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# Road Safety as a Shared Responsibility and a Public Problem in Swedish Road Safety Policy

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## Abstract

Sweden's road safety policy, Vision Zero, seeks to eliminate deaths and serious injuries from traffic crashes, and it recognizes that the bottleneck in improving road safety is displacing mobility as the main priority of the road transportation system. This analysis considers the theory and practice of Vision Zero, first interpreting its proposed changes to responsibility for road safety, and then examining how it has been implemented. The research methods include document analyses, field observations, and interviews with Swedish safety practitioners. This study found that Vision Zero's main innovation is its explicit call for experts to have causal responsibility for injuries. Moreover, Vision Zero expands the responsibility attributed to road users, who are called on to voice demand for safety improvements to civil servants and elected officials. However, Vision Zero also needed to create institutions through which experts could be accountable for their new causal responsibility, and it needed to support popular organizing

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around traffic injury prevention. I suggest that a major limitation to increasing the status of road safety as a public problem is that it is generally understood as a private problem and changing this perception through policy requires a more deeply engaged public process.

### **Keywords**

Sweden, Vision Zero, public problems, road safety, risk, engineered systems

## **Introduction**

Traffic-related injuries affect millions of people, but they are relatively unnoticed as a public problem. From 2000 to 2010, motor vehicle crashes were the *leading* cause of death in the United States for people age five to thirty-four, and accounted for either the first or second highest proportion of injury deaths in all age groups (Centers for Disease Control and Prevention [CDC] 2013), though preliminary data for 2011 show that this has changed from autos to suicide for some age-groups (Hoyert and Xu 2012). Motor vehicle deaths in the United States also disproportionately affect socially and economically disadvantaged groups (Baker et al. 1998; Braver 2003; Beck, Dellinger, and O’Neil 2007). In a global context, the World Health Organization (WHO) estimates that as low- and middle-income countries continue to motorize, traffic-related fatalities will be the fifth leading cause of death in the world in 2030. In 2004, they were the ninth leading cause of death, accounting for 2.2 percent of deaths worldwide (WHO 2009).

In contrast to the collective burden of traffic injuries that these public health statistics illustrate, when we try to understand a traffic crash one of our first reactions is to learn how the individual drivers or victims might have caused it—were they speeding, drinking, or talking on the phone? But there is another way to frame the problem of traffic crashes and injuries, and we could instead ask how the transportation system might have failed to protect people who made predictable errors. This systems perspective—which is well established in industries such as aviation and nuclear power—has increasingly become part of the road transportation sector’s discourse in many parts of the world, though it is usually not the dominant one. The appeal of framing road traffic crashes and injuries as a systemic and collective problem, instead of understanding them as a problem of individual behavior, is that it offers a larger set of ways to organize the infrastructure, operations, and institutions of the road transportation system around injury prevention.

One important example of this shift in road safety thinking is the policy that the Swedish Parliament adopted in 1997, *Vision Zero (Nollvisionen)*. The policy says that no one should die or be seriously injured while using the road transportation system and that “system designers”—including members of the motor vehicle industry, road traffic planners, road safety engineers, police, health professionals, educators, and road users—have a shared responsibility to ensure that the transportation system protects all travelers, even when they make mistakes or are at fault (Tingvall 1997; Sveriges Riksdag 1997). This policy has come to represent a “Scandinavian model” of road safety thinking (Nihlén Fahlquist 2006).

Practitioners, scholars, and road safety advocates who support Vision Zero’s agenda claim that Vision Zero offers a new road safety policy and planning paradigm (Rechnitzer and Grzebieta 1999; Tingvall and Haworth 1999; WHO 2004; Elvebakk 2007). Vision Zero’s advocates point to the various ways in which this policy departs from traditional road safety values, including understanding that traffic injuries are preventable, that road safety is a social equity issue, and that it is a shared responsibility. In my interpretation, the essential ingredient of Vision Zero is a belief that safety should not be traded for mobility. At its core, Vision Zero articulates a direct challenge to the mobility paradigm that organizes the road transportation system.

Despite the advocates’ claims, others have been skeptical that Vision Zero represents a fundamental change. Hagson (2004) examined Swedish traffic planning and street design concepts from the 1960s to the present and concluded that the design ideas that have arisen from Vision Zero do not change, but simply extend, the modernist mobility paradigm that has guided Swedish planning through the decades. Elvebakk (2007) has interpreted the roles and responsibilities of various actors in the road transportation system under Vision Zero, focusing on the implications of applying system safety ideas from highly controlled systems, such as aviation, to the road transport system. Elvebakk argues that applying system safety ideas to road transport has enabled experts to exert more control over road users who have traditionally been relatively autonomous in their travel. She argues that these changes reflect the power of the state in defining roles and responsibilities for system designers and road users alike. Andersson and Petterson (2008) arrived at a similar conclusion about control: Vision Zero redistributes responsibilities according to an interest group logic that centralizes control for road safety in the National Road Administration, rather than distributing it through a multi-sectoral network of actors. Thus, Vision Zero’s creators and admirers aspire to a new approach to road safety, but the existing

literature indicates that the policy does not change larger policy regimes or redefine relationships among actors.

### **Research Questions**

Vision Zero is a policy worth revisiting because a new definition of traffic risk and responsibility—essentially redefining what situations, behaviors, and designs count as being “safe”—can influence the types of interventions that society considers effective and legitimate, and therefore what interventions will be implemented.

In this article, I go beyond the existing literature to understand Vision Zero in both theory and practice, and the analysis centers on three questions:

*Research Question 1:* How are the roles of design experts and road users changed by Vision Zero’s ideas about risk and responsibility?

*Research Question 2:* What are the antecedents of Vision Zero’s ideas and how did the policy develop in practice?

*Research Question 3:* Have these theorized changes in roles, responsibilities, and risks been adopted in road safety planning and design practice in Sweden, and are there conflicts surrounding these changes?

### **Theoretical Framework and Method**

In the first part of the article, I interpret Vision Zero’s ideas using a typology of responsibility created by Gusfield (1981) that includes three dimensions—political responsibility, causal responsibility, and ownership of a public problem. Next, the article presents a discussion of the practical development and application of Vision Zero in Sweden. Considering the implementation of Vision Zero’s policy ideas highlights where road safety practitioners can adopt new practices, and where new practices meet resistance and are not adopted.

For instance, one of the main practical implications of Vision Zero is that traffic speeds should be reduced to prevent injuries. But calling for slower speeds is in conflict with traditional transportation planning strategies that emphasize mobility and traditional claims that higher traffic speeds are necessary to increase access to activities and markets (i.e., through lowering the time cost of accessibility). Thus, by aiming to change functional and socio-political aspects of road safety, Vision Zero challenges some of the basic interests and institutions that have formed to produce road transportation

system infrastructure, operations, and management, and which currently shape safety decision making.

Following an approach developed by Latour (1987) and Callon (1987), Wetmore (2004) examined vehicle safety regulation in the United States, arguing that system risks and responsibility for those risks were coconstructed through the dynamics of actually designing and implementing technologies such as seat belts and airbags. Examining these dynamics is one reason why analyses of Vision Zero's political and technological agenda should consider its actual implementation, and why I consider implementation in this article.

This analysis also frames Vision Zero as an example of how road safety policy is changing focus from risks of a "first modernity," such as how to prevent crashes, to risks of a "second modernity" such as how we create institutions and organizations that help us prevent crashes (Beck 1992, 1999). When understood from this perspective, Vision Zero reflects what has been learned about safety in the industrial context. In the industrial context, creating safe operations means being concerned about both the "sharp end" of the system (e.g., infrastructure) and with the latent social, economic, and organizational factors that shape how we design infrastructure (Reason 1990, 59–60, 173–174, 199–212; Reason 1994). This perspective is consistent with ideas from Wetmore (2004) and introduces the additional question of how to actively organize experts and road users such that they prioritize safety in their everyday activities (Rochlin 1999).

The analysis in this article uses multiple methods to understand the Swedish road safety policy context and the Vision Zero policy within that context. These include (1) analyses of Swedish safety planning and policy documents, urban planning and design documents, and academic and gray literature from Swedish and international authors from the 1950s to the present; (2) interviews with nineteen professionals from different disciplines in Sweden working in road safety, transportation planning and engineering, local government, and other fields that participate in road safety; and (3) field observation of the transportation system and built environment in the Stockholm region.

In Sweden, I conducted sixteen semistructured interviews with nineteen people. I spoke with men and women, and people in different stages of their careers. About half of the interviews were with safety experts, and the other half were with people who know the transportation, city planning, and public health fields more broadly and who could place road safety expertise in a larger context. The interviewees were safety experts in behavior and enforcement (two people), vehicle safety experts (three people), infrastructure designers (four people), transportation experts from research institutes

(five people), and transportation experts from industry/practice/policy (five people).

## Summary of the Vision Zero Policy

The original ideas in Vision Zero emerged from a small, multidisciplinary working group in Sweden that met during the early part of the 1990s to develop child restraint interventions. Thus, the origin of Vision Zero relates to the ongoing safety initiatives of the motor vehicle industry, though it is not limited to this interest group. Its core members had backgrounds in public health, injury prevention, and motor vehicle design. Others had experience working on safety in urban planning contexts, and with the Road Administration, police, and safety advocacy organizations.

One member of this working group said that the diversity of the participants helped him see how he had been “doing it the wrong way before. [He had been] working narrowly, and in relative isolation.” He said that because the members of the working group arrived at the problem from different paths, collectively they put child restraint in a bigger context. This direct experience with enlarging the scope of road safety sparked the idea for Vision Zero. The members of the working group generalized from their own experience working on this one particular topic to make a broader statement about road safety.

The WHO (2004, 3) summarized the main differences between traditional traffic safety and Vision Zero’s approach and these are the following:

1. Traffic injuries are preventable, not accidental;
2. In addition to road users, experts from all relevant sectors—transportation, health, and so on—are responsible for road safety and should share responsibility for it;
3. Transportation systems should be designed to be tolerant of road users’ errors, and road users who make errors should not die or be seriously injured because of them;
4. Safe transportation systems should be designed around the human body’s limited tolerance for harmful kinetic energy;
5. Road safety is a social equity issue, not just an engineering and design problem;
6. Assistance from high-income to low-income countries should target local conditions and needs; and
7. Safety interventions should be based on local knowledge, not only the application of professional guidelines.

Instead of advocating for these new ideas within the Swedish road safety establishment, the core developers of Vision Zero went outside of it. First, they took the ideas to the international safety community where they found support from the World Bank and the WHO. Next, with international support, they advocated for their ideas among high-level ministers in the Swedish government, one of whom had a background in occupational health and safety. With support from ministers, the ideas became national policy. But Vision Zero as a policy did not arise from within the ranks of safety engineers, public works officials, or victims groups, and the policy does not reflect a general consensus about the best way to address road safety. One of the most common critiques, for example, is that Vision Zero evades cost-benefit scrutiny by privileging life at any cost.

Within the larger transportation policy context, Vision Zero is framed as being consistent with more general goals such as using performance measures, devolving decision making, and increasing participation from the private sector to achieve long-run sustainability goals.

## Vision Zero's Assignment of Responsibility for Road Safety

Social understanding of accidents has changed over time. To some extent, accidents are still a catchall category for random, unwanted events that cannot be explained by reason. Yet, the prevailing popular and professional belief is that traffic accidents can be prevented. Specifically, they can be prevented by designing interventions based on knowledge of risk factors (Green 1997).

But who, exactly, is responsible for creating and using knowledge to prevent traffic accidents? The answer depends on road safety's status as a public problem.

Gusfield (1981) used the concept of a public problem to understand responsibility for traffic safety. He analyzed how a network of actors involved in road safety in the United States constructed drinking and driving as a public problem, and identified three dimensions of responsibility for public problems. The first dimension is *ownership*: who has "the ability to create and influence the public definition [of road safety]?" (p. 10) The second dimension is *causal responsibility*, which refers to the causes of accidents: how do they happen, and what are their root causes and circumstances? The third dimension is *political responsibility*: who is responsible for *doing* something about the problem? (p. 13)

Overwhelmingly, individuals are blamed for causing accidents, or in Gusfield's framework, individual road users have causal responsibility assigned to them. According to the traditional popular and professional understandings, bad driving, bicycling, and pedestrian behavior are the main causes of traffic crashes, and thus the appropriate method for improving road safety is to improve the behavior of road users (Tingvall 1997). Indeed, analyses of the causes of accidents assert that road users' errors are contributing or primary factors in 90 percent of crashes (Evans 1996; Åberg 1998; Rumar 1985).

Yet, individual causal responsibility is not completely divorced from more collective forms of responsibility. Individuals' causal responsibility for crashes and injuries is a justification for regulating individual behavior. Rumar (1988) argued that individual road users do not accurately perceive the collective statistical risk of their automobile travel (because they feel that they are in control and are more skilled than the average driver) and that experts should intervene to either protect them or help them become sensitive to the true risk. More recently, Elvik (2010) argued that speed limit laws are justified because drivers cannot select a driving speed that would be socially best. Thus, historically and more recently, in both popular and technical literature, road safety been defined as a problem of driver behavior, a private problem, though one with consequences that justify public intervention, and this pattern has been found in various contexts: Sweden (Lundin 2008), the United States (Albert 1997), and the United Kingdom (Irwin 1985).

Public intervention to prevent traffic crashes and injuries requires that some groups—generally government agencies that claim ownership of the problem (e.g., police, transportation)—assume some portion of, but not necessarily all, political responsibility. Norton (2008) and Lundin (2008) analyzed the development of professional expertise in road safety for the cases of the United States and Sweden, respectively, and found that during the early twentieth century ownership of and political responsibility for road safety shifted from specialists in education and enforcement to engineering as traffic increased, creating pressure on engineers to design better roads and manage traffic.

Vision Zero aims to redistribute roles and responsibilities across these various dimensions and create a new social and political arrangement for road safety policy and intervention.

### *Political Responsibility for Road Safety*

Early Vision Zero policy statements emphasized shifting more political responsibility for traffic-related injuries to the system designers. It argued

that government agencies, nongovernmental organizations, and markets together are responsible for designing the system and regulating and monitoring road users. These system designers “bear the responsibility to do everything in their power to make the system as safe as possible” (Tingvall 1997, 55). One way that Vision Zero tries to shift more responsibility to system designers is by expanding the field of experts to include a more diverse set of actors. This is the idea of shared responsibility for road safety. Instead of holding only transportation safety experts responsible for road safety, Vision Zero also includes among those responsible educators, public health professionals (e.g., emergency medicine, epidemiology, and community health), car designers and manufacturers, as well as employers who rely on private fleets.

But sharing political responsibility for road safety is not novel, and this is not one of Vision Zero’s innovations. System designers from various backgrounds have shared political responsibility for traffic crashes and injuries with road users since driving clubs and government agencies began to regulate drivers and vehicles, and since government agencies began to assume responsibility for constructing roads. This is true for Sweden (Lundin 2008) and in other regions such as the United States (Norton 2008; Wetmore 2004).

Although system designers in Sweden have shared political responsibility for road safety for several decades, this does not imply that they were eager to take on a greater role under Vision Zero. Interviewees said that some transportation professionals did not like the idea of sharing responsibility for traffic safety with the road users because “they were happy to think of safety as a problem of individuals.” Other professionals resisted the idea, saying, “No way. You can’t get fatalities down to zero.” Advocates for Vision Zero said that traditional minded safety professionals “didn’t understand the principle” and that it was easier to convince safety professionals outside of the core profession because they had less at stake in the status quo.

What is novel about Vision Zero’s recalibration of political responsibility is that it assigns more political responsibility for traffic injuries to individual road users. In the traditional model of road safety, road users’ political responsibility for road safety called on them to have safe behavior and to obey rules. In Vision Zero, road users are still responsible for following rules and protecting themselves and others, but above and beyond their responsibility for safe behavior they are also morally responsible for “making clearly-stated and powerful demands on the designers of the system” (Tingvall 1997, 42).

One interviewee explained, “Once people learn about safety, they start to demand it.” Interviewees described how transportation planners in Sweden already respond to neighbors who demand safer local streets for their children, or safer routes to school. Increasing the political role of road users in shaping the safety of the larger road network implies more public participation in transportation decision making.

A common assumption that road safety experts make is that vehicle owners shape safety when they express their demand for safety technology in the marketplace, and would therefore have an economic relationship with experts. But not all road users are drivers, and Vision Zero does not explicitly create a new role for pedestrians and bicyclists, for example, to influence the safety of vehicles. Thus, it is not explicit in Vision Zero whether road users’ demands for road safety would imply an economic, consumer–producer relationship with road safety experts, or whether their relationship would be political.

In addition, the rhetoric of Vision Zero departs from traditional safety thinking by calling out the political responsibility associated with vehicles and roads. Safety experts from Sweden explained in interviews that Vision Zero frames cars and roads as sources of protection as well as hazard. For example, when a drunk driver crashes into a barrier, how should the barrier protect that driver? Or, how should the driver’s car respond when it knows that the driver is drunk? Should it fail to start, travel at a maximum speed of 40 km/h, or take some other action? Vision Zero’s authors contemplated whether safety technologies have agency, and through the policy they give vehicle designers explicit political responsibility for preventing injury through these technologies.

### *Causal Responsibility*

In addition to expanding political responsibility for road safety to a larger set of experts and increasing the political role of road users, Vision Zero seeks to shift some of the causal responsibility for accidents to system designers. This is one of the most radical aspects of the Vision Zero policy.

One of Vision Zero’s authors, Claes Tingvall, explained that because road users can obey all of the traffic rules and still be injured or killed in a crash they should not be solely responsible—causally responsible—for injuries. System designers bear some of the causal responsibility for injuries because they have the knowledge necessary to design road transportation systems that ensure human errors do not result in serious injury or death.

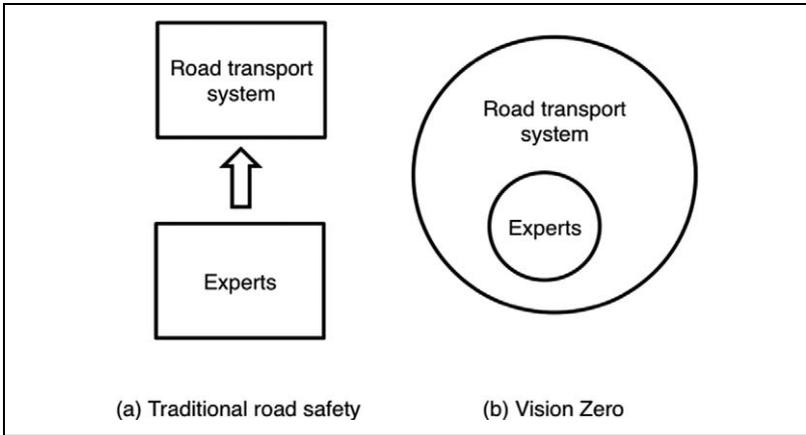
System designers can create “fault tolerant” systems, though they cannot prevent errors, which Tingvall (1997, 50–51) argues cannot be eliminated. “The designers of the system are always ultimately responsible for the design, operation and use of the . . . system and thereby responsible for the level of safety within the entire system” (Tingvall 1998, 3).

In traditional road safety policy and decision making, the safety experts are considered independent of the road transportation system, which comprises vehicles, road users, and road environments (see Figure 1). In the traditional model, safety experts intervene in the road transportation system to correct its failures, but they are not considered part of it. Vision Zero redefines the road transportation system to include these safety experts and their fallibility. Because Vision Zero says that safety experts can be causally responsible for accidents (through errors in designing interventions or by taking no action at all), they must also be defined as part of the system.

If experts responsible for road safety are a source of risk in the system, what approach does Vision Zero recommend for controlling the risk that they contribute? How do experts know that what they do is reducing injuries and deaths?

In interviews, Swedish safety professionals explained that counts of injuries and deaths are the main way they will know the policy is working and that the system designers are doing the right thing. Vision Zero uses two types of safety indicators. The first type is the annual target, which measures fatalities and injuries. Sweden has used this kind of indicator since the 1970s (Belin 2009). In addition, Vision Zero’s performance is measured with a second type of indicator, one that measures performance of risk factors such as the percentage of motor vehicle occupants wearing seatbelts and the percentage of drivers obeying safe speeds in urban and rural areas. This approach is consistent with broader efforts to bring performance management into public administration. Yet, it is not clear that these indicators provide valid causal connections between experts’ work and safety performance, or that the feedback they offer is sufficient to influence experts’ behavior.

Regarding experts’ accountability for this extra responsibility, interviewees discussed issues that are not traditionally part of conversations about road safety, though they are part of mainstream safety science for industrial sectors such as aviation. For instance, one interviewee said that if “all the organizations working in safety were to have quality as a priority in their organizations, then we would have a way of doing accountability. It would be part of quality.” Interviewees also said that it would be better to use a corporate responsibility approach, or to have safety management systems in place for all providers of road safety expertise.



**Figure 1.** Vision Zero reconstructs transportation system risk to include experts.

In addition to safety management systems and corporate social responsibility, Tingvall (1997) proposed that system designers should follow a code of ethics, similar to the code of ethics followed by health care professionals, lawyers, and urban planners. The understanding is that a code of ethics would influence attitudes and provide guidance in cases where experts are faced with moral dilemmas. Each of these proposed approaches relies on experts' self-regulation.

### *Ownership of Road Safety*

With respect to the issue of ownership, Tingvall stated that traditionally the Swedish central government has delegated "overall responsibility for safety for the road transport system and its results to the National Road Administration" (Tingvall 1997, 41). Though Vision Zero seeks to expand political responsibility to include police, public health, vehicle manufacturers, safety technologists, and other groups that participate in the system, it is not clear whether these other actors would have ownership of road safety or include it on their own policy agendas.

Some interviewees offered a critique of Vision Zero and said that it actually concentrates ownership for safety with the National Road Administration and leaves out other groups of experts such as specialists in road user behavior. These interviews confirm the perspective of Andersson and Pettersson (2008), that Vision Zero concentrates responsibility.

This tacit concentration of ownership of road safety may be the result of not explicitly legislating that road safety must be shared by multiple policy sectors. In interviews, safety experts from public health explained that their field is apathetic toward assuming ownership of road safety, even under Vision Zero.

In Sweden, and more generally in Europe, the United States, and other regions, emergency medicine (both ambulance services and trauma centers) provides the link between the health care system and road safety, and emergency care makes significant contributions to road safety practice. But the field of public health sees road safety as a specialization of injury, and often not central to the larger public health agenda. Interviewees said that the majority of public health professionals view road safety as a matter between individuals and police. They suggested that public health experts might feel this way because trauma does not play a major role in the Swedish health care delivery system. Though the relative burden of trauma in Sweden may be small, the absence of road safety on the public health agenda in the United States, where traffic-related injuries are a significant proportion of trauma cases, indicates that the underlying issue may not be the significance of the injury burden, but the historical development of the public health policy agenda (Starr 1982).

## **Vision Zero's Antecedents, Aspirations, and Implementation**

We talked with the original authors of Vision Zero about the ideas that influenced their new safety thinking, and we talked with practitioners who would have new responsibilities under Vision Zero about their work, how they frame the issue of safety, how they understand their role in creating a safe transportation system, and sometimes explicitly about how Vision Zero has and has not affected them. These interviews provide details about the dynamics of developing a new road safety policy agenda and professional practice, advocating for these new ideas, and then ultimately organizing to implement them.

In interviews, members of the original Vision Zero working group told the story of how they arrived at their new understanding of road safety, and from these conversations I have identified three antecedents that influenced their ideas and aspirations: (1) the multidisciplinary collaboration of road safety planning in Sweden in the 1960s; (2) systems safety thinking from industrial sectors; and (3) public health approaches to injury prevention. These next sections discuss each one in turn.

## Mid-century Transportation Planning

In the middle of the twentieth century, a small group of researchers at Chalmers University of Technology in Göteborg comprising a transportation engineer, a community planner, and an architect/urban designer combined their ideas about road safety and created a watershed transportation design guide for Sweden entitled, *The SCAFT Guidelines 1968: Principles for urban planning with respect to road safety (SCAFT 1968: riktlinjer för stadsplanering med hänsyn till trafiksäkerhet*, hereafter SCAFT).<sup>1</sup>

The literal and figurative investment in housing in Sweden during the 1960s, combined with a comprehensive approach to subdivision planning, provided the incentive and audience for this multi-sectoral collaboration. The SCAFT group presented road safety as a problem for both the road transportation sector and the urban development in general. This framing and specific policy and institutional context created the opportunity to implement an integrated, multidisciplinary approach to road safety (Lundin 2008).

The ideas in *SCAFT* centered on the then contemporary problem in Sweden of designing new transit-oriented subdivisions to address the shortage of quality housing and need to improve regional accessibility. They are based on the Swedish experience, as well as on Colin Buchanan's 1963 *Traffic in Towns*, a method of transportation planning based on the United Kingdom's experience mitigating the negative effects of traffic on quality of life. The primary mechanism for such mitigation was the "environmental area," a quiet residential area that is protected from and surrounded by roads that carry heavy traffic, which is similar to transportation planning ideas from the 1920s and 1930s in the United States such as Clarence Perry's neighborhood unit. These ideas are the foundation of the functional classification of streets and have been codified into contemporary transportation planning in many parts of the world. Within this context, *SCAFT* made four propositions that focused on the safety of road transportation systems.

1. Activities and land uses should be located to minimize conflicts among cars and other modes of travel, and to minimize the number of trips made by car. An example of this is to site nurseries, playgrounds, and schools away from driveways, parking lots, and roads that carry motorized traffic.
2. Road space should be organized into a hierarchical network, where the main network provides mobility for cars, and the local network gives access to activities, with priority on the local network given to pedestrians and bicycles.

3. Roads and their surrounding environment should be clear and legible for drivers to prevent confusion and distraction.
4. Safety should be a factor in the design of a development early in the planning process, and pedestrian infrastructure—the network that provides access to all major activity centers—should be planned before roads for cars (SCAFT Group 1968, 9, 22–23).

The ideas in *SCAFT* were widely implemented through the design and construction of Sweden's transportation and land use system in the 1960s and 1970s. Even more importantly, *SCAFT* was the foundation for decades of subsequent transportation planning design guidelines and is the basis for contemporary transportation planning in Sweden (Hagson 2004).

The concepts from *SCAFT* and the process for creating it were discussed during interviews with some contemporary safety planners in Sweden. In particular, practitioners reflected on collaboration and sharing in their work, and alluded to the precedent of *SCAFT* to show how Vision Zero's ideas about multi-sectoral collaboration are an extension of modern Swedish road safety practices.

In interviews, Swedish transportation practitioners said that their city planning processes have a history of being more collaborative than what they see in other countries. Interviewees valued the idea of collaboration, and one interviewee who wanted to know about safety planning in the United States asked me, "Do you have a shared vision?" Underlying this question was the norm of collaboration and sharing. Some interviewees explained that in Swedish transportation politics the contested issues are discussed behind closed doors until the main stakeholders reach agreement. This process helps maintain an image of agreement, instead of bringing the messy politics to light. This may be an exaggeration, and similar comments could be made about many other technocratic planning processes, but it illustrates that Swedish practitioners reflect on the role of collaboration in their work.

According to those who have been included in decision making around Vision Zero, the policy has increased the participation of a diverse set of actors in road safety. One example of the change is the new accident investigation process called OLA (*Objektiva fynd, Lösningar och Avsikter*; objective findings, solutions, and intentions), in which representatives from various organizations come together to analyze crash data for all traffic-related injuries in Sweden to learn what can be done to prevent similar accidents from happening again. These investigations can include representatives from organizations ranging from transportation engineering to the

municipal waste management department depending on the factors that caused the crash. The multidisciplinary group analyzes the crash data together, face-to-face in a meeting, and generates lessons learned that each participating organization implements separately. This was one interviewee's example of how Vision Zero has given safety practitioners a "shared vision" that they did not have before.

However, some safety experts have not been included in decision making for Vision Zero, and they perceived Vision Zero's emphasis on collaboration as limited. An interviewee said that road safety planning under Vision Zero had not been any different than before because the decision makers are still focused on infrastructure, and safety continues to be dominated by transportation engineering, which this interviewee characterized as "conservative" in the sense that the field is not open to new ideas and does not include many women.

Although Vision Zero has given practitioners a language to describe and promote a common vision, except for processes such as OLA, interviewees did not discuss any specific institutions that Vision Zero has created to cultivate cross-sectoral relationships. The example of OLA shows that creating forums and institutions that create a platform for actually sharing ideas, if not responsibility, is a mechanism for implementing Vision Zero.

### *System Safety Influences*

One of Vision Zero's central claims is that risk in the road transportation system should be understood from a systems perspective. This means understanding how upstream factors such as design guidelines, public participation, and vehicle regulations influence injuries and deaths. The systems perspective contrasts with the traditional approach to road safety that views the interaction of vehicles, drivers, and road environments as the source of hazard.

Members of working group that created Vision Zero had experience with systems safety through ISO 9001 and Total Quality Management, which were originally developed in a manufacturing context, but were ultimately applied more widely to understanding organizational safety. In fact, one of the early members of the Vision Zero working group had experience working in Swedish nuclear power safety. According to the interviewees who participated in this working group, system safety ideas reinforced what they already believed about road safety, specifically that crashes and injuries could be prevented through system design and organization, and that they are also caused by system design and organization. One member of the group explained, "We thought: These road builders, why, they are actually

crash designers! The speed and movements on the roads very much determine the nature of the crash.”

This last quote expresses three important ideas that are part of Vision Zero: the idea of system safety, the idea that system designers have causal responsibility for injuries, and that Vision Zero challenges the mobility paradigm by calling on “these road builders” to deprioritize speed. Whereas some critics of Vision Zero say that it has privileged infrastructure partners to the exclusion of other partners, the policy’s original aim was to reform the practice of planning transportation infrastructure. According to the interviewees who developed Vision Zero, the transportation system trades off health, safety, and environment for the production of mobility, and Vision Zero aims to reframe the mobility argument in terms of ethics instead of economics. These advocates say that health and safety are not resources that can be traded.

Vision Zero complicates the mobility paradigm by showing how high speeds—an essential ingredient in increasing mobility—cause more injuries. It challenges the norm of speed in the road transportation system by promoting design approaches that slow speeds. Interviewees explained that slowing speeds to improve safety has more support from professional communities and elected officials when the slower speeds affect only local, neighborhood streets and not the large arterial roads that provide regional connections. This pattern of resistance is similar to the challenges that the sustainable transportation movement faces when it promotes walking, bicycling, and public transit. Making changes to local streets that affect one neighborhood constituency is feasible, but transforming the regional system of mobility is usually characterized as a threat to economic development that increases congestion and causes widespread inconvenience.

### *Public Health Ideas*

In addition to the systems safety perspective, a public health understanding of risk has influenced Vision Zero. In traditional approaches to road safety the outcome of interest has always been the crash, and road safety planning has sought to prevent crashes. Vision Zero advocates changing the focus of road safety planning and analysis away from crashes to injuries. Instead of defining risk as the probability of crashing, Vision Zero redefines risk as the probability of suffering an injury. In a Vision Zero framework, it is acceptable, and even expected, for people to crash cars. What designers need to do differently is prevent injury given a crash. This is a conversion from an engineering perspective to a public health perspective.

An interviewee explained that the original Vision Zero group that was a working group on child restraint problems was thinking about the vulnerability of children's bodies in the transportation system, and they used the phrase "children are not small adults." Focusing on children's bodies highlighted the vulnerability of all travelers' bodies and the role that system designers have in protecting bodies in crashes. It shifted the focus away from crash prevention and toward injury prevention.

The relationship with public health and Vision Zero's ideas about risk and is an example of the multi-sectoral thinking that has informed the policy. Yet, when I asked others whether the role of the public health sector in Sweden has increased, the answer was generally "no." Thus, this relationship with public health might be characterized as a "one-way" relationship rather than a "two-way" relationship.

Integration with the public health sector is not the only challenge that Vision Zero has faced. Each member of the group with whom I spoke described colleagues' resistance to the Vision Zero ideas that they developed with the working group, and how members of the road safety establishment in Sweden did not support it. For example, the group's understanding that the transportation system should protect people even when they make mistakes or are at fault contradicted traditional approaches led by experts in driver behavior. An interviewee described the reaction this way: "When we introduced the idea [of Vision Zero] to the user behavior people who framed the problem around the drunk drivers, they did not accept it as a solution. Not only did it not address the problem—the drunk drivers—it even protected them."

## **Vision Zero's Limitations and Implications for Organizing to Improve Road Safety**

These implementation challenges that Vision Zero faces (e.g., creating meaningful linkages with other sectors, seeking to reduce speeds in the transportation system) are examples of how changing definitions of risk in road transportation have both technical and sociopolitical implications.

Interviews with practitioners suggest three underlying limitations of the Vision Zero policy. These are (1) calling for more intersectoral participation in road safety without creating new institutions through which these sectors include road safety as a formal issue on their policy agendas; (2) assigning causal responsibility to road safety experts without creating a system through which they are accountable for their share of responsibility; and (3) relying on road users to voice political demands for better road safety

outcomes without mobilizing them through a public process, grassroots organizing, or some other mechanism for generating collective action.

For example, safety experts expressed doubt that the processes that Vision Zero has adopted in practice are inclusive of a broad set of experts. They believe that it has privileged people who represent transportation infrastructure interests and the automobile industry. In general, interviewees who work directly on road safety did not talk about how their work has changed to meet their new political responsibilities under Vision Zero. This implies that mainstream transportation professionals are not changing their roles and adopting more political responsibility in their practice.

Nor did the political responsibility that Vision Zero gives to road users come through in interviews. Interviewees did not discuss any new strategies to engage travelers in public processes around road safety planning. No one discussed ways to create dialogue between safety experts and road users, or institutions through which road users could demand safer transportation systems.

Because Vision Zero did not make explicit how experts could be held accountable for crashes and injuries in a consistent or coherent way, interviewees were not responding to specific incentives to reduce traffic injuries. Vision Zero has suggested developing a code of ethics for road safety experts, but this self-regulation approach does not generate any leverage for compliance without valid feedback about the safety of the system.

Based on these limitations, I argue that Vision Zero needed to do more than articulate a new balance of responsibility. It also needed to create new institutions that would give meaning to the new responsibilities that it proposed, and processes for organizing people such that they could have a collective, political voice. This is because policy is the manifestation of collective values as well as collective action, and Vision Zero's message needs to represent the collective values of safety professionals or road users. Vision Zero sought to change collective values, but this does not happen through policy, but through discourse and organizing. I think that a next step for Vision Zero would be to organize support among neighbors, schools, pedestrian and bicycle advocates, and other interest groups that directly experience traffic risk, in addition to organizing road safety professionals working in the mainstream of the profession.

Experts have stated that road safety as a policy issue is "neglected" (WHO 2004) and "grossly underemphasized" (Evans 2004), and does not receive enough public attention. I suggest that one reason that traffic crashes are neglected as a public problem is that they are usually understood as an individual-level disaster, not a social catastrophe. The 2007 *Global*

*Report on Urban Settlements* concluded that traffic crashes are “small disasters,” not “large disasters,” because they affect only individuals, families, or households, whereas large disasters affect entire communities or groups at a larger scale (United Nations Human Settlements Programme 2007). Similarly, Hewitt (2000), a geographer of disasters, classified traffic crashes as “lifestyle hazards” along with heart disease. Genuine “crises” include epidemics, floods, biological extinctions, and global climate change. These taxonomies of disasters create an ordinal system where events fall along an axis with values ranging from the individual to the collective. Compared to most other disasters, traffic crashes are problems for individuals, not for society as a whole, and this is the challenge for Vision Zero.

A more collective approach to safety has been demonstrated in the industrial sectors, where safe systems are socially constructed by their members who have a variety of rituals, norms, stories, rules, and knowledge that enable them to operate safely (Rochlin 1999). This analysis of Vision Zero shows that the road transportation system struggles to create cohesion in its collective approach. In contrast to the existing literature, adopting a systems safety perspective in road transportation does not require increasing the degree to which it is centrally controlled, because centralized control is only one form of organizing. Instead, it needs to manifest a greater collective consciousness about safety that is organized around reducing deaths and fatalities.

Yet, one of the ironies of Vision Zero is that it developed in a context that is among the safest in the world, and perhaps where popular experience with traffic injury is relatively uncommon and is not a pressing issue around which to organize. Vision Zero may need to focus on organizing in other regions, such as the US or motorizing contexts, where traffic injuries and deaths are a more significant health burden. Such a grassroots organizing approach would be consistent with the origins of road safety policy (Norton 2008), at least in the United States, when women’s groups brought attention to the problem, joined agendas with workplace safety advocates, and started a safety movement. Vision Zero took first steps in this direction, and the next task for research and practice is to learn how to carry out this safety organizing in the road transportation system.

## Conclusions

In aiming to shift the balance of responsibility for road safety to reflect experts’ roles in system risk, Vision Zero has raised the salience of road safety on the Swedish transportation policy agenda and stirred debate.

Overall, Vision Zero is an example of a social process seeking to redefine system risk and influence roles and responsibilities. With respect to increasing experts' political responsibility for road safety, Vision Zero has called for including a broader set of sectors, such as public health and the private sector, in road safety decision making. People working in the traditional model of road safety with existing institutions such as design guidelines, crash prediction models, and educational programs may be reluctant to assume new responsibility for traffic crashes and injuries. Although Vision Zero calls for a redistribution of power to make safety decisions and hold people accountable, it does not necessarily seek a different policy regime, and ownership of road safety as a public problem remains rooted in the transportation sector.

More radically, Vision Zero reframes causal responsibility for road safety by asserting that road users are not solely responsible for causing accidents and that system designers also have a causal role in causing and preventing them through their direct influence over roads, laws, and vehicle and other technologies. Yet, Vision Zero does not include ways in which experts can be held directly accountable for crashes in a consistent or coherent way. It does suggest a code of ethics for road safety experts, but this self-regulation approach, combined with the policy's call for road users to hold experts more accountable, does not create any leverage for creating compliance.

With respect to introducing system safety ideas into the road transportation system, Vision Zero makes a case for treating road safety as a collective, social–technological problem instead of a private problem. But traffic crashes and injuries remain discrete, individual events in a road transportation system that provides mobility for individual travelers. A remaining task for road safety advocates is to create a collective interest this public problem, and that requires a more deeply engaged public process, not policy alone.

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