A Primer for Traffic Safety Culture

By Nicholas J. Ward, Ph.D., Jay Otto, and Jeff Linkenbach, Ph.D.

We need to transform our culture, from a culture that accepts loss of life and limb as a price of mobility, to one in which elected officials, transportation professionals, and individual citizens expect safety, demand safety, and refuse to accept that an annual casualty count roughly equal to the population of Arkansas is a fair price to pay for mobility.

—Peter Kissinger, Director of AAA Foundation for Traffic Safety

In November 2013, *ITE Journal* reported on the Institute of Transportation Engineers' participation in the first National Roadway Safety Culture Summit that took place in August 2013. The article, "Partnering Across Disciplines for Traffic Culture Change" detailed the summit's focus on the impact safety culture has on roadway crashes and how that culture can contribute to eliminating fatalities and serious injuries on roadways. The summit concluded with a call to action to create a toolkit, best practices, and guidance on models for measuring behavior and changes for reliability, validity, and interventions. Work is ongoing to develop a common, tangible definition of traffic safety culture and the associated materials to help promote it. This current article supports these efforts. To easily access the websites referenced within the article, please visit the online version of *ITE Journal* at www.ite.org.

The concern: 32,367. It is the total number of persons killed on U.S. roadways in 2011.[1] Our roadway system is a public service managed by road authorities and transportation agencies. In this context, this number of traffic fatalities signifies our failure to safely manage the roadway system.

The hope: Zero. It is the only number of traffic fatalities that represents absolute success in the management of our roadways. The vision of zero traffic fatalities is also a moral declaration of our responsibility as traffic engineers: *It can never be ethically acceptable that people are killed or seriously injured when moving within the road transport system.*[2] To accept any number above zero is arbitrary—if not defeatist.

The strategy: A strategic basis for safely managing any system is to identify the primary hazards in that system. And so, we must comprehend all relevant hazards in the roadway system to achieve the goal of zero traffic fatalities. As an example, Figure 1 describes two hazard pathways that determine crash risk.

First, the physical environment can impose inherent hazards, such as a rural location where the mountain topography creates short radius curves with insufficient sight lines and narrow shoulders adjacent to naturally occurring obstacles.

Second, the culture that emerges in a geographical area can influence driver responses to perceptions of risk associated with system hazards and driver intentions to engage in risky behaviors. For instance, drivers in rural areas may share a belief system described as "denial of risk" that increases risk-taking behaviors such as speeding.[3] This aspect of society that influences behavioral choices that affect traffic safety is called "traffic safety culture."

Our current traffic safety paradigm primarily focuses on the environment (system) hazards by designing safer roads and safer vehicles. Even our response to behavior hazards is predicated on environment design. For example, traffic engineers create environment constraints that restrict driver behavior (e.g., speed bumps) or mitigate the risk of unsafe behavior (e.g., crash barriers).

All these methods share the perspective that the external environment can be designed or modified to make the person safer. We refer to this traffic safety paradigm as "safety by design."

The safety by design paradigm has been effective in reducing traffic fatalities.[4] However, this paradigm alone cannot achieve our zero fatality vision, because it does not address the cultural influence on behavior hazards resulting from the social environment that we always occupy. And so, the safety by design paradigm cannot *sustain* our goal of zero fatalities. For example, the effectiveness of safety by design methods is limited to its spatial (and temporal) location in the environment. For example, speed bumps are only effective in reducing speed in the location of those bumps.[5]

Conversely, the social affiliations that define our social environment are always part of our own identify. As social beings, the influence of our social environment—in terms of our identification with specific groups (e.g., family, community, work) and our roles within those groups (e.g., parent, coach, police officer)—is always present regardless of where we drive. For example, the fear of disappointing a parent when anticipating a drunk driving charge resides with the driver and is not dependent on a specific location on the roadway. And so, we can achieve sustainable changes in behavior across the road network by instilling a social environment that intrinsically supports safe behaviors. Therefore, by changing our culture to support safer driving behaviors, we are calling upon our very innate protective nature as humans to be safer drivers. This is the paradigm we refer to as "safe by nature."
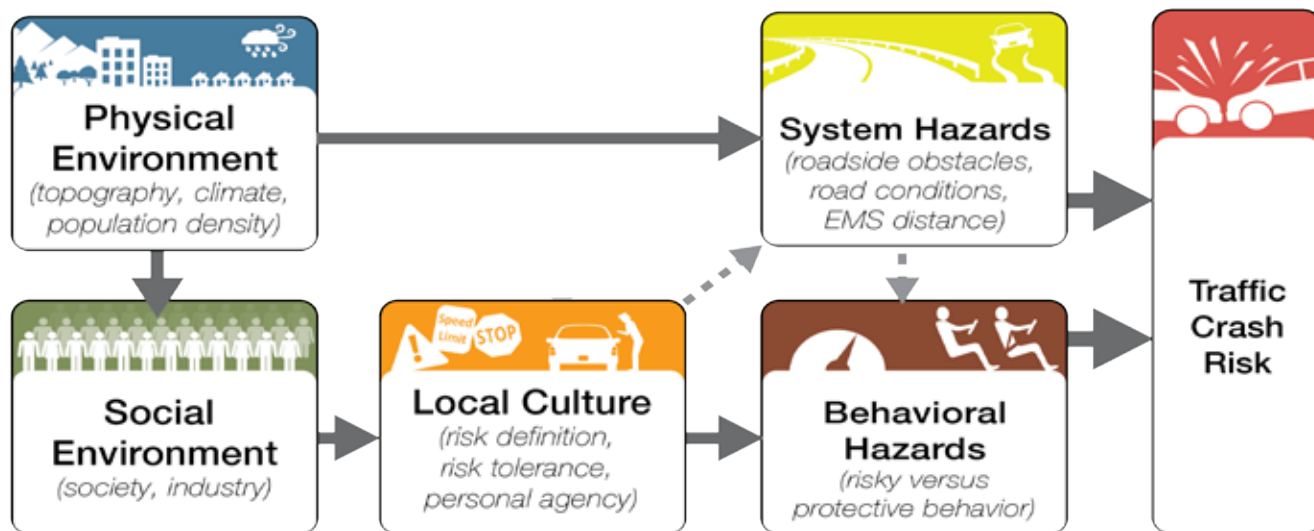

Figure 1. Model of crash risk based on hazard pathways in the physical and social environment.

How then do we impact driver behavior through this safe by nature approach? We first need to be more specific about what we mean by "culture." Groups often share experiences. These shared experiences influence our thinking both about the behaviors themselves and about the group as a social entity. Psychologists refer to these different types of thought as "cognitions."

The cognitions shared by a group of people are one part of that group's culture. This element of culture then influences the decisions made by individuals identifying with that group.[6]

From this cognitive perspective, culture can be described in terms of shared **values**. Values are the ideals to which we aspire and judge the merit of our behaviors (e.g., "The most important thing is to take care of family").

Our values in turn dictate the things we try to understand by generating a system of **beliefs**. Behavioral beliefs refer to our expectations about the possible consequences of our behavior and our valuation of those consequences (e.g., "It's unlikely that by speeding I will get a ticket" and "I don't care about the fine"). Normative beliefs refer to our perceptions about the behaviors that are common and sanctioned within our group culture (e.g., "All my friends speed—and so approve of me speeding, too"). Control beliefs represent our perceived role and ability to respond in our environment (e.g., "I am able to choose my own speed," "I am a good driver and can drive faster than the speed limit safely").

Our values and belief system influence our intentions to behave through the formation of attitudes, perceived norms, and perceptions of control.

Attitudes are the adjectives we use to describe perceived utility and emotional response to a behavior. For example, if we evaluate the expected outcome of a behavior to be positive and believe most other people perform and endorse the same behavior, we will have positive attitudes about that behavior.

Similarly, our belief that most other people perform and endorse a behavior will motivate our intention to conform to **perceived norms** in order to belong to the group.

Finally, our intention to engage in a behavior will be less if there is no **perceived control** over that behavior in our environment. And of course—intention aside—we cannot engage in a behavior that we cannot control.

Important to this discussion is the fact that the origin of these cognitions is our shared experiences and identification with the social groups that define our social environment. As shown in Figure 2. Depiction of multiple groups and sources of social influence in society., there are many layers to our social environment that influence the decision-making of individuals. Since each of these layers influences individual decision-making, the work of improving traffic safety culture involves impacting each of these layers (view online: www.mostofus.org/wpcontent/themes/mostofus/scripts/osflvPlayer. swf?iframe=true&width=640&height=480&movie=/wp-content/

uploads/2011/08/Social-EcologicalModel.flv&fgcolor=0x0b7ba4&bg-color=0x333333&autoload=on&autoplay=on&autorewind=on&vol-ume=80). And because these social affiliations are part of our own identities, their influence on our behavioral intentions is omnipresent (e.g., I am always my parent's son no matter where I am).

Figure 2. Depiction of multiple groups and sources of social influence in society.

Next, we need to have predictive models of how the cognitions that define our culture influence the behaviors we are seeking to change in order to improve traffic safety.

The Theory of Planned Behavior illustrated in Figure 3. Theory of Planned Behavior as an example of a model to explain the effect of cognitions on intentional behavior. It indicates that our plan (intention) to commit a behavior is predicted by our attitudes about the behavior, perceived norms, and perceptions of control over the conditions that support that behavior.[7]

For example, this model predicts that people choose to speed if they feel speeding is exciting or useful (attitude), think other members of their group also speed and endorse speeding, and believe there are no external factors that constrain their speed choice. Conversely, strategies to change speeding behavior would seek to transform these same cognitions so that speeding is no longer socially motivated by these cultural factors.

Finally, the behavioral model must be specific enough about the predictive pathways to guide the design of strategies to transform the shared cognitions (culture) that determine the intention to commit the target behavior(s). In this regard, the following examples represent strategies to transform the different cognitions that define the influence of culture on behavioral intentions:

- **Value:** This example shows a family embracing the unbelted father to prevent an unseen car crash (view www.youtube.com/watch?v=h-8PBx7isoM). The family embrace is used as a metaphor for wearing a seatbelt. In so doing, this message associates seatbelt use with protecting family. Because protection of family is a fundamental value, the behavior of wearing a seatbelt is itself valued. Once it becomes a more valued behavior, seatbelt use is expected to increase because it reinforces an intrinsic value.
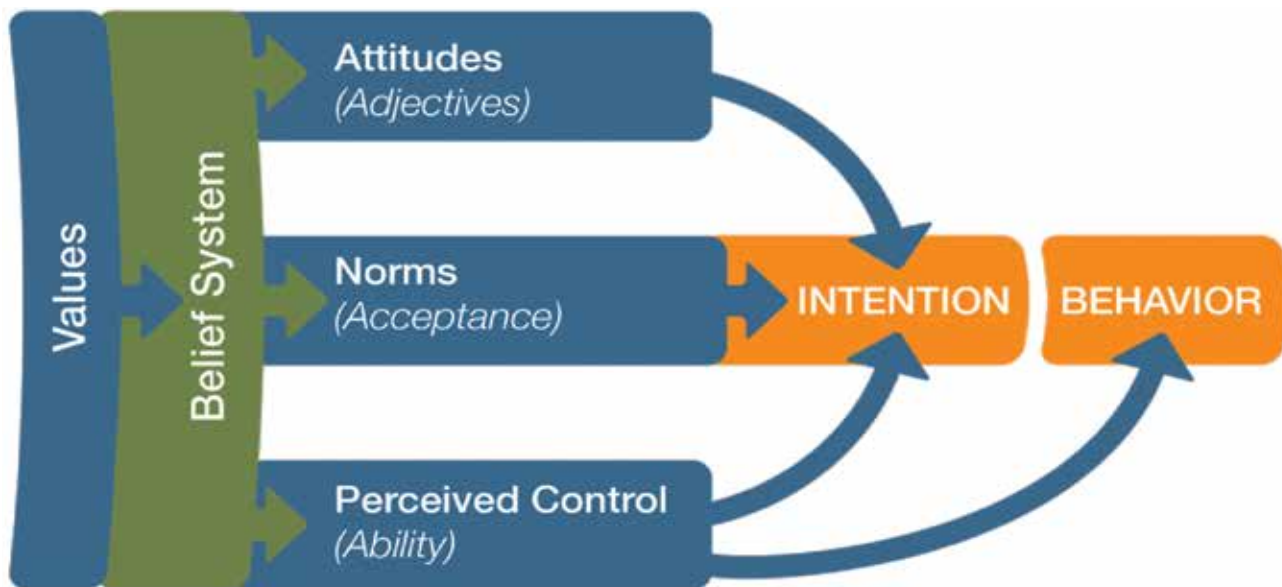
Figure 3. Theory of Planned Behavior as an example of a model to explain the effect of cognitions on intentional behavior.

- **Beliefs:** This example shows two friends in a pub discussing the consequences of drunk driving (view www.adforum.com/creative-work/ad/player/9426). Both the social context and the use of social satire were chosen to resonate with the target group for this message—young males who drink. As a result, the portrayed consequence of guilt that ruins the life of the drunken friend involved in a fatal crash is socially relevant to this group. This will cause beliefs (and attitudes) about the consequences of drunk driving to become increasingly more negative.

- **Attitudes:** This example shows a group of young friends killed in a speed-related crash arriving at heaven, only to learn that it is a nightclub for old people (view www.youtube.com/watch?v=X-EAWs-TAPhI). This message focuses on attitudes in two ways. First, the existing attitude within this cohort that old people are not cool is used to create the attitude that heaven is also not cool. Second, the attitude toward speeding itself becomes more negative because of the perception that it can hasten one's entrance to the (undesired) heaven.

- **Perceived Norms:** This example shows a young male speeding through town under the misperception that everyone (including his friends) approves of speeding (assumed norm) and shares the attitude that it is manly (view www.youtube.com/watch?v=gNsv-Vky3k_s). However, the message challenges this false belief by showing that even his friends do not approve of speeding. Moreover, by chastising the driver with an emasculating gesture, the perception that speeding is also masculine is challenged.

- **Control:** This example portrays the consternation of young male Maoris to intervene with a drunken friend intending to drive home from a party (view www.youtube.com/watch?v=CtWirGxV7Q8). In this case, the message explores the personal angst and misconceptions about the social consequences of diverting from the perceived norms of a culture. In so doing, this message is unique

in its empowerment of individuals to make individual decisions that enable them to control their (social) environment rather than conform to misperceptions about the group expectations.

Aside from demonstrating specific strategies for transforming culture, these examples also demonstrate the main tenets of the traffic safety culture paradigm:

1. All of these messages are framed positively with a combination of concern and hope rather than with threats and fear. Indeed, the message about drunk driving even used mild humor to draw our attention to undesirable consequences. Despite their intuitive appeal, fear-based messages have many unintended and undesirable consequences (view www.mostofus.org/wp-content/themes/mostofus/scripts/osflvPlayer.swf?iframe=true&width=640&height=480&movie=/wp-content/uploads/2011/08/Challenges-of-Fear-Based-Approaches.flv&fgcolor=0x0b7ba4&bgcolor=0x333333&autoload=on&autoplay=on&autorewind=on&volume=80).

2. These examples seek to change behavior by transforming the existing culture rather than by imposing an external culture. For example, the message about heaven and speeding with teen drivers used the attitudes that already existed in the culture of the target audience. Change will be more accepted and sustained by the existing culture than by an imposed culture that is not part of the group identity.

3. The existing culture may already contain the positive leverage needed to change behavior. For example, the message about speeding amongst young males communicated the existing positive aspect of that culture; namely, most people important to the young male drivers do not approve of speeding.

Although not immediately recognizable from these examples, there are several other important elements for creating effective transformational strategies:

4. There is a need for a systematic process of developing effective transformational strategies. This involves an iterative process of developing and evaluating solutions within the prevailing culture (e.g., view www.westerntransportationinstitute.org/documents/centers/culture/ACTION_Framework_for_Traffic_Safety_Culture_v5_2012-12-31.pdf). These strategies require a longer time than traditional traffic safety methods as a result of the iterative nature of the design process and the time lag to effect cultural change within any social environment.

5. As noted in Figure 2. Depiction of multiple groups and sources of social influence in society., individuals belong to many groups in society, so individual decisions may have multiple sources of cultural influence. For some behavioral choices, the cultural influences of different groups are oppositional. Therefore, it is necessary to integrate multiple strategies to transform the cultures for all the relevant groups to sustain changes in behavior relevant to traffic safety.[8]

6. Cultural transformational strategies are not expected to work in isolation. These strategies should be used as part of a strategic plan to integrate all relevant forms of traffic safety intervention. This ideology is embraced by the "safe-system approach." As shown in Figure 4. Representation of safe-system approach to traffic safety., this approach integrates strategies that address both the physical (roads, vehicles) and behavioral (people) hazards in the roadway system. In response, this approach integrates our traditional methods (engineering, enforcement,

and education) to achieve safety by design in our roads, vehicles, and people. In this context, new strategies to understand and transform culture will make people "safer by nature" by making safer speeds part of our social identities.

The goal of the traffic safety culture paradigm *is to develop a process for changing values and attitudes so that safety is part of every transportation decision, whether individual or organizational.*[9] One model to illustrate the possible process for sustaining the goal of zero traffic fatalities is shown in Figure 5. Model of possible process to sustain transformation of traffic safety culture..

The impetus for this process is the safety culture of the organizations that are responsible for managing traffic safety. Only these organizations have the resources and authority to implement and sustain the types of integrated strategies that are necessary to transform traffic safety culture.

In essence, an organization's desired safety culture to support this integration is evident from the processes and policies that give priority to safety above all other decision criteria. This can be described as a *social climate in which traffic safety is highly valued and rigorously pursued.*[10]

And yet, this type of safety climate within an organization does not emerge without the inspiration and innovation of transformational leaders. Transformational leaders are those with the professional competence, visionary courage, and personal charisma necessary to instigate and inspire innovative change in the vision, strategy, and culture of the organization.[11] These leaders accomplish this change by developing plans to manage the change process itself.[12]

However, a strong safety culture within a traffic safety organization does not ensure the adoption of strategies to transform the traffic safety culture of road users. Indeed, a strong organization safety culture could result in safety plans that simply increase the resourcing of the traditional methods that are already used to improve traffic safety (safety by design). Thus, in addition to valuing safety, the organization culture must also encourage and reward innovation so that new methods are developed, including those that change the traffic safety culture (safety by nature).

One way to motivate the implementation of new methods is to codify their need within the planning tools of the organization. For example, the Strategic Highway Safety Plan (SHSP) developed by a state Department of Transportation is a well-established type of safety planning tool.[13] Accordingly, states could specify the transformation of traffic safety culture as a performance target or prescribe cultural change strategies in response to identified critical emphasis areas (e.g., speeding). This formalization will give credence to traffic safety culture as a determinant of traffic safety, as well as provide the mandate to invest resources to develop and implement specific cultural change strategies.

Over time, systematic changes like those noted above can result in the transformation of the traffic safety culture. The groups served
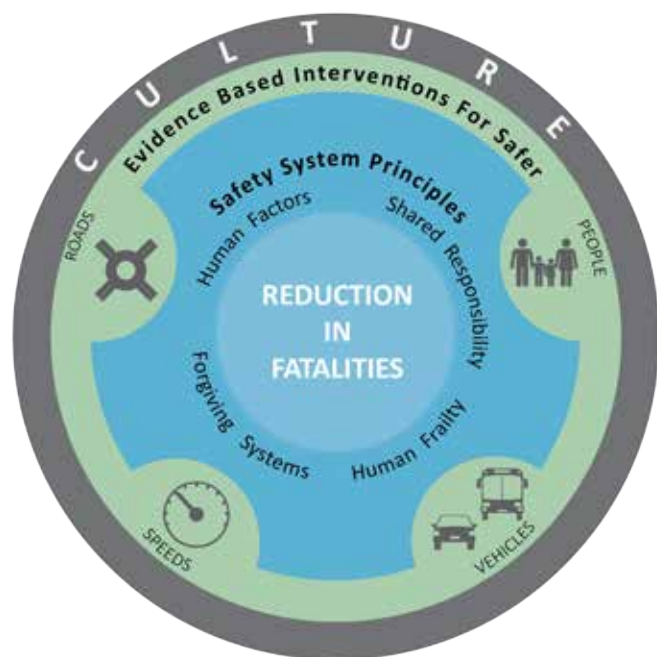

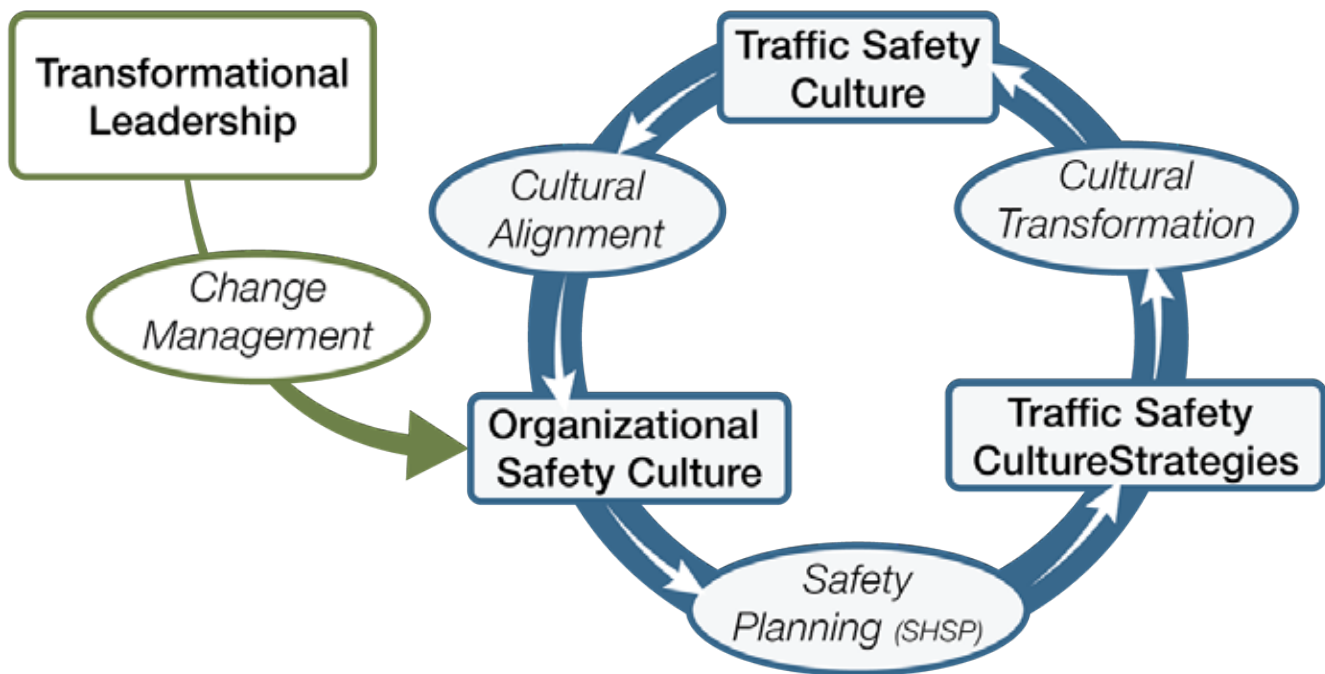*Figure 4. Representation of safe-system approach to traffic safety.*

Figure 5. Model of possible process to sustain transformation of traffic safety culture.

by traffic safety organizations will eventually create a political voice that will further speed the process. This voice will request and expect the traffic safety organizations to expand their efforts to improve traffic safety, because that goal has become embodied in the group culture. In response, these organizations will invest and innovate more in order to sustain traffic safety goals, including the continued transformation of traffic safety culture. This will eventually create a cycle of mutual reinforcement between the organization and population cultures. Without this cultural alignment, we will neither achieve nor sustain a goal of zero traffic fatalities. **itej**

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6. The distinction between individual and social experience in the formation of cognitions is important to the efficient application of strategies to make safer drivers. Because cognitions based on individual experience are likely to be highly idiosyncratic, there would need to be as many strategies as there are different types of individual experience. In contrast, strategies that are based on the shared social experience in a group can influence a wider segment of the cognitions that comprise a group culture. It is this shared experience that strategies to transform traffic safety culture seek to exploit.

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8. This integration across groups can take two forms. First, the effect of culture across multiple groups on an individual's behavior can be targeted. For example, reductions in male teen speeding can be sustained by transforming the aspects of family, friend, and work culture that are relevant to speeding behavior. This may include strategies that discourage speeding by emphasizing the disapproval of parents (injunctive norm), the attitudes of friends that speeding is stupid, and the belief in the workplace that speeding tickets could reduce promotion prospects. Second, the effect of culture for different groups that have a role in "managing" the behavior can be targeted. For example, the culture of the local government and police force could be transformed to create more effective traffic laws that would then be more rigorously enforced.

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