“From time to time in human history there comes a killer epidemic that is not recognized for what it is and is not acted against until it is almost too late. HIV/AIDS, which is ravaging Sub-Saharan Africa, is one such. Road traffic injuries have the potential to be another.”

– Desmond Tutu, Emeritus Archbishop of Cape Town, Nobel Peace Prize Laureate, 1984

“Beyond the enormous suffering they cause, road traffic crashes can drive a family into poverty as crash survivors and their families struggle to cope with the long term consequences of the event, including the cost of medical care and rehabilitation and all too often funeral expenses and the loss of the family breadwinner.”

– Margaret Chan, Director-General, World Health Organization

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


“The safe system approach is simple, sustainable, affordable and effective.”

– Claes Tingvall, Architect of Sweden’s “Vision Zero” policy and Director of Traffic Safety, Swedish Road Administration

“We have the tools, the knowledge, to undertake this work. Now we need to see the political will to implement a Decade of Action. The United Nations has recognized that the global road injury epidemic is serious enough to warrant General Assembly resolutions and a first Ministerial-level conference.”

– Lord Robertson of Port Ellen, Former Secretary-General of NATO and current Chairman, Commission for Global Road Safety

“Our work on regional and global public goods will require close cooperation with other agencies that have specialized expertise. We also must determine the Bank Groups comparative advantage to best focus our resources through selective, differentiated approaches. Given our specialization in working on development at the national level, our most important operating challenge will be to support countries as they determine how best to integrate public goods policies—and regional and global opportunities—into national programs. These opportunities should draw on private sector entrepreneurs and energies, too.”

– Robert Zoellick, President, The World Bank

“Nowadays, a Minister of Health cannot consider his or her job done simply by looking at the health care system. It’s not enough to have a health policy, you need healthy policies elsewhere. We need to redefine health not as a specialized sector with doctors and nurses, but as a social objective. You need strong policies for empowering women, for promoting a fair justice system that brings perpetrators of violence to justice, and—in the case of accidental injury—for safe roads.”

– Julio Frenk, Former Health Secretary of Mexico and current Dean of the Harvard School of Public Health

“All multilateral development banks (MDB’s) are committed to taking a leading role to address what is becoming one of the most significant public health development priorities of the early 21st century.”


Confronting “Death on Wheels”
Making Roads Safe in Europe and Central Asia
Establishing multisectoral partnerships to address a silent epidemic

Europe and Central Asia Region
Human Development Department (ECSHD)
Sustainable Development Department (ECSSD)
Global Road Safety Facility (GRSF)
The World Bank
Confronting “Death on Wheels”
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The World Bank
# TABLE OF CONTENTS

Acknowledgements..................................................................................................................... vii
Abbreviations and Acronyms......................................................................................................viii

Executive Summary ..................................................................................................................... xi

Chapter I. Introduction ................................................................................................................1
1. Negative transport-related environmental and health impacts ................................................1
2. What is a road traffic injury (RTI)? ............................................................................................2
3. RTIs risks from increasing motorization in LMICs .................................................................2
4. The broad potential benefits of road safety policies ...............................................................3
5. Road safety: The way forward .................................................................................................3
6. Report objectives .......................................................................................................................4

Chapter II. The Epidemic of Road Traffic Injuries ..................................................................7
1. The global context ................................................................................................................... 7
2. ECA: A bleak situation and prognosis .................................................................................. 8
3. Country variability ..................................................................................................................11
4. Fatal road traffic injuries by ECA road user type .................................................................11
5. RTIs among population groups .............................................................................................15
6. Inequality dimension of RTIs ...............................................................................................15
7. What are the economic and social consequences of RTIs? ..................................................16

Chapter III. Interventions and Results: What Is the Evidence? .............................................21
1. Engineering measures that improve road design and make roads safer ................................21
2. Vehicle design and safety equipment ..................................................................................22
3. Education, laws and enforcement ........................................................................................22
4. Traffic management and reducing risk exposure to RTIs ....................................................26
5. Private sector role and practices to support road safety efforts ...........................................26
6. Cost-effectiveness of selected interventions and financial gains to society .......................27
7. How to finance road safety efforts? .....................................................................................28
8. Country experiences: Selected international good practices ..............................................28
9. Country-level responses in ECA .........................................................................................31

Chapter IV. The Role of Health Systems in Preventing RTIs and Helping Victims ...............35
1. Public health actions .............................................................................................................35
2. The role of primary care services in RTIs prevention ..........................................................36
3. Emergency medical care systems to deal with crash victims ..............................................36
4. The importance of blood transfusion services in dealing with RTIs ....................................37
5. Rehabilitation services .........................................................................................................38
6. Good practices in organizing emergency medical services ................................................38
Chapter V. Road Safety Approaches and Policies ................................................................. 41
1. The safe systems approach .............................................................................................. 41
2. Policy framework at the international level ..................................................................... 41
4. Setting road safety targets ............................................................................................. 45
5. Car and road assessments ............................................................................................. 46
6. International organizations addressing road safety in ECA (other than the World Bank) ..... 46
7. Institutional arrangements at the country level ................................................................ 48

Chapter VI. World Bank Support for Road Safety Improvements in ECA and in other Regions .......................................................................................................................... 51
1. The Objectives and Scope of Action .............................................................................. 51
2. The Global Road Safety Facility ..................................................................................... 51
3. Road safety management capacity reviews in ECA countries ....................................... 52
4. Guidelines for the implementation of the recommendations of the 2004 World Report .... 52
5. World Bank-supported road safety projects ................................................................... 52

Chapter VII. Priorities for Intersectoral Work on Road Safety in ECA ............................ 59
1. Implementing the recommendations of the 2004 World Report: What needs to be done? ............................................................................................................................... 59
2. Building institutional management functions .................................................................. 60
3. Focus on results .............................................................................................................. 62
4. Design demonstration projects ....................................................................................... 64

Chapter VIII. The Task Ahead: Operationalizing an Effective Response in ECA .......... 67
2. Options to support ECA countries in improving road safety ......................................... 67
3. Building blocks ............................................................................................................ 69
4. Partnership arrangements with international agencies at the country, regional, and global levels .............................................................................................................................. 70
5. Implementing arrangements .......................................................................................... 70
6. Choice of instruments .................................................................................................. 70
7. “Window of opportunity” for advancing the road safety agenda under ECA economic recovery programs ................................................................................................. 71
8. What could be achieved in a road safety decade? The case for action ......................... 72
9. Safety on the roads: Multilateral Development Banks joining forces to save lives ...... 72

Epilogue ................................................................................................................................ 75
Annexes: The Response in ECA – Selected Indicators by Country .................................... 77
Annex 1: Institutional Framework for Road Safety, ECA Countries .................................. 77
Annex 2: Road Safety Requirements and Compliance Rates, by ECA Country ................ 78
Annex 3: Conference Declaration ..................................................................................... 79
References .............................................................................................................................. 83
Map of the World Bank Europe and Central Asia (ECA) Region ........................................ 91
LIST OF FIGURES

Figure 1: Estimated External Costs by Mode of Passenger Transport (Excluding Congestion), in the EU in 2002, 15 countries ................................................................. 2

Figure 2: Standardized Mortality Rates from Road Traffic Injuries in the European Region, EU-27 and CIS Countries, per 100,000, 1980–2007 ........................................ 9

Figure 3: RTIs Death Rates in WHO-EURO Member Countries, per 100,000 Populations, 2007 ........................................................................................................ 12

Figure 4: Trends in Age-standardized Mortality Rates from Transport Injuries among People Aged 0–14 and 15–24 in the European Region, the EU, and CIS Countries, 1980–2005 ...................................................... 14

Figure 5: Cost-effectiveness of Road Traffic Injury Prevention Strategies, in Europe and Central Asia, 2005 .............................................................................................. 28

LIST OF TABLES

Table 1: Predicted Road Traffic Fatalities, by World Bank Region ........................................ 8
Table 2: Leading Causes of Death, All Ages, 2004 and 2030 .............................................. 8
Table 3: Road Traffic Deaths and Nonfatal Injuries in ECA, by Country ............................... 10
Table 4: Percentage of Fatal Road Traffic Injuries by Road User Type, 2007 ...................... 13
Table 5: Road Traffic Deaths Involving Alcohol in ECA, 2007 ............................................. 14
Table 6: Socioeconomic Cost Estimates for Road Injuries in ECA (2008 prices) .............. 17
Table 7: Why Should the Private Sector be Interested in Road Safety Issues? ..................... 26
Table 8: Estimated Financial Savings to Society from Selected Road Safety Interventions .... 29
Table 9: Haddon’s Matrix for Crash and Injury Prevention ................................................... 41
Table 10: Building Blocks for the Implementation of an Effective Road Safety Program ....... 69
Table 11: Multisectoral Collaboration for Road Safety ......................................................... 71

LIST OF BOXES

Box 1: Sources and Quality of the Statistics and Indicators on Road Traffic Deaths and Injuries in Europe ...................................................................................... 11
Box 2: RTIs Contribute to High Mortality Rates among Working-age Males in Russia and Ukraine .................................................................................. 16
Box 3: Stepwise Approach to the Choice of Alcohol-control Policies ................................ 24
Box 4: Traditional and Alternative Sources of Funding for Road Safety Programs ............. 29
Box 5: Selected International Country Experiences ............................................................. 30
Box 6: How is Russia Responding to the RTIs Challenge? .................................................. 32
Box 7: Seatbelts in Armenia .................................................................................................. 32
Box 8: SAMU: France’s Emergency Medical Services ......................................................... 39
Box 9: Towards Zero: Ambitious Road Safety Targets and the Safe System Approach ....... 43
Box 10: World Bank-supported Road Safety Projects in ECA ........................................... 53
Box 11: Vietnam’s Safe System Road Safety Improvement Project ..................................... 55
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<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>ADB</td>
<td>Asian Development Bank</td>
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<tr>
<td>AIDS</td>
<td>Acquired immune deficiency syndrome</td>
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<tr>
<td>APL</td>
<td>Adaptable Program Lending</td>
</tr>
<tr>
<td>AusAID</td>
<td>Australian Agency for International Development</td>
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<td>AusRAP</td>
<td>Australian Road Assessment Program</td>
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<tr>
<td>BAC</td>
<td>Blood alcohol concentration</td>
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<tr>
<td>CIS</td>
<td>Commonwealth of Independent States</td>
</tr>
<tr>
<td>DALYs</td>
<td>Disability-adjusted life years</td>
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<tr>
<td>dB</td>
<td>Decibels</td>
</tr>
<tr>
<td>DCPP</td>
<td>Disease Control Priorities Project</td>
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<tr>
<td>DRLs</td>
<td>Daytime running lights</td>
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<tr>
<td>DRUID</td>
<td>Driving Under the Influence of Drugs, Alcohol and Medicines</td>
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<tr>
<td>EC</td>
<td>European Commission</td>
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<tr>
<td>ECA</td>
<td>Europe and Central Asia</td>
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<tr>
<td>ECMT</td>
<td>European Conference/Council of Ministers of Transport</td>
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<tr>
<td>ECS</td>
<td>Electronic stability control system</td>
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<td>ECSHD</td>
<td>Europe and Central Asia Human Development</td>
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<tr>
<td>ECSSD</td>
<td>Europe and Central Asia Sustainable Development Department</td>
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<tr>
<td>ECSCQ</td>
<td>Europe and Central Asia Quality</td>
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<tr>
<td>EEA</td>
<td>European Environment Agency</td>
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<tr>
<td>EIB</td>
<td>European Investment Bank</td>
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<tr>
<td>EMS</td>
<td>Emergency medical system</td>
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<tr>
<td>EMSs</td>
<td>Emergency medical services</td>
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<tr>
<td>EU</td>
<td>European Union</td>
</tr>
<tr>
<td>EU-15</td>
<td>Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden, and the United Kingdom</td>
</tr>
<tr>
<td>EuroRAP</td>
<td>European Road Assessment Program</td>
</tr>
<tr>
<td>FBS</td>
<td>Fee-Based Services</td>
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<tr>
<td>FIA</td>
<td>Fédération Internationale de l’Automobile</td>
</tr>
<tr>
<td>G-8</td>
<td>Canada, France, Germany, Italy, Japan, the Russian Federation, United Kingdom, United States; the EU is represented.</td>
</tr>
<tr>
<td>GAP</td>
<td>Global Aids Council</td>
</tr>
<tr>
<td>GBP</td>
<td>Great Britain Pound</td>
</tr>
<tr>
<td>g/dl</td>
<td>Grams per deciliter (measure of alcohol concentration in blood)</td>
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<tr>
<td>GDP</td>
<td>Gross domestic product</td>
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<tr>
<td>GNP</td>
<td>Gross National Product</td>
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<tr>
<td>GRSF</td>
<td>Global Road Safety Facility</td>
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<td>GRSP</td>
<td>Global Road Safety Partnership</td>
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<tr>
<td>H-MICU</td>
<td>Hospital mobile intensive care unit</td>
</tr>
<tr>
<td>HIC</td>
<td>High-income country</td>
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<tr>
<td>iRAP</td>
<td>International Road Assessment Program</td>
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<tr>
<td>ITF</td>
<td>International Transport Forum</td>
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<tr>
<td>km/h</td>
<td>Kilometers per hour</td>
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<tr>
<td>LMICs</td>
<td>Low- and middle-income countries</td>
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<tr>
<td>MDB's</td>
<td>Multilateral Development Banks</td>
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<tr>
<td>MDG</td>
<td>Millennium Development Goal</td>
</tr>
<tr>
<td>mph</td>
<td>Miles per hour</td>
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<tr>
<td>NCAP</td>
<td>New car assessment program</td>
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<tr>
<td>NGO</td>
<td>Nongovernmental organization</td>
</tr>
<tr>
<td>NHTSA</td>
<td>National Highway Traffic Safety Administration (United States)</td>
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<td>NLTP</td>
<td>National Land Transport Program</td>
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<tr>
<td>NRSC</td>
<td>National Road Safety Council</td>
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<tr>
<td>NTSC</td>
<td>National Traffic Safety Committee</td>
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<tr>
<td>NZD</td>
<td>New Zealand dollar</td>
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<tr>
<td>NZRSP</td>
<td>New Zealand Road Safety Program</td>
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<tr>
<td>OECD</td>
<td>Organization for Economic Co-operation and Development</td>
</tr>
<tr>
<td>OECD/IT</td>
<td>OECD International Traffic Federation</td>
</tr>
<tr>
<td>OLA</td>
<td>Objective data, List of solutions/actions, Addressed action plans</td>
</tr>
<tr>
<td>PHRD</td>
<td>Policy and Human Resources Development Fund</td>
</tr>
<tr>
<td>RSMCR</td>
<td>Road safety management capacity review</td>
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<tr>
<td>Acronym</td>
<td>Description</td>
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<tr>
<td>RTI</td>
<td>Road traffic injury</td>
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<tr>
<td>SAMU</td>
<td>Services d’Aide Médicale Urgente, Emergency Medical Services</td>
</tr>
<tr>
<td>SIDA</td>
<td>Swedish International Development Cooperation Agency</td>
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<tr>
<td>SIL</td>
<td>Sector Investment Loan</td>
</tr>
<tr>
<td>SMR</td>
<td>Standardized mortality rate</td>
</tr>
<tr>
<td>SRSO</td>
<td>Swedish Road Safety Office</td>
</tr>
<tr>
<td>SWOV</td>
<td>Institute for Road Safety Research (The Netherlands)</td>
</tr>
<tr>
<td>TB</td>
<td>Tuberculosis</td>
</tr>
<tr>
<td>TRRL Ltd.</td>
<td>Transport and Roads Research Laboratory, Ltd. (United Kingdom; formerly the Road Research Laboratory, RRL)</td>
</tr>
<tr>
<td>TSPMU</td>
<td>Traffic Safety Project Management Unit</td>
</tr>
<tr>
<td>UK</td>
<td>United Kingdom</td>
</tr>
<tr>
<td>UN</td>
<td>United Nations</td>
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<tr>
<td>UNECE</td>
<td>United Nations Economic Commission for Europe</td>
</tr>
<tr>
<td>USRAP</td>
<td>United States Road Assessment Program</td>
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<tr>
<td>UNRSC</td>
<td>United Nations Global Road Safety Collaboration</td>
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<tr>
<td>VND</td>
<td>Vietnam Dollar</td>
</tr>
<tr>
<td>VRA</td>
<td>Vietnam Road Administration</td>
</tr>
<tr>
<td>WHA</td>
<td>World Health Assembly</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organization</td>
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<tr>
<td>WHO EURO</td>
<td>World Health Organization Regional Office for Europe</td>
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Executive Summary
Executive Summary

“Death on wheels” evokes a bleak image, but an appropriate one for countries in the World Bank’s Europe and Central Asia (ECA) Region. A combination of weak road safety management capacity, deteriorated roads, unsafe vehicles, poor driver behavior, and patchy enforcement of road safety laws, alongside exponential growth in the number of vehicles, have contributed to road traffic injuries and fatalities multiplying at a rapid pace.

This report provides an overview of the challenges and opportunities in addressing road safety in the ECA Region. It presents information on the size, characteristics, and causes of the problem; presents evidence on the effectiveness of measures that countries world-wide have adopted to improve road safety; briefly describes current international road safety policy; and discusses a range of strategies and actions that could be undertaken by the World Bank in coordination and partnership with the World Health Organization (WHO), multilateral development banks, other international agencies and donors, as well as with private and civil society institutions.

A primary audience of this report is internal—particularly managers and staff of the World Bank working in the transport, health, education, and governance sectors, to raise awareness about the multisectoral nature of the road safety challenge and of effective options to address it. It proposes ways that the World Bank might engage more to support ECA countries in tackling this issue, working in partnership with other international agencies and donors. The secondary audience is external—policy makers, senior analysts, program managers, and their advisers in the governments of ECA countries, private sector officials, and civil society and international organizations working in this field. The goal is to support discussion on appropriate choices and instruments for advancing the road safety agenda as a top development priority over the short and medium term.

To begin to address the problem of road traffic injuries and fatalities, country authorities, the World Bank, and international partners need to (Saghir 2009):

- Recognize that the scale of the public health crisis from death on wheels in low- and middle-income countries (LMIC) is unacceptable.
- Commit to implementing road safety measures that are: (a) sustainable, which requires proper sequencing and a long-term commitment; (b) integrated, which requires multisectoral and multidisciplinary engagement; and (c) inclusive, which takes into account country development objectives and recognizes that the poor and those thrust into poverty by road crashes have rights that deserve protection.
- Prioritize safe, clean, and affordable transport for development.
- Accelerate knowledge transfer and scale-up road safety engagement and investments.
- Understand that the World Bank, in partnership with other institutions, could play an important role in supporting governments to raise the political importance of road safety as a development priority and in designing and implementing programs and projects over the medium term to achieve road safety targets. This in turn will help raise the importance of road safety in country and regional assistance agendas of other international agencies and among the donor community.

THE NATURE OF THE PROBLEM

Most passenger and goods traffic uses roads (for example, close to 80 percent and 50 percent, respectively, in the European Union). Rising incomes in many developing countries have led to more motor vehicles and greater traffic volumes, but road safety management capacity, road infrastructure and enforcement of traffic safety regulations have not kept pace. As a result, road traffic injuries (RTIs) have become a major public health challenge in many low- and middle-income countries (LMICs),

1 Countries of the Former Soviet Union, the Baltics, the Balkans, Eastern and Central Europe, and Turkey.
including in ECA. About 90 percent of the 1.3 million deaths and 50 million injuries from road traffic crashes worldwide each year occur in LMICs, although these countries have only 48 percent of the world’s registered vehicles (WHO 2009a). Increasing motorization and urbanization in LMICs could double this toll by 2030. The difference between low- or middle-income countries and high-income countries—where many road deaths still occur—is stunning.

The ECA countries have experienced rapid growth in the number of passenger cars on the roads over the last two decades. In the Commonwealth of Independent States (CIS) there was a 120 percent increase in passenger cars per 1,000 persons from 64 in 1990 to 141 in 2003 (UNECE and WHO EURO 2009). Similar trends are observed in countries in South-Eastern Europe: an increase from 18 passenger cars per 1,000 persons in 1994 to 48 in 2002 in Albania, and from 143 to 276 in Croatia. However, there are still far fewer cars in most ECA countries than the typical range of 400 to 600 in Western Europe (UNECE and WHO EURO, 2009). Increased reliance on private cars for transport in ECA is reflected in the smaller increase in the number of buses (Eurostat 2007). Vehicles in many ECA countries, particularly in the CIS, tend to be old and have substandard safety features. Cross-border trade in cars considered too unsafe, old, or polluting for Western European countries exacerbates this problem. Length of roads (in 1,000 km.) and highways (in km.) has also increased since the 1990s, by 18 percent and 157 percent in the CIS, 21 percent and 75 percent in EU-10 countries, and 46 percent and 144 in South-Eastern Europe, respectively. In spite of significant investments in road infrastructure since the 1990s, in some CIS countries the road infrastructure suffers from poor maintenance and under-investment. The population in the CIS travels 800 km per capita by car, as compared to more than 12,000 km per capita in Western Europe.

While road traffic fatalities have declined steadily in Western Europe, to below 6 fatalities per 100,000 in the Netherlands, Sweden, Switzerland, Norway, and the United Kingdom (2006), deaths from RTIs have increased in most ECA countries in spite of the smaller car fleet and relatively low number of km travelled

---

2 The 10 countries which joined the EU in 2004: Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia and Slovenia.

per capita by car. RTI deaths in ECA in 2007 showed increases ranging from 8 percent to 39 percent. In 2007, there were an estimated 80,000 reported traffic deaths in ECA countries, where RTIs are already among the top 10 causes of death. Besides deaths, the societal toll of RTIs in ECA is also reflected in more than 800,000 nonfatal injuries that occurred in 2007.

RTIs negatively affect economically productive age groups: 55 percent of road traffic deaths in ECA countries are among people aged 15–44, mostly among those aged 15–29; more than 80 percent of these deaths are men. Alcohol misuse is linked to increases in traffic fatalities and differences in death rates between males and females. Children and the elderly are also vulnerable on the roads, especially as pedestrians, and are seven to nine times more likely to be killed in a road crash than car occupants.

The proportion of deaths among different road users varies from country to country, reflecting differences in exposure and safety. The majority of road traffic fatalities in ECA occur among motorized four-wheeler occupants. However, pedestrian fatalities are also very high in several ECA countries, accounting for 40 percent or more of total road fatalities in Albania, Belarus, Kyrgyzstan, Tajikistan, and Ukraine.

**RISK FACTORS**

The main risk factors for RTIs are:

- Road design features, including those that expose vulnerable road users when mixing with traffic (for example, due to lack of crossings or walkways).
- Lack of effective regulation and enforcement of required vehicle condition, driver’s education and training, and risky behaviors.
- Driver behavior: speeding; recklessness; drinking and driving; not using seatbelts, helmets, and other protective equipment; and using mobile phones, especially texting.

**ECONOMIC COST OF RTIs**

The RTI epidemic has negative effects on individuals, societies, and health budgets. Worldwide, the cost of road deaths and injuries is estimated at about 1 percent of Gross National Product in low-income countries, 1.5
percent in middle-income countries, and 2 percent in high-income countries. The total costs to governments exceed US$500 billion annually. In ECA, the highest costs are in the large economies with sizeable populations: Russia (US$34 billion per year), Turkey (US$14 billion), Poland (US$10 billion), and Ukraine (US$5 billion). In addition to death and disability from road crashes, hazardous road conditions restrict citizens' mobility and opportunities to lead healthy, active lives, aggravating the risk of developing non-communicable conditions such as cardiovascular diseases and diabetes and contributing to increased obesity rates.

**HOW TO TACKLE THIS PROBLEM?**

An effective road safety strategy requires a multisectoral, “safe system” approach. It needs a lead agency to coordinate contributions by the many government departments across which road safety responsibilities tend to be diffused: transport, interior, police, health, and education, among others. The goal is to prevent the occurrence of injury, minimize the severity of injury when traffic injuries occur, and reduce the severity of injury in the aftermath.

Road safety must be integrated into the design of transport plans and programs and considered in broader public policy discussions that influence people’s transport options and decisions. When road safety becomes an integral part of transport policy, the benefits of reducing noise and air pollutants, controlling alcohol abuse, and promoting walking and cycling become apparent. For example, maintaining lower speeds reduces the costs of injuries and also the costs from air pollution, greenhouse gas emissions, noise, and fear-based barriers among would-be pedestrians and cyclists.

**ECA EFFORTS TO PREVENT ROAD TRANSPORT INJURIES**

Many ECA countries have structures and processes in place to address RTIs, including institutional frameworks where lead agencies coordinate the national response, funding in national budgets, and national road safety strategies with measurable targets. National laws set speed limits, regulate driving under the influence of alcohol, and mandate the use of safety equipment. In addition, many ECA countries require formal audits of major road construction projects and regular audits of existing roads —many follow the EU Directive mandating audits for all investments in core road networks—and have policies promoting public transportation, walking, and cycling. Formal, publicly available pre-hospital care systems for post-crash medical care are in place, albeit with varied quality.

In spite of progress observed in ECA countries, additional and scaled-up efforts and resources are needed to remedy the significantly worse road safety performance (including in countries that are now part of the EU) than their counterparts in Western Europe.

Experience from high income countries (HICs) and other middle-income countries shows that improving road safety requires a consistent, 20-to-30-year effort to develop and implement comprehensive, integrated safe system programs, under the coordination of a well-structured and funded, technically and operationally competent, lead agency. Business planning processes and performance monitoring systems must be developed and strengthened to support a long-term strategy, and the first phase of a strategy should foster consensus among stakeholders and public sector agencies on a long-term action plan based on demonstrably successful interventions. A financing plan for implementing the strategy should be specified. Support should be provided to develop a program of road user education, traffic safety enforcement and emergency preparedness along a first set of demonstration corridors. Certainly efforts to reduce corruption, lack of transparency, and lack of credibility and public trust of road police should improve.

The excessively large numbers of deaths and injuries in ECA countries are evidence of the need for international support for implementing a safe systems road safety approach over the short and medium term.

**Scaling up implementation of the recommendations of the 2004 World Report on Road Safety: what needs to be done in ECA?**

The findings of this landmark report (Peden and others 2004) led to six over-arching recommendations that set out the strategic initiatives necessary to improve country road safety performance:

- Identify a lead agency in government to guide the national road safety effort.
• Assess the problem, policies and institutional settings relating to road traffic injury, and the capacity for road traffic injury prevention in each country.
• Prepare a national road safety strategy and plan of action.
• Allocate financial and human resources to address the problem.
• Implement specific actions to prevent road traffic crashes, minimize injuries and their consequences, and evaluate the impact of these actions.
• Support the development of national capacity and international cooperation.

Implementing these recommendations at country level requires building capacity, to create the resources and tools necessary to implement target initiatives on a scale capable of reducing road deaths and injuries significantly and sustainably. It also requires an integrated framework that treats the recommendations of the World Report as a totality, and ensures that institutional strengthening initiatives are properly sequenced and adjusted to the absorptive and learning capacity of the country concerned (Bliss and Breen, 2009).

A systematic response is needed. Managing for improved road safety results at country level must address three inter-related elements of the road safety management system: institutional management functions, interventions, and results; with prime importance being placed on institutional management functions and more specifically the role of the lead agency. Interventions alone will not suffice.

Building institutional management functions requires:
• Strengthening institutions and governance capacity for RTI prevention, including lead agency capacity, targeting evidence-based training of senior policymakers, executive managers in the various relevant sectors, and ministry focal points and practitioners, especially in transport, justice, traffic police, and health. Creating space for civil society and private sector participation has the potential to galvanize political support on the basis of well-articulated social demands from communities that bear the burden of RTIs.
• Improving nationwide traffic injury surveillance systems to better map the causes, risks, extent, and consequences of injuries; to pinpoint risks for more effective action; and to evaluate the effectiveness of those actions.
• National road safety reviews are a sound basis for formulating policies and plans. These reviews help identify main risk groups and exposures to determine priorities, set realistic targets, allocate budgets, specify implementation responsibility, and ensure rigorous evaluation.

A focus on results requires:
• Integrating road safety in all phases of planning, design, and operation of road infrastructure. At the planning stage, before project approval, strategic comparative analysis of substantial changes and new construction need to be conducted to examine the network’s safety performance. Road safety audits and safety impact analyses complement these assessments focusing on the design characteristics of a road infrastructure project. In addition, reviews of high road traffic crash concentration sections need to be undertaken to help target investments to road sections with the highest crash concentrations and/or the highest crash reduction potential.
• Reducing speed limits, particularly in urban areas, and strengthening these efforts with road design, enforcement, publicity, speed cameras and appropriate penalties, to generate immediate safety benefits.
• Reducing drinking and driving. Given the relative importance of alcohol abuse in some ECA countries, broad alcohol-control policies, fiscal measures, and interventions are required to support the long-term sustainability of road safety efforts. Blood alcohol limits need to be aligned with international practice and priority given to systematic general deterrence-based police enforcement with severe penalties.
• Increasing seatbelt use through enforcement and publicity campaigns, revising specifications (at least for new cars), promoting vehicle seatbelt reminder systems, and undertaking periodic surveys to monitor front and rear seatbelt usage rates.
• Reducing young driver risk through graduated licensing schemes and extended training programs.
• Improving emergency medical systems as part of broader health system modernization efforts to reduce fatalities and mitigate injuries.
Integration of road safety and transport policy. Recent research indicates that improving transportation options (for example, better walking and cycling conditions, and improved ride sharing and public transport services) can reduce car collision frequency.

Designing demonstration projects. Well-designed demonstration projects can support the process of catching up with best practice in road safety performance and are an essential part of building capacity. They can provide useful benchmarks for rolling out a modern road safety program to the rest of the country with support from donors and international finance organizations.

THE WORLD BANK’S ROLE

To advance the road safety agenda, the World Bank co-founded the Global Road Safety Facility in 2006 with other partners. The Facility works with international partners to provide funding and technical assistance to scale-up LMIC capacity to implement cost-effective road safety programs.

Road safety is routinely a key component in World Bank road infrastructure projects. For example, recently approved projects in Bosnia and Herzegovina, Bulgaria, Georgia, Poland, and Ukraine include pilot measures (and monitoring), such as road safety reviews, strengthening capacity of national road safety authorities, improving safety features of road infrastructure, tightening enforcement, and public campaigns for safer driving. In Vietnam, a World Bank-supported project dedicated to road safety and complementing related initiatives supported by other international agencies is enabling the government to achieve good results (for example, unprecedented enforcement of a new law mandating motorcycle helmet use is contributing to reducing road traffic fatalities). This example of a multisectoral approach includes institution—capacity strengthening, physical road improvements, user education, and monitoring and evaluation. The new road projects in Georgia are trying to emulate this approach and apply it to specific road corridors. World Bank projects in Russia and other countries have engaged the health sector to reorganize and strengthen emergency medical services to improve care for RTI victims.

The World Bank, working with international partners, could support ECA countries in their effort to reduce road crash fatalities during 2010–16 by exploring options to support the identification, selection, design, and implementation of actions most likely to prevent road crashes and improve road crash emergency and rehabilitation services. Some ECA countries, as members of the EU, have the opportunity to deal with the RTI challenge through that membership. And, since non-EU ECA countries may not have the same opportunity, the support that could be provided by the World Bank would follow a tailored approach.

As seen in ongoing U.S.-supported efforts under the Recovery and Reinvestment Act of 2009, programs being funded by governments in different countries to reactivate economic growth and employment offer a “window of opportunity” to scale-up and improve road safety in ECA. This implies that investment directed to roads and highways should incorporate safety features and be coupled with support for implementing existing road safety plans.

On the basis of priorities set by ECA countries and taking into account the individual circumstances of each country, the World Bank could provide an assistance program that advocates greater investment in certain road safety initiatives, taking into account evidence-based, cost-effective approaches and international best practices, evidence from modeling exercises, extrapolation of the impact of different interventions for improving road safety, and available economic evidence.

Following the recently-issued World Bank guidelines for implementing the recommendations of the 2004 World Report (Bliss and Breen 2009), programs could concentrate on the following areas:

Capacity review. The conduct of a safety management capacity review is a vital first step in the process of a country tailoring the World Report recommendations to its unique circumstances. The review can help a country determine its readiness to commit to the productive and sustainable steps necessary to improve road safety outcomes. It also identifies related institutional responsibilities and accountabilities and provides a platform to reach an official consensus on country capacity weaknesses and how best to overcome them.

Role of lead agency. The World Report highlights the fundamental role of the lead agency in ensuring the effective and efficient functioning of the road safety management system. Responsible and accountable road
safety leadership at country, state, provincial and city levels is vital to success. In the absence of such leadership with a sustained focus on results, improvements, for example, in program coordination, decentralization and promotion will often be elusive and unsustainable. Likewise, action plans prepared without a designated agency mandated to lead their implementation and a realistic and sustainable funding base are likely to remain paper plans and make no positive impact.

**Staged investment.** Countries wishing to improve their road safety performance must be well organized to achieve improved results in a systematic way. Institutional management functions must take the highest priority as the foundation on which road safety management systems are built: they produce the interventions that achieve the desired results. In practice, institutional strengthening must be staged. During the formative stages, emphasis must be put on improving the focus on results and related inter-agency coordination. As these institutional management functions become more effective, the remaining management functions are in turn strengthened.

**Learning by doing.** Sustained long-term investment is the key to improving country road safety results. This requires a staged process of investments that address revealed capacity weaknesses, first building core capacity to achieve initial targeted safety outcomes, then scaling up investment to accelerate capacity strengthening and achieve improved results across the national road network. Building upon the findings of the country capacity review, investment must be grounded in learning by doing, backed with sufficient targeted investment to overcome the barriers presented by weak institutional capacity.

One way to operationalize this approach would be to support the design and implementation of **safe system demonstration projects** that aim to anchor country capacity building efforts in systematic, measurable and accountable investment programs that simultaneously build management capacity while rapidly achieving safety improvements in targeted high-risk corridors and areas.

Demonstration projects could be located in distinct geographic areas where road safety issues vary in nature: (a) in a densely populated urban area within a major city, for example, Baku, Kiev, Moscow, St. Petersburg, and Tbilisi; and (b) along a high-speed and highly trafficked highway, for example, Moscow-St. Petersburg, or any other with a high rate of road crashes. Particular attention could be devoted to exploring links and synergies with transport policy options to mitigate the effects of climate change through reduced greenhouse gas emissions – this would garner additional support for policies to reduce speeding and a modal shift toward safer, cleaner transport modes. In addition, this is an important area for synergy with other health policies and programs, and with other international agencies and donors.

The objective of the **demonstration projects** would be to: (a) field-test a road safety improvement strategy that implements a combination of preventive safety engineering measures and legal and regulatory measures to reduce urban speed limits to 50 km/h; and (b) encourage local authorities to impose 30 km/h limits in highly populated areas and to strictly enforce key safety behaviors concerning speed, seatbelts, and alcohol, supported by high-intensity public education campaigns and strengthened emergency medical care services.

Combined with the development of lead agency capacity that would operate a continuous, detailed monitoring and evaluation system, the demonstration projects would generate benchmark performance measures. This would allow successful interventions to be extended to the rest of the country within a reasonable time frame, for example, five years. In some countries, this effort would also require a clearer distinction of what is possible at local, regional, and national levels and their respective responsibilities and related policy options and interventions, particularly since the World Bank is starting to work at the sub national level.

**WHY NOW?**

The time to support concerted efforts to make roads safer in ECA has arrived. Growing urbanization, poor road conditions, accelerating growth in the number of vehicles, patchy efforts to legislate and enforce road safety measures, and increases in the rate of road injuries and fatalities, present a real threat. Investing in effective interventions under a safe systems approach as suggested in this report would reduce premature mortality and disability, which contribute significantly to the demographic decline in countries such as the Russian Federation and Ukraine. It would also support human capital accumulation, a key factor for sustainable economic growth in ECA and elsewhere.
CALL TO ACTION

This report provides evidence that road traffic safety has tremendous implications for health, social welfare, and economic well-being in ECA countries. Road traffic injuries are a major cause of death and disability, in particular afflicting children, adolescents, working-age men, and the elderly. The report argues that accumulated evidence from country experiences worldwide reveals promising measures that would strengthen institutions, laws and regulations, policies, enforcement mechanisms, and health service delivery systems to reverse deteriorating road safety conditions, save lives, and prevent injuries in the ECA countries.

The proposed road safety effort is fully consistent with and supports the World Bank’s transport strategy of “Safe, Clean and Affordable Transport for Development” (World Bank 2008a), and the new World Bank guidelines for implementing the recommendations of the 2004 World Report (Bliss and Breen 2009c). It also supports the health improvement and poverty alleviation objectives outlined in the “Healthy Development” strategy for health, nutrition and population results (World Bank 2007a). These efforts are also consistent with the new strategic directions guiding the World Bank’s overall work, particularly those of fostering regional and global public goods that transcend national boundaries and of cooperating with other agencies having special expertise (Zoellick 2008).
“From time to time in human history there comes a killer epidemic that is not recognized for what it is and is not acted against until it is almost too late. HIV/AIDS, which is ravaging Sub-Saharan Africa, is one such. Road traffic injuries have the potential to be another.”

– Desmond Tutu, Emeritus Archbishop of Cape Town, Nobel Peace Prize Laureate, 1984

Chapter I. Introduction

Transport is central to development—it facilitates the movement of people, goods, and services; enhances employment opportunities; and improves access to health care, education, and other essential services (World Bank 1996). Most passenger and goods traffic uses roads (for example, close to 80 percent and 50 percent, respectively, in the European Union) (Commission of the European Communities 2001). Transport investments contribute to economic growth in both densely populated cities and major corridors and more sparsely populated suburban, rural, and other areas (Banister and Wright 2005; Straub 2008). Transport investments reduce social exclusion by facilitating mobility; increase access to markets and basic services; and improve health, education, and quality of life.

The transport sector is affected by the policy decisions of several other sectors, including fiscal, land use, urban and rural development, energy, and health. These, together with the transportation options available, facilitate or discourage the use of private cars and otherwise influence the choices people make for traveling. Perceptions of whether roads are safe or not also influence people’s transportation choices, as does the social status associated with different modes of transport. For example, in some countries public transportation is perceived as being “for the poor,” while luxury cars are perceived as being “for important people.” The types of transport available to and chosen by populations can have a dynamic and complex influence on exposure to hazards or risks, with acute and chronic health effects.

1. Negative transport-related environmental and health impacts

While contributing to economic growth and improving living conditions, road traffic may expose people to risks in a number of ways. For example, there may be sudden and catastrophic negative impacts on health as in the case of road traffic deaths, or long term damage such as chronic respiratory diseases caused by air pollution. Road traffic-related emissions of greenhouse gases contribute to climate change, which in turn, can result in extreme weather events, including floods—with attendant destruction of vital infrastructure; drought, and changes in the habitats of disease vectors that help spread communicable diseases such as malaria and dengue in many regions of the world, including Central Asia. Air pollution costs are estimated at 2 percent of Gross National Product (GDP) in high-income countries (UNECE and WHO EURO 2009).

Pervasive traffic noise, congestion, and driver stress tend to aggravate psychosocial and mental health problems. Recent estimates indicate that in many European Union (EU) countries approximately 30 percent of the population is exposed to traffic noise levels above 55 decibels (dB), although World Health Organization (WHO) guidelines would limit them in residential areas to 55 dB during the day and 45 dB at night (UNECE/WHO-EURO 2009). The use of older vehicles and poor vehicle maintenance worsens traffic noise in many LMICs, including former Soviet Union countries.

3 In Moscow, for example, motor vehicles are the main source of air pollution, accounting for more than 80 percent of pollutants (UNECE and WHO EURO 2009).
Various time periods after a road crash are used when defining a road traffic fatality or injury, and other criteria also vary for nonfatal injuries. In some countries, a serious injury is defined as one requiring hospital attention, while in others it is inpatient care for at least 24 hours or longer admission times (WHO 2009a).

### 3. RTI risks from increasing motorization in LMICs

The rapidity with which the risk of road traffic fatalities grows depends on the rate of growth in motorization and the rate of change in fatalities per vehicle (Kopits and Cropper 2003). Over the last 25 years in most LMICs, the rate of vehicle ownership rose faster than the rate at which fatalities per vehicle fell. In many LMICs, particularly in ECA’s transition countries, a dramatic decline in the quality of public transport has further accelerated private motorization. This decline is due to limited or reduced public financing of the system and pushes many people to meet their mobility needs through private cars or informal public transportation, such as minibuses.

Improvements in road infrastructure, public transport policies, and governance systems, including enforcement of laws and regulations, have not accompanied increasing motorization. Many of the technical aspects of planning, highway design, traffic engineering, and traffic management that are the hallmarks of transportation systems in many high-income countries (HICs) are absent in LMICs (Tiwari, 2000). The lack of enforcement of speed limits and very high prevalence of drunk driving combine with poor road planning factors—such as high traffic in residential areas, schools on busy roads, dangerous passing on two-lane roads, lack of safe crossing points and secure underpasses, and lack of barriers to prevent pedestrian access onto high-speed roads—to create an environment with an extremely high combination of risk factors for RTIs.

Several factors increase injury severity from crashes. Roadside hazards, such as...
as trees, poles, and road signs are one factor. Lack of in-vehicle crash protection devices is another. Evidence indicates that many engineering advances made to vehicles in HICs are absent in LMICs, due to out-of-date design standards and the fact that most cars are more than 15 years old (UNECE and WHO EURO 2009), as is often the case in ECA countries. Failure to use helmets by users of motorized two-wheeled vehicles and bicyclists is also a significant risk factor for increased severity of injury.

Efforts to strengthen emergency medical services also have lagged in many countries, resulting in failure to address RTIs effectively when they occur and contributing to rising numbers of deaths and people with disabilities. HIC experience shows that at higher incomes, with slowing motorization and increasing investments by governments, civil society, and individuals in road safety, RTIs mortality rates decline.

4. The broad potential benefits of road safety policies

When road safety becomes an integral part of transport policy, the benefits of reducing noise and air pollution, controlling alcohol abuse, and promoting safe walking and cycling become apparent. In addition, the range of strategies available to improve road safety becomes broader and more cost-effective as investments deliver multiple health benefits unavailable from singularly focused approaches (Yasuf, Nabeshima, and Ha 2007). For example, maintaining lower speeds saves the costs of injuries and also the costs from air pollution, greenhouse gas emissions, noise, and fear-based barriers among would-be pedestrians and cyclists. In turn, facilitating walking and commuting by bike could achieve significant reductions in the health risks associated with sedentary lifestyles—obesity, non-communicable diseases such as heart attacks and strokes, and diabetes (WHO 2006).

In recent years, policies that can deliver multiple health “co-benefits” have been increasingly attracting the interest of policymakers as they face the challenge of reducing greenhouse gas emissions from the transport sector. Policies primarily intended to combat climate change but that can simultaneously result in immediate health benefits, are those that reduce average speeds and the need for traveling or that substitute short car trips with pedestrian, bicycle, or public transport trips.

It is clear, therefore, that a broader approach to promote road safety facilitates linkages with other policy initiatives and the search for synergies to maximize health gains in a society (WHO-EURO 2006).

5. Road safety: The way forward

As noted by the Commission for Global Road Safety (2009), transport safety is the “orphan child of global public policy,” often falling through the cracks of the development agenda. This is reflected in the minimal development assistance allocated to RTI prevention and the omission of transport and road safety from the Millennium Development Goals (MDGs). At the country level, road safety responsibilities tend to be diffused across government departments—transport, interior, and police—without coordinated leadership. In large federal countries, lack of national responsibility is usually not balanced by subnational efforts.

The Commission for Global Road Safety (2009) also notes that while the primary rationale for investing more than US$4 billion each year in road infrastructure is to improve road transport efficiency to spur economic growth, the risk and magnitude of increased societal costs associated with rising RTIs is often overlooked. It warns that unless road safety is integrated at the design stage of road building and repair programs, new road investments will lead “to higher casualty rates as they increase both the speed and volume of traffic, intensifying injury risk especially to vulnerable road users, such as pedestrians, cyclists and children.”

RTI prevention is now recognized as a major public health priority worldwide that must be based on societal values (for example, a more balanced car and public transport culture), national policies, and laws and regulations that are properly enforced. As discussed in this report, broadening the effort beyond dealing solely with the consequences of traffic crashes requires political commitment and the allocation of resources from national authorities and the international community to support the development of multisectoral strategies and interventions in the short and medium term. This, in turn, requires the involvement of multiple stakeholders and actors (Bakefi 2006).

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5 An example of this new trend at the international level is the Amsterdam Declaration (UNECE and WHO EURO 2009), which commits European countries to adopting this approach.
6. Report objectives

This report, based on a desk review, provides an overview of the challenges and opportunities in addressing road safety in the countries that are part of the World Bank’s Europe and Central Asia Region. It presents data and information on the magnitude and characteristics of the problem in ECA countries; briefly describes the current international policy framework on road safety, including support provided by international organizations; offers examples of effective ways that countries worldwide have responded to different dimensions of this epidemic; and discusses a range of strategies and actions that could be undertaken by the World Bank’s ECA team working in coordination and partnership with other units in the institution and with WHO, multilateral development banks, and other international agencies and donors, as well as with private and civil society organizations. The report argues that road safety is best approached through intersectoral cooperation and that the transport, health and policing/enforcement sectors have key roles to play in preventing RTIs and their attendant deaths and disabilities.

This report draws heavily on data and assessments prepared by the WHO, the World Bank, the Disease Control Priorities Project (DCPP), the Commission for Global Road Safety, the EU, and the United Nations Economic Commission for Europe (UNECE). Data collection was facilitated by the WHO-EURO Rome Center. A wide literature review from scientific publications and other documentation was also conducted.

The primary audience is internal—particularly managers and staff of the World Bank working in the transport, health, education, and governance sectors, to raise awareness about the multisectoral nature of the road safety challenge and of effective options to address it. It proposes ways that the World Bank might engage more to support ECA countries in tackling this issue, working with partner organizations.

The secondary audience is external—policymakers, senior analysts, program managers, and their advisers in the governments of ECA countries, and people working on health and transport issues in the private sector, international organizations, and civil society organizations. The goal is to support discussion of appropriate choices and instruments for advancing the road safety agenda as a top development priority over the short and medium term.
“Beyond the enormous suffering they cause, road traffic crashes can drive a family into poverty as crash survivors and their families struggle to cope with the long term consequences of the event, including the cost of medical care and rehabilitation and all too often funeral expenses and the loss of the family breadwinner.”

– Margaret Chan, Director-General, World Health Organization

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


**Chapter II. The Epidemic of Road Traffic Injuries**

1. The global context

*How should exposure to RTI risk be measured?* With the growing level of cooperation between the health and transport sectors, deaths—“fatalities per 100,000 population” are becoming a widely used measure of exposure to RTI risk (OECD and ECMT, 2006). The use of population as a denominator permits comparisons with other causes of injury or with diseases.

Global road traffic fatalities are growing fast, and most occur in low- and middle-income countries (LMICs). Table 1 on the next page presents World Bank projections for global road fatalities, predicting they will increase by 66 percent between 2000 and 2020 unless road safety interventions are intensified. These fatalities are estimated to increase by 80 percent in LMICs, while declining by close to 30 percent in HICs. Over 90 percent of RTI deaths occur in LMICs, although these countries have only 48 percent of the world’s registered vehicles (WHO 2009a). Road traffic fatality rates in LMICs, at about 20 per 100,000 population, are nearly double the rate in high-income countries (HICs), at 10.3 per 100,000 (WHO 2009a).

The gaps between poor and rich countries are widening. Scaled-up and effective measures are needed to reduce the growing vulnerability of LMICs experiencing rapid motorization and intensified provision of road infrastructure. This is important when considering the expected negative health impact of RTIs in the world (Plasencia and Borrell 2001; Murray and Lopez 1996).

*Road traffic injuries are growing relative to most other diseases worldwide* (WHO 2004a). Table 2 on the next page shows that RTIs accounted for about 1.3 million deaths worldwide in 2004, 2.2% of total deaths, expected to rise to 2.1 million and 3.2% of total deaths by 2030. Other sources estimate another 20 to 50 million nonfatal road traffic injuries annually (Murray and others 2001; Peden and others 2004).

RTIs are the leading cause of death for young people aged 10–24 globally (this group accounts for 30 percent of the world’s population), and are forecast by the WHO to become the top cause of disability and premature death for children aged 5–14 in LMICs by 2015. This would cause far more disability-adjusted life years (DALY) lost than malaria, tuberculosis (TB), or acquired immune deficiency syndrome (AIDS).

Pedestrians, cyclists, and motorized two-wheeler riders and passengers are vulnerable road users, at especially high risk of having an RTI and of dying from it. They account for about 46 percent of global road traffic deaths (WHO 2009a).
Table 1: Predicted Road Traffic Fatalities, by World Bank Region

<table>
<thead>
<tr>
<th>Region</th>
<th>% Change 2000–20</th>
</tr>
</thead>
<tbody>
<tr>
<td>South Asia</td>
<td>144%</td>
</tr>
<tr>
<td>East Asia &amp; Pacific</td>
<td>80%</td>
</tr>
<tr>
<td>Sub-Saharan Africa</td>
<td>80%</td>
</tr>
<tr>
<td>Middle East and North Africa</td>
<td>68%</td>
</tr>
<tr>
<td>Latin America and the Caribbean</td>
<td>48%</td>
</tr>
<tr>
<td>Europe and Central Asia</td>
<td>18%</td>
</tr>
<tr>
<td>Subtotal</td>
<td>83%</td>
</tr>
<tr>
<td>High-income countries</td>
<td>-26%</td>
</tr>
<tr>
<td>Global Total</td>
<td>66%</td>
</tr>
</tbody>
</table>


Road crashes tend to disproportionately affect low-income groups, and their attendant costs can plunge households into poverty due to the loss of breadwinners and the added burden of caring for members disabled by road traffic injuries (Borrell and others 2005; Natulya and Reich 2003; Roberts and Power 1996, Peden and others 2004). The population groups exposed to highest risks of injury and fatality from traffic crashes in low-income and middle-income countries—pedestrians, passengers of buses and trucks, motorcyclists and bicyclists—are from lower socioeconomic groups because the more affordable modes of transport present higher risks than private cars (Natulya and Reich 2003, and Mock and others 1997).

2. ECA: A bleak situation and prognosis

Rapid motorization has occurred without adequate infrastructure and regulation. Transition countries that experienced rapid economic growth since the 1990s, such as Kazakhstan and Russia, motorized rapidly but without adequate infrastructure. Nor have effective regulatory controls been put in place—vehicle safety checks, particularly for public transport vehicles; drivers’ licensing systems; and enforcement of speed and alcohol limits and seatbelt and helmet use.

ECA countries have experienced rapid growth in the number of passenger cars on the roads over the last two decades. The Commonwealth of Independent States (CIS) went from 64 passenger cars per 1,000 persons in

Table 2: Leading Causes of Death, All Ages, 2004 and 2030

<table>
<thead>
<tr>
<th>Year</th>
<th>Disease or Injury</th>
<th>Deaths (millions)</th>
<th>% Total Deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>Ischemic heart disease</td>
<td>7.2</td>
<td>12.2</td>
</tr>
<tr>
<td></td>
<td>Cerebrovascular disease</td>
<td>5.7</td>
<td>9.7</td>
</tr>
<tr>
<td></td>
<td>Lower-respiratory infections</td>
<td>4.2</td>
<td>7.1</td>
</tr>
<tr>
<td></td>
<td>Chronic obstructive pulmonary disease</td>
<td>3.0</td>
<td>5.1</td>
</tr>
<tr>
<td></td>
<td>Diarrheal diseases</td>
<td>2.2</td>
<td>3.7</td>
</tr>
<tr>
<td></td>
<td>HIV/AIDS</td>
<td>2.0</td>
<td>3.5</td>
</tr>
<tr>
<td></td>
<td>Tuberculosis</td>
<td>1.5</td>
<td>2.5</td>
</tr>
<tr>
<td></td>
<td>Trachea, bronchus, lung cancers</td>
<td>1.3</td>
<td>2.3</td>
</tr>
<tr>
<td></td>
<td>Hypertensive heart disease</td>
<td>0.9</td>
<td>1.5</td>
</tr>
<tr>
<td></td>
<td>Stomach cancer</td>
<td>1.3</td>
<td>1.9</td>
</tr>
<tr>
<td></td>
<td>Malaria</td>
<td>1.0</td>
<td>1.7</td>
</tr>
<tr>
<td></td>
<td>Hypertensive heart disease</td>
<td>0.9</td>
<td>1.5</td>
</tr>
<tr>
<td></td>
<td>Birth asphyxia and birth trauma</td>
<td>0.9</td>
<td>1.5</td>
</tr>
<tr>
<td>2030</td>
<td>Ischemic heart disease</td>
<td>9.6</td>
<td>14.2</td>
</tr>
<tr>
<td></td>
<td>Cerebrovascular disease</td>
<td>8.2</td>
<td>12.1</td>
</tr>
<tr>
<td></td>
<td>Chronic obstructive pulmonary disease</td>
<td>5.8</td>
<td>8.6</td>
</tr>
<tr>
<td></td>
<td>Lower-respiratory infections</td>
<td>2.8</td>
<td>3.8</td>
</tr>
<tr>
<td></td>
<td>Trachea, bronchus, lung cancers</td>
<td>2.3</td>
<td>3.6</td>
</tr>
<tr>
<td></td>
<td>Diabetes mellitus</td>
<td>2.2</td>
<td>3.3</td>
</tr>
<tr>
<td></td>
<td>Road traffic crashes</td>
<td>2.1</td>
<td>3.2</td>
</tr>
<tr>
<td></td>
<td>Hypertensive heart disease</td>
<td>1.5</td>
<td>2.2</td>
</tr>
<tr>
<td></td>
<td>Stomach cancer</td>
<td>1.3</td>
<td>1.9</td>
</tr>
<tr>
<td></td>
<td>HIV/AIDS</td>
<td>1.2</td>
<td>1.8</td>
</tr>
<tr>
<td></td>
<td>Nephritis and nephrosis</td>
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<td>1.6</td>
</tr>
<tr>
<td></td>
<td>Self-inflicted injuries</td>
<td>0.98</td>
<td>1.5</td>
</tr>
<tr>
<td></td>
<td>Liver cancer</td>
<td>0.95</td>
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</tr>
<tr>
<td></td>
<td>Colon and rectum cancer</td>
<td>0.94</td>
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</tr>
<tr>
<td></td>
<td>Esophageal cancer</td>
<td>0.88</td>
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1990 to 141 in 2003, a 120 percent increase (UNECE and WHO EURO 2009). Similar trends are observed in countries in South-Eastern Europe: in Albania the increase was from 18 passenger cars per 1,000 persons in 1994 to 48 in 2002, and in Croatia from 143 to 276. However, the level of cars in some of the ECA countries is still much lower than the typical range of 400 to 600 in Western Europe (UNECE and WHO EURO, 2009). The population in the CIS travel 800 km per capita per year by car, as compared to the population in Western Europe that travels more than 12,000 km per capita by car (passenger cars account for about 80 percent of this total). While still well below Western European levels, increased reliance on private cars for transport in ECA is reflected in the smaller increase in the number of buses (Eurostat 2007).

Vehicles and road infrastructure are generally in poor condition. Vehicles in many ECA countries, particularly in the CIS, tend to be old and have substandard safety features. Cross-border trade in cars considered too unsafe, old, or polluting for Western European countries exacerbates this problem. Kilometers of roads and highways have increased since the 1990s, by 18 percent and 157 percent in the CIS, 21 percent and 75 percent in EU-10 countries, and 46 percent and 144 in South-Eastern Europe, respectively. But in spite of significant investments in road infrastructure since the 1990s, in some CIS countries the road infrastructure suffers from poor maintenance and under-investment.

Changing mortality rates. Road traffic fatalities have steadily declined in Western Europe, reaching levels below 6 fatalities per 100,000 in 2006 in the Netherlands, Sweden, Switzerland, Norway, and the United Kingdom. The annual number of deaths from RTIs declined in the Western European countries by 61 percent over the 1970-2005 period. Central and Eastern European Countries (CEEC) and the CIS achieved considerable annual reductions in the 1990s but since about 1997 fatality rates have stabilized in the CEEC and have increased in the CIS (Figure 2), in spite of the smaller car fleet and the low number of kilometers travelled per capita by car (OECD and ITF, 2008). While better than in Africa and Asia, ECA residents are three times more likely to die from RTI than people in Western Europe (Sethi and others 2006a; Hyder and Aggarwal 2009). Moreover, fatalities from RTIs are just

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**Figure 2: Standardized Mortality Rates from Road Traffic Injuries in the European Region, EU-27 and CIS Countries, per 100,000, 1980–2007**

Note: CIS countries are Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, the Republic of Moldova, Russia, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan. EU-27 countries are Austria, Belgium, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, and the United Kingdom.

Source: WHO EURO Health for All Data Base (2009).

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6 The 10 countries that joined the EU in 2004: Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia and Slovenia.

7 Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Serbia, Montenegro, Slovakia, Slovenia, The former Yugoslav Republic of Macedonia.
the tip of the iceberg—for every death, more people are hospitalized and many more have injuries that require medical attention.

Table 3 shows, by ECA country, the rate of increase in deaths from 2006 to 2007 and the number of nonfatal injuries in 2007. Of the estimated 127,000 RTI deaths in the WHO European Region, close to 80,000 deaths or 73 percent of the total deaths occurred in ECA countries, which have only 28 percent of the registered cars in the Region. In contrast, only 27 percent of the deaths occur in non-ECA countries, where 72 percent of the cars are registered (WHO 2009a).

Nonfatal injuries in ECA neared 820,000 in 2007, contributing importantly to disabilities (WHO 2009a). For example, a study in Turkey found that of approximately 95,000 people injured in road traffic crashes in 2005, 13 percent had a subsequent disability (Esiyok and others 2005). In Auckland, New Zealand, evidence on the burden of disability after motor vehicle crashes in a population-based study shows that 43 percent of crash drivers admitted to the hospital and 20 percent of those not admitted reported that their overall health at an 18-month follow-up was worse than before the crash (Ameratunga and others 2006). The drivers who reported worsened health reported both worsened physical and mental health.

The burden of RTIs can be measured by disability-adjusted life years (DALYs). Supplanting mortality data, the DALY is an indicator that captures the full burden of disease or injury. It is calculated by summing the years of life lost due to premature death (defined as the difference between the actual age of death and the life expectancy at that age in a low-mortality population) and the years of fully productive life or full functionality lost because of a disability (Murray 1993; Murray and Lopez 1993). For example, each year lived with a disability that leaves a person able to perform only half the normal functions of their life would be counted as one-half of a DALY lost. DALYs capture both the fatal and non-fatal effects of RTIs. Recent estimates indicate that in ECA countries RTIs account for 3.1 percent of total DALYs lost, as compared with 2.4 percent in EU-15 countries (WHO accessed October 20, 2009). Overall, RTIs are the sixth-leading cause of DALY losses in ECA compared to ninth among EU-15 countries (WHO 2005a).

RTI data underestimate and underreport the situation. As explained in Box 1 on the next page, ECA countries still differ substantially in the

### Table 3: Road Traffic Deaths and Nonfatal Injuries in ECA, by Country

<table>
<thead>
<tr>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
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<td>619</td>
<td>n.a.</td>
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</tr>
<tr>
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<td>n.a.</td>
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</tr>
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<td>Estonia</td>
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<td>196</td>
<td>n.a.</td>
<td>3,270</td>
</tr>
<tr>
<td>Georgia</td>
<td>675</td>
<td>737</td>
<td>9.2</td>
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<td>1,252</td>
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<td>759</td>
<td>n.a.</td>
<td>8,254</td>
</tr>
<tr>
<td>Moldova</td>
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<td>589</td>
<td>n.a.</td>
<td>2,985</td>
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<tr>
<td>Montenegro</td>
<td>n.a.</td>
<td>122</td>
<td>n.a.</td>
<td>2,796</td>
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<td>Poland</td>
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<td>n.a.</td>
<td>63,224</td>
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<tr>
<td>Romania</td>
<td>n.a.</td>
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<td>n.a.</td>
<td>29,832</td>
</tr>
<tr>
<td>Russian Federation</td>
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<td>33,308</td>
<td>1.8</td>
<td>292,206</td>
</tr>
<tr>
<td>Serbia</td>
<td>n.a.</td>
<td>962</td>
<td>6.8</td>
<td></td>
</tr>
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<td>n.a.</td>
<td>11,310</td>
</tr>
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<td>Slovenia</td>
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<td>464</td>
<td>n.a.</td>
<td>2,048</td>
</tr>
<tr>
<td>The Former Yugoslav Republic of Macedon</td>
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<td>173</td>
<td>23.6</td>
<td>6,133</td>
</tr>
<tr>
<td>Turkey</td>
<td>4,633</td>
<td>5,004</td>
<td>8.0</td>
<td>169,080</td>
</tr>
<tr>
<td>Turkmenistan</td>
<td>650</td>
<td>1,606</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ukraine</td>
<td>7,592</td>
<td>9,921</td>
<td>30.7</td>
<td>40,887</td>
</tr>
<tr>
<td>Uzbekistan</td>
<td>n.a.</td>
<td>2,034</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
</tbody>
</table>

n.a. = Not available.

Sources: ITF (2008); WHO (2009a).
availability, quality, and completeness of data on mortality and injuries related to road traffic crashes. Underestimation and underreporting of RTI data is one of the key institutional building challenges that need to be tackled, as argued in Chapter VII of this report.

3. Country variability

The average mortality rate due to RTIs in CIS countries (21.8 per 100,000 population) is nearly three times that of EU-15 and other Western European countries (7.9 per 100,000) (data from WHO 2009a, shown in Figure 3 on the next page). Kazakhstan has by far the highest mortality rate in ECA (30.6 per 100,000), followed by Russia (25.2 per 100,000) and Kyrgyzstan (22.8 per 100,000). With 33,308 victims in 2007, Russia had the most RTIs deaths in ECA. As crashes tend to increase with traffic density, urban driving tends to claim more lives per vehicle-mile than rural driving, although rural crashes tend to be more severe because they occur at higher speeds (Janke 1991, BTS 1997). Recent data for several ECA countries indicate that cities, especially major ones with the largest concentrations of population and cars, and inadequate road infrastructure, face huge challenges with RTIs. In 2008, for example, 21 percent of Armenia’s road deaths and 35 percent of injuries were in Yerevan; 47 percent of Azerbaijan’s road deaths and 47 percent of its injuries occurred in Baku; and in Georgia, 48 percent of road deaths and 68 percent of injuries were in urban centers (Camos-Daurella and Silcock 2009).

4. Fatal road traffic injuries by ECA road user type

The proportion of deaths among different road users varies from country to country, reflecting differences in exposure and safety. Table 4 on page 13 presents the estimated distribution of fatal injuries by road user category in ECA countries. It shows that the majority of road traffic fatalities in ECA occur among motorized four-wheeler occupants—typically 40 to 75 percent.

However, in several ECA countries pedestrian fatalities are also very high, accounting for 40 percent or more.

Box 1: Sources and Quality of the Statistics and Indicators on Road Traffic Deaths and Injuries in Europe

In most European countries, the road police, the health sector, the agency responsible for collecting statistics about road traffic deaths and injuries. States that are members of the European Union, the European Council of Ministers of Transport (ECMT), the Organization for Economic Co-operation and Development (OECD), the United Nations Economic Commission for Europe (UNECE), and the World Health Organization (WHO) also report their national data, according to internationally agreed questionnaires, to these international bodies, which run databases (such as the WHO Health for All Database, statistics on road traffic crashes from the UNECE, the International Road Traffic and Accident Database [IRTAD], and the Community Road Accident Database [CARE]), and publish reports, such as the statistical reports on road crashes of the ECMT, which allow some international comparisons and analyses of trends across the Region.

The statistics on road safety in the European Region are relatively good compared with other regions. Nevertheless, countries still differ substantially in the availability, quality, and completeness of data on mortality and injuries related to road traffic crashes, which makes international comparisons difficult. At the international level, the IRTAD and CARE adjust the data to the internationally agreed definition. Data on injuries differ even more, since there is ample room for discretion in interpreting the definition of “slightly” versus “seriously” injured. Data on mortality are comparatively more reliable and complete than data on nonfatal injuries. The reasons include differences in methods and the quality of data collected, differences in definitions used by bodies involved in monitoring crash outcomes, and difficulty in reconciling data from different sources.

Related to this is the important problem of underestimating the real burden of road traffic injury because data are underreported. The reasons for underreporting include the public failing to report injuries; the police not recording cases reported to them; hospitals not reporting cases presenting to them; and certain institutions such as the military being exempt from reporting directly to the police. Underreporting is not exclusive to low- and medium-income countries. Within countries, the numbers of reported fatalities and injuries differ between road police records and those of public health institutions, such as first aid stations and hospitals. Finally, data collected by insurance companies are often published in the form of representative surveys, to protect information considered commercially sensitive.

Source: Adapted from Racioppi and others (2004).
Note: MKD is the international standardized abbreviation for the Former Yugoslav Republic of Macedonia.

Source: WHO EURO (2009).

Figure 3: RTI Death Rates in WHO-EURO Member Countries, per 100,000 Populations, 2007

Deaths per 1,000 population

Note: MKD is the international standardized abbreviation for the Former Yugoslav Republic of Macedonia.

Source: WHO EURO (2009).

of total road fatalities in Albania, Belarus, Kyrgyzstan, Tajikistan, and Ukraine. Road infrastructure in these countries lacks features to make roads safer for pedestrians (for example, crossings, walkways, and guardrails), and the speed limits are too high in urban areas. In most ECA countries urban speed limits are 60 kilometers per hour (km/h), whereas good practice advocates 50 km/h in urban areas and 30 km/h in residential areas (Racioppi and others 2004; UNECE and WHO EURO 2009). The high limits are also poorly enforced. Speeding vehicles are particularly dangerous for pedestrians: the probability of a pedestrian being killed increases eight-fold as the speed of impact with a car increases from 30 km/h to 50 km/h.

Pedestrians, cyclists, and motorcyclists usually suffer the most severe RTIs and report more continuing health problems that require more assistance. Among pedestrians, children and older people tend to be more affected. Risk analysis for the EU shows that the fatality risk for people using motorized two-wheeled vehicles is the highest of all modes of transport—on average, 20 times that of car occupants. Fatality for cyclists and pedestrians is seven to nine times that of people in cars (Racioppi and...
The impact of RTIs among pedestrians must be stressed since most safety interventions historically have focused on protecting vehicle occupants rather than pedestrians. Walking and cycling are more likely to be chosen if people feel their safety is assured. In addition to the RTI gains from safer walking and cycling, getting people to use these healthier modes of transport and exercising as part of everyday life would achieve important health gains by reducing obesity and other non-communicable conditions such as cardiovascular diseases and diabetes.

Drunk driving is an important risk factor for all road users, and young drivers and riders aged 18–25 are particularly at risk of crashing (Sethi, Racioppi, and Bertollini 2007). As blood alcohol concentration (BAC) increases, so does the likelihood of crashing, particularly above a BAC of 0.04 grams per deciliter (g/dl). Increases in alcohol consumption in many ECA countries are strongly associated with the region’s unprecedented rise in mortality due to RTIs. Russia, Ukraine and some Eastern European countries have the highest overall alcohol consumption—11.9 liters of pure alcohol (100 percent ethanol) per adult per year compared to the worldwide average of 6.2 liters per adult per year (Rehm and others 2009). Other areas of Europe also have high overall alcohol consumption.

The data reported by national sources to WHO (Table 5) show that alcohol consumption was estimated to be responsible for more than 30 percent of all reported road traffic deaths in Estonia, Georgia, Latvia, and Slovenia in 2008, and at least 10 percent in Russia and several other countries. These figures are influenced by legislative testing practices and it has been suggested that the actual figures are much higher in ECA countries as a result of their extremely high alcohol consumption.

### Table 4: Percentage of Fatal Road Traffic Injuries by Road User Type, 2007

<table>
<thead>
<tr>
<th>Country</th>
<th>Pedestrians</th>
<th>Bicyclists</th>
<th>Motorcyclists</th>
<th>Motorized Four-wheelers</th>
<th>Drivers</th>
<th>Passengers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albania</td>
<td>40</td>
<td>6</td>
<td>9</td>
<td>24</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>Armenia</td>
<td>39</td>
<td>1</td>
<td>n.a.</td>
<td>34</td>
<td>26</td>
<td></td>
</tr>
<tr>
<td>Azerbaijan</td>
<td>38</td>
<td>1</td>
<td>1</td>
<td>28</td>
<td>31</td>
<td></td>
</tr>
<tr>
<td>Belarus</td>
<td>40</td>
<td>9</td>
<td>4</td>
<td>24</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>Bosnia and Herzegovina</td>
<td>24</td>
<td>6</td>
<td>5</td>
<td>38</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>Bulgaria</td>
<td>26</td>
<td>4</td>
<td>n.a.</td>
<td>65 (drivers and passengers)</td>
<td></td>
<td></td>
</tr>
<tr>
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<td>20</td>
<td>5</td>
<td>19</td>
<td>29</td>
<td>21</td>
<td></td>
</tr>
<tr>
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<td>10</td>
<td>11</td>
<td>41</td>
<td>18</td>
<td></td>
</tr>
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<td>9</td>
<td>6</td>
<td>39</td>
<td>27</td>
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<tr>
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<td>unspecified</td>
<td>unspecified</td>
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<td>10</td>
<td>34</td>
<td>21</td>
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<td>4</td>
<td>43</td>
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<td>8</td>
<td>4</td>
<td>31</td>
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<td>7</td>
<td>5</td>
<td>28</td>
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<td>5</td>
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<td>6</td>
<td>18</td>
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<td>Serbia</td>
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<td>6</td>
<td>37</td>
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<td>Tajikistan</td>
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<td>1</td>
<td>18</td>
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<td></td>
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<tr>
<td>The Former Yugoslav Republic of Macedonia</td>
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<td>11</td>
<td>29</td>
<td>12</td>
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<td>8</td>
<td>24</td>
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<td>n.a.</td>
<td>n.a.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

n.a. = Not available.

Source: National sources as reported WHO (2009a).
Reflecting this high drinking pattern, the European region, particularly the countries of the former Soviet Union, had the highest proportion of alcohol-attributable net deaths in the world in 2004, with more than one in every ten deaths in European men attributed to alcohol. A recent study in Russia (Zaridze and others 2009) documenting the impact of alcohol on the high and fluctuating adult mortality rates found that among men, RTIs are one of the three leading causes accounting for alcohol-related deaths, particularly among young adults.

Medicines can also cause road-traffic injuries. Many commonly used medicines act on the central nervous system and impair cognitive function (for example, they can result in slow reaction time, somnolence, and dizziness). There are many examples but the most consumed medicines that can produce these effects

Table 5: Road Traffic Deaths Involving Alcohol in ECA, 2007

<table>
<thead>
<tr>
<th>Country</th>
<th>% of Road Traffic Deaths</th>
<th>Country</th>
<th>% of Road Traffic Deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albania</td>
<td>5</td>
<td>Latvia</td>
<td>21</td>
</tr>
<tr>
<td>Armenia</td>
<td>6</td>
<td>Moldova</td>
<td>17</td>
</tr>
<tr>
<td>Azerbaijan</td>
<td>3</td>
<td>Poland</td>
<td>14</td>
</tr>
<tr>
<td>Belarus</td>
<td>13</td>
<td>Romania</td>
<td>2</td>
</tr>
<tr>
<td>Bosnia and Herzegovia</td>
<td>7</td>
<td>Slovenia</td>
<td>38</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>5</td>
<td>Russian Federation</td>
<td>10</td>
</tr>
<tr>
<td>Croatia</td>
<td>30</td>
<td>Serbia</td>
<td>6</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>3</td>
<td>Serbia</td>
<td>6</td>
</tr>
<tr>
<td>Estonia</td>
<td>48</td>
<td>Tajikistan</td>
<td>5</td>
</tr>
<tr>
<td>Georgia</td>
<td>37</td>
<td>Turkey</td>
<td>2</td>
</tr>
<tr>
<td>Hungary</td>
<td>12</td>
<td>Turkmenistan</td>
<td>7</td>
</tr>
<tr>
<td>Kazakhstan</td>
<td>3</td>
<td>The Former Yugoslav Republic of Macedonia</td>
<td>5</td>
</tr>
</tbody>
</table>

No data available for Kyrgyzstan, Montenegro, Ukraine and Uzbekistan.

Source: National sources as reported in WHO (2009a).
are antidepressant drugs, anti-anxiety drugs and hypnotics, and classical antihistamines used for allergies. Mixing such medication and alcohol potentiates the cognitive and motor impairment effects; some research has found a positive association between road injuries and consumption of antidepressants (Hours and others 2008).

5. RTIs among population groups

Children and young adults are highly impacted. Although RTIs affect all age groups, their impact is most striking among the young, whose daily lives tend to carry them from one area to another for school, home, and leisure. Mortality rates for RTIs among children are highest in Latvia, Moldova, Romania, and the Russian Federation (UNECE 2003). Young drivers, particularly males, have especially high road traffic fatality rates, associated with high-risk behaviours. CIS road traffic death rates are about four times greater among those aged 15–24 than among children aged 0–14. Figure 4 on the previous page highlights these striking differences. For both age groups, the average rates for CIS countries are higher than for the EU. Except for a peak in 1989–91, recent death rates from transport injuries in the two age groups have declined in the EU but have increased in CIS countries since 1997. RTIs are the leading cause of death among people aged 15–29, and this age group accounts for one-third of total victims (WHO 2002).

The distribution of road deaths by type of road user varies with age. For children aged 0–14 in the ECA Region, nearly half of the deaths were pedestrians (48 percent), followed by car occupants (32 percent), cyclists (9 percent), and motorcyclists (6 percent) (UNECE and WHO EURO 2009; Sethi, Racioppi, and Mitis 2007). Adolescents aged 15–17 are more likely to die in car crashes (40 percent) or on motorized two-wheelers (31 percent) and less likely to die as pedestrians (21 percent) and cyclists (5 percent). This reflects different risk exposures, with older children using cars and motorcycles more than walking and cycling.

The elderly are particularly vulnerable. People over age 60 are more vulnerable to road traffic injuries due to fragility and reduced ability to cope with traffic. Although injuries in those aged 15–29 are a bigger public health problem, older people—frequently as pedestrians and often more frail—have a higher fatality rate if injured since their injuries tend to be more severe. For example, older people account for nearly half of all fatalities in pedestrians in the European member states of the Organization for Economic Co-operation and Development (OECD). As population aging accelerates in ECA, identifying new strategies that address their mobility, sensory impairment and safety needs are essential.

Working-age population. RTIs are among the main causes contributing to premature mortality and disability among working-age males, particularly in ECA. This is clearly illustrated by the situation in Russia and Ukraine, where adult male mortality levels are as high as in low-income countries (Box 2 on the next page, World Bank 2005a, 2009a).

Gender differences. Males are more adversely affected than females by RTIs in ECA. A recent study documented that in 2004, the male predominance of deaths among young people aged 10–24 years for all causes in ECA was largely due to more than a seven-fold rise in injury deaths, particularly RTI fatalities, between adolescence and young adulthood (from 24 to 179 per 100,000, which accounted for 65 percent of male deaths and 48 percent of all deaths (Patton and others 2009). In 2007, males in all age groups accounted for 74 to 83 percent of all road traffic fatalities in ECA countries (WHO 2009a). In the course of their life, women and men play different roles in society, which affect their risk-taking behavior, exposure to risks and health-seeking behavior (WHO EURO, 2006). Although exposure data are not available, males travel much more in most of these countries, so the relative risk between males and females may be much less imbalanced than indicated by the absolute number of deaths. Heightened alcohol misuse among young males has been linked to high road fatalities and other injuries in ECA (McKee and Shkolnikov, 2001, Bye 2008). Alcohol-attributable mortality rates in ECA are four times higher among men than among women (Rehm and others 2009). In ECA, extremely high mortality levels among working age men shortens the average man’s life expectancy by 10-12 years.

6. Inequality dimension of RTIs

Across and within countries, lower incomes are associated with high death rates from injuries. People in low- to middle-income ECA countries are three to six times more likely to die from injuries than people in EU-15 countries (Sethi and others 2006, Mohan 2002a, 2002b). Even EU-15 and other Western European coun-
Box 2: RTIs Contribute to High Mortality Rates among Working-age Males in Russia and Ukraine

Road traffic injuries (RTIs) play a major role in reducing life expectancy among males in Russia and Ukraine. The probability of men surviving to old age in Russia and Ukraine is low compared not only with European Union (EU) countries but with Central European countries. The probability is especially low among working-age males, whose death rates are similar to those of men in countries with less than one fifth the Gross National Product per capita.

Russia

At 25.2 per 100,000 population, Russian road traffic mortality rate is five or six times higher than in several Western European countries such as Sweden, the Netherlands, Norway, and the United Kingdom, about double that in the United States, and higher than in other Eastern European countries such as Poland and Hungary (OECD/EMCT 2008). This difference is even more remarkable considering that Russia has fewer automobiles than Western Europe, the United States, or Canada. Russia’s traffic mortality rate is also higher than in other former Soviet states. In 2007, more than 30,000 people in Russia—mostly working-age males—died in crashes. Driver factors are the major causes: intoxication, lack of discipline, and aggressive driving. In addition, nearly half of all these deaths victimize pedestrians, not drivers or passengers.

By a second, more meaningful measure, fatalities per 10,000 vehicles, Russia’s rate of 12.2 is exceptionally high—50 percent higher than the second highest (the Republic of Korea at 8.2) among reporting countries. The severity of road crashes is often measured by the proportion of fatalities to serious injuries. For this measure, Russia is similar to the other transition countries, with an index of 0.12; that is, 12 percent of people injured in road crashes die. Russia’s index for the severity of RTIs is 5 to 10 times higher than that in most developed countries (which may result partly from poor registration of road crashes not leading to deaths or injuries). However the problem is measured, Russia clearly has a serious problem of road fatalities and injuries.

Ukraine

Mortality due to road injuries began to decline in Ukraine in 1992 but started to rise again in 1999. Four years later, it was twice the EU average. In 2007, transport injuries caused 21.5 deaths per 100,000 population (compared to 13 per 100,000 in 1999), representing 14 percent of all external causes of death. Again, this rate is even more remarkable considering that there are fewer automobiles per capita in Ukraine than in Western Europe. Alcohol consumption plays an important role in RTIs and other injuries, as well as causing increased risk of cirrhosis of the liver, high blood pressure, heart disease, and cancers.


7. What are the economic and social consequences of RTIs?

Impact on health systems. RTIs are a major burden on health systems worldwide, placing heavy demands on already overburdened facilities, and straining limited budgets. The results from a comprehensive review of epidemiological studies show that traffic-related injuries accounted for 30 to 86 percent of all trauma admissions in hospitals, with an overall mean length of stay of 20 days. Patients who sustained spinal or head injuries or compound fractures were hospitalized for longest—more 60 days in 25% of cases in one study (Odero, Garner, and Zwi 1997). This review also found that patients with traffic injuries represented 13 to 31 percent of all injury-related visits to medical facilities, 48 percent of bed occupancy in surgical wards, and were the most frequent users of operating theaters and intensive care units.

Similar data for Russia indicate that road traffic victims are seven times more likely to need hospitalization compared with victims of other types of trauma; RTIs account for 75 percent of all types of injury, with victims of road traffic crashes representing more than 60 percent of the total number of severe trauma cases (for example, patients with sustained spinal or head injury or severe and multiple fractures). 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 (World Bank 2005a). This is about 10 percent of total health care expenditures in Russia.

The economic cost of RTIs. Globally, RTIs have a significant negative impact on society which occur through many channels (Peden and others 2004; Mohan 2002a, 2002b; Jacobs, Aeron-Thomas and Astrop 2000) and disproportionately affect the most economically productive age groups. Motor vehicle crashes and injuries cause direct and indirect costs to individuals and to society as a whole, arising
from the decline in the general health status of those injured in motor vehicle crashes (Blincoe and others 2002). In estimating the total economic cost of RTIs, 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 have been used for increasing societal well-being.

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 include productivity costs in the workplace due to temporary and permanent disability and decreases in household productivity emanating from these disabilities. Property damage and travel delay and crash costs are estimated for injury and non-injury crashes (Blincoe and others 2002).

The method used to calculate the economic cost of RTIs does not include costs associated with loss of emotional well-being unless it requires medical attention or there are permanent losses in functional capacity or earning capacity.

Estimates indicate that in HICs, 80 percent of the cost of RTIs is attributable to nonfatal events, with 2 percent of nonfatal crashes accounting for 44 percent of lifetime medical costs (NHTSA 1987; Miller, Luchter, and Brinkman 1989, as reported in Ameratunga, Higar, and Norton 2006).

The economic cost of road deaths and injuries globally is estimated at US$518 billion—1 percent of GNP in low-income countries, 1.5 percent in middle-income countries, and 2 percent in high-income countries (Peden and others 2004; Jacobs, Aaron-Thomas, and Astrop 2000).

The cost in ECA. One estimate from Russia suggested that the loss from RTIs was as high as 3 percent of GDP (ECMT 2006). Using the conservative estimate of the economic costs of road crashes in ECA as being approximately 1.5 percent GDP, Table 6 presents the results for ECA countries. Of course, human life has no price tag, and the results are presented only for economic comparison purposes. The highest costs are in the large economies that also have sizeable populations: Russia (US$34 billion per year), Turkey (US$14 billion), Poland (US$10 billion), and Ukraine (US$5 billion).

### Table 6: Socioeconomic Cost Estimates for Road Injuries in ECA (2008 prices)

<table>
<thead>
<tr>
<th>Country/Economy</th>
<th>GDP (US$b)</th>
<th>GDP Per Capita (US$)</th>
<th>Number of Fatalities (Million)</th>
<th>Number of Fatalities per Million Inhabitants</th>
<th>Estimated Economic Costs (US$b)</th>
<th>Estimated Unit Economic Cost per Fatality (US$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Russia</td>
<td>2,285</td>
<td>16,161</td>
<td>34,506</td>
<td>246</td>
<td>34.3</td>
<td>1,131,270</td>
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<tr>
<td>Turkey</td>
<td>937</td>
<td>13,447</td>
<td>4,496</td>
<td>59</td>
<td>14.1</td>
<td>941,290</td>
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<tr>
<td>Poland</td>
<td>669</td>
<td>17,560</td>
<td>5,583</td>
<td>145</td>
<td>10.0</td>
<td>1,229,200</td>
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<tr>
<td>Ukraine</td>
<td>350</td>
<td>7,634</td>
<td>6,966</td>
<td>152</td>
<td>5.3</td>
<td>534,380</td>
</tr>
<tr>
<td>Romania</td>
<td>273</td>
<td>12,698</td>
<td>2,794</td>
<td>126</td>
<td>4.1</td>
<td>888,860</td>
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<tr>
<td>Czech Republic</td>
<td>266</td>
<td>25,755</td>
<td>1,221</td>
<td>120</td>
<td>4.0</td>
<td>1,802,850</td>
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<tr>
<td>Hungary</td>
<td>199</td>
<td>19,830</td>
<td>1,392</td>
<td>124</td>
<td>3.0</td>
<td>1,388,100</td>
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<td>Kazakhstan</td>
<td>180</td>
<td>11,563</td>
<td>3,136</td>
<td>204</td>
<td>2.7</td>
<td>809,140</td>
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<tr>
<td>Belarus</td>
<td>118</td>
<td>12,344</td>
<td>1,688</td>
<td>175</td>
<td>1.8</td>
<td>864,080</td>
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<tr>
<td>Slovakia</td>
<td>120</td>
<td>22,242</td>
<td>627</td>
<td>115</td>
<td>1.8</td>
<td>1,556,940</td>
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<tr>
<td>Bulgaria</td>
<td>94</td>
<td>12,372</td>
<td>1,006</td>
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<td>866,040</td>
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<tr>
<td>Azerbaijan</td>
<td>78</td>
<td>8,958</td>
<td>1,027</td>
<td>125</td>
<td>1.2</td>
<td>627,060</td>
</tr>
<tr>
<td>Serbia</td>
<td>81</td>
<td>10,911</td>
<td>897</td>
<td>88</td>
<td>1.2</td>
<td>763,770</td>
</tr>
<tr>
<td>Croatia</td>
<td>73</td>
<td>16,474</td>
<td>614</td>
<td>137</td>
<td>1.1</td>
<td>1,153,180</td>
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<tr>
<td>Uzbekistan</td>
<td>71</td>
<td>2,606</td>
<td>2,075</td>
<td>75</td>
<td>1.1</td>
<td>182,420</td>
</tr>
</tbody>
</table>

(Continued on next page)
Table 6: Socioeconomic Cost Estimates for Road Injuries in ECA (2008 prices)  
(continued)

<table>
<thead>
<tr>
<th>Country/Economy</th>
<th>GDP (US$b)(^a)</th>
<th>GDP Per Capita (US$)</th>
<th>Number of Fatalities(^b)</th>
<th>Number of Fatalities per Million Inhabitants</th>
<th>Estimated Economic Costs (US$b)(^c)</th>
<th>Estimated Unit Economic Cost per Fatality (US$)(^d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lithuania</td>
<td>64</td>
<td>18,855</td>
<td>739</td>
<td>208</td>
<td>1.0</td>
<td>1,319,850</td>
</tr>
<tr>
<td>Slovenia</td>
<td>58</td>
<td>28,894</td>
<td>292</td>
<td>146</td>
<td>0.9</td>
<td>2,022,580</td>
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<tr>
<td>Latvia</td>
<td>40</td>
<td>17,801</td>
<td>419</td>
<td>188</td>
<td>0.6</td>
<td>1,246,070</td>
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<tr>
<td>Turkmenistan</td>
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<td>5,765</td>
<td>533</td>
<td>109</td>
<td>0.5</td>
<td>403,550</td>
</tr>
<tr>
<td>Bosnia and Herzegovina</td>
<td>30</td>
<td>7,618</td>
<td>436</td>
<td>95</td>
<td>0.5</td>
<td>533,260</td>
</tr>
<tr>
<td>Estonia</td>
<td>28</td>
<td>20,754</td>
<td>196</td>
<td>151</td>
<td>0.4</td>
<td>1,452,780</td>
</tr>
<tr>
<td>Armenia</td>
<td>19</td>
<td>5,437</td>
<td>259</td>
<td>87</td>
<td>0.3</td>
<td>380,590</td>
</tr>
<tr>
<td>Georgia</td>
<td>22</td>
<td>5,001</td>
<td>637</td>
<td>138</td>
<td>0.3</td>
<td>350,070</td>
</tr>
<tr>
<td>Albania</td>
<td>22</td>
<td>6,797</td>
<td>277</td>
<td>76</td>
<td>0.3</td>
<td>475,790</td>
</tr>
<tr>
<td>The Former Yugoslav Republic of Macedonia</td>
<td>19</td>
<td>9,128</td>
<td>143</td>
<td>69</td>
<td>0.3</td>
<td>638,960</td>
</tr>
<tr>
<td>Moldova</td>
<td>11</td>
<td>3,154</td>
<td>391</td>
<td>90</td>
<td>0.2</td>
<td>220,780</td>
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<tr>
<td>Kyrgyz Republic</td>
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<td>2,174</td>
<td>892</td>
<td>164</td>
<td>0.2</td>
<td>152,180</td>
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<tr>
<td>Tajikistan</td>
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<td>483</td>
<td>66</td>
<td>0.2</td>
<td>138,880</td>
</tr>
<tr>
<td>Montenegro</td>
<td>7</td>
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<td>122</td>
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<td>728,980</td>
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<tr>
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<td>2,300</td>
<td>152</td>
<td>84</td>
<td>0.1</td>
<td>161,000</td>
</tr>
</tbody>
</table>

\(^a\) IMF World Economic Outlook Database, October 2008.

\(^b\) Fatalities data: Latest available from WHO, UNECE, EuroStat databases, and World Bank. The statistics used are the average number of fatalities during 2003–05.

\(^c\) Economic costs estimated at 1.5 percent of country GDP at 2008 prices.

\(^d\) To quantify the savings due to lower deaths, a cost to human life has to be approximated. This is referred to as the value of a statistical life (VSL). The literature presents two main approaches: the willingness-to-pay approach and the human capital or lost output approach. In the willingness-to-pay approach, as the name implies, an estimate is made of the value that individuals in a society attach to road safety in terms of the amount of money that they are willing to pay to avoid the risk of loss of life. Either stated preference or revealed preference techniques can be used in this method. In the human capital approach, the main part of the estimate is the discount to present value of a victim’s foregone future output or income due to the death resulting from a road crash. Both approaches have a clear linkage to the level of income (GDP per capita). The willingness-to-pay approach is discussed in the literature as being more robust but presents the weakness of requiring intensive and sophisticated surveys. One approach has been devised to estimate the statistical value of a life based on available studies from both approaches; and linking simply to the GDP per capita of the country (McMahon and Dahdah, 2008). The estimate of VSL at 70 times GDP per capita has been found to fit most data samples from different countries’ estimations of VSL depending on the datasets used. This research is supported by earlier work (European Road Safety Observatory, 2006). In that study, there were wide variations in VSL in the official valuations of road safety fatalities in 23 different countries. However, all the countries with good road safety records were using an official valuation in the range of 60 to 80 times GDP per capita, and confirm the estimation at 70 times GDP per capita recommended in McMahon & Dahdah (2008).

“The safe system approach is simple, sustainable, affordable and effective.”

– Claes Tingvall,
Architect of Sweden’s “Vision Zero” policy and
Director of Traffic Safety, Swedish Road Administration

Chapter III. Interventions and Results:
What Is the Evidence?

To prevent the occurrence of road traffic injuries, minimize their severity when they occur, and reduce the severity of victims’ injuries and the impact on others following injury events, various programs and interventions have been designed and implemented in different countries. There is strong evidence of the effectiveness of interventions in high income countries, but evidence from low- and middle-income countries is relatively rare, so international organizations such as the WHO endorse tailoring HIC-proven interventions to LMICs (Peden and others 2004, World Bank 2007a).

This section describes the nature of road, vehicle, and user interventions implemented in many countries, particularly in HICs, to improve road safety. While in most countries these measures have been adopted individually, evidence from good international practice indicates that applying them as part of broader systemic approaches in combination or as a series of measures is more cost-effective (Bliss and Breen 2009).

1. Engineering measures that improve road design and make roads safer

Engineering interventions improve road infrastructure, introduce safety awareness into the process of planning road networks, incorporate safety features in road design, and remedy high-risk sites with signs, markings and preventive measures. HICs have adopted many of these strategies, and though they have not been examined in rigorously controlled studies, such strategies form the basis of best practice guidelines and manuals for use in LMICs (Ross and others 1991). In the short term, appropriate measures for safer roads and roadsides include targeted improvements that identify and treat the highest crash locations with specific measures such as audible edge-lining, shoulder sealing, clearing of roadside vegetation, and construction of passing lanes (OECD and ITF 2008).

Safety awareness in engineering and road planning, and safety audits, are required in many countries, including Australia, Denmark, New Zealand, the Netherlands, and the United Kingdom. Macaulay and McNerney (2002) found these audits and systematic safety impact assessments to have a cost-benefit ratio of 1:20 in New Zealand.

Engineering technologies and road designs to improve infrastructure—such as better geometric design, intersection control, safety (or crash) barriers, signs, markings, and maintenance—are effective intervention strategies (World Bank 2003). For example, lighting columns that break away on impact are widely used with cable barriers in Denmark, Sweden, Switzerland, and the United Kingdom (ETSC 1998). Cirillo and Council (1986) reported that some crash-protective roadside objects, guardrails, crash cushions, and so forth could reduce injuries by 30 percent. Other low-cost traffic engineering measures that are highly cost-effective are skid-resistant surfacing, central refuges and islands, and signal control or operation of junctions. The United Kingdom has moved away from a “black spots” to a “whole route” approach, with a reported significant reduction in killed or seriously injured (KSI) casualties on Britain’s roads—currently 33 percent below the 1994–1998 baselines, against a target of 40 percent by 2010 (DETR 2007).

Traffic-calming measures that reduce traffic speeds, such as speed bumps, that are appropriately incorporated into road design also reduce RTIs, especially among pedestrians (Afkar 2003). A systematic review and meta-analysis confirmed that area-wide traffic-calming schemes can reduce road crash-related deaths and injuries (Bunn and others 2003).
A 2004 summary of research findings suggests that automated speed enforcement has a significant impact on controlling speeding (ICF Consulting Ltd. and Imperial College Centre for Transport Studies 2003). Another meta-analysis found that speed cameras led to a 14 percent reduction in fatal crashes and a 6 percent reduction in nonfatal crashes in HICs (Elvik and Vaa 2004).

2. Vehicle design and safety equipment

Strategies focusing on safer vehicles include improving vehicle visibility (for example, daytime running lights [DRLs]), incorporating crash protective design into vehicles (for example, seatbelts and airbags), and promoting further development of “intelligent” vehicles for active crash avoidance (for example, adoption of electronic stability control systems [ESCs])8, which the U.S. National Highway Traffic Safety Administration (NHTSA) has already announced its intention to require all vehicle manufacturers to include as part of the standard equipment list for every vehicle by the start of the 2012 model year. However, in LMICs, more basic strategies have the potential to be cost-effective, such as ensuring regular maintenance of older vehicles and removing “clunkers” (vehicles that are not roadworthy) from the roads, and vehicle licensing and inspection (Peden and others 2004). Likewise, installing seatbelts in cars that lack them will help improve passenger safety; the WHO estimated in 2008 that 20 percent of cars in HICs and 50 percent in lower-income countries lack seatbelts.

Measures to make vehicles safer help drivers avoid crashes, and protect drivers, passengers and others when crashes do occur. Meta-analyses of the effects of automatic

8 An ESC helps maintain the direction of a vehicle if it begins to drift beyond the driver’s intended path. For example, if the driver misjudges the speed reduction required when entering a sharp curve in the road, there is a good chance the vehicle could skid out of control. To prevent the vehicle from rolling over or spinning out of control, the ESC takes over and sends computerized commands, applicable to the situation, which apply the brakes to one or more wheels and/or reduce engine throttle. The reduction in engine power enables maximum traction and helps keep the vehicle under control and on course. ESC uses a computer that communicates with a series of sensors that detect wheel spin, steering angle, wheel speed, and sideways motion. ESC does not actually increase the available traction, but it does highly increase the chances of keeping the vehicle on the road and under control in high-risk situations (Carseek webpage: http://www.carseek.com/articles/electronic-stability-control.html#).

DRLs consistently show that they reduce road crashes (Elvik and Vaa 2004). Lights on motorcycles show similar results (Radin, Mackay, and Hills 1996; Yuan 2000).

Research also indicates that injury protection designs—such as installing seatbelts, a known and effective safer-vehicle measure—helps to reduce traffic deaths and serious injuries when crashes occur. Studies show that seatbelt use in cars by drivers and passengers in HICs reduces fatal injuries an average of 11 percent and serious injuries 18 percent (Elvik and Vaa 2004). Another study found an average reduction of 9 percent in fatal injuries (Dinh-Zarr and others 2001). A review in the United Kingdom found that crash protection improvements reduced casualties 15 percent compared with 11 percent for drunk-driving measures and 6.5 percent for road safety engineering measures (Broughton and others 2000). The relative difference safety measures make depends on the exposure to risks in different settings.

3. Education, laws and enforcement

Intervention strategies aimed at improving road user behavior increasingly focus on combining education interventions with the introduction and enforcement of relevant legislation (ETSC 2003a). Research by Poli de Figueiredo and others (2001) in Brazil indicates that media coverage, increasing fines, and suspending drivers’ licenses reduced RTIs and deaths. Graduated driving licenses along with extended training during the learner period are effective in reducing deaths among young drivers (OECD and ITF 2008). For example, notable success in the United States has been achieved by graduated driving permits for teens, requiring six months with a learner’s permit, a curfew against driving between midnight and 5:00 a.m., and restrictions on the number of passengers in the vehicle for the first year after acquiring a license. The Texas Transportation Institute reported that the rate of fatal teen crashes in Texas dropped from 625 deaths in 2002 to 419 in 2007 after these measures were adopted (Linderberger 2009).

Public communication and advertising campaigns have been used to influence driver’s attitudes toward speed and speeding behaviors (OECD and ITF 2008). Evidence on the impact of these measures indicates that high levels of recognition and understanding are achieved, as in the case of the United Kingdom’s Department of Environment and Transport (DETR) “Kill Your Speed” campaign.
There is also strong evidence that laws requiring the use of seatbelts and child restraints reduce occupant deaths and injuries. However, such laws have not been introduced in all LMICs (Peden and others 2004). Wearing a seatbelt can reduce the risk of RTIs by 40 to 65 percent (Peden and others 2004), and if combined with airbags, they can reduce deaths by an additional 8 to 14 percent (Cummins and others 2002). Mandatory seatbelt-use laws accompanied by strict police enforcement and intensive mass-media programs are successful in preventing deaths, as demonstrated in a 30-year study in Finland and the United Kingdom (ETSC 1996; Ashton, Mackay, and Camm 1983). Countries of the European Union (EU) and elsewhere in Europe have seatbelt enforcement laws allowing the police to stop a motorist for not wearing a seatbelt (primary enforcement), increasing the laws’ effectiveness (Dinh-Zarr and others 2001). Mandatory, enforced seatbelt use in the EU increased use from 37 percent to 95 percent and quickly resulted in a 35 percent reduction in hospital admissions for RTIs. Aggressive seatbelt use campaigns in Malta helped bring seatbelt use compliance rates to 99 percent for drivers, 93 percent for front seat adult passengers, and 43 percent for backseat adult passengers. Malta also introduced speed cameras, improving road traffic enforcement.

Motorcycle and bicycle helmets provide significant protection against injuries when they meet a recognized safety standard and are used correctly. Although education can increase helmet use among riders of motorized two-wheelers, the effect is greater when combined with laws and enforcement. The enactment and enforcement of helmet laws in Malaysia and Thailand led, respectively, to 56 percent and 30 percent reductions in road traffic fatalities (Ichikawa, Chadbunchchai and Marui 2003; Supramaniam, Belle, and Sung 1984). A meta-analysis showed that motorcycle helmet use is associated with a 36 percent reduction in fatal injuries and a 72 percent reduction in nonfatal injuries (Liu and others 2004). Bicycle helmet use also reduces the risk of injury. A 1999 meta-analysis found that helmets reduced fatal head injuries by 69 percent (Thompson, Rivara, and Thompson 2000). The use of child restraints—infant seats, child seats, and booster seats—is estimated to prevent 70 percent of deaths among infants and 54 to 80 percent of deaths among small children in the event of a car crash (WHO 2009).

Measures to control speeding, drunk driving, and cell phone use while driving have also proved effective. International experience and research have proven that behavior measures to limit speed, blood alcohol concentration (BAC) levels and, lately, cell phone use are also effective, especially with good enforcement (Elvik and Vaa 2004).

Evidence from different studies indicates that increased vehicle speeds are associated with an increased risk of crash and injury, both for motor vehicle occupants and for vulnerable road users, particularly pedestrians (Jamison and others 2006). Enforcement of existing speed limits can provide immediate safety benefits, perhaps more quickly than any other single safety measure (OECD and ITF 2008). A large body of research, although little of it in LMICs, shows that setting and enforcing speed limits reduces RTIs by up to 34 percent, particularly among vulnerable road users (pedestrians, cyclists, and motorcyclists). Urban speed limits should not exceed 50 kilometers per hour (km/h) and should be lower near schools and in residential areas. As noted earlier, the probability of a pedestrian being killed increases eightfold as the speed of the impact car increases from 30 kilometers per hour (km/h) to 50 km/h. Reducing speed limits by 10 km/h on rural roads could reduce traffic-related deaths by 6 percent, and reducing them by about 14 km/h on highways could reduce deaths by 21 percent (Racioppi and others 2004). Recognizing speed as a major contributory factor in about a third of road crashes, and being one of the best performers on road safety in Europe (second to Sweden in terms of fatalities), the United Kingdom has adopted effective measures, including: (a) increased publicity and awareness programs; (b) speed limits appropriate to location and road function (70 mph limits on motorways and dual carriageways and 30 mph in urban areas); local authorities are allowed to introduce 20 mph zones and rural speed limits of 60 mph on single carriageways; (c) targeted use of speed cameras at high-crash areas; and (d) improved signage (DETR 2000).

Alcohol consumption among both drivers and pedestrians also increases the risk of road crashes and injuries. The dose-response gradient is clear: the likelihood of a crash rises as blood alcohol concentration (BAC) increases. At a BAC of 0.06 grams per deciliter (g/dl), drivers were twice as likely as sober drivers to cause a road crash, and at 0.10 g/dl they were six times as likely (Levine 2003).
Driving under the influence of drugs is another risk factor, and mixing drugs and alcohol amplifies impairment.

*Setting and enforcing blood alcohol limits has proved highly effective in reducing RTIs.* Most countries set the legal limit at 0.05 g/dl. A BAC limit of 0.05 g/dl or less is recommended for the general population; if enforced, 5 to 40 percent of traffic-related deaths could be eliminated (ETSC 1996, 2003a). Research also shows that RTIs are reduced by varying magnitudes by setting and enforcing BAC limits and minimum drinking-age laws, using checkpoints to randomly stop drivers to detect alcohol, and running mass media campaigns aimed at reducing drinking and driving (Peden and others 2004). Random breath testing has been found to be twice as effective as selective checkpoints (Henstridge, Homel and Mackay 1997). Enforcement is most effective when backed by extensive publicity, with tough sanctions for repeat offenders (OECD and ITF 2008). In the United States some state legislatures are considering measures to further reduce drunk driving. For example, California and Wisconsin are considering legislation to require people convicted of drunk driving to use an “ignition interlock”; that is, drivers blow into a device that measures BAC; if it is too high, the car will not start. Fourteen states routinely use this technology, which experts say could reduce drunk-driving offenses by up to 64 percent (Wallwork, Winik and Massey 2009).

*Given the relative importance of alcohol abuse in some ECA countries, broader alcohol control policies and interventions are required to support the long-term sustainability of road safety efforts.* As clearly articulated in a recent study (Casswell and Thamarangsi 2009), despite clear evidence of the major contribution alcohol makes to the global burden of disease and its substantial economic costs, focus on alcohol control is inadequate internationally. Certainly this is the case in most ECA countries, particularly in Russia, Ukraine, and other

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**Box 3: Stepwise Approach to the Choice of Alcohol-control Policies**

<table>
<thead>
<tr>
<th><strong>Core</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Affordability:</strong> Excise tax graded by volume of ethanol, inflation-adjusted taxes.</td>
</tr>
<tr>
<td><strong>Availability:</strong> Regulation of all production and sale, licensing of places for sale and consumption, licensing of days and hours of sale, and minimum purchase age.</td>
</tr>
<tr>
<td><strong>Regulation of marketing:</strong> Regulation of all marketing, including sponsorship, content restricted with no lifestyle advertisements, bans on sponsorship, placement restricted by volume and media (for example, no electronic media).</td>
</tr>
<tr>
<td><strong>Drunk-driving:</strong> Limit on blood alcohol concentration established in law, sobriety checkpoints.</td>
</tr>
<tr>
<td><strong>Treatment:</strong> Brief intervention.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Expanded</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Availability:</strong> Bans on sales and drinking in public places, enforce laws against serving intoxicated customers and minors, different availability based on volume of alcohol.</td>
</tr>
<tr>
<td><strong>Regulation of marketing:</strong> No pricing promotions or discounts, no promotions using competitions or gifts.</td>
</tr>
<tr>
<td><strong>Drunk-driving:</strong> Random breath testing, administrative license suspension.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Optimum</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Affordability:</strong> Minimum price.</td>
</tr>
<tr>
<td><strong>Availability:</strong> Mass media campaigns supporting availability policy.</td>
</tr>
<tr>
<td><strong>Regulation of marketing:</strong> Restrictions on packaging and product design, ban advertising of corporate philanthropy, ban all forms of product marketing.</td>
</tr>
<tr>
<td><strong>Drunk-driving:</strong> Mass media campaigns supporting policy; for example, drunk driving, mandatory treatment for repeat drinking drivers.</td>
</tr>
<tr>
<td><strong>Treatment:</strong> Detoxification, cognitive-behavioral therapies, pharmacological treatments.</td>
</tr>
</tbody>
</table>

*Source:* Adapted from Casswell and Thamarangsi (2009).
former Soviet Union (FSU) republics. Industrial production of alcohol is expanding and aggressive marketing is increasing alcohol use, both in emerging markets and among young people in mature alcohol markets.

As shown in Box 3, cost-effective and affordable interventions to restrict harm do exist and are in urgent need of scaling-up. There is a need to overcome factors impeding progress, such as lack of political will, unhelpful participation of the alcohol industry in the policy process, and increasing difficulty in free-trade environments to respond adequately at a national level.

Other driver-related factors that increase the risk of road crashes include fatigue and stress caused by stifling levels of traffic congestion that influence aggressive driving, inadequate visibility of vulnerable road users and, more recently, the use of handheld mobile telephones and texting devices. A recent survey in Great Britain revealed that 45 percent of drivers use short message services (SMS), particularly young drivers, and complementary research found that drivers were significantly impaired in their performance when both reading and writing text messages, with the latter producing the greatest impairment (Reed 2008). It was also noticed that when texting, drivers slowed significantly, indicating that they recognized the impairment caused by their texting activities and were attempting to mitigate risk by reducing speed. Recent studies in the United States (Box 2009) monitored light-vehicle and truck drivers as they manipulated phones, such as dialing and texting. Findings indicate these behaviors pose a substantial increase in the risk of being involved in a safety-critical event, such as a crash or near crash. However, talking or listening increased risk much less for light vehicles and not at all for trucks. The studies estimate risk for **light vehicles and cars** as follows:

- Placing a call on a cell phone made the risk of a crash or near-crash event 2.8 times higher than non-distracted driving.
- Talking on or listening on a cell phone made the risk of crash or near-crash event 1.3 times higher than non-distracted driving.
- Reaching for an object such as an electronic device made the risk of a crash or near-crash event 1.4 times higher than non-distracted driving.
- A study on texting while driving in light-duty vehicles is currently underway, and is looking specifically at teenagers. Early results from car drivers are similar to those of truck drivers (see below) with texting associated with an enormous increase in risk of a crash or near-crash.

For **heavy vehicles and trucks** risk estimates were:

- Placing a call on a cell phone made the risk of a crash or near-crash event 5.9 times higher than non-distracted driving.
- Talking or listening on a cell phone made no difference to the risk of a crash or near-crash event compared to non-distracted driving.
- Use of or reaching for an electronic device made the risk of a crash or near-crash event 6.7 times higher than non-distracted driving.
- Text messaging made the risk of a crash or near-crash event 23.2 times higher than non-distracted driving (large trucks made up 8 percent of all vehicles involved in fatal crashes in 2008 in the United States). According to the study, drivers spend five seconds out of a six-second window looking away from the road when they are engaged with an electronic device. Clearly, keeping the driver’s eyes on the road significantly improves safety.

**Measures adopted at the state level in the United States to outlaw the use of cell phones by young drivers are starting to generate positive results.** Besides the tougher laws, peer influence programs and other measures have reinforced the rules and contributed to Texas’ success in reducing fatal crashes involving teen drivers. For example, since 2003, 300 school districts have been implementing an innovative program, called “Teens in the Driver Seat,” which starts teens talking to peers about driving risks (Linderberger 2009).

Finally, to alert users of certain prescription drugs about their side effects that could impair the capacity to drive or to use other machines, drug companies include leaflets in the packages. However, most people do not read the leaflets. Several initiatives propose including pictograms outside the boxes of these medicines (Goullé and others 2008) to alert users to possible dangers. It is also important to highlight that the use of alcohol and illicit drugs in combination with prescription drugs could further impair reaction time. Specific studies on these points should be encouraged as should active interventions to reduce risks.
4. Traffic management and reducing risk exposure to RTIs

The least-used and least-evaluated road safety intervention strategies are those that aim to reduce exposure to risk of RTIs. Estimates in high-income countries indicate that under certain conditions, for each 1 percent reduction in distance traveled, the corresponding reduction in crash incidence is 1.4 to 1.8 percent (Litman 2000; Edlin 2002). It follows that governments should improve transport networks and land use to reduce distances and the need to travel. Steps include providing shorter, safer routes; better management of commuter transport; better mass transit; and prioritizing or restricting access to parts of road networks (preventing pedestrian and cyclist access to motorways and keeping vehicles out of pedestrian zones). Well-designed and positioned crossings and improved signal-controlled junctions are also important. The United Kingdom has adopted child safety measures as well, such as improving school travel safety, child road safety audits, local transport plans for traffic calming in school areas, safer crossing facilities and speed cameras on roads prone to crashes; and training children in basic pedestrian skills.

5. Private sector role and practices to support road safety efforts

Table 7 illustrates how effective measures to address RTIs not only save lives but are also good for business. Private sector firms working in partnership with governments and civil society organizations have a vital role to play in advocating and supporting road safety policies and strategies. Effective partnerships have been established in a variety of countries with multiple, related aims: Brazil (safety for schools), Poland (driving education, black spot treatment), Hungary (improving the visibility and safety of black spots), Vietnam (motorcycle helmets), and Thailand (safer school zones and better discipline, improved vehicle visibility), and South Africa (responsible alcohol use, pedestrian safety and visibility) (Bekefi 2006). These country experiences—and a recent example in India where strong business and management skills coupled with sound public health programming helped boost health outcomes (Kusek, Wilson, and Thomas 2009)—clearly illustrate the potential benefits of applying private sector business practices to improve road safety and the delivery of related services in ECA.

Table 7: Why Should the Private Sector be Interested in Road Safety Issues?

<table>
<thead>
<tr>
<th>Industry Type</th>
<th>Area of Interest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auto</td>
<td>Safe product development and use, protection of customer base, regulatory costs.</td>
</tr>
<tr>
<td>Oil and gas, chemical</td>
<td>Product transport is key to business, and better road transport management reduces safety and environmental risks.</td>
</tr>
<tr>
<td>Alcoholic and other beverage</td>
<td>Safe product use serves market and safeguards “good product image.” Safe transport of product to guarantee supply.</td>
</tr>
<tr>
<td>Fleet operators, especially transport and delivery</td>
<td>To achieve reliable services and high fleet productivity, protect cargo investment, safety of drivers, welfare of their families, liability and medical costs, and community relations.</td>
</tr>
<tr>
<td>Diversified technology</td>
<td>Market for goods.</td>
</tr>
<tr>
<td>Consumer device</td>
<td>Safe product use (cell phones, handheld devices) to safeguard market.</td>
</tr>
<tr>
<td>Construction</td>
<td>Transport of materials, safety of workers.</td>
</tr>
<tr>
<td>Agribusiness/forestry</td>
<td>Product transport is key to business, and better road transport management reduces probability of damage to their products</td>
</tr>
<tr>
<td>Banking and insurance</td>
<td>Bear burden of insuring for crashes.</td>
</tr>
<tr>
<td>Tourism</td>
<td>Safe transport of tourists to sites, creating positive image of locale to attract visitors.</td>
</tr>
</tbody>
</table>

Source: Adapted from Bekefi (2006).
6. Cost-effectiveness of selected interventions and financial gains to society

The call for greater effort in road safety must include the cost of paying for interventions within a country’s budgetary constraints. The allocation of additional funds and/or the reallocation of existing funds to finance expanded road safety programs will depend on a clear policy decision by governments to assign greater priority to these efforts. One approach for priority setting is the comparison of the likely costs and impacts of single and combined interventions. Since the costs of, responses to, and effects of interventions differ substantially among countries, this should be seen only as an attempt to provide a “sense of priority” among various road safety interventions and not as a prescription on how to rationalize the allocation of public resources in ECA.

A recent analysis of the cost-effectiveness of RTI prevention strategies in different regions was carried out as part of the WHO’s CHOICE work program (Chisholm and Naci 2008). Results are expressed in terms of the cost of achieving one additional year of healthy life (or averting one disability-adjusted life year). Costs are in international dollars (USD), which account for differences in purchasing power among countries and therefore provide a more suitable basis for international comparisons. A selected set of interventions for reducing the burden of road traffic injuries was assessed: enforcement of speed limits via handheld speed cameras; drunk-driving legislation and enforcement by breath-testing campaigns; legislation and primary enforcement of seatbelt use in cars; legislation and enforcement of helmet use by motorcyclists; and legislation and enforcement of helmet use by bicyclists under age 15.

Estimates of what works best in a given country or region depend crucially on the underlying distribution of fatal crashes and non-fatal RTIs by road user group (pedestrians, bicyclists, motorcyclists, car occupants, and bus/lorry drivers and occupants), and also on various risk factors that are the target for interventions (speeding, drunk driving, and not wearing seatbelts or helmets). In ECA—covered by the WHO subregions EurB and EurC—pedestrians are particularly vulnerable road users (31 to 38 percent of fatal RTIs), along with drivers and passengers of cars (43 percent and 24 percent, respectively). Of the risk factors specifically considered, excessive speed (21 to 22 percent) and driving under the influence of alcohol (16 to 21 percent) contribute the most to the overall death toll: 97 per 1 million and 248 per 1 million population (in each case, the first number refers to subregion EurB, the second to EurC).

Looking at the cost-effectiveness of particular interventions addressing exposure to these risk factors and compared to the situation of no intervention, legislation and enforcement of bicycle helmet use by children is the most cost-effective strategy in EurB (I$10,395 per DALY saved), followed by roadside breath testing for alcohol-impaired driving (I$12,691 per DALY saved). In EurC, breath testing is the most cost-effective strategy (I$5,825 per DALY saved). Results for all single and combined interventions are shown in Figure 5 on the next page. Combining roadside enforcement strategies—against alcohol-impaired driving, speeding, and non-use of seatbelts, for example—offers the prospect of major synergies on the cost side, making it an attractive proposition. The investment costs to gain a year of healthy life is less than the respective per capita annual income of the selected populations, a threshold used internationally to determine whether an intervention is cost-effective. It could be concluded, therefore, that the evidence and costs indicate that an integrated, systemic approach is a promising approach to effectively address RTIs.

Society’s financial gains from selected road safety interventions. Although the size of a cost-benefit ratio may be country specific, the measures in Table 8 on page 29 and those mentioned in Table 2 have been proven to provide value for money (ETSC 2003, SWOV 2001, and U.S.

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9 The costs of RTI prevention span a wide array of resource inputs, including engineering and design of roads and vehicles, safety devices and technology, and ambulance and trauma care services. The intervention costs in the WHO study are those that are incurred at a more programmatic level (not at health-facility level), and include the resource costs associated with legislation, program management, and law enforcement, coupled with the privately borne costs to bicycle and motorcycle owners of buying helmets and the cost of fitting front and rear seatbelts in cars that lack them.

10 Countries in the WHO European Region with low child and adult mortality (EurB) are: 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 and high adult mortality (EurC) are: Belarus, Estonia, Hungary, Kazakhstan, Latvia, Lithuania, Republic of Moldova, Russia, and Ukraine.
Figure 5: Cost-effectiveness of Road Traffic Injury Prevention Strategies, in Europe and Central Asia, 2005

Note: International dollars per DALY saved.

EurB (countries with low child and adult mortality) = Albania, Armenia, Azerbaijan, Bosnia and Herzegovina, Bulgaria, Georgia, Kyrgyzstan, Poland, Romania, Serbia and Montenegro, Slovakia, Tajikistan, the former Yugoslav Republic of Macedonia, Turkey, Turkmenistan and Uzbekistan.

EurC (countries with low child and high adult mortality) = Belarus, Estonia, Hungary, Kazakhstan, Latvia, Lithuania, the Republic of Moldova, the Russian Federation, and Ukraine.

Source: Chisholm and Naci (2008).

National Center for Injury Prevention and Control (2000). For example, one measure shows that every US$1 spent on random breath testing for alcohol control saves US$36. Affordability of personal safety equipment is important and depends on price relative to disposable income. A combination of free-market competitive pricing and subsidies may be required to achieve affordability (Hendrie and others 2004).

7. How to finance road safety efforts?

One of the main challenges facing governments in many countries is how to fund necessary investments and other program costs of a road safety initiative to help achieve targets in the medium and longer terms. The traditional and alternative funding sources presented in Box 4 may be relevant for the ECA context since some of them individually or in combination have been adopted with success in some countries (OECD/ITF 2006, 2008).

8. Country experiences: Selected international good practices

Box 5 on page 30 describes policies, strategies, funding arrangements and interventions in a sample of countries that have achieved good road safety results. Clearly, these experiences show that at the root of these good practices is a firm and sustained commitment by government, including proper allocation of funding, over many
Table 8: Estimated Financial Savings to Society from Selected Road Safety Interventions

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Savings (US$ per US$1)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Road Design</strong></td>
<td></td>
</tr>
<tr>
<td>Simple road markings</td>
<td>1.5</td>
</tr>
<tr>
<td>Upgrading marked pedestrian crossings</td>
<td>14.0</td>
</tr>
<tr>
<td>Pedestrian bridges or underpasses</td>
<td>2.5</td>
</tr>
<tr>
<td>Guardrails along the roadside</td>
<td>10.4</td>
</tr>
<tr>
<td>Removal of roadside obstacles</td>
<td>19.3</td>
</tr>
<tr>
<td>Median guardrail</td>
<td>10.3</td>
</tr>
<tr>
<td>Signing of hazardous curves</td>
<td>3.5</td>
</tr>
<tr>
<td>Area wide speed and traffic management</td>
<td>9.7</td>
</tr>
<tr>
<td><strong>Conspicuousness</strong></td>
<td></td>
</tr>
<tr>
<td>Daytime running lights (normal bulbs)</td>
<td>4.4</td>
</tr>
<tr>
<td>Roadside lighting</td>
<td>10.7</td>
</tr>
<tr>
<td><strong>Alcohol control</strong></td>
<td></td>
</tr>
<tr>
<td>Random breath testing</td>
<td>36.0</td>
</tr>
<tr>
<td><strong>Car Restraints</strong></td>
<td></td>
</tr>
<tr>
<td>Audible seatbelt reminders</td>
<td>6.0</td>
</tr>
<tr>
<td>Child restraints</td>
<td>32.0</td>
</tr>
<tr>
<td>Seatbelt enforcement programs</td>
<td>3.0</td>
</tr>
<tr>
<td><strong>Helmets</strong></td>
<td></td>
</tr>
<tr>
<td>Bicycle helmets</td>
<td>29.0</td>
</tr>
<tr>
<td>Motorcycle helmets</td>
<td>1.0</td>
</tr>
</tbody>
</table>


Box 4: Traditional and Alternative Sources of Funding for Road Safety Programs

**Traditional funding sources:**

**General tax revenues:** As part of the national budgeting processes, specific road safety components are embedded within larger engineering, enforcement, and education programs.

**Road funds:** Revenue sources for road funds typically come from fuel taxes, vehicle registration and licensing fees, and road user charges for heavy vehicles.

**User fees:** Regulatory services associated with driver’s licensing, vehicle inspection, and operator licensing are directly funded from road user fees, paid to either the government agencies responsible or private sector agencies working on their behalf. User fees are usually collected on a cost-recovery basis.

**Insurance levies:** Some countries levy a fee on vehicle insurance premiums to help fund road safety programs, but the amount of funding raised is often small and used to fund education and publicity initiatives to improve road user awareness of road safety risks.

**Earmarked charges:** Various taxes and user charges are being channeled to road funds for a variety of purposes. For example, revenue from traffic fines is used to finance road safety activities in some countries.

**Alternative financing sources:**

More recently, the following alternative options to complement the traditional funding sources are being discussed in various countries (ECORYS 2006):

**Price/tax policy:** This includes fiscal incentives to encourage private and business investments in safety measures and to promote the design of safer infrastructure and vehicles. The incentives could relate to certain categories of equipment with proven safety effectiveness (for example, production of safety belt reminders for retrofitting in existing vehicles).

**Insurance premiums:** Behavior that reduces safety on roads could be discouraged by adjusting premiums to: (a) ensure that road safety gets prominent attention within companies (for example, through safe fleet management practices); (b) match travel speeds through pay-as-you-drive or pay-as-you-speed mechanisms; (c) spread the costs of risks associated with crashes causing bodily injuries more fairly; and (d) assign the total costs of a car crash from society to the person who caused the crash.

**Financial options:** Using financial and fiscal incentives to change the behavior of road users and to stimulate safety measures by car manufacturers and infrastructure managers has the advantage of using market principles and might be more acceptable than direct interference by governments: unsafe behavior becomes more expensive while safe behavior is rewarded.

Source: Adapted from OECD (2002) and Aeron-Thomas and others (2002), as cited in Peden and others (2004); ECORYS (2006).
Policies and Strategies

Sweden is a world leader in road safety. Since the mid-1990s, it has implemented a bold road safety initiative known as “Vision Zero,” which aims to eliminate deaths and serious injuries. Road fatality numbers have plummeted since the 1990s to 4.3 fatalities per 100,000, about half the European Union average. The main strategic principles guiding the road safety effort are: (i) the traffic system has to adapt to take better account of the needs, mistakes and vulnerabilities of road users; (ii) the level of violence that the human body can tolerate without being killed or seriously injured forms the basic parameter in the design of the road transport system; and (iii) vehicle speed is the most important regulating factor for safe road traffic. It should be determined by the technical standard of roads and vehicles so as not to exceed the level of violence that the human body can tolerate. The action strategy aims to: (i) prevent crashes leading to serious injury especially by limiting exposure to risk; (ii) reduce the severity of injury in a crash through crash protective design and protective clothing; and (iii) ensure that the severity of injuries received is minimized through efficient rescue service, health and rehabilitation.

The Netherlands has one of the lowest fatality rates in the world at 4.6 per 100,000 inhabitants. The Dutch Sustainable Safe Traffic System’s main components are: (i) infrastructure adapted to human limitations through proper road design; (ii) vehicles equipped to make driving easier and to offer good crash protection; and (iii) road users provided with adequate information and education and, where necessary, deterred from undesirable or dangerous behavior. The strategic principles are: (i) re-classifying the road network according to road function, including the flow function to enable high speeds of long-distance traffic and large volumes; the distribution function, serving districts and regions as containing scattered destinations, and the access function, enabling direct access to properties alongside a road or street; (ii) establishing speed limits according to road function; and (iii) ensuring compatibility through design in function, layout and use to prevent unintended use, large discrepancies in speed, direction and mass at moderate and high speeds, and uncertainty amongst road users by making the road course more predictable.

Funding Approaches

Australia. The federal government directs its fuel tax revenues to the states to make significant investment to upgrade the national highway system and for black spot programs. Each state raises its own revenues for investment in its own roads and for enforcement, regulatory, and educational activity. Injury insurers also play a growing role in safety investment, particularly in Victoria, where insurers have invested heavily in educational and infrastructure projects. Road fatalities have fallen significantly since the 1970s through mandatory seatbelt wearing and random breath testing for alcohol, improvements in vehicle safety, increases in speed enforcement supported by major public education and publicity, bicycle helmet wearing (mandated in 1990), graduated licensing, and, since 2001, lower traffic speed limits (50 kilometers per hour [km/h] on urban roads and 40 km/h near schools and shopping centers), increased penalties, increased enforcement, and continuing public service announcements. Infrastructure improvement contributes as an ongoing commitment.

New Zealand. Specific road safety budgets and allocation processes have been critical elements in improving road safety in New Zealand since 1990. Revenue from fuel taxes (New Zealand dollars [NZD] 1.315 billion) and vehicle registration and licensing fees (NZD222 million) were directed to a National Land Transport Fund in May 2004. These funds, channeled through the New Zealand Road Safety Program (NZRSP), have financed the national road policing program, national road safety education, national publicity and awareness campaigns, and national strategy management and coordination processes. National and local low-cost safety engineering measures and general road network investments that contribute to improved road safety outcomes have been financed through the National Land Transport Program (NLTP). The NZRSP and the NLTP complement local govern-
ment activity. In addition, a compulsory injury insurance scheme, the Motor Vehicle Account (NZD583 million), charges road users premiums to meet injury treatment, rehabilitation, and compensation costs from crashes. While most of this income is directed to injury management and rehabilitation, the insurer applies a portion of this account to safety promotion programs.

**Selected Interventions**

**Germany.** The number of fatalities on German roads fell more than 50 percent during 1991–2005: from 11,300 to 5,361. This resulted from (a) active and passive safety features of vehicles (for example, seatbelts, front passenger airbags, side protection systems); and (b) development and implementation of governmental road safety programs that prioritize developing a safe road culture, protecting vulnerable road users, making novice drivers less prone to collisions, reducing the danger posed by heavy-duty vehicles, and raising road safety on rural roads.

**United Kingdom.** The number of deaths and serious injuries in London from road traffic crashes fell 45 percent during 1994–2005, well ahead of the national target of 40 percent by 2010. The success is attributed to: (a) having strong political support from the mayor; (b) a new London Road Safety Unit established to coordinate road safety activities; (c) large budget increases; and (d) applying a full range of known infrastructural and behavioral interventions. Enforcement activities include use of over 600 cameras, which helped reduce by over 40 percent serious casualties at camera sites where speed had caused collisions. Direct expenditure on road safety rose sharply from GBP10 million a year in 2000 and 2001 to GBP39 million in 2005.

**Mexico.** A key investment for Mexico’s road safety improvements has been the modernization of 14 central road corridors. By 2006, this program had upgraded 17,320 kilometers of the most important highways in the country, 90 percent of the total length of the 14 corridors.

**United States.** Since 40 percent of all fatal crashes are alcohol related in the United States, laws governing blood alcohol concentration (BAC) levels for law enforcement have been enacted by all states. All have enacted zero-tolerance laws that make it illegal for drivers under age 21 to have any detectable alcohol on their breath. By 2005, all 50 states, the District of Columbia, and Puerto Rico had enacted 0.08 BAC laws. This, along with strict police enforcement, has helped reduce highway deaths from 43,384 in 2007 to 39,397 in 2008.

Source: OECD/ITF (2008); OECD/ECMT (2006); Breen, Howard, and Bliss (2008); and Halsey (2009).

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9. **Country-level responses in ECA**

Annex 1 shows that many ECA countries now have structures and processes to address the RTIs epidemic. These structures range from institutional frameworks that include lead agencies to coordinate the national response funded by national budgets and national road safety strategies with measurable targets, to laws that set speed limits, regulate driving under the influence of alcohol, and mandate the use of motorcycle helmets, seatbelts, and child restraints.

In addition, many ECA countries require formal audits for major new road construction projects and regular audits of existing road infrastructure, and have national policies to promote public transportation, walking, and cycling. Formal, publicly available pre-hospital care systems for post-crash care are available in ECA countries, but their quality varies significantly.

**Significant progress has been achieved in Poland** for example, with public education on road safety and safe-driving training for professional drivers, campaigns to increase seatbelt use, programs to reduce alcohol abuse, special cautionary road signs to warn drivers of black spots, and improved pre-hospital care. Russia, too, has had some recent success in health promotion to reduce
RTIs, the details of which are presented in Box 6. Armenia has seen dramatic improvements in seatbelt use as a result of its decision to enforce its seatbelt law, as described in Box 7.

Enforcement of road safety laws and regulations, however, is often lacking, for example: Georgia’s seat-belt law, Kyrgyzstan’s drunk-driving law, Moldova and Serbia’s drunk-driving and motorcycle helmet laws, and Tajikistan’s seatbelt law (WHO 2009a). Due in large measure to deteriorated epidemiological surveillance systems, few ECA countries have reliable data on the level and magnitude of RTIs and their associated risk factors (World Bank 2004).

In spite of progress observed in ECA, additional and scaled-up efforts and resources are needed to remedy the

Box 7: Seat belts in Armenia

Armenia has had a law since 2007 requiring all car passengers to wear seatbelts. However, the law was widely ignored and not enforced. Casual observation suggested very low usage rates in urban areas and only a small proportion of drivers and front-seat passengers wearing seatbelts on inter-urban roads.

In 2008, the World Bank funded the preparation of a road safety strategy and a five-year action plan which, among other things, stressed the case for enforcing the law.

On August 13, 2009, the government formally approved the strategy and action plan. On the same day, the Prime Minister and Minister of Transport appeared on television to express their support for action on road safety, and both personally pledged to wear seatbelts. They announced that the law would be enforced. The police immediately began stopping drivers but initially only gave advice to drivers, pointing out that the law would soon be strictly enforced.

Now, the law is enforced and the impact has been dramatic. While systematic surveys are yet to be undertaken, it is clear that usage rates have increased dramatically—casual observations suggest that over 90 percent of drivers and front-seat passengers now “belts-up” in the capital, Yerevan, and that higher rates prevail on highways.

Political endorsement at the highest level has been vital in this, both in high-profile personal commitment to wear seatbelts, and in giving the police the security of knowing that their enforcement effort has strong backing. The Prime Minister made it clear in his television speech that the government, and in particular members of the cabinet, should lead by example. The effect can now be seen on the streets of Yerevan.

Source: Camos-Daurella and Silcock (2009).

Box 6: How is Russia responding to the RTIs Challenge?

The Government of the Russian Federation is implementing the “Federal Targeted Program for Ensuring Road Traffic Safety 2006–2012,” aimed at decreasing the number of road crashes by 15 percent and reducing the number of people killed on the country’s roads by 15-20 percent by 2010. The Department of Road Traffic Safety within the Ministry of Internal Affairs (MIA) is coordinating this program with the participation of the Transport, Emergency Situations, Health and Social Development Ministries, other federal agencies, and regional and municipal governments.

The main components of the program are roads modernization and education and information campaigns. Also, several promising measures were recently adopted: fines for driving without a seatbelt were increased tenfold, a law was enacted to make crossing into an oncoming lane an offense punishable by revocation of driver’s license, and anti-alcohol campaigns have been launched, in some cases with the participation of the Russian Orthodox Church (Parfitt 2009). As a result of these efforts a positive trend in RTIs was observed during 2007–08.

However, road conditions in Russia are still very dangerous. As President Medvedev emphasized in a national speech on August 6, 2009, poor road infrastructure, bad organization of road traffic, and insufficient efforts at the regional and local levels, hinder further improvements. This situation is aggravated by the absence of effective education programs for drivers, particularly young drivers, and a limited road police purview which concentrates on collecting penalties and not on preventing road crashes. Road fatalities and disability among car crash victims also occur due to the weak organization and limited resources that constrain the timely and effective operation of emergency medical services and of rehabilitation services at the facility and community levels upon discharge of the patient.
significantly worse road safety performance (including in countries that are now part of the EU) compared with their counterparts in the EU.

Experience from HICs and other middle-income countries shows that improving road safety requires a consistent, 20-to-30-year effort to develop and implement comprehensive, integrated safe system programs, under the coordination of a well structured and funded, technically and operational competent, lead agency. Business planning processes and performance monitoring systems must be developed and strengthened to support a long-term strategy, and the first phase of the strategy should foster consensus among stakeholders and public sector agencies on a long-term action plan based on demonstrably successful interventions. A financing plan for implementing the strategy should also be specified using a staged approach to address revealed capacity weaknesses. This requires building core capacity to bring targeted safety outcomes under control, then scaling up investment to accelerate this capacity building strengthening and the achievement of improved results across the national road network. Support should be provided to develop a program of infrastructure safety improvements, road user education, traffic safety enforcement and emergency preparedness along a first set of demonstration corridors, with successful measures being rolled out across the remaining network (Bliss and Breen, 2009).
“He went to him and bandaged his wounds, pouring on oil and wine. Then he put the man on his own donkey, took him to an inn and took care of him.”

– Parable of the Good Samaritan, New Testament
Luke 10:34

Chapter IV. The Role of Health Systems in Preventing RTIs and Helping Victims

In accordance with the vision outlined in “The Tallinn Charter: Health Systems for Health and Wealth” (WHO-EURO 2008b), strengthened health systems have a major role to play as part of a multisectoral effort to improve road safety and other health conditions. The quality and effectiveness of the health system have a direct bearing on achieving road safety goals.

Health system activities that effectively contribute to reducing the burden of RTIs could be grouped into four broad categories: (a) public health, (b) primary health care, (c) post-impact medical care, including (d) blood transfusion services, and (e) rehabilitation. Each of these categories is discussed in detail in this chapter.

1. Public health actions

The public health approach to RTIs involves a logical sequence of actions including (a) identifying the size of the problem; (b) analyzing the associated risk factors; (c) finding out what preventive measures work; and (d) designing, implementing, and evaluating programs (Sethi 2007; WHO Regional Committee for Europe resolution 2005; Krug, Sharma, and Lozano 2000). The scope of these actions encompasses the following:

- Monitoring and Evaluation. This includes assessing, through injury surveillance and surveys, all aspects of road crash injury—by systematically collecting data on the magnitude, scope, characteristics, and consequences of road traffic crashes. Data collection for road safety requires well-organized and well-run epidemiological surveillance systems, with standards and guidelines; well-trained data management personnel; and robust information systems to ensure the connectivity and flow of data and information among different agencies, including centralized data repositories at coordinating agencies, first responders, and medical care providers. Reliable RTIs statistics are fundamental for identifying trends and priority interventions, designing programs and managing their implementation, allocating resources efficiently, and monitoring and evaluating the cost-effectiveness of programs and interventions. It is reported that police data significantly underestimate fatal and non-fatal RTIs (Racioppi and others 2004).

- Research into the causes of traffic crashes and injuries, factors that increase or decrease risk, and factors that might be modifiable through interventions.

- Advocacy. This involves efforts to persuade policy makers and decision makers of the necessity of addressing injuries in general as a major issue and of the importance of adopting improved approaches to road traffic safety.

- Policy. This involves translating effective science-based information into policies and practices that protect pedestrians, cyclists, and the occupants of vehicles.

- Population-based prevention and control interventions. The overall objective is to prevent the occurrence of RTIs by changing related behaviors and lifestyles, environmental factors, and their social and economic determinants in an entire population (for example, information and communication programs addressing the risks of RTIs, excise and other taxes aimed to reduce alcohol abuse). The main argument for these interventions is that they target a high proportion of the population at risk of RTIs; 70 percent or the majority of the population (Rose 1992). This approach offers an opportunity for synergy with other
programs and interventions targeting risk factors that are associated with the onset of non-communicable conditions such as cardiovascular diseases, diabetes and obesity.

2. The role of primary care services in RTI prevention

Recent and ongoing reforms of primary health care services aim to secure healthier communities by strengthening the response to complex health challenges that are associated with growing urbanization, aging of the population, and changing lifestyles (WHO 2008c). The reality of individuals facing multiple symptoms, illnesses, and injuries demands that service delivery be more integrated and comprehensive for effective case management. As such, well-structured and well-run primary care services can provide a “place to which people can bring a wide range of health problems,” and be a “hub from which patients are guided through the health system,” and that “opens opportunities for disease and injury prevention and health promotion.”

Primary health care services have an important role to play in helping address RTIs – they are an integral part of a community-based health care delivery system that brings together promotion and prevention, treatment, and care services. For example, general practitioners (GPs) or family medicine teams provide medical assessments of drivers who may be in special categories, have underlying medical conditions, or who are over age 70. The primary-care level also provides an opportunity for health interventions concerning alcohol abuse or the collateral effects on driving of using certain prescribed medications. For example, there is evidence of the cost-effectiveness of advice given by a physician in a brief encounter in primary care and emergency department settings about the harmful effects of alcohol. Since leading risk factors for RTIs such as alcohol misuse are also associated with other leading causes of death and disability (for example, cardiovascular diseases), health gains can be maximized by simultaneously implementing population-level health promotion and disease prevention programs targeting multiple risk factors and groups and individual at high risk, while enhancing population coverage of effective treatment and care.

3. Emergency medical care systems to deal with crash victims

The aim of medical care after crashes is to avoid death and disability, limit the severity and suffering from injuries, and ensure optimal functioning of the survivors and reintegration into the community (Peden and others 2004). The term emergency medical services (EMSs) has evolved from referring to a simple transportation system (ambulance service) to an interconnected pre-hospital and facility-based medical care system.

The first step toward the modern organization of emergency medical assistance was taken by Dominique Larrey, surgeon-in-chief of Napoleon Bonaparte’s Grande Armée, in the late 18th century, in treating casualties rapidly on the spot. An emergency medical system (EMS) is “a comprehensive system that provides the arrangements of personnel, facilities and equipment for the effective, coordinated and timely delivery of health and safety services” to victims of RTIs (Moore 1999). These services comprise a “continuum of care” from first contact with a victim until he or she is stabilized (communication systems, transport systems, paramedic teams), to medical care provided at different trauma care facilities of varying technological capacity, to the rehabilitation of victims in health facilities and in communities after discharge.

A major review of worldwide evidence summarized the components of an emergency medical service (Kobusingye and others 2006) as follows:

Pre-hospital care for initial emergency care and stabilization of road traffic victims. This component encompasses: (a) a first tier that involves care provided by the community at the injury scene to arrival at a formal health care facility, and (b) a second tier that involves trained paramedic personnel who use dedicated vehicles and equipment to get to patients and take them to hospitals within the shortest possible time. Effectiveness has also been demonstrated of well-placed dispatch sites in urban populations, where vehicles and personnel can be optimized. Shorter pre-hospital times are an important parameter of the quality of pre-hospital care. These times have the following components:

- Notification time is the time from injury occurrence or recognition of injury until the EMSs are notified.
• Response time is the time from notification until arrival of an emergency unit to the injured person. The recommended ratio of one emergency unit for 50,000 people (McSwain 1991) results in response times as low as four to six minutes, although traffic congestion, poor maps, and poor signage may increase the time. Monterrey, Mexico has an average response time of 10 minutes with one unit per 100,000 people. Hanoi, Vietnam, with one unit for 3 million people, has an average response time of 30 minutes (Mock and others 1998).

• Scene time is the time pre-hospital providers take from arrival at the scene until departure from it.

• Transport time is the time from leaving the scene until arrival at a treatment facility.

Traditional and innovative communications systems. Nowhere is efficient communication and rapid transportation more critical than in emergency medical care. The best teams equipped with the best technology and supplies are wasted if they cannot be reached quickly or lack contact with health care facilities. Radio communication is one solution in low-income settings. Cellular telephones may offer better communications to communities that are remote from standard communications infrastructure.

Medicines and equipment for the care of people that have suffered traffic injuries. Medicines and equipment for emergency care play an important role in stabilizing and saving the life of an injured person. Training ambulance drivers and paramedics and medical personnel in the administration of first responder care (for example, for shock, appropriate use of intravenous fluids) is vital. Proper emphasis on essential medicines and equipment to be included in first aid kits to attend the needs of people with multiple injuries, hypovolemia (low blood volume due to blood loss), and other conditions, is required. Training in trauma triage11 is also important.

Health-facility-based subsystem. This subsystem within the health care system delivers definitive care. It may be a regional hospital with specialists (major trauma center), a district hospital with generalists, or a health center with competent clinicians, depending on the country. The triage or screening process—in the pre-hospital sub-system or receiving area of a fixed facility—should determine the appropriate facility to transport patients to, rather than sending them to the nearest facility. Precious time and lives may be lost when patients are taken to facilities unable to offer appropriate care. Equipment and supplies at each level should match the knowledge and skills of the personnel available to use them.

Systems organization. Emergency care must be planned and implemented carefully. The various EMS components should be linked to ensure that the entire system operates as a unit.

Health financing for emergency care. Direct payment of costs for transportation, medical treatment, and drugs erects a barrier between the poor and EMSs everywhere. Emergencies can financially devastate individuals and families, often for many years. Financial protection for emergency health care is a necessity in low-income countries and has lacked adequate attention. The goal is to ensure that individuals and families do not spiral down to abject poverty as a result of interacting with the national health system. In some ECA countries, the system of co-payments or informal payments disadvantages the poor.

Quality assurance. For an EMS to maintain and improve the care of patients, systematic documentation and periodic audits or other processes to ensure quality of care must be incorporated. Quality management systems that are simple and continuous and allow for rapid changes in the system must be implemented.

4. The importance of blood transfusion services in dealing with RTIs

Blood transfusions, coupled with safe medical procedures, save lives after a road traffic injury. Life-saving transfusions of blood or blood-based products are an indicated procedure for situations involving massive blood loss due to trauma or surgery. Blood is also needed for people requiring complicated surgical procedures that result from trauma events.

Blood transfusion services are responsible for ensuring safe and sufficient quantities of blood in a health system.

11 Triage is a process of prioritizing patients based on the severity of their condition. Triage helps determine the order and priority of emergency treatment, the order and priority of emergency transport, and the transport destination for the patient after an RTI.
Blood service organizations educate, recruit, and select donors, collect and process their blood, prepare blood products,\(^\text{12}\) screen blood donations for various infectious markers, and do other tests in a quality-controlled fashion, and, in coordination with health service providers, follow up on the safe and appropriate use of blood and blood products. Whole blood and its products must be stored and maintained under proper refrigeration, requiring an accurate and reliable cold chain.\(^\text{13}\)

In 2004, blood services in 172 countries collected a total of 81 million units of blood, according to the World Health Organization (WHO) global database. However, only 1 percent was collected in low-income countries, where about 37 percent of the world population lives; 44 percent were collected in medium-income countries; and 55 percent in high-income countries (HICs). In addition, 94 percent of blood collected in HICs is donated without pay, whereas 43 percent of blood in low- and middle-income countries is donated for pay or is from replacement donors.\(^\text{14}\)

The problem of blood supply shortages and increasing safety concerns are particularly acute in low- and middle-income countries (LMICs). Of the 53 WHO European Member States (which include the ECA countries), only 26 have national programs for voluntary blood donation.

Standard blood safety principles prescribe that blood services screen blood and blood products for at least HIV, hepatitis B and C, and syphilis contamination (The Lancet 2007). However, complete and accurate data on testing of donated blood is not available in many LMICs (WHO 2007a). In many FSU countries, blood services are functioning well and providing safe transfusions.

However, particularly in Central Asia, existing blood services are in dire need of reorganization and upgrading, with particular emphasis on strengthening the control systems that would ensure the quality and safety of transfusion therapy (Marquez, 2008).

To protect RTI victims from contaminated blood transfusions and related unsafe medical practices, a well-organized blood transfusion service, with quality control systems in all areas, must be secured as part of scaling-up road safety efforts in ECA.

5. Rehabilitation services

In many LMICs, rehabilitation services are in short supply, and their strengthening needs to be considered as part of health system reform and improvement efforts, particularly to help RTI victims avoid lasting disabilities. In HICs, a variety of specialists—physical therapists, occupational therapists, prosthetics specialists, neurologists, psychological counselors, and speech therapists—provide rehabilitation (Peden and others 2004). Services and equipment are also provided at home. Building up rehabilitation services would also be useful for the proper management of stroke victims and other non-communicable conditions.

6. Good practices in organizing emergency medical services

Different countries have initiated programs and made related investments to improve pre-hospital care systems and strengthen health-facility-based subsystems. Recent noteworthy experience in the United States indicates that by 2005, 31 states had established formal trauma care systems, up from eight in 1980 (Haider 2007). Trauma systems are organized on the basis of different levels of care: Level 1 centers offer the highest level of care (major trauma center) plus research and a commitment to injury prevention, Level 2 centers offer the second-highest level of care and can manage most emergencies, Level 3 centers are smaller and can handle only moderate injuries, and Level 4 centers need to transfer any significantly injured patients to a higher level.

Multiple studies have shown that state trauma systems improved outcomes and survival among RTI victims. Increased survival was found to result from better pre-hospital care (expedited access) and improved in-hospital

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12 The WHO definition of blood products includes blood components (labile) and stable blood fractions resulting from plasma processing. The European Union blood directive has different definitions and considers only the stable fractions as blood products.

13 Different blood products require different storage temperatures (from +21° C to -40° C according to type of product).

14 Where health facilities have blood supply shortages, patients needing transfusions recruit friends and family members for donations before the patient undergoes a procedure requiring a transfusion. These family replacement donations are seen as essential and as far safer than paid blood donors, but not as safe as blood from those who donate for the public good (Carolan and García 2005).
care processes (quality of care), revealing the potential for an EMS to address the growing burden of trauma and injuries through improvements in both pre-hospital and hospital-based care.

Another good example in this field is France’s Service d’Aide Médicale Urgente (Emergency Medical Services, SAMU). Formally begun in the 1960s with the support of the French Ministry of Transport, SAMU is now part of the health sector. It contributed to the development of the first pilot hospital mobile intensive care units (H-MICUs) (Box 8).

**Box 8: SAMU: France’s Emergency Medical Services**

The principles of Service d’Aide Médicale Urgente (SAMU) hold that emergency medical assistance is the first (and therefore a key) step in the provision of medical care. Interventions in the field must be speedy and efficient and use suitable resources. The approach to each individual case is simultaneously medical (to provide care), operational (movement is necessary, so distance, time, weather, and so forth are considerations), and human (patient dignity and comfort must be primary concerns). The responsibilities and detailed arrangements for coordination among those involved must be regulated by a set of working rules. Results depend in large measure on the skill of those involved. Preventive action must complement emergency action.

Organizational and operational elements include integration of fire departments and private ambulance networks. Services are activated by a call to a SAMU call center, where a physician and staff determine the most suitable response and implement it by giving information or advice or by sending appropriate help. Call centers are situated at hospitals, usually next to the hospital mobile intensive care unit (H-MICU). Hospitals are pivotal, managing the call centers, coordinating staff in the pre-hospital phase, managing H-MICUs, and receiving patients. H-MICUs are hospital units operating in close collaboration with the hospital departments responsible for receiving emergency patients. The H-MICU transport system includes light rapid-intervention vehicles, ambulances, and helicopters. The vehicles are equipped with essential resuscitation and intensive care equipment.

*Source: France’s SAMU online.*
“We have the tools, the knowledge, to undertake this work. Now we need to see the political will to implement a Decade of Action. The United Nations has recognized that the global road injury epidemic is serious enough to warrant General Assembly resolutions and a first Ministerial-level conference.”

– Lord Robertson of Port Ellen,
Former Secretary-General of NATO and current
Chairman, Commission for Global Road Safety

Chapter V. Road Safety Approaches and Policies

The approach to road safety has evolved in recent decades from “blaming the victim” to “safe systems.” In the 1950s and 1960s, road safety policies emphasized the role of individual responsibility and used legislation, traffic management, drivers’ licensing and vehicle inspections, and information and communication to change road users’ behaviors. Little progress was made in reducing road injuries. This chapter describes the more systematic “safe systems” approach that has evolved, which identifies the risk factors that contribute to crashes and injuries, and then discusses interventions that reduce the risks associated with those factors (Peden and others 2004, OECD/ITF, 2008; and Bliss and Breen, 2009).

1. The safe systems approach

Blaming the victims has given way to strategies emphasizing a systems approach to intervention. This approach embraces improvements in road infrastructure and vehicle safety, and legislation and enforcement of laws to ensure road users’ compliance with safety measures. The Haddon Matrix in Table 9 is a framework for holistically addressing road transport and its risks. It divides a car crash into three phases—before, during, and after—to highlight the times when crashes can be prevented or their effects minimized. Each phase involves three factors—human, vehicles and equipment, and environment—and each of the nine resulting cells in the matrix outline possible areas for intervention. This holistic, systems approach—operationalized through action-focused plans with numerical outcome targets, broad packages of system wide measures, close monitoring and evaluation of performance, and development and application of new knowledge—helped reverse the rising trend in road facilities in high-income countries (HICs) in the 1980s and 1990s. By the late 1990s, this holistic approach had evolved into the ‘safe system’ approach that highlights the shared responsibility and accountability by all parties

Table 9: Haddon’s Matrix for Crash and Injury Prevention

<table>
<thead>
<tr>
<th>Phase</th>
<th>Nature of Intervention</th>
<th>Factor</th>
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<td></td>
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<td>Human</td>
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<td>Pre-crash</td>
<td>Crash prevention</td>
<td>Information/training</td>
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<td></td>
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<td>Attitudes/impairment</td>
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<td>Police enforcement</td>
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<tr>
<td>Crash</td>
<td>Injury prevention</td>
<td>Use of restraints</td>
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<td>(during crash)</td>
<td></td>
<td>Impairment</td>
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<tr>
<td>Post-crash</td>
<td>Life-sustaining</td>
<td>First aid skill</td>
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<td></td>
<td></td>
<td>Access to medical care</td>
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</tbody>
</table>

to the road transport system for improved road safety performance.

A safe system approach has as its goal the elimination of death and serious injuries, and this influences how interventions are designed. The guiding principles of the safe system approach are:

- Not all road crashes can be prevented, but traffic injuries can be reduced.
- Road traffic systems should be designed and operated to cope with human error and take better account of the vulnerability of the human body.
- Responsibility and accountability for road safety is shared by road and car designers and road users.

Proven approaches fall into four categories: (a) vehicle design and safety equipment (helmets and seatbelts, daytime running lights, airbags); (b) road user measures and their enforcement (for example, speed limits, seatbelts, restrictions on drinking and driving and cell phone use); (c) engineering measures that improve road design (intersection control, safety and crash barriers, clear markings and signs); and (d) traffic management and reducing exposure (providing shorter, safer routes, better mass transit, and reducing mixing between pedestrians and cyclists and motorized traffic). Also, when prevention fails, effective post-crash emergency medical and rehabilitation services are important to reduce both the number of fatalities and the length and severity of surviving victims’ disability.

“Towards Zero: Ambitious Road Safety Targets and the Safe System Approach” was released by an international group of safety experts under the aegis of the Organization for Economic Co-operation and Development (OECD) and the International Transport Forum (ITF) (OECD/ITF 2008). As detailed in Box 9, the report sets out a policy framework for pursuing road safety targets, one that has been adopted by many countries worldwide.

2. Policy framework at the international level

The last decade witnessed several international policy developments on road safety, raising the policy profile of road safety worldwide. In April 2004, UN General Assembly Resolution A/Res/58/289 on “Improving Global Road Safety” mandated the World Health Organization (WHO) to coordinate (in collaboration with the UN regional commissions) road safety issues within the UN system.

United Nations World Health Assembly Resolution WHA 57.10 on Road Safety and Health, May 22, 2004, recognizes that road traffic injuries (RTIs) are a major but neglected public health problem causing significant mortality and morbidity and considerable social and economic costs and requiring urgent action (WHA 2004). It offers countries several recommendations to reduce RTIs. The resolution urges Member States to integrate RTIs prevention into public health programs; establish government leadership in road safety; facilitate multi-sectoral collaboration across ministries, communities, and society; assess the national situation and ensure that available resources are commensurate with the size of the road safety problem; prepare and implement a national strategy on road injury prevention; and take specific measures to prevent mortality and morbidity and evaluate their impacts. The resolution requests the WHO Director-General to collaborate with Member States to undertake further research, build capacity, advocate road injury prevention, raise awareness about the risk factors related to road traffic collisions, and strengthen pre-hospital and trauma care for survivors.

The World Report on Road Traffic Injury Prevention (Peden and others 2004) emphasizes the role of public health in preventing RTIs. It covers the fundamental concepts and prerequisites of RTI prevention, the intensity and impact of RTIs, key determinants and risk factors, intervention strategies, and recommendations.

UN Resolution A/62/L.43 on Easing the Global Road Safety Crisis and the call for the First UN Ministerial Summit of Road Safety, hosted by Russia in November 2009, are further raising the policy profile of road safety globally.


The current comprehensive EU policies and legislation and other measures to deal with RTIs are already insti-
1. **Adopt a highly ambitious vision for road safety.** All countries are advised to adopt and promote a level of ambition that seeks in the long term to eliminate death and serious injury arising from use of the road transport system. Adopting such a vision will reverse people’s view of the inevitability of road trauma, alter institutional and societal responsibilities and accountability, and reshape road interventions.

2. **Set interim targets to move systematically toward the vision.** All countries should adopt ambitious, achievable, and empirically derived road safety targets to drive improved performance and accountability. The targets should be developed in a way that links interventions and institutional outputs with intermediate and final outcomes to develop achievable targets for different intervention options.

3. **Develop a safe system approach, essential for achieving ambitious targets.** All countries, regardless of their level of road safety performance, should adopt a safe system approach. This approach builds on existing road safety interventions but reframes the way road safety is viewed and managed in the community. It addresses all elements of the road transport system in an integrated way with the aim of ensuring crash energy levels are below what would cause fatal or serious injury. It requires system designers and road users to share responsibility and accountability. It stimulates the development of innovative interventions and new partnerships that are necessary to achieve ambitious long term-targets.

4. **Exploit proven interventions for early gains.** Countries experiencing difficulty in improving their road safety performance should urgently conduct high-level reviews of their safety management capacity and prepare long-term investment strategies and related programs and projects to overcome capacity weaknesses revealed through such reviews.

5. **Conduct sufficient data collection and analysis to understand crash risks and current performance.** All countries should develop data collection procedures to cover: final outcomes (including at least deaths and serious injuries by road users); exposure measures (for example, relating outcomes to population levels, numbers of licensed drivers, distances traveled); intermediate outcomes (also called safety performance indicators and including mean speeds, seatbelt wearing, drunk driving, and vehicle and infrastructure safety ratings); institutional delivery outputs (including different categories of enforcement effort); socioeconomic costs associated with road trauma; and underlying economic factors (including new vehicle sales). Careful data analysis should be used to improve understanding of crash and other trends to inform different intervention mixes and intensities.

6. **Strengthen the road safety management system.** All countries should commit to ensuring an effective road safety management system and in particular foster a strong results focus through institutional arrangements. A results focus requires the identification of a lead agency, the core group of government ministries and agencies and their roles and responsibilities, and performance targets for institutional outputs and intermediate and final outcomes to be achieved within a defined strategy.

7. **Accelerate knowledge transfer.** Knowledge transfer initiatives must be supported with adequate investment in targeted programs and projects and be designed to overcome institutional capacity weaknesses, especially by creating sustainable learning opportunities in the countries concerned. Strong and sustained international cooperation will be required to mobilize required resources.

8. **Invest in road safety.** Most countries need to better understand the costs of road crashes, both by government and personal injury insurance companies, and the value of investment in road safety. Opportunities for road safety investments with competitive returns are available; the business case for this investment needs to be developed.

9. **Foster commitment at the highest levels of government.** Sustained government commitment at the highest levels is essential for improving road safety. To secure this, road safety managers must develop evidence-based road safety programs and advocate strategies that reflect an understanding of political constraints, such as the electoral cycle.

*Source: Joint Research Centre of the OECD and ITF (2008).*
tutionalizing a “safe system approach”, rather than a

A group of parallel interventions. Taking into account that

ECA is a mixed group of non-EU and EU countries,
current EU policies and legislative measures offer a clear
framework to recently ascended countries and candidates
for ascension for adjusting their policies and programs.
The EU approach focuses on three pillars, briefly termed
“infrastructure,” “vehicles,” and “user behavior.”

The White Paper, “European Transport Policy for 2010:
Time to Decide” (EC 2001) approved by the European
Commission (EC) in September 2001, set the ambitious
goal of reducing the number of fatalities on European
roads by 50 percent by 2010. This target was recon-
firmed in 2003 with the European Road Safety Action
program, “Halving the Number of Road Accident
Victims in the European Union by 2010: A Shared
Responsibility” (EC 2003). (The fourth European Road
Safety Action Program 2011–2020 is under prepara-
tion.) A European Road Safety Observatory15 was set up
to disseminate information, best practices, and findings
of research on road safety, and to collect and analyze
data.

The current EU program aims to improve road infra-
structure, make vehicles safer, and encourage better road
user behavior. The program proposes that all concerned
parties, whether public or private, should subscribe to
a European Road Safety Charter.16 EU Road Safety
Program managers recently approved directives to
improve all three pillars.

A. Road infrastructure

The EU approach integrates road safety in all phases of
planning, design, and operation of road infrastructure.
For example, Directive 2008/96/EC of 19 November
2008 introduces a comprehensive system of road infra-
structure safety management (EC 2008a). It addresses
substantial changes to the existing network and new
construction that affect the traffic flow within the trans-
European road network. It focuses on four procedures to
address safety concerns relative to road infrastructure:

• Road safety impact assessment. Undertake—at the
planning stage, before project approval—strategic
comparative analysis of substantial changes and new
construction to examine the network’s safety perfor-

15 The observatory Website is http://ec.europa.eu/transport/wcm/
road_safety/erso/index-2.html.

16 The charter is available at: http://www.erscharter.eu/.

**Daytime running lights (DRLs).** Directive 2008/89/EC makes these lights mandatory after February 2011 for all new cars and light vans and after August 2012 for other new vehicles (EC 2008b).


**eSafety.** This refers to the Intelligent Car Initiative supported by the EC, industry, and other stakeholders. It aims to accelerate the development, deployment, and use of intelligent vehicle safety systems that use information and communication technologies to increase road safety and reduce the number of road crashes (EC 2009).

**C. Human behavior**

The EC is involved in four initiatives to improve behavior: (i) regulating the conditions for issuing drivers’ licenses; (ii) cooperating in, coordinating, and co-funding European campaigns for road safety; (iii) training and education through legislative work and projects; and (iv) enforcing traffic rules.

Legislation becoming effective in January 2013 will convert 110 European models of driver’s licenses to a single model. Also anticipated are antifraud measures, harmonization of five-year medical checks for professional drivers, minimum requirements for the training of examiners, and better harmonization of license categories.

The research project “DRUID” (Driving Under the Influence of Drugs, Alcohol and Medicines) is expected to provide a solid base to generate harmonized, EU-wide regulations for driving under the influence of these substances, fix thresholds for driving a power-driven vehicle, evaluate tracking devices, define strategies for driving bans and rehabilitation schemes for drivers, and define doctors’ legal responsibility (FHRI 2007).

**D. Post-crash care**

Improved response and care in the event of road crashes could save several thousand lives. However, emergency medical services appear to have a secondary role in the mechanisms for disaster preparedness and response in many EU countries, including in road safety approaches (WHO EURO 2008c). To address this situation, the European Inter-Ministerial Panel on Emergency Health Care—a group of experts in the field of emergency medical services—has been established with the support of all Ministries of Health, with the goal of meeting regularly and exchanging and analyzing information on emergency medical services. This panel is expected to be instrumental in developing and sustaining a continuous process of risk and crisis management at the EU level.

**4. Setting road safety targets**

A long-term policy vision and system-wide strategies need to be complemented by interim targets to raise society’s interest in road safety and guide policymaking and strategy development. International experience indicates that setting quantitative targets in road safety programs can lead to better programs, more effective use of resources, and improved road safety performance. A prerequisite for setting targets is data on injuries and fatalities and information on traffic trends.

Targets for reducing road fatalities have been set by individual countries and internationally. For example, at the intergovernmental level within OECD, the International Transport Forum (ITF), (formerly known as the European Conference of Ministers of Transport [ECMT]), unanimously adopted a target for all 43 member countries to reduce the number of road deaths by 50 percent by 2012 from 2000 levels (ECMT 2002). Monitoring procedures were set in 2004 (ECMT 2004). Data from 2006 on progress toward the target indicated that the only countries on track to achieve the target on time were Luxembourg, France, Portugal, Denmark, Netherlands, Norway, Germany and Belgium (OECD and ECMT, 2006, ITF 2008). Although this is only a handful of countries, it shows that targeted reductions can be achieved with adequate political will, institutional organization, and sufficient allocation of resources.
5. Car and road assessments

New car assessment programs (NCPs) subject new cars to crash tests and rate their performance using a “star” system. These assessments are a resource for consumers, promote safety, and motivate car manufacturers to focus on safety. They have led to substantial improvements in car design over and above legal requirements. The United States established the first NCAP in 1978; Australia followed suit in 1992 and EuroNCAP in 1996.

The International Road Assessment Program (iRAP 2008) is an international association created to develop independent safety ratings for road infrastructure. These programs are underway in Australia (AusRAP), Europe (EuroRAP), and the United States (USRAP). iRAP road safety plans in Chile, Costa Rica, Malaysia, and South Africa have identified opportunities to prevent 73,000 road deaths and injuries and save US$7 billion. Several components form the core of the iRAP approach and programs: (a) partnerships among organizations involved in making roads safe (for example, governments, automobile associations, funding agencies); (b) roads inspections using specially equipped cars, software, and trained analysts to focus on design features that influence crashes and their severity (for example, intersection design, crossing sections and markings, footpaths, bicycle lanes); (c) star ratings based on road inspection data that provide an objective measure of the level of safety that is built into roads; (d) targeted road safety plans for road improvements; (e) risk mapping to document the number of deaths and injuries on a road network; (f) performance tracking based on measuring and reporting road safety outcomes; and (g) support and capacity building of stakeholder organizations (iRAP 2008).

Coordinated policies for sustainable transport and land use. The Amsterdam Declaration of the Third High-Level Meeting on Transport, Health and Environment issued in January 2009 generated a good reference framework for action, articulating the importance of a coordinated approach to sustainable transport and land use policy. It was adopted by representatives of European countries in attendance. The declaration recognizes the opportunity provided by the current financial crisis to rethink investments in transport policies and opportunities for economic growth provided by investments in sustainable transport policies. In particular, it sets four priority goals: (a) contributing to sustainable economic development by directly investing in environment- and health-friendly transport; (b) managing more sustainable mobility by better coordinating land use and transport planning; (c) improving road safety and the infrastructure for walking and cycling; and (d) reducing emissions of transport-related greenhouse gases and noise by investing in alternative sources of transport.

6. International organizations addressing road safety in ECA (other than the World Bank)

The World Health Organization coordinates road safety issues in the United Nations system and plays a leading role by helping to integrate road safety into public health programs worldwide. The WHO uses a public health approach, combining epidemiology, prevention, and advocacy, aimed particularly at low- and middle-income countries (LMICs). The WHO objectives for road safety are to: (a) incorporate road traffic injury prevention and control into public health agendas around the world; (b) build capacity at the national and local level to monitor the magnitude, severity, and burden of road traffic injuries; and (c) promote action-oriented strategies and advocate for prevention and control of road traffic injuries.

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The United Nations Global Road Safety Collaboration (UNRSC) was established by the WHO as a follow-up to UN General Assembly Resolution A/Res/58/289 (United Nations General Assembly 2004). UNRSC members include all UN Regional Commissions, international finance agencies including the World Bank, and a number of national road safety agencies and key delivery organizations in global road safety such as the Global Road Safety Partnership (GRSP). Under the auspices of the UNRSC, World Bank, WHO, GRSP, and the Foundation for the Automobile and Society are publishing a series of good practice manuals to guide actions. To date, manuals on helmets, drinking and driving, speed management, and seatbelts have been published. Manuals on data systems and fleet management are in preparation. These manuals provide a basis for action on the key risk factors in road safety.

In 2006, a Commission for Global Road Safety, led by Lord Robertson, was created to advocate for the recommendations of the World Report on Road Traffic Injury Prevention, propose sources of funding to implement the recommendations, raise political awareness, and
make the connections between road safety and the wider
development agenda. The Commission’s 2009 report, “Make Roads Safe,” endorsed by the world’s leading road experts, recommends that:

• The UN should approve a Decade of Action for Road Safety, and governments should collectively commit to reducing the forecast 2020 level of road deaths by 50 percent (from 1.9 million to below 1 million a year). The decade would have a status similar to that of the UN’s Decade to Roll Back Malaria. Achieving the 2020 target could save up to 5 million lives and prevent 50 million serious injuries.

• During the decade, the international community should invest in a US$300 million action plan to catalyze traffic injury prevention and refocus national road safety policies and budgets.

• Interim targets and strategies should be established to promote 100 percent helmet and seatbelt use in every country by 2020, together with road safety interventions.

• The World Bank, regional development banks, and other donors should dedicate at least 10 percent of their road investment budgets to road safety and adopt a harmonized policy on dealing with road safety within their programs.

• The UN Secretary General should appoint a Special Envoy for Road Safety to raise the issue’s profile.

• Governments attending the Moscow conference are urged to support the Decade of Action for Road Safety.

The International Transport Forum, formerly the European Conference of Ministers of Transport, is an intergovernmental organization within the OECD comprising Ministers of Transport of member countries. Established in Brussels in 1953, it has 43 member countries: EU countries and the countries of Central and Eastern Europe, Russia, and Turkey. It also has seven associate member countries: Australia, Canada, Japan, Mexico, New Zealand, the Republic of Korea, and the United States. The ITF’s main objective is to provide a forum for ministers to discuss policies and set joint approaches and actions. The ECMT led the setting of international fatality reduction targets and convened important policy discussions on road safety. A Joint OECD and ITF Transport Research Center was created in January 2004 (ITF 2008).

The United Nations Economic Commission for Europe (UNECE), established in 1947, aims to promote pan-European economic integration. UNECE brings together 56 countries in the EU; non-EU countries in Western and Eastern Europe, South-East Europe, and the CIS; and North America. These countries dialogue and cooperate under UNECE’s aegis on economic and sectoral issues, including road safety.

The European Bank for Reconstruction and Development, the European Investment Bank, and the Asian Development Bank (ADB) are committed to promote and support road safety features in road infrastructure projects in ECA. For example, by adopting an integrated multisectoral approach, the ADB seeks to assist its developing country members in formulating and implementing comprehensive approaches to enhance road safety, and provides funding for such activities.

The Global Road Safety Partnership (GRSP) is a global partnership of businesses, civil society, and governments dedicated to the sustainable reduction of death and injury on the roads in developing and transition countries. By creating and strengthening links between partners, GRSP aims to increase awareness of road safety as an issue affecting all sectors of society. GRSP was established at the end of 1999 under the World Bank’s Business Partners for Development Program and now operates in 20 countries around the world.

The Foundation for the Automobile and Society is an independent, U.K.-registered charity that manages and supports an international program promoting road safety, environmental protection, and sustainable mobility, and funds specialist motor sport safety research. The foundation was established in 2001 with a US$300 million donation from the Fédération Internationale de l’Automobile (FIA), a nonprofit federation of motoring organizations and the governing body of world motor sport.

The foundation works with the UN Economic and Social Council, is a regular participant in the Working Party on Traffic Safety and the World Forum on Harmonization of Vehicle Standards at the UN Economic Commission for Europe, and is a leading participant in the UN Global Road Safety Collaboration. The foundation works with a range of international
agencies including WHO, the World Bank, and the United Nations Environment Program on road safety and environmental issues.

7. Institutional arrangements at the country level

Improving road safety requires the concerted action, participation, and support of many different stakeholders in various sectors. It is a shared responsibility of governments and citizens. It is important to designate a lead agency, with clearly defined institutional management functions, organizational arrangements, and processes, and to develop institutional capacity across a range of sectors to facilitate intersectoral coordination, backed by strong political commitment and adequate and sustainable resources (Peden and others 2004).

Institutional arrangements for road safety management in countries have evolved together with the maturation of thinking about road safety. With the sharp increases in motorization in the 1960s and deteriorating road safety conditions, road traffic safety agencies, and regulatory and management arrangements were established in many countries. In some countries, responsibilities for road safety are assigned to different levels of government. For example, in the United States, the federal government establishes national road safety goals, develops and enforces vehicle and commercial driver safety regulations, and influences actions by the states through funding and national initiatives. The states oversee and implement road safety operational programs and enact conforming state laws on important state initiatives, such as seatbelt use, vehicle inspections, speed limits, and impaired driving.

Organizational arrangements for road safety management differ across countries; having a lead agency is important. Experience indicates that better results were achieved in implementing road injury prevention strategies where a separate government agency had been created with a clear mandate and adequate budget. Examples include creation of the Swedish Road Safety Office (SRSO) in the 1960s and the U.S. National Highway Traffic Safety Administration (NHTSA) in the 1970s. NHTSA developed the first set of vehicle safety standards, and its new approach to traffic safety helped reduce road deaths and injuries. It sets and enforces safety performance standards for motor vehicles, provides grants for local road safety programs, and conducts research on traffic safety and driver behavior. Similarly, the Swedish Roads Administration has been the lead agency for road safety since 1993 in charge of well-coordinated and well-funded multisectoral interventions that have helped make Sweden a world leader in road safety with one of the lowest death rates globally (Breen, Howard, and Bliss 2008). The 2004 World Report highlighted the fundamental role of a lead agency in ensuring the effective and efficient functioning of the road safety management system. The effective delivery of core institutional management functions can be achieved with varied lead agency structural and procedural forms and no preferred model for this can be identified and promoted (Bliss and Breen, 2009).

Successful implementation of comprehensive road safety programs requires coordination under a lead agency of the multiple government entities responsible for transport, infrastructure, urban planning, health, education, and law enforcement. The main role can be assigned either to a lead ministry, a national road safety council, or a commission. In any case, the lead agency should have a clear mandate, high-level support, and sustainable funding. If a national road safety council is created to lead concerted efforts in a country, then its multidisciplinary body should be headed by a high-ranking official and supported by a permanent secretariat of road safety specialists. Sustained commitment at the highest levels is crucial for the success of such programs as was recently demonstrated in France under the leadership of President Jacques Chirac, who declared road safety as one of three top national priorities for his presidency and spearheaded a new road safety action plan with good results in decreased road traffic injuries and fatalities (Observatoire National Interministeriel de Sécurité Routière 2004).

Over the three last decades, road safety policy making was strengthened by the creation of national technical and scientific support bodies in some countries. These include the Swedish National Road and Traffic Research Institute, the United Kingdom Road Research Laboratory (now TRRL Ltd), and the Australia Road Research Board. The United States established both the National Transportation Safety Board and the Transportation Research Board. The combination of road safety institutions and scientific research has led to some major changes and innovations in the approaches adopted to improve road safety.
Members of parliaments can also be instrumental in advancing the road safety agenda. For example, in the Australian state of Victoria, political action and a report by a parliamentary committee led to the world’s first laws on the compulsory use of front seatbelts. The law came into effect in early 1971, and by the end of the year, car occupant deaths had fallen by 18 percent, and by 1975, by 26 percent (Heiman 1988). In other countries, committees in parliament monitor the performance of national road safety agencies.

Road safety management should focus on results, set goals, and assign responsibilities. Ambitious but achievable targets provide an important stimulus for developing new approaches and facilitate better implementation of road safety strategies. They need to be supported by key performance indicators. To monitor the impact of road safety measures and interventions, it is very important to have a reliable system of data collection and analysis, maintenance of a crash database, and crash investigation.

Increased institutional capacity is required to develop strategies, a policy framework, and research and interventions, and to implement road safety action plans and sustain improved performance. Laws and enforcement are also essential. Effective enforcement requires ensuring that the perceived risk of punishment for violations remains high by making the penalties sufficiently severe and enforcing them quickly and efficiently. This element of road safety requires improvement in many ECA countries.

Creating space for civil society participation helps galvanize political support on the basis of well-articulated social demands from communities that bear the burden of RTIs. A good example of a successful grassroots advocacy group is the U.S. nonprofit organization Mothers Against Drunk Driving (MADD). This organization, established in 1980, has been effective in promoting and supporting initiatives to stop drunk driving, assisting those affected by drunk driving, preventing underage drinking, and making an overall push for stricter alcohol policy (MADD 2009). For example, MADD was involved in lobbying to reduce the legal limit for blood alcohol from a blood alcohol concentration (BAC) of .10 grams per deciliter (g/dl) to .08 g/dl, which was approved by the United States Congress in 2000 and adopted by all state governments. These measures have contributed to decreasing traffic fatalities in alcohol-impaired driving crashes in the United States by nearly 10 percent, from 13,041 in 2007 to 11,773 in 2008 (NHTSA 2008). In addition, MADD efforts have helped make public attitudes more negative toward drunk driving than they were in the early 1980s. Organizations active in the ECA countries include the Red Cross national bodies.
“Our work on regional and global public goods will require close cooperation with other agencies that have specialized expertise…We also must determine the Bank Group’s comparative advantage to best focus our resources through selective, differentiated approaches. Given our specialization in working on development at the national level, our most important operating challenge will be to support countries as they determine how best to integrate public goods policies—and regional and global opportunities—into national programs. These opportunities should draw on private sector entrepreneurs and energies, too.”

– Robert Zoellick, President, The World Bank

Chapter VI. World Bank Support for Road Safety Improvements in ECA and in other Regions

With an understanding of what Europe and Central Asia (ECA) countries are doing and could do to improve road safety, it is appropriate to examine the World Bank’s road safety work, which has been underway for more than two decades. This chapter presents an overview of that work, with special emphasis on efforts in ECA and the lessons the World Bank has learned through various country projects.

1. Objectives and Scope of Action

The World Bank promotes better road safety outcomes in low- and middle-income countries (LMICs) as a global development priority. In the past, relatively modest road safety initiatives were embedded in large-scale road investment projects and were part of so-called “1st Generation” road safety improvement projects. Since 2000, the World Bank has shifted to “2nd Generation” or “Safe System” road safety improvement approaches, as components of road projects or in projects specifically dedicated to road safety.

Safe system projects emphasize government “ownership” and agency “accountability,” with a clear focus on measurable safety outcomes. Safe systems road safety projects are multisectoral and address all elements of the safety management system: institutional management functions, interventions, and targeted results. They are the foundation of a process designed to foster learning by doing and to scale-up and roll out successful initiatives incrementally across the road network.

The 2004 World Report on Road Traffic Injury Prevention, jointly produced by the World Health Organization (WHO) and the World Bank, summarized what is known about the magnitude, risk factors, and impact of road traffic injuries (RTIs) (Peden and others 2004). It provides a framework for guiding institutional efforts to support countries in preventing and lessening the impact of road crashes. The World Bank’s mission in this area is to help countries accelerate their implementation of the report’s recommendations, emphasizing building their capacity to invest in road safety and mobilizing global partnerships.

2. The Global Road Safety Facility

The Global Road Safety Facility was established in 2006 to generate funding and technical assistance for global, regional, and country-level activities to accelerate and scale-up LMIC efforts to build scientific, technological, and managerial capacity to prepare and implement cost-effective road safety programs. The facility is funded through the World Bank Development Grant Facility and funding from external donors. In partnership with its founding donors—the Fédération Internationale de l’Automobile (FIA) Foundation, the government of the Netherlands, the Swedish International Development
Cooperation Agency (SIDA), and the Australian Agency for International Development (AusAID)—the facility is seeking additional donor support to sustain funding in the longer term. During FY06–FY09 (July 2005–June 2009), the facility disbursed more than US$7 million in grants.

Beginning in 2009, the Facility is partnering with international leaders of police agencies to develop a police engagement model designed to improve the governance of road safety enforcement in LMICs. This model aims to target police chief/commissioner/executive leadership in police agencies through a global police network, RoadPol.

3. Road safety management capacity reviews in ECA countries

The World Bank has been involved in road safety management capacity reviews (RSMCRs) in ECA countries supported under the Facility. These reviews report current status and institutional arrangements and recommend strategies and action plans for short-, medium-, and long-term investment priorities. RSMCRs in ECA countries were undertaken during 2006–08 in Armenia, Bosnia and Herzegovina, Bulgaria, Kazakhstan, Montenegro, Serbia, and Ukraine. The iRAP survey in Serbia and in Montenegro was recently funded as well. A broad review was also supported in Russia in partnership with other international organizations, and the road safety performance review report launched in 2006 (ECMT, WHO EURO, World Bank, and OECD 2006).

4. Guidelines for implementing the recommendations of the 2004 World Report

The purpose of these guidelines (Bliss and Breen 2009) is to promote a safe system approach to road safety management, and specify a management and investment framework to support successful implementation of the World Report recommendations. The guidelines are a revised and expanded version of an earlier World Bank Transport Note (Bliss, 2004) and provide practical procedures designed to be applied at country level to accelerate knowledge transfer and sustainably scale up investment to improve road safety results. They have been prepared to assist country road safety professionals, World Bank and regional development staff, international consultants, community groups, private sector organizations and all other global, regional and country partners and stakeholders supporting country road safety efforts.

5. World Bank-supported road safety projects

A. Examples of transport projects in ECA

Several ongoing transport projects in ECA countries include interventions to help improve road safety. They include: (i) development of a results-based road safety strategy and pilot tests of risky road sections in Bosnia and Herzegovina; (ii) eliminating black spots in Ukraine; (iii) engineering works, consultancy services, training, and equipment projects in Georgia; (iv) technical assistance in preparing plans, campaigns, legal aspects, enforcement improvements, emergency service responses, and infrastructure improvements in Bulgaria; and (v) road safety improvements as part of the Western Europe-Western China corridor upgrade and rehabilitation project in Kazakhstan. The World Bank also has worked with the European Commission and the European Investment Bank (EIB) to establish a National Road Safety Council (NRSC) in Poland, contributing to road safety campaigns on seatbelts, alcohol and driving, speeding, safety of children and pedestrians, and technical assistance. Several of these projects are described in Box 10.

B. World Bank-supported health projects and other related initiatives

A number of World Bank-funded health sector projects have supported implementation of road-safety-related health promotion and prevention activities. These include information, education, and communication activities to reduce risky behaviors, and strengthening of emergency medical services—pre-hospital and facility-based treatment, care, and rehabilitation. They are part of larger health system reform and modernization projects, as exemplified by the Russia Health Reform Implementation Project and Chuvash Republic Subnational Lending Health Project.

Within this US$30 million project implemented during 2004–08, support was provided to strengthen emergency medical services in the Chuvash Republic and Voronezh Oblast. Investments included development of automated central dispatcher networks and communication systems, reorganized transport systems and purchase of new
Albania Transport Project. This project, which began implementation in September 2007, includes a significant component to develop and implement a results-focused Road Safety Strategy and Action Plan. The component started in October 2008 and is planned to take 16 months. It builds on the Action Plan prepared by the National Road Safety Council, and the component in the earlier Road Maintenance Project, which closed in December 2006. It involves, among other things: (a) provision of technical assistance to develop and implement a results-focused Road Safety Strategy and Action Plan, including assistance to implement changes in the primary and secondary legislation and to collect baseline survey data; (b) analysis of statistics, black spot identification, and extension of the Accident Information System; (c) undertaking a road safety inspection on the Tirana to Durrës highway, which would result in an action plan for road safety improvements and is intended to have a significant demonstration effect; (d) the provision and operational introduction of essential equipment, speed radar guns, and breathalyzers, for the Traffic Police within the Ministry of Interior; and (e) strengthening education curricula and awareness of road safety issues.

Armenia Local Roads Improvement Project. The recently approved additional financing to this project of US$1.6 million provides for implementation of the road safety program, which will include development of a road safety audit manual tailored to Armenia’s conditions to provide checklists for assessing designs and inspecting project sites throughout different phases of a road project development, including assessments of existing roads. This financing will also cover implementation of the “safe villages” pilot program, which will support rural communities in implementing road safety measures recommended by the road safety audit and the National Road Safety Strategy, which was approved by the government in August 2009. The World Bank has also secured a US$50,000 grant from the Global Road Safety Facility to support the National Road Safety Secretariat, which is charged with implementation of the strategy and action plan.

Azerbaijan Highway 2 Improvement Project. This project will finance development of a national road safety strategy and action plan.

Bosnia and Herzegovina Road Infrastructure and Safety Project. This project, begun in 2008, emanates from a 2007 road safety management capacity review (RSMCR). A US$2.6 million equivalent results-focused road safety subcomponent is implementing a road safety strategy with multisector coordination among the various ministries of the Federation and Srpska Republic. It is also helping develop the capacity of road authorities, interior ministries, the police, and the health and education sectors. Support is also given for action plans for road safety measures related to seatbelt use, speed, alcohol, and monitoring.

A US$2.5 million equivalent test pilot subcomponent aims to pilot interventions in high-risk areas. Pilots could include high-traffic, linear development section interventions, such as pedestrian safety at urban arterials. Typical interventions would be procurement of police equipment, road signs, small works implementation, user surveys, data collection, local promotion campaigns, and multisector crash investigations. If effective, these measures will be scaled to the entire road network by local authorities.

Bulgaria Road Infrastructure Rehabilitation Project. This project will (a) provide technical assistance in preparing road safety plans, public awareness campaigns, legal foundations for road safety, new enforcement approaches, and a focus on the timeliness of emergency medical services (EMSs); and (b) finance priority road safety improvements to eliminate black spots and improve areas with high traffic conflicts, and associated technical assistance.

Georgia Second East-West Highway Improvement Project. This project’s roads safety component budget of US$2.13 million funds engineering improvements addressing black spots, guardrails, and signing and marking. It is also strengthening the capacity of the Road Directorate to deal with black spots and develop new standards for road safety (signs, marking, and traffic management, among others). The project supports development of Road Safety Audit Guidelines for Georgia, training in their application, and development of a road crash database. The project also aims to strengthen the Road Safety Unit of the Roads Department.

(Continued on next page)
Two new Georgia transport operations were approved in 2009 that include road safety components: the Third East-West Highway Project and the Kakheti Regional Roads Improvement Project. These projects will test the holistic approach to traffic safety along the selected road corridors consisting not only of black spot removal, but also integrating ambulance services, police, first aid training, and other safety measures under the corridor safety management plan with the target of reducing fatalities in these corridors by 30 percent by project end.

Kazakhstan. Road safety improvements are part of the Western Europe-Western China corridor upgrade and rehabilitation project.

Poland Third Road Maintenance and Rehabilitation Project. This World Bank support builds on the success of two previous road project safety components under the National Road Safety Council (NRSC). The project supports road safety campaigns on alcohol and drunk driving, speeding, and child and pedestrian safety. It also finances technical assistance to the NRSC Secretariat and contributes to the program of road safety initiatives co-financed by the European Commission and the European Investment Bank.

Serbia Corridor X Highway Project. This project is expected to become effective in late 2009 and involves a substantial road safety component, building on the earlier Road Safety Management Capacity Review (conducted in 2007) and the International Road Assessment Program (iRAP) survey of a sample of primary and secondary roads, conducted with the support of the GRSF in Serbia in 2008. A new Road Safety Law (RSL) was adopted by the Serbian Parliament on 29 May 2009, the first major legislative update since the 1980s, and incorporates many aspects of the acquis communautaire (the body of law of the European Union). The new law, which comes into force in December 2009 to allow time to complete the necessary secondary legislation, envisions the establishment of a new state multisectoral coordinating body, the National Road Safety Council, to bring together the key government stakeholders. The component in the project will support plans for: (a) road safety capacity building to support the establishment of the National Road Safety Council (NRSC) as lead agency; (b) creation of a road safety performance framework; (c) development and launching of a results-focused national road safety strategy; (d) preparation and piloting of two multisectoral road safety pilots; and (e) procurement and establishment of a road safety database and other road safety equipment.

Ukraine Roads and Safety Improvement Project. This project aims to support the government’s efforts in collaboration with the European Union. It includes a road safety component to remove 110 black spots. Measures will eliminate or reduce road safety hazards at intersections; install guardrails and modern crash barriers, and so forth; and make pedestrian crossings safer.

Sources: Elaboration of authors on the basis of World Bank documentation.

ambulances, development of guidelines and protocols for trauma care, and training of paramedics and medical personnel on basic and advanced life support systems. These investments complemented government health promotion efforts to: (i) improve the legal framework for and enforcement of crash-minimizing regulations; (ii) develop information, education, and communication about risky behaviors; and (iii) strengthen anti-alcohol-abuse programs. In 2009, under subnational lending arrangements, a follow-on loan of US$7 million to the Chuvash Republic is funding the rehabilitation and strengthening of trauma services at ambulatory facilities and hospitals.

The conference “Meeting the Challenge of Non-communicable Diseases and Injuries (NCDI) in the Commonwealth of Independent States (CIS) Countries,” which was jointly organized by WHO-EURO and the World Bank and hosted by the Russian Government, on 30–31 October 2007 in Moscow, is a good example of a multisectoral approach that could be followed to support regional efforts to tackle RTIs as part of a broader
initiative to address non-communicable conditions in ECA (WHO-EURO and World Bank 2007). The conference was attended by high-level representatives from ministries of health, finance, and transport and from the parliaments of Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyz Republic, Moldova, Tajikistan, Turkmenistan, Russian Federation, Ukraine, and Uzbekistan, and observers from the Baltic countries, Mongolia, Romania, and leading international organizations. The conference stressed the gravity and urgency of the NCDI situation and the need to adopt a multisectoral approach to deal with it as a top development priority, because these conditions are the leading causes of premature death, ill health, and disability.

C. World Bank support outside ECA: Selected examples

There is a broad regional program in the Latin America and the Caribbean (LAC) Region. Work in urban transport reform—carried out and supported in Argentina, Brazil, Colombia, Mexico, Peru, and other countries—is improving safety with dedicated bus lanes, safer access to transport, and the removal of unsafe or inefficient public transportation vehicles from the roads (Cox 2009).

Recent work in Argentina and Peru in key road corridors targets road curvature, road signs, and facilities for pedestrians. These programs will also tackle regulatory issues, such as licensing of drivers and vehicles.

The World Bank is also moving toward preparing multisectoral road safety projects in demonstration corridors in LAC where infrastructure improvements along with enhanced enforcement are deployed. Collaboration with the health sector will enhance emergency response mechanisms along the demonstration corridor.

Box 11: Vietnam’s Safe System Road Safety Improvement Project

With a population of 83.6 million and a GDP of US$52.8 billion, Vietnam is experiencing increasing industrialization, urbanization, and motorization. Road traffic fatalities soared from 4,907 in 1994 to 11,534 in 2005. Initial public sector efforts to reduce accident rates through drivers’ licensing, vehicle inspections, and registrations had limited impact.

Risk factors include non-use of helmets by two-wheeler users, speed, poor road conditions, traffic mix, alcohol use, and poor visibility of road users. Many partners, including the World Health Organization (WHO), are collaborating with the Ministries of Health and Transport to improve the situation. For example, the Traffic Injury Prevention Project, supported by Bloomberg Philanthropies, WHO, and other partners, focuses on helmet use and drunk driving.

The Bank supports a stand-alone road safety project specifically designed to reduce the rate of crashes, injury, and death associated with road transport, through physical improvement works and institutional development to strengthen the management of road transport safety (World Bank 2005b).

The first component, an institutional and capacity-building program (US$7.8 million), provides technical assistance to (a) strengthen the management and technical capacity of the National Traffic Safety Committee (NTSC) Executive Office and the Traffic Safety Project Management Unit, and (b) prepare a national road safety strategy. The second component, a road safety demonstration and awareness program (US$20.9 million), assists the government in developing and implementing safety programs, including enhancing road safety auditing processes and funding black spot treatments for three high-risk road demonstration corridors. It is also implementing a program of road user education, traffic safety enforcement, and emergency services preparedness (materials, equipment, and training) along these corridors. The third component, a road safety monitoring and evaluation program (US$6.2 million), supports development of a national road crash database system for the Vietnam Road Administration to identify and treat black spots, and a program of the Ministry of Public Safety to improve enforcement strategies.

ment and institutional development to strengthen the management of road transport safety (Box 11). Useful lessons from this project could be adapted to help each ECA country address its unique challenges.

D. Lessons learned from World Bank-funded programs

A review of worldwide experiences as well as World Bank-supported country programs in different regions revealed several challenges that may be relevant for work in the ECA Region (World Bank 2008b, 2009b, Bliss and Breen 2009).

A key challenge concerns the need to strengthen countries’ institutional capacity and governance for road safety, including aspects of accountability and transparency, and to improve institutional arrangements to facilitate multisectoral and multi-jurisdictional interventions in order to implement the actions proposed by national programs. A key limitation is the common failure to link action plans to (i) specific, measurable outcomes to be achieved; or (ii) investment/funding flows. Also, action plans often fail to identify the risks associated with multisectoral and multi-jurisdictional interventions, to propose measures to lower the risks or factor in other weaknesses, for example, in the enforcement system. Thus, moving forward on the ECA road safety agenda will require concentrating on the following challenges:

Moving away from ineffective plans. There has been a tendency for past technical assistance support provided to LMICs to prepare national action plans which simply detail the interventions that should be made to reduce road deaths and injuries with little consideration given to the institutional capacity and funding needed to deliver them. This is neither appropriate nor effective. Countries are becoming more sensitized to the road safety problems they must address, aware that they must improve the safety of road infrastructure, vehicles and emergency medical response services, as well as road user behavior, and are now seeking advice on how to do it. This underscores the emphasis on mobilizing financial and human resources for capacity strengthening, as country priorities are becoming more focused on building sustainable management systems and related financing functions.

Creating political commitment to strive for quantified results. Building on both positive and negative lessons learned from international experiences, national target programs should be developed and approved that will reduce the number of road deaths over a defined period. Current country programs must be seen as the first phase of a long-term (20-to-30 year) strategy. A first step would be establishing the business-planning processes, financial management, and performance-monitoring systems needed to support such a plan. Important limitations are the lack of methods for setting priorities and of an effective monitoring and evaluation framework. The first action phase should develop a consensus among key stakeholders and commitment at the highest political level to support progress. A national agency must coordinate the multisectoral response.

Increasing inter-institutional coordination and accountability. The most challenging aspect of the road safety problem in most World Bank-supported countries is the need to foster inter-institutional and multi-jurisdictional interventions among the agencies responsible for delivering and overseeing road safety policies and programs. This challenge is more acute in federal countries with different levels of government. The complex division of responsibilities for road safety among these levels results in blurred lines of accountability and failure to monitor results. These shortcomings lead to fragmented delivery and diffused accountability. The country agencies need to build their institutional capacity, financial resources, and skills to ensure sound coordination of the various actors, to enable them to lead strategic investments and interventions, achieve measurable results in the short term, and gain credibility by coordinating interventions across sectoral jurisdictions, including different levels of government, the private sector, and nongovernmental organizations. Issues that are difficult to address but cannot be ignored are good governance of the law enforcement system and widespread corruption of the road police. Any effective program would have to confront this disturbing reality head-on because in many countries it plays an important role in the lack of progress made in improving road safety.

Strengthening national capacity. Low- and middle-income countries (LMICs) need investments in a cadre of road safety practitioners from different disciplines: policymakers, police, public health providers, and engineers. Educational curriculums could be tailored for ECA countries to support specialized training at universities and institutes of higher learning for these practitioners, and providers of continuous professional development should be encouraged to adopt such curriculums.
Identifying a large-scale pilot project along high-risk corridors and in urban areas to demonstrate the adaptation and transfer of international best practice offers promise for building national capacity. These opportunities for improving training and knowledge among practitioners should be seized.

Building a culture of safe road use and design. Over 60 percent of crashes are attributed to driver and pedestrian behavior. Educational programs targeting students and media campaigns targeting drivers and pedestrians are needed alongside strict enforcement. In addition, safer road infrastructure must be targeted through programs such as road safety audits and adoption of standards that promote safe road design. Enforcement and good governance are critical features of a culture of road safety, and this is particularly important in many ECA countries where they are believed to be less than optimal (WHO 2009a).

Strengthening data collection systems to improve decision making, program management, and impact evaluation. Efficient systems for collecting, managing, and analyzing crash data and providing feedback must be developed to correct ineffective programs. Such strengthening must be done at different levels of government, with sufficient financial resources and appropriate coordination of responsibilities.
“Nowadays, a Minister of Health cannot consider his or her job done simply by looking at the health care system. It’s not enough to have a health policy, you need healthy policies elsewhere. We need to redefine health not as a specialized sector with doctors and nurses, but as a social objective. You need strong policies for empowering women, for promoting a fair justice system that brings perpetrators of violence to justice, and—in the case of accidental injury—for safe roads.”

– Julio Frenk, Former Health Secretary of Mexico and current Dean of the Harvard School of Public Health

Chapter VII. Priorities for Intersectoral Work on Road Safety in ECA

International good practice suggests effective RTIs prevention in ECA countries would need to be implemented systematically over the short and medium terms, with a high level of committed political support and funding under the stewardship of a lead agency to ensure sustainability, tailored to the individual circumstances of each country, sequencing the interventions over time, and in accordance with consistent and harmonized policies and strategies across sectors and disciplines. Building on that knowledge, this chapter outlines broad strategic themes to use to set priorities for moving the road safety agenda forward in ECA.

1. Implementing the recommendations of the 2004 World Report: What needs to be done?

The findings in this landmark report (Peden and others 2004) led to six over-arching recommendations that set out the strategic initiatives necessary to improve country road safety performance:

- Identify a lead agency in government to guide the national road safety effort.
- Assess the problems, policies and institutional settings relating to road traffic injury and the capacity for road traffic injury prevention in each country.
- Prepare a national road safety strategy and plan of action.
- Allocate financial and human resources.
- Implement specific actions to prevent road traffic crashes, minimize injuries and their consequences, and evaluate the impact of these actions.
- Support the development of national capacity and international cooperation.

Implementing these recommendations at country level requires capacity building to create the resources and tools necessary for target initiatives on a scale capable of reducing road deaths and injuries significantly and sustainably. Also, it requires an integrated framework that treats the recommendations of the World Report as a totality and ensures that institutional strengthening initiatives are properly sequenced and adjusted to the absorptive and learning capacity of the country concerned (Bliss and Breen 2009).

A systematic response is needed. Managing for improved road safety results at the country level must address three inter-related elements of the road safety management system: institutional management functions, interventions, and results. Institutional management functions and specifically the role of the lead agency are of prime importance. Addressing interventions alone will not suffice.
2. Building institutional management functions

A. Strengthen political commitment, funding, and institutional capacity for road safety

The first and most important factor in improving road safety is government recognition of the problem, followed by commitment and champions at the highest political levels. These need to be converted into sustainable institutional and funding arrangements under a lead agency in charge of coordinating the different sectoral efforts. In addition, as the 2004 World Report argues, multisectoral, high-level planning is a cornerstone of effective governance for crash prevention. Planning is essential to ensure effective implementation, and also to engage the various sectors to set priorities and prepare to work collaboratively. Many countries have begun such planning but restricted it to a few sectors, organizing efforts vertically and failing to exploit the full potential of intersectoral engagement. In particular, the potential contributions of the health sector tend to be overlooked. National road safety committees or bodies operating as a lead agency with strong political leverage and well-defined institutional management functions and organizational arrangements can advance the agenda, coordinating effort horizontally across sectors and vertically to involve different levels of government, as well as civil society. A recent review identified countries with functioning national road safety bodies that could make stronger multisectoral investments in safety. Unfortunately, these committees tend to lack technical capacity, and vertical organization and difficulties in working across sectors compound the problem.

Specific actions. Political commitment and institutional and governance reforms for national road traffic injury (RTI) prevention policies must be supported by assertive advocacy and creation of institutional and technical capacity to lead and sustain reform. Capacity building must occur at all decision-making levels and during implementation of policy reforms. The main actions for capacity building include:

- Conducting short courses targeting senior policymakers at national and subnational levels specifically tailored to expose policymakers to: (i) the nature and characteristics of the problem; (ii) alternative evidence-based options to address the problem, including alternative funding arrangements; (iii) resource allocation mechanisms to target priority areas; and (iv) different governance models and policy options for safer roads. The courses would leverage consensus building to strengthen capacity for intersectoral work and promote discussion of safety among the different sectors. Adapted to national and local needs, such courses could bring together participants from different countries to promote and facilitate exchanges during different stages of road safety development.

- Conducting workshops for executive managers from different sectors to strengthen their knowledge and skills related to road safety, and facilitate their role in ensuring that policy reforms are implemented. Workshops should be interactive and include national case studies that apply knowledge and skills to real scenarios. If designed well, the training exercises would contribute to actual planning. Subregional workshops involving countries that share similar policy structures and issues (for example, rapid development of motorization) should be considered in order to stimulate exchange of knowledge and experiences. Study tours and exchanges could be organized and mentoring encouraged.

- Leveraging existing networks of focal persons for road safety. Further investment is needed to build capacity in the networks that have responsibility for road safety. Sectoral ministry focal persons for injury prevention and for road safety in almost every ECA country participate on multisectoral teams with a road safety mandate. These regional networks are a conduit for transmitting and implementing evidence-based practices and policies. Investment should be made in the capacity of these networks to implement evidence-based actions. To maximize adaptation and transfer of best practices, regional networks of trainers should be developed to exchange expertise and knowledge on how to build capacity in road safety across the disciplines.

- Courses for practitioners from the health, transport, and justice sectors should support the deployment of national policies and the sharing of objectives and understanding of the roles and responsibilities of different sectors. A critical mass must be developed in each target country, achievable by mainstreaming the curriculums in the higher professional training of health and other frontline staff (for example, traffic police and road safety engineers). Such capacity build-
ing should be designed to meet the specific needs of each country. Curriculums that advocate the use of evidence-based safety programs include WHO’s TEACH-VIP (WHO 2007) and the Road Traffic Injury Prevention: Training Manual, available in Russian.

B. Enhance nationwide RTI information systems

Datasets are a foundation for measuring a problem and enabling rigorous program evaluation. RTI information systems vary in quality, and poor systems result in underestimates of the problem and leave program managers unable to pinpoint risks and evaluate the effectiveness of preventive interventions. In addition, mortality and injury rates in some countries may reflect underreporting, especially in the Central Asian republics, the Caucasus countries, and some countries in the Balkans region. Some countries may under-register deaths by as much as 20 percent. Many countries have not yet adopted the standard definition of a road traffic death as one that occurs within 30 days of a crash (rather than on the scene, within 24 hours, or within 7 days, as in some ECA countries; these definitions underestimate mortality). Problems related to validity and reliability of non-fatal injury data also result in underestimates. Reliance on traffic police information systems can lead to underestimates of almost 50 percent. Data on blood alcohol concentrations (BACs) and road crashes should be more reliable and could be collected at emergency departments and linked to brief physician advice interventions.

Specific actions. Nationwide road crash monitoring and analysis tools should be developed. These tools should integrate data from health and traffic police information systems. Health information systems should capture data on the causes, risks, extent, and consequences of injuries so they can be mapped. The WHO injury surveillance guidelines describe a methodology that includes information on external cause coding and risk factors. This template should be adapted and used to include a module on injury surveillance in electronic health information systems in ECA countries. This information must be readily accessible to be used meaningfully for planning and evaluation and to share with civil society. There is a need to share anonymized data describing levels of fatal and nonfatal road traffic injuries across sectors to improve the completeness and reliability of data and target and evaluate interventions. A major information need is to better delineate fatal and non-fatal RTIs by risk factor (the study by Chisholm and Naci 2008 tried to isolate the fraction of total RTIs attributable to a sample of risk factors (speeding, alcohol, not wearing a helmet or seatbelt) but this is just a subset of the relevant risk factors. Interactions between risk factors are a major challenge— for example, being under the influence of alcohol increases the chance of excessive speed and not wearing a seatbelt. This is a priority for more information and research in the years ahead in ECA— without a good understanding of the underlying distribution of risk exposure, it is difficult to target effective responses appropriately.

It is important to acquiring better knowledge and understanding of the joint nature of RTI risk exposure and intervention effectiveness. One of the key conclusions of recent research (Chisholm and Naci 2008) is that major synergies can be obtained in the costs of enforcement strategies, which makes combined interventions increasingly cost-effective. But this needs to be complemented by compiling better evidence on effectiveness.

C. Support national policy reform by undertaking national road safety management capacity reviews and specifying lead agency reforms, investment strategies and safe system projects

National policy reform for RTI prevention should be based on a reliable assessment of the current road safety situation. This needs to be supported by accurate information from different sectors, both governmental and private, regarding the magnitude of problems, risk factors, the groups at risk, existing policy frameworks, institutional arrangements, and roles and capacities.

Specific actions. National road safety management capacity reviews should be undertaken in targeted ECA countries with a view to contributing to national road safety planning and policy reforms. World Bank guidelines provide a comprehensive framework and checklists for conducting such reviews (Bliss and Breen 2009). Different stakeholders from transport, justice/interior, health, insurance, nongovernmental organizations, and international agencies need to be engaged in these reviews. The reviews would identify priority areas for lead agency reform and related institutional strengthening, and specify long-term investment strategies and
related safe system projects to implement the strategies. Stock should be taken of existing national policy. Essential baseline information has already been collected in many ECA countries but should be enhanced. The contribution of international experts would be invaluable in conducting such reviews. Data collected would contribute to the development of national road safety strategies and related action plans. The plans would: (i) address road safety across the board, identify at-risk groups, major risk factors, and exposures; and (ii) propose comprehensive strategies and evidence-based actions in targeted high-risk corridors and areas to tackle them in a staged learning by doing process. Targets should be realistic, with sufficient budgets for activities allocated to the different stakeholders concerned with implementation. Interim indicators would need to be measured using a rigorous evaluation framework to ensure that actors were implementing programs. These initiatives should be developed in tandem with transport, land use, and urban policies.

3. Focus on results

In managing for improved road safety results, the foremost and pivotal institutional management function is results focus (Bliss and Breen 2009). All the other institutional management functions are subordinate to this function and contribute to its achievement. In the absence of a clear focus on results all other institutional functions and related interventions lack cohesion and direction and the efficiency and effectiveness of safety initiatives can be undermined. There would be great potential benefits from a rapid shift by ECA countries to a safe system approach with a results focus which aims to eliminate road deaths and serious injuries. A safe system approach would be well attuned to the high priority global, regional and country development goals of sustainability, harmonization and inclusiveness. Its focus on safer and reduced speeds harmonizes with efforts to reduce local air pollution, greenhouse gases and energy consumption. And its priority to protecting all road users is inclusive of the most vulnerable at-risk groups such as pedestrians, young and old, cyclists and motorcyclists. These co-benefits of shifting to a safe system approach further strengthen the business case for its implementation.

To achieve desired results, interventions need to concentrate on safe planning design, operation and use of the road network, the conditions under which vehicles and road users can safely use it, and the safe recovery and rehabilitation of crash victims, and set specific standards, rules and enforcement mechanisms to achieve these aims.

A. Safe planning design of the road network

Road safety needs to be integrated in all phases of planning, design, and operation of road infrastructure.

Specific actions. At the planning stage, before project approval, strategic comparative analysis of substantial changes and new construction need to be conducted to examine the network’s safety performance. The purpose is to know the implication for road safety of different alternatives to ensure that road safety is weighed carefully in decisions. Safety rating tools can be used to achieve this. Road safety audits complement these assessments. These are independent, detailed, systematic, and technical exercises that focus on the design characteristics of a road infrastructure project. They cover all stages from planning to early operation in order to identify and detail any unsafe features of a project. In addition, reviews of high road traffic crash concentration sections need to be undertaken. As noted earlier, these reviews examine sections of the road network in use for more than three years where large proportions of crashes have occurred. They identify, analyze, and classify parts of the network according to their potential for safety development and crash cost savings. This helps target investments to road sections with the highest crash concentrations and/or the highest crash reduction potential.

B. Address excessive speeding, particularly in urban areas

Urban speed limits in most ECA countries are 60 kilometers per hour (kph), and speed enforcement is ineffective in many. This puts pedestrians and bicyclists at high risk. Many interventions have proved effective in reducing speeding with associated reductions in road traffic mortality.

Specific actions. Road safety plans must call for legislation lowering most speed limits to 50 km/h and to 30 km/h in residential areas. Effective implementation combines publicity, road design, engineering, and enforcement measures, such as speed cameras and penalty point systems. Many ECA countries do not use speed cameras
for enforcement and the legal framework (for example, fines for speeders), capacity and equipment would need to be established. Well-publicized, area-wide speed camera operations are cost-effective in reducing speed.

**C. Implement drunk-driving and broader alcohol control policies**

**Driving under the influence of alcohol affects all groups, but male, youth, and novice drivers are at highest risk.** Most ECA countries set BAC limits for drivers in accordance with international norms, but enforcement needs to be significantly improved to prevent alcohol-related road traffic fatalities.

**Specific actions.** There is good evidence on what works to prevent drunk driving. A BAC level of 0.05 grams per deciliter (g/dl) is sensible paired with a limit of 0.02 milligrams per deciliter (mg/dl) for novice and young drivers; however, cultural factors in some countries may preclude these low limits. Many countries need legislation allowing mandatory BAC and evidential roadside alcohol breath testing and high-visibility random road checks for alcohol. These are more effective if accompanied by high-profile media campaigns. Systematic police enforcement with severe penalties for offenders is paramount and should be well publicized. A swift and efficient execution of penalties of adequate severity is needed to deter risky behavior. Brief counseling interventions in emergency wards reduce alcohol-related injuries. Road safety plans need to address legislative, capacity, and implementation issues. Broader alcohol control policies, such as taxation, licensing hours, legal age limits, training for bar staff, providing nighttime public transport, and preventing alcohol sales near highway exit ramps would help reduce alcohol-related crashes, as well as violence and acute and chronic alcohol-induced disease, major causes of premature mortality in ECA countries.

**D. Increase seatbelt use**

**Studies indicate that seatbelt use halves the risk of fatal injury in car crashes.** Levels of front and rear seatbelt use are low in most ECA countries, and compliance must be raised. Few reliable surveys exist to guide future enforcement activities. The problem is compounded by the high volume of old cars that lack rear seatbelts.

**Specific actions.** Enforcement combined with publicity campaigns, shown to be cost-effective in European Union (EU) countries, should be undertaken in most ECA countries. A penalty system would be an effective deterrent. Audible and visual seatbelt reminders in new cars should be a minimum safety standard. Car restraint specifications need to match the latest EU safety standards, and the health sector could help by implementing community-based car restraint loan programs through obstetric and midwifery services. Occasional surveys should measure levels of seatbelt and car restraint use to determine compliance levels. Police should record whether seatbelts were worn at the time of crashes.

**E. Reduce young driver risk and protect pedestrians**

Young drivers and pedestrians are disproportionately affected by crashes. Graduated licensing schemes and extended training are effective in reducing deaths among young drivers. Pedestrians’ risk can be lowered through better infrastructure and lower speeds in urban areas (safe and frequent crossings, safe underpasses, pavements and lightening, traffic calming, and low speeds in residential areas).

**Specific actions.** Reduced young driver risk can be achieved through graduated licensing schemes and extended training programs during the learner period. Document and increase awareness of pedestrian vulnerability, and improve vocational and academic training to address the perception that pedestrians cause crashes; require the development and/or rehabilitation/improvement of infrastructure for pedestrians as a systematic requirement of any transport infrastructure intervention; pilot-test traffic-calming schemes in residential areas and near attractors of large numbers of pedestrians (for example, schools, playgrounds, health care facilities, and public transportation stations). Implement projects that increase the inherent safety of trips, such as “safe routes to school.” Separate pedestrians from high-speed traffic and create more pedestrian facilities.

**F. Develop high-quality emergency medical systems as part of health system reform and improvement efforts**

Rapid response and high-quality emergency pre-hospital and hospital care require readiness and a coordinated response by emergency services. Appropriate and timely management of victims is critical to outcomes. Little information is available on the quality and organization of emergency services in many ECA countries, and
injury severity scales, essential for evaluation, are seldom used. European literature suggests that about 50 percent of deaths occur at the scene, about 15 percent in the first four hours after a crash, and about 35 percent thereafter. Opportunities are available in ECA countries to influence the chain of events based on evidence and evaluation of emergency care.

**Specific actions.** Collect data on coverage and response times of emergency services to identify gaps and measure such times, which may be overlong, especially in rural areas. Injury surveillance systems based on the WHO Injury Surveillance Guidelines must be strengthened so that preventive programs and service quality can be evaluated. Optimize the organization of emergency care, and retrain staff, especially in rural areas, in emergency care. Training materials, protocols, and guidelines—WHO’s Essential Trauma Care Guidelines, Pre-hospital Trauma Care Systems, and Guidelines for Trauma Quality Improvement Programs—can be adapted to local needs based on the Advanced Trauma Life Support training course.

**G. Put road safety at the center of sustainable transport policies**

Road safety needs to be reframed as an attribute of transport, along with other performance indicators. If road safety is seen as separate from the other “performance attributes” of transport systems, it is more difficult to also “judge” the performance of transport in terms of safety, and ministries of infrastructure/transport will be “rewarded” more for kilometers of new roads than for road capacity to protect life. Also, recent research indicates that improving transportation options (for example, better walking and cycling conditions, and improved ride sharing and public transport services) could reduce car collision frequency by 14 percent (total) and 15 (severe) (Lovegrove and Litman, 2008).

**Specific actions.** Integrate RTI prevention into policies for sustainable transport. This will be assisted by increased use of cost-effectiveness analysis of sustainable transport and safety interventions that emphasize benefits across a range of sectors. Take advantage of the commitment to and investments in policies to reduce greenhouse gases to develop the evidence and advocate for policies that provide health “co-benefits,” including road safety improvements.

**4. Design demonstration projects**

As discussed in detail in Chapter VII, well-designed demonstration projects can support the process of catching up with best practice in road safety performance and are an essential part of building capacity. They can provide useful benchmarks for rolling out a modern road safety program in the rest of the country with the support from donors and international finance organizations.

**Specific actions.** Opportunities should be pursued for demonstration projects in urban areas and high-risk corridors, including road infrastructure improvements. These should be multisectoral and well resourced and use international expertise to promote the transfer of best practice. Demonstration projects should be part of the process of building national capacity through enhancing the knowledge and skills of professionals. These projects require careful evaluation and monitoring using appropriate methodologies and tools.
“Cowardice asks the question – Is it safe? Expedience asks the question – Is it politic? Vanity asks the question – Is it popular? But conscience asks the question – Is it right? And there comes a time when one must take the position that is neither safe, nor politic, nor popular, but one must take it because it is right.”

– Martin Luther King, Nobel Peace Prize Laureate, 1964

“All multilateral development banks (MDB’s) are committed to taking a leading role to address what is becoming one of the most significant public health development priorities of the early 21st century.”


Chapter VIII. The Task Ahead: Operationalizing an Effective Response in ECA

1. Framework for action: World Bank future engagement on road safety

Drawing from lessons worldwide, the following key considerations have been offered to guide World Bank efforts on road safety, working in partnership with governments, international agencies, private sector entities, and civil society organizations (Saghir 2009):

- The scale of the public health crisis from road traffic fatalities in low- and middle-income countries (LMICs) is unacceptable.

- Commitment is needed to implementing road safety measures that are: (a) sustainable, which requires proper sequencing and a long-term commitment that is systematic and at scale; (b) integrated, which requires multisectoral and multidisciplinary engagement to focus on the varied, related dimensions of the phenomenon: urbanization, increasing wealth, demographic maturation, poor behaviors, insufficient (sometimes corrupted) resources, human frailty, and perhaps a host of other variables; and (c) inclusive, which takes into account country development objectives and recognizes that the poor and those thrust into poverty by road crashes have rights that deserve protection.

2. Options to support ECA countries in improving road safety

The World Bank, working with other international partners, could support ECA governments in the selection, design, and implementation of safe system programs to reduce road crash fatalities during 2010–16. It should also be clear, as noted, that some ECA countries, as members of the EU, have the opportunity to deal with the RTI challenge through that membership. And, since the opportunity it affords may be different from that of non-EU ECA countries, the support that could be provided by the World Bank should follow a tailored approach.

On the basis of priorities set by ECA governments and taking into account the individual circumstances of each country, the World Bank could structure an assistance program that takes into account evidence-based, cost-effective approaches and international best practices, evi
dence from modeling exercises based on assumptions and extrapolation of the impact of different interventions for improving road safety, and available economic evidence on the basis of which to advocate for greater investment in certain road safety initiatives. Following the recently-issued guidelines for implementing the recommendations of the World Report (Bliss and Breen 2009), programs could concentrate on the following areas:

A. Capacity review. A safety management capacity review is a vital first step in the process of a country taking the necessary actions to tailor the World Report recommendations to its unique circumstances, and in determining its readiness to commit to the steps needed to improve its road safety outcomes. It also serves to identify related institutional responsibilities and accountabilities and provides a platform to reach an official consensus on country capacity weaknesses and how best to overcome them.

B. Role of lead agency. The World Report highlights the fundamental role of the lead agency in ensuring the effective and efficient functioning of the road safety management system. Responsible and accountable road safety leadership at country, state, provincial and city levels is vital to success. In the absence of such leadership with a sustained focus on results, improvements, for example, in program coordination, decentralization and promotion will often be elusive and unsustainable. Likewise, action plans prepared without a designated agency mandated to lead their implementation and a realistic and sustainable funding base are likely to remain paper plans and make no positive impact on results.

C. Staged investment. Countries wishing to improve their road safety performance must be well organized to manage the achievement of improved results in a systematic way. Institutional management functions must take the highest priority as they are the foundation on which road safety management systems are built: they produce the interventions that achieve the desired results. In practice, the process of institutional strengthening must be staged. During the formative stages emphasis must be put on improving the focus on results and related interagency coordination. As these institutional management functions become more effective the remaining management functions are in turn strengthened.

D. Learning by doing. Sustained long-term investment is the key to improving country road safety results. This requires staged investments that address revealed capacity weaknesses by first building core capacity to achieve targeted safety outcomes, then scaling up investment to accelerate this capacity strengthening and the achievement of improved results across the national road network. Building upon the findings of the country capacity review, investments must be grounded in a learning by doing process, with sufficient targeted investment to overcome the barriers presented by weak institutional capacity.

One way to operationalize this approach will be to support the design and implementation of demonstration projects which aim to anchor country capacity building efforts in systematic, measurable and accountable investment programs that simultaneously build management capacity while rapidly achieving safety improvements in targeted high-risk corridors and areas.

These demonstration projects could be located in distinct geographic areas where road safety issues vary in nature: (i) in a densely populated urban area within a major city, for example, Baku, Kiev, Moscow, St. Petersburg, and Tbilisi; and (ii) along a high-speed and highly trafficked highway, for example, Moscow-St. Petersburg, or any other with a high rate of road crashes. Particular attention could be devoted to exploring links and synergies with transport policy options to mitigate the effects of climate change through reduced greenhouse gas emissions, since such attention garners additional support for policies to reduce speeding and a modal shift toward safer, cleaner transport modes. In addition, this is an important area for synergy with other health policies and programs, and with other international agencies and donors.

The objective of the demonstration projects would be to: (i) field-test a road safety improvement strategy that implements a combination of preventive safety engineering measures and adoption of legal and regulatory measures to reduce urban speed limits to 50 km/h; and (ii) encourage local authorities to impose 30 km/h limits in highly populated areas and to strictly enforce key safety behaviors concerning speed, seatbelts, and alcohol, supported by high-
intensity public education campaigns and strengthened emergency medical care services. Combined with the development of lead agency capacity to operate a continuous, detailed monitoring and evaluation system, the demonstration project would generate benchmark performance measures. This would allow successful interventions to be extended to the rest of the country within a reasonable time frame, for example, five years. In some countries, this effort would also require a clearer distinction of what is possible at local, regional, and national levels and the respective responsibilities and related policy options and interventions, particularly since the World Bank is starting to work at the subnational level.

3. **Building blocks**

A list of building blocks that could be used for structuring safe system programs supported by the World Bank is presented in Table 10.

<table>
<thead>
<tr>
<th>Area of intervention</th>
<th>Investments and actions</th>
</tr>
</thead>
</table>
| 1. Institutional capacity building. | Technical assistance and related investments for the establishment, organization and strengthening of management and operational capacity of a lead agency for road safety, resourcing it adequately, and making it publicly accountable.
Training programs for policymakers, executive managers, road engineers, health practitioners, traffic police officers, and other officials involved in management and design of road safety programs and implementation of road safety programs. |
| 3. Road environment: support of interventions to create a safer road environment. | Infrastructure investments to improve safety in demonstration road corridors and beyond, such as guardrails, signaling and marking, and reengineering of most critical crossroads in selected urban areas. Technical assistance for undertaking network safety rating surveys and road safety audits and inspections. |
| 4. Road safety enforcement: equipment and training traffic police to deter risky behavior. | Acquisition of radar equipment, speed cameras, and breath analyzers combined with roadside checks to control and monitor speed, alcohol, and seatbelt use. |
| 5. Public information and education campaigns and programs on road safety. | Technical assistance and funding for the development of public information, education and communication programs to support the enforcement of laws and regulations for speed-control, use of seatbelts, and deterring drinking and driving. |
| 6. Support for improvements of health promotion and prevention programs, emergency medical services, and rehabilitation services. | As part of health system reforms and modernization efforts, technical assistance for strengthening public health programs, national and regional road safety strategies and organizational arrangements for first aid emergency responses; funding for procurement of ambulances, medical equipment and other inputs; training of medical personnel on basic and advanced life support systems; communication systems investments, including centralized dispatchers and global positioning systems (GPSs); and technical assistance and investments for developing/strengthening of trauma centers, safe blood transfusion services, and rehabilitation programs. |
| 7. Monitoring and evaluation. | Investments for development of computerized information systems to support data collection, assessment and sharing of information for decision-making and program management across sectors. |
4. Partnership arrangements with international agencies at the country, regional, and global levels

The World Bank could bring the best international approaches to road safety improvement to work alongside ECA peers. In particular, partnership arrangements in ECA could be established with the International Road Assessment Program (iRAP) to address engineering safety issues, and with RoadPOL to offer peer-to-peer services to traffic police in countries where the World Bank works. In the case of RoadPOL, a law enforcement advisory panel of international police leaders of the highest rank has been established as its governing body. The World Bank-developed RoadPOL model could be piloted as part of World Bank support in a selected major road corridor in ECA. A pilot could engage best practice road-policing support, with iRAP providing best practice safety engineering services. Similar capacity-building initiatives in the area of data development, working with the International Road Traffic Accident Database Group, could also be supported.

The World Bank could establish partnerships with and mobilize the technical cooperation of other specialized agencies, such as the World Health Organization (WHO), to contribute to capacity building to complement other initiatives to improve road safety. Developing institutional and technical capacity by working with concerned policymakers and practitioners from multiple sectors is essential in taking concerted action, and will achieve synergies with other initiatives. Ample evidence demonstrating the cost-effectiveness of interventions should be disseminated to help create a culture of safety among key road safety practitioners and policymakers. WHO, for example, could provide training to promote traffic injury prevention using curriculums already available in Russian (WHO’s TEACH-VIP (WHO 2007b) and the Road Traffic Injury Prevention: Training Manual (WHO 2000). Executive managers, road engineers, policymakers, health professionals, and police are among those who could be trained. Information systems are essential to monitoring the success of the program. WHO may be able to contribute to ensuring the sound development of health information systems for monitoring, using the WHO guidelines for injury surveillance (WHO 2001). Also, WHO could support the development of increased capacity to improve emergency trauma services and train health personnel to improve pre-hospital and emergency trauma care (WHO 2004b, 2005, 2009b).

5. Implementing arrangements

Given the multisectoral nature of the road safety effort (Table 11), the proposed support by the World Bank in ECA would need to mobilize the involvement of different government agencies, private sector entities, and civil society organizations under the overall coordination of a lead agency. Similarly, World Bank teams would need to include staff from different disciplines and sectors.

6. Choice of Instruments

Taking into consideration the medium-long term timeframe required to improve road-safety, ECA governments could use an Adaptable Program Lending (APL) instrument. It provides a sequence of well-targeted investment projects supporting long-term development programs, such as the ongoing “Traffic Safety Increase 2006–2012.” APLs typically involve a series of loans that build on lessons learned during previous loans in the series. Loans are phased on the basis of satisfactory progress in meeting agreed quantified milestones, benchmarks, or triggers. The APL instrument offers a framework for coordinated action by governments and possible co-financing with regional governments in federal countries and could support a country’s agencies in adapting, according to the country’s situation, the provisions of national policies and strategies for road safety improvement.

A second instrument ECA authorities could consider is a series of free-standing Specific Investment Loans (SILs) that would be designed and implemented in a sequential way, either focusing solely on road safety or through transport projects with road safety components, as is currently done in many ECA countries.

A third instrument, Fee-Based Services (FBS), is being used with several regional governments and institutions in Russia. Under this arrangement, the World Bank would help: (a) design and prepare the technical, administrative, and financial aspects of a program, including the mechanisms for facilitating participation of different agencies and local governments; (b) support
Table 11: Multisectoral Collaboration for Road Safety

<table>
<thead>
<tr>
<th>Action Areas</th>
<th>Scope</th>
<th>Main Actors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Partnerships</td>
<td>Promotion, engagement, coordination, and harmonization of efforts across many sectors of society to ensure long term sustainability of the effort.</td>
<td>Governmental agencies addressing transport, health, education; law enforcement, and civil society organizations; private companies, religious entities, and mass media.</td>
</tr>
<tr>
<td>Policies, legislation, enforcement</td>
<td>Enactment of laws and regulations. Costing of strategies and programs, adoption of sustainable funding mechanisms, and assignment of institutional responsibilities and accountability. Establishment of enforcement mechanisms.</td>
<td>Governmental agencies, parliaments, civil society organizations, car insurance companies, interior ministries, and police.</td>
</tr>
<tr>
<td>Design, building and maintenance of roads</td>
<td>Assessment and implementation of policies, plans, and new investment projects.</td>
<td>Transport ministries, finance, economic development, private firms, and enterprises.</td>
</tr>
<tr>
<td>Safe vehicles</td>
<td>Improvements in vehicle design to meet safety and environmental standards.</td>
<td>Automakers, regulatory agencies, insurance companies, and consumer organizations.</td>
</tr>
<tr>
<td>Public information, education and communication</td>
<td>Creation of a road safety culture to support implementation of road safety strategies. Inclusion of road safety themes in core curriculum of health education programs, targeting children and adolescents.</td>
<td>Transport, education and health ministries, mass media, and insurance companies.</td>
</tr>
<tr>
<td>Injury prevention, medical care, rehabilitation</td>
<td>Implementation of health system interventions along a continuum of service provision: public health, primary health care, post-impact medical care, including blood transfusion services, and rehabilitation.</td>
<td>Health ministries and health insurance agencies.</td>
</tr>
<tr>
<td>Data collection, monitoring, and use for decision-making and management</td>
<td>Collection and assessment of detailed and accurate data and information on road traffic injuries and fatalities for policymaking and program management across sectors.</td>
<td>Government agencies and systems (e.g., epidemiological surveillance systems), data depositories at policy departments, and insurance companies.</td>
</tr>
</tbody>
</table>


7. “Window of opportunity” for advancing the road safety agenda under ECA economic recovery programs

As seen in ongoing U.S.-supported efforts under the Recovery and Reinvestment Act, signed by President Obama in February 2009 (U.S. Department of Transportation Federal Highway Administration 2009), programs that are being funded by governments in different countries to reactivate economic growth and employment offer a “window of opportunity” to scale-up and improve road safety in ECA. In the United States, for example, investment directed to roads and highways...
incorporates safety features and is coupled with encouraging local governments to implement existing strategic highway safety plans. The goal is to support the development and promotion of programs and technologies to reduce the number of road traffic injuries (RTIs) on U.S. roadways, the site of 37,261 deaths in 2008.

Looking at economic stimulus packages around the world, at the 2009 International Transport Forum held in Germany, it was concluded that, while many of these have significant transport components, projects with short lead times are required in order to create jobs rapidly and to resolve chronic maintenance backlogs in many countries (ITF, 2009). Maintenance and upgrading of infrastructure is particularly suited to this.

8. What could be achieved in a road safety decade? The case for action

The Commission for Global Road Safety’s “Make Roads Safe” report (launched in Rome in May 2009) proposed the following goals for a Decade of Action worldwide (Ward 2009) that should be adopted to guide ECA country efforts:

- Demonstrate measurable success in stabilizing and then reversing the growth in RTIs by pursuing the goal of achieving a 50 percent reduction in the forecast level of fatalities by 2020;
- Encourage countries to implement the recommendations of the World Report on Road Traffic Injury Prevention and set interim targets that will contribute to the overall fatality reduction goal;
- Raise professional capacity in RTI prevention in low- and middle-income countries;
- Ensure that road safety management and reducing injury levels become self-sustaining over the long term; and
- Provide a common framework for action shared by countries, bilateral and multilateral donors, NGOs, and civil society.

9. Safety on the roads: Multilateral Development Banks joining forces to save lives

To help achieve the Decade of Action goals, on November 11, 2009 seven multilateral development banks (MDBs) issued a joint statement ahead of the Global Ministerial Conference on Road Safety being held in Moscow on November 19-20, 2009, outlining a broad package of measures that each would implement to reduce an anticipated and alarming rise in the number of road fatalities and casualties in developing countries (World Bank, 2009c).

The MDBs—the African Development Bank, Asian Development Bank, European Bank for Reconstruction and Development, European Investment Bank, Inter-American Development Bank, Islamic Development Bank, and the World Bank—committed to launching joint initiatives as part of growing programs of work they will undertake as international development partners.

The measures to be carried out fall into four broad categories:

- Strengthening road safety management capacity;
- Implementing safety approaches in the planning, design, construction, operation, and maintenance of road infrastructure projects;
- Improving safety performance measures; and
- Mobilizing more and new resources for road safety.
Epilogue
Epilogue

This report makes the case that road traffic safety has tremendous implications for health, social welfare, and economic well-being in the World Bank’s ECA countries. Road traffic injuries are a major cause of death and disability, and the most vulnerable populations—young people and the elderly—bear the highest burden of injuries and fatalities, often as pedestrians. The report presents accumulated evidence from country experiences worldwide that point out a clear path for dealing with the problem: strengthen institutions, laws and regulations, policies, road design, safety equipment, enforcement mechanisms, and health service delivery systems to reverse increasing road traffic injuries and fatalities in ECA.

The time to act has arrived. The Ministers and heads of delegations as well as representatives of international, regional and sub-regional governmental and nongovernmental organizations and private bodies that gathered in Moscow, Russian Federation, from 19–20 November 2009 for the First Global Ministerial Conference on Road Safety agreed to invite the United Nations General Assembly to declare the decade 2011–2020 as the “Decade of Action for Road Safety” with a goal to stabilize and then reduce the forecast level of global road deaths by 2020 (see Conference Declaration in Annex 3). The goal of halving projected deaths by 2020 sets a time frame for action. The design and implementation of safe system programs could contribute to reversing premature mortality and disability and supporting human capital accumulation, a key factor for sustainable economic growth in ECA countries.

The World Bank, partnering with other international agencies such as WHO, multilateral development banks, donor agencies, and private and civil society organizations, could play an important role in supporting governments to raise the political importance of road safety as a development priority, and in designing and implementing related programs and projects over the medium term to achieve road safety targets. This would help to raise the importance of road safety in country and regional assistance agendas of other international agencies and among the donor community.

To this end, this report strongly argues that it is critical that the World Bank mount well-designed and well-funded multisectoral efforts to support ECA countries in designing and implementing effective and sustainable road safety strategies over the medium term. The combined participation and contributions of transport, public health, education, economic, legal, public sector management, and private sector specialists operating as a team could help overcome the limitations of uncoordinated sectoral approaches, harmonize them, and sequence the implementation of safe system programs over time to address the breadth of factors that drive this silent and neglected epidemic.

The proposed road safety effort is fully consistent with and supports the World Bank’s transport strategy of “Safe, Clean and Affordable Transport for Development” (World Bank 2008a), and the new World Bank guidelines for implementing the recommendations of the 2004 World Report (Bliss and Breen 2009c). It also supports the health improvement and poverty alleviation objectives as outlined in the “Healthy Development” strategy for health, nutrition and population results (World Bank 2007a). These efforts are also consistent with the new strategic directions guiding the World Bank’s overall work, particularly those of fostering regional and global public goods that transcend national boundaries and of cooperating with other agencies with specialized expertise (Zoellick 2008).
## ANNEX 1: INSTITUTIONAL FRAMEWORK FOR ROAD SAFETY, ECA COUNTRIES

<table>
<thead>
<tr>
<th>Country</th>
<th>Lead Agency</th>
<th>Funded in National Budget</th>
<th>National Road Safety Strategy</th>
<th>Measurable Targets</th>
<th>Funded</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albania</td>
<td>Interministerial Committee of Road Safety</td>
<td>No</td>
<td>No</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
<tr>
<td>Armenia</td>
<td>National Road Safety Council^a</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>n.a.</td>
</tr>
<tr>
<td>Azerbaijan</td>
<td>State Road Police</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Belarus</td>
<td>Standing Committee by Council of Ministers of Republic of Belarus, Ensuring Road Safety</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Bosnia and Herzegovina</td>
<td>Ministry of Communication and Transport</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>State-Public Consultative Commission on the Problems of Road Safety</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Croatia</td>
<td>Ministry of Interior</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>Ministry of Transport</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Estonia</td>
<td>Government Road Safety Committee</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Georgia</td>
<td>Transport Commission</td>
<td>—</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Hungary</td>
<td>Interministerial Committee for Road Safety</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Kazakhstan</td>
<td>Road Police Department</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Kyrgyzstan</td>
<td>Kyrgyzstan Commission of Traffic Accident Prevention</td>
<td>No</td>
<td>Multiple</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
<tr>
<td>Latvia</td>
<td>Road Safety Council</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Lithuania</td>
<td>State Traffic Safety Commission</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Moldova</td>
<td>National Traffic Safety Board</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Montenegro</td>
<td>None</td>
<td>n.a.</td>
<td>No</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
<tr>
<td>Poland</td>
<td>National Road Safety Council</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Romania</td>
<td>Interministerial Council for Road Safety</td>
<td>Yes</td>
<td>Yes</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
<tr>
<td>Russian Federation</td>
<td>Commission of the Government of the Russian Federation for Road Safety</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Slovakia</td>
<td>Road Safety Council</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Slovenia</td>
<td>Interministerial Working Group on Road Traffic Safety</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Serbia</td>
<td>None</td>
<td>n.a.</td>
<td>Multiple</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
<tr>
<td>Tajikistan</td>
<td>Department of the State Automobile Inspection (Ministry of Internal Affairs)</td>
<td>Yes</td>
<td>Multiple</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
<tr>
<td>The Former Yugoslav</td>
<td>Republic’s Council for Road Traffic Safety</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>n.a.</td>
</tr>
<tr>
<td>Republic of Macedonia</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Turkey</td>
<td>Board of Road Traffic Safety</td>
<td>Yes</td>
<td>Multiple</td>
<td>n.a.</td>
<td>n.a.</td>
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<tr>
<td>Turkmenistan</td>
<td>None</td>
<td>n.a.</td>
<td>Multiple</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
<tr>
<td>Ukraine</td>
<td>Ministry of Public Health</td>
<td>Yes</td>
<td>Multiple</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
<tr>
<td>Uzbekistan</td>
<td>The State Motor-Vehicle Inspectorate, Ministry of Internal Affairs</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>n.a.</td>
</tr>
</tbody>
</table>

n.a. = Not available.

^a The Strategy approved in August 2009 identifies the National Road Safety Council as the lead agency. The decree on its establishment is under consideration by the government.

Source: National sources as reported in WHO (2009a).
## ANNEX 2: ROAD SAFETY REQUIREMENTS AND COMPLIANCE RATES, BY ECA COUNTRY

<table>
<thead>
<tr>
<th>Country</th>
<th>Seatbelt Use</th>
<th>Motorcycle Helmet Use</th>
<th>Maximum Urban Speed Limit</th>
<th>BAC Limit, General Population</th>
<th>Random Breath Testing and/or Checkpoints</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albania</td>
<td>30% front</td>
<td>n.a.</td>
<td>40 km/h</td>
<td>0.05 g/dl</td>
<td>Yes</td>
</tr>
<tr>
<td>Armenia</td>
<td>n.a.</td>
<td>n.a.</td>
<td>60 km/h</td>
<td>0.08 g/dl</td>
<td>Yes</td>
</tr>
<tr>
<td>Azerbaijan</td>
<td>n.a.</td>
<td>n.a.</td>
<td>60 km/h</td>
<td>0.0 g/dl</td>
<td>Yes</td>
</tr>
<tr>
<td>Belarus</td>
<td>n.a.</td>
<td>n.a.</td>
<td>60 km/h</td>
<td>0.05 g/dl</td>
<td>Yes</td>
</tr>
<tr>
<td>Bosnia and Herzegovina</td>
<td>n.a.</td>
<td>n.a.</td>
<td>60 km/h</td>
<td>0.03 g/dl</td>
<td>Yes</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>n.a.</td>
<td>n.a.</td>
<td>50 km/h</td>
<td>0.05 g/dl</td>
<td>Yes</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>90% front; 80% rear</td>
<td>97%</td>
<td>50 km/h</td>
<td>0.0 g/dl</td>
<td>Yes</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>n.a.</td>
<td>n.a.</td>
<td>50 km/h</td>
<td>0.05 g/dl</td>
<td>Yes</td>
</tr>
<tr>
<td>Croatia</td>
<td>45%</td>
<td>n.a.</td>
<td>50 km/h</td>
<td>0.05 g/dl</td>
<td>Yes</td>
</tr>
<tr>
<td>Estonia</td>
<td>90% front; 68% rear</td>
<td>n.a.</td>
<td>50 km/h</td>
<td>0.02 g/dl</td>
<td>Yes</td>
</tr>
<tr>
<td>Georgia</td>
<td>2% front urban, 41% highways</td>
<td>n.a.</td>
<td>60 km/h</td>
<td>0.02 g/dl</td>
<td>No</td>
</tr>
<tr>
<td>Hungary</td>
<td>71% front; 40% rear</td>
<td>95%</td>
<td>50 km/h</td>
<td>0.0 g/dl</td>
<td>Yes</td>
</tr>
<tr>
<td>Kazakhstan</td>
<td>n.a.</td>
<td>n.a.</td>
<td>60 km/h</td>
<td>None</td>
<td>Yes</td>
</tr>
<tr>
<td>Kyrgyzstan</td>
<td>n.a.</td>
<td>n.a.</td>
<td>60 km/h</td>
<td>None</td>
<td>Yes</td>
</tr>
<tr>
<td>Latvia</td>
<td>77% front; 32% rear</td>
<td>93%</td>
<td>50 km/h</td>
<td>0.05 g/dl</td>
<td>Yes</td>
</tr>
<tr>
<td>Lithuania</td>
<td>n.a.</td>
<td>n.a.</td>
<td>50 km/h</td>
<td>0.04 g/dl</td>
<td>Yes</td>
</tr>
<tr>
<td>Moldova</td>
<td>n.a.</td>
<td>n.a.</td>
<td>60 km/h</td>
<td>0.05 g/dl</td>
<td>Yes</td>
</tr>
<tr>
<td>Montenegro</td>
<td>n.a.</td>
<td>n.a.</td>
<td>50 km/h</td>
<td>0.05 g/dl</td>
<td>Yes</td>
</tr>
<tr>
<td>Poland</td>
<td>74% front; 45% rear</td>
<td>n.a.</td>
<td>50 km/h</td>
<td>0.02 g/dl</td>
<td>Yes</td>
</tr>
<tr>
<td>Romania</td>
<td>80% front; 20% rear</td>
<td>90% drivers; 65% passengers</td>
<td>50 km/h</td>
<td>0.00 g/dl</td>
<td>Yes</td>
</tr>
<tr>
<td>Russian Federation</td>
<td>33%</td>
<td>No consensus</td>
<td>60 km/h</td>
<td>0.03 g/dl</td>
<td>Yes</td>
</tr>
<tr>
<td>Serbia</td>
<td>50-60% front; 4-5% rear</td>
<td>n.a.</td>
<td>60 km/h</td>
<td>0.05 g/dl</td>
<td>Yes</td>
</tr>
<tr>
<td>Slovakia</td>
<td>n.a.</td>
<td>n.a.</td>
<td>60 km/h</td>
<td>0.0 g/dl</td>
<td>Yes</td>
</tr>
<tr>
<td>Slovenia</td>
<td>85% front; 50% rear</td>
<td>n.a.</td>
<td>50 km/h</td>
<td>0.05 g/dl</td>
<td>Yes</td>
</tr>
<tr>
<td>Tajikistan</td>
<td>n.a.</td>
<td>n.a.</td>
<td>60 km/h</td>
<td>0.03 g/dl</td>
<td>Yes</td>
</tr>
<tr>
<td>The Former Yugoslav Republic of Macedonia</td>
<td>16%</td>
<td>2%</td>
<td>60 km/h</td>
<td>0.05 g/dl</td>
<td>Yes</td>
</tr>
<tr>
<td>Turkey</td>
<td>70%</td>
<td>12%</td>
<td>50 km/h</td>
<td>0.05 g/dl</td>
<td></td>
</tr>
<tr>
<td>Turkmenistan</td>
<td>n.a.</td>
<td>n.a.</td>
<td>60 km/h</td>
<td>0.05 g/dl</td>
<td>Yes</td>
</tr>
<tr>
<td>Ukraine</td>
<td>n.a.</td>
<td>n.a.</td>
<td>60 km/h</td>
<td>0.00 g/dl</td>
<td>Yes</td>
</tr>
<tr>
<td>Uzbekistan</td>
<td>n.a.</td>
<td>n.a.</td>
<td>70 km/h</td>
<td>None</td>
<td>Yes</td>
</tr>
</tbody>
</table>

n.a. = Not available.

km/h = Kilometers per hour.

g/dl = Grams per deciliter.

Source: National sources as reported in WHO (2009a).
ANNEX 3: CONFERENCE DECLARATION

First Global Ministerial Conference on Road Safety: Time for Action
Moscow, 19-20 November 2009
Moscow Declaration

We, the Ministers and heads of delegations as well as representatives of international, regional and sub-regional governmental and non-governmental organizations and private bodies gathered in Moscow, Russian Federation, from 19–20 November 2009 for the First Global Ministerial Conference on Road Safety,

Acknowledging the leadership of the Government of the Russian Federation in preparing and hosting this First Global Ministerial Conference on Road Safety and the leadership of the Government of the Sultanate of Oman in leading the process for adoption of related United Nations General Assembly resolutions,

Aware that as described in the 2004 World Health Organization/World Bank World report on road traffic injury prevention and subsequent publications, road traffic injuries are a major public health problem and leading cause of death and injury around the world and that road crashes kill more than 1.2 million people and injure or disable as many as 50 million a year, placing road traffic crashes as the leading cause of death for children and young people aged 5–29 years,

Concerned that more than 90% of road traffic deaths occur in low-income and middle-income countries and that in these countries the most vulnerable are pedestrians, cyclists, users of motorised two- and three-wheelers and passengers on unsafe public transport,

Conscious that in addition to the enormous suffering caused by road traffic deaths and injuries to victims and their families, the annual cost of road traffic injuries in low-income and middle-income countries runs to over USD 65 billion exceeding the total amount received in development assistance and representing 1–1.5% of gross national product, thus affecting the sustainable development of countries,

Convinced that without appropriate action the problem will only worsen in the future when, according to projections, by the year 2020 road traffic deaths will become one of the leading causes of death particularly for low-income and middle-income countries,

Underlining that the reasons for road traffic deaths and injuries and their consequences are known and can be prevented and that these reasons include inappropriate and excessive speeding; drinking and driving; failure to appropriately use seat-belts, child restraints, helmets and other safety equipment; the use of vehicles that are old, poorly maintained or lacking safety features; poorly designed or insufficiently maintained road infrastructure, in particular infrastructure which fails to protect pedestrians; poor or unsafe public transportation systems; lack of or insufficient enforcement of traffic legislation; lack of political awareness and lack of adequate trauma care and rehabilitation,

Recognizing that a large proportion of road traffic deaths and injuries occur in the context of professional activities, and that a contribution can be made to road safety by implementing fleet safety measures,

Aware that over the last thirty years many high-income countries have achieved substantial reductions in road traffic deaths and injuries through sustained commitment to well-targeted, evidence-based injury prevention programmes, and that with further effort, fatality free road transport networks are increasingly feasible, and that high-income countries should, therefore, continue to establish and achieve ambitious road casualty reduction targets, and support global exchange of good practices in road injury prevention,

Recognizing the efforts made by some low- and middle-income countries to implement best practices, set ambitious targets and monitor road traffic fatalities,

Acknowledging the work of the United Nations system, in particular the long standing work of the United Nations Regional Commissions and the leadership of the World Health Organization, to advocate for greater political commitment to road safety, increase road safety activities, promote best practices, and coordinate road safety issues within the United Nations system,

Also acknowledging the progress of the United Nations Road Safety Collaboration as a consultative mechanism...
whose members are committed to road safety and whose activities include providing governments and civil society with guidance on good practice to support action to tackle major road safety risk factors,

Acknowledging the work of other stakeholders, including intergovernmental agencies; regional financial institutions, nongovernmental and civil society organizations, and other private bodies,

Acknowledging the role of the Global Road Safety Facility established by the World Bank as the first funding mechanism to support capacity building and provide technical support for road safety at global, regional and country levels,

Acknowledging the report of the Commission for Global Road Safety Make roads safe: a new priority for sustainable development which links road safety with sustainable development and calls for increased resources and a new commitment to road infrastructure safety assessment,

Acknowledging the findings of the report of the International Transport Forum and the Organisation for Economic Co-operation and Development Towards zero: ambitious road safety targets and the safe system approach and its recommendation that all countries regardless of their level of road safety performance move to a safe system approach to achieve ambitious targets,

Acknowledging the findings of the World Health Organization/UNICEF World report on child injury prevention which identifies road traffic injuries as the leading cause of all unintentional injuries to children and describes the physical and developmental characteristics which place children at particular risk,

Recognizing that the solution to the global road safety crisis can only be implemented through multi-sectoral collaboration and partnerships among all concerned in both public and private sectors, with the involvement of civil society,

Recognizing that road safety is a ‘cross cutting’ issue which can contribute significantly to the achievement of the Millennium Development Goals and that capacity building in road traffic injury prevention should be fully integrated into national development strategies for transport, environment and health, and supported by multilateral and bilateral institutions through a better aligned, effective, and harmonized aid effort,

Conscious that global results are the effect of national and local measures and that effective actions to improve global road safety require strong political will, commitment and resources at all levels: national and sub-national, regional and global,

Welcoming the World Health Organization’s Global status report on road safety – the first country by country assessment at global level – which identifies gaps and sets a baseline to measure future progress,

Also welcoming the results of the projects implemented by the United Nations regional commissions to assist low-income and middle-income countries in setting their own road traffic casualty reduction targets, as well as regional targets,

Determined to build on existing successes and learn from past experiences,

Hereby resolve to:

1. Encourage the implementation of the recommendations of the World report on road traffic injury prevention,

2. Reinforce governmental leadership and guidance in road safety, including by designating or strengthening lead agencies and related coordination mechanisms at national or sub-national level;

3. Set ambitious yet feasible national road traffic casualty reduction targets that are clearly linked to planned investments and policy initiatives and mobilize the necessary resources to enable effective and sustainable implementation to achieve targets in the framework of a safe systems approach;

4. Make particular efforts to develop and implement policies and infrastructure solutions to protect all road users in particular those who are most vulnerable such as pedestrians, cyclists, motorcyclists and users of unsafe public transport, as well as children, the elderly and people living with disabilities;

5. Begin to implement safer and more sustainable transportation, including through land-use planning initiatives and by encouraging alternative forms of transportation;

6. Promote harmonization of road safety and vehicle safety regulations and good practices through the implementation of relevant United Nations
resolutions and instruments and the series of manuals issued by the United Nations Road Safety Collaboration;

7. Strengthen or maintain enforcement and awareness of existing legislation and where needed improve legislation and vehicle and driver registration systems using appropriate international standards;

8. Encourage organizations to contribute actively to improving work-related road safety through adopting the use of best practices in fleet management;

9. Encourage collaborative action by fostering cooperation between relevant entities of public administrations, organizations of the United Nations system, private and public sectors, and with civil society;

10. Improve national data collection and comparability at the international level, including by adopting the standard definition of a road death as any person killed immediately or dying within 30 days as a result of a road traffic crash and standard definitions of injury; and facilitating international cooperation to develop reliable and harmonized data systems;

11. Strengthen the provision of prehospital and hospital trauma care, rehabilitation services and social reintegration through the implementation of appropriate legislation, development of human capacity and improvement of access to health care so as to ensure the timely and effective delivery to those in need;

Invite the United Nations General Assembly to declare the decade 2011–2020 as the “Decade of Action for Road Safety” with a goal to stabilize and then reduce the forecast level of global road deaths by 2020;

Decide to evaluate progress five years following the First Global Ministerial Conference on Road Safety;

Invite the international donor community to provide additional funding in support of global, regional and country road safety, especially in low- and middle-income countries; and

Invite the UN General Assembly to assent to the contents of this declaration.

Moscow, Russian Federation
20 November 2009
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