A DECADE OF ACTION TOWARD ZERO DEATHS: A WORLDWIDE PLAN FOR ROAD SAFETY AND THE U.S. HIGHWAY SAFETY STRATEGY CASE STUDY

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ABSTRACT

Worldwide, 1.3 million people die annually on the roads. Deaths will increase to 1.9 million by 2020. The FIA Foundation helped establish the UN Decade of Action for Road Safety (2011-2020), which incorporates a Safe Systems approach with the goal of reducing projected deaths by half, saving 5 million lives in 10 years. With 43,000 U.S. deaths annually, the American Association of State Highway and Transportation Officials (AASHTO) spearheaded in 2007 a national goal of halving the current number of fatalities in two decades. Now AASHTO is taking the effort further with their many federal, state and local safety partners by developing Toward Zero Deaths (TZD), a data-driven 25 year strategy.

This paper presents the strategies of the Decade and TZD for use by PIARC members from developing and developed countries for policy formulation, institutional framework-building, countermeasure implementation, and social marketing. Evidence-based interdisciplinary collaboration is essential to success in every PIARC member country.

The collaborative, evidence-based frameworks for the Decade and TZD built support among stakeholders. The Decade's Five Pillar Plan is mirrored by results of the TZD stakeholder meeting in August 2010, where experts in infrastructure, enforcement, technology, education, emergency medical services, and public health worked on high-payoff strategies.

1. INTRODUCTION AND BACKGROUND

Worldwide, road crashes cause nearly 1.3 million fatalities and 50 million serious injuries annually, and fatalities will increase to 1.9 million by 2020. Road crashes are the leading cause of death for young people 10 to 25 years old and deaths and injuries are predicted to continue rising. It is estimated that road traffic injuries will rise from being the 9th leading cause of death worldwide to the 5th leading cause of death by the year 2030 (Figure 1). [1]

TOTAL 2004

RANK	LEADING CAUSE	%
1	Ischaemic heart disease	12.2
2	Cerebrovascular disease	9.7
3	Lower respiratory infections	7.0
4	Chronic obstructive pulmonary disease	5.1
5	Diarrhoeal diseases	3.6
6	HIV/AIDS	3.5
7	Tuberculosis	2.5
8	Trachea, bronchus, lung cancers	2.3
9	Road traffic injuries	2.2
10	Prematurity and low birth weight	2.0
11	Neonatal infections and other	1.9
12	Diabetes mellitus	1.9
13	Malaria	1.7
14	Hypertensive heart disease	1.7
15	Birth asphyxia and birth trauma	1.5
16	Self-inflicted injuries	1.4
17	Stomach cancer	1.4
18	Cirrhosis of the liver	1.3
19	Nephritis and nephrosis	1.3
20	Colon and rectum cancers	1.1

TOTAL 2030

RANK	LEADING CAUSE	%
1	Ischaemic heart disease	12.2
2	Cerebrovascular disease	9.7
3	Chronic obstructive pulmonary disease	7.0
4	Lower respiratory infections	5.1
5	Road traffic injuries	3.6
6	Trachea, bronchus, lung cancers	3.5
7	Diabetes mellitus	2.5
8	Hypertensive heart disease	2.3
9	Stomach cancer	2.2
10	HIV/AIDS	2.0
11	Nephritis and nephrosis	1.9
12	Self-inflicted injuries	1.9
13	Liver cancer	1.7
14	Colon and rectum cancer	1.7
15	Oesophagus cancer	1.5
16	Violence	1.4
17	Alzheimer and other dementias	1.4
18	Cirrhosis of the liver	1.3
19	Breast cancer	1.3
20	Tuberculosis	1.1

Source: World health statistics 2008 (http://www.who.int/whosis/whostat/2008/en/index.html)

Figure 1- Leading Causes of Death

The FIA Foundation initiated the Make Roads Safe Campaign and worked with the World Health Organization (WHO) to establish the first UN Decade of Action for Road Safety (2011-2020). The Decade strategy incorporates a Safe Systems-oriented approach with the goal of reducing projected deaths by half, saving 5 million lives over the next 10 years. In the U.S., with 34,000 road deaths in 2009 (a decrease from 43,000 in 2006), the American Association of State Highway and Transportation Officials (AASHTO) spearheaded in 2007 a national goal of halving the current number of fatalities in two decades. Now AASHTO is taking the effort further with their many federal, state and local safety partners by developing Toward Zero Deaths (TZD), a data-driven 25-year strategy.

Although countries differ in innumerable ways, including in its death rate per capita, every country has a stake in improving safety (Figure 2). [2]

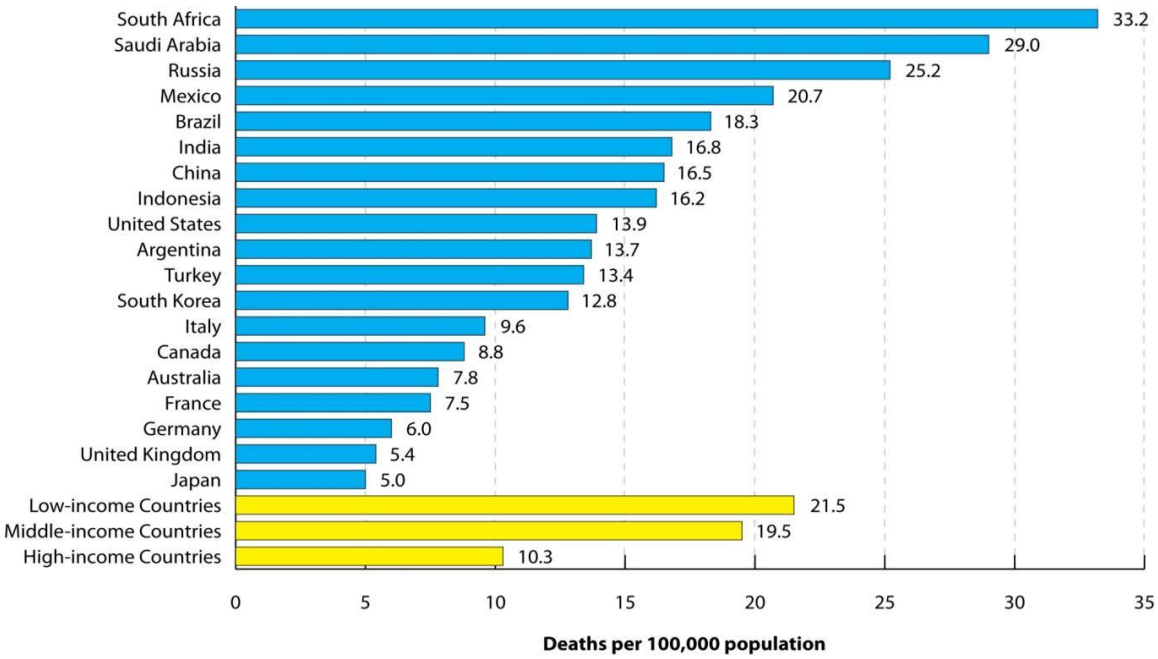

Figure 2 - Road Death Rate Per 100,000 Population By Country (2007)

Similar to the road death rate range in different countries, different states in the U.S. show a range of deaths per 100,000 population (Figure 3). The more rural states have the higher death rates.

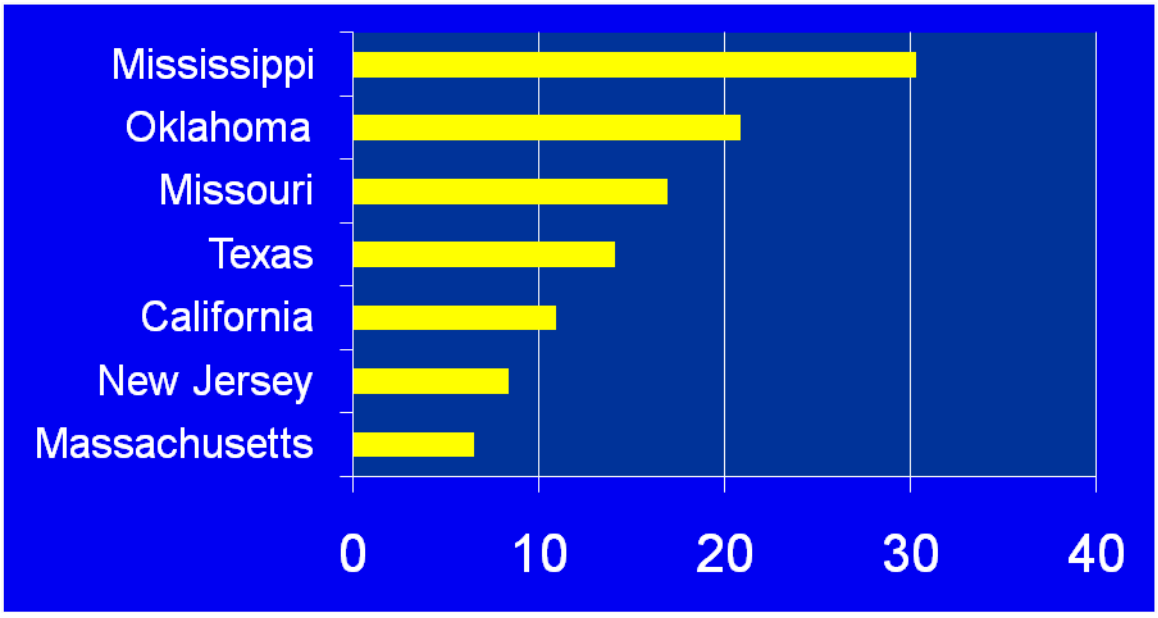

Figure 3 - Road Death Rate Per 100,000 Population by State (2007)

TZD represents a major contribution towards the Decade's goals for the U.S. With goals that mirror the goals of the Decade and States that mirror the death rates per capita, TZD can serve as a model for other countries because it addresses road safety issues in the geographically and culturally diverse U.S. States and Territories.

1.1 Paper Objective

This paper presents the strategies of the Decade of Action for Road Safety and for Toward Zero Deaths efforts for use by PIARC members from developing and developed countries for policy formulation, institutional framework building, countermeasure implementation, and social marketing. Evidence-based interdisciplinary collaboration is essential to success in every PIARC member country.

The collaborative, evidence-based frameworks for both the Decade of Action and Toward Zero Deaths that have successfully built support among safety stakeholders will be presented. The FIA Foundation's strategy of integrating road safety with poverty reduction and development work, as well as continuing with traditional public health avenues, will be presented, along with details of the U.S. national strategy which were the result of the TZD stakeholder national meeting.

2. THE DECADE OF ACTION FOR ROAD SAFETY

Proclaimed by the UN General Assembly in March 2010, the Decade of Action for Road Safety is a call to action for countries and communities to save lives on the world's roads. Like the Decade to Roll Back Malaria and other UN public health efforts, the objective is to bring attention to the burden of road deaths and injuries and to provide a framework for governments and civil society around the world to develop a plan to address this growing problem affecting people's lives and health. If road traffic injuries continue at the current rate, by 2020, there will be 1.9 million deaths each year. The FIA Foundation helped develop the Decade of Action plan which shows that there is the potential to save five million lives and prevent 50 million serious injuries in the next 10 years if effective countermeasures are applied worldwide. [3]

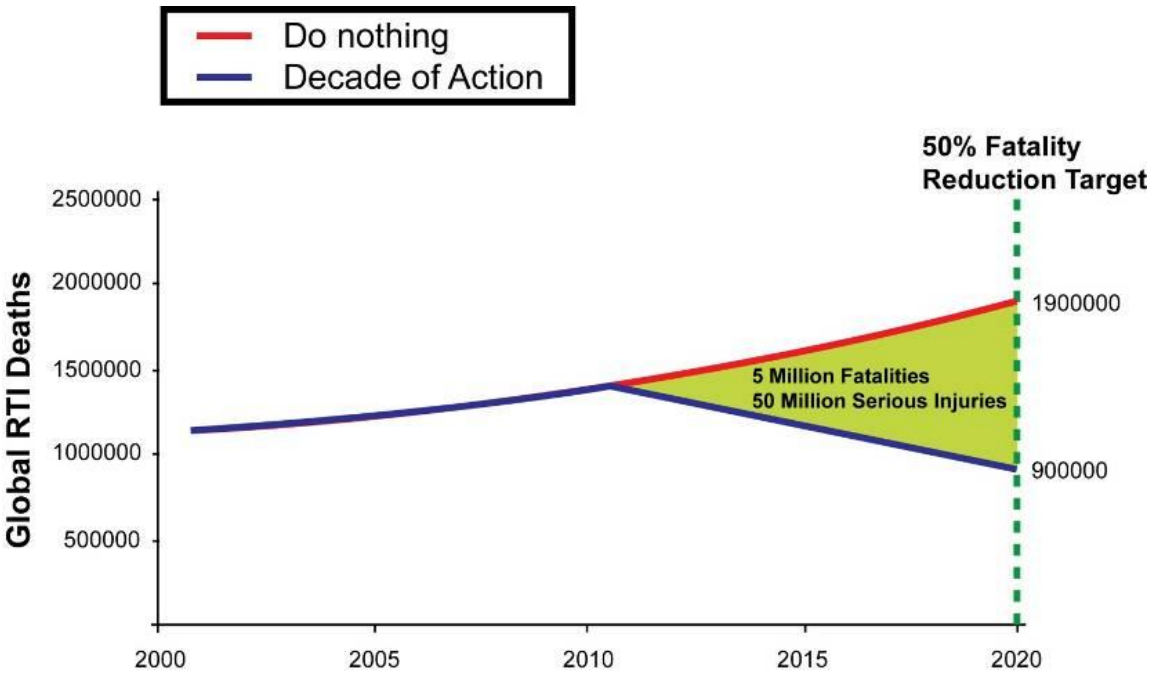

Figure 4 - Road Traffic Injury Deaths Projected for the Decade

2.1 The History of the Decade of Action for Road Safety

The Decade of Action for Road Safety will begin worldwide on May 11, 2011, but much more than a decade of work led to this worldwide recognition of road deaths and injuries as an international priority by the UN. In 1998, the International Federation of the Red Cross declared road traffic injuries a "global disaster" and in 2004, the World Health Organization proclaimed road safety as the theme for World Health Day. But it was not until 2007, following the independent Commission for Global Road Safety's Make Roads Safe report the previous year calling for UN Ministerial conference, that an official UN Road Safety Week was declared, showing high-level support for the issue. Following the political leadership of the Sultanate of Oman and the Russian Federation, the first Ministerial Meeting on Road Safety was held, and ultimately, the Decade of Action for Road Safety was declared. As seen in the timeline (Figure 5), political leadership by certain countries was instrumental to the success of the road safety effort and inspired additional political leadership in other countries.

1998: International Federation of the Red Cross International Disasters Report raises the alarm on the extent of road traffic injuries, described as a "worsening global disaster destroying lives and livelihoods".

1999: The World Bank launches the 'Global Road Safety Partnership' designed to harness private sector support in partnership with government donors.

2001: WHO launches 5-year Road Injury Prevention Strategy.

2003: FIA Foundation hosts conference on global road safety at which WHO Director General Dr Gro Harlem Brundtland announces road safety as theme for 2004 World Health Day. First UN General Assembly resolution on the global road safety crisis, introduced by the Sultanate of Oman, is approved without debate.

2004: World Health Day sees the publication of the first major international report on road safety, the WHO/World Bank World Report on Road Injury Prevention.

2005: World Bank Global Road Safety Facility established to encourage donor governments to support road safety. World Bank and FIA Foundation are leading donors. Sweden, Netherlands and Australia also contribute.

2006: Commission for Global Road Safety publishes first Make Roads Safe report, calling for UN Ministerial conference, more attention to infrastructure safety by the MDBs and a $300 million, ten year, action plan. Make Roads Safe campaign launched.

2007: First UN Global Road Safety Week sees hundreds of events held around the world, including a Youth Assembly at the UN in Geneva. The Make Roads Safe campaign launches a petition for a UN Ministerial Conference, with support from public figures including Desmond Tutu, Michael Schumacher and Tony Blair.

2008: UN General Assembly endorses proposal for a Ministerial Conference, which

the Russian Federation offers to host. A million-name-petition is presented to UN Secretary General Ban Ki-moon by the Make Roads Safe campaign.

2009: Commission for Global Road Safety publishes second report 'Make Roads Safe: A Decade of Action for Road Safety' in Rome. First Ministerial Conference on Road Safety held in Moscow in November 2009, opened by President Medvedev of Russia, and attended by 80 Ministers.

2010: UN General Assembly approves UN Decade of Action for Road Safety 2011-2020, with the goal to 'stabilize and reduce' road deaths by 2020, with one hundred countries co-sponsoring.

2011: Worldwide Launch of the UN Decade of Action for Road Safety on May 11th.

Figure 5- Timeline to the Decade of Action

2.1 The Decade of Action Five-Pillar Plan

The Safe Systems approach is the basis of the international Decade of Action 'Five Pillar' Plan:

1.Building Management Capacity
2.Encouraging Safer User Behavior
3.Building Safer Roads
4.Building Safer Vehicles
5. Improving Post Crash Care [4]

Figure 6 - Five Pillars of the Decade of Action

The Safe Systems approach treats road users, roads, and vehicles as parts of a dynamic whole in which the risk of human error is anticipated in a 'forgiving' system that is designed and managed so that its consequences are non-fatal as much as

possible. This Safe Systems approach is echoed in the work of the TZD effort in the U.S., as will be discussed in Section 3. This Section will discuss non-traditional methods of framing road safety utilized before and in early parts of the Decade in order to increase political and public support. By presenting road safety as a development and good governance issue and by using countermeasures as a tool for building both coalitions and management capacity, the FIA Foundation has advanced the goals of the Decade of Action.

2.2 Road Safety as a Development Issue

While there has been general acceptance of road crashes as a public health hazard, the FIA Foundation has worked with partners to frame road safety as an economic development issue as well. As well-known development experts like Professor Jeffrey Sachs and Dr. Kevin Watkins have shown in their work, road crashes are not only a growing public health menace in their own right, but also have a serious impact on the very development goals that international communities are working to deliver. Watkins estimates that the economic costs of road crashes could be directly contributing to up to 70 million people being in poverty (5) while the burden on already overstretched health services and related budgets means that other health priorities suffer as a consequence. Global education objectives are also hit when at least half a million children of primary and early secondary school age are killed or injured each year, deprived of their right to an education and even their life, often - ironically and tragically - often because they are trying to cross a road to get to school. The FIA Foundation has worked with multilateral development banks to establish road safety as a key component of their poverty reduction and economic development work. In 2009, with the encouragement of the FIA Foundation, the World Bank and the six leading development banks have published a joint statement outlining a new harmonized approach to improving road safety, in a significant policy success for the Make Roads Safe campaign. The World Bank, the African Development Bank, the Asian Development Bank, European Bank for Reconstruction and Development, European Investment Bank, Inter-American Development Bank and the Islamic Development Bank issued their declaration 'A Shared Approach to Managing Road Safety' which commits the multilateral development banks (MDBs) to "ensure that safety is integrated in all phases of planning, design, construction, appraisal, operation and maintenance of road infrastructure." [REF] All countries want more infrastructure and now, with the increasing support of the MDBs, during the Decade of Action, they will also begin demanding more and safer infrastructure.

2.3 Road Safety as a Good Governance Issue

Over the last ten years a new framework for road safety policy and management has emerged which can support implementation of, and accountability for performance during, the Decade of Action. The often-neglected area in road safety of good governance is a prerequisite of effective road traffic injury prevention, and also a country with a strong road safety performance is very likely to enjoy high qualities of good governance. The hallmarks of good governance are transparency, accountability, participation, consensus driven, equity and inclusiveness, responsiveness, cost effectiveness, and promotion of the rule of law. All these characteristics are necessary attributes for successful implementation of effective road safety programs.

Good governance matters because injury prevention requires a systematic effort to change the behavior of road users. Safety requires a shared responsibility in which we respect each other's use of the road. Managers of road networks are responsible for shaping the 'choice architecture' that influences the way in which we travel through our shared mobility space. This involves a range of interventions, from soft guidance or 'nudges' to hard measures that eliminate some options altogether. For example an active speed warning sign is a 'soft' form of guidance whilst a pedestrian zone is a 'hard' measure that eliminates the risk of collision with a motor vehicle altogether. In applying such measures, road network managers need to base their decisions on sound evidence that interventions are cost effective, but they also need to work transparently, engaging with the community, consulting all affected groups and not necessarily the most influential. That is why good governance is central to the operation of effective management systems for safety.

It is well established that enforcement is essential in tackling the key risk factors of inappropriate speed, impaired driving, use of helmets and seat belts. Clearly the effectiveness of enforcement depends crucially on its efficiency and respect for the rule of law. Again these are core issues of good governance and pose significant challenges to road injury prevention. According to Transparency International's 2009 Global Corruption Barometer, police are the most likely recipients of bribes throughout the world. Unfortunately in too many countries road traffic police suffer from such corruption issues, prompted by poor employment conditions, and training, which undermine both public trust and effective enforcement of safety related traffic rules. As part of the Decade efforts, the FIA Foundation is working in countries such as the Republic of Georgia (as will be discussed further in Section 2.4) to integrate good governance and road safety.

2.4 Countermeasure Implementation (Road Infrastructure, Helmets, and Seatbelts) as part of Coalition Building

Catalyzing national coalitions and building capacity for road injury prevention is a unifying theme in the intervention programs supported by the FIA Foundation as part of the Decade of Action, especially in developing countries. These are concrete programs that galvanize public and political support. Building sustainable home-grown skills is a central component of the International Road Assessment Program (iRAP). In addition, the Global Hemet Vaccine Initiative (GHVI) and the Global Seat Belt Vaccine Initiative (GSBVI) are sowing the seeds for strong and viable national partnerships dedicated to saving lives.

IRAP targets high-risk roads where large numbers of people are killed and injured to identify affordable program of safety engineering to reduce the numbers of road crashes. In Kenya, the Government is stepping up efforts to reduce the number of deaths on the country's roads with the launch of a National Road Safety Council and Road Survey Assessment Program (RSAP) which has been set up in collaboration with the International Road Assessment Program (iRAP). The aim will be to gather data to pinpoint danger areas and help plan the introduction of new safety measures. The Kenyan Government wants to improve its road safety auditing and is focusing on making its roads safe for non-motorized transport and vulnerable road users. iRAP is currently active worldwide, with Kenya following South Africa as the second country in Africa to benefit from the program. In Kenya, the NRSC and RSAP not

only will help make roads safer through iRAP methods, but in doing so, help build road safety capacity in the country.

In Vietnam, in one year, the number of motor vehicles in Vietnam increased by 14% while deaths rose by 31% and injuries by 16%. [6] Vietnam's National Helmet Law, Resolution 32, introduced in December 2007, was an overwhelming success and national helmet usage rates immediately increased to 99% and have stayed at above 90%. The GHVI is led by the non-profit AIP Foundation, based in Vietnam, which led the advocacy and awareness campaign in Vietnam resulting in a successful, government effort to increase motorcycle helmet use. In 2008 and 2009, there has been a 14% reduction in fatalities and 24% reduction in serious injury. The success of the GHVI lies not only in the safety of its helmets, but in its strong media and social marketing efforts. For the Decade, GHVI will expand this model to other target countries in Asia, Africa and Latin America, where motorcycle use is exploding

In the Republic of Georgia, as part of the Global Seat Belt Vaccine Initiative, the NGO 'Partnership for Road Safety' has spearheaded the efforts to update seat belt legislation. Amendments to the country's Code of Administrative Violations are set to be introduced in 2011, making seat belt wearing in the front seats obligatory on all roads in the country. Currently seat belt laws only apply on inter-urban highways and roads where the speed limit is above 80 kph. The new amendments will extend this to all roads and streets. The fine for non-compliance will be 40 GEL (approximately US$20). The Partnership for Road Safety NGO has the strong endorsement of Georgia's First Lady, Sandra Roelofs, and is working with leading legislators to buttress the legislation with effective police enforcement and awareness raising among road users. Georgia will begin the Decade of Action with a tougher seat belt law in a victory for new road safety leaders and the Global Seat Belt Vaccine Initiative.

IRAP, GHVI, and GSHVI, are just three examples of how effective countermeasures also can be key components of coalition and capacity building in countries around the world.

In the U.S., Toward Zero Deaths is the major contribution towards the Decade of Action's goals. The worldwide Five Pillar Plan for the Decade of Action was mirrored by the results of the stakeholder workshop on Toward Zero Deaths where experts in highway infrastructure, law enforcement, driver education, emergency medical services (EMS), public health, research, and safety culture worked on high-payoff strategies for reducing highway fatalities and implementation challenges.

3. THE UNITED STATES CASE EXAMPLE – Toward Zero Deaths: a National Strategy for Highway Safety

3.1 What is TZD?

T*oward Zero Deaths: A National Strategy on Highway Safety* is a data-driven effort focusing on identifying and creating opportunities for changing American culture as it relates to highway safety. The effort will also focus on developing strong leadership and champions in the organizations that can directly impact highway safety through engineering, enforcement, education, emergency medical service (EMS), policy, public health, communications, and other efforts. The national strategy will be utilized

as a guide and framework by safety stakeholder organizations to enhance current national, state and local safety planning and implementation efforts. The intent is to have a mechanism for bringing together a wider range of highway safety stakeholders to work toward institutional and cultural changes.

One of the most significant needs is to change Americans' attitudes toward highway safety. There are already programs and technologies that can result in substantial reductions in fatalities; however, those benefits will not be realized as long as the public and elected officials are not willing to pass laws or take the actions needed to implement them. [7]

The TZD effort builds on the AASHTO Strategic Highway Safety Plan which was released December 1997 and updated in 2005. [8] The AASHTO Plan was developed with input from numerous highway safety stakeholders and has guided AASHTO's efforts in working toward its goal of reducing highway fatalities by half over two decades. What makes the TZD different is:

- Broadens the outreach to highway safety stakeholders
- More inclusive in ownership: multiple organizations targeted to formally adopt
- Longer time horizon, at least 25 years
- Safety culture strategies are included
- Technology will be a big part of the long term solution

3.2 Where is the USA now in terms of fatalities and what are the main concerns?

As shown in Figure 7, highway fatalities have significantly decreased in recent years. The concern is how to keep the momentum going.

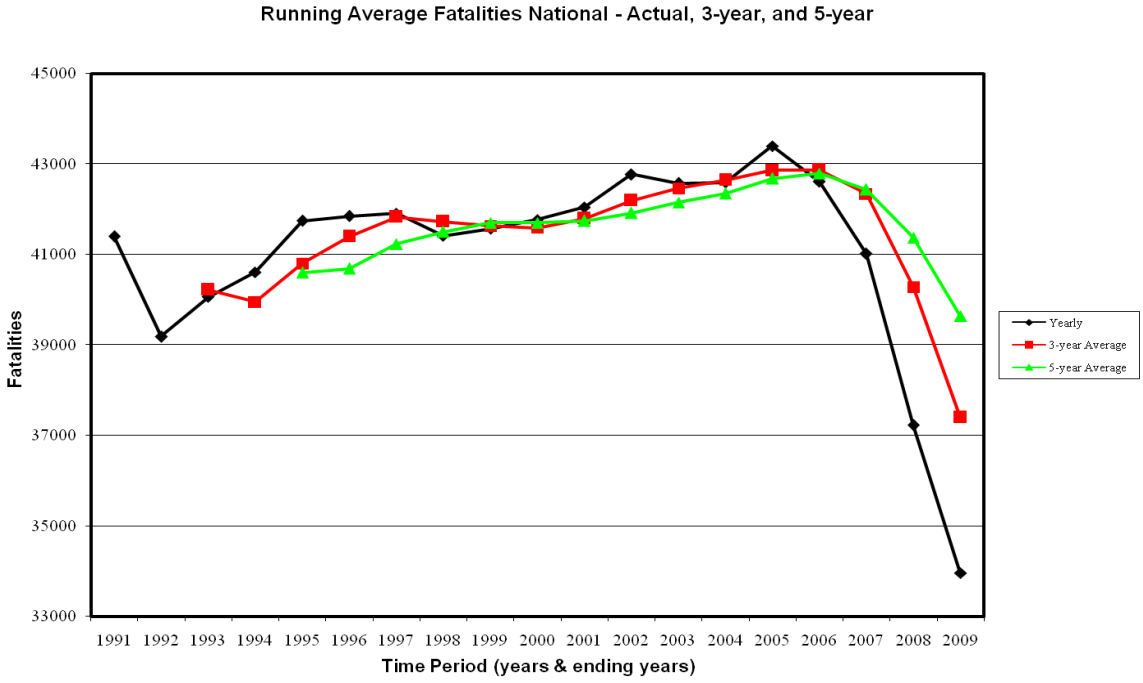

Figure 7 - Running Average National Fatalities – Actual, 3-year, and 5-year

In 2010, the early estimates have a 4% decline from 2009, and the last quarter had an increase vs. the same quarter in 2009. [9]

Major concerns in the USA include:

- Rural roads: 60 percent of highway fatalities are on rural roads. Half of these are off the state DOTs' highway systems, which presents challenges for the many local jurisdictions addressing highway safety. The challenges are magnified by the large number of roads serving a sparse population.
- Special road users are over-represented in highway fatalities. Pedestrian and bicycle fatalities are 14 percent of the total fatalities in the US. Motorcycle fatalities are 13 percent of the total and 12 percent of fatalities involve heavy trucks.
- The ability of emergency medical services to respond to serious crashes is limited in rural and congested areas. The proximity of rural areas to health facilities also presents challenges in improving the highway safety experience in rural areas.
- Traffic laws vary by state and local jurisdiction, and it can be difficult to pass new laws, even those proven to have a positive impact on highway fatalities and injuries. It can be difficult to enforce laws due to budgetary constraints, and often the judiciary process will reduce penalties, thereby reducing the threat of punishment to violators.

There are additional driver behavior-related factors that contribute to fatalities, including speeding (over 30 percent), impairment (32 percent), not using seatbelts (50 percent), suspended/revoked/unlicensed drivers (15 percent), and distracted driving (16 percent and increasing).

As we look to the future it will be quite difficult to maintain the reduction momentum without a strong goal-oriented plan. Figure 8 merely plots out two trends, the upper line is our desirable goal; the lower line projects the recent trends from the last three years (through 2009):

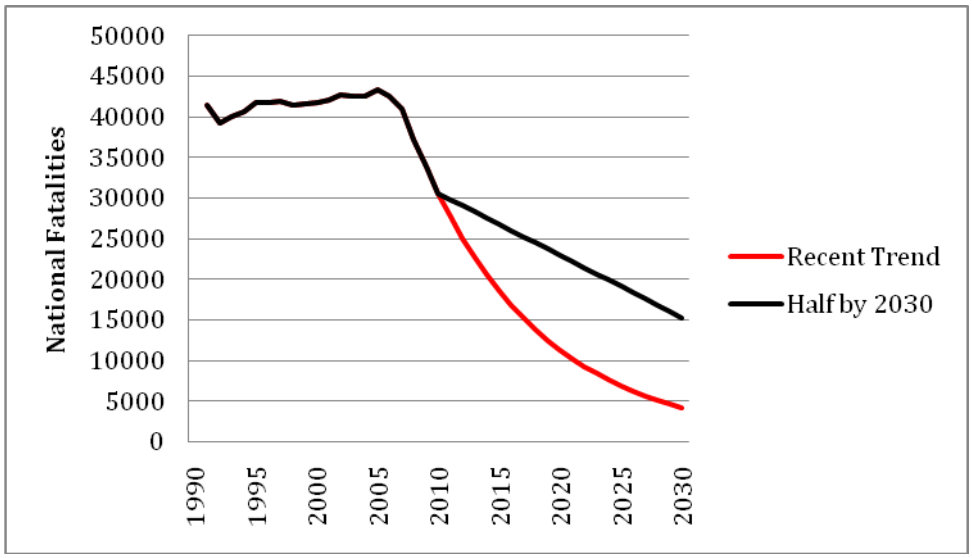

Figure 8 - Possible National Fatality Trends

Halving the absolute number of fatalities from today's base in twenty years is consistent with the Decade of Action's goal of halving the projected number in ten years, which includes a projected increase due to economic and population growth.

3.3 What are the strategies?

The TZD strategies are closely aligned with the five pillars as shown in Table 1, and discussed in more detail below. Key strategies are mentioned, but this is by no means an exhaustive list of the activities that need to be undertaken in order to meet highway safety goals.

Table 1 – Five Pillars and TZD

FIVE PILLARS And TZD	Building Management Capacity	Safer User Behavior	Safer roads	Safer Vehicles	Post Crash Care
Safety culture	X	X	X	X	X
Safer Drivers		X			
Vulnerable Users		X			
Safer Vehicles				X	
Safer Infrastructure			X		
Enhanced Emergency Medical Services					X
Enhanced Data; Analysis Tools and Manage Processes	X	X	X	X	X

3.3.1 Safety Culture

There is a need for a significant shift in safety culture through a grassroots movement. Examples of successful grassroots movements display strong national leadership, with champions at all levels, both political and non-political. Key strategies for addressing safety culture include:

- Additional research to better understand safety culture and the effects on driving behavior decisions. For example, why do drivers choose unsafe options? Also, research is needed to develop ways to better explain the external costs of crashes to legislators and the public. An example is motorcycle helmet laws: more than half of the states do not require helmets but the impact of a motorcycle fatality reaches far beyond the rider killed from not wearing a helmet.
- Early education in schools and throughout communities to teach young people the rules of the road and to be advocates for safe behavior.
- Public health programs to educate people on the impacts of poor traffic safety choices, through positive and strategic media messaging that is sustained over time.
- Workplace education programs.
- Focused public outreach efforts. Lessons can be learned from the anti-smoking campaigns.

3.3.2 Safer Drivers

Key driver-related issues are impaired driving, occupant protection, speed and aggressive driving, and distracted driving. There are many strategies with a known

impact on highway fatalities, including high-visibility enforcement, and primary seat belt laws. Thos category overlaps the vehicle considerations section with regard to the technology.

Several strategies can be implemented in the near-term but have legal or technological hurdles to overcome to see widespread use. These include:

- Determination of appropriate speed limits for specific roadways, and other speed management techniques.
- Greatly increased use of automated enforcement to reduce speed and aggressive driving.
- Real-time speed warning systems on the roadside or in vehicles.
- Ignition interlocks, particularly for first-time impaired driving offenders.

Longer-term technology-based strategies that with real payoff potential include:

- New devices that can monitor driving (particularly speeding, fatigued, and distracted driving).
- Technologies that would provide greater surveillance of drivers in and out of the driver licensing system.
- Advanced technology to detect driver impairment.

Note that technology or legislation alone would not solve the problem of unsafe drivers. Enforcement and marketing would continue to play key roles. Community involvement is also critical to program success. Tools, such as peer assistance teams, should also be developed to help states implement the most effective driver behavior plans and programs.

3.3.3 Safer Vulnerable Users

Younger drivers, older drivers, motorcyclists, pedestrians, and bicyclists need to be the target of strategies to reduce their fatality numbers and to improve their attitudes regarding road use as well.

Many strategies to improve safety for pedestrians and bicyclists are already used across the country and could have additional benefits if implemented further. Updating existing design guidelines to include these practices, as well as newer concepts such as complete streets and self-enforcing roads, would promote more wide-spread use of these techniques. Additional education programs regarding visibility, helmet use, impaired walking and cycling, and general safe walking and cycling principles are also needed.

A key issue with motorcycle safety in the USA is helmet use, and the need to enact and enforce laws requiring helmets. Over half the states do not have all rider helmet laws in place. Other strategies to improve motorcyclist safety include education programs focused on impaired and distracted driving, the need for rider training, and use of protective equipment. New technologies for the roadway and for motorcycles can supplement the on-going Infrastructure improvements focused on improving motorcyclist safety.

3.3.4 Safer Vehicles

Technological improvements to vehicles are developed constantly, and several show significant promise for reducing fatalities when implemented in the partial fleet and

certainly in the entire fleet in the USA. These include technologies such as electronic stability control, automatic braking, vehicle backup cameras; lane departure warning and sleep detection warning technology and vehicle-to-vehicle and vehicle-to-infrastructure communications. Not all of the technological advances can be implemented in the vehicle fleet in the short term, as there are challenges related to costs, various methods for introducing enhanced safety to the vehicle fleet, the time needed to implement fully in the fleet, and federal motor vehicle regulations. There is also a need to educate consumers, legislators, law enforcement, and adjudicators about these technologies. Considerations are being given to implement tax incentives to induce the sale of safer vehicles—similar to the "Cash for Clunkers" bill that encouraged greater fuel efficiency.

3.3.5 Safer Infrastructure

As with other aspects of the highway environment, there are many proven and promising strategies for addressing safety aspects of roadway infrastructure. More pervasive and systematic use of these treatments, such as speed management techniques, retroreflective signage and markings, rumble strips and stripes, cable median barrier, intersection improvements, and work zone strategies will contribute to reaching the fatality reduction goal. Separation of traffic in specific situations will also result in improvements in fatality numbers – including separation of directions of travel on two-lane roads, and separation of heavy trucks or bicycles from other traffic.

3.3.6 Enhanced Emergency Medical Services

There are several technologies and strategies that can improve the ability of emergency medical personnel to respond to crashes. These include Enhanced 911, which will improve the ability of responders to locate crashes, geographic information system mapping to better allocate scarce resources, regulation of EMS vehicles, communications tie-ins with general transportation traffic management centers, and coalition-building with partners in the health care community.

3.3.7 Enhanced Data Systems, Analysis Tools and Management Processes

Enhanced data systems will improve the ability of highway safety professionals to make decisions regarding programs or treatments to implement and allocation of staff and resources. Each category of safety strategies discussed in this paper faces its own specific data challenges, and the integration of the many data systems is also a significant challenge that needs to be overcome to improve the ability to reduce highway fatalities. Enhanced data analysis and modeling tools for all of the "Es" of highway safety will contribute to the safety professionals' efforts.

Highway agencies' practices in managing safety have changed as new treatments, methods, and programs have developed. Further implementation of such practices as road safety audits, evaluation and updating of strategic highway safety plans, and local agency safety plans will contribute to an additional impact on highway safety. Performance-based approaches will help focus highway agencies' safety programs, as well.

The Toward Zero Deaths national strategy will be finalized in the Fall of 2011, prior to the presentation of this paper. As organizations and agencies across the country begin to adopt and implement the national strategy, relationships between highway

safety partners will be strengthened and will help us share lessons learned and new ideas for reducing highway fatalities.

4. IMPLICATIONS FOR THE PIARC MEMBER NATIONS

Every Nation should adopt a comprehensive fatality reduction plan as part of pledging their nation to the Decade of Action. Lessons learned around the world and in the fifty states in the United States are:

- Top leadership is essential--everyone from the top ministers to the top legislators need to be on-board
- Driving must be considered a privilege rather than a right—this implies tough requirements for both drivers and vehicles
- Partnerships across disciplines and across levels of government are essential--partnerships must exist among the health, transportation, economic development, and public safety communities, at the least
- Fatality reduction must become a shared value, shared goal and shared responsibility for communities and the Nation
- We can learn from each other on effective roadway and behavioral countermeasures as well as vehicle and emergency care practices
- We must implement best practices across the nations to help others avoid the same tragic learning curve of high fatalities and injuries
- Let's unite during the Decade of Action

We know a great deal about the causes of road traffic deaths and serious injuries, and we have some very good countermeasures, but we still need:

- Political will and leadership at all levels of government to overcome institutional and policy challenges
- To further demonstrate the link of traffic deaths and injuries to health and governmental and personal costs, which will support the message of road safety needs
- To share a common vision of a world without road deaths and injuries!

5. CLOSING

The strategies shown are not applicable to every country but the range of strategies is illustrative of what countries should consider and adopt. Cultural values vary around the world and within the USA. Most countries—both developed and developing— still have far to go on their safety journey. But together, we can move towards a safer world during the Decade of Action. Five million lives depend on it!

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