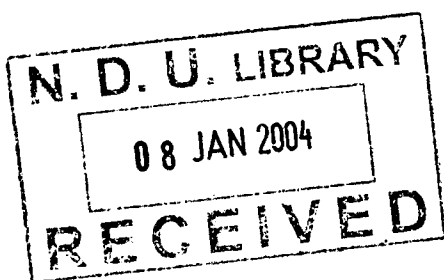


Notre Dame University

**Faculty of Political Science, Public Administration &
Diplomacy**

International Cooperation for Road Safety



M.A. Thesis

By

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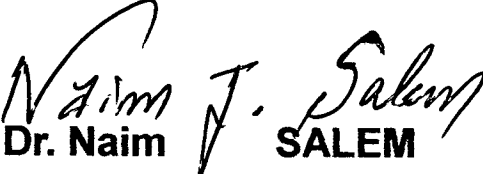
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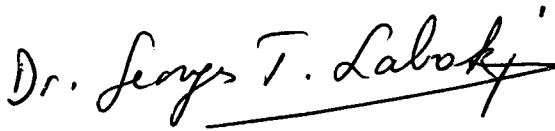
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Definition of Safety

With the collaboration of the World Health Organization, the Indian Institute of Technology in Delhi together with the Foundation for Innovation and Technology Transfer organized in March 2000 organized the 5th World Conference on Injury Prevention and Control in New Delhi, India and agreed on the following definition of Safety:

Safety can be defined as a state in which hazards and conditions leading to physical, psychological, and material harm are controlled in order to preserve the health and well – being of individuals and communities. Safety is a dynamic state resulting from the interaction of human beings with their physical, social, cultural, technological, political, economic and organizational environment. The objective is to establish a permanent state of vigilance and develop the mechanisms to control danger on a continuous basis.

Safety can be achieved by acting on structures, environments, and Attitudes and behaviors. This can be affected by;

- Sharing information on risk and options for risk control between the public and political, professional, scientific, and community groups;
- Concerted actions to maximize levels of safety achievable under the given conditions;
- Adequate mechanisms for allocating resources for those in need and for resolution of conflicting interests; and
- Legal bases for ensuring accountability of individuals, organizations and governments at all levels.¹

Safety relates to various dimensions of physical, social, and psychological well being. It includes the prevention and control of injuries, both physical and psychological, to individuals and communities.²

¹ - "Definition of Safety", Declaration of New Delhi . Fifth World Conference Injury Control and Prevention. World Health Organization, 8 March , 2000.

² - The notion of "Human Security" , UN Security Council, March 2001.

In order to bring international consensus on the concepts of safety and safety promotion, a collaborative effort is embarked upon, between the two WHO Collaborating Centers on Safety Promotion and Injury Prevention: Ministry of Health, Quebec, Canada and Community Safety Promotion, Karolinska Institutet, Sweden. The document (WHO 1998:11) includes a proposed definition of Safety Promotion.

Safety promotion is the process applied at a local, national and international level by individuals, communities, governments and others, including enterprises and non-governmental organizations, to develop and sustain safety. This process includes all efforts agreed upon to modify structures, environment (physical, social, technological, political, economical and organizational), as well as attitudes and behaviors related to safety.³

Safety as a Human Right

The attendees of the 5th World Conference on Injury Prevention and Control declared their support for Safety as a Human Right, in the New Delhi declaration in March 2000, based on three reasons:

- First. Injury is a huge burden as measured by the number of victims, injured and especially the disabled.
- Second. It is important to look at safety because of the increase in complexity and interdependence of many related issues that interact with safety, including health, environment, peace promotion and economic well being and development.

³ - Svanstrom, L. Laflamme, L. Schelp, L. Safety Promotion Research. 1999,p.35.

Third. The notion of safety as a human right is an important policy tool for injury control and safety promotion. It is a way to bring together the injury control community for collective action that can be more effective than separate communities or individuals acting alone.⁴

The Global Burden of Injuries

Each injury incident is a complex interaction between a number of factors, including the host, agent, and physical and socio cultural environment. Dr. William Haddon, one of the first theorists in injury prevention, developed the Haddon Matrix to describe the inter-action between these elements during three phases: pre-event (before the injury occurs), event (while the injury is occurring), and post event (after the injury has occurred). The matrix helps professionals to assess the different elements of an injury and identifies which ones can be used to prevent injury.

The traditional view of injuries as “accidents”, or random events, has resulted in the historical neglect of this area of public health. During the past few decades, public health officials have recognized that injuries are preventable, and they have established methods of scientific study for the prevention of injuries.⁵ Road traffic injuries are the leading cause of injuries, worldwide.

The most recent estimates show that injuries are among the leading causes of death and disability in the world. They affect all populations, regardless of age, sex,

⁴ - Fifth World Conference Injury Control and Prevention: New Delhi, India, 8 March 2000.

⁵ - Haddon W. “The Changing Approach to the Epidemiology, Prevention, and Amelioration of Trauma: the Transition to Approaches Etiologically rather than Descriptively Based”. *American Journal of Public Health*. 1968, 58: 1431-1438.

income or geographic region.⁶ An injury is defined as “ a bodily lesion at the organic level, resulting from acute exposure to energy in amounts that exceed the threshold of physiological tolerance. In some cases, the injury results from an insufficiency of a vital element”.⁷ The WHO estimated that injuries caused, in 2000, around 5 million deaths that is a mortality of 83.7 per 100000 populations, and injuries caused 16 per cent of the global burden of disease. For every person who dies of injuries, several thousand injured persons survive, but many of them are left with permanent disabilities.

Decreasing the burden of injury is among the main challenges for public health. Many prevention strategies have already shown to be effective such as using seat belts and child seats in cars, and also helmets for motorcyclists. Another lesson is that the approach to injury prevention needs to be multidisciplinary and inter sectoral. In many cases it is only through effective collaboration between physicians, sociologists, psychologists, lawyers, politicians, engineers, designers, human right experts, journalists, and other professionals from the public and private sectors that the right injury prevention strategy can be developed and promoted.

Statement and Magnitude of the Problem

The world is changing every day. Globalization has been in the making for many years. We all became more interdependent and closer to each other because of

⁶ - Krug, E. Sharma, G. Lozano, R. “The Global Burden of Injuries”. *American Journal of Public Health*. April 2000, Vol. 90, No.4, p.523.

⁷ - Baker, SP. o’Neill, B.Karpf, RS. *The Injury Fact Book*. Lexington,MA,Lexington Books, 1984.

globalization. Threats to health and safety are also globalized.⁸ A major threat to safety is the growing problem of road traffic injuries. Traffic crashes and injuries are rapidly growing around the world and causing a huge economic and social impact on all societies, especially in the developing world.⁹ In 1990, the World Health Organization (WHO) stated that, worldwide, road accidents were the ninth most important cause of years of life lost. Unless all countries take action immediately, by 2020, they will rise to second place.

Almost anybody can be involved in a traffic crash. No special time, place, or equipment is necessary. Crashes and related-injuries are not restricted or limited to race, creed, social status, age, or sex. The aged and the young, the rich and the poor, men and women all may have crashes.¹⁰

The injury problem has been largely neglected because injuries were viewed as random events. Nowadays, injuries are known to be preventable by the majority of people. The use of helmets by motorcycles, seat belts, child seats, and pedestrian bridges have all been proven to be effective measures for injury prevention.¹¹

According to World Health Organization (WHO) press, there are more than one million and two hundred thousand victims on roads and more than 25 million serious injuries per year that are caused by traffic crashes. Road crashes form the leading cause of death for people between 4 and 30 years old in most countries. Road

⁸ - Welander, G. Svanstrom, L. Ekman, R. Safety Promotion -An Introduction. Karolinska Institutet, Sweden 2000 , p.8.

⁹ - "The Growing Problem of Traffic Accidents". *Arabmotor Magazine*, January 2003 , p.74-75.

¹⁰ - Strasser, A. Bohn, E. Fundamentals of Safety Education. 1973,p.13.

¹¹ - Injury Report. World Health Organisation, Geneva, 2000.

traffic injuries are the leading cause of death due to injury¹², and according to the global burden of disease study, the ninth leading cause of all deaths.

Although men are more likely to suffer a fatal injury than women (men accounted for two thirds of the total number of deaths due to injury worldwide in 1998), injuries are a leading cause of death for both sexes and in all age groups.¹³

Combined figures from Australia, the Netherlands, New Zealand, Sweden and the United States indicate that, in these countries at least, for every person killed by injury, around 30 times as many people are hospitalized and 300 times as many people are treated in hospital emergency rooms and then released. Many more are treated in other health care facilities, such as family doctors' offices and first-aid clinics.¹⁴

Unfortunately, injury prevention has been considered seriously only in developed countries. It is estimated that around 75 per cent of the global burden of traffic injuries is in the developing countries, whereas only 25 per cent are occurring in the developed countries. This contrasts the fact that more than 75 per cent of the vehicles of the whole world are circulating in the developed countries (vehicles circulating in low-income developing countries are less safe than those in developed industrialized countries).¹⁵

According to YASA, a Lebanese Non-governmental Organization specialized in Injury Prevention, the number of road victims will increase during the next two

¹²-WHO Press- Press release, WHO/ 4 0 ,12 May 2003.

¹³-Injury Surveillance Guidelines. CDC and WHO 2001 , p. 1.

¹⁴-Injury Pyramid. Geneva , WHO 2001.

¹⁵ -"Road Safety: An International Issue". *YASA Copilot* . Nov 2000, p. 48-50.

According to YASA, a Lebanese Non-governmental Organization specialized in Injury Prevention, the number of road victims will increase during the next two decades in most developing countries. YASA and many advocacy non-governmental organizations recommend that all governments monitor the growing number of road tragedies and work to save people's lives by reducing mortalities and morbidities caused by road crashes.¹⁶

For more than four decades, most of the developed countries have been organizing sustainable national campaigns to decrease traffic accidents. The number of people killed and injured due to traffic crashes had significantly decreased in the developed world with different rates among developed countries. With this clear success, many institutions adopted "Vision Zero" initiated by Sweden that targets a theoretical zero death by road crashes. In June 2003, a new European charter for road safety was launched in a target of reducing the burden of injuries.¹⁷

People from all socioeconomic groups suffer fatal injuries, but death rates due to injury tend to be higher in those with lower income groups. The poor are less likely to make a full recovery following an injury due to the lack of required means.¹⁸

In most of the developing countries no effective traffic safety campaigns have been organized.¹⁹ The governments and the citizens of most of the developing world perceive road safety as a low priority issue in spite of the fact that victims of road

¹⁶ -Akl, Z. President of YASA. "The Growing Problem of Traffic Accidents". *Arabmotor*, January 2003, p.74.

¹⁷ -Fédération Européenne des Victimes de la Route- FEVR-(International Federation for Road Victims), *Newsletter #36*, June 2003.

¹⁸ - Krug, E. Foreword of *Injury Surveillance Guidelines*. CDC and WHO 2001,p.4.

¹⁹ - "International Festival of Road Safety Campaigns", Tunisian Association for Road Safety, Sousse, Tunisia, 28 October 2001.

accidents in most developing countries are significantly increasing.²⁰ No sustainable effort has been done to decrease road crashes. International agencies have almost done no successful effort to assist developing countries to combat this burden of injury. Even the last world summit organized in South Africa in summer 2002 did not adopt traffic safety as an international issue for sustainable development.

Unfortunately, the United Nations Development Program UNDP, an international NGO dedicated to help all countries in their efforts to achieve sustainable human development, did not consider until recently that the struggle against road tragedies as included in its mission.²¹

In contrast, during the past few years, road safety has increasingly become present in the agenda of many international organizations such as the World Bank, whose President James D Wolfensohn said: “Road safety is an issue of immense human proportions, it’s an issue of economic and social proportions and also an issue of equity. Road safety very much affects poor people”.

Hunger, poverty and diseases in the low-income countries overtake the concern of road safety. Even the two world summits of Rio in 1992 and Johannesburg in 2002 had not considered the global burden of traffic injuries as a major problem for sustainable development. There is a serious need of lobbying to push this subject to be a high priority issue on the international agenda.

In 2003, for the first time, the World Health Organisation (WHO) recognised its required role by adopting traffic safety as the theme of the international day of the

²⁰ -Akl, Z. President of YASA. “Road Safety:An International Issue”. *YASA Copilot*, 2001, p.50.

²¹ -Minutes of a meeting of International Visitors with Mr Jonas Rabinovitch-Senior policy advisor ,Urban development and Rural –Urban Relations, UNDP, August 8 2003,New York,USA.

organisation on April 7, 2004. The year 2004 will be a significant milestone in the road safety work of WHO.²²

The objectives for this World Health Day are:

- a) To raise awareness about the health impact and social and economic costs of road traffic injuries.
- b) To stimulate debate on the possibility for road traffic injury prevention
- c) To issue a call for action.

Events will be organized around the world by governments, organizations and groups. The day will hopefully mark the start of a global campaign for road traffic injury prevention.²³

Rationale of the Problem

The basic research question is:

What are the requirements needed for effective international cooperation that targets the decrease of the global burden of traffic crashes?

This basic research question is divided into five sub-questions:

- 1- What are the major individual-related causes of road crashes?
- 2- What are the major sources of the growing problem of road crashes in the low-income developing countries?

²² -WHO Consultation to develop areas of collaboration with Road Traffic injury Advocacy Organisations- Scope and purpose of the meeting of 18-19 September 2003, WHO press release, Geneva, Switzerland.

²³ -www.who.int/violence_injury_prevention/

- 2- What are the major sources of the growing problem of road crashes in the low-income developing countries?
- 3- What are the reasons for the positive achievements in road safety in the developed states?
- 4- How experiences of successful multi-sectoral cooperation between governmental agencies may be helpful to fight the lack of cooperation in developing countries?
- 5- How the existence of a better system of registration of road accident victims may help to decrease the underestimation of road accidents in developing countries?

Relevance of the Research

This study aims at enhancing the efforts targeting the international cooperation for road safety. Unfortunately, the burden of traffic related injuries is still underestimated in most developing countries. As soon as we can design a better system of traffic injury registration and a better system of cooperation on national and international levels, this research will push many institutions (media, specialized non-governmental organizations and governmental agencies) to study seriously the needs of road safety and to put more pressure on citizens and governments to prioritize safety. Very few studies have tried to treat this subject.

Moreover, non-governmental organizations in developing countries had not been well supported by their governments compared to the support of similar institutions in developed countries. Most of these associations are disappointed by the

carelessness of governmental agencies in dealing with road safety.²⁴ For example, the injury surveillance systems in Jordan and Kuwait are reliable compared to other Arab countries. There is a lack of cooperation between Arab countries that caused the surveillance system to remain inaccurate and biased.²⁵

Having reliable numbers of victims and injured under an acceptable transparent registration system will push governmental agencies to formulate and implement national strategies in order to start decreasing the burden of injuries. The loss of productivity due to death and disability from injury represents a significant loss of economic opportunity in all countries. The treatment and rehabilitation of injured persons account for a large proportion of many national health budgets. Personal loss, to the injured and to those close to them, is immeasurable.²⁶

Unfortunately, most developing countries did not realize the various negative impacts of road crashes (pain, hospitalization and tourist frustration by unorganized traffic) on their GDP and on their sustainable development.

Objective of the Research

The main aim of this research is to provide both public and private policy makers in developing countries and cities, with scientific tools and practical experiences to draw strategies and design and implement road safety programs that can be effective in reducing the death toll on roads by taking into consideration that

²⁴ - Bou Lahoud, C. "Securite routiere au Liban -La jungle". *Le Commerce Du levant*. August 2003, p. 58-59.

²⁵ - Ghour Abzaj, M. Assistant Director of Jordanian Traffic Directorate, International Conference for Road Safety , SORIC2, Bahrain, October 2002.

²⁶ - Rahbani, E. YASA interivew with Hyam Bou chedid, " Jadal" program, MTV,10 May 2001.

international cooperation was effective in reducing accidents in most developed countries. Learning by sharing is considered a very efficient tool to reduce the impact of road traffic injuries.

In the European Union, sharing experiences has been relatively successful in learning from other experiences through many activities (Conferences, courses, reports and workshops) that had been organized to promote cooperation between various public and private organizations.

Neighboring countries can benefit a lot by sharing their experiences, such as GCC states, NAFTA states and EU states, where many similarities can be noticed. Facing, almost the same challenges, require more cooperation between the aforementioned regional organizations.

Specific Objectives

The specific objectives of this research are:

1. To better estimate the information that is related to road traffic injuries and not according to biased numbers by improving the surveillance and registration system.
2. To study the results of the cooperation established between many developed countries that had been effective in building many successful interventions.
3. To encourage the process of learning by sharing in research and in many other aspects between many developing countries that can be effective in building road safety interventions .The educational institutions, the civil society organizations

and the media have a major role in lobbying on government in order to raise the priority given to road safety.

4. To better estimate the huge financial loss caused by traffic injuries in most developing countries.
5. To describe the social impact of well-designed media campaigns in raising safety awareness in developing countries, because the media can have an active role in the constructive criticism of the inappropriate strategies or plans endangering road safety.

Methods and Variables of the Research

This study will try to establish comparisons between trends in developed countries and those in developing countries and cities. Among the developed countries the focus will be on the United States, United Kingdom, Canada and Sweden because their good road safety records.

Mainly qualitative descriptive analysis will be utilized in this study. A cross sectional study will be conducted among the subjects of the research. Cases of successful international interventions will be explored. A case control study will be conducted to explore the successful experiences of road safety. The trans-theoretical model of behavior change will be applied to the required change for safe behavior and engagement in required actions for change. (This model, designed in the USA during the last two decades, is a newly designed model that consider the stages of changes through different steps starting in the pre-contemplation stage and reaching

one of two choices: either a decision not to act for road safety or a decision to follow sustainable actions to reach better road safety).

The General sub-Themes Developed in this Thesis

Chapter One: Introduction to Road Safety

This chapter deals with the causes of traffic crashes and the growth of this problem. This study will try to prove that traffic crashes are preventable. The chapter starts by including the major elements leading to crashes by concentrating on specific circumstances such as alcohol, drugs, prolonged stress and speeding. This chapter contains also some basic recommendations for all drivers of heavy vehicles, two-wheel motors, school transport, traffic management and safety in construction zones.

Chapter Two : Major Requirements for Safe Driving

This chapter highlights the requirements for safe driving. It starts with the driving ability and the driving style, then by talking on mobile phones while driving, using horn, headlights and emergency signals, and driving in emergencies and in special conditions such as fatigue, at night, in winter, in the rain or fog.

Chapter Three: Safety Inside Vehicles

This chapter deals with safety measures that can be used inside vehicles such as seat belts, child seats, airbags and the importance of adoption of these measures, especially in the developing countries.

Chapter Four: Major Requirements for Road Safety

The new concept of 5Es: Education, Enforcement, Engineering, Emergency and Evaluation that targets to increase the cooperation between various agencies for

road safety by asking all of them to share the responsibility instead of accusing others.

Chapter Five: Major Actors for Road Safety

Some principal actors or factors should be involved effectively in road safety efforts especially in developing countries.²⁷ This chapter tries to list the role of major public and private agencies responsible for road safety promotion. The civil society organisations had to do tremendous efforts in most developing countries in order to convince both citizens and government agencies to raise concern of road safety.

Chapter Six: Road Safety is a Growing International Dilemma

The number of road casualties in the world is expected to increase .We are heading for Millions of road casualties per year worldwide. By 2020 WHO projected road traffic injuries (RTI) will account for about 2.3 million deaths, with 90% of these occurring in the less motorised countries (LMC)²⁸ and rise to 3rd most significant burden of diseases. This chapter will try to define road traffic injuries as a major public health problem and emphasizes the need to draw better transport policies. In the majority of the developed countries, many policy-makers and politicians have become convinced by the importance of road safety due to the estimation of the huge loss caused by traffic crashes and casualties. This chapter will deal with the social and economic impacts of road traffic injuries and the medical

²⁷ -YASA declaration for road safety, “Second National Conference for Road Safety” ,Unesco palace, Beirut, Lebanon, 29 October 1999.

²⁸ - Peden, MM. Department of Injury Prevention and Violence, World Health Organization, 2001.

costs of pre hospital care and the efficiency of improving the emergency systems in most hospitals.

Chapter Seven: The Needs of the Developing Countries

This chapter deals with strategies to prepare the public to act towards road safety in partnership with media, educational institutions and non-governmental organizations. It deals also with various strategies and interventions to reduce traffic crashes as considered in the five E's mentioned in the introduction. For example, developing countries have to consider that safety specifications should be treated seriously and the trend of opening new unsafe highways should be seriously reconsidered.

Finally, this chapter will deal with a proposed methodology for road safety campaigns in developing countries and cities. Building on the recommendations of the previous chapters especially on sharing experiences with the developed countries, this chapter will propose a general guideline that may be used in most developing countries and cities. Starting with the identification of the problem, then the setting of clear goals in order to reduce the burden of traffic injuries, followed by the planning stage, then the implementation phase, and finally the evaluation of the whole intervention.

Chapter Eight: Sharing the Experiences of Developed Countries

Learning by sharing experiences has a long successful history in international relations. Developed countries programs were initiated through "learning by doing". At a later stage, many regional and international programs were successful due to cooperation of member states and due to international organizations interventions:

Road safety had benefited from these aforementioned programs, such as the World conferences organized biyearly by the “Prévention Routière Internationale” (PRI) and the Global Road Safety Program (GRSP) initiated by the World Bank.

Since the first world conference on Injury prevention organized in Stockholm in 1989, and till the seventh conference that will be organized in Vienna in June 2004, many public and private institutions were resolved to cooperate on findings ways to prevent injuries especially road traffic injuries, to treat them, and to rehabilitate and reintegrate injured persons into their communities and their workplaces.

This chapter tries to highlight the benefits of many international events, research and activities in road safety promotion, and to propose ideas and projects on governmental and non-governmental organizations in road safety. In this regard, the efforts done by the commission of the European Union have been successful in pushing cooperation between the 15 member states. For example, Lebanon, Jordan and Syria have to cooperate together by sharing experiences in law enforcement, infrastructure, emergency institutions, and injury surveillance. North African countries such as Tunisia, Algeria and morocco can also learn a lot by sharing their experiences.

Chapter Nine: Surveillance and Registration of Road Casualties

To develop effective prevention strategies, most countries need better information about injuries. Surveillance and registration describes the magnitude of ~~injury problem, the location of the problem, and who is affected.~~

In developing countries and cities, the present status of road safety information is relatively poor. The major factor hindering the improvement of road

safety is the lack of comprehensive, dynamic, and reliable road safety information systems.²⁹ This information allows those who make decisions about safety programs and research to allocate resources where they are most needed and where they will have positive impact .The need for education in this area is great and no such education has been available.³⁰ Injury data should be shared through annual publications and comparison between states and countries.

²⁹ - Hussain, M. OICC advisor and United Nations Representative. Integrated Road Safety Programs in Developing Cities. Ankara, Turkey, July 1993.

³⁰ - Outline of "Injury Surveillance and Registration" course , Karolinska institutet, Fall 2003-2004.

CHAPTER ONE

INTRODUCTION TO ROAD SAFETY

The early beginnings of motoring started with the carriages as the first vehicles where the horsepower was replaced by engines. On 10th of May 1733, it was written about the invention of a vehicle using springs. The driver could control the speed and direction of this vehicle. In 1885, after 150 years of the invention of the first vehicles, it was recorded the first ride with a vehicle that could move without the power of horses. This new vehicle used petrol engine. Few decades later, the world was challenged by the great expansion of motorization. After World War I, there had been more than 200 thousands vehicles in England, 65 thousands vehicles in Germany and 35 thousands in Italy. However, in 1999, there are more than 174 million vehicles in the EU countries. Due to the worldwide rising number of vehicles and increased traffic, the sad consequence is a terrifying rise in the number of casualties caused by road crashes.³¹

Why this? When this increase will stop? Is driving so dangerous?

Identification of risk factors and avoiding danger situations are the key words in safe transportation. There are significant differences among people regarding

³¹ -Zlender, B and Polic, M. Road Safety Council Director and Department of Psychology, University of Ljubljana, Slovenia, "Driver's Interaction with the Type of Vehicle Driven, Adaptation and Strategies", February 2002.

identifying risks and making decisions. The differences can vary with regards to an individual road user, depending on many factors, such as state of alertness. We have also the ability to avoid driving under difficult conditions and the ability to compensate for our weaknesses through other means.

Today's traffic demands a great deal from the road user.³² YASA has estimated that during a distance of two kilometres, a driver of a car encounters 600 traffic events, makes 240 observations, 80 decisions, 60 acts and one error. Against this background, it is no wonder that people make mistakes in traffic. People's abilities are often put to a serious test and the demands of traffic often surpass our capacity to make observations and decisions. Many people have to operate on the outer limit of their abilities.³³

All factors that bring interfering elements into the driving process increase the chance of the driver making a mistake. In addition to outside factors such as changes in the weather or the surprising traffic behaviour of others, we ourselves weaken our own chances of survival in traffic. The reason can be the use of alcohol or drugs, stress or careless attitude towards our safety or that of others.

Alcohol and Traffic

Studies show that alcohol multiplies the risk for accident by a factor of three, as the blood alcohol level rises above 0.8 per ml content.³⁴ The risk when driving with a 1.5 blood alcohol level is 40 times the normal. It has been estimated that a 1.0

³² Khatib, H "Road Safety in Lebanon" *Daily Star Newspaper*, 3 March 2002.

³³ -Report of the "Third National Conference for Road Safety", YASA, UNESCO Palace, Beirut, 19 January 2001.

³⁴ - "First National Conference for Road Safety" . SRF, UNESCO Palace, 31 October 1998.

blood alcohol level corresponds to speeding 20 km per hour over the legal limit in regards to the danger it represents. Alcohol has a paralysing effect on the central nervous system. It weakens the accuracy of observations and decisions and also weakens the co-ordination and reaction abilities. While under the influence of alcohol, people also tend to overestimate their own skill level and take unreasonable risks due to this.

The effect of alcohol regarding driving skills varies from person to person.³⁵ The studies have not found a threshold where the abilities that relate to driving were not weakened at all due to alcohol. Even low blood alcohol level can lead to accidents with inexperienced drivers and critical danger situations.

Recent research in the Netherlands highlighted the increased risks involved in driving under the combined influence of drugs and alcohol - a problem related to prescription as well as illegal drugs. In 2002, Police in Victoria, Australia found that 29% of individuals involved in serious accidents tested positive for illicit drugs, compared with 22% who were under the influence of alcohol.³⁶

The prevention of drinking and driving is based mainly on legislation and enforcement. One function of the law is to show that drinking and driving is dangerous and not acceptable. The other function is to threaten potential drinking drivers with sanctions and to enable detection and conviction of drinking drivers. Law enforcement has to be practical and effective. It is quite obvious that the ~~enforcement of the blood alcohol limit is an absolute necessity, together with~~

³⁵ - "First National Conference for Road Safety", SRF, 31 October 1998.

³⁶ - "Road Safety Performance-Trends and Comparative Analysis", OECD transport division, 20 December 2002.

practical methods for measuring the alcohol level. Sweden was one of the first countries to introduce a legal blood alcohol limit for drivers in 1951. In Sweden and the United Kingdom, the sanctions for drinking and driving, with an illegal blood alcohol limit, lead to a disqualification from driving for at least one year.³⁷ Disqualification is effective in the prevention of drinking and driving in the general population, in addition to fines, especially to repeat offenders, even though some disqualified drivers will still drive and will also continue drinking.

The numbers of drunken drivers' related fatalities dropped from 1450 in 1980 to 530 in 2000 in Great Britain. These numbers need to be linked with the changes in proportions of alcohol related fatalities between years, to give an estimate of the saving from drink drive policies. The proportion of alcohol related fatalities is estimated to have been about 24% in 1980, falling to 15.5% in 2000. Thus the estimated saving in all alcohol related fatalities (related to 1980 fatality levels) is about 500 fatalities in Britain where most of these fatalities (84%) are car occupant fatalities. For the Netherlands the number of police-reported fatalities from accidents involving drinking and driving was about 300 in 1980 (15 % of all fatalities) dropping to 90 for 2000 (8% of all fatalities). A similar calculation shows that for Sweden alcohol-related fatalities dropped from about 100 in 1980 (14% of total fatal accidents) to 55 in 2000 (10% of total fatal accidents in Sweden), yielding an estimate of about 30 fatalities saved.³⁸

³⁷ - SUNflower: A Comparative Study of the Development of Road Safety in Sweden, the United Kingdom, and the Netherlands, 2002, p. 52.

³⁸ - SUNflower: A Comparative Study of the Development of Road Safety in Sweden, the United Kingdom, and the Netherlands, 2002, p. 104.

In contrast with other public health issues, it seems that the problem of drinking and driving is bigger in developed countries than in developing countries.

Many non-governmental organizations are established in various developed countries to prevent drinking and driving such as Mothers Against Drunk Driving (MADD) in the United States. MADD was founded in May 1980, in California by Candy Lighter after her thirteen year old daughter was hit and struck by a drunk driver, who happened to be a repeat offender. Chapters were quickly chartered across the United States through the early 1980s. In 1984, MADD was key in persuading former President of the United States Ronald Reagan to sign the federal law requiring states to pass 21 as the minimum drinking age in order to receive federal highway funds.³⁹

MADD was relatively successful in its mission to stop drunk driving, to support the victims of this violent crime and to prevent underage drinking. Many other interventions were executed in the developed countries, in contrast with the developing countries that also need similar efforts.

Breath Tests and Blood Tests

The blood alcohol level is measured by a breath test. The random breath test means that police can stop the driver at any time when driving or even attempting to drive and give a breath test. If the roadside test shows that the driver is over the limit, or if he is driving over the limit or if he refused to have the breath test, the driver may be seriously charged. In case of being involved in a crash, the driver will also be

³⁹ -www.madd.org

given a breath test, unless the injury prevents him from being tested. In case he is injured and admitted to hospital, blood tests will be taken for his alcohol level.

Alcohol Problems among Emergency Department Patients

In the book of the Institute of Medicine titled “Broadening the Base of Treatment for Alcohol Problems”, alcohol problems are defined broadly and simply as those problems that may arise in individuals around the use of alcohol.⁴⁰ The use of alcohol or alcohol consumption is often defined as the number of standard drinks, over a certain period of time. As consumption increases, so does the risk for more problems. The National Institute on Alcohol Abuse and Alcoholism at the U.S. National Institutes of Health has set guidelines for determining the levels of consumption at which drinkers are at increased risk to develop alcohol-related problems: for men, on average, that level is no more than two drinks per day or no more than four drinks per occasion; for women, on average, no more than one drink per day or no more than three drinks per occasion.⁴¹ Drinkers who exceed this recommended level of consumption are considered to be engaging in risky driving or are “At-risk drinkers.”

For as long as emergency medicine has existed, emergency physicians and nurses have encountered and helped patients with alcohol problems. However, because alcohol problems are occult and screening is not routine, emergency

⁴⁰ -Committee for the Study of Treatment and Rehabilitation Services for Alcoholism and Alcohol Abuse, Institute of Medicine, Division of Mental Health and Behaviour Abuse, National Academy of Sciences. Broadening the Base of Treatment for Alcohol Problems. Washington (DC): National Academy Press, 1990.

⁴¹ -U.S. National Institute on Alcohol Abuse and Alcoholism. The Physician’s Guide to Helping Patients with Alcohol Problems. Washington (DC): U.S. Department of Health and Human Services; 1995. NIH Publication No. 95-3769.

department patients who have alcohol problems are not generally identified, offered on-site interventions, or referred to assistance outside emergency departments.

Drivers with Medical Conditions

In most developed countries, if the driver has a medical condition that affect driving, such as epilepsy or diabetes, he must tell the road traffic authorities. Drivers are required to give details when filling the application form. With some medical conditions, drivers need to have regular medical examinations to make sure that they are fit to drive. Doctors should assess the medical guidelines for assessing the fitness to drive for the relevant class of license sought or held. Road Traffic authorities may suspend or cancel the driving license if it receives information, from physician, that the concerned person is not eligible to drive.⁴²

In many developing countries, the situation is quite different because most of the examinations to get driving licenses disregard, unfortunately, the medical examination. According to the Scientific Research Foundation (SRF), Lebanese drivers not fit medically to drive cause many serious road traffic injuries.

Sleeping While Driving

In September 2003, The Scientific Research Foundation (SRF) did a small survey, in Lebanon, by asking many drivers the question if they find themselves sleepy at times during the day. The best answer was “It is quite possible to experience daytime sleepiness sometimes after pushing too hard for a long period”.

⁴² -“Drivers with Medical Conditions”. Road Users’ Handbook. Road Traffic Authority, New South Wales, Australia, p.28.

Daytime sleepiness is a common and serious complaint, and is an important cause of road traffic crashes. It occurs more frequently among older people than other age groups, which is due to changes in the sleep cycle with age such as the inability to sustain sleep during the night because of age-associated biological rhythm changes. However, daytime sleepiness may also indicate suffering from a certain medical condition. For instance, common causes of persistent daytime sleepiness include: insomnia, tiredness and fatigue resulting from long term viral illness; and types of drugs and medications, such as benzodiazepines, which include daytime sleepiness.

Another important cause of daytime sleepiness is sleep apnea. Sleep apnea refers to difficulties in breathing while sleeping, which often leads to daytime sleepiness. Sleep apnea most often affects men who are middle aged or older, heavy snores, overweight and medium to heavy drinkers of alcohol. People affected by sleep apnea stop breathing repeatedly during their sleep. Lapses from breathing can last between 10 and 60 seconds. It is possible for a person to stop breathing 400 times during one night, resulting in having very little sleep. Due to these reasons, people with sleep apnea are often very sleepy during the day. They can get very tired while driving, and even fall asleep at traffic lights or while driving. Sleep apnea is a significant factor in many road crashes.⁴³ If left untreated, it can lead to serious life-threatening conditions such as high blood pressure, heart disease, and brain damage due to low blood oxygen levels. Unfortunately, many individuals realize that they are suffering from sleep apnea after being involved in a crash.

⁴³ -Health. Handbook for Older Drivers. the Road Traffic Authority, New South Wales ,Australia, December 1996, p.29-30.

Intoxicants in Traffic

Although speeding and alcohol remains among the primary causes of fatalities, driving under the influence of drugs appears to be an increasingly widespread road safety problem. Many intoxicants weaken especially the car drivers' assessment, decision-making, co-ordination and operating abilities. There are also differences in the way drugs take effect depending on the substance.⁴⁴ Cocaine, Crack, Narcotics and the LSD (Lysergic Acid Diethylamide) are considered as the most dangerous while driving.

Cannabis makes a person groggy and weakens his/her ability to estimate distances and speed. Amphetamine increases risk-taking behaviour, causes aggression and can lead to psychotic episodes. Hallucinogenic substances can cause distortion of the senses as well as panic attacks. Relaxants and sleeping pills can, when used in traffic, weaken the observation and co-ordination skills as well as slow down reaction times and compromise one's sense of balance. The effects from mixed use of intoxicants can be unpredictable and the interference factors can increase many times when compared against just one substance.⁴⁵

In many developed countries, all medicines have an authorised Patient Information Leaflet explaining how the medicine acts, how it should be used and any side effects that might be experienced, including any influence on the ability to drive.

⁴⁴ - Jarvinen, M. Likenneturva Director, Finnish Road Safety Association , Finland, 2002.

⁴⁵ - Farah, E. MD. Coordinator of YASA physicians, " Sabah el Ward program", NTV, 20 March 2003.

The issue of a European-wide symbol on the labelling of medicines known to affect driving is currently being considered by the European Pharmaceutical Committee. The Committee, chaired by the European commission, consists of representatives from all EU states and is consulted on any legislative changes.

Illegal drugs cause far wider social problems, and their effect on road safety have to be seen in the context of wider Government policy on drugs. We need to raise the profile by targeted public information advertising to highlight the risks of driving under the influence of drugs.⁴⁶

Emotional States and Stress in Traffic

Our state of mind can have a great impact on how we behave in traffic. For example, a message of mourning to a cell phone in the car can undermine our concentration dramatically. We may get angry with the other drivers. Our emotion-based response may be due to many different factors.

In the background, there may be issues relating to our current life situation, such as depression, crisis or work-related stress that erupt in traffic. The traffic itself may cause fear, anxiety and uncertainty, and these things bring interference into the interactive dialogue of the road users. Also, our character has an effect on how we tend to react in traffic. Almost all people have aggressive reactions sometimes. In traffic, genuine or imagined mistakes committed by other road users can lead to a disproportionate reaction when one analyses the situation as a whole. Aggressive behaviour blows things out of proportion and feeds itself. Aggression manifests itself as erratic behaviour, as forceful "sports" driving or – in extreme cases – as road rage.

⁴⁶ -Tomorrow's Roads:Safer for Everyone"-The Government's Road Safety Strategy and Casualty Reduction Targets for 2010, Department of the Environment,Transport and the regions:London ,March 2000,p.36.

SRF (Scientific Research Foundation) studies have been able to identify people whose so-called sensation seeking is connected to traffic accidents and traffic violations. A sensation-seeking person has a need to experience new sensations and he/she is ready to take physical and mental risks in order to achieve them. This character trait has primarily been connected to drunk driving, but it has also been linked to speeding and close-range driving.

Speeding

Speed kills by increasing crash severity. The laws of physics clearly dictate that the higher the speed at impact, the more energy must be absorbed by hard metal and by vehicle passenger. Speed at impact will be a function of pre-incident speed and of the time and distance available to take avoiding action (steering and braking). Reducing speeds will allow more time for the avoidance of intersecting trajectories.

Speed is power. It is motion energy that we have acquired for our own use. Speed increases a sense of power; it excites, urges, and blinds many drivers. Many people do not want to consider the negative aspects of high velocity. However, speed is in a crucial role regarding safety.

As speed grows, the driver has less time to make observations, to interpret them and to react in surprising situations.⁴⁷ Also, the chances of outsiders to evaluate the actions of a speeding driver diminish. People have a natural tendency to estimate the speed of an approaching vehicle as slower and the distance as bigger than it

⁴⁷ -Brochure about "Alcohol and Speed", YASA and SRF, November 1997.

actually is. In other words, people underestimate the speed of an approaching car and overestimate the distance.

Speed is directly related to the consequences of crashes. The higher speed the greater the damages on those people who are involved in the accident. For example, a collision at 70 kilometres per hour equals to falling down from a six-story building. The human physiology is ill equipped to handle collision forces of this magnitude. The risk of death starts to grow already as the change of speed in collision exceeds 10 kilometres per hour.⁴⁸ The risk increases very rapidly as the collision speed accelerates.⁴⁹ The fundamental speed law for motor vehicle is that drivers must never travel faster than what is reasonable and proper for the current conditions and public safety.

Regardless of what a posted speed limit sign says, the accepted speed must depend on road conditions (Quality of the road surfaces, the amount of water, ice, or snow, and the width of the roadway), weather conditions and visibility (rain, snow, ice, dust and wind), and pedestrians or bicyclists or people who might be traveling along or crossing the road. The driver should never exceed the posted speed limit. All speed limits are based on ideal driving conditions. If conditions are hazardous, speed must be lower. The driver must be aware of changes in speed limits as he drove in different kinds of roads or enter and exit highways. Also, the drivers must be aware that some highways post minimum speed limits as well.

⁴⁸ - Jamous, Z. ATCL. "Second National Conference", Unesco Palace, Beirut, 29 October 2001.

⁴⁹ - Bou Daher, A. Internal Security Forces, "Third National Conference for Road Safety" YASA, Unesco Palace, Beirut, 19 January 2001.

Illegal speed elevates crash frequency. Research done in the field of accident prevention suggest that being detected speeding is a very good indicator of a car driver's risk potential. Usually, drivers who break the speed limits, violate other traffic rules.⁵⁰ In a research done in the United Kingdom, drivers who were involved in crash in the previous 3 years scored significantly higher not only on speeding offences but also on Highway Code violations compared to those who reported no crashes. Mainly, these highway violations include racing from traffic lights, close following, speeding and drunk driving.⁵¹

Speed reduction may be achieved by modifying roads or vehicles to reduce the opportunities for speeding, or modifying drivers and their trip agendas to reduce the inclinations to speed, or by increasing the likelihood of detection and penalty for speeding. Violations reduce safety margins, thereby increasing the likelihood of both active and passive crash involvement. Excessive mental workload demands promote errors, which may take advantage of reduced safety margins.

Speed cameras are intended to reduce casualties and reducing accidents by reducing speed at specific high-risk locations. Use of speed cameras to supply an evidential basis for prosecution was made possible in many traffic laws in many countries. Photographs from an approved automated speed camera may be used as evidence in prosecuting drivers for exceeding speed limits.

⁵⁰ - Metni, A. Rally driver, "Third National Conference on Road Safety", YASA, Unesco Palace, Beirut, 19 Jan 2001.

⁵¹ -Tomorrow's Roads:Safer for Everyone-The Government's Road Safety Strategy and Casualty Reduction Targets for 2010. Department of the Environment,Transport and the regions:London ,March 2000, p.36.

Accident Prevention

Numerous definitions for accidents are found,⁵² for example:

-An accident is an unplanned and uncontrolled event in which the action or reaction of an object, substance, person or radiation results in personal injury or the probability thereof (Heinrich, 1959).

-An accident is a special class of processes, by which a perturbation transforms a dynamically stable activity into unintended interacting changes of states with a harmful outcome (Henrich and Benner, 1987).

-An accident is an event that results or could result in a harmful injury (WHO 1989).

The word accident, that implies an unforeseen event, which occurs without anyone's fault or negligence is now replaced by many writers by the word crash, because most people involved in a crash should usually claim some responsibility for what happened in the crash.

During the last decades, the theories explaining the behaviour of vehicle drivers have emphasised the drivers' motives and self-control abilities. Theories that have primarily focused on the driver's ability to technically control his/her own vehicle and various traffic scenarios are not the focus point anymore. In other words, it is more important to pay attention to what the driver is doing and is willing to do rather than what he/she is capable of doing.

⁵² - Svanstrom, L. Laflamme, L and Schelp, L. Safety Promotion Research. Karolinska Institutet, 1999,p.16.

Traffic Management and Safety in Construction Zones

Traffic management applied to construction and maintenance operations involves a comprehensive series of actions designed to minimize motorist delays while enhancing the safety of the motorist and the highway worker.⁵³ These actions span the entire life of the construction of a project; beginning in the early project planning phase and continuing through programming, design, construction, operations, and maintenance.

Work zone traffic management encompasses most of our current areas of emphasis: safety, mobility, quality, team work, road user focus, asset management, Intelligent Transportation Systems (ITS), technology transfer, longer lasting materials, performance-based specifications, innovative contracting, life-cycle costing, motorist information, and incident management.

The objective of traffic management is the development and implementation of an overall strategy that allows construction and maintenance operations to be completed safely with a minimum impact on the motorist, the highway worker, and the adjacent residential and business communities. While the principles of traffic management apply to all construction and maintenance operations, traffic management is not a “one size fits all” approach. Obviously, the degree and extent of the techniques needed to mitigate the effects of a construction or maintenance operation vary from project to project and will depend upon the location, traffic demand volumes, and available capacity.

⁵³ - Yazbeck, K. Vice president of the Council for Development and Reconstruction. YASA and CDR Workshop on Safety in Construction Zones, Unesco palace, Beirut, 23 April 2002.

Truck Safety

The most common causes of truck accidents are: mechanical failures, high speed driving and failures to meet safety standards set on weight limits of trucks. Most national regulations state that all material transported in trucks should be well fastened to the truck and should be covered so as not to be apparent. Truck width should not exceed 2.5 meters and truck height should not exceed 3.8 meters with the cargo it carries.⁵⁴ However, the enforcement of these regulations has been weak and awaits a clear commitment from most governments to make road safety a higher priority.

The following are a few important aspects prepared by YASA related to truck safety:

Antilock Brakes

Antilock brakes have been proven to be very effective in preventing wheel lock and loss of steering control in emergency stopping, particularly on wet roads. Antilock brakes also help the driver keep better control of the vehicle in a skid, and may help prevent a motor vehicle from going off the road, a key factor in rollover crashes.

Cab Safety

In most countries, truck cabs currently do not have to meet safety standards for passenger cars, including occupant protection standards requiring the installation

⁵⁴ - Akl, I. "YASA Recommendations for Truck Safety" . *Al-Diyar newspaper* , 16 August 2001 .

of three point belts and air bags. Measures to be adopted should increase the crashworthiness of truck cabs through improvements to interior features of cabs and cab integrity, as well as requiring occupant restraints and three point safety belt systems.

Hazardous Materials Transportation

If trucks are transporting hazardous materials (gasoline, diesel, fuel oil, dangerous chemicals and weapons), they should be subjected to special regulations, increasing the safety and reliability of their operations. Special regulations for hazardous material transportation are adopted in most developed countries.

Inspection

Overweight and oversized vehicles violating Traffic regulations restrictions continue to endanger other roads users and inflict enormous damage to our roads and bridges.

In Lebanon, till end of 2003, all trucks do not undergo routine regular inspections.⁵⁵ This has already led to many injuries over the past few years. If a radical change in truck inspection approach is not adopted, these crashes will increase in number and severity in the future. Other developing countries should also improve their mechanical inspection system and must be stricter in the truck inspection.

Lighting Display

Many drivers, especially the elderly with lower contrast sensitivity and poorer night vision, do not detect trucks in enough time to avoid crashes. Improvements to

⁵⁵ - Azzam, Y. YASA. Interview With Fadi Nacouzi, Radio Liban Libre, September 2003.

truck cab and trailer lighting and reflectivity will increase their visibility and prevent crashes by providing early detection and recognition of trucks by motorists.

Truck Size and Weight Limits

When tractor-trailers are operated in an unsafe manner, other motorists are likely to be the victims. In the United States, of the 5,031 people who died in large truck crashes in 1996, only 12% were truck occupants. In crashes involving a large truck and a passenger vehicle, 98% of the fatalities were the occupants of cars, vans, pickup trucks or sport utility vehicles. As the size and weight of trucks increase, so does the seriousness and likelihood of the crashes.

Truck Tires

Adequate tires on heavy trucks are essential to assure the consistent and safe operation of heavy trucks, prevent the need for emergency handling procedures due to tire blowouts, and to minimize damage from wear and tear on roadways. The quality and reliability of truck tires should be updated to improve skid resistance, stopping performance and fuel efficiency per payload, to mitigate damage to highway pavement and to assure the optimal performance of antilock brake systems.

Truck Underride/Override Protection

Small vehicles involved in side- and rear- crashes with large trucks have much higher than average frequency of serious physical injury. The front ends of passenger vehicles often slide underneath the cargo units of large trucks; in some cases, the ~~passenger compartment is sheared off. Passenger vehicles are also subject to front~~ underride of large trucks as well as rear override by large trucks; both situations result in serious injuries and fatalities to occupants of the passenger vehicles. Truck

underride and override guards can substantially mitigate the severity of passenger vehicles-large truck crashes.

Health of Professional Drivers

If the professional drivers are tired, stressed, or have not been eating regular meals, they cannot drive to the best of their ability, this make them unsafe drivers.

The four most important ways to stay healthy and keep on top of their jobs are to get enough sleep, eat a well-balanced diet, exercise regularly and try to relieve stress.

Enough sleep

Not all people need the same amount of sleep to perform at there best. Time spent relaxing, playing sport or with friends is important, but time spent sleeping is even more important. They should try to sleep regularly and for about 8 hours a day, preferably 8 hours in a row.

Well Balanced Diet

Although it is often hard to get good, healthy food while driving, being aware of what is good for their body and what is not can help to make the decision about their next meal. It is best to eat small meals often rather than large meals as digestion is an energy drain and tends to make sleepy. Common problems, which are related to poor diet, include the following health problems: Weight gain, coronary heart disease, high blood pressure, digestive problems, constipation, some cancers, gallstones, leaver disease, diabetes and tooth decays.

To improve diet, professional drivers should eat a variety of foods each day, including one from each from the following groups: Bread and cereals, vegetables and fruit, lean meat, fish, poultry, eggs, milk, cheese, yogurt, butter, margarine

Exercise Regularly

The more professional drivers exercise, the better for their health. Regular moderate exercise, such as walking, brings the same benefits. It is the amount of energy used that counts most, not how they used it up or how quickly.

Walking, gardening, cycling and swimming are all good forms of exercise. They should start at a low level and build up slowly over time. They should not overdo it. It is preferable to choose suitable clothing and footwear. In case the weather is very hot, humid or cold, straight after meals or alcohol, or if the driver does not feel well, they should not drive. It is best to check with a specialist before starting exercises.

Relieve Stress

Stress affects driving. If professional drivers have problems at home or at work, they are more likely to be involved in a crash. Divorce and psychological problems, for example can affect driving. The crash rate can be twice as high as that of the average driver and even higher during the 6 months before and after a divorce. Because they are on the road much longer than the average driver it is very important to park their personal problems before they get behind the wheel.

If they need help to overcome any problems, it is recommended to see a doctor who can put them in touch with the best people to give advice.

Two Wheel Motor Safety

Mopeds and motorcycles can present environmental advantages on some journeys. They are a sensible means of transport for many journeys where public transport is limited and walking or cycling unrealistic. However, motorcyclists represent a large proportion of road casualties in relation to their numbers. In the United Kingdom, they make up less than 1% of road traffic, but suffer 14% of deaths and serious injuries. In the rapidly motorizing countries of South East Asia over half of deaths are motorcyclists.⁵⁶

The most effective way to reduce the number of deaths and serious injuries from motorcycle crashes is through better training (use of motorcycle safety helmets) and testing for both riders and drivers and through better engineering construction and design, which will help to make motorcycling safer than it is now. Most developing countries have laws and regulations for motorcycles. However, the enforcement of these laws is not serious in most of these countries.

In comparison with other vehicles, motorcycles are considered the most dangerous. SRF Statistics show that nearly 75% of fatalities from motorcycles accidents occur when the driver's head collides with the road.⁵⁷ Some of the risky driving patterns of motorcycles drivers (diving on one wheel, erratic and zigzag driving on highways) greatly increase the risk of injury.

Motorcycle risk is estimated around 20 times higher than that of car travel. And an increasing time trend of mortality is noted. In Malaysia, for instance,

⁵⁶ -www.GRSProadsafety.org

⁵⁷ - Aoun, A. SRF. "First National Conference for Road Safety", UNESCO palace, 31 october 1998.

motorcycles represent nearly 51% of the total vehicles registered and 49% of vehicles involved in road crashes. This pushed the government of Malaysia to prompt various steps. One of them is the Motorcycle safety program.

Motorcycle safety programs should focus on increasing the training and knowledge of motorcyclist, especially on the importance of knowing that accidents can happen on any rider experienced or not, the importance of understanding road signs and creating self-awareness on the importance of safety. Therefore to ensure reducing the number of crashes among the motorcyclist, safety campaigns should be carried on. The campaign should consider the differences between riders in terms of knowledge, attitude and practice of motorcyclist on road safety between ethnic, age and gender groups.

Safe School Transportation

“30 Children die as bus plunge into Delhi River. India’s perilous roads witness another tragedy.”⁵⁸ Unfortunately, most developing countries suffer from severe crashes caused by buses transporting pupils to schools. These crashes lead to the fact that more than 20 per cent of those killed and injured in road crashes in developing countries are under 15 years old.⁵⁹

Providing transportation for students has become a very large enterprise. Students are transported to and from school daily in school buses, including private

⁵⁸ - *Times of India newspapers*, India, Nov 1997.

⁵⁹ - “Keep Death of Your Roads”, World Road Association and GRSP Brochure, 2002.

passenger cars that are used regularly for this purpose. School bus transportation has progressed rapidly from the relatively inefficient horse-drawn vehicles to the fast, efficient, and safe steel-bodied school buses of today. This expansion of school transportation programs has not only provided broader educational experience but has also provided a greater degree of safety for schoolchildren. Students being transported in school buses must be subject to some adult supervision. This usually is the responsibility of the assistant of the bus driver. Finally, the bus driver is the key factor in the safe operation of the school bus. Martinez has said, "If the driver is lacking in ability, judgment, or training, the best equipped bus, the best students, the best roads do not mean a thing."⁶⁰

Despite the increasing dangers of highway travel, many countries and communities pay minimum attention on pupil transportation. The scope and sequence of education for school bus riders is variable from a school to another within the same city. "Each passenger on a school bus should know its personal responsibility for his own conduct and his own safety. No matter how young or how handicapped a rider may be, he must be taught to feel responsible for his actions. As a child matures, he will be expected to take more and more responsibility. He should be given every opportunity to obtain the information and attitudes necessary to understand and appreciate the fact that his own conduct is of basic importance in developing safer school transportation."⁶¹

⁶⁰ - Crosby, R. Block, V. It's Time to Face the School Bus Problem. Family Safety Association, Fall 1968, p.18.

⁶¹ -Asli, M. "Workshop on School Safety" , Municipality of Beirut, 1 June 2002.

Human Errors as Causes of Crashes

Human errors are the principal cause of crashes as described in this section.

Many of the crashes attributed to chance, fate, or mechanical failure can be traced to some aspect of human error. It is characteristic of people to look for excuse rather than a cause. An automobile accident resulting from brake failure is often attributed to mechanical failure or fate. However, this and similar defects often provide warning signals in the forms of leaks, decreasing pedal, and so on. The proper checking of mechanisms, following planned safety procedures, and cautions use can eliminate many of the accidents classified as fate or chance. However, many people ignore safety until after an accident has occurred. This lack of action is, within itself, a human error.⁶² Whenever an accident could have been avoided through a planned safety program or procedure, the cause of the accident can be attributed, at least in part, to human error. In evaluating the cause of an accident, all errors that led to the accident must be studied in order to plan necessary programs to prevent similar crashes.

⁶² - Strasser ,A and Bohn, E. Fundamentals of Safety Education. Macmillan ,1973,p.89.

CHAPTER TWO

MAJOR REQUIREMENTS FOR SAFE DRIVING

Driving Ability and Driving Style

The issues that have an effect on all levels are important from the viewpoint of safe driving. YASA uses the problem that relates to speeding as an example. Driving speed is normally seen as a measuring stick for one's driving ability: he/she is driving using a speed that he/she is comfortable with. This way the driver is in control of the vehicle and can also control different traffic situations. As experience grows, the driver's ability to recognize risks improves. It is also possible to improve one's driving skills with training.

We have already discussed sensation-seeking drivers. When a person is driving a car, he/she is expressing his/her personality and also his/her attitudes towards other road users. As we talk about driving ability, we should also be talking about driving style. The driving style can be seen in the driving tempo, the willingness to pass, the driving distance and the attitude regarding obeying traffic rules. Driving style does not develop into a safer direction as experience and mileage increase. Actually, it's quite the opposite.

The selected driving speed normally depicts the driving style of the driver rather well. It does not change very much over time. The same drivers are constantly

speeding and speeding is directly related to traffic violations and accidents. The traditional driver's training is hardly enough to deal with the problem. The solutions must be sought after on the higher levels of the hierarchy.

Especially in accidents caused by alcohol, drugs, and stress or speeding, it is possible to see the factors behind the visible actions of the driver. These factors include motives, goals for moving, ability to control oneself, and, in the end, the values and attitudes that are dominant in society. The reasons are rooted deep in the life of the people: on the top level of the hierarchy. The problem confronts us as we move higher up in the hierarchy – the issues get more and more complicated. We must find ways to advance from solutions on an individual level to solutions that involve the traffic system and the entire society.

The Hierarchic Model of Driving

A hierarchic model has portrayed driving a vehicle and the driver's ability level. There are four levels in this model. At the lowest level, there are the skills needed to technically control the driving performance (regulating direction and speed). On the second level, there are the tactical processes, such as recognising different scenarios and making decisions concerning speed. On the third level, there are the issues that depict the driver's readiness to make strategic decisions, such as decisions concerning travelling: what kind of travelling, when and in what kind of circumstances the driver sets out on his journey.

~~The issues on the highest level relate to driving only indirectly. These issues include the driver's objectives in life, his/her self-control and self-discipline abilities,~~

and in the end, his/her moral principles. They affect the driver's motives and guide his/her activities in the processes of the lower levels of the hierarchy. The characteristics and processes of the higher level, which relate to the driver, guide and explain the performances of the lower level.

Safety Features in Buying a Vehicle

Safety should always be a top priority when shopping for a vehicle. Research the safety performance of any vehicle you are considering buying including how the vehicle performs in crash tests. Both driver and passenger side air bags are now mandatory in all new cars. Look for side impact bags in many new models as well. When buying a used vehicle, look for one with air bags. Research what type of safety systems are in the car and choose the safest to protect you and your loved ones in the event of a collision.

Seeing and Hearing Clearly

Most of what drivers do, on roads, depends on what they see. In order to be a successful driver, it is a must to see well. The single biggest contributor to accidents is failing to see what is happening. Drivers must look down the road, to the sides and behind the vehicle and they should be alert for unexpected events. At night and at other times when it is hard to see, drivers must use headlights. For example, drivers reported that they looked but did not see motorcycles, bicycles and pedestrians.

In order to see, drivers must be alert to what is going on around them. Many accidents occur because drivers do not pay enough attention for their driving. They should not take their eyes off the road for more than an instant at any one time. For

example, if a driver needs to look at a map, he should pull safely off the road before trying to look at it.⁶³

Drivers should avoid staring at crashes or at someone getting a ticket, or other roadside activity. In case the driver is taking his eyes off the road to look at something, he could run into a vehicle ahead that has slowed or stopped. Good vision is a must for safe driving, otherwise the driver will have trouble identifying traffic and road conditions, spotting potential trouble, and reacting in a timely manner. On the other hand, hearing can also be helpful to safe driving. Drivers should not drive with headphones or earphones, which cover or go on both ears, because they will make it hard to hear emergency horns or sirens. The sound of horns, sirens or screeching tires can warn the driver of danger.

Hearing problems, like bad eyesight, can come on so slowly that the driver may not notice it. While drivers who know they are deaf or have hearing problems can adjust and be safe drivers, because they learn to rely more on their vision and stay alert.

Driver Fatigue

A person who is tired or near the end of a long period of exertion is more likely to be involved in a crash than an alert and rested person. This situation accounts for a part of the high crash rate. Several major reviews and commentaries

⁶³ -“Be in Shape to Drive”, Iowa Driver’s Manual, 1999-2000, Iowa Department of Transportation, USA, p.55.

have recently suggested that fatigue or sleepiness in car drivers increases the risk of crash. ~~Estimates of the proportion of crashes attributable to fatigue have been made~~ by extrapolating from different data sources and vary widely from 1-25% of crashes and almost one third of all fatal truck crashes on highways.⁶⁴

The driving and general safety abilities decrease as the day progress. Fatigue arrives and emotional stress can easily build up by the end of the working day. In Lebanon, most crashes caused by fatigue occur between 11 pm and 8 am, the body's normal sleeping time.⁶⁵ Another high-risk time is from early to mid-afternoon. This does not mean that driver fatigue only happens in those periods, but it is when drivers are most likely to suffer the effects. In order not to lose concentration, the driver should get plenty of rest between trips and should not drink alcohol before driving.

The driver should watch out for signs of fatigue-drowsiness, aches and pains, or lazy steering, and pull over to the nearest safe place and rest. Finding time to rest may seem difficult, but many heavy vehicle drivers lose the battle with fatigue on the road every year. Drivers should plan their trips and resist demands for long hours. After all, it is the drivers who may suffer the loss of their driving license and pay the associated fines, not to mention the health effects and the safety risks.

Emotions and Human Behavior

Fear, hate, love, anger, and other emotions play an important role in determining the cause of accidents. Emotion may be defined as a disturbed psychological condition, which can be described as a disintegrative activity. As a

⁶⁴ -Farah, E. MD.YASA, "Nharkoun Said", LBCI interview, 18 Jan 2001.

⁶⁵ -SRF observation, Summer 2001.

result, an activity that is affected or controlled by emotions is the most disorganized form of behavior. Because of this disorganized condition, behavior may be illogical and unpredictable. This explains why, under certain conditions, normally safe individuals act in a reckless manner.⁶⁶ For example, a person who has just been fired or cheated or had a severe argument with his wife may act erratically, take unnecessary chances, and drive in a manner completely different from his normal driving pattern.

Talking on the Phone While Driving

People often use the mobile phone, in order to manage their works and their personal affairs. Although it is a perfect mean to solve the problem in a fast way, it may also be considered among the main factors of car crashes.⁶⁷

The “Don’t talk and Drive: broken leg” billboard ad won many awards in Lebanon.⁶⁸ Studies show that the use of a hands-free phone system is no safer than that of a hand-held one, simply because they both require a diversion of attention when dialing a number or answering a call or searching in the phone menu: this could lead to accidents or disturbances in driving.

If the mobile phone has to be used while driving, it should only be done in traffic conditions where unexpected events have a low probability of occurring and traffic intensity is low, and according to the following rules:

⁶⁶ Strasser, A and Bohn, E. Fundamentals of Safety Education. Macmillan , 1973, p.91.

⁶⁷ - Maokadiéh, S. “Danger of Talking on Mobile While Driving”, Nharkoum Said program, LBCI interview, 12 May 2001.

⁶⁸ -“Together”. *Libancell Magazine*. August 2003, p.14.

Buckling up.

Keeping both hands on the driving wheel.

Keeping both eyes fixed on the road and the traffic.

Positioning the phone where it is easy to see and reach.

Familiarizing yourself with the phone's operational aspects while the car is parked.

Using a hands-free microphone while driving.

Never taking notes while driving, pull off the road when any reading or writing is required.

Using voice mail to pick up your incoming calls if it is inconvenient or unsafe to answer immediately.

Don't participate in any conversation that may disturb you while you are driving.

Inform the person who are calling that you are driving; but in urgent cases, pull over and answer.

Be careful in bad weather conditions especially in rainy and foggy days.

Mobile use should be restricted to emergencies such as providing assistance to people in need.

Using Horn, Headlights and Emergency Signals

It is important to know how to operate vehicle's safety equipment properly.

Drivers should use horn to warn pedestrians or other drivers of possible trouble and avoid accidents. On the other hand, drivers should not use horn to express anger or complain about other drivers' mistakes nor to try to get a slower driver to move faster, not to forget that they should not use horn to try to get other vehicles moving

in a traffic jam. Drivers should use headlights in rain, snow, fog, or other inclement weather that makes it hard to see, anytime they have trouble seeing other vehicles, and to flash another vehicle to alert the driver to turn on their headlights. The law requires drivers to use their headlights from one-half hour after sunset until one-half hour before sunrise.

Using emergency lights and signals when the vehicle breaks down, so that other drivers can see it. Drivers should make sure to get your vehicle as far to the side of the road as you can. For their own safety, they should stay off the road and never take chances changing a flat tire in a traffic lane. Instead, they should wait for help to arrive. Drivers can also use your emergency lights to warn drivers behind them that a traffic accidents or major hazard lies ahead; they should give other drivers as much warning as possible.

Driving in the Rain or Fog

Rain and wet roads make it harder to start, stop, and turn. Hard rain, fog and mist can also reduce the driver visibility dramatically. Drivers are advised to use windshield wipers⁶⁹ and to slow down at the first sign of rain. Many roads are most slippery when rain first mixes with road dirt and oil, forming a greasy film on the road's surface. If a road is slippery, the tires are riding on a layer of water and have lost partial contact with the road.⁷⁰ If the vehicle starts to hydroplane, that means that the speed is too high for these conditions. Drivers should slowly ease up on the gas

⁶⁹ -YASA brochure "Winter Driving", October 1998.

⁷⁰ -YASA press release "Safe Driving in Winter", 15 Jan 2001.

pedal and they should never hit the brakes or turn suddenly because they may lose control and go into a skid.

The following are some useful driving tips for driving in rain or fog:

- Drivers should increase the space between their vehicle and other vehicles. There is a need of more distance to stop the vehicle.⁷¹
- Drivers should be careful of wet leaves on the road. They can be as slippery as ice.
- They have to make sure that their windshield wipers and window defoggers are in good conditions.
- In fog, they should use low beam headlights to reduce glare, and they should always use their directional signals.
- If it is hard to see the pavement or signposts, drivers should slow down and look edge markings to guide.
- Avoid driving through puddles. Wet brakes do not work properly. If you drive through a large puddle, apply your brakes lightly as soon as you can to dry them until you feel them working normally again.

Driving at Night

There may be fewer cars at night, but that doesn't mean people are safer. In fact, about a third of all crashes happen at night. Speeds are generally higher at night. This is despite the fact that it is more difficult to see.⁷²

⁷¹ - Daccache, J. Vice president of YASA, "Jadal program", MTV, 10 Jan 2002.

⁷² - "Driving at Night" article written by YASA, *5 index newspaper*, August 2003.

Drivers should slow down for the conditions and see well at night. They should keep a close watch on the road at night. Many clues, visible in the daytime, are not easily seen at night. Special problems at night include: Cars, people, animals, bicycles and motorcycles may seem to “come from nowhere”, people on foot and on bicycles can be very hard to see. Bicycle lights are faint, and some cyclists ride illegally without any lights at all. In addition, pedestrians are more likely to have been drinking, and to behave unpredictably. Drivers should be especially careful at places where they may be pedestrians. There are more drivers on the road who have been drinking, especially on Friday and Saturday nights. Crash risk is higher at night. Half of the crashes involving probationary license holders happen at night (between 6p.m. and 6a.m.) and half of these happen on Friday and Saturdays nights!

Seeing Well At Night

Drivers should keep their speed down, and they will have time to react. They should be able to stop within the distance you can see. In the country this will be their headlight range.

Head And Taillights

Vehicles must have their head and tail lights on between sunset and sunrise. It is wise to have headlights on during the day if the weather, and/or conditions, around are bad.

High Beam

Drivers should use high beam for extra seeing distance. They may do this whether or not there are streetlights. They must, however, dip their headlights to low beam when an approaching vehicle is within 200m, or the other vehicle’s headlights dip, whichever is sooner. Drivers must also dim their headlights when driving 200m

or less behind another vehicle. High beam should not be used in foggy conditions as their lights r

eflect back at them and they can't see as clearly.

If another driver comes towards another with high beam on, the driver should look to the right side of the road and drive towards the right of his lane. If the driver is dazzled, he should slow down or pull over until his eyes recover.

Loose Luggage

Many serious injuries occur after an accident or a hard braking from the loose objects or luggage that hit the passengers. After an accident or even a strong braking the vehicle is nearly motionless; however, loose luggage continues to travel at nearly the same speed the car had before. Loose luggage not properly secured in the car can take on the effect of a deadly missile not only in the case of an accident, but also during hard braking. For example at 50km/h, an umbrella weighing 45gr can, in these situations, exert power equivalent to a heavy blow from a hammer; a briefcase originally weighing 5kg can turn into a lethal weapon with an equivalent weight of 45kg.

Drivers should always remember to place luggage right behind the back of the rear car seats - this means that in the event of an accident, the seats act as barriers to the luggage moving forward. When packing the boot, drivers should ensure that the heaviest items are placed at the bottom.

Driving on International Highways

Country driving requires constant attention to a frequently changing environment. Drivers should be aware of prevailing speed limits and adjusting their speed accordingly. Long distance driving also requires preparation, to avoid fatigue and to maintain alertness during the journey. Drivers are recommended to have:

1. A good sleep before setting out. They should not drive when obviously tired, stressed or ill, and avoid driving during normal sleeping hours.
2. Watch for the symptoms of fatigue-boredom, lazy steering, aches, pains, sore eyes, and restlessness.
3. Pull over at the safest place and rest for at least half an hour or until recovered.
4. Be alert for the presence of crop dusting, or storms of insects, which can impede vision.
5. Drive more slowly through cutting gorges, winding and unsealed roads and where there are heavy vehicles, wide or dangerous loads (e.g. explosives or chemicals), farm machinery or school buses.

Driving Emergencies

In any emergency driving situation, it is very important that drivers think clearly and don't panic. In most emergency situations, drivers have only a short time to react. This section will include what to do when an emergency occurs.

Skidding

The technique for handling a skid is the same for front-and rear-wheel drive vehicles:

- Ease of the gas, and shift into neutral.

- Do not hit the brakes. The skid will be worse.
- Turn the steering wheel in the direction of the skid. If the rear tires are skidding to the left, the steering wheel should be turned left. If they are sliding right, the steer should be turned right.
- The driver must be prepared to steer left and right a few times until his car will be completely under control.

Running off the Pavement

In case of driving off the pavement edge and to the shoulder of the road, the driver must pay attention to the following remarks:

- Grip the steering wheel tightly.
- Gently apply the brake to reduce the speed of the vehicle.
- Check for traffic behind, and then steer gently backs onto the road.

Flat Tire, Blowout, or Wheel Loss

If a flat tire surprise the driver, he should grip the steering wheel tightly and ease his foot off the gas pedal and gently apply the brakes. In case he begins to skid, the driver should turn the steering wheel in the direction of the skid. As he recovers gently, he should straighten the car and do not use the brake until the vehicle is under control. Finally, the driver should pull the vehicle well off the road as soon as possible.

Brake Failure

If the brake pedal is fully depressed but the brakes fail to respond, the driver should pump the brake pedal several times rapidly to build up brake fluid pressure, but he should do not pump antilock brakes.

Moreover, the driver should shift down to a lower gear, and work his way down to the lowest gear, if necessary. The driver should apply the parking brake gently, but hold the brake release in case the vehicle starts to skid. In case the driver cannot slow the vehicle, he should sound his horn and flash lights to warn drivers or pedestrians.

Stuck Gas Pedal

If the gas pedal (accelerator) sticks, the driver should put the car in neutral and apply the brakes to slow down. He should use his feet to try to free the gas pedal. If the gas pedal do not release, he should reapply the brakes and he must always keep his eyes on the road.

Vehicle Approaching Head On

If a vehicle approaches head on in the same lane, the driver should slow down and pull to the right. He should sound horns to alert the other drivers.

Headlight Failure

If a headlight suddenly goes out, the driver should turn on the parking lights, emergency flashers, or turn signal. First, drivers should try the headlight switch a few times, then pull off the road as quickly as possible and leave the emergency flashers on.

Breakdowns

The driver should move the vehicle off the pavement to the side of the road and he should never park on a hill or on a curve where others cannot see. If he cannot

get his vehicle off the pavement safely, he should get all passengers out of the vehicle and off

the road. On a highway with a breakdown lane or shoulder, it is recommended to move the vehicle as far from the travel lane as possible. He should not stand anywhere near the travel lane or in the breakdown lane, if he can avoid doing so.

Turn on the emergency warning lights (flashers). At night, the driver should also turn on the vehicle's interior lights. It is recommended to tie a white cloth to the antenna or door handle (use a red cloth when it's snowing). If he has flares or reflective signs, he should place them 200 feet in front of and behind the vehicle to warn other drivers.

Pedestrian Safety

In most developed countries, the number of pedestrians killed in traffic crashes has declined over the past 15 years, yet pedestrian deaths constitute the second largest category of motor vehicle related fatalities. In the Middle East region, pedestrians are involved in more than 40 per cent of fatal crashes. Most of pedestrian fatalities were young children, older adults, and people impaired by alcohol.

Statistics reported by the Jordan Traffic Institute, indicated that 146,469 traffic crashes occurred during the period from 1998 to 2000, which have resulted into 1974 deaths and 55,034 injuries. Pedestrians were involved during the same period in 17,909 traffic crashes (12,22 % of all traffic crashes), which have resulted into 869 deaths (44,02 % of all traffic crashes deaths) and 18254 injuries (33,17% of all traffic

related-injuries).⁷³ Unfortunately, many adult pedestrians who are killed in motor vehicle collisions have very high blood alcohol concentrations. Changing the behavior of drinking pedestrians will not be easy.⁷⁴

Pedestrian signals

Pedestrian signals assign right-of-way to pedestrians, in much the same way as vehicular signals do for vehicular traffic. However, they is no guarantee of safety. Pedestrians still have to exercise sound judgment when crossing a roadway. The following suggestions are offered in the interest of safety:

Before crossing a signalized intersection, always push the pedestrian detector if one is present. This will guarantee adequate crossing time.

- 1- If no pedestrian signal is present, push the pedestrian detector if one is available, and always cross as soon as the vehicular signal turns red. This will insure that adequate crossing time will be available. Pushing the detector when the signal is already green will not cause the green time to be extended during that particular green interval. The next green interval will, however, be extended. If the green signal has been on for any length of time prior to your arrival, be very cautious about entering the roadway - the vehicular signal could be ready to turn green and you could be trapped out in the roadway when it changes!

⁷³ -Al-Omari, B. Assistant Professor of Civil Engineering. "Characteristics of Pedestrian Accidents in Jordan", Second Safety on Road International Conference-Abstracts and Keynote Speeches, Bahrain Conference Centre, Holiday Inn, Bahrain, 21-23 October 2002,p.118.

⁷⁴ -Prevention of Motor Vehicles-Related Injuries: A Compendium Articles from the Morbidity and Mortality Weekly Report 1985-1996, Center for Disease Control and prevention, Atlanta, Georgia,1997,p.7.

- 2- When full pedestrian signalization is present, push the pedestrian detector and cross when the pedestrian indication turns to WALK. Don't panic when the indication turns to flashing DON'T WALK - there is still adequate time to finish crossing before opposing traffic is released.
- 3- Whenever crossing a roadway, regardless of the presence or absence of pedestrian controls, minimize the time you spend in the roadway - DON'T SAUNTER!
- 4- Always be attentive and watch for possible vehicular traffic turning across your path. By law, vehicles have to yield to pedestrians lawfully within the intersection.
- 5- However, in any contest of right-of-way between pedestrians and vehicles the pedestrian will ALWAYS lose. Too many epitaphs for former pedestrians could read - "But I was in the right."

Pedestrian signals are special types of traffic signal indications installed for the exclusive purpose of controlling pedestrian traffic. They are frequently installed at signalized intersections when engineering analysis shows that the vehicular signals cannot adequately accommodate the pedestrians using the intersection. Pedestrian signals have evolved over the years and are now effective, sophisticated traffic controls. Unfortunately, their necessary sophistication has resulted in common misconceptions being held by the very people they are designed to serve - the pedestrian! The following discussion tells when pedestrian signals are normally installed, how they function, and what the indications mean.

When are pedestrian signals used?

Pedestrian signals are installed for a variety of reasons. Frequently they are installed:

- When the layout of an intersection is such that vehicular indications are not visible to pedestrians.
- If pedestrian volumes are very heavy, as in a central business district.
- When the traffic movements at an intersection are so complex that special efforts have to be made to communicate with pedestrians.
- If a special pedestrian path has to be defined across a complex intersection.
- If pedestrians have to be given exclusive use of an intersection in the interest of safety.

How do pedestrian signals function?

There are two types of pedestrian signals; those with pedestrian detectors ("Push-to-Walk" buttons) and those without detection. Pedestrian detectors are normally installed at intersections when:

- Arrival rates of side street vehicles are occasionally low and pedestrians experience undue delay waiting for a vehicular indication to turn green.
- Vehicular green indications are too short to allow for a pedestrian to safely cross a wide street - in these instances the pedestrian push button causes the signal controller to "extend" the green time for both vehicles and pedestrians.
- Pedestrians can get "trapped" on median islands in the middle of a complex intersection.

What do the indications mean?

Pedestrian signals consist of the illuminated words WALK and DON'T WALK, or the illuminated symbols of a walking person and an upraised hand.

The meanings of the indications are as follows:

- A steady, illuminated WALK display, or a steady illuminated symbol of a walking person, means that a pedestrian may enter the roadway and proceed in the direction of the indication.
- A flashing, illuminated DON'T WALK display, or a flashing illuminated symbol of an upraised hand, means that a pedestrian may not start to cross the roadway in the direction of the indication, but that any pedestrian who has partly completed his crossing during the steady WALK indication may continue across.
- A steady, illuminated DON'T WALK display, or a steady illuminated symbol of an upraised hand, means that a pedestrian cannot legally enter the roadway.

Common misconceptions about Pedestrian Signals

There are several misconceptions about pedestrian signals and pedestrian detectors. They include:

- The erroneous belief that the WALK indication should be displayed for the entire time required for crossing the street.
- The critical requirement in pedestrian signal timing is that opposing vehicles not be permitted to go before all pedestrians who have entered the roadway on the steady WALK interval have had adequate time to complete their crossings.
- The pedestrian protection does not terminate for pedestrians already in the roadway when the steady WALK ends and the flashing DON'T WALK begins.

- Complete protection exists for any pedestrian who begins to cross the roadway during any part of the steady WALK interval, even if most of the actual crossing takes place during the flashing DON'T WALK interval.
- Essentially the steady WALK indication informs pedestrians that they may begin to cross the roadway. The flashing DON'T WALK provides protection for pedestrians who began crossing during the WALK interval and prevents late arrivals at the intersection from beginning to cross.
- The mistaken belief that available pedestrian detectors don't have to be pushed to gain access to the roadway. Some pedestrians fail to push available detector buttons and instead proceed to cross by observing the vehicle indications rather than the pedestrian indications. Since vehicles normally move faster than pedestrians, the green time needed to cross the intersection is less for a vehicle than for a pedestrian. If the detector is not used, the pedestrian indication remains at steady DON'T WALK, and the green time given by the vehicular signal is not always sufficient to permit a pedestrian to completely cross the roadway.
- The misconception that pedestrian signals and detectors automatically increase safety and should be installed at all signalized intersections. Every signalized intersection has to be evaluated independently. If the combination of signal timing, intersection layout, pedestrian volumes, and vehicular volumes are such that pedestrian signals and detectors are not needed, then they should not be installed. In addition to the substantial installation costs, pedestrian signals consume a significant amount of electrical power at a typical intersection.

- If the vehicular indications can safely accommodate pedestrian traffic, then there is no justification for spending scarce resources to install elaborate pedestrian controls.
- At some intersections it may be that only pedestrian detectors need to be installed. Where pedestrian volumes are low and pedestrian signals are not needed, a pedestrian detector can be used to extend the vehicular green, if it would otherwise be too short for a pedestrian to cross.

Crosswalks

Marked crosswalks are widely classified as safety devices. Interestingly, however, there is strong evidence that many pedestrians feel overly secure when using a marked crosswalk - to the degree that they may aggressively place themselves in a hazardous position with respect to vehicles in the mistaken belief that the vehicle can and will stop in all cases, even when it may be impossible to do so. It is not unusual, also, for this type of pedestrian behavior to cause rear-end collisions.

By contrast, a pedestrian using an unmarked crosswalk generally feels less secure, less certain that the vehicle will stop – and exercises more caution in waiting for safe gaps in traffic before crossing. The end result is fewer accidents at unmarked crosswalks.

The crosswalk is a very important warning device. One of the commonly accepted functions of the marked crosswalk is that it serves as a warning device to the travelling public. And yet, studies show that the driver's view of a crosswalk is greatly reduced at the safe stopping sight distance - where he should be able to

perceive and react to a pedestrian in a crosswalk - due to the effects of foreshortening and distance diminishment. The view of the crosswalk is further affected by road alignment, irregularities in the pavement and other variables like weather, a dirty windshield, glare, and adverse lighting conditions.

Another contributor: Exposure Ratio

Assume that for every pedestrian who crosses a street in a marked crosswalk there are some 70 vehicles that drive over it. This is a ratio of use only - obviously each pedestrian does not encounter 70 vehicles. The pedestrian may have only encountered a few, if any, vehicles. Similarly, few, if any of the 70 drivers may have had to slow down or stop for the pedestrian.

In many locations on roads and streets, the pedestrian and the driver most often encounter marked crosswalks with no necessity to slow down or stop. The result of this relatively low incidence of actual exposure is that it tends to precondition both the pedestrian and the driver to a presumption of safe passage and they are ill prepared to react when danger does occur.

Does this mean marked crosswalks should not be installed?

Not necessarily. The marked crosswalk is a useful traffic-engineering device for channelizing pedestrians and helping pedestrians find their way across complex and confusing intersections. It will continue to be used until a better means is developed to show the preferred route to pedestrians when crossing the street. The answer, of course, is the understanding by pedestrians that as much caution needs to be used when using a marked crosswalk as those unmarked - which is the purpose of this brief discussion.

The decision to install or not install a marked crosswalk should not be taken lightly. Rational warrants have been adopted in "Crosswalk Policy" for their installation. Care should be taken that crosswalks are not installed where there is a question of their resulting in traffic casualties. In general, marked crosswalks have the following advantages and disadvantages:

Advantages

- 1- May help pedestrians orient themselves and find their way across complex intersections.
- 2- May help show pedestrians the shortest route across traffic.
- 3- May help show pedestrians the route with the least exposure to vehicular traffic and traffic conflicts.
- 4- May help position pedestrians where they can be seen best by oncoming traffic.
- 5- May help utilize the presence of luminaries to improve pedestrian nighttime safety.
- 6- May help canalize and limit pedestrian traffic to specific locations.
- 7- May aid in enforcing pedestrian crossing regulations.
- 8- May act, in a limited manner, as a warning device and reminder to drivers that this is a location where pedestrian conflicts can be expected.

Disadvantages

- 1- May cause pedestrians to have a false sense of security and to place themselves in a hazardous position with respect to vehicular traffic.

- 2- May cause the pedestrian to think that the driver can and will stop in all cases, even when it is impossible to do so.
- 3- May cause a greater number of rear-end and associated collisions due to pedestrians not waiting for gaps in traffic.
- 4- May cause an increase in fatal crashes and serious injuries.
- 5- May cause disrespect for all pedestrian regulations and traffic controls.

Unjustified and poorly located marked crosswalks may cause an increased expense to the taxpayers for installation and maintenance costs which may not be justified in terms of improved public safety. Indeed, such crosswalks may tend to increase the hazard to pedestrians and drivers alike.

In conclusion, it is appropriate to restate that marked crosswalks will continue to be a useful traffic control device. But, it is important that the general public recognize what marked crosswalks can and cannot do. It is also important that public officials not install them, unless the anticipated benefits clearly outweigh their associated risks.

Sharing the Road with Bicycle Riders

Bicycling is a means of transportation for many people and an increasingly important recreational and fitness activity. Worldwide, bicycle sales have grown far more rapidly than automobile sales in the past two decades, so that the number of new bicycles produced is now three times the number of automobiles. Most fatalities are associated with head injuries. In most developed countries, the past few years

have witnessed a dramatic upsurge of interest in bicyclists' head injuries and their prevention.⁷⁵

Bicycle riders have the same rights and responsibilities as drivers and motorcycle riders. They are part of the traffic scene, sharing the road with other users. When overtaking, give bicycle riders a safe amount of clearance, at least 1 meter in 60 km/h zones. If the sign posted speed is higher, then bicycle riders need more clearance for their safety. Bicycle riders are affected by rough road edges, gravel, parked cars and other things; this is why they travel away from the curb. In most developed countries, they are entitled to a whole lane and can also travel two abreast in a lane provided they ride not more than 1.5 meters apart.

Advocacy non-governmental organizations in these developing countries should learn from the experiences in developed world to put pressure on their governments in order to enact and apply legislations that protect the most vulnerable road users such as pedestrians and bicycle riders.

Bicycle Helmets

Bicycle helmet use, which was uncommon, a decade ago except among some serious cyclists, is rapidly increasing, worldwide. Legislation to require bicycle helmet use has been passed in many jurisdictions and is under consideration in others. Bicycle helmet use is now viewed, by most members of the injury prevention community, as an effective, relatively inexpensive injury prevention measure likely to

⁷⁵ - Baker, S. Li, G. Fowler, C. Danneberg, A. "Injuries to Bicyclists: A National Perspective," The John Hopkins Injury Prevention Center and the Smell Memorial Foundation, St James, New York, 1993, p.11.

be implemented by a large portion of the population, with resulting measurable reductions in morbidity and mortality.

Two successful programs, in Australia and the United States, for increasing helmet use and their results are viewed.⁷⁶

The state of Victoria, Australia, made bicycle helmet use compulsory in July 1990. Observational surveys indicated that the prevalence of helmet use among children aged 5-11 years increased from 26 per cent before the law's enactment to 80 per cent after enactment.

The second program, in 1986, a Seattle coalition implemented a community-based education program to reduce bicycle-related head injuries among children by promoting helmet use. Helmet use among children 5-15 years of age increased from 5 per cent to 38 per cent between 1986 and 1992, and the number of children in this age group treated for bicycle-related head injuries at the regional trauma center decreased 50 per cent between 1990 and 1992.

Sharing the Road with Horse Riders

Horse riders and horse drawn vehicles have equal rights to share our roads. Watch out for ridden, driven or led horses.

When drivers come across horse traffic they should keep these points in mind:

- As horses can be unpredictable, drivers should slow down and give them plenty of room and never sound horns or pass a horse at high speed.

⁷⁶ Prevention of Motor Vehicles-Related Injuries: A Compendium Articles from the Morbidity and Mortality Weekly Report 1985-1996. Center for Disease Control and prevention, Atlanta, Georgia, United States, 1997, p.245.

- Drivers should slow down or stop, if a rider is having difficulty with a horse
- In case drivers are signaled by a person in charge of a horse that is difficult to control, they should stop their vehicle.

Finally, horse riders must wear bright clothes and a safety helmet and obey the same general traffic laws as other vehicles such as keeping to the left and giving hand signals.

CHAPTER THREE

SAFETY INSIDE VEHICLES

Seat Belts

The wearing of seat belts has made a significant contribution to the reduction of road casualties, and the risk inherent in not wearing a seat belt in the front of a vehicle is now widely understood. There are many myths that are still circulating concerning seat belt wearing: if I wear my seat belt I will get trapped in the car in an accident; it would be better to be thrown from the car; I can hold on firmly to the steering wheel.

Accident statistics have shown conclusively that the seat belt is the most important piece of life saving equipment available within a car. Although the vast majority of drivers in Europe are smart enough to rely on their seat belts, still if everybody used their seat belt on every journey, it is estimated that 7,500 lives could be saved throughout the European Union, annually. Further, the number of serious injuries would also be dramatically reduced, as would medical costs.

The risk to back seat passengers in cars is perhaps less well understood, but the fact remains that seat belts are equally effective in the back as in the front seat of a car. In a crash at 30 mph, an adult back seat passenger is thrown forward with a force of three and half tones, equal to the weight of an elephant. Without a seat belt, this

could result in death or serious injury not only to the passenger, but also to others traveling in the front and back of the vehicle. If there are not enough seat belts for the number of passengers traveling in the car, it is worth noting that the heaviest passengers will cause greater injury to others. For pregnant women, wearing a seat belt may prove uncomfortable, but it is important for the safety of the mother and her baby. The lap should go across the hips, fitting comfortably under the bump, while the diagonal strap should be placed between the breasts and around the bump.⁷⁷

Part-time users, are often people who believe that seat belts reduce the severity of injury in motor vehicle crashes, but who believe that they are not at risk when driving on short, familiar, low speed trips. According to YASA, they consist now the majority of people, worldwide. Many part-time users think of themselves as full-time users because they wear their belts when they believe they are at risk of crash involvement. The greatest gains in seat belts use have been achieved by increasing the number of situations in which part-time users wear their seat belts. Since members of this group already believe that seat belts are beneficial, they may be converted to full-time users through education, but messages must be presented in new ways so part-time users will pay more attention to the importance of using seat belts.

Non-users represent the minority of the population in most developed countries, but are the most difficult to convert to seat belt use. High-risk drivers are most

⁷⁷ - Saab, B. MD. Faculty of Medicine, American University of Beirut, Second National Conference for Road Safety, YASA , 29 October 1999.

typically non-users of seat belts. They are more likely than others to drive after drinking, to be involved in a serious crash, and are also the least likely to be responsible for the social and economic consequences of their behavior. These are the drivers who would benefit most from using their seat belts. They often appear to believe that seat belts can cause more harm than good or that government should not mandate behaviors that affect only them. Non-users come from all segments of the societies but are frequently male, less than 30 years of age, unmarried, and have little or no post-secondary education.

The Way Safety Belts work

When people ride in or on anything, they go as fast it is going. To study that, let's take the simplest vehicle. Suppose it is just a seat on wheels, put someone on it and get it up to speed, then stop the vehicle. The rider does not stop, but keeps going until stopped by something.

With safety belts, people slow down as the vehicle does; therefore, they get more time to stop. When safety belts are worn properly, the body's strongest bones can better withstand the forces during a crash, while the vehicle's structure crushes and helps to protect by absorbing the energy of the crash.

In many crashes, people who use the safety belts can survive and sometimes walk away. Without belts, they could have been badly hurt or killed. After more than 30

years of safety belts in vehicles, the facts are clear. In most crashes, fastening your belt up does matter a lot.⁷⁸

The Way to Wear Safety Belts

Lap-only belts should be worn low and snug on the hips, just touching the thighs. In a crash, this applies force to the strong pelvic bones, and makes it less likely that a person would slide under the lap belt. Sliding under the belt would apply force at the abdomen. This could cause serious or even fatal injuries.

Lap-shoulder belts go over the lap and across the chest and shoulder. The lap part of the belt should be worn in the same manner as a lap-only belt. The shoulder belt should go over the shoulder and across the chest. These parts of the body are best able to take belt-restraining forces. The shoulder belt should never be worn behind the back or under the arm. If the belt is worn this way, it could cause serious injury.

Only one person must use a safety belt at a time. In a crash, the belt cannot spread the impact forces properly for more than one person. Two people wearing the same belt could be crushed together and injured seriously.

Head Rest

Headrest decreases dramatically the risk of neck injury during a crash. If a car hits you from the rear, your head is thrust violently backwards, then forwards, before returning to the pre-impact position. This is called "whiplash".⁷⁹ Your neck muscles

⁷⁸ - Nuwaihid, I. MD, PhD. Faculty of Health Sciences, American University of Beirut, May 1995.

⁷⁹ - Saab, B. MD. Faculty of Medicine, American University of Beirut, Conference organized by YASA with the Student Representative Committee, AUB, 24 March 1999.

are not able to absorb the impact, your spine becomes extended; bones, muscles, blood vessels and nerves can be damaged. Experts define whiplash as an "acceleration/deceleration mechanism of energy transfer to the neck" which, even at speeds of just over 10km/h you are in danger of suffering from.

Whiplash is one of the most common forms of injuries sustained in car accidents, particularly in rear-impact incidents. Widespread research puts the figure as high as 95% for the proportion of individuals suffering from whiplash after an accident. In Germany alone, there are 400,000 reported sufferers annually. Scientists distinguish between three different types of whiplash: the mildest cases equate to stiffness, neck pain or tenderness. Secondly, the more severe injuries (normally incurred at slightly higher speeds) include musculoskeletal symptoms, such as limited range of movement for the neck. The most serious cases involve neurological problems such as sensory problems. All forms of whiplash can be detected and assessed by computer topography, but as this can be expensive, this type of examination is usually only reserved for the most severe cases.

Protecting Children

Parents should learn to protect their children. People expose children, many times every day, to the risk of death and injury by not restraining them properly in moving vehicles.

Neither the distance to be traveled nor the age and size of the traveler changes the need, for everyone, to use safety restraints. The principles of occupant restraint

apply to all motor vehicles in every country in the motorized world.⁸⁰The proper use of the safety restraint systems, provided by the vehicle manufacturer, and a portable child restraint system, purchased by the vehicle owner, enhances the protection of small travelers in a crash.

If all adults and older children in the world wore the safety belts properly that are provided in the vehicles, thousands of highway fatalities would be prevented and many more thousands of injuries would be less serious every year.⁸¹

Each year hundreds of children under the age of five are killed while riding in motor vehicles. In addition, hospital emergency rooms care for thousands more who are injured in crashes. With the proper use of child restraints, injuries to young children could be reduced dramatically, and more than one-half the deaths could be prevented.⁸²

What Kinds of safety restraints systems are there?

Vehicle manufacturers provide several kinds of safety restraint systems. The adult safety belt system have lap-only and lap-shoulder safety belts. Manufacturers also provide another safety restraint system, the air bag system. Since the air bag is only a supplemental restraint, it works with safety belts but does not replace them. In addition, the vehicle may have a built-in, forward-facing child restraint. Another safety restraint system is the portable child restraint system, purchased by the vehicle

⁸⁰ -YASA and SRF report, First National Conference for Road Safety, Beirut, 31 October 1998.

⁸¹ - Bou Zeid, M. YASA. "Sabah el Ward", NTV interview, 22 Jan 2002.

⁸² -Saab, B. Family Medecine Association. "Conference on disabilities caused by Traffic Accidents". Portemilio, Jounieh, Lebanon, 1993.

owner. Be sure that child restraints are designed for use in a vehicle. If they are, the restraints will have labels saying that they meet motor vehicle safety standards.

Although there are a wide variety of child restraints available, there are only four basic types: the infant car bed, the rear-facing infant seat, the forward-facing child seat, and the booster seat. The convertible child restraint can serve as either a rear-facing infant seat or a forward-facing child seat.

When do infants and young children need to use child restraints?

Every time infants and young children ride in vehicles, they should have the protection provided by appropriate restraints. People need to understand how necessary it is to use safety belts and child restraints. Every day adults place children at considerable risk by allowing riding in a vehicle when they are not properly restrained. Kneeling or standing on a seat, climbing around, sleeping unrestrained, riding in the bed of a pickup truck—all are activities, if there is a collision, that expose children to the risk of sudden injury or death. Even a child held or sitting in an adult's lap is placed at great risk of injury.

Young children, who cannot make correct decisions for themselves, depend upon others to protect them. Many countries have laws saying another reason to restrain children properly, on every trip, is the vehicle's frontal air bags. They have to inflate very quickly, faster than a person can blink an eye, and with great force. Air bags are designed to restrain adults. Serious injury, and even death, can result for anyone – especially a child – who is up against, or close to, a frontal air bag when it inflates.

What are the different types of add-on child restraints?

Add-on child restraints, which are purchased by the vehicle's owner, are available in four basic types. Selection of a particular restraint should take into consideration the child's weight, height, and age but also whether or not the restraint will be compatible with the motor vehicle in which it will be used. An infant car bed, a special bed made for use in a motor vehicle, is an infant restraint system designed to restrain or position an infant on a continuous flat surface. Make sure that the infant's head rests toward the center of the vehicle.

A rear-facing infant seat is a child restraint system that positions an infant to face in the direction opposite to the normal direction of travel of the motor vehicle. Rear-facing seats are designed for infants of up to about 9 kg, 48 cm to 66 cm in height, and up to least one year of age. It is necessary that this restraint face the rear, so the infant's head, neck, and body can have the support they would need in a crash. Some infant seats come in two parts. The base stays secured in the vehicle, and the seat snaps in and out. A forward-facing child seat is a child restraint system that positions a child upright to face in the normal direction of travel of the motor vehicle. These forward-facing seats are designed to protect children who are from 9 kg to 18 kg and about 66 cm to 102 cm in height, or up to around four years of age. A convertible child seat is a restraint system designed for use either as a rear-facing infant seat or a forward-facing child seat. Some convertible seats are designed to be used rear-facing for infants who weigh more than 9 kg.

A booster seat is a child restraint designed for use by children who are about 18 to 27 kg (or more) and about 89 cm to 122 cm in height, about four to eight years of age. It is designed to improve the fit of the vehicle's safety belt system. Some

booster seats have a shoulder-belt positioner, and some high-back booster seats have a five-point harness. A booster seat also helps a child to see out the window. For most of the basic types of child restraints, there are many different models available. In addition, there are many kinds of restraints available for children with special needs.

Where in the vehicle should add-on child restraints be secured?

Placement of add-on child restraints is important. Children generally are safer if they ride in a rear seat; therefore, child restraints should be secured in a vehicle's rear seat, including an infant or child riding in a rear-facing infant seat or a forward-facing child seat, and an older child riding in a booster seat.⁸³

A rear-facing infant seat should never be secured in front of an air bag. In a crash, the inflating air bag could strike the back of the restraint with such force that the infant could be injured seriously or even killed. If a forward-facing child seat must be secured in the vehicle's right front seat, the seat should be moved back as far as possible. But it is better to secure the restraint in a rear seat.

How do child restraints work?

A child restraint system is any device designed for use in a motor vehicle to restrain seat, or position children. A built-in child restraint system is a permanent part of the motor vehicle. An add-on child restraint system is a portable one, which is purchased by the vehicle's owner.⁸⁴

Today's add-on child restraints use the adult belt system in the vehicle. To help reduce the chance of injury, the child also has to be secured within the restraint.

⁸³ - "Child Safety", Report of the First National Conference for Road Safety, YASA, Unesco Palace, 31 October 1998, p.19.

⁸⁴ - "In the Mother Day", YASA press release. *Diyar newspaper*. 22 March 2002.

The vehicle's belt system secures the add-on child restraint in the vehicle, and the add-on child restraint's harness system holds the child in place within the restraint.

A rear-facing infant seat provides restraint with the seating surface against the back of the infant. The harness system holds the infant in place and, in a crash, acts to keep the infant positioned in the restraint. When purchasing add-on child restraints, be sure they are designed for use in a motor vehicle. If they are, the restraints will have labels saying that they meet motor vehicle safety standards.

When securing an add-on child restraint into the vehicle, refer to the instructions that come with the restraint, which may be on the restraint itself or in a booklet, or both, and to the vehicle owner's manual.

The instructions that come with the child restraint, together with the vehicle owner's manual, will explain how to secure the child into the restraint, using the restraint's harness system and also, if needed, the vehicle's belt system.

What is the proper way to use add-on child restraints?

There are two steps in this process. First, the add-on child restraint must be secured properly to the vehicle. If the restraint has a tether strap, the strap must be fastened to a special anchor on the vehicle. Second, the child must be secured properly within the restraint.⁸⁵ Within the basic types of add-on child restraints, there are several kinds available. They determine the proper way to use them.

Both the vehicle owner's manual and the instructions that come with the child restraint contain specific information about securing the restraint to the vehicle. Each

⁸⁵ -YASA brochure on Child Safety, May 1998.

is important, so if either one of these is not available, obtain a replacement copy from the manufacturer.

What adults should do?

Adults share the responsibility of take care of the children. Children need love and protection. Placing children in specially designed child restraints helps to give them the security and protection that they need.⁸⁶If you start using a restraint and always use it properly, the child is much likely to accept the restraint as the normal way to travel. Using child restraints consistently and correctly is the key.

Starting with the first ride home from the hospital, infants and young children need the special protection that only child restraints can provide. Selecting the proper child restraint helps to make a child safer and more comfortable. The more convenient the restraint is to use, the more likely it is to be used.

When selecting and purchasing an add-on child restraint

- Check your vehicle owner's manual for any specific instructions or special equipment needed for proper installation of a child restraint.
- Before purchasing a child restraint, try the restraint out, if possible, to see whether or not it will fit properly in your vehicle.
- Since not all child restraints are the same, take the child along when shopping for a child restraint in order to try different models.
- Consider the child's size when selecting the proper child restraint. Check the instructions that come with the restraint for weight and height limitations.

⁸⁶ -Raidi, B. "Nharkoum Said", LBCI Interview, 30 August 1997.

- An infant car bed should be used if the baby weighs less than about 2 ½ kg.
- Most newborn infants are too small for restraints with a T-shield harness or with a shelf-like shield.
- A booster seat with a shield is designed for use with a vehicle's lap-only belt.
- A booster seat without a shield is designed for use only with a vehicle's lap-shoulder belt.
- Child restraint buckles are stiff to keep children from undoing them, but some may be harder to work than others. Check the ease of latching buckles, straps, locks, and harnesses.
- Be sure the child restraint has a label saying that it meets motor vehicle safety standards.

When placing and installing an add-on child restraint in a motor vehicle

- Installing a child restraint properly takes time and is of critical importance.
- Refer to all the instructions that come with the child restraint, to the section in the vehicle owner's manual on installation of child restraints and the vehicle.
- Since a vehicle's rear seat is the safest place for children, it is usually the best place to install a child restraint.
- In a vehicle with a passenger-side frontal air bag, never put a rear-facing infant seat in the vehicle's front seat because this places the infant in danger of death or serious injury if the air bag inflates. Some vehicles, however, have a switch that lets you turn the air bag off.

- A child restraint must be used only on motor vehicle seats that face forward: do not place them on rear-facing vehicle seats.
- When using an infant car bed, place the infant's head toward the center of the vehicle.
- In order to secure a child restraint in some vehicles, you may need a locking clip or a special additional belt. Check the vehicle owner's manual.
- Secure installation of a child restraint may be difficult in some deeply contoured vehicle seats, bucket seats, and raised-center rear seats.
- Be sure that vehicle's safety belt system holds the child restraint securely in place.
- Check that a child restraint's tether strap can be securely tightened when fastened to the vehicle's tether anchor.
- Even when not occupied, a child restraint should remain firmly anchored in the vehicle, since an unsecured child restraint could injure someone in a sudden stop or crash.

When securing an infant or child into an add-on child restraint

- The instructions provided by the child restraint manufacturer explain the proper way to secure an infant or child in that particular restraint.
- An infant's or child's back and buttocks should be flat against the back the restraint.
- Harness straps are adjusted in different ways for different child restraints, but they need to fit snugly.

- Harness straps must remain over the child's shoulders. They should never be placed around or under the child's arms.

When traveling with an infant or child

- Never buckle an adult and a child, or two children, in one safety belt.
- A young child must be secured in an appropriate child restraint; otherwise, the child should not make the journey.
- Never put the shoulder portion of a lap-shoulder belt behind the back or under the arm of the child.
- Never take an infant or child out of the child restraint while the vehicle is moving.
- In hot or sunny weather, travel with a blanket, or other covering, to throw over the restraint when it is not in use, and always check the fabric and metal buckles for heat before putting a child into the child restraint.
- In winter, try to warm up the vehicle and the child restraint before securing the child in the restraint, and dress the child in clothing with arms and legs that will not interfere with buckling the harness.

Finally, never leave children unattended, even when sleeping, while they are in a child restraint.

What the judicial system should do?

The judicial system is an integral part of increasing seat belt and child safety seat use. The court system must support law enforcement officers who cite individuals for noncompliance of belt laws or who put their children at risk by not

properly restraining them. As officers of the court, prosecutors and judges can send a firm message to the public that seat belt and child restraint laws are important.

According to the U.S. National Highway Traffic Safety Administration, Child passenger safety facts and statistic in the United States of America are:

- On average each day, seven children age 14 and under are killed, and 908 more are injured, in traffic crashes.
- Six out of ten children who died in traffic crashes in 1997 were unrestrained.
- Child safety seats reduce the risk of fatal injury by 69 percent for infants under one year and by 47 percent for toddlers age 1-4.
- From 1975 through 1997, an estimated 3,894 children's lives were saved by safety belts and child restraint systems.
- 5,992 children under the age of 21 were killed on our highways in 1997 alone.
- Children who ride in the back seat suffer a third fewer fatalities than those in the front seat. (Insurance Institute for Highway Safety)
- Rear-facing child safety seats should NEVER be placed in the front seat of a vehicle with a passenger side air bag. The best way to protect children age 12 and under from risks posed by air bags is to place them in the back seat, properly restrained by the appropriate child safety seat or safety belt.
- Adult safety belt use is the best predictor of child occupant restraint use. A driver who is buckled up is three times more likely to restrain a child passenger than one who is not buckled. (Journal Pediatrics, Vol. 102, No. 3, September 1998)

Air Bags Enhance Safety

Air Bags are lifesaving safety devices built into automobiles and designed to activate when a frontal impact occurs. Air bags should be used with safety belts to provide maximum occupant protection. The air bag opens with a speed of 300 km/hour. If not well buckled to his seat, a passenger might get severely injured by the sudden inflation of the air bag even if the crash is minor.

A driver side air bag is stored in the steering column, while a passenger side air bag is stored above the glove compartment. Air bags are not visible until they are needed but are marked by the initials "SRS" on the cover which stands for

"Supplemental Restraint System". This label proves that air bags are supplemental safety system and do not replace seat belts.

Air bags are made of lightweight nylon, and are inflated with a nitrogen gas. Air bags are packed with powder or cornstarch to insure smooth inflation. This powder sometimes causes a cloud, which is sometimes mistaken for smoke.

While air bags are saving lives, it is important to know that air bags and young children (under age 13) do not mix. The risk to these young children can be entirely eliminated if they are properly buckled up in the back seat.

Determining Head Injury Risk

The major focus is on head injury since it is the major cause of serious injury or fatalities in crashes. In addition, head injuries occur where the air bag can provide a supplemental benefit over the seatbelt. YASA and many other specialized road safety institutions have done many Television promotions about the importance of airbags in enhancing safety.

How do air bags work?

A front air bag is designed to inflate in moderate to severe frontal or near-frontal crashes. A side air bag is designed to inflate in moderate to severe impacts at a side of the vehicle. In an impact of sufficient severity, the air bag sensing systems detect that the vehicle is stopping suddenly or, in the case of a side air bag, that there is a side impact. The sensing system triggers the inflation of the air bag very quickly, faster than the blink of an eye.

One way to comprehend the power of an inflating air bag is to understand the weight, which an air bag can resist. An inflating frontal air bag can resist more than 1,134 kg of force. Safety belts must be used with air bags; which are designed to

supplement the protection that safety belts provide. Air bags distribute the force of the impact more evenly over the occupant's upper body, stopping the occupant more gradually.

Air bags plus lap-shoulder belts offer the best protection for adults and older children, but not for young children and infants. Neither the vehicle's safety belt system nor its air bag system is designed for them. Young children and infants need the protection that a child restraint system can provide.

Following a few precautions, which can ensure greater protection for all travelers. Those in danger from a passenger-side frontal air bag include anyone leaning up against, or very close to, the instrument panel of children, especially those riding unrestrained: and a baby in a rear-facing infant seat. In addition, objects should never be placed over an air bag or between an air bag and an occupant.

Children and Air Bags

YASA recommends to never put a rear -facing child seat (those used with infants) in the front seat of a car with an air bag and to make sure that all children are buckled up no matter where they sit because unbuckled children can be hurt or killed by an air bag. The rear seat is the safest place for children of any age to ride.⁸⁷

What's the problem?

⁸⁷ - Ghanem Jamal el Din, T.YASA, Future Television Interview. 19 February 1999.

- Most new cars have air bags for front-seat passengers. When used with lap/shoulder belts, air bags work very well to protect older children and adults who ride facing the front of the car.
- Air bags do not work with rear-facing child seats (those used with infants).
- Air bags could seriously injure or even kill an unbuckled child or adult who is sitting too close to the air bags or who is thrown toward the dash during emergency braking.
- In a crash, the air bag inflates very quickly. It could hit anything close to the dashboard with enough force to cause severe injuries or even death because the back of a rear-facing child seat sits very close to the dashboard, the seat could be struck with enough force to cause serious, or even fatal injuries to a baby.⁸⁸
- Even older children (who have outgrown child seats) are at risk from a deploying air bag, if they are not properly restrained with a lap/shoulder belt.

What should be done?

The rear seat is the safest place for children of any age to ride. An infant in a rear-facing child seat must ride in the back seat if your vehicle has a passenger side air bag (babies under 1 year and 20 pounds always ride in a rear-facing seat). Parents should make sure that everyone in the front seat is properly buckled up and seated as far back from the air bags as is reasonably possible.

They should make sure that all young children are properly secured in a child safety seat and older children by a lap/shoulder belt. It is advised to know how to

⁸⁸ - Gerbaka, B. MD. YASA conference, Ras El Matn, April 1996.

properly install children in the car. According to YASA, rare are parents who read both the owner's manual for the vehicle and the instructions for their child safety seat.⁸⁹

⁸⁹ - Bou Zeid, M. YASA. MBS interview, 18 July 2003.

CHAPTER FOUR

MAJOR REQUIREMENTS FOR ROAD SAFETY

The conventional concept for road safety was the three E s (Education, Engineering, Enforcement) that was developed by Sidney Williams, of the U.S. National Safety Council. The 3 Es concept has been a corner stone of road safety improvement programs.

The programs of traffic safety throughout the years have undergone a series of developments, but they always had a co-ordination element built-in their structure. The Youth Association for social Awareness (YASA) adopted in 2000 the concept of five Es that is based on a wider coordination compared with the standard 3 Es .The two new Es that YASA proposed are Emergency and Evaluation. By that way, the 5 Es are: Education, Emergency, Enforcement, Engineering and Evaluation.⁹⁰

Education

Education has been consistently viewed as the method of safety promotion that will lead to the ultimate degree of accident prevention. Education often precedes with other methods since people must be aware of the traffic safety need before they will

⁹⁰ - Akl, Z. YASA interview, NBN Tv, 2 September 2003.

authorize engineers and personnel to act. In addition, education has the responsibility of informing the public of new equipment or enforcement procedures. Basic principles of road safety have to be continuously promoted by NGOs, schools, universities, clubs, parents, media and many others. Traffic education should be life-long starting from the primary school since behavior change and education on safety needs time and effort.⁹¹

The concept of partnership between heavy vehicles, standard vehicles, motorcycles, and the pedestrians, has to be highlighted in order to avoid the aggressive behavior of many road users. All road users should accept sharing roads with others. Since most people are often reluctant to attend safety meetings or take an active part in safety activities, traffic safety education should also be planned to bring its concepts to the individual. The best way that usually accomplishes that target is through the mass media sources and the publicity campaigns. In addition, special handouts, billboards, and bulletin boards can be used to distribute traffic safety information. Effective traffic education should span over a person's entire lifetime. Elementary and secondary schools are the most important phases of this system. However, traffic education has to compete for space against many other topics that are considered to be important and current.

Increased education is an essential part of improving road safety promotion. Improved methodology of providing such education is equally important. Visualization can be highly effective in providing safety education. With the

⁹¹ -Jarvinen, M. Traffic Education in Schools, The Finnish Approach. the Central Organization for Traffic Safety, Finland, 1 March 2002.

enhancement in the capability of computers and reduction in price, it is expected that the computer will become an effective tool for education, even in the developing countries. Computer based multimedia can be successful in safety education.⁹²

Traffic education should not be removed from every-day reality. Many pupils and teachers agree that traffic education consists of memorizing traffic rules that do not seem to relate to one's daily movement. Schools, teachers and specialized institutions should work together in order to make traffic education more functional and effective. All countries, especially the developing world, can benefit a lot from the following traffic educational experiences that have positively affected road safety in Germany and Lebanon (Appendix I).

Engineering

A. Better Road Infrastructure

The building of more new roads is not the answer to traffic growth. The emphasis is now on making best use of the existing highway networks, giving priority to treating the places with the worst safety, congestion and environmental records.

For safer infrastructure, the following remarks and guidelines should be considered;

- 1- Regular road maintenance .

⁹² -Bin Alam, J and Hoque, M. "Effective Utilization of Computer Based Multimedia Technology in Traffic Safety Promotion", Department of Civil Engineering, Bangladesh University of Engineering and Technology, Dhaka, Bangladesh.

2- Construction of more pedestrian bridges and proper sidewalks as well as consider the specific needs of the disabled .

3- Lane Width

The design of lane width on highways must take into consideration the speed limit and type of traffic.⁹³

4- Pavement type

It is very crucial that the highway pavement be executed as designed in accordance with international standards. Finish grading of the pavement must also be completed properly to eliminate bumps, and holes in the pavement.⁹⁴

In its road safety strategy to reduce casualties caused by infrastructure , the United Kingdom government applies the following:

1. ensuring safety as a main objective in designing, building, operating and maintaining trunk and local roads;
2. ensuring safety continues to be part of the planning framework for main and local routes;
3. publishing guidances about engineering for safer roads based on sound research and experiment;
4. using local transport plans to promote safer neighbourhoods; and
5. monitoring progress on local efforts to reduce casualties.⁹⁵

⁹³ -Abi Nader, C. *Arabmotor Magazine*. July-August 2002, p.74 ,75.

⁹⁴ - Abi Nader, C. Workshop on Safe Highways, “Second National Conference on Road Safety”, Unesco Palace, 29 October 1999.

B. Traffic signals

Advantages of Traffic Signals

Signals offer the maximum degree of control at intersections - they relay messages of both what to do and what not to do. The primary function of any traffic signal is to assign right-of-way to conflicting movements of traffic at an intersection, and it does this by permitting conflicting streams of traffic to share the same intersection by means of time separation. By alternately assigning right-of-way to various traffic movements, signals provide for the orderly movement of conflicting flows. They may interrupt extremely heavy flows to permit the crossing of minor movements, which could not otherwise move safely through the intersection.

When properly timed, the traffic signal increases the traffic handling capacity of an intersection, and when installed under conditions, which justify its use, it is a valuable device for improving the safety and efficiency of both pedestrian and vehicular traffic. In particular, signals may reduce certain types of accidents, most notably the angle (broadside) collision.

Disadvantages of Signals

While many people realize that traffic signals can reduce the number of angle collisions at an intersection, few realize that signals can also cause an increase

⁹⁵ -Tomorrow's Roads: Safer for Everyone-The Government's Road Safety Strategy and Casualty Reduction Targets for 2010. Department of the Environment, Transport and the regions: London, March 2000, p.40.

in other types of accidents (it has been well documented that other types of accidents, notably rear-end collisions, usually increase when a signal is installed).

Normally, traffic engineers are willing to trade off an increase in rear-end collisions for a decrease in the more severe angle accidents; however, when there is no angle accident problem at an intersection, there is nothing to trade off and the installation of traffic signals can actually cause a deterioration in the overall safety at the intersection. This situation sometimes prompts the remark; "You mean you won't do anything until somebody gets killed!" What is not fully understood is that traffic signals are not a "cure-all" and that the primary goal of all traffic engineers is to attain the safest and most efficient traffic flow feasible. In addition to an increase in accident frequency, unjustified traffic signals can also cause excessive delay, disobedience of signals, and diversion of traffic to inadequate alternate routes.

Traffic signals are much more costly than is commonly realized, even though they represent a sound public investment when justified. Modern signals cost taxpayers to install depending on the complexity of the intersection and the characteristics of the traffic using it. On top of this, there is a perpetual cost, which is almost never considered, of maintenance and the electrical power consumed in operating a signalized intersection 24 hours a day.

Unjustified Signals

Because of the widespread belief that traffic signals offer the solution to all intersection traffic control and accident problems, many traffic signals have been

installed nationwide where no legitimate operational warrant exists. Traffic records clearly show the attitudes and misunderstandings, which sometimes lead to unjustified installations, should be resisted. It is important that the selection and use of this traffic control device be preceded by a thorough study of traffic and roadway conditions and that the determination of the type of control and method of operation be based on the study data.

Traffic signals should be used only where lesser forms of control have proven ineffective, since signals almost always create more "overall intersection delay." In fact, minor movements may experience excessive delay, particularly if the signal is improperly timed. As a result, many drivers switch to less desirable alternate routes or to residential streets to avoid the added delay.

C. Vehicle Improvement:

Since Charles and Frank Duryea built the first successful gasoline powered car back in 1893, the automobile industry has made phenomenal advances in vehicle reliability, capability and safety. However, despite these impressive achievements, driver judgment has remained one of the key factors in traffic accidents. New vehicles are engineered to reduce or eliminate the risks on the roads. Sensors, infrared detectors, radar systems, and optical imaging may improve visibility and enhance driver sensitivity to impeding dangers. Smart chips may even automatically initiate certain corrective or evasive actions.

The industrialized countries should make vehicles safer, in particular by harmonizing passive safety measures (fitting and compulsory wearing of seat belts, in particular in coaches, widespread use of universal attachment systems for child-restraints devices and development of vehicle design to reduce the impact of accidents) and support for technical progress.⁹⁶

The development of brake control systems started with the ABS in the late seventies. Brake interventions at the driven wheels emulates the function of an automatic differential lock. In combination with an engine control the first stage of a stability control system became available. Further additional control circuits were introduced to reduce excessive wheel slip at the driven wheels during downshifting of the gear box or during light braking while cornering close to limit speed. With the development of automatic wheel individual brake control systems, which limit oversteering or undesteering during extreme driving manoeuvres, a further step towards a very efficient improvement of active safety became available.⁹⁷ With additional driving dynamic sensors, which generate signals for an actual nominal comparison of the driving situation, further functions became possible, which lead to the introduction of Electronic Brake Management.⁹⁸

⁹⁶ -Britta, T. German Council for Road Safety, "First National Conference for Road Safety", Unesco Palace, 31 October 1998.

⁹⁷ -Ayoubi, M. BMW Group, "Prevention of Accidents by Innovative Safety Technologies", Second Safety on Road International Conference-Abstracts and Keynote Speeches. Bahrain Conference Centre, Holiday Inn, Bahrain, 21-23 October 2002, p.143.

⁹⁸ -Konik, D., Leffler H, Muller R, Prestl W, Toelge Th: Elektronisches Bremsen Management als erster Schritt zu einem Integrierten Chassis Management ICM. ATZ Automobiltechnische Zeitschrift, 100 Jahrgang, Nr 4,5, April 1999.

The National Highway Traffic Safety Administration (NHTSA) has been using crash test dummies to assess the occupant protection performance of motor vehicles sold in the United States for the past 30 years. Since 1986, NHTSA has specified the use of the 50th percentile male Hybrid III dummy for compliance testing under U.S. Federal motor vehicle safety standard No. 208, *Occupant Protection*, initially on an optional basis and more recently on a Mandatory basis. However, with the advent of advanced safety systems, especially inflatable restraint devices, the use of only the 50th percentile male dummy has limited NHTSA 's ability to assess the risks and determine the level of enhanced occupant protection for all occupants, including infants, children and adults in vehicle crashes. In 1987, NHTSA initiated the development of a dummy "family" focused on the small (5th percentile) female and large (95th percentile) male crash test dummy, followed by the development of several child-sized dummies.

NHTSA believes that the use of a family of new dummies in the U.S Federal motor Vehicle Safety standard for occupant protection will lead to changes in vehicle design resulting in improved restraint system performance that can enhance the ability of air bags to cushion and protect occupants of different sizes. This would also require air bags to be redesigned to minimize risks to infants, children, and other occupants.⁹⁹

The aspects concerning electronic technologies will be spelled out in the forthcoming European Commission communication on information and communication technologies for intelligent vehicles which, in particular, will be aimed at developing navigation and guidance systems, providing information on the traffic situation, alerting drivers in the event of accidents, and monitoring vehicles carrying hazardous goods.¹⁰⁰

Recent developments in vehicle safety have included:

- 1-Computer-aided vehicle design, enabling engineers to tune vehicle structures to provide better protection for occupants in a crash and to improve vehicle handling;
- 2-Improved materials and design, which have transformed vehicle interiors, reducing the risk of injury;

⁹⁹ Karianthra, J. "New Generation of Crash Test Dummies for Improving Vehicle Safety", National Highway Traffic Safety Administration, Department of Transportation, Washington D.C., U.S.A.

¹⁰⁰ -European Commission, Brussels, 4 June 2003. IP / 03 / 797

3-Advanced technologies, which, for instance, allow airbags to operate in the tenth of a second duration of a crash;
4-More sophisticated suspension and braking systems at affordable cost;
5-Antilock brakes, which are becoming the norm on many vehicles;and
6-Improved rubber compounds and tyre construction, which have increased reliability and road surface adhesion.These improvements will continue to filter through the vehicle fleet and bring safety dividends.¹⁰¹

Safety depends also on how well vehicles are maintained.¹⁰² Here the burden of responsibility falls mainly on the individual vehicle owner.In most developing countries, there is a need of more quality control on imported second- hand vehicles.¹⁰³

Enforcement

Road traffic law sets the framework for using the roads safely. It provides clear standards based on experience and analysis. Implementing all traffic rules and regulations on all who share the roads and regular review of these rules.¹⁰⁴ It is crucial to use Technology as a means to help law enforcement (for example, using speed radars and alcohol tests). Traffic offences range from minor, careless errors to

¹⁰¹ Tomorrow's Roads:Safer for Everyone-The Government's Road Safety Strategy and Casualty Reduction Targets for 2010-Department of the Environment,Transport and the regions:London ,March 2000,p.57.

¹⁰² - Bou Lahoud Carine,Report on road safety, Commerce du levant , Beirut, August 2002, p.58.

¹⁰³ - Kabbani Mohammad,Chairman of Transport Committee in the Lebanese Parliamant, NBN interview,8 Jan 2003.

¹⁰⁴ -“ Towards a Better Relation between Police and Citizens” report,YASA, Unesco Palace, Beirut, Feb 2002.

extremely serious, deliberate offences with devastating consequences for other road users and the drivers themselves.¹⁰⁵

It is a serious problem facing all enforcement agencies in most countries that road traffic offences are not regarded by society with the same degree of condemnation as other crimes. This is partly a question of social attitudes but it is also affected by a lack of understanding. Road traffic laws are usually complex and the reasons for regulation are not always obvious for people. Safety Education can be helpful by raising the knowledge and acceptability of traffic rules and regulations.¹⁰⁶

The fine for not using the seat belt is 30 Euros in the Netherlands. The number of fines (about 230000 in 2001) increased dramatically the last few years, but apparently did not lead to an improved seat belt behaviour. Still, about 20% of drivers do not use their seat belts in the Netherlands. Not only in the Netherlands, but also in most countries there is a need of more efforts in both education and enforcement in order to have a higher rate of seat belt use.

More bridges of cooperation should be built between the citizen and the police because the relationship between the traffic police and the citizen could be best described as dysfunctional.¹⁰⁷

Countries with relatively good road safety records, such as the U.K. and the Netherlands tend to have tough enforcement and are more likely to stop speeders and alcohol offenders. For example, mainly due to enforcement, seat belt use continues to

¹⁰⁵ - Atallah, O. Ministry of Public works, "Workshop on Injury Surveillance in Lebanon", 22 July 2003.

¹⁰⁶ - Daccache, P. MD. Member of Lebanese parliament, Conference on child safety, Goethe institute, Beirut, 22 Jan 1999.

¹⁰⁷ - "Building Bridges between Police and Citizens". *Arabmotor Magazine*. April 2002, p.68.

increase, with more than 90% of vehicle occupants in countries such as Germany, Australia and New Zealand.¹⁰⁸

Strengthening of penalties and enforcement in the drug field should reflect the similar changes in relation to alcohol, including higher penalties and longer disqualification for high risk offenders, requirements to retake the test following disqualification, targeted enforcement and extended rehabilitation options.¹⁰⁹

Random roadside spot checks, using a joint team of police and vehicle inspectors, are of crucial importance in reminding drivers and operators of the continuing need to upkeep vehicles for safety. These checks can be combined with document and weight checking, forming a useful enforcement tool that can be installed for long or short periods at a variety of locations. The standards of vehicle maintenance and operation can be effectively controlled only by regular vehicle condition checks carried out in approved and regulated testing premises and by frequent roadside spot checks so that all drivers feel at risk of prosecution if they drive a vehicle without a valid roadworthiness certificate.¹¹⁰

¹⁰⁸ - FEVR News Letter 38-August 2003-Little improvement in road safety in OECD countries in First Half of 2002.

¹⁰⁹ Tomorrow's Roads: Safer for Everyone-The Government's Road Safety Strategy and Casualty reduction Targets for 2010-Department of the Environment, Transport and the regions: London, March 2000, p.37.

¹¹⁰ -Road Safety Guidelines for Asian and Pacific Region, Chapter 4. 9, 'Vehicle Safety Standards', p.7.

Emergency

In order to improve the performance and capacity of the pre-hospital care system and the emergency care in hospitals,¹¹¹ the following remarks should be considered :

- 1- New roads should include emergency lanes;

Paved emergency lanes must be provided on all highways on both sides of the pavement , and in each direction of the highway. The emergency lane has several purposes; Access for ambulance and emergency vehicles to the accident site in a timely fashion , and also to provide a safe location , to park the vehicle in case of flat tyre or a mechanical problem.

- 2- People should get used to call quickly the emergency institutions.¹¹²

- 3- Training all people on basic first aid .All educational institutions and corporations should train their employees on needed action in case of accident or disaster.¹¹³

- 4- Teach road users (for example, during training for a driving licence) how to secure and signal the area of an accident (i.e. triangle,lights,road flares) in a safe way and to avoid and prevent further complications,pending the arrival of emergency units.^{114\}

¹¹¹ - Akl khouri, M. YASA Board member ,“What to Do When you Come across or Face an Accident”, *Arabmotor Magazine*. March 2003,p.81.

¹¹² - Hayek, W. YASA. *Teledumiere* interview, 23 September 2002.

¹¹³ - Mina, N. Civil Defense, “National Conference for Fire Safety”, Lebanese Fire Prevention Committee, Unesco Palace, Beirut, 22 February 2003.

¹¹⁴ -YASA Simulation with the Civil Defense and Red Cross , LAU Beirut, 9 April 2001.

In April 2001, the economic and social council of the United Nations adopted a new resolution highlighting the role and the importance of First Aid training and equipment for road users through specific recommendations, applicable in UN Member states from 2003. These achievements were done in close collaboration with FEVR and Red cross/Red crescent.¹¹⁵

Since September 2003, it is obligatory for all new drivers in the EU to know how to behave in the case of a road crash and have basic knowledge of First Aid and Knowledge of measures to be taken after a road crash or similar occurrence, including emergency actions such as evacuation of passengers.¹¹⁶

Yielding for emergency vehicles

Drivers must always yield the-right-of way to fire engines, ambulances, police cars, and other emergency vehicles when those vehicles are using a siren and/or emergency flashing lights. If they see or hear an emergency vehicle coming from any direction, drivers must pull as close as possible to the right side to the road and stop until the vehicle has passed. Slowly rolling is not acceptable.¹¹⁷

Drivers must check their mirrors and find a safe place to pull over to the right. They should not pull their vehicle to the left or slam on brakes and stop suddenly. They should use right turn signal to let those driving behind know what they plan to do.

¹¹⁵ -FEVR News Letter 38 , “Compulsory First Aid Training for New Drivers in Europe”, August 2003.

¹¹⁶ - <http://europa.eu.int/comm/transport/home/drivinglicense/>

¹¹⁷ - YASA Simulation with the Civil Defense and Red Cross, NDU, Zouk Mosbeh, 10 January 2003.

After the emergency vehicle has passed, use your left turn signal and make sure the lane is clear before merging into traffic. Drivers must also be sure that there are no other emergency vehicles approaching before they enter traffic. In most developed countries, it is illegal for drivers to follow closer than 100 meters behind an emergency vehicle responding to an alarm.

What to do when you come across or face a crash?

There are many things that a passer by or even a person, involved in a crash, can do to minimize the risk. The first task in the event of a road crash is to secure the scene before trying to get close to the casualty. It is not sufficient to simply switch on the hazard warning lights, you should also use the warning triangle (red triangle), which all drivers are required to have in their vehicle. It must be placed at an appropriate distance away from the location of the crash (Ahead of a curve or at least 200 meters before in the traffic direction). Then, he should inform the concerned parties by calling the emergency institutions. When someone calls for help, he should inform the exact location of the crash with the approximate number of casualties.

After calling for help, and in case of knowing the basic first aids principles, it is possible to try helping the casualty. The basic and most important thing is that the casualty should not be moved except when there is threat to the casualty's life such as the car catching fire, or the car on the verge of rolling over to a valley. It is a need for every car to be equipped with a first aid kit and likewise it is also very important that every single person knows basic first aid. For this reason YASA emphasizes to the public the importance of taking First Aid Courses since any

rational person might be able to save the life of another individual at the scene of a crash if he is well trained. YASA also emphasizes the importance of stating the exact scenario of how the crash took place as soon as possible (the scene, the position of the vehicles and the precise extent of the damage should be documented by photographs if possible).

Evaluation

Injury surveillance and registration rely on comparison with past years and forecasting for the future. Evaluation should be useful in both policy development and in the implementation of new interventions.¹¹⁸ Evaluations should be systematic because they require careful planning and consistent use of the chosen techniques.

Evaluations should also be reliable. The findings of an evaluation should be reproducible by a different evaluator with access to the same data and using the same methods of data analysis. Finally, Evaluations should be user-driven.

Evaluation is a cornerstone for the success of road safety interventions in most of the developed countries. As an example, in the study entitled “A small area study of motor vehicle crash fatalities in Alberta, Canada”, most quantitative analysis achieved in that study are based on the developed injury surveillance system. Through evaluation and comparisons between many variables, interventions to reduce road traffic related injuries could be designed in a better way.

Each year in Canada, motor vehicles crashes are responsible for around 3300 deaths and more than 240,000 injuries. Between 1993 and 1995, motor

¹¹⁸ - Hneineh, Y. President of the Scientific Research Foundation, “Naharkoum Said”, LBCI, 28 September 2000.

vehicle crashes were the tenth leading cause of death in Canada and the leading cause of death among those under 30 years of age. In terms of potential years of life lost, motor vehicles crashes in Canada are the third leading cause of premature mortality, exceeded only by ischemic heart disease and cancer.

Across Canada, the motor vehicle crash fatality rate in the province of Alberta has consistently been one of three highest provincial rates. The rates showed substantial, statistically significant variation across areas, with fatality rates lowest in the urban areas of Calgary and Edmonton, and highest in rural areas.¹¹⁹

¹¹⁹ -Kmet, L. Brasher, P. Macarthur, C. " A Small Area Study of Motor Vehicle Crash Fatalities in Alberta, Canada". Calgary, Alberta, Canada, 17 October 2001.

CHAPTER FIVE

MAJOR ACTORS FOR ROAD SAFETY

While it is ultimately the responsibility of the individual to drive safely, there is also a role for many groups and organizations, both public and private, to provide the tools that will help road safety. The following lists examples of major actors and the kinds of roles they can adopt:

Legislators

The influence of legislation has been one of the strongest forces at work for traffic safety in most developed countries. The desires of people, as expressed by their legislators, have provided education of young drivers in high schools, provided compensation for injured people, and made provisions for many more safety measures to protect all persons.¹²⁰ In most countries, legislative acts to create safer conditions are direct result of many other forces such as the safety organizations, universities and media. “Seat belt legislation is one of the most important public health measures of modern times”. This was the conclusion in 1988 in “Strategies for accident prevention” for the U.K. (HMSO, 1988). The seat belt was introduced in 1971 in the Netherlands, in 1975 in Sweden and by 1983 this law was passed in most

¹²⁰ - Moawad, N. Member of Lebanese Parliament. “Second National Conference for Road Safety”. YASA, Unesco Palace, 29 October 1999.

developed countries.¹²¹ After around three decades, most developing countries passed the seat belt law under the influence of the road safety movements in these countries.¹²²

Country Presidents

Realizing the seriousness of the situation and the urgent need for attention to the road crashes problem, it is desired that country presidents participate themselves in the efforts targeting to reduce the burden of traffic injuries.

In his letter dated January 23, 1935 to Honorable Eugene Talmadge, Governor of Georgia, Franklin D. Roosevelt said:

I am gravely concerned with the increasing number of deaths and injuries occurring in automobile accidents. Preliminary figures indicate that the total of these losses during the year 1934 greatly exceeded that of any previous year. We should as a people, be able to solve this problem, which so vitally affects the lives and happiness of our citizens.¹²³

In order to assist in this, the federal government, through the secretary of commerce, has taken the leadership in developing remedial measures. Proposals for uniform state legislation have been worked out by national conference on street and highway safety with the cooperation of responsible state officials and representatives of interested organizations from all parts of the United States.

Not only President Roosevelt was convinced by the importance of road safety but most US presidents tried to face this problem. John F Kennedy, the US

¹²¹ -SUNflower: A Comparative Study of the Development of Road Safety in Sweden, the United Kingdom and the Netherlands, 2002, p.55.

¹²² -Hayek, H.YASA. "Arab Workshop for Road Safety". the National Committee for Road Safety, Morocco, 19 May 2001.

¹²³ - "Roosevelt Letter". *American Journal of Preventive Medicine*. November 2001, p.2.

President of 1960-1963, said: "Traffic accidents are one of the greatest, perhaps the greatest of the nation's public health problems."

Dr Thomas Klestil, the Federal President of the Republic of Austria, said in welcoming guests to the Seventh World Conference on Injury Prevention and Safety Promotion:

As Federal President of the Republic of Austria I have accepted with pleasure the patronage of the "Seventh World Conference on Injury Prevention and Safety Promotion" to be held in 2004 in Vienna.

For many years I have followed attentively the international scientific in this field, which are reflected in meetings and congresses in Austria. And I am glad that the relevant issue of risk and injury prevention will be discussed in Vienna. Our modern world, which-through communication and technology-has made life much easier for us, has unfortunately also lead to a multiplication of the risks and threats with which we have to live, a fact too little noticed and inadequately investigated so far. It has thus also become increasingly necessary to analyze the wide realm that has opened itself in the field of risk prevention. I hope that the result of this World Conference will contribute to making questions of safety and injury prevention a central issue, thus reducing the risks faced by human beings.¹²⁴

Tony Blair, the Prime Minister of the United Kingdom, showed also his interest about Road Safety in 11 February 2003 by saying:

Road Safety is one of those issues that confront us all, and one of the biggest causes of accidents and deaths, particularly for children. That is true within the UK, even though we have a good road safety record overall. It is even more evident in the wider world. For example, it has been estimated that over 75% of road casualties occur in developing countries, even though they account for only 32% of motor vehicles.

Regional, Provincial Governments and Local Authorities

The development and implementation of safety programs are the responsibility of the local community. Planning and development of a road safety

¹²⁴ -www.safety2004.info

campaign can often be done on a national basis. The actual program must, however, be implemented by people in the community. If leadership does not exist at the local level, all educational programs except simple public information announcements will be poorly developed, if at all. In order to have an effective traffic safety program, the community leaders must take an active part in the program.¹²⁵

Community leaders are in a position to determine which programs are most effective and the best time to start them. They will be able to present the program in a manner that will be acceptable to a majority of the people.¹²⁶

Schools, Research Institutes and Universities

Formal education in the schools and mass education of the public have both played important roles in the development of the accident prevention movement. Since accidents result from human failures, there is a need for education and training in safe practices in nearly every type of human endeavor.

Justin Okot, the chairman of the National Road Safety Council of Uganda, said: "If road safety education could be introduced into primary schools in Uganda it would be the single most important contribution to road safety ever seen in this country." Educational institutions, in the developing countries, should raise the priority of safety education and play their role in changing behavior of the new generations.

¹²⁵ - Strasser, A and Bohn, E. Fundamentals of Safety Education. Macmillan , 1973,p.75.

¹²⁶ - Gerbaka, B. MD.Board of Beirut municipality, "School safety workshop", 30 May 2002.

Also, in developed countries, college and universities prepared and disseminated many safety publications that contributed materially to the development of safety education. These publications include reviews of doctoral level and other research projects at these institutions in addition to many promotional safety materials that have been used to advantage accident prevention work.

In developed countries, universities and research centers work together in joint research and programs that targets to study and analyze accidents and prevention. Many books and researchers from different institutions in different countries join efforts and experiences in their common work. Many developing countries institutions fail to work together, because they have a tendency to be attracted by Western Institutions. These institutions should continue learning from the developed countries, but they must share their experiences with their counterparts in the developing countries.

Ministry of Education

The planning of safety education experiences into the school curriculum should involve many sectors of the school and community. Many persons can contribute materially to the program. Bringing persons from these sectors into the planning stages of the instructional program will lead to broader, more meaningful experiences and create wider acceptance of the safety curriculum. These groups should include teachers, pupils, and representatives of community agencies and organizations interested in the objectives of safety education.

Vehicle Manufacturers and Importers

The motor industry is highly competitive. It operates worldwide. Unless there is a consumer or other demand for a safety feature, safety is unlikely to be offered.¹²⁷ Better information on safety is now available, and as consumers become better informed, they are starting to choose vehicles with a better safety record, especially in developed countries. If this continues, the motor industry should be encouraged to provide further improvements.

This is an exciting time: modern technology is constantly pushing back the frontiers of vehicle design, offering innovative approaches to age-old problems. These new technologies are already delivering many improvements to new vehicles. In the next few years we expect to see vehicles that are intelligent in their own right, helping to avoid accidents and to protect road users.¹²⁸

Despite all the aforementioned improvements to the design, manufacture and quality of new vehicles, many cars are subject to a safety-related recall by the manufacturer during their lifetime. There seems to be a worrying trend of car recall during the last decade. Most vehicle manufacturers can do more to halt this increasing trend of recalls in order to avoid defects that are causing undesired crashes and casualties before the first recall.¹²⁹

There are many efforts and campaigns organized by vehicle manufacturers to raise safety awareness as reflected by the following initiatives organized by Daimler Chrysler and Volvo.

¹²⁷ -Akoghlianian, B. Mechanical engineer, YASA, Summer camp, LIONS Club, Lebanon, August 2001.

¹²⁸ -Tomorrow's Roads: Safer for Everyone - The Government's Road Safety Strategy and Casualty Reduction Targets for 2010 - Department of the Environment, Transport and the regions: London, March 2000, p. 57.

¹²⁹ -Chakkour, B. Zein interview. YASA, 31 Jan 2002.

Vehicle Inspecting Agency

In most developed countries, the role of the vehicle inspectorate is to prevent road accidents from happening and to protect drivers and passengers when an accident occurs, by checking that vehicles are roadworthy and through other road safety enforcement measures.

Its work should include:

- 1- Supervising all vehicles (Cars, buses, coaches, lorries and trailers).
- 2- Checking that the operators of heavy lorries, buses and coaches are meeting their license conditions.
- 3- Cooperating with the police in a program of spot checks on heavy commercial vehicles and their drivers to check licenses, hours, and roadworthiness and vehicle weights.
- 4- Checking and certifying the safety standards of imported vehicles
- 5- Inspecting vehicles as part of accident investigations
- 6- Considering with manufacturers the reports of safety defects.

Media

Road safety issue must be presented to the entire population through major campaigns to highlight the risks facing road users and to win over the whole population for the struggle to minimize these risks.

Media (Television and radio, internet, billboards, brochures, posters, magazines, and newspapers) has a major role in sensitizing the general public about road safety.

Education of the general public through the news media and the distribution of literature are the only effective means of achieving the objectives of some road safety programs. Newspapers and magazines have been equally effective educational media in public education for all types of accident prevention.¹³⁰

The press contributes a lot for the purpose of educating the public on various phases of safety. It is always the first group to be called upon to support safety campaigns. Television and radio channels are considered the most important media communication vehicles in providing safety education for the public and are required to provide a portion of their broadcast time in the interest of public service. Alfred P. Sloan said, "Radio and television have added a new dynamic to the nationwide effort to curb traffic accidents. Broadcasting has become a potent educational force for informed opinion and constructive safety action throughout the country".¹³¹ Radio and television have supported many types of road safety campaigns. For example, in the Arab countries, YASA, the Tunisian Association for Road Safety and many Arab ministries of Interiors, had organized many radio and television programs that are based on road safety themes.¹³²

In all countries, publicity campaigns are important, particularly when laws are introduced, in order to inform the vehicle users. This has been the case in most developed countries where it can be assumed that there is a high level of knowledge concerning traffic safety issues. To keep this knowledge, media is a strong partner in the sustainability of road safety campaigns. But when horrific scenes are constantly

¹³⁰ - Raidi, B. "YASA Conference on Road Safety". Meridien Hotel, Latakia, Syria, 10 March 2003.

¹³¹ -Automotive Safety Foundations, ASF report, Washington, D.C.: The Foundation, June 1962, p.14.

¹³² -Akl, Z. President of YASA, "Workshop for Tunisian Media Specialists Training on Road Safety", Hamamat, Tunisia, 28 September 2001.

seen on television, whether in the news, in crime thrillers or in motor racing events. Shock as a permanent condition is, however, a contradiction in itself. With increasing saturation it becomes difficult to attract any attention whatsoever by shock methods.

Motoring Associations

Motorcycle instructors and associations have a basic role to do for safety education. One agency in the United Kingdom declared:

We propose to develop the compulsory basic training course for all learner riders and possibly introduce different courses for different types of motorcycles. We shall work closely with motorcycle instructors, safety experts and rider organizations to get the training package right.¹³³

Commercial Advertising

Advertising is a powerful tool and this is recognized in most countries. There has been too much speed-dominated car advertising. This kind of commercial advertising is irresponsible and stimulates youth to behave in a dangerous way. Advertisers can do more to encourage responsible, safe and considerate behavior among road users.¹³⁴

Early initiatives to influence vehicle advertising were taken in Germany, Switzerland and Austria. In 1988, the European Conference of Traffic ministers moved in the direction of greater internationality. It pronounced itself against

¹³³ -Tomorrow's Roads:Safer for Everyone-The Government's Road Safety Strategy and Casualty Reduction Targets for 2010-Department of the Environment,Transport and the regions:London, March 2000, p66.

¹³⁴ -Maokadih, S.Vice president SRF,Voice of Lebanon interview, Feb 2003.

aggressive advertising, which trivialized the actual risks involved. It adopted a resolution, which included the commitment of the ministries of all European participants to initiate steps to limit all advertising which was detrimental to safety.¹³⁵

In Germany, the conditions for monitoring and influencing vehicle advertising had been set up already ten years earlier. They went far beyond the rules and regulations and self-controlling institutions in other countries. In 1988 the Association of the German Automobile Industry, together with the Importers Association, had convened a special expert Group which was to assess periodically motor car and accessory advertising according to certain agreed upon, as well as the media to be monitored. The intervention procedure had been set up in collaboration with the members of these associations. Since then this Group observes, on a monthly basis, all motor car advertisements in the German media. Approximately 3% of German manufacturers and importers are contacted by letters because they surpassed safety guidelines. Through these interventions, the Observer Group establishes a dialogue with the authors of the advertisements that may cause, in many cases, a prompt a change in the advertisement.¹³⁶

¹³⁵ - Pfaffrerott, I. BAST Germany. "Publicity Related to Vehicles and its Impact on Road Users Behavior". Security Focusing on the Individual, PRI. Madrid, Feb 2002, p.238.

¹³⁶ -Pfaffrerott, I. BAST Germany. "Publicity Related to Vehicles and its Impact on Road Users Behavior". Security Focusing on the Individual, PRI. Madrid, Feb 2002, p.239.

The Military

The armed forces represent in most countries one of the largest employers. The individuals involved in various job tasks also make the military a source of numerous traffic accidents with a higher rate of deaths compared to others. Therefore, the various branches of the armed forces must do a lot of efforts to reduce their mortality rate that is caused by traffic crashes.

The Norwegian army has decided that they want to get down the number of accidents where soldiers, on duty or on leave, are involved. The Norwegian Public Roads Administration, Telemark, has on several occasions been visiting the Royal Norwegian Air Force School of Transport to run the video and talk with the guys there. The Royal Norwegian Army's Transport Officer now works on a concept for the rest of the army.¹³⁷

Religious leaders

Religious Leaders have also a critical role in Safety Awareness. His Holiness Pope John Paul II said in the World Remembrance Day for Road Traffic Victims in November 17, 2002:

Every year, this Sunday invite us to remember road traffic victims. While especially praying for the Lord to welcome in His love all those who tragically died in a road accident, I entrust to the tenderness of the Madonna the numerous injured people, often permanently disabled, as well as there families, and I appeal to the solidarity of all. Finally I fervently demand all drivers to show respect for others, accepting to drive in a careful and responsible way.¹³⁸

Although all religious leaders have a major role to do in order to raise safety promotion, rare are those aware of their roles. It is highly required that road safety

¹³⁷ -Hermansen, Per Harald. Road Safety Advisor for the Norwegian Road Administration, "Youngsters on Motorized Wheels", Norway, 2002.

¹³⁸ -www.vatican.va/cgi-bin/w3-mysql/news_services/bulletin/news/12296.html

experts and practitioners try their best to convince religious leaders in promoting safety awareness.

Driver Training Schools

In most industrialized countries, driver training is seen as a necessary requirement in the quest for a driving license or permit. The normal approach is to follow a syllabus that covers sufficient elements to enable the student to pass a test for granting of the license. Ideally, the syllabus and the training should aim to prepare learner drivers for all potential hazards and situations and not just those tested by the examiner at the time of the test. But in reality, it cannot. It is evident that most candidates are concerned only about learning enough to pass the test.

Better driving skills and better driving behavior would make an enormous difference to reduce the number of road casualties. Driving is an acquired skill that takes years to master, and a demanding one.¹³⁹ In addition to the right skills, drivers need the right attitude-towards speed, other road users, alcohol, drugs and fatigue. Learning to drive should be relevant to today's road conditions. Learning does not and should not stop when the candidate passes the driving test. Safe driving is as much about attitude as about ability to control the car. Driver training should not only introduce safe driving, but should reinforce it throughout training.

There are number of basic essentials for the safe and efficient operation of a motor vehicle. Among the most salient of these are attitude, skill, and good

¹³⁹ -Tomorrow's Roads:Safer for Everyone-The Government's Road Safety Strategy and Casualty Reduction Targets for 2010. Department of the Environment,Transport and the regions:London, March 2000, p 22.

knowledge of road safety. The driver training schools have a major role to prepare well-trained drivers to know the potential risk faced on roads, install in young people the right attitudes towards road safety and to guide learner drivers to take a more structured approach to learning, to prepare them for their driving career, not just to pass a test.

According to YASA, there is ample evidence that the way many new drivers learn is unsatisfactory in many developing countries. Unfortunately, new drivers are not gaining a thorough knowledge of the Highway Code and a thorough understanding of their responsibilities as drivers. The developing countries governments should do more to train new drivers on defensive driving. YASA suggests that any new syllabus for learner drivers of motor vehicles should cover the following main headings:

- legal requirements.
- car controls, equipment, and components.
- road user behavior and basic first aid principles.
- vehicle characteristics.
- traffic signs, rules and regulations.

For motorcycle riders, training needs to emphasize their vulnerability and the risk of not using an approved safety helmet. Defensive driver training, either as part of the initial training or as an advanced driver course, has been found to be effective, especially in reducing crashes involving company vehicle drivers.

Driving Instructors

Governments must ensure that people advertising themselves as driving instructors are qualified to do so. In order to receive a qualification, they must have successfully completed a training course organized by the appropriate authorities and be qualified to drive vehicles of the type in which they wish to instruct. Once qualified, their names should appear on a register of driving instructors and they are then entitled to charge for driving lessons. However, it is not essential that only qualified driving instructor instruct learners.

Driving instructors should have the ability to impart practical and theoretical knowledge to their students. As well as the obvious skills in driving the vehicles and giving demonstrations of techniques where appropriate, they should be conversant and comfortable with classroom procedures and be good communicators. It should always be remembered that a competent driver does not necessarily make a good driving instructor, but a competent driving instructor must always be a good driver.

In most developed countries, all instructors are trained and qualified by a recognized authority and this should be the aim of any driving instructor registration scheme. The most efficient way to monitor the profession is by way of a central register. It is illegal to charge tuition for driving instruction unless the name of the instructor is on that register.

Health Care Professionals

Doctors, nurses, and other medical, emergency, and health care professionals can also add their unique perspective to road safety. They can use their experience, knowledge, and professional reputations to educate state legislators, the media, patients, and the general public about the various dangers traffic such as not buckling up, drinking and driving, and not using child restraints properly.

To achieve better road safety, the health sector has to integrate its policies with transport and safety policies. This sector has to improve emergency and casualty services especially for the vulnerable and the poor. It has to develop sustainable training programs at regional and national level for improving first aid knowledge and trauma care management. Finally, the health sector should encourage and strengthen partnerships with the transport sector, NGO's and the insurance sector.¹⁴⁰

Civil Society Organizations

Groups such as Advocates for Highway and Auto Safety, Colleges of Emergency Physicians, Academies of Pediatrics, Coalitions for Traffic Safety, International Association of Chiefs of Police, Network of Employers for Safety Products, Parent Teacher Association, Transportation engineers and others can provide valuable technical assistance and resources. They can build constituent efforts and partnerships, advocate strengthened laws and increased enforcement, and provide better road safety education. Athletes from professional, college, school, and neighborhood sports teams can also serve as role models and set examples by being

¹⁴⁰ - Downing, A. GRSP, Meeting the Public Health Challenges in the 21 century in the MENA region. the World Bank, WHO and AUB. Beirut, Lebanon, 16-21 June 2002, p.18.

seat belt wearers and safe drivers. Sports teams can promote road safety through a variety of venues, such as special activities, media events, signs, and announcements.

Important key players in road safety are non-governmental organizations. These organizations have emerged to fill in gaps in the response to the increasing number of road traffic deaths and injuries as well as the resultant health, economic and social consequences. There are many voluntary organizations working for road safety in many countries.

Business Enterprises

Many businesses already have made major contributions toward increasing road safety, from local businesses to major international corporations. They should provide more support for enforcement safety laws by implementing, for example, seat belt use policies and programs for their employees and their families. Many enterprises communicate road safety messages to their employees and customers. As a group, business is respected by country legislatures, community governments, and private citizens, and wields influence in determining legislative, economic, and commercial priorities. Business can promote the "healthy habit" through a wide variety of strategies and is an essential partner in collective road safety efforts. More business enterprises should join in coalitions with other businesses and national organizations to advance road safety education, legislation, and enforcement. In most developing countries, they consist the cornerstone of the scarce funding available for road safety campaigns.

The Emergency Units

In most developed countries, the rescue team may be at the place of the accident within 10 minutes in cities and 20 minutes in suburban areas. The duties of the team of medical or paramedical personnel, is to stabilize the vital functions of the victim for the transport to the hospital (and not performing surgical operations). It is important that the team performs on the spot a preliminary diagnostic in order to direct the patient to the appropriate hospital.

In spite of substantial efforts made in developed countries during the last decades (medicalized ambulances and helicopters) about half of all the road victims who die, die on the site of the crash or during their transport to the hospital. In many developing countries, the emergency units are in a disastrous situation.

CHAPTER SIX

ROAD SAFETY: AN INTERNATIONAL DILEMMA

The objective of road safety work throughout the eight decades that follows 1923 is still the same. The whole target is to reduce the number of the casualties, and the diversified impacts of road accidents. But the most important and difficult element of achieving this objective is in the HOW phase of the improvement process. The answer of developed countries is through sustainable planning, programming and implementing of road safety campaigns.

The International Federation of Red Cross and Red Crescent Societies stated in its World Disasters Report in 1998 that: “Road crashes are a worsening global disaster destroying lives and livelihoods, hampering development and leaving millions in greater vulnerability.”

Child health is often used as an indicator of social differences. Average injury mortality in Europe among children aged up to 14 years was 15.90 per 100000 in 1988. Corresponding mortality in central and Eastern Europe was almost twice as high as in Western Europe, at 23.70 compared with 12.60.

Road Crashes are Causing Huge Losses

The accidents and loss of human lives would be seriously strained if steps were not taken at this time to find conventional solutions to dealing with the traffic problem. After many years, we can assure that the context of the aforementioned

statement is still valid although major changes had occurred and road safety is considered today as a high priority transport and public health issue in most developed countries.

Mortality due to road traffic injuries have always existed in the past but their recognition as a public health problem is a phenomenon of the last decades of the twentieth century.¹⁴¹ Policy makers and safety professionals in many countries find it very difficult to institute changes that can result in dramatic decrease in fatalities. This is mainly because experience shows that public sectors and individuals do not abide easily by instructions given in order to promote road safety. Attempts to educate people face many problems due to wide variations between people's knowledge and their actual behavior. This makes injury prevention and safety promotion a very complex process. Therefore, there is a societal and moral responsibility to design our vehicles and our roads and different domestic traffic laws so that people find it easier and convenient to behave in a safe manner without sacrificing their needs to earn a living or to fulfill their other societal obligations. With better designs, rules and regulations, the probability of people hurting each other or themselves will decrease. Such systems cannot be put in place unless there is a societal and political understanding about the ethical and moral responsibility of the governments and the civil society organizations to ensure the right to life of all its citizens. This right to life includes living in good health. Once we admit that injury

¹⁴¹ - Dinesh, M. Opening of Fifth World Conference for Injury Prevention and Control , Indian Institute of Technology , Delhi , March 2000.

control is a public health problem and that we have ethical responsibility to arrange for the safety of individuals, the worldwide problem of injuries will start to be solved.

Injury control work needs very innovative working techniques.¹⁴²The present collaboration mechanisms for inter disciplinary research, sharing techniques between different states, and structures for interaction between scientists and the public are still somewhat weak. The better structures and methodologies will become apparent only if we consciously evaluate experiences, successes and failures in widely different societies and settings.

Road safety is an issue of immense human proportions, it is an issue of economic proportions, it is an issue of social proportions and it is also an issue of equity. Road safety very much affects poor people. Collaboration between individuals and countries had almost succeeded in many environmental issues and it is highly urgent to enhance efforts of international collaboration on all plans to reduce road traffic injuries caused by all types of accidents, especially traffic accidents.

European Commission: Placing Users at the Heart of Transport Policy

Of all modes of transport, transport by road is the most dangerous and the most costly in terms of human lives. Still viewed as something of a fact of life in most developing countries, it is only recently that road accidents have aroused any particularly strong reaction. Road safety should be placed in the heart of domestic and international transport policies.¹⁴³

¹⁴² -Akl, M. YASA, "Sabah El Ward", NTV interview, Dec 2002.

¹⁴³ White Paper ; European Transport Policy for 2010 : Time to Decide, Italy, 2001,p.66.

Studies indicate that drivers in Europe (as in most developed countries) expect stricter road safety measures, such as improved road quality, better training of drivers, enforcement of traffic regulations, checks on vehicle safety, and road safety campaigns.¹⁴⁴ While in most developing countries, the aforementioned recommendations still considered as a low priority.

In the European Union, in the 1990's, many directives related to technical standardization have been promulgated in order to develop safe motor vehicle equipment and accessories (compulsory use of seatbelts, transport of dangerous goods, use of speed limitation devices in lorries, standardized driving licenses and roadworthiness testing of all vehicles).

The Maastricht treaty in 1992 finally provided the community with the legal means to establish a framework and introduce measures in the field of road safety.¹⁴⁵

In the battle for road safety, the European Union set to itself an ambitious goal to reduce the number of people killed between 2000 and 2010. The commission plans to halve the number of road deaths over that period by a series of recommendations such as harmonization of penalties and promotion of new technologies to improve road safety.¹⁴⁶ While in developing countries, the situation is very different. The sums spent on improving road safety fail to reflect the severity of the situation. Efforts to prevent road accidents are still inadequate.

¹⁴⁴ Sartre (Social attitudes to road traffic risk in Europe) projects ; Sartre 1 involved 15 countries in 1992 and Sartre 2 , 19 countries in 1997.

¹⁴⁵ - Article 71 of the EC Treaty , as amended by the treaty on European Union.

¹⁴⁶ -White Paper ; European Transport Policy for 2010 : Time to Decide. Italy,2001,p.67.

In most countries, the scattering of responsibilities and resources over a large number of organizations and authorities responsible for road safety, both centrally and regionally, tends to rule out large-scale action and discourage the introduction of coordinated policies. “Most developing countries are not adequately responsive or even aware of the impacts concerning road accidents as is the case in the developed countries”¹⁴⁷.

World Health Organization’s Response (WHO)

In recent years, indications that road traffic injuries are rising sharply, particularly in developing countries, have given WHO a new impetus to address this major public health concern. The WHO Director-General has recently announced that the annual World Health Day in 2004 will be dedicated to “Road Safety”. This will provide an ideal venue for the global launch of the World report on road traffic injury prevention that WHO is currently preparing with the World Bank. Although efforts on road traffic injuries have been rather sporadic since the World Health Assembly called on WHO to act on the problem since 1974, there is no doubt of WHO’s renewed determination to address the issue.

The first tangible outcome of this renewed commitment was the production of the “Five-year WHO strategy for road traffic injury prevention”. Developed in 2001 in collaboration with experts from health, transport and policing, as well from NGO’s and the private sector, the document covers the areas of epidemiology, prevention and advocacy. It outlines a strategy for building capacity at local and national levels to

monitor the burden of road traffic injuries; for incorporating road traffic injury prevention and control into national public health agendas; and for promoting action-oriented policies and programs so as to prevent road traffic injuries.¹⁴⁸

In order to identify effective and cost-effective strategies for preventing road traffic injuries, WHO has commissioned the Cochrane Injuries Group to conduct a systematic review of existing good practice in this area. The Cochrane Injuries Group, based at the London School of Hygiene and Tropical Medicine, is an international network whose task is to prepare, maintain and promote high-quality, peer-reviewed systematic reviews. The “Manual of good practice in road traffic injury prevention” will identify interventions in this field, which have been proved to be effective, as well as those which are promising but warrant further evaluation. According to WHO, this manual, expected to be available in early 2004, will serve as a resource for policy makers and practitioners involved in the prevention of road traffic accidents, especially in the developing countries where there is a need to learn by sharing successful experiences achieved in developed countries and even in some developing countries.

WHO Collaborating Centers

The Department of Violence and Injury Prevention of the WHO is supported in its work by a network of WHO Collaborating Centers- National institutions designated by the WHO Director-General to form part of an international network undertaking activities in support of WHO’s program priorities. Seventeen such bodies

¹⁴⁸ - Annual report 2002- Department of Injuries and Violence Prevention. World Health Organization, Geneva, Switzerland, p.18.

have been designated WHO Collaborating Centers on Injury Prevention and Control. Discussions to create additional six –five of them in developing countries- are in progress. In November 2002, VIP hosted the 12th Meeting of WHO Collaborating Centers on Injury Prevention and Control. With the participation of VIP staff and Regional Advisors and representatives of the Collaborating Centers, the meeting was also an opportunity to update participants on the current work of WHO and the Collaborating Centers for Injury Prevention and Control.¹⁴⁹

These Collaborating Centers assist cooperation of the international efforts to promote injury prevention and safety promotion. In Stockholm, the Department of Public Health Sciences in the Karolinska Institutet established one of the most active Collaborating Centers that focused its efforts on Community Safety Promotion. Its major role is to review applications from Communities based on 12 Criteria for Safe Communities, organizes together with Safe communities an annual International Safe Community Conferences, coordinates training courses, organizes research and publishes a newsletter about safe communities. There are also many organizations considered as affiliate safe community Support centers that provide advice and assistance in the field of injury prevention and safety promotion to the communities.¹⁵⁰

¹⁴⁹ -“Partnerships”. Annual Report 2002 of Department of Injuries and Violence Prevention. World Health Organization, Geneva, Switzerland, p.29.

¹⁵⁰ -www.phs.ki.se/csp

The Resolution of the General Assembly of the United Nations 57/309

A turning date in the improvement of road safety, worldwide, was 22 May 2003 when the Fifty-eighth session of the General Assembly of the United Nations took the resolution 57/309. This resolution discussed road traffic injuries and the challenges relating to the prevention of road crashes and their impacts. It emphasizes that road traffic injuries now pose a global public health crisis that requires urgent action at the national and the international level.

The resolution 57/309 described the magnitude of the problem, the health, social and economic consequences, and the risk factors and determinants that predispose certain groups to vulnerability to road traffic injuries. This resolution calls on member states, particularly developing countries, to stimulate a new level of commitment in tackling the problem of road safety.

This resolution encouraged each member state to assess its own road traffic safety problem and situation. This includes promoting and facilitating research that will build capacity and improve data collection methods, and encouraging collaboration between various sectors so that effective surveillance, data management and evaluation can be enhanced. Accurate assessment of the road traffic injury problem involves collecting data not only on deaths and morbidity, but also on the economic impact of road traffic injuries, so that this can be compared with other social problems or government priorities.

This resolution called on the United Nations regional commissions to add to their respective work programs activities that will:

- Promote regional best practices regarding matters related to road safety.
- Assist member states in drawing up road safety standards appropriate to their setting.
- Support human and technical capacity-building programs pertaining to road safety.
- Develop and implement sustainable transport policies that incorporate road safety.
- Adopt multisectoral approaches to road safety with clear targets and appropriate management structures.
- Develop short and medium-term strategies to address road safety problems.¹⁵¹

The World Bank Response

“It is important to look at the overall picture of what causes road deaths, and take a cross-sectoral approach that can be nested within a country’s development framework, and is therefore capable of being applied nationwide”, says taskforce member Eva Jarawan, AFR Lead Health Specialist.

The need to reduce road traffic injuries pushed the World Bank to create recently a Bank taskforce with members drawn from across the health, education, and transport sectors. On the other hand, the World Bank has project work underway in 28 countries on either improving road design and other road systems, or improving

¹⁵¹ -“Global Road Safety Crisis”, Report of the Secretary-General, Fifty-eight session of the General Assembly, United Nations, Item 162 of the provisional agenda, 22 May 2003 (A/58/150).

road design and other road systems, or improving emergency medical care for people injured in road crashes.

In his report about “ The Role of NGOs in Road Safety” Leif Agnar Ellevest, World Bank Road Safety Consultant, stated that:

A seminar on “the Role of NGOs in Road Safety” was held on 23 September 1996 in Dhaka. The Bangladesh Road Transport Authority (BRTA) of the ministry of Communications organized the seminar as part of the World Bank efforts of improving road safety in Bangladesh. National and international experts, and representatives presented a number of technical papers from NGOs and government. After detailed plenary discussions, a set of important recommendations was unanimously adopted. The seminar decided that road safety awareness was the most important and cost effective way of reducing accidents and enhancing road safety.¹⁵²

The World Bank support and cooperation with NGOs in road safety should be improved during the next years. The aforementioned successful seminar in Bangladesh was a good example to be replicated in other developing countries and cities, especially because it includes NGOs which often have proved to play an important role in the work to prevent road crashes.

Injuries in Southeast Asia

The medical, social, economic and human cost of injuries is overwhelming in South East Asia. Deaths, disabilities and hospitalizations due to injuries continue to increase in all countries in that region. Injuries rank high as a cause of death and for

¹⁵² -Ellevest, A World Bank Road Safety Consultant, “The Role of NGOs in Road Safety-Road Safety in Bangladesh”, Dhaka, 16 June 1997.

years of life lost.¹⁵³ Yet, injury prevention is not a priority in the public health agenda of the member countries. In fact, road traffic injuries alone were ranked as the primary cause of disease among children in the age group of 5 to 14 years, and the third leading cause among people between the ages of 15 to 29 years in 2000. Road traffic injuries are between the second to the sixth leading causes of deaths in the age groups 15-60 years.¹⁵⁴

In countries of the Southeast Asia region, most victims of road traffic crashes face some special problems, which include:¹⁵⁵

- Reallocation of labor of family members and reduced productivity of the whole family.
- Permanent loss of job for the victim even if he survives.
- Loss of land, personal savings, household goods.
- Poor health and educational attainment of surviving members.

Such losses have an adverse impact on the well being of Southeast Asia. However, none of the above issues is taken into consideration in the standard economic calculations done for estimating the cost of road crashes.

Research has revealed that in the countries of this region, the vulnerable road users, including pedestrians, bicyclists and motorized two-wheeler riders, sustain a

¹⁵³ -Health Information of India 1997 &1998. Central Bureau of Health. Intelligence, Directorate General of Health Services, Ministry of Health and Family Welfare, New Delhi, 1999.

¹⁵⁴ -“World Health Report 2001”, Database Geneva:WHO, 2002.

¹⁵⁵ -Over M, Ellis PE, Huber JH, and Solon. The Consequences of Adult Ill Health. Feachman RGA, et al, editors.

vast majority of fatalities and injuries due to road traffic crashes.¹⁵⁶ As in most developing countries, more efforts are required, in Southeast Asia, to ensure the safety of the vulnerable road users in order to be able to make a significant reduction in the health burden of road traffic injuries.

In the last three decades, the incidence of traffic crash fatalities and injuries has been reduced significantly in the high-income countries but not South East Asia. Regional cooperation between neighboring countries may be efficient in safety promotion and in reducing the burden of road traffic injuries.

Gender and Road Traffic Injuries

Globally, almost three times as many males as compared to females die from road traffic accidents, accounting for the largest sex differentials in mortality rates from unintentional injury.¹⁵⁷ In Barcelona, Spain, a large 6-hospital study found that 7 of 10 road traffic injury cases above the age 14 years were among males, and the overall death rate was more than three times higher for men than women (Plasencia 1995). Injury and fatality rates for males are higher for every category of road injury victim in several developing countries. In a 1997 hospital study in Kampala, Uganda, males outnumbered females among road injury victims by a factor ranging from 2 to

¹⁵⁶ -Mohan, D.Tiwari, G. Road Safety in Less Motorized Countries-Relevance of International Vehicle and Highway safety Standards.Proceedings International Conference on Vehicle Safety. London:Institution of Mechanical Engineers,2000: p.155-156.

¹⁵⁷ - Global Mortality from Unintentional Injury, A leading cause of the Global Burden of Disease, World Health Organization,WHO 1999.

7 among pedestrians, vehicle occupants, motor vehicle and motorcycle drivers and cyclists. Similar findings have been reported from Kenya and Ethiopia.¹⁵⁸

Higher male risk of road traffic injuries and fatality is associated to a significant extent with greater exposure to driving as well as to patterns of high-risk behavior when driving. On the other hand, higher male pedestrian injury and fatality rates appear to hold irrespective of time spent walking on the road, and are attributable to alcohol use and risky behavior.

In many developing countries women's mobility is traditionally restricted, men may spend substantially more time in moving vehicles than women, and in all settings other than among the small economic elite, men are more likely to own cars than women. Men are also more likely to be employed as drivers and mechanics in cars and trucks, including long-haul vehicles, which means spending several days and nights in the vehicle. This would result in a higher exposure to the risk of traffic injuries in male drivers of vehicles, which is clearly attributable to gender-based differences in male and female roles.

Other Impacts of Road Crashes

“The sleeping giant of health care is awakening to its new role in society. As we move from a system designed to care for illness to one that emphasizes wellness, we change our measuring rod of success. Injury prevention takes on a new and more important dimension, not only for improving the health of the nation, but also in the

¹⁵⁸ - Gender and Road Traffic Injuries. Department of Gender and Women's Health, World Health Organization, January 2002.

ability to truly control health care costs”.¹⁵⁹ Unlike air crashes, road traffic accidents draw generally limited public attention because of their frequent and small-scale recurrence. This is in spite of their colossal global human and socioeconomic costs.¹⁶⁰ Efforts to increase the awareness to this problem, to improve road safety and the assistance to victims are not easy because of the wide geographical extension of these accidents and the necessity to involve all road users. Analysis of road accidents indicates that this undeclared disaster has very dangerous implications, which affect, in varying degrees, the world’s socio-economic system.¹⁶¹

Road traffic injuries involve issues of equity. They disproportionately affect the poor in developing countries, where the majority of road crash victims are vulnerable road users (pedestrians, cyclists, children, and passengers). In more developed countries too, there are steep social class gradients in figures on pedestrian injury, with children of lower socio-economic status being more likely to die in collisions involving pedestrians than their more affluent counterparts. A further inequity issue is that poorer socio-economic groups have less access to medical services, leading to disparities in chances of recovery or survival. An important inequity is the trend of investing increasing resources in the building and maintenance

¹⁵⁹ - Ricardo, M. MD, JAMA, 1994.

¹⁶⁰ -Rahbani, E.YASA,Interview on Future Television, “Yaomiat”- April 8, 2003.

¹⁶¹ - Jazzar, N.Conference Insurance and Prevention. Saint Joseph University, Beirut, April 1998.

of an infrastructure for private motorized transport, while overlooking the public transport needs of the larger part of the population.¹⁶²

Road safety is suffering a lot from the international underestimation of the socio-economic costs of road crashes. Many non-governmental and educational organizations are doing their best to struggle in order to raise road safety on the top of the agenda of human development (For example, PRI, FEVR, YASA, MADD and FIA).

Social and Economic Cost

The experiences of the developed world show clearly that “Economic assessment of the costs involved is an essential element in the planning of the implementation phases” of road safety improvement programs. This sort of assessment played a significant role in motivating the political leadership in developed countries to respond energetically towards improving the level of road safety. Such response had helped the declaration of road safety as a national and strategic goal, and the allocation of adequate funding for this purpose.

At present, the socio-economic and environmental costs of road accidents worldwide are not known. However, Retting estimated a global economic impact of motor vehicle injuries and property damage being of more than US 300 billion USD annually.¹⁶³

¹⁶² -“Global Road Safety Crises”,United Nations, General Assembly Resolution 57/309, 22 May 2003.

¹⁶³ - Retting, R. Improving Road Safety in the Urban Environment , the 70 Transportation Research Board Annual Meeting. International Symposium on Urban Road Issues , session 177, Washington D.C., January 1991.

SRF using the same calculation principles as Retting estimated in 2000 the global economic impact at more than US 500 billion USD annually. In the United Kingdom, the estimated economic costs of road accidents, despite the decrease in road fatalities, has increased from 230 million pounds in 1961 to 2820 million pounds in 1985, a percentage increase of 1126%. In the United States, in 1940, the estimated economic cost of road accidents of 34501 road fatalities was 1.6 billion USD .In 1950, the cost of 34763 fatalities increased to 3.1 billion USD. In the 1990's, it reached 95 billion USD.¹⁶⁴ It is estimated to be more than 300 billion USD in 2010.

According to Tignor during the next two decades the United States' public will probably continue to promote other highway initiatives to reduce the annual societal loss due to highway transportation fatalities and injuries. Estimation of road accidents' social costs is not yet adopted in all industrialized countries. In most developing countries, no estimation of the social costs is also adopted. Also, no apparent agreed upon criteria or standard procedure seems to exist at the regional or international level for the estimation of social and environmental impacts' costs of road crashes.

According to the estimates of the United Nations, the economic costs of road accidents in developing countries represents 1 to 3 % of their GNP. Although, many developing countries and cities suffer losses of many billions of USD by road crashes, the United Nations had not considered till 2003 that road safety is needed for sustainable development. Both the two world summits of Rio De Jenero in 1992 and

¹⁶⁴ -Highway Safety Performance: Fatal and Injury Accident Rates on Public Roads in the United States. FHWA, USDOT,P.u No.FHWA-SA-92-003, April 1991.

Johannesburg in 2002, disregarded road safety and addressed many other urban problems of much less tangible socio-economic impacts.

National economic policies of most developing countries pay little or no attention to the economic losses of road accidents¹⁶⁵. This factor is crucial for politicians. Accordingly, the estimation of economic costs of road accidents should be given priority in any future road safety program launched anywhere in the world. For developing countries and cities, the socio-economic estimation of road crashes requires adequate research effort that will help in raising awareness about road safety.

Medical Cost

There is an urgent need to spend more money on improving and upgrading the quality of the pre-hospital care for road traffic victims especially by improving the means of emergency medical transport (medicalized ambulances and helicopters) and by a better preparation of the rescue team in emergency medicine.¹⁶⁶

In the European Union, according to the present definition of the injured road traffic victim and the evaluation of the total medical expenses, the average cost of an injured victim amounts to 3,000 Euros, which represents a yearly expense of 15 Euros for each European citizen. Thus, the total annual European medical expenses amount to 4.5 billion euros, which represents only 3% of the total annual socio-economic costs of the 150 billion Euros of road, crashes.¹⁶⁷ Therefore an increase of, for example, 30% of the medical expenses (representing only 1 % of the above total

¹⁶⁵ - Hussain, A. Soric 02, Manama, Bahrain, 23 October 2002.

¹⁶⁶ -Kettani, G. Chairman of First Aid teams in the Lebanese Red Cross. "National Conference for Fire Safety." Lebanese Fire Prevention Committee, Unesco palace, Beirut, 22 February 2003.

¹⁶⁷ - Haegi, M. President of FEVR. "Assistance to Victims of Road Traffic Accidents", February 2002.

socio-economical costs of road traffic accidents), would permit to decrease drastically the 20% to 40% “avoidable deaths” in hospitals.

People Disabled

According to WHO, disability is a huge public health problem affecting, taking all causes together, at least 10% of the world population. From these more than 20 million people are severely disabled because of road traffic accidents. Proper treatment and care of the disabled would represent an enormous burden to the public health problem services, therefore most of the care for these victims is left to its families, self –help groups and charities, or they are simply abandoned and left for themselves.

The most tragic situation is that of the mentally disabled (due to brain trauma) who will need continuous care and assistance for the remainder of his life. Motor disabled people (often due to spinal trauma) may frequently, after rehabilitation, be able to undertake some activities, allowing them certain independence. It is however necessary to provide them the necessary equipment (wheelchairs and artificial limbs) and to adapt the surroundings in order to allow them to practice their mobility (fitting pavements, buses, trains, doors, lifts and toilets). This would give them the access education, professional training and eventually to find a job.¹⁶⁸ In the 15 member states of the European Union, many activities (for example, a bus traveling through

¹⁶⁸ - “People Disabled by Traffic Accidents”. *FEVR News Letter* 32. January 2003.

the EU) were organized in the framework of the “European Year of People with Disabilities 2003.”¹⁶⁹

Indirect Effects

After hearing of the death of his eldest son in a road accident, in 1969, Nelson Mandela said: “I do not have words to express the sorrow or loss I felt. It left a hole in my heart that can never be filled.”¹⁷⁰ According to FEVR, most parents who lost a child will face indirect effects on their health and behavior for their whole lives.

There are also considerable indirect effects of road traffic injuries: members of the public may be affected by road traffic injuries even when they or their family members are not directly involved in road crashes. For example, fear of road traffic injuries can prevent old people from venturing outdoors. In many high-income countries, increasing use of cars has led to a general decline in walking and an increase in sedentary lifestyles, which in turn has had adverse consequences in terms of increasing obesity and cardiovascular health problems.

¹⁶⁹ -www.eypd2003.org

¹⁷⁰ - Mandela, N. President of South Africa. “Long Walk to Freedom”, South Africa, 1994.

CHAPTER SEVEN

THE NEEDS OF DEVELOPING COUNTRIES

“Estimated annual economic costs of road traffic accidents in most developing countries represent more than one percent of the GNP and sometimes may reach around three per cent of the GNP as in the case of Thailand.”¹⁷¹ Although the huge cost caused by road crashes, road safety is still a low priority issue in most developing countries. Road traffic accidents are the most serious but hidden disaster threatening the existence of millions of the world’s population. Road problems are a complex dilemma of a multi-facet and multi-disciplinary characteristic. It has also a continuous and non- ending socioeconomic, environmental and health impacts. Unfortunately, the annual road accident casualties of millions of innocent and productive population in developing countries receive relatively little interest at the international and even at the national levels.¹⁷²

Review of Road Safety in Developing Countries

In developing countries, the road problems in the last decade have reached high levels, despite their relative low motorization rates. According to the Global Road Safety Partnership (GRSP), about 70 million in-patient days are taken up, each year,

¹⁷¹ - “Asian Seminar on Road Safety”, World Health Organization, Bangkok , 10-12 March ,1987.

¹⁷² -“Prevention Routiere International workshop”, Madrid, 1 March 2002.

in the hospitals of the developing countries with road crashes victims. This is due to the lack of:

- One- Effective pressure groups
- Two- Strong political will and support
- Three- Effective traffic safety organization
- Four- Sufficient resources
- Five- Adequate road safety education

The deterioration of road safety has grave implications on development and the protection of environment. Therefore, extensive commitments, planning, and skilled efforts are needed urgently to reduce the complex impacts of road accidents.¹⁷³ However, many governments of the developing world during the last three decades exerted efforts in spite of their inability to effectively solve this highly complex problem.¹⁷⁴ In addition, developing countries with ineffective or no road safety programs, usually have inefficient law enforcement by internal security forces, high accident and casualty rates and uncontrollable road user-vehicle – environment system. Therefore, any developing country or city trying to lessen the catastrophic impacts of road accidents should examine carefully its road safety situation as a pre condition to any attempt in this respect (wide comparisons with different developed countries can be very helpful).¹⁷⁵ Improving road safety can only be achieved through

¹⁷³ - Mikati, N. H.E. Lebanese minister of Transportation , “Fourth National Conference of Road Safety”, YASA, Unesco palace, 26 April 2002.

¹⁷⁴ -Al-Khawashshky, M. Socio-Economic Effects of Road Traffic Accidents in Saudi Arabia, World Health Organisation , 1982.

¹⁷⁵ -Jarjoura, C. YASA. LBCI Interview. July 2003.

good planning and scientific programming. Both public and private sectors must share efforts.

“Road crashes constitute a grave and growing problem in Syria and in other developing countries.”¹⁷⁶ It is worth noting that the situation in developing countries is different from other problems in many ways. It is continuous, escalating at a high rate, lacks strong political recognition and support, lacks the wide attention of the public and the media, causes human losses and injuries and affects all age groups, its socio-economic and environmental costs are higher than other national problems, and has no simple, direct, inexpensive, or quick solution. Demographic and technological changes coupled with development in the socio-economic sectors have increasing demand on transport facilities in urban and rural areas. The main objective of the planning and design of road networks and infrastructure in developing countries was, and continues to be, mainly to provide better mobility to aid national economic development. Improved road surfaces and vehicle performance, and the enjoyment of high vehicle speeds gave the motor vehicle its usual predominant role in the motorization process of every developing country.

Sudden changes of this nature coupled with educational and cultural complexities could not be accommodated safely by developing countries. Millions of innocent people (children, youths and the adults) are dead, or crippled for the rest of their lives.

¹⁷⁶ - Keghdo, S. MD. “Meeting with YASA team”, Damascus, Syria, 25 November 2001.

The diversity of authorities responsible for road safety in the majority of developing countries make it very difficult to put the issue in perspective at the international, national, and local levels. This division of authority has also resulted in many failures of valuable investments and ad-hoc programs aimed at reducing the impacts of road crashes. Most of such programs were based on subjective assessment of causes. Some developing countries and cities realized the desperate need to reduce the escalating casualties of road traffic crashes and took some actions in this respect. Construction of road infrastructure was intensified and expanded, traffic police departments were established and strengthened, national committees and associations on the prevention of road accidents were created at governmental and non-governmental levels, ad-hoc traffic safety campaigns were carried out, road traffic safety journals were published, and some investment in road safety research were committed in very few countries. In general, road safety efforts by developing countries until the early 1980 were fragmented and their results, due to many factors, were difficult to evaluate tangibly. Then, the trend started to change very slowly towards a more comprehensive approach to combat the problem.

Some developing countries (Bostwana, Brazil, Colombia, Kenya, Chile, Indonesia, Jordan, Kuwait and Malaysia) have embarked on a national road safety programs and experienced some attempts towards a more comprehensive approach to combat the road safety problem. But, still we can consider that the majority of developing countries are in their first steps in solving the problem caused by road crashes.

Carlson and Hedman, after reviewing a sample of the World Bank Appraisal reports concerning developing countries, stated, “The road accident problem is seldom discussed beyond a superficial treatment of the problem. Safety effects are rarely estimated and included in the economic appraisals.” Fahelson reported that in Saudi Arabia, royal decrees mandating the inclusion of road safety as a goal in the national development plan (NDP) was issued in the early 1980 the NDP required the establishment of a National Road Safety Strategy.¹⁷⁷ A National Traffic Safety Committee (NTSC) was established and assigned the responsibility of coordinating the comprehensive road safety strategy at the national level.

Unfortunately, the majority of the developing countries did generally not learn from the lessons of the developed world. Some regions such as Sub-Saharan Africa and the Middle East have three times as many road deaths than might be expected by their levels of vehicle ownership. Between 1980 and 1995, the total number of road deaths increased in Asian countries by an average of 70 per cent and around 40 per cent in the Latin American and Caribbean countries.¹⁷⁸

Bus Crash Prevention

In northeast China, a bus crash killed 18 people on the Shenyang-Siping Highway in Liaoning Province. In Cameroon, at least 70 people die when two buses collide at Ebony, about 90 km east of the main port city of Doula. Dozens of other

¹⁷⁷ - Fahleston, K. Road Safety Management within the Responsibility of a Road Administration. Proceedings, 3rd International Road Federation Middle East Regional Meeting, Riyadh, Saudi Arabia, Volume 2,13-18 .2.1988 ,pp . 2 . 101-2 . 112.

¹⁷⁸ -www.GRSProadsafety.org

people were injured in a third bus behind them. In West Bengal, a truck loaded with paint crashes into a bus, killing at least 40 people, police said. The head-on collision occurs 50 km south of Calcutta in dense fog. These road crashes, occurred in March 2003, illustrate the often-lethal experience that awaits drivers, passengers, and pedestrians living in developing countries with poor road conditions and overburdened medical treatment facilities.¹⁷⁹

“Conventional car oriented use and transportation policies coupled with inefficient public transport systems contribute negatively to the road safety situation as a whole in the majority of developing countries”.¹⁸⁰ Bus crashes cause major astonishing disasters in most developing countries. One of the most terrible traffic crashes in history occurred in Dar Salaam, in 1998: “Another tragedy befalls Tanzania. 75 people die and 25 injured in a bus accident.”¹⁸¹

A Special Council for Road Safety

The United Nations resolution 57/309 recommends that a leadership role for road safety efforts lie with governments of member states. A single agency or focal point is required to be responsible and accountable for road safety issues, with sufficient authority and resources to fulfill a leadership role. This agency should be responsible for involving other organizations and bodies within government, in order to create an environment that is conducive to road safety promotion. Similarly, the

¹⁷⁹ -“Road Crashes Bring Death and Poverty”, <http://intranet.worldbank.org>

¹⁸⁰ -United Nations Environment Program . The UN System Wide MediumTerm Environment Program. 1990-1995, UNEP , Nairobi, 1988 , p .60.

¹⁸¹ -*Daily News*. Dar es Salaam, May 1998.

agency should be responsible for encouraging the participation of citizens in road safety efforts. For example, Oman has established a National Committee for Road Safety, an independent institution whose remit includes legislation, promoting the improvement of transportation services and raising awareness of the road safety problem.

The complexity and development of the road accident phenomenon required more coordination and integration of efforts for the road safety process.¹⁸² It should be highlighted, as a result of the British Transport and Road Research Laboratory's road safety experience in developing countries, the "need to bring together all the relevant agencies in some form of National Safety Council". YASA stressed the importance of the integration concept and elaborated on the benefits of its adoption for developing countries. The German Council for Road Safety DVR is also a successful experience of cooperation between public and private agencies working for road safety in Germany.

George Leber, a road safety expert, called together all the agencies and public authorities engaged in road safety work with the aim of drawing up a strategy for tackling the problem. The result was the creation of an umbrella organization for all governmental and non-governmental authorities and agencies concerned with issues of road safety called German Road Safety Council DVR. The aim of the DVR was twofold: to bring together all the forces committed to the joint effort in this field and, at the same time, to develop new methods of road safety work.

¹⁸² -Kabbani, M. President of Transportation Committee in the Lebanese Parliament, Road safety Workshop, Beirut, 2 April 2003.

The DVR is not a state institution but a private body organized in the form of a registered association. Alongside the federal government, came the governments of most of the Landers helping in the DVR where they are represented through their respective transport or interior ministers. This is an exemplary arrangement for making full use of the potential for cooperation between the state and all the relevant groups in society.

With over 275 member organizations, the Council has more than satisfied the expectations of its founders that it should serve as a permanent "round table" for everyone engaged in road safety issues, since it had started its work with less than 100. The General Assembly takes place once a year to adopt the yearly budget also elects the Board of Governors in a four-year period. From its membership the Board of Governors elects a president and three vice presidents. An Executive Council handles priority matters. Appointed committees advise and prepare decisions of the Board of Governors. Personnel of member organizations work as honorary members of the committees. Committee chairmen are automatically members of the Board of Governors, ensuring permanent contact between the members and the board.

To this end, the following committees have been set up:

Safety education for children in school and in pre-school age, youth traffic education, adult traffic safety information, publicity, legal matters, road traffic technology, motor vehicle technology, traffic medicine and rescue.

DVR's main office in Bonn is responsible to the Board and the committees in the conduct of administration, organizational matters and contacts to the Parliament and the Federal Government. Its 45 staff members are employed by DVR on a full-

time basis. The DVR has no regional organization. The only affiliated office had been opened in Berlin after the reunification.

The second reason for founding the DVR was to create an organization to develop new approaches to road safety. First of all the council had to find out the best ways of reaching the public. The DVR founders recommended presenting safety as a positive value, and to show considerate driving habits as the trademark of a good driver. All that was to be presented to the road user by positive measures, not by threats or deterrents.

The legal status of DVR as other non-profit making organization means that any resolutions it passes are not binding on the state and its organs. With regard to its members, too, the strength of such an organization lies primarily in the persuasiveness of its arguments and in the quality of the programs it offers. The inclusion of both academics and persons with practical experience in road safety work from member associations in the committees of the German Road Safety Council has been extremely successful since this enables close cooperation between the two, thus ensuring that DVR programs are as up to date as possible and designed to be implemented in such a way that all members can identify with them. In total, there are around 5.000 unpaid moderators working on German Road Safety Council (DVR) programs throughout Germany. Some programs, such as "Children in Traffic", for example, reach about a quarter of a million parents every year.

Funding and Support for Road Safety

Road safety is only one of the many competing demanding need from the scarce resources of the various countries. With the worldwide growing problem of road crashes and related injuries, more funds are expected to be available in order to face this problem. Many multilateral and bilateral aid agencies had already started to assist with the funding of road safety activities and by providing specialist support.

In most developed countries, many private companies were committed in funding road safety efforts, especially the insurance and automobile industry. These companies consider themselves funding for their conviction in road safety and for improving their image in serving the community, which may be fruitful as any other advertising.

In addition to the aforementioned funding, other conventional funding sources should be pursued, especially in developing countries:

- Road user charges (from vehicle licensing, taxation and insurance)
- A proportion of traffic fines
- An element of the road maintenance budget

Unfortunately, most developing countries are facing the deterioration of road safety due to the absence of the adequate funding.

Proposed Methodolgy for Developing Countries

Each element of a program to promote traffic safety can make important contributions, but these elements are most effective when they are integrated into a comprehensive program appropriate for the physical, cultural, and social environment

of the particular region or country. There is a need for an emergency sustainable action in many developing countries and cities in order to prevent more injuries caused by traffic crashes.

Problem Identification:

The success of such action depends to a large extent on clear problem identification. But it is rather impossible to identify and analyze the road safety situation without thorough investigation and lengthy analyses based on reliable and comprehensive information on accidents, traffic and travel, road environment and other road accidents' contributing factors¹⁸³. Therefore, an important step in this respect is to establish a workable and efficient framework for comprehensive data collection system. The entire existing data collection system should be thoroughly reviewed and assessed.

This should include the organization; data sources, types, and processing system; caliber, qualification, and experience of personnel in charge of the data collection, and edition. The available data should be reviewed and assessed, and if necessary supported with additional new data. This task should include the collection, validation and analysis of road-safety related data covering accidents, vehicles, roads, environment, expenditure, road users, available technology as well as legislation, socio-economic costs and environmental costs. This task as a whole should serve the preliminary identification of the magnitude, types, exposure, risk, trends,

¹⁸³ - Kosm, M. Syrian Writer. "Lebanese Tunisian Workshop about Impact of Media on Road Safety", YASA office, Lebanon, 7 June 2002.

geographical distribution, deficiencies, requirements, and socio-economic and environmental impacts.

Goal Setting:

Caution should be exercised during this activity in order to avoid duplication and maintain coherence among the selected array of sub-programs and countermeasures. To ensure realistic setting of goals, the existing road safety related conditions in a city or country must be critically evaluated. This should include the assessment of:

1. All sectors and factors contributing to directly and indirectly to the occurrence of road crashes and casualties .The 5 Es mentioned in the introduction emphasis the role of multi sectoral cooperation to achieve better safety on roads.
2. Planning and economic policies, and legislation as related to transport and its safety.
3. Urban planning and design procedures,
4. Organization and management,

Road safety administrations in developing cities and countries should avoid adopting subjective goals. On the contrary, the adoption of clear target values (quantitative goals) would be an essential factor in the planning and implementation of successful road safety campaigns. These clear targets will be helpful in the process of evaluation and cooperation and would lead to more coherent and clearer results.

Planning:

“One of the most important aspects in the planning of road safety campaign is the adherence to the goals and objectives of the prepared campaign within the limitations

of budget, time and execution capabilities”¹⁸⁴ Flexibility is advised in condition of taking care of the aforementioned limitations.

Implementation of the campaign should be applied on a pilot base in every respect. A pilot-based implementation of countermeasures plans is more economical, manageable, and practical to apply on small scale so that they could be effectively monitored, validated, tested, evaluated, and probably modified before the wide application of the campaign. Extensive and sustainable coordination among concerned public and private agencies is required prior and during the implementation of the campaign.

Evaluation:

Evaluation is an essential part of every safety education program. It is the process of determining the success or failure of either a person’s performance or a planned activity. It often includes the level of success or failure. Evaluation is an activity that is conducted on both a formal and informal basis.¹⁸⁵ Evaluation procedures may be as simple as a speculative discussion between program planners or can involve a complex research study that may take years to complete, such as on the accident reduction effectiveness of high-school driving education.¹⁸⁶ Safety education has often been the victim of erroneous evaluation. Such comment as “Let’s drop driver education from the schools; roads still kill thousands annually” is an example

¹⁸⁴ - Saab, B. Association of Family Medicine, “YASA Conference on Road Safety”. Forzol, Bekaa, Lebanon, 31 August 1996.

¹⁸⁵ - Svanstrom, L. Karolinska Institutet. Final session of the Third International Course titled “Global Burden of Injuries.” Stockholm, Sweden, 31 January 2003.

¹⁸⁶ - Said, A. Traffic Directorate of the Kingdom of Saudi Arabia, Interview on Orbit Television “Oyoum Beirut”, Beirut, Lebanon, 26 April 2002.

of evaluation based on partial information. This critic failed to consider what the scope of the problem would be if these education programs had never existed.

Whatever the scope or nature of the program, evaluation is a process that must be an integrated part of early planning and must even be considered during the actual execution of the program activities.¹⁸⁷ Due to the strong interrelation between goals, priorities, and the evaluation phase, the evaluation criteria should be selected from the planning of the whole campaign at specified time intervals.

¹⁸⁷ - Strasser Aaron and Bohn Eales, Fundamentals of Safety Education, Macmillan, 1973, p.449.

CHAPTER EIGHT

SHARING THE EXPERIENCES OF DEVELOPED COUNTRIES

During the last five decades vast investments and efforts were implemented in many developed countries, which have almost one fifth of the world road casualties.¹⁸⁸ The results of these efforts, commended by both media and political apprehension of the problem and the application of social and scientific research in the process of reducing the impacts of road crashes, were encouraging. In most developed countries, at the beginning of the seventies the number of road casualties started to decrease, despite the sustainable increase in both the travel rates and the motorization. The relative success was accomplished through the formulation and implementation of comprehensive road safety improvement programs.

Road Safety in developed countries went through three major periods:

Before pre-World War II period, the post World War II until 1973 and the post 1973 period. The first two periods witnessed increases in motorization and road accidents casualties. The third period could be characterized by continued high vehicle ownership with reduced road casualties

¹⁸⁸ -Federal Highway Administration. Proceedings of Symposium on Effective Highway Highway Accident Countermeasures: Ideas into Action-Highway Safety . Federal Highway Administration U.S. Department of Transportation. June 12-14 , August 1990.

due to improvement in road safety level. This reduction was the fruit of a long and elaborate planning and programming to reduce road accidents casualties.¹⁸⁹

Hans Van Holst; from the Swedish Royal Institute of Technology, said in 1995: “The slaughter and mutilation that occurs on the streets and roads are events which are unacceptable in modern society.” Developed countries tackled road accidents with the commitment of their governments to act effectively and mobilize available resources for this task.¹⁹⁰ Devised countermeasures were, and are based on careful planning, programming, and research. The role of Research and Development continues to constitute a corner stone in successful road safety programs.¹⁹¹ The conceptual frameworks of these programs changed gradually with the change in national and local conditions and requirements.

OECD member countries are aware of the need for much more active co-operation and coordination among the various road safety fields as a precondition for continued reductions in road traffic fatalities, injuries and associated economic loss.¹⁹²

In the early 1980’s, many developed countries suffered from slight increases in road casualties which required them to review and assess the situation.¹⁹³ In 1983, there were approximately 130,000 people killed by road crashes in OECD countries.

¹⁸⁹ - Highway Safety Performance , Fatal and Injury Accident Rates on Public Roads in the United States, 2000.

¹⁹⁰ - Aaron, J. Driver & Traffic Safety Education : Contents , Methods, Organisation , Macmillan , New York, 1966.

¹⁹¹ - Youssef, H. President SRF, LBCI Interview, 29 september 2000.

¹⁹² - OECD Road Safety Research Group, 1984.

¹⁹³ - Integrated Road Safety Programs, Organisation for Economic Co-operation and Development report, Road Transport Research, Paris, 1984.

Despite the relative low accident rates and severity indices in these countries in comparison with the developing world, it has

been stated, in respect to the aforementioned figures, by many policy makers that “What is at stake is enormous”, and that “presents programs, although comprehensive still suffer from unnecessary redundancies, imbalance, incoherence and unexploited opportunities.” This thinking by many policy makers around OECD countries necessitated the evolution of a new management concept utilizing available techniques, optimizing resources, and improving efficiency. Effective management of the road safety distributed horizontally activities demands a high degree of coordination and comprehensive information base on accident causation, impacts, and cost: and costs of countermeasures. With the vertical structure of the traditional lead governmental road safety organization, the integration of actions into a coherent program became obvious.

At the national level, developed countries initiated and implemented pilot road safety plans. After their success at the experimental level, these schemes gained national and worldwide acceptance and appreciation. However, extensive planning efforts of industry, academic, governmental and non-governmental organizations have been, and are being, exerted in most of the developed countries in order to achieve the objectives of the road safety programs in the new century (millennium).¹⁹⁴

¹⁹⁴ - Trigozo, J. President of the “Prevention Routiere Internationale”. Madrid, 1 March 2002.

In the 1991, the council of ministers of the European Conference of ministers of transport (ECMT) in its 74th session, stated that:

After the poor results recorded in the previous years, road safety improved overall in Europe .The fact remains, however, that such progress is quite modest and does not reflect a return to level of safety attained in 1985, the best year in this respect.

Between 1970 and 1990, the number of road fatalities in 19 European countries decreased from 81330 to 61100 respectively. The U.S. National Transportation Policy, "Moving America Safely", published in early 1990, indicated that nothing is more important to people than their safety and security. It also stated categorically " Traffic safety is a top priority even for some states who are national leaders in highway safety such as the state of Minnesota."

Retting, reported about the traffic safety program of the New York City Department of transportation, indicated that the creation of the agency's Traffic Safety Division was triggered by the " highly publicized series of fatal and near fatal collisions on the Queensboro Bridge in 1982 and 1983 in which nine deaths occurred." Guided by the belief that traffic deaths and injuries are preventable, an "innovative traffic safety program, which integrates activities in the areas of engineering, infrastructure maintenance, enforcement, education, health care, and research" was developed by the city of New York. Retting indicated that more than 500 low cost safety improvements were developed and implemented between 1984 and 1990 which qualified New York city, as be claimed, for the International Volvo Safety Award.

In 1992, The U.S. Automotive Safety Foundation (ASF) stated that:

“Highway and Traffic Safety no longer revolve around a handful of standards established in the 1960. Since that time, new concerns have arisen calling for a broader attack on the traffic accident problem.”¹⁹⁵The ASF, addressing the new Inter-modal Surface Transportation Efficiency Act (ISTEA) of 1991, stated that this act “marks a new day for safety” in the USA. AASHTO recommended, “The safety of people, using the surface transportation facilities and services, should be preserved and enhanced through the continued national commitment to safety research, safety applications, and safety projects.”

Road safety is often improved by initiatives incorporated in road safety programs. In the United States, initiatives with proven potential to reduce the number of fatal accidents were adopted by the federal highway administration for nationwide application such as “The corridor Safety” concept which was initiated, developed and implemented by Pennsylvania Department of Transportation to be implemented nationwide. Although the traffic safety records of the developed countries are the best among all other countries, their accident toll is still considered unacceptably high. New ways for further improvement have to be, and are being sought, to further reduce casualties in these countries.

¹⁹⁵ - Proceedings of the Automotive Safety Foundation, Safety Symposium, Automotive Safety Foundation, Washington, DC, March 5, 1992.

CHAPTER NINE

SURVEILLANCE AND REGISTRATION OF ROAD CASUALTIES

Traffic safety research workers realized the seriousness of road accident casualties and the continuous deterioration of road safety. Having around ten per cent of world passenger cars, developing countries accommodate more than three-quarters of the one million estimated annual road accident fatalities. Also, the severity indices (rate of number of fatalities to the number of accidents) are far higher than those of developed countries. The annual death toll, as a result of economic development, is shocking and relatively inconceivable.

In developing countries and cities, the present status of road safety information is relatively poor.¹⁹⁶ The major obstacle to an improved road safety in developing countries is the absence of comprehensive, detailed, and reliable information. In 1981, The UN/WHO conference on road traffic accidents in developing countries acknowledged that:

Information was central to the whole question of a rational, scientific approach to the problems of road safety. Without adequate data sources and facilities for data collection, analysis and interpretation, there could be no efficient countermeasures, evaluations, strategies, and-perhaps most importantly-no clear case to put to national policy-makers charged with allocating scarce resources to different sectors of the economy.¹⁹⁷

¹⁹⁶ -Bener, A. Road Traffic Accidents in Riyadh, *Journal of the Royal Society of Health*, London.

¹⁹⁷ - "Road Traffic Accidents in Developing Countries". Report of a WHO meeting. Technical Report series 703, WHO, Geneva, 1984.

Many developing countries have accident recording procedures-often for judicial purposes-but the data is not in a form suitable for systematic analysis and for guiding remedial actions.¹⁹⁸ The British Medical Association (BMA) changes words to the British House of Commons Transport Committee has called the resulting numbers of road injuries “not only defective but positively misleading”. The BMA estimated that some 30 % of traffic accident casualties seen in hospital are not reported to the police, and that 70 % of cyclist casualties in Britain go unrecorded.

In 1987, Nilsson¹⁹⁹ reported that some hospital records of traffic casualties in Sweden are twice as large as that recorded by the police and, in certain cases, is even larger in those age groups, which use bicycle or walk more than other age groups. He also reported that in a research project undertaken in Italy, accident reporting systems of ten west European countries and one East European were investigated. The research results showed (a) a wide gap between these systems, (b) all forms included the date, time, weather, and location information, and (c) differences as to the details of accident location, road category and pavement characteristics, accident causation, persons involved, accident type, and type of accident representation.

The efforts of OECD countries to further improve the road safety information systems are continuous. Examples of such efforts include U.S. Highway Safety Information System HSIS and others, which could be found in the OECD International Road Research Documentation (IRRD). The U.S. Federal Highway

¹⁹⁸ -Yerrel, J. Road Safety in Developing Countries: Some General Trends and Future Directions.

United Nations Workshop on Traffic and Safety , National Swedish Road and Traffic Research Institute , Linkoping , Sweden 28 September , 4 October 1987.

¹⁹⁹ -Nilson, G. Traffic Records, United Nations Workshop on Road Traffic and Safety , Swedish Road and Traffic Research Institute , Linkoping, Sweden, 28 September –4 October 1987.

Administration initiated the HSIS in 1983 as a solution to the needs to have a location-based system and to measure the level of Highway Safety.

Sweden published, in 2002, a very interesting “Child Injury Atlas” that has been produced to draw attention to injuries among children from 1987 till 2000, and thereby provide a factual base for measures to be taken by government agencies, municipalities, county councils, voluntary organizations, etc. Its primary purpose – by means of maps, tables and charts – is to demonstrate geographical differences and similarities in the extent of child injury within Sweden.²⁰⁰

In fact, International comparisons are highly needed for many monitoring and assessment purposes. Generally, statistical comparisons of international data are difficult and rarely deal with variables of similar conditions. Nilson said in 1987: “Each country has its own accident reporting which makes it almost impossible to compare traffic safety between countries”. Statistical comparisons of road accident data, especially between developed and developing countries may lead to very distorted conclusions if not treated cautiously.

Briefly, the first reason is that no standardization of road accidents-related definitions and reporting forms exist. Second, the collection procedures of road accidents related data such as injuries, distance traveled and the socioeconomic costs are ambiguous and not standardized. Third, the coverage and accuracy of available data is questionable.

²⁰⁰ -Barns Skador I Sverige-Barnskadeatlas med frekvenser ovh trender pa nationell. Swedish report about Child Injuries, 1987-2000,p.9.

Fourth, the formulation of accident causation in developing countries is still based on the judicial approach and not on accident prevention one, “ Internal security forces report accidents for judicial purposes not for safety.”²⁰¹

Fifth, the quality and composition of transportation modes vary considerably within and among countries.

Developed states such as UK and Scandinavian states (Sweden, Norway and Finland) had reached the most accurate data in the recording of deaths caused by accidents or even illness in the driving time; while as mentioned previously and in similar records by the Sweden Medical Association, most of injuries still not recorded in the official records.

A substantial reduction in the number and rates of accident casualties in the UK and Scandinavian states was achieved during the last three decades .In 2000,UK had almost the lower percentage of deaths worldwide (around 6 victims per 100,000 habitants), while Sweden rate is slightly higher (around 6.5 victims per 100,000 habitants).²⁰²

The high level of accuracy is due to the advanced systems of data based on hospital records, where appear a truer picture of the real road safety situation.

“For injury prevention actions it is highly important to get information about the kind of injuries and both the short-term and long-term consequences of the injuries. It is highly important to get access to information from hospitals about in-patients, about the injuries, diagnosis, length of stay and so on”.²⁰³ Another reason for success in these developed states is the data from some emergency units (Small but

²⁰¹ -El Jorr, H. SRF. Workshop with ISF about Surveillance and Registration of road traffic injuries. Dekwaneh, Lebanon, 22 July 2003.

²⁰² -BBC news,15 Jan 2001.

²⁰³ -Arvesten, M. SWEROAD, Amman, Jordan , 4 to 10 May 2001.

representative sample from such units) in order to get data about injury patterns for different road-users and for making estimates of the situation for injured persons for the national level.

Developing countries should, and must, benefit rationally from the considerable experience of industrialized countries in the field of road safety registration. Theories, methodologies, and technologies, which have been successfully applied in road safety information in the developed world during the last three decades, could be adapted rationally to many developing countries and especially the issue of data reports.²⁰⁴

²⁰⁴ -Gustin, P. General Delegate of the French Road Safety Organization. International Festival for Road Safety. Tunisia, 29 October 2001.

CHAPTER TEN

CONCLUSION

Road traffic injuries are a deadly scourge, taking the lives of 1.2 million men, women and children around the world each year. Hundreds of thousands more are injured on our roads, some of whom become permanently disabled. The vast majority of these occur in developing countries, among pedestrians, cyclists, motorcyclists and users of public and scholar transport, many of whom would never be able to afford a private motor vehicle.²⁰⁵

This research focused on the requirements and policies that may be efficient in the struggle against underestimation of road safety on the global scene. There is a need on a number of fronts to prevent these needless deaths and disabilities, and the immense loss and suffering that road injuries are causing. During the last five decades, many programs and policies were implemented to prevent road traffic crashes in the developed countries. Recently, few developing countries started to organize interventions that aim to reduce traffic injuries. Road safety efforts include strategies to address rates of speed and alcohol consumption; promotion of airbags, helmets and seat belts and other restraints; and greater visibility of people walking or cycling. A concerted effort on the part of governments and their partners to improve road safety can make a difference.

²⁰⁵ -www.who.int/world-health-day/2004/en/

Road crashes can indeed be prevented, although the historical approach that used to place responsibility mainly on the road user is inadequate and confusing. This old approach is now absent in the developed countries, but still exists in the majority of the developing countries. This research advocated an approach that recognizes, not only the fallibility of road users, but also the major roles of emergency systems, law enforcement and the infrastructure. The 5E concept, as a summary of major requirements of road safety, is proposed on developing countries for their national campaigns targeting the reduction of road traffic injuries.

Public and private organizations, working in the road safety field, should establish a sustainable cooperation on the local, regional and international scenes. They can share experiences to reduce the global burden of road traffic injuries through safety promotion and learning by sharing from other successful and failed interventions, either in the developed countries or in the developing countries. This cooperation will help for more spreading the word that road traffic injuries are preventable. Developing countries should take benefit from the extensive research and studies organized in the industrialized countries about traffic safety measures. Not only the civil society organizations, but also the governmental agencies can take advantage of the successes and failures of road safety campaigns that were organized in the developed countries. International organizations such as the WHO, the World Bank, and the UNICEF started to realize their primordial role for road safety. In early September 2003, the secretary-General of the United Nations Mr. Annan recommended most United Nations agencies to integrate road safety into other policies, such as those related to sustainable development, the environment, gender,

children or the elderly. He also said that road safety requires strong political will on the part of the governments.²⁰⁶

Strong political advocacy is required. Road safety is a political issue that frequently involves tensions between various sectors of society. For example, improving the rights of vulnerable road users may involve tensions with those advocating increased motorized travel. Furthermore, there is often a lack of clarity about the exact role and responsibilities of government at the local, national and international levels, which hinders effective and sustained political advocacy.²⁰⁷ A change of approach regarding motor vehicle related crashes must take place. All people, including political and religion leaders, should know and understand that road injuries are not natural disasters. Men created them, and therefore mankind has the ability to prevent road traffic injuries.

Finally, advocacy non-governmental organizations specialized in road safety issues should share their experiences for creating more pressure and awareness targeting reducing road traffic injuries. If policy makers will be more aware of the gains to be achieved by implementing policies on issues such as mandatory seat belts, drunk driving and helmets, many lives could be saved. In most developing countries, these NGOs need to enhance their cooperation with other civil society organizations in order to enhance or even start sustainable road safety campaigns in these countries. They have to carefully review the successful strategies for reducing road traffic injuries in developed countries and especially in other developing countries.

²⁰⁶ -www.un.org/apps/news/story.asp

²⁰⁷ -“Global Road Safety Crisis”.United Nations-General Assembly Resolution 57/309, 22 May 2003.

APPENDIX I

TIPS FOR PEDESTRIAN and BYCICLE SAFETY

Pedestrians must have their rights to share roads. Drivers must always give way to pedestrians if there is danger of colliding with them. All drivers should take extra care especially for children because they can do unexpected things. Children aged between five and nine years old have a greater risk of pedestrian injuries.²⁰⁸

According to YASA, there are some obvious times and places where drivers should take extra care:

- Near shopping centers and other busy places where there is a greater chance of people crossing the road.
- Near schools, particularly when children are arriving or leaving.
- Wherever children are seen walking or playing.
- Near hotels where there is a possibility to meet pedestrians who have been drinking. Pedestrians who are affected by alcohol are one of the most common groups involved in crashes.
- In wet weather when people may hurry and take risks.
- At night, when many crashes happen, pedestrians are not always aware of how hard it can be for the drivers to see them.
- Where there are parked cars or stopped buses, especially school buses.
- At and near pedestrian crossings

²⁰⁸ - Bou Raad, S. Transportation engineer. "YASA Conference in LAU Blat", March 1999.

- When approaching a stationary light rail vehicle and passengers are getting off or crossing the road from the light rail vehicle
- At and near intersections where pedestrians cross
- When the sun is low in the sky

On the other hand, pedestrians should take care of the following remarks:

- If there is a footpath or nature strip, pedestrians must use it
- If there is no footpath, they must keep as to the left or right side of the road as possible. Pedestrians may find it safest to walk along the right edge of the road, facing traffic coming towards them.
- Cross at lights or where crossing is possible
- Do not cross the road within 20 meters of marked crossings: it is especially dangerous as motorists do not expect it
- At lights, they must not start to cross once the DON'T WALK, or red figure is showing.
- Wear light colored clothing, especially at night, or carry a brightly colored bag
- Do not ever assume a driver has seen them
- Do not block the path of a light rail vehicle
- Do not travel past a NO PEDESTRIANS sign
- Do not cause a traffic hazard or unreasonably obstruct the path of a road user or other pedestrian
- Be especially careful in case of drinking alcohol.

Finally, it will be useful to study some remarks and analysis of the Road Traffic Authority in the Australian state “New South Wales”:

- The majority of pedestrians are hit on roads zoned 60 km/h or less in urban areas.
- The faster the car is going when it hits a pedestrian the greater the chance of a fatality.
- Only 5% of pedestrians hit at 32km/h are killed while 85% of pedestrians hit by a vehicle traveling at 64km/h will be killed.
- Pedestrian collisions involve all age groups.
- Young school age children are more likely to be hit in the afternoon on week-days.
- Slightly more males are involved in pedestrian collisions than females.
- Pedestrian casualties with a Blood Alcohol Concentration of 0.05 or higher are more likely to be male and more likely to have been at night.
- Adult pedestrians are more likely to be involved in crashes during daylight hours and occur at about the same rate for men and women.
- Pedestrians are almost twice as likely as vehicle occupants to die in an injury crash.

Pedestrians 70 years and over are particularly vulnerable and their fatality ratio is 6 to 7 times greater than that of 17 to 20 year olds due to physical frailty rather than frequency of accidents.

On the other hand, there are a number of things to be aware of when driving near bicycle riders:

- Bicycle riders are more difficult to see than cars or trucks
- Where possible drivers may overtake a bicycle rider by leaving a whole lane clearance. If it is not possible to leave a whole lane, drivers must leave at least one-meter clearance.
- Always drivers have to check for bicycle riders whenever they travel on the road, particularly when they are turning at intersections.

- Sometimes a bicycle can travel as fast or faster than a car, particularly in heavy traffic. Never underestimate their speed and be sure not to cut them off by moving in front of them
- When passengers are about to leave your car check for bicycle riders. Be careful not to open the car doors into the path of bicycle riders. This can be dangerous and legally a fault in most developed countries.
- Children on bikes are unpredictable: slow down
- Take care to check for bicycle riders in blind spots. Bicycles are smaller than other vehicles and are therefore harder to see
- At night bicycle riders can be difficult to see

For a bicycle rider, YASA recommend the following:

- Bicycles are vehicles by law with equal rights to share the roads. You are required to obey the road rules like any other vehicle. You are also required to obey other rules meant for cyclists only
- Bicycle riders are entitled to use a whole lane and you can ride two abreast provided you are not more than 1.5 meters apart
- They must correctly wear approved bicycle helmets when riding on roads or public places. Only a correctly worn helmet will reduce the risk of head injury in case of being involved in a crash or fall off the bike
- Ride with traffic on the left side of the road
- They should not ride in the gutter as this makes it harder for motorists to see them

- As other vehicles, they always have to obey traffic lights and signs
- Bicycle riders must give hand signals if they want to turn left or turn right. This signals their intention to follow traffic when turning. They must give way to pedestrians crossing the road at intersections and especially at pedestrian crossings
- They must not be towed by another vehicle
- When entering a road from a driveway you must stop close to the footpath and give way to pedestrians and other vehicles on your left and right
- In most developed countries, it is against the law to ride on footpath unless
 1. you are under 12 years of age
 2. you are an adult riding with a child under 12 years old
 3. you are under 18 years old and riding with an adult who is responsible for a child rider
 4. they are for shared use by bicycle riders and pedestrians
- At night or in bad weather, your bicycle must display a flashing or steady white light to the front and a flashing or steady bright red light to the rear which are visible for at least 200 meters. The bike must also have a red reflector visible for at least 50 meters to the rear
- Your bicycle must have at least one working brake and a suitable warning device, such as a bell or horn in working order, fitted to it.

- Take care when passing parked cars. Make sure you allow ample room in case a motorist opens a car door. Do not ride between and around parked vehicles.
- It is an offence to ride no hands or with your feet off the pedals or to carry any load which prevents you having control of your bicycle.
- Riders must walk their bicycles across pedestrian crossings.
- Riders are allowed to ride in a transit lane, truck lane unless there is a sign prohibiting your travel in these lanes.
- When using a footpath or shared pedestrian/bicycle path, you must keep to the left and give way to pedestrians. Just as motorists need to be considerate of you when you ride on the road, it is your responsibility to travel safely on the footpath or shared path without hindering pedestrians.
- You may do a hook turn at any intersection unless there is a “no hook turn by bicycles sign.”

When you do a hook turn you must obey any traffic lights or signs you pass.

- When turning right at roundabouts with two or more lanes, it is suggested that you get off your bicycle and negotiate the intersection as a pedestrian. This is particularly important if you are a novice rider or not comfortable with lots of traffic.

In case of choosing to ride through the roundabout, the rider may either do so as a vehicle by obeying the normal roundabout rules or by choosing to do a hook

turn. In case of using the hook turn, riders must give way to vehicles leaving the roundabout at each exit.

- It is wise to use bicycle facilities such as bike paths when they are available. Signposted bicycle routes are selected to provide fast, safe and convenient travel
- If the road has a sign posted bike lane then you must use the lane
- Cross-as near as possible to right angles if crossing light rail tracks in Sidney.

This sign tells you that you cannot ride your bicycle beyond the sign. These signs are usually placed on footpaths in areas that are too dangerous or crowded for safe bicycle riding.²⁰⁹

In contrast with the aforementioned regulations found in developed countries such as Australia and Canada, in most developing countries no similar regulations were promulgated in their traffic laws. Although crashes where bicycle riders were involved are generally very serious, most developing countries did not enforce safety regulations on bicycle riders to protect them from road traffic injuries.

²⁰⁹- A Simple Guide to Bicycle Safety. Australian Transport Safety Bureau, 1996.

APPENDIX II

VOLUNTARY LOCAL AND INTERNATIONAL SAFETY ORGANIZATIONS

1. The Youth Association for Social Awareness-YASA

The tragic death in a car accident of Tarek Assi, 19 years old, in August 1994, in Saghbine – West Bekaa, has motivated his friends to establish a club in the American University of Beirut for his memory. After one year Tarek Assi's friends decided to organize a national campaign to reduce car accidents.²¹⁰

From September 1995 until now, YASA has organized thousands of activities in Lebanon and starting at the end 1998 hundreds of activities in different Arab countries. YASA had also many active participations in international forums organized in developed countries (Sweden, Norway, USA, Canada, France and Spain). Many traffic accident victims, their relatives and other specialists in various traffic safety fields joined YASA and many other motivated people from all regions of Lebanon and neighboring countries. YASA is a Lebanese NGO – registered in the Lebanese government since 1996 specialized in raising awareness to reduce deaths and injuries caused by traffic and home accidents. Through:

- Lobbying for law enforcement.

²¹⁰ -www.yasalebanon.com

- Lobbying for improvement (need of more pedestrian bridges, traffic lights, safety in construction zones and sidewalks).
- Practical training for safety education in schools & clubs.
- Media & NGO networking to collaborate to promote road safety principles.
- Participation in major international events related to traffic safety in order to improve safety conditions in Lebanon -and also in Arab countries - by continuous interaction with developed countries.

The remarkable success of YASA's lobbying was first witnessed in 1999, with the introduction by the Lebanese Ministry of Interiors to the Speed Radars and Alcohol Tests. Another remarkable success of the continuous lobbying efforts was witnessed in May 2001 with the enforcement of the use of seatbelt to the front seat occupants. Along with its awareness programs, YASA also seeks to provide social assistance to victims of road accidents. In line with this objective, YASA is working with the European Federation for Road Victims and with most of its member association. In 2001, YASA expanded the scope of its work to reach other countries in the region, especially Syria. In 2002, YASA won the Best Practice Certificate for Dubai International Award for Best Practice to Improve the Living Environment which was given by: United Nations, Dubai Municipality, and UN-Habitat.

In 2003, YASA chose to address the issue of traffic lights and bring more education around the issue of traffic light. In this perspective, it chose the theme of "Traffic Signs... So Healthy." For this theme YASA had the idea of a symbolizing the traffic lights each with a fruit and saying that traffic lights are healthy. The red

light was replaced with a tomato, the orange light with an orange and the green with an apple. This made the well known traffic light post a post made of fruits with the a quote saying “Traffic Signs... So Healthy.”

2. Drive Alive

Drive Alive was established in 1989 in South Africa. It is a non-profit organization that is registered with the Department of Social Welfare and Pensions. It is considered an active movement of concerned South African citizens determined to create a new environment in which the number of road deaths and casualties will be drastically reduced.

The aim of the association is to educate the youth of South Africa, changing the attitudes of road users, and creating a climate where the law is implemented and the government recognizes where additional legislation is required.²¹¹

3. The Global Road Safety Partnership (GRSP)

GRSP is not a funding agency and does not finance the sort of road safety interventions normally financed by governments. Instead, it operates in a limited number of focus countries where road safety has been identified as a problem, governments are willing to tackle the problem and there is an agreed framework, usually a national road safety action program, within which GRSP can operate.

In the selected focus countries, GRSP try to animate local business partners and civil society and encourages them to work together with government in the cause of road safety. GRSP offer advice on road safety “good practice” and encourages

²¹¹ -www.drivealive.org.za

others to share their knowledge with the wider road safety community; Facilitates implementation of focus projects in selected target countries; and Monitors lessons learned and makes them available to others. Initial attention of GRSP is being placed on the following countries: South Africa and Zambia; India, Malaysia, Thailand and Viet Nam; Hungary, Poland and Romania; Brazil and Costa Rica; Jordan, Lebanon and Syria.²¹²

4. The International Road Safety Organization known in French as “Prevention Routiere Internationale (PRI)”

PRI is a non-governmental organization, founded in 1959 to promote cooperation among national institutions dealing with road safety. Some fifty countries are represented within PRI from Africa, America, Asia, Europe and the Middle East.²¹³ The aims of PRI are to promote traffic safety at an international level and to encourage the improvement of road traffic prevention. Its main fields for action are education, information and research.

Its major tasks are, among others:

- To advise and assist national bodies and promote the co-operation of all bodies interested in road safety.
- To heighten everyone’s awareness to the consequences of accidents.
- To support research into all matters relating to traffic safety and likely to develop interest in road safety problems.

²¹² - www.GRSProadsafety.org

²¹³ -www.lapri.org

- To promote the training of specialist and the exchange of experience in the traffic safety.”

5. The European Federation of Road Traffic Victims (FEVR)

FEVR is a non-profit, international, independent organization that was founded on 6th July 1991 in Geneva, Switzerland, by five national victim associations from France, Switzerland, Italy and the United Kingdom. The foundation was facilitated by both the United Nations and European Union administrations, which welcomed the formation of a body aiming to defend and to represent road traffic victims at an international level. The European Commission and European Parliament also regularly consult FEVR for their periodical action programs on road safety and the implementation of directives concerning motor insurance.

The European Federation of Road Traffic Victims (FEVR), having its headquarter in Geneva include more than 30 national and regional road victim associations situated in Europe and abroad. FEVR:

- Organizes regular meeting between the representatives of these associations in order to exchange ideas and to identify and promote best practices both in the field of prevention and moral and juridical assistance to the victims and / or their relatives.
- Organizes road safety awareness campaign with distribution of topical, national or European leaflets sponsored by national governments or the European Commission”²¹⁴

The main achievements of FEVR are:

²¹⁴ -www.fevr.org

- Taken the lead in promoting European Day of Remembrance for road crash victims on the third Sunday of every November.
- Been able to establish strong partnerships with affiliated organizations all over Europe and the rest of the World.
- The involvement of his Holiness, the Pope John Paul II in some of the campaigns they have launched.
- The 1997 publication by the European Commission of an enquiry that focused on the decline in quality of life and living standards suffered by road crash victims and families.

APPENDIX III

BEST PRACTICES FOR ROAD SAFETY

This appendix will summarize some examples of successful experiences that had active roles in enhancing international cooperation to promote road safety in the developed countries:

1. Safe Communities Around the World

Safe Community as a formal concept, closely associated with the World Health Organization, can be traced back to the First World Conference on Accident and Injury Prevention.²¹⁵ The network of “ Safe Communities around the World” is being under the auspices of the Karolinska Institutet, Sweden, a WHO Collaborating Center on Communities Safety Promotion. Since 1989, seventy-one demonstration programs have been developed in eleven countries: Australia, Austria, Canada, Denmark, the Netherlands, Norway, New Zealand, South Africa, the Republic of Korea, Sweden, and the United States of America. These programs promote safety through partnerships involving communities, their leaders, academic institutions and private sector bodies.

Since 1998, the municipality of Suwon City, in South Korea, has started to promote safety within the community. After the completion of the preliminary studies to identify and prioritize injury problems, Korean citizens from multi-sectoral groups

²¹⁵ -Svanstrom, L. “Safe Communities Moving into Asia: What is our Baggage and What is the Future?” Developing Safe Communities-Two Decades of Experiences. Suwon, South Korea, 2002, p.5.

actively participated in these efforts of safety promotion. Suwon was the first city in Korea to become accredited by the WHO Collaborating Center on Community Safety Promotion as a “Safe Community.” It organized the first Asian Regional Conference on Safe Communities in 2002.²¹⁶

The Sherpur Safe Community Program in Bangladesh has been designed to reduce the injury morbidity and mortality in a local community. The goal of the program was to convince national Government Authority and opinion leaders to design national injury prevention plans.²¹⁷

2. Recommendations for US Travelers

The United States Senate has included a request in its Foreign Relations appropriations Bill No.588 for American embassies to inform American travelers of road and traffic conditions around the world to promote road safety. These efforts may pave the way for the United States to become more active regarding the issue of global road safety that affects all people.²¹⁸

3. “Good Practice Guide” of the Red Cross/ Red Crescent societies

To improve the lives of vulnerable people by mobilizing the power of humanity. This is the heart of the mission and work of the International Federation of Red Cross and Red Crescent Societies. The Federation’s Strategy addresses the key issues of vulnerability, the need to support National Society capacity building appropriate

²¹⁶ -“Introduction”. Suwon Safe Community-Application to Become a Member of the WHO Safe Community Network. September 2001,p.4.

²¹⁷ Rahman, F. “Safe Communities: the Experiences from Introducing Safe Community into Bangladesh”. Developing Safe Communities-Two Decades of Experiences , Suwon, korea,2002,p148.

²¹⁸ - Sobel, R. Founder and president of the Association for Safe International Road Travel, Geneva, 18 September 2003.

partnerships with international organizations as well as with national and international business communities.

In nearly every country and for nearly all of its history, the Red Cross and Red Crescent has addressed the needs of vulnerable road users. Its 1998 World disaster Report was instrumental in raising global awareness regarding the scale of the problem. It calls road accidents “a worsening global disaster destroying lives and livelihoods, hampering development and leaving millions in greater vulnerability.”²¹⁹

Supported by the European commission, the 25 National Red Cross Societies in the European Union have produced a Good Practice Guide, which specifically addresses the campaign of Road Safety and First Aid education in schools and in the community.²²⁰ They organized in the 25 capitals of the 25 countries of the new EU, the World First Aid Day in September 13, 2003.

4. Award for Safety-Promoting Advertising

Since 1986, Germany had already instituted an Award for safety-promoting advertising concepts. Print advertisements and spots which succeed in ideally merging the concept of safety with their advertising concepts are candidates to compete for the Award. During the evaluation of the candidates, the global concept of safety communication is taken into account during the competition where 60 manufacturers nominate their advertisements for the award.²²¹

²¹⁹ -Document freely distributed in all Red Cross and Red Crescent departments.

²²⁰ -www.l-life.info

²²¹ - Pfaffrerott, I. BAST Germany, “Publicity Related to Vehicles and its Impact on Road Users Behavior”. Security Focusing on the Individual, PRI. Madrid, Feb 2002,p.240.

5. DAIMLER CHRYSLER Company

On August 30, 2000, twenty polish children between 7-10years of age arrived as guests of Daimler Chrysler Automotive Polska in Berlin to participate in four days of sight seeing and road safety exercises. The youth were among the winners of the spring 2000 drawing contest “be Partners on the Road” which kicked off the Daimler Chrysler Polska GRSP program in Poland.

Some 30.000 Polish children participated in the contest. Highlights of the four-day program included a trip to the Youth-Traffic-School in Berlin, where the children learned about and practiced bicycle safety, a visit from the Captain Blue Bear Truck, during which the children were told about how to be safe around trucks. Further highlights included a visit to the Debis Tower on Potsdamer Square, with has a spectacular view of the city, the technical Museum, the Zoo and the Babelsberg film studios. By the time the children departed they had learned more about road safety and were anxious to share this information of their adventures with family and friends at home.²²²

²²² - Anna, F. DaimlerChrysler Polska, GRSP NEWS Issue, 3 January 2001, p.5.

Annex IV

More Tips for Safe Driving

Tips for Winter Driving

Winter driving on roads and highways in the snowcapped mountains can be a pleasant adventure or it can be frustrating, tiring and sometimes even hazardous. According to the California Highway Patrol, YASA provides the following information to help make mountain driving safe and pleasant.

Before Heading for Snow Country:

- Make sure of brakes, windshield wipers, defroster, heater and exhaust system are in top condition.
- Check the antifreeze and be ready for colder temperatures and add special solvent to the windshield washer reservoir to prevent icing.
- Check the tires and make sure they are properly inflated and the tread is in good condition.
- Always carry chains. Make sure they are the proper size for your tires and are in working order. Carry a flashlight and chain repair links. Chains must be installed on the drive wheels. Drivers should make sure to know if their vehicle is front or rear wheel drive.
- Other suggested items to carry in the vehicle are an ice scraper or commercial deicer, a broom for brushing snow off your car, a shovel to free your car if it's

"snowed in," sand or burlap for traction if the wheels become mired in snow and an old towel to clean hands.

- It is also a good idea to take along water, food, warm blankets and extra clothing. A lengthy delay will make you glad to have them.
- Put an extra car key in your pocket. A number of motorists have locked themselves out of their cars when putting on chains and at ski areas.
- Allow enough time. Trips to the mountains can take longer during winter than other times of year, especially if you encounter storm conditions or icy roads. Get an early start and allow plenty of time to reach your destination.
- Keep your gas tank full. It may be necessary to change routes or turn back during a bad storm or you may be caught in a traffic delay.
- Keep windshield and windows clear because driver may want to stop at a safe turnout to use a snow or, ice or scraper. Driver may also use the car defroster and a clean cloth to keep the windows free of fog.
- Slow down. A highway speed of 100 km an hour may be safe in dry weather but an invitation for trouble on snow and ice. Snow and ice make stopping distances much longer, so keep your seat belt buckled and leave more distance between your vehicle and the vehicle ahead. Bridge decks and shady spots can be icy when other areas are not. Remember to avoid sudden stops and quick direction changes.
- Be more observant. Visibility is often limited in winter by weather conditions. Slow down and watch for other vehicles and for snow equipment. Even

though snow removal vehicles have flashing lights, visibility may be so restricted during a storm that it is difficult to see the slow moving equipment.

- When stalled, stay with your vehicle and try to conserve fuel while maintaining warmth. Be alert to any possible exhaust or monoxide problems.

Chain Controls

- Drivers must stop and put on chains when highway signs indicate chains are required. Usually, there is about a mile between "Chains Required" signs and the checkpoint to install the chains.
- Control areas can change rapidly from place to place because of changing weather and road conditions. The speed limit when chains are required is 25 or 30 miles and hour and will be posted along the highway.
- When drivers must put on chains, they should wait until pulling completely off the roadway to the right. They should not stop in a traffic lane where the driver may endanger himself and block the traffic.

Seat Belt Key Tips

- Always wear a seat belt - wherever and whenever you travel anywhere.
- Make sure that every occupant of your car, whether in the front or back of the car, uses their seat belt.
- Lap-and-diagonal seat belts are preferable to lap-only belts.

- The belt should always be adjusted properly, with the lap part as low as possible over the hips - not over the abdomen. Always ensure that the shoulder belt lies on the chest and over the shoulder: there should not be any slack in the belt at all.
- Avoid wearing any thick clothing under the seat belt as this could interfere with the effectiveness of the seat belt action.
- Do not attempt to improve seat belt comfort with padding or cushions.

Head Rest Key Tips

- Adjust the seat so that your back is as straight as possible
- Check each time before you drive whether the headrest is adjusted correctly:
 - The upper edge of the headrest should be higher than the level of the ear of the driver
 - The distance between your head and the headrest should be as small as possible and should not exceed 4 cm.
- When buying a car, make sure that the headrest is able to give adequate protection:
 - If adjustable, you should be able to move it upwards far enough for your use
 - It should be able to remain in a fixed position after adjustment
 - There should be head rests for the rear seats as well

The best type of headrest is the fixed type; the adjustable versions have been proved to be far less effective.

Keeping Distance Between Vehicles

When a driver makes a mistake, other drivers need time to react. The only way to be sure to have enough time is to react by leaving plenty of distance with other cars. That distance becomes a safety margin, which protects from others.

Drivers should keep their distance when they are already within a stream of traffic, and also when they move to join another stream of traffic, such as when they change lanes. Drivers must keep their vehicle a safe distance from any vehicle in front of them.

Keeping a Safety Margin

If the driver keeps plenty of distance around his vehicle, he will always have an escape route. The driver should keep his distance from others whenever possible, and should stay as far away as driving conditions will allow.

Guide to Space Ahead

The two-second guide – Understanding and using it will decrease the driver chances of ever causing a ‘rear-ender’. All drivers should keep a gap of at least 2 seconds between their vehicle and the one ahead. This means that it should take 2 seconds to get to where the car in front is at any given moment.

Of course, the actual distance depends on the speed of the driver.

At 60 km/h, 33 meters are covered in 2 seconds.

At 100 km/h, 56 meters are covered in 2 seconds.

Sometimes the driver needs to keep more than 2 seconds back. A larger gap is needed when visibility is poor, when it is dark, when the road is wet or slippery and

he can't stop as quickly and when he has a heavy load and he can't stop as quickly or in case the driver is tired and might not react as quickly.

When the traffic is heavy, other vehicles will often push in front of the driver when he allows a 2 second following distance. Then he will find himself far too close to them. The closer he is to the vehicle in front, the more time he will need to spend watching it carefully to see what it will do. This means the driver has less time to watch out for other hazards. If this happens, drivers should slow down gradually to allow a greater distance with the vehicle in front.

Space Behind:

Rear-end collisions are common, but there is plenty of precautions that drivers can do to protect themselves. They should keep the speed even, signal in advance when they have to slow down, not change speed or stop suddenly, slow or stop to make a right turn, keep checking their mirrors, keep wheels pointed straight ahead so that if the vehicle is hit from behind it will roll forward, which is usually safer than being pushed into oncoming traffic.²²³

²²³ - Daccache, J. Vice President of YASA. *Arabmotor Magazine*. January 2003, p. 74.

FATALITIES 1998-1999.				Population in 1000			Fatalities per one million population		
Fatalities in selected developed countries				1998	1999	▲ 99/98	1998	1999	▲ 99/98
Germany	7.792	7.772	-0,26	82.057	82.037	-0,02	94,96	94,74	-0,23
Australia	1.763	1.763	0,00	18.751			94,02		
Austria	963	1.079	12,05	8.075			119,26		
Belgium	1.500	1.397	-6,87	10.192			147,17		
Canada	2.939	2.972	1,12	30.300					
Denmark	499	514	3,01	5.294	5.313	0,36	94,26	96,74	2,64
Spain	5.957	5.738	-3,68	39.347	39.418	0,18	151,40	145,57	-3,85
United States	41.471	41.611	0,34	270.299	272.691	0,88	153,43	152,59	-0,54
Finland	400	431	7,75	5.147	5.160	0,25	77,72	83,53	7,48
France	8.918	8.487	-4,83	58.967	58.967	0,00	151,24	143,73	-4,83
Greece	2.226	2.116	-4,49						
Hungary	1.371	1.306	-4,74	10.135	10.92	-0,42	135,27	129,41	-4,34
Ireland	458	413	-9,83	3.705	3.744	1,05	123,62	110,31	-10,76
Iceland	27	21	-22,22	275	279	1,45	98,18	75,27	-23,34
Italy	6.326			57.563			109,90		
Japan	10.805	10.372	-4,01	126.486	126.686	0,16	85,42	81,87	-4,16
Luxemburg	57	58	1,75	424	429	1,18	134,43	135,20	0,57
Norway	352	304	-13,64	4.418	4.445	0,61	79,67	68,39	-14,16
New Zealand	502	509	1,39	3.781	3.806	0,66	132,77	133,74	0,73
Netherlands	1.066	1.090	2,25	15.654	15.760	0,68	68,10	69,16	1,56
Portugal	2.126	1.995	-6,16	9.474	9.490	0,17	224,40	210,22	-6,32
United Kingdom	3.581	3.564	-0,47	59.236	59.500	0,45	60,45	59,90	-0,92
Czech Republic	1.360	1.455	6,99	10.299			132,05		
Sweden	531	580	9,23	8.848	8.854	0,07	60,01	65,51	9,15
Switzerland	597	583	-2,35	7.096	7.123	0,38	84,13	81,85	-2,72

Injury Accidents in selected developed countries	1998			1999			▲ 99/98		
	1998	1999	▲ 99/98	1998	1999	▲ 99/98	1998	1999	▲ 99/98
Germany	377.257	395.689	4,89	49.586	50.609	2,06	7,61	7,82	2,77
Austria	39.225			4.807			8,16		
Belgium	51.167			5.454			9,38		
Canada	150.974			17.988			8,39		
Denmark	7.556	7.605	0,65	2.327	2.366	1,68	3,25	3,21	-1,01
Spain	97.570	97.810	0,25	21.306	22.411	5,19	4,58	4,36	-4,70
United States	2.029.000	2.091.000	3,06	207.588	212.685	2,46	9,77	9,83	0,59
Finland	6.902	6.997	1,38	2.311	2.402	3,94	2,99	2,91	-2,46
France	124.387	1224.524	0,11	32.507	33.416	2,80	3,83	3,73	-2,61
Greece	24.836	850.363	5,78	4.323	5,75				
Hungary	20.147	18.923	-6,08	2.671	2.671	-4,50	7,20	7,08	-1,64
Ireland	8.239	7.807	-5,24	1.511	1.608	6,42	5,45	4,86	-10,96
Iceland	992			160	173	8,13	6,20		
Italy	204.615			37.836			5,41		
Japan	803.878	850.363	5,78	77.056	77.810	0,98	10,43	10,93	4,76
Luxemburg	1.058	1.062	0,38	295	305	3,39	3,59	3,48	-2,91
Norway	8.864	8.361	-5,67	2.485	2.543	2,29	3,57	3,29	-7,79
New Zealand	8.770	8.444	-3,72	2.318	2.512	8,37	3,78	3,36	-11,15
Netherlands	41.299	42.271	2,35	7.216	7.640	5,88	5,72	5,53	-3,33
Portugal	49.319	47.966	-2,74	6.924			7,12		
United Kingdom	246.410	242.610	-1,54	28.140			8,76		
Czech Republic	27.207			4.549			5,98		
Sweden	15.514	15.834	2,06	4.495	4.607	2,49	3,45	3,44	-0,42
Switzerland	22.232	23.434	5,41	4.349	4.470	2,78	5,11	5,24	2,55

INJURY ACCIDENTS AND NUMBER OF VEHICLES 1998-1999
(Source: Traffic General directorate- Ministry of interior-Spain).

REFERENCES

- Laflamme, Lucie. Social Inequality in Injury Risks. Karolinska Institutet, 1998.
- Security Focusing on the Individuals. IX World Congress of the International Road Safety Organization, Madrid, 26 to 28 Feb 2002.
- Svanstrom, Leif. Laflamme, Lucie. Schelp, Lothar. Safety Promotion Research, Karolinska Institutet, 1999.
- Welander, Glenn. Svanstrom Leif. Ekman, Robert. Safety Promotion: an Introduction. Karolinska Institutet, 2000.
- Joon Cho Pil. Svanstrom, Leif. Developing Safe Communities –Two Decades of Experiences, Suwon, Korea, 2002.
- Prevention of Motor Vehicles Related Injuries: A Compendium Articles from the Morbidity and Mortality Weekly Report 1985-1996. Center for Disease Control and prevention, Atlanta, Georgia, United States of America, 1997.
- Injury Fact Book 2001-2002. Center for Disease Control and prevention, Atlanta, Georgia, United States of America, 2002.
- Injury Research Agenda. Center for Disease Control and Prevention, Atlanta, Georgia, United States of America, June 2002.
- Svanstrom, Leif. Haglund, Bo J A. Evidence –Based Safety Promotion and Injury Prevention –an Introduction. Stockholm, Sweden, Feb 2000.
- White Papers: European Transport Policy for 2010, Time to Decide. European commission, Italy, 2001.
- Fédération Européenne des Victimes de la Route (FEVR), International Federation of Road Victimes, Weekly newsletters.

“Fourth National Conference for Road Safety”. Youth Association for Social Awareness, Unesco Palace, Beirut, Lebanon, 26 and 27 April 2002.

“Cooperation between Arab Countries for Road Safety”. Jordanian Association for Road Safety, 1980.

“Safety in Construction Zones”. Council for Development and Reconstruction and YASA, Unesco Palace, Beirut, April 2002.

“Towards a Better Relation between Citizen and Police”, YASA, Unesco Palace, Feb 2002.

Strasser, Aaron and Bohn, Eales. Fundamentals of Safety Education, Macmillan, 1973.

Tomorrow’s Roads: Safer for Everyone-The Government’s Road Safety Strategy and Casualty Reduction Targets for 2010 .Department of the Environment, Transport and the regions: London, March 2000.

“World Disasters Report.” The International Federation of Red Cross and Red Crescent Societies, 1998.

“Meeting the Public Health Challenges in the 21st century in the MENA region.” The World Bank, WHO, AUB, Beirut, Lebanon, 16-21 June 2002.

“Iowa Driver’s Manual.” Iowa Department of Transportation, USA, 1999-2000.

Motorcycle Riders’ Handbook. Road Traffic Authority, New South Wales, Australia, March 1997.

Handbook for Older Drivers. Road Traffic Authority, New South Wales, Australia, December 1996.

Baker, S. Li, Guohua. Fowler, Carolyn. Danneberg, Andrew. "Injuries to Bicyclists: A National Perspective". The John Hopkins Injury Prevention Center, Smell Memorial Foundation, St James, New York, 1993.

"Global Road Safety Crisis". Report of the Secretary-General, Fifty-eight session of the General Assembly, United Nations, Item 162 of the provisional agenda, 22 May 2003. (A/58/150)

"Department of Injuries and Violence Prevention- Annual Report 2002". World Health Organization, Geneva, 2003.

"Injuries in South East Asia Region- Priorities for Policy and Action". World Health Organization, Geneva, 2003.

"WHO Consultation to Develop Areas of Collaboration with Road Traffic Injury Advocacy Organizations". Geneva, Switzerland, 18-19 September 2003.

Ellevest, Leif Agnar. World Bank Road Safety Consultant, "The Role of NGOs in Road Safety-Road Safety in Bangladesh". Dhaka, 16 June 1997.

Hungerford, Daniel. Pollock, Daniel. Alcohol Problems among Emergency Department Patients, Proceedings of a Research Conference on Identification and Intervention. Arlington, Virginia, United States, March 19-21,2001.

Suwon Safe Community-Application to Become a Member of the WHO Safe Community Network. Suwon, South Korea, September 2001.

Holder, Y. Peden M. Krug E. Lund J. Gururaj G. Kobusingye O. Injury Surveillance Guidelines. CDC and WHO, Geneva, Switzerland, 2001.

Retting, Richard. Improving Road Safety in the Urban Environment, the 70 Transportation Research Board Annual Meeting. International Symposium on Urban Road Issues, session 177, Washington D.C., January 1991.

“WHO Consultation to Develop Areas of Collaboration with Road Traffic Injury Advocacy Organizations”. Profiles of Participating NGO’s, Geneva, Switzerland, 18 September 2003.

Baker, SP. o’Neill, B. Karpf, RS. Injury Fact Book. Lexington, MA, Lexington Books, 1984.

Committee for the Study of Treatment and Rehabilitation Services for Alcoholism and Alcohol Abuse, Institute of Medicine, Division of Mental Health and Behaviour Abuse, National Academy of Sciences. Broadening the Base of Treatment for Alcohol Problems. Washington (DC): National Academy Press, 1990.

Hussain, Ayad Muhsen. OICC advisor and United Nations Representative, Integrated Road Safety Programs in Developing Cities. Ankara, Turkey, July 1993.

U.S.National Institute on Alcohol Abuse and Alcoholism. The Physician’s Guide to Helping Patients with Alcohol Problems. Washington (DC): U.S. Department of Health and Human Services; 1995. NIH Publication No.95-3769.

Second Safety on Road International Conference-Abstracts and Keynote Speeches. Bahrain Conference Center, Holiday Inn, Bahrain, 21-23 October 2002.

“Sharing the Road” brochure, Transports Quebec and Society of Car Insurance of Quebec, 1996.

A Simple Guide to Bicycle Safety. Australian Transport Safety Bureau, 1996.

Jarvinen, Matti. Traffic Education in Schools, The Finnish Approach, the Central Organization for Traffic Safety, Finland, 1 March 2002.

Downing, Andrew. GRSP, "Meeting the Public Health Challenges in the 21st century in the MENA region." the World Bank, WHO and AUB. Beirut, Lebanon, 16-21 June 2002.

Health Information of India 1997 & 1998. Central Bureau of Health Intelligence, Directorate General of Health Services, Ministry of Health and Family Welfare, New Delhi, 1999.

Fahlestone, Kurt. Road Safety Management within the Responsibility of a Road Administration Proceedings. 3rd International Road Federation Middle East Regional Meeting, Riyadh, Saudi Arabia, Volume 2, 13-18 .2.1988 ,p.2 .101-2.112.

Proceedings of the Automotive Safety Foundation (ASF). Safety Symposium, Automotive Safety Foundation, Washington, DC, March 5, 1992.

Federal Highway Administration Proceedings. Symposium on Effective Highway Accident Countermeasures: Ideas into Action-Highway Safety, Federal Highway Administration U.S. department of transportation, June 12-14, August 1990.

Kmet Leanne. Brasher, Penny. Macarthur, Colin. " A Small Area Study of Motor Vehicle Crash Fatalities in Alberta", Calgary, Alberta, Canada, 17 October 2001.

Motorcycle Operator Manual- Supplement to the Digest of Ohio Motor Vehicle Laws. Ohio, United States of America, April 2002, p.3.