical uses of goals.

Goals are achievement-inducing, or rational (functional), when they guide and motivate people to act in ways that further them. Four major properties of a goal contribute to making it achievement-inducing, namely the properties of being *precise*, *evaluable*, *approachable*, and *motivating*. We call them rationality criteria for single goals.[2] They can be structured according to three major dimensions that are involved in goal-based human action. The first dimension concerns what the agents know about the goal and the means to reach it. This epistemic dimension is reflected by two rationality criteria, namely those of precision and evaluability. The second dimension concerns what the agents can do to reach or at least approach the goal. This ability-related dimension is reflected by the criterion that a goal should be approachable. The third dimension concerns the ability of the goal to motivate action. It is expressed in the criterion of motivity.

Goals are often parts of goal systems. Such systems can contain closely related goals with a ''division of labour'' in terms of the four rationality criteria. Hence, an overarching goal that satisfies motivity, but that lacks in precision, can be supplemented with more tangible, precise, and evaluable interim targets.

4.1. Precision

A goal must be precise in order for the agent to know what to do. First of all, this means that the goal should be clearly stated and free from vague and/or ambiguous terms. There are at least three central terms that need to be well defined in order for Vision Zero to be precise: ''death'', ''serious injury'', and ''road traffic accident''. In Sweden ''death'' is defined by the medical definition of brain death.[3] A death is counted as caused by an accident only if it occurs within 30 days of the accident; a ''serious injury'' is defined as an injury leading to someone being hospitalized for more than 3 weeks; and a ''road traffic accident'' is defined as an event that has occurred on a road, in which at least one moving vehicle has been involved and which has resulted in personal injury or material damage (SIKA and SCB, 2004).[4] With respect to clarity of definitions, therefore, Vision Zero is a precise goal.

Three different notions of precision can be distinguished: directional, completive, and temporal precision (Edvardsson and Hansson, 2005).[5] A goal is *directionally* precise if it tells the agent in which direction to go in order to approach the goal. Since Vision Zero expresses a quantitative statement, the direction to go in order to reach the goal amounts to a reduction of the annual number of road traffic casualties and serious injuries. A goal is *completively* precise when it tells the agent to what extent the goal should be reached. In this

[2] This terminology may be seen as stretching the meaning of ''rationality'' a bit with respect to the fourth criterion (motivity). It can be argued for it as follows: It does not appear rational to set a goal that will be without effect because it does not motivate action. A goal should not be labelled as rational if it is not rational to set the goal in question. Readers who prefer a more restricted notion of rationality can replace ''functional'' for ''rational'' in what follows.

[3] A person is dead when the activity of his/her brain fully and irretrievably has ceased (Lag (1987:269) om fastställande av kriterier för bestämmande av människans död).

[4] Since 2003 suicides are included in the official statistics of road traffic fatalities, whereas deaths due to illness are not (Brüde, 2005). One possible interpretation of this – when applied to Vision Zero – is that it is unacceptable that a person willingly drives against a tree in high speed in order to commit suicide, whereas it could be accepted that a driver dies due to losing control of the wheel during an attack of illness. The definition of ''accident'' differs from the commonsense use of the word, since it does not make a difference between intentional and unintentional events on the road, as long as they involve a moving vehicle and result in personal injury or material damage. Note that, according to this definition, accidents involving only pedestrians (and no moving vehicles) do not count as ''road traffic accidents'', even if they occur on roads or pavements.

[5] The requirement that the goal be stated in non-ambiguous terms can be seen as a prerequisite for each of the three forms of precision.

respect, Vision Zero appears as the most precise of the Swedish transport policy goals. In contrast to the other goals, with the possible exception of the environmental goal (4), vision zero clearly expresses a specified end-state that is to be attained (SIKA, 2000).

As for the *temporal* notion, however, the goal clearly lacks precision. Vision Zero is a long-term goal, and it is not specified when it should be attained. In contrast to the interim target, which specifies that no more than 270 persons should be killed on the roads in the year 2007, Vision Zero does not by itself specify what year there should be zero casualties and serious injuries. One obvious conclusion can be drawn from this; it will never be too late to achieve the goal. In summary, Vision Zero satisfies directional and completive but not temporal precision, but it is associated with an interim target that satisfies all three types of precision.

4.2. Evaluability

Goals regulate performance more reliably when work towards goal achievement is evaluated and fed back to the goal-setter or implementer. When the agent is provided with information about where she stands in relation to the goal, she can more easily improve strategies to reach the goal (Minogue, 1993). Successful goal-evaluation presupposes that it is possible to assess actual goal-achievement. The criterion of evaluability resembles that of precision in that both are epistemic properties that concern what the agent can know. But while precision concerns information about the goal itself, evaluability concerns information about the agent's actions and their effects.

Progress in approaching Vision Zero can be measured in terms of reductions of road traffic fatalities and serious injuries. Therefore, Vision Zero is an evaluable goal. The same applies to the interim target for 2007, as can be seen from on-going debates about the non-achievement of this target. However, two factors should be mentioned that somewhat complicate the evaluation of Vision Zero.

First, Vision Zero refers to both casualties and serious injuries. We should expect a successful strategy for approaching Vision Zero to lead to a reduction on both these counts. However, Vision Zero does not provide us with tools to weigh means along these two dimensions against each other. Suppose that there is a slight increase in the number of road traffic fatalities but a significant increase in the number of serious injuries, or vice versa. When should such a mixed result be interpreted as an advance in the direction of Vision Zero? Of course, there are several rational procedures in which positive and negative effects can be weighed against each other, but Vision Zero does not itself suggest such a procedure.[6]

Second, evaluations of short and medium run fluctuations or of unsustainable improvements may be ambiguous. Vision Zero is a long-term goal, and it would be logical to evaluate long-term achievement of the goal, but such evaluations are often uncertain. Accident statistics from the years around 2000 may give the impression that little progress was made during these years. However, it takes time to redesign the transport system to meet the requirements of Vision Zero, and consequently it may take time before changes can be noticed. Moreover, as previously mentioned, fluctuations in large-scale factors such as the weather and the economy can conceal the effects of improvements in the road traffic system.

4.3. Approachability

Goals are often rejected because they are thought of as unrealistic, or impossible to reach. It is often argued that utopian goals are irrational (dysfunctional), since they cannot be achieved (Laudan, 1984). This view is often based on a binary conception of goals as either realistic or unrealistic. Such a binary conception of goals is misleading since it ignores the fact that goals can be attainable to various degrees (cf. Cíntora, 1999). A goal that is impossible to fully attain can still be possible to approach to a satisfactory degree. In fact, many important goals in actual social practice are difficult, or perhaps impossible, to fully achieve.

This is exemplified by political ideals such as those of liberty (freedom) and social justice. Most of us would be suspicious of a claim that someone had constructed a blueprint for a society in which freedom or social

[6] Perhaps the most obvious options to evaluate fatalities and injuries are according to willingness-to-pay or quality-adjusted life-years (QALYs). Neither of these methods seems to conform very well with Vision Zero.

justice (or both) will be perfectly achieved, so that once this society is constructed, then we no longer need to strive for the ideal. It would seem more realistic to assume that all societies will contain forces that threaten the freedom (and the social justice) already achieved. Therefore, ideological goals like these cannot be achieved once and for all, but will always have to be fought for. This does not prevent social and political movements from using ideals such as freedom and justice as goals. It does not seem constructive to claim that goals like these should never be set, but should be replaced by goals that are known to be fully achievable. The only demand of attainability that seems to be generally required is that goals should be approachable, i.e., it should be possible to increase the degree to which they are achieved.

This applies not only to the most abstract goals on the highest level of the hierarchy of social goals, but also to many goals that are much more concrete and limited. It is for instance a sensible political goal that we should all be able to move about freely in public places without running the risk of being victims of violence. Given what we know about human nature, this is an unrealistic goal. However, there is no reason to believe that law enforcement agencies would do a better job if they were instead instructed to achieve an economically optimal level of street violence. A "Vision Zero" with respect to street violence seems to be functional as a social goal, even if it cannot be fully realized.

A similar approach is taken in most social sectors where human safety is the major concern. Workplace health and safety is another example. Few would deny that compromises between costs and workplace safety are unavoidable. Nevertheless, government agencies for health and safety are not, at least not in any case that we are aware of, instructed to try to achieve an economically optimal frequency of fatal accidents in the work environment (If that were the goal, the need for government agencies in this sector could be put in doubt). Instead, they treat every fatal or otherwise serious workplace accident as a failure that should not be repeated.

In other social areas, there is another tradition, namely to work only with goals that are believed to be fully attainable. Economic policies illustrate this practice. It would be a major achievement to eradicate both inflation and unemployment, but economic policies are not conducted in terms of such goals. Instead, more realistic goals are used in this area.

The difference between these two ways to work with goals is shown in Fig. 1. Either we make compromises and adjustments first, and then set the goals (as in economic policies) or we set goals first and make compromises afterwards (as in law enforcement and health and safety). Vision Zero follows the second pattern in the figure. What makes this controversial is that it takes place in a policy area, namely traffic and transportation, in which the other procedure for goal-setting is the norm. We can indeed regard Vision Zero as an attempt to discuss traffic safety in the same way as safety is discussed in other social areas. This means that it will be discussed in a way different from how the other goals of transportation policies are discussed.

In summary, Vision Zero satisfies the criterion of approachability, although it is not fully achievable. This is shared with many other goals on different levels in the hierarchy of social and political goals.

4.4. Motivity

A goal can be achievement-inducing not only by guiding action towards the desired end-state, but also by motivating the agent to act in ways that further the goal. The criterion of motivity is closely related to the other rationality criteria for single goals. In most situations the other rationality criteria support the criterion of motivity in the sense that the satisfaction of one or several of them contributes to making a goal motivating. For example, empirical findings suggest that goals that are precise and challenging contribute to enhancing the motivation that an agent experiences as she encounters the goals (Locke and Latham, 1990). Further to the

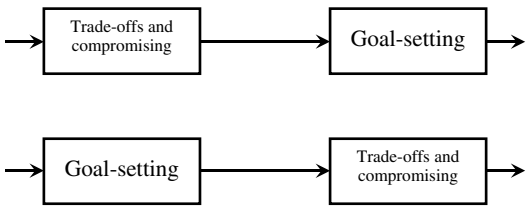

Fig. 1. Two contrasting views on goal-setting and trade-off.

point, motivation is believed to increase when goals are evaluable and feedback is provided on the basis of the goals (Locke and Latham, 2002).

However, it is difficult to capture exactly what the requirement of motivity consists in. It may for example be objected that there are other sources of such motivation than the actual goal, for example, participation in the goal-setting process, encouragement, and other incentives. It may also be argued that motivity need not be a stable property of goals, i.e., agents can find goals motivating to various degrees at different points in time, and that it is therefore impossible to determine the presence of this property conclusively by considering the goal in isolation from the context in which it is to be implemented. On a theoretical level these objections must be addressed in order for the theory of rational goal-setting applied here to be robust. For the purpose of this article, however, it will be enough to assume that the criterion of motivity simply requires that Vision Zero is set in a way that makes the agents that are responsible for its implementation long to achieve it.

It could be argued that Vision Zero is an irrational (dysfunctional) goal, since it does not satisfy the criterion of motivity. The basic idea behind this line of argument is that when a utopian goal (like Vision Zero) is used as a standard to which performance is compared, the discrepancy between the goal and the agent's actual performance is so great that it usually does not, as is commonly the case with other goals (e.g. Campion and Lord, 1982), create a corrective motivation to change the agent's behaviour towards the goal. This idea is also to some extent supported by empirical findings. For example, Stedry and Kay (1966) have shown that the agents perform worse when they aim for goals that are very challenging than when they aim for goals that are challenging but not very difficult to achieve. The lesson to learn is that goals that are too difficult to achieve can become counterproductive.

Nevertheless, many great statesmen, Martin Luther King perhaps being one of the most famous ones, have used visionary images to make the masses enthusiastic and to pave the way for concrete action. Considering the frequent reference to utopian aims made in politics, art, and literature, it appears as if utopian thinking and utopian goals are indeed influential sources of inspiration in people's lives. In addition, people who aim for utopian goals are often admired for their idealism, and commonly serve as role models for other people. For example, as was pointed out by Cíntora (1999), the church encourages its disciples to aspire to Christian perfection just like St. Francis did, even though to be perfectly Christlike is clearly a utopian goal. Further to the point, many ideals and visions cannot be weakened without losing their appeal, or value. Vision Zero illustrates this point neatly. Suppose that the goal is weakened to read: ''No more than 250 people should be killed or seriously injured on the road every year''. Such a weakening seems utterly unpalatable. The problem is that no number above zero seems good enough for this kind of policy goal.

Whether Vision Zero motivates the action it is intended to motivate is, in the end, an empirical question that will be settled in the years to come as experience from attempts to satisfy the goal accumulate.

5. The effects of Vision Zero

A rationality analysis of Vision Zero on the basis of the criteria of precision, evaluability, approachability, and motivity suggests that Vision Zero is action-guiding and, therefore, a rational goal. So what are the actual effects of Vision Zero?

Unfortunately, the empirical evidence of the effects of Vision Zero does not so far amount to a success story. Since the goal was adopted in 1997, the annual number of deaths peaked in 2000 (see Table 1). Alternative statistical series, such as the number of traffic fatalities per capita, per vehicle, or per kilometre travelled, also peaked in the same year. There are many plausible explanations for the temporary increase in the number of traffic deaths. Fluctuations in the economy, the weather, and other important factors may have had a negative effect on road traffic safety. Since 2000, there has been a steady decrease in the annual number of road traffic deaths. In 2005, the number of casualties dropped to less than 440, but this number is obviously still quite a bit higher than the interim target of an annual 270. The annual number of serious injuries has fluctuated and is presently at around 4000.

It is clear, however, that Vision Zero has had practical implications for policy-making since it was adopted. This is mainly manifested through the clear focus on preventing fatalities and serious injuries. According to the Swedish Road Administration, the following four changes on Swedish roads are effects of systematic attempts to implement vision zero (Vägverket, 2004):

Table 1
Deaths (excluding deaths due to illness, but including deaths due to suicide) and serious injuries (as reported by the police) due to traffic accidents in Sweden (Brüde, 2005; Vägverket, 2006)

Year	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005*
Deaths	508	507	492	536	564	551	532	529	480	432
Serious injuries	3 837	3 917	3 883	4 043	4 103	4 058	4 592	4 664	4 022	3 964

* During the first six months of 2006, 200 people died in road traffic accidents in Sweden; this is almost exactly the same as the number of fatalities (201) during the first six months of 2005, but considerably less than the average number of fatalities (234) during the corresponding periods in 2001–2005.

- *More roundabouts*: Roundabouts have become more common in intersections, in particular within population centres. The significance of roundabouts for road safety has been emphasized during the efforts to implement Vision Zero. The pace of traffic is moderated. If collisions take place, their consequences will be less severe than in regular intersections, since angles of collision will be different and speeds will be lower.
- *Roads with midrails*: The so-called 2 + 1 road with a barrier in the middle was introduced in 1998 on a route that had previously been the scene of many fatal accidents. There was much initial scepticism towards the experiment, but it has proved effective against accidents and further development has accelerated since the year 2000.
- *Lower speed limits within population centres*: One of the first impacts of Vision Zero was that it allowed municipalities to lower speed limits to 30 km/h. This limit was not unknown before Vision Zero, but the new implementations were explicitly aimed at preventing fatalities among unprotected road-users.
- *Safer roadsides*: Efforts have been made to mitigate accidents where vehicles drive off the road. Rails have been set up and roadsides have been cleared of dangerous objects such as boulders and trees.

Adopting Vision Zero as a national transport policy goal has also signified an important shift of responsibilities from individual road-users to system designers (Nihlén Fahlquist, 2006). Before Vision Zero became Sweden's road safety goal, it was often pointed out that 90 percent of all accidents are due to individual road-users. In contrast, it is now often emphasized that 90 percent of all fatalities could have been prevented if those who design the system, in particular those involved in road maintenance and vehicle manufacture, had acted differently (Lind and Schmidt, 1999). In addition, the adoption of Vision Zero has involved a shift of focus concerning the object of traffic safety policy, from preventing accidents to preventing fatalities and serious injuries.

What will happen next? In 2007, the interim target of an annual 270 fatalities runs out and a new target must be set. Several key actors, including the Road Traffic Inspectorate, have expressed doubts whether this target will be achieved, and the statistics of the last few years clearly show that much effort is needed in order to reach the target. Nevertheless, politicians still take the target seriously and have proposed measures to improve results during the time that remains. These measures include imposing stricter punishments, lowering speed limits, and changing drivers' attitudes – measures that primarily focus on individual road-users, rather than on system design and implementation as such. While the original intention was to cause a shift of responsibility from individual drivers to those who design and implement the transport system, it may appear that the responsibility of the latter includes checking that the responsibilities of the former are taken.

6. Conclusion

The analysis performed here suggests that Vision Zero is an action-guiding and, hence, a rational goal. Strengths as well as weaknesses of the goal have been identified. On the whole, the conclusion is that it satisfies the criteria of *precision*, *evaluability*, *approachability*, and perhaps also *motivity*. In actual practice, Vision Zero has led to a number of implementation measures, such as the construction of roundabouts and safer roadsides. However, despite the steps that have been taken to reach Vision Zero, the goal is at present far from being realized. Only experiences from the coming years will tell us whether the setting of the goal was an efficient way to improve traffic safety in the long run.

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