

## **THE GOAL IS ZERO: MAKING ROADS SAFE IN RUSSIA TO REDUCE INJURIES AND PREMATURE DEATHS<sup>1</sup>**

*“The national economy lost USD 175 billion from traffic accidents over the past five years. That is comparable with overall health care expenditures of the same period.”*

– Dmitry Medvedev,

President of the Russian Federation, August 6, 2009

*The First Global Ministerial Conference on Road Safety was hosted by President Medvedev and the Russian Government in November 2009. This is a major public health issue in Russia, but also in many other developing countries. While the current economic crisis has focused the policy attention on important macroeconomic and unemployment and poverty issues, it is important to recall other major social and public health issues such as road safety. This note reviews the sources of the road safety problem in Russia, discusses economic and social consequences, and draws tentative conclusions about available policy options for confronting “death on wheels” and contributing to saving lives and to prevent further loss of population in the Russian Federation.*

### **Diagnosis of the problem**

***Transport is central to development.*** It facilitates the movement of people, goods, and services; enhances employment opportunities; and improves access to essential services (World Bank 1996). It is affected by policy decisions in many sectors, and these, together with the transportation options available, facilitate or discourage the use of private cars and otherwise influence the choices people make for traveling. While enhancing social welfare, transport investments can also expose people to hazards or risks, with possible acute and chronic health effects, including road traffic injuries, the subject of this note.

***The growth of road traffic injuries depends on the rate of growth of motorization and the rate of change in fatalities per vehicle*** (Kopits and Cropper 2005). In many transition countries of Eastern Europe and Central Asia, the rate of vehicle ownership grew faster than the decline in the rate of fatalities per vehicle, while policy and governance did not keep pace with the booming motorization. The lower quality of public transport, due to limited or reduced public financing, has pushed many people to use private cars or informal public transportation, such as informal networks of minibuses.

***Since the 1990s, with incomes rising in the Russian Federation, the motor vehicle fleet increased by 260 percent,*** and cars account for more than 70 percent of the total (ECMT 2006). However, improvements in road infrastructure and the enforcement of traffic safety regulations have lagged behind. As a result, road traffic injuries involving drivers, occupants, and pedestrians have become a major public health burden.

***In 2008, Russia had nearly 30,000 road traffic deaths and about 271,000 non-fatal road traffic injuries.*** While these figures represent a drop of 13 percent from 2004, road safety in Russia is still worse than in any European country (box 2.1).

---

<sup>1</sup> This note was prepared in February 2010 by Patricio V. Marquez, Lead Health Specialist, Europe and Central Asia Region, and Tony Bliss, Lead Road Safety Specialist, Energy, Transport and Water Department, the World Bank. It benefited from technical guidance and comments on a larger report on the situation in Europe and Central Asia (ECA) provided by leading public health experts at the World Health Organization.

### Box 2.1. Comparing Russia's road fatalities with other countries

Russia's traffic mortality rate is five times higher than that in several European Union (EU) countries, about twice that in the United States, and higher than that in other Eastern European countries such as Poland and Hungary and the average for the Commonwealth of Independent States (CIS) countries. While road fatalities rose in Russia by about 25 percent over the last two decades and showed only a modest fall in 2008, they have declined by 59 percent in Western European countries and by 21 percent in Canada and the United States. This rate is even more remarkable considering that there are fewer cars per 1,000 people in Russia than in Western Europe—161 per 1,000 in Russia compared with 448 in Sweden and 524 in Germany. *One possible explanation for the lower rates in many EU countries is the relative reduction in traffic speeds encountered in urban areas; another is the greater efficiency of the emergency services available to accident victims in towns and cities* (ITF 2010). Road traffic injuries are already among the leading 10 causes of death and of disability-adjusted life year losses in Russia.

**Box figure. Road fatalities in Russia and selected countries, 2008**

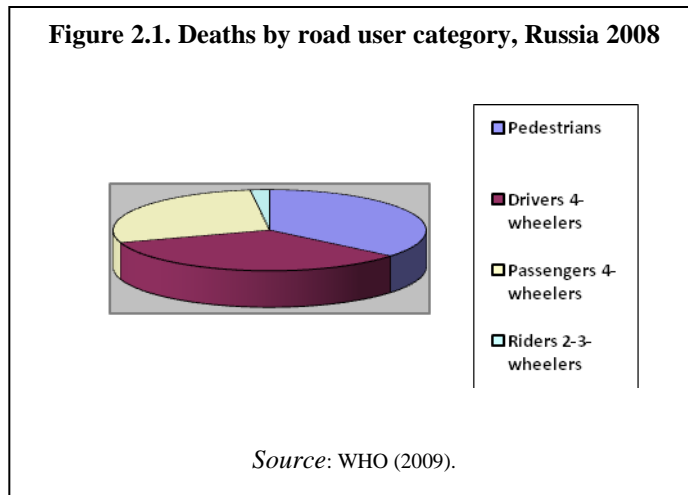
Country	Mortality rate due to road traffic injuries per 100,000 people
<b>Russian Federation</b>	<b>21.1</b>
Commonwealth of Independent States (CIS) average	15.0 (2007)
Poland	14.3
United States	12.3
Hungary	9.9
European Union (25) average	11.0 (2007)
New Zealand	8.6
Australia	6.8
Germany	5.4
Great Britain	4.3
Sweden	4.3
The Netherlands	4.1

Source: ITF/OECD (2010), ITF/WHO-EURO/World Bank/OECD (2009), WHO (2009).

### What are the vulnerable regions and population groups?

*About 72 percent of all car crashes in Russia occur in urban areas. Moscow and the Moscow region together contribute to more than 12 percent of the country's car crashes, injuries, and fatalities.* Data for 2007 show that the majority of traffic deaths are among car occupants (62 percent), followed by pedestrians (36 percent) (figure 2.1). The high percentage of pedestrian deaths, in sharp contrast with other European countries,<sup>2</sup> is evidence of the Russian transport system's limited ability to cope with rising traffic and the needs of vulnerable road users.

<sup>2</sup> By comparison, in France and Germany, pedestrian deaths account for about 12 percent of road fatalities.



**Road traffic injuries disproportionately affect economically productive age groups in Russia.** More than 50 percent of road traffic deaths are among those aged 15–44, and 75–80 percent of such deaths are among males. Children and the elderly are particularly vulnerable, especially as pedestrians, and are seven to nine times more likely to be killed in a car crash than car occupants. On average, a child is injured in every eighth road traffic crash in Russia. Older people—frequently as pedestrians and more frail—have a higher fatality rate if injured, because their injuries tend to be more severe. As Russia’s population ages, identifying new strategies to address the mobility and safety needs of the elderly becomes more urgent.

**Several factors contribute to road traffic injuries.** An estimated one-third of car crashes in Russia are caused by speeding vehicles, particularly dangerous for pedestrians. The possibility of a pedestrian being killed increases eightfold as the speed of impact with a car increases from 30 kilometers per hour (km/h) to 50 km/h. Drunk driving, accounting for 10 percent of all road crashes, is another risk factor, and young drivers and riders aged 18–25 are particularly at risk.<sup>3</sup> Other risk factors are poor road conditions and poor driving that result in head-on collisions. Also looming is distracted driving while using cell phones and sending text messages.

**The economic and social consequences of road traffic injuries are severe.** The economic or “human capital” cost components for motor vehicle crashes and injuries include direct and indirect costs<sup>4</sup> to individuals and to society from the decline in health of those injured (NHTSA 2002). In estimating the total economic cost of road traffic injuries, the value of the decreased production and consumption of injured individuals is included, as are the resources consumed as a result of any injury or crash that might otherwise be used for increasing societal well-being. Recent data from the United States, where the total economic cost of motor vehicle crashes in 2000 was estimated at USD 230.6 billion, illustrate how the total social costs of road traffic injuries are computed.

<sup>3</sup> As blood alcohol content increases, so does the likelihood of crashing, particularly above 0.04 grams per deciliter. A recent study assessing the impact of alcohol on the high and fluctuating mortality rates among adult men in Russia shows that road traffic injuries are one of the three main causes accounting for alcohol-related deaths (Zaridze and others 2009).

<sup>4</sup> **Direct costs** include emergency treatment, initial medical costs, rehabilitation costs, long-term care and treatment, insurance administration expenses, legal costs, and employer/workplace costs. **Indirect costs** are productivity costs in the workplace due to temporary and permanent disability and decreases in household productivity due to these disabilities. Property damage and travel delay, crash costs other than those directly attributable to an injury, are estimated for injury and non-injury crashes as well (NHTSA 2002).

- The most significant costs were **lost market productivity** due to the level of disability documented for crashes involving injury and death and **property damage** due to the high incidence of minor crashes in which injury does not occur or is negligible. Each accounted for 26 percent of the total economic costs.
- **Medical care and emergency services** (including police and fire services) were responsible for about 15 percent of the total.
- **Travel delays** caused by congestion at the crash site account for 11 percent.
- **Lost household productivity** accounts for 9 percent (NHTSA 2002).

*Similar estimates by the Russian Ministry of Internal Affairs in 2005 indicate that the cost of road crashes in Russia absorbs 2.5 percent of gross domestic product (GDP), or about USD 26 billion annually.<sup>5</sup> The provision of medical services for traffic injuries and other external causes absorbed approximately 0.27 percent of Russia's gross domestic product (GDP) in 2003, or about US\$1.2 billion<sup>6</sup>. This is about 10 percent of total health care expenditures in Russia.*

***The impact on the Russian health system is large.*** Road traffic injuries are a major burden on health systems worldwide, both in terms of placing excessive demands on already overburdened facilities and straining limited budgets. Estimates in Russia indicate that road traffic victims are seven times more likely to need hospitalization compared with victims of other types of trauma. And road traffic injuries account for 75 percent of all types of injury, with victims of road traffic crashes representing more than 60 percent of severe trauma cases. The provision of medical services for traffic injuries and other external causes absorbed about 0.27 percent of GDP in 2003, or about USD 1.2 billion (World Bank 2005).

***How is Russia responding to this challenge?*** The government is implementing the Federal Targeted Program for Ensuring Road Traffic Safety 2006–2012, aimed at decreasing the number of people killed on the country's roads by 33 percent compared with 2004 levels. In 2006, a multisectoral Government Commission for Road Safety was established to provide oversight of the delivery of the Road Safety Program along with a Federal Target Program Coordination Council.

***The main parts of the program have been to establish a comprehensive legislation framework and strengthened enforcement system.***<sup>7</sup> New legal blood (0.3 g/l) and breath (0.15 g/l) alcohol content limits were introduced in 2007; the penalty for failure to submit to medical examination was increased to disqualification from driving for 18 months to 2 years. Other offenses that are now penalized include prison terms for causing death as a result of drunk driving; increasing tenfold the fines for driving without a seat belt; enacting a law to make crossing into an oncoming lane an offense punishable by license revocation; and conducting anti-alcohol campaigns, in some cases with the Russian Orthodox Church (Partitt 2009). Also, there have been improvements in the safety of the cars (e.g., decrease in age, seat belt use reminders, daytime running lights), and the introduction of new road signs on speed limits, pedestrian zones, speed humps and parking restrictions. These efforts, as noted, reduced road traffic injuries during 2007–08.

---

<sup>5</sup> The estimation of the cost of a death due to road traffic accidents in Russia values years of life lost before retirement at EUR70,000, a much lower amount than that in other countries (ECMT 2006).

<sup>6</sup> World Bank. 2005. *“Dying Too Young. Addressing Premature Mortality and Ill Health Due to Non-Communicable Diseases and Injuries in the Russian Federation.”* Washington, D.C.

<sup>7</sup> ITF/WHO/World Bank/OECD. 2009. *Road Safety Performance. National Peer Review: Russian Federation. Preliminary Draft.*

New draft legislation proposals have recently been introduced to reduce speed limits in cities from 60 km/h to 50 km/h; 30 km/h around office areas and 20 km/h in residential areas with traffic calming measures, intelligent transport systems and tougher requirements for drivers to give way to pedestrians.

***However, road conditions in Russia are still very dangerous.*** As President Medvedev emphasized in a national speech on 6 August 2009, poor road infrastructure, bad organization of road traffic, and insufficient regional and local efforts hinder further improvements. Exacerbating the situation are the absence of effective education programs for drivers, particularly young drivers, and limitations on the purview of road police, who concentrate on collecting penalties and not on preventing road accidents. Poor emergency medical and rehabilitation services also account for road fatalities and disability among car crash victims.

***What added actions can Russia take?*** Countries that have successfully reduced road traffic injuries, such as Australia, Great Britain, the Netherlands, New Zealand, Sweden, and the United States, have implemented systematic management arrangements over the last three to four decades to sustain the improvement of road safety results on a continuous basis. These developments have evolved into what has been termed the *Safe System* approach which is anchored in a long-term vision-- *the elimination of death and serious injuries--*, and in embracing improvements in road infrastructure, vehicle safety, and enforcing laws to ensure compliance with safety measures (OECD/ECMT 2006). Key ingredients are sustained political support and funding for system-wide strategies, targeted action plans, and delivery mechanisms involving multiple institutions at all levels of government under the direction of a lead agency supported by related multisectoral coordination and working group mechanisms.

***The experience of several OECD countries suggests possible options to scale up and intensify road safety efforts in Russia in the medium and longer terms.*** One such option would be to focus an intensive multisectoral response on major inter-urban road corridors and high-speed urban roads where significant concentrations of deaths and injuries are experienced. The objective would be to test an optimized road safety improvement strategy that could later be replicated sequentially throughout other regions.

***Under the Safe System approach,*** improved road safety results depend on three inter-related elements: institutional management functions, interventions and results. *A reliance on addressing interventions alone will not suffice*<sup>8</sup>. Therefore, sustained support is required to:

- Strengthen the results focus of the lead agency and related horizontal coordination across sectoral institutions and vertical coordination between the federal and regional and municipal agencies to harmonize activities with the vision, goals and priorities set at the national level. Also, active engagement by business, professional and non government sectors need to be supported.
- Implement institutional reforms and policy reviews in order to improve, for example, legislation and enforcement practices, organizational accountabilities, testing and licensing of drivers and vehicle safety standards, in accordance with international good practices.

---

<sup>8</sup> Bliss, T and J. Breen J 2009. *Implementing the Recommendations of the World Report on Road Traffic Injury Prevention. Country guidelines for the Conduct of Road Safety Management Capacity Reviews and the Specification of Lead Agency Reforms, Investment Strategies and Safe System Projects.* World Bank Global Road Safety Facility, Washington D.C.

- Secure sustainable and adequate funding for lead agency and key stakeholders and strengthen their management and operational capacity, to support campaigns promoting the achievement of *Safe System* goals and interim targets.
- Enhance nationwide road traffic injury surveillance systems to collect and assess data, better understand the nature and characteristics of the problem, and evaluate the results of interventions. This needs to be complemented by related research and knowledge transfer.
- Improve the safe planning, design, operation and use of the road network in accordance with good international standards and practices.
- Launch public education campaigns using modern social marketing practices to support general deterrence-based traffic enforcement, particularly to deter drunk driving, speeding, and the raising problem of talking on cell phones and texting while driving.
- Strengthen emergency medical services, including both pre-hospital and in-hospital systems, that are critical to saving lives and long-term impairment after a crash has occurred.

### **What is the international evidence on effective interventions to reduce road traffic injuries?**

**Engineering technologies and road designs.** Improving intersection control, crash barriers, signs, markings, and maintenance are effective intervention strategies (World Bank 2003). For example, collapsible lighting columns and other devices that break away on impact are widely used, and low-cost cable barriers have been cost effective in Denmark, Sweden, Switzerland, and in England (European Transit Safety Council 1998). Traffic-calming measures, such as speed bumps, reduce road traffic injuries, especially pedestrian injuries (Afukaar, Antwi, and Ofosu-Amaah 2003). And speed cameras led to a 14 percent reduction in fatal crashes and a 6 percent reduction in nonfatal crashes in developed countries (Elvik and Vaa 2004).

**Vehicle design and safety equipment.** Strategies focusing on safer vehicles include improving the visibility of vehicles by using daytime running lights for cars and motorcycles (Elvik and Vaa 2004; Radin Umar, Mackay, and Hills 1996; Yuan 2000), promoting further development of “intelligent” vehicles, and incorporating crash protective design into vehicles (such as seat belts and airbags). New active safety technologies such as electronic stability control systems for vehicles promise to produce significant safety benefits.

**Laws, regulations, and enforcement.** Intervention strategies aimed at improving road user behavior rely on enforcing relevant legislation, not just on education. Examples in the United States include graduated driving permits for teens, requiring six months with a learner’s permit and a curfew prohibiting driving between midnight and 5:00 a.m., and passenger restrictions for the first year after getting a license.<sup>9</sup> Using seat belts is an effective strategy for reducing traffic deaths and serious injuries once a crash has occurred, and there is strong evidence that laws requiring the use of seat belts and child restraint laws reduce occupant deaths and injuries.<sup>10</sup> Motorcycle and bicycle helmets also protect against injuries.<sup>11</sup>

---

<sup>9</sup> A new report by the Texas Transportation Institute noted that the state’s rate of fatal teen crashes dropped faster than anywhere else in the United States over five consecutive years after the adoption of these measures (*Dallas Morning News* 2009). Media coverage, increasing fines, and suspending drivers’ licenses have helped reduce road traffic injuries and deaths in Brazil (Poli de Figueiredo and others 2001).

<sup>10</sup> Wearing a seat belt, for example, can reduce 45–55 percent of traffic-related injuries (WHO 2004). Mandatory seat belt use laws accompanied by strict enforcement are successful in preventing deaths, as demonstrated in a 30-year study in Finland and the United Kingdom (European Transport Safety Council 1996; Ashton, Mackay, and Camm 1983). European Union (EU) countries have seat belt enforcement laws allowing the police to stop a motorist for not wearing a seat belt (primary enforcement), which increases the laws’ effectiveness (Dinh-Zarr and others 2001).

**Measures to control speeding, drunk driving, and cell phone use while driving.** Setting and enforcing speed limits reduces road traffic injuries by up to 34 percent, particularly among pedestrians, cyclists, and motorcyclists. Road traffic injuries are also reduced by setting and enforcing legal blood alcohol limits and minimum drinking-age laws, using checkpoints to randomly stop drivers to detect alcohol, and running mass media campaigns to reduce drinking and driving (Peden and others 2004). Random breath testing has been found to be twice as effective as having predetermined checkpoints (Henstridge and others 1997). Other measures such as license revocation and suspension have been enacted in numerous countries, markedly reducing the fatalities from alcohol-related crashes. Measures at the state level in the United States to outlaw the use of cell phones and texting devices by young drivers are starting to reap positive results. Peer influence programs have also reinforced the rules and contributed to reducing fatal crashes involving teen drivers in Texas (*Dallas Morning News* 2009).

**Managing traffic and reducing risk.** The least-used and least-evaluated road safety interventions aim to reduce exposure to risk of road traffic injuries. It has been estimated in high-income countries that each 1 percent reduction in distance traveled reduces crash incidence by 1.4–1.8 percent (Litman 2000; Edlin 2002). Policies that improve transport networks and reduce distances and the necessity to travel reduce road traffic injuries, as well as reducing local air pollution, greenhouse gases and fuel consumption.

**Emergency medical care systems to deal with crash victims.** Effective post-crash medical care and treatment can prevent deaths and limit the severity of injuries. France’s Service d’Aide Médicale d’Urgence (Emergency Medical Assistance Service, SAMU) and the U.S. experience in this area are noteworthy. Better survival rates among road traffic victims have been achieved by improving emergency medical systems to get people to the hospital faster after a road crash and by enhancing in-hospital quality of care (Haider 2007).

**Are the proposed interventions cost-effective?** While the most cost-effective strategies vary by region, a combined intervention strategy that simultaneously implements multiple road safety interventions produces the most health gain for a given investment (Chisholm and Naci 2008). Roadside enforcement strategies—in relation to alcohol-impaired driving, speeding, and non-use of seat belts, for example—can offer major synergies on the cost side (figure 2.2).<sup>12</sup> That makes them a good, cost-effective investment option for the Russian Government.<sup>13</sup>

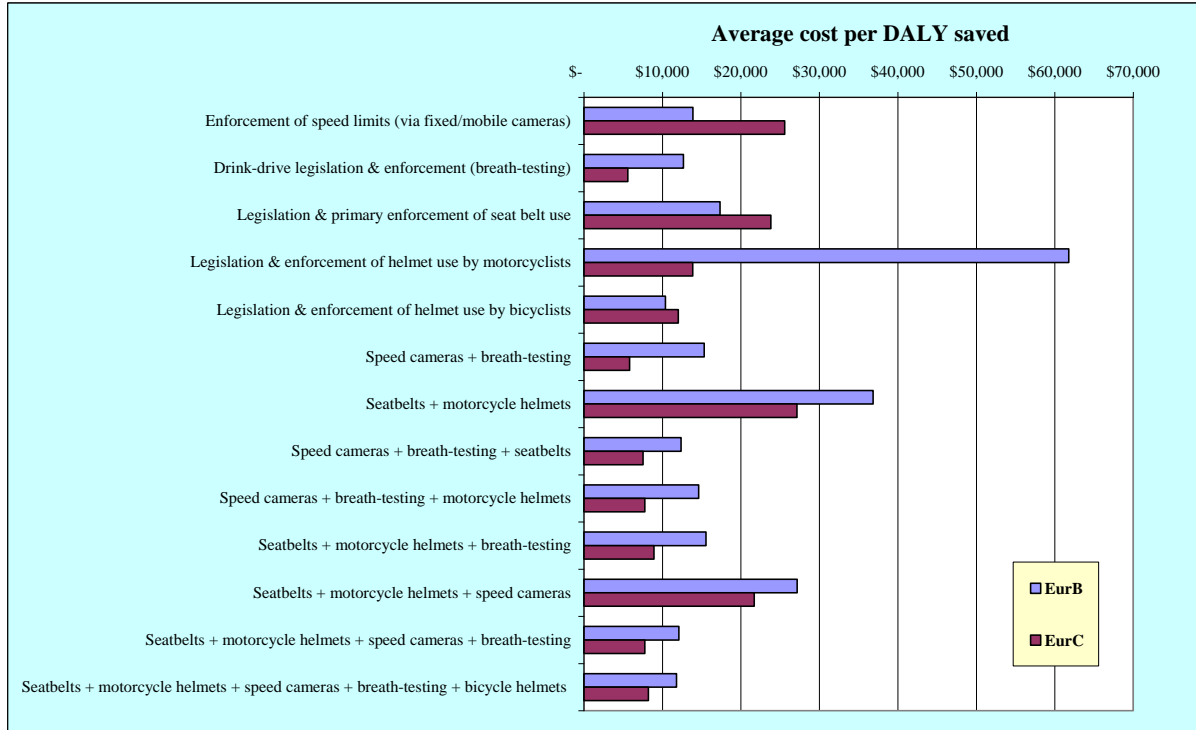
---

<sup>11</sup> For example, in Malaysia and Thailand, the enactment and enforcement of helmet laws have led to a 56 percent and 30 percent reduction in road traffic fatalities, respectively (WHO 2002; Ichikawa, Chadbunchachai, and Marui 2003; Supramaniam, Belle, and Sung 1984). Similar results have been observed in recent years in Vietnam after the introduction of mandatory helmet laws in 2007 (Passmore 2009).

<sup>12</sup> Road traffic injury prevention inputs include engineering and design of roads and vehicles, safety devices, technology, and ambulance and trauma care services. The intervention costs in the World Health Organization study are those that are not incurred at the health facility level but at a more programmatic level, including the resource costs associated with legislation and program management and law enforcement, combined with the privately borne cost to bicycle and motorcycle owners of buying helmets and the cost of fitting front and rear seat belts in cars that do not already have them.

<sup>13</sup> The investment for a year of healthy life is less than the respective per capita income, an internationally used threshold to determine whether an intervention is cost-effective.

**Figure 2.2. Cost-effectiveness of road traffic injury prevention strategies in Europe and Central Asia (International dollars per DALY saved, 2005)**



*Note:* Countries in the WHO European region with low child and adult mortality (EurB): Albania, Armenia, Azerbaijan, Bosnia and Herzegovina, Bulgaria, Georgia, Kyrgyzstan, Poland, Romania, Slovakia, Tajikistan, the Former Yugoslav Republic of Macedonia, Turkey, Turkmenistan, and Uzbekistan. Countries in the WHO European region with low child/high adult mortality (EurC): Belarus, Estonia, Hungary, Kazakhstan, Latvia, Lithuania, the Republic of Moldova, the Russian Federation, and Ukraine.

*Source:* Chisholm and Naci (2008).

***A window of opportunity is open for advancing the road safety agenda under current economic recovery programs in Russia.*** Programs funded by government to reactivate economic growth and employment offer a window of opportunity to scale up and improve road safety in Russia. For example, in the United States investment is now being directed to roads and highways, incorporating safety features into planned projects and encouraging local governments to implement existing highway safety plans. The goal is to support the development and promotion of programs and technologies to reduce the 37,261 deaths on U.S. roads in 2008.

## Conclusion

On March 2, 2010, the UN General Assembly formally approved a UN Decade of Action for Road Safety in line with the ‘Moscow Declaration’ agreed by all participating countries at the First Global Ministerial Conference on Road Safety, held in Moscow on 19–20 November 2009. Millions of lives are at stake. *So it is time for action.* Accumulated worldwide experience can be used to enhance ongoing road safety efforts in the Russian Federation. Investing in a *Safe System* approach to road safety will reap substantial gains for Russian society and help to provide a good practice example to other CIS countries.