

Emerging Programs that Stimulate Road Users Awareness as Part of the Decade of Action for Road Safety Initiatives in Puerto Rico

Benjamín Colucci¹, Iraida Meléndez², Sonia C. Señeriz³

Abstract

The United Nations General Assembly approved in March 2010 a resolution proclaiming The Decade of Action for Road Safety: 2011-2020. This historic decision, with the endorsement of over 90 countries, is expected to provide specific actions to address the world-wide road safety crisis during the next ten years. Moving Toward Zero Death (TZD) is the US initiative that supports the Decade of Action and ITE has been very active in this endeavor.

In May 2011, the government of Puerto Rico signed a proclaim supporting this initiative recognizing a highway safety problem in the island which includes 285,000 reported crashes, and 350 fatalities. Furthermore, during the last eleven years there have been a total of 5,461 fatalities of which 1,711 are pedestrians representing 31.3% of total fatalities while 2,137 are associated with consumption of alcohol and controlled substances representing 39.1% of total fatalities during this decade. The pedestrian fatalities exceed 300% over the national trend of 11%.

The Puerto Rico Transportation Technology Transfer Center (T2 Center), in its commitment to education and awareness in road safety, has conducted a series of training and professional development activities with the public and private sector, established alliances with non-profit community based organizations, and created new programs to promote road safety in the island and reduce pedestrian and other road user fatalities. This paper describes emerging programs that were successfully implemented during the first year of the Decade of Action for Road Safety in the Commonwealth of Puerto Rico and its impact in reducing fatalities in our highway network.

Introduction

The 23,000 Kms. of paved road of the highway network of the Commonwealth of Puerto Rico is one of the engineering works in modern times and responsible for the unprecedented growth of socio-economic development of our island and quality of life of our stakeholders⁴. The absence of a rail network on the island impose a major burden in the existing highway network that currently provides mobility to approximately 95% of all the merchandise and provides accessibility and mobility to all road users from their homes to their places of employment and other traffic generators for educational, recreational, cultural and health activities, among others.

¹ Director, Puerto Rico Transportation Technology Transfer Center and Transportation Engineering Professor at UPRM, and Spokesperson of the Decade of Action for Road Safety: 2011-2020.

² Vice-president of Quality, Social Responsibility and Corporate Relations of MAPFRE Puerto Rico.

³ Founder and President of Luis A. Señeriz Foundation (FLAS)/ Puerto Rico Mothers Against Drunk Driving (MADD).

⁴ Colucci, Benjamín and Díaz, Kathleen, et. al., *Evaluation of Safety Features and Development of Guidelines to Identify Hazardous Intersections in Puerto Rico*, International Journal of Natural Disasters, Accidents and Civil Infrastructure, Volume 4, Number 1, January 2004, ISSN 1535-0088.

Previous studies in the Commonwealth of Puerto Rico showed that in the past eleven (11) years (2000 to 2011) there have been a total of 5,461 fatalities of which 1,711 are pedestrians, representing 31.3% of total fatalities while 2,137 fatalities are related to alcohol and controlled substances representing an alarming 39.1% of total fatalities during the period. There is a need to stimulate road users awareness with emphasis on highway safety and crash prevention. The Decade of Action for Road Safety: 2011-2020 and the initiatives that different public, private and non profit entities in the Commonwealth of Puerto Rico has initiated, has the potential to improve overall safety in our public roads and safe lives.

Historical Background

Traditionally, crashes on public highways are associated with property damage, personal injury to occupants, drivers, pedestrians and motorcyclists and human losses in the worst case scenario. Previous studies have shown that on public highways in Puerto Rico approximately 300,000 crashes occurred every year. Findings documented by the Federal Highway Administration (FHWA) of the U.S. Department of Transportation, have shown that a key component to improve safety on public highways depends upon a systematic and rational process based on data collection and implementation of four (4) E's namely engineering, education, enforcement and emergency medical services)⁵.

Between 90% and 93% of fatalities on public highways are associated with human factor that include drivers and pedestrians while 2% to 3% is associated with geometric and operational deficiencies. The aggressive behavior of drivers, consumption of alcoholic beverages and controlled substances, fatigue and tiredness, and distraction associated with the new trend in cellphone use and texting, are contributing factors of highway crashes⁶. Early interactive education with the next generation of drivers and road users plays a leading role in raising awareness and reducing fatalities on public highways. Citizen awareness of public policy, laws and regulations, combined with effective and timely training, impactful campaigns and partnerships, are other key elements that can contribute in reducing highway fatalities⁷.

Although the mission and traditional programs of the Puerto Rico Traffic Safety Commission (TSC) have contributed to the socioeconomic development of the island, in this millennium our highway network is facing new challenges, namely, a significant number of fatalities, including over 30% of pedestrian fatalities, which have an adverse impact on our society.

Pedestrian Collision Trends in Public Highways: 2000-2011

In the last eleven (11) years, there have been a total of 5,461 fatalities on public highways in Puerto Rico of which 1,711 are pedestrians representing 31.3% of total fatalities while 2,137 fatalities are related to alcohol and controlled substances representing a whopping 39.1% of all fatalities during this period.

As a result of educational and awareness campaigns sponsored by the TSC combined with an interagency effort with other safety programs, the 567 fatalities recorded in year 2000 fell

⁵<http://safety.fhwa.dot.gov/>, January 19, 2012.

⁶<http://www.nhtsa.gov/people/injury/aggressive/symposium/introduction.html>, January 28, 2012.

⁷ Highway Safety –Human Factors, Education, and Enforcement Strategies, *Louisiana Highway Safety Commission*,

http://www.ltrc.lsu.edu/ltrc_11/pdf/Highway%20Safety%20Human%20Factors,%20Education,%20and%20Enforcement%20Strategies.pdf, January 28, 2012.

dramatically to 361 by 2011 as shown in Figure 1. Although pedestrian fatalities decreased from 182 in 2000 to 111 in 2011, the percent of total fatalities has remained consistently between 28% to 33%.

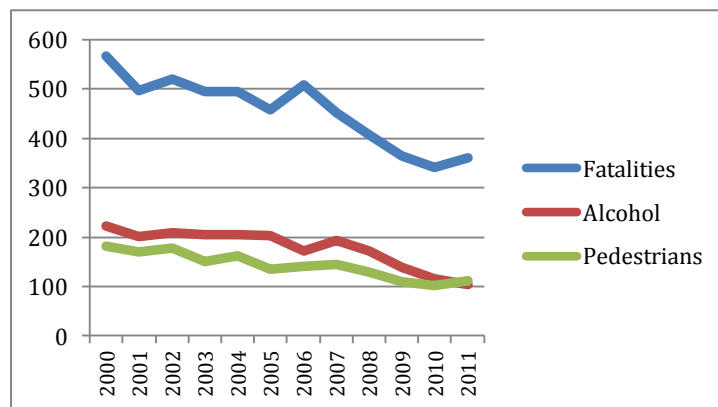


Figure 1: Distribution of total fatalities during the period of 2000-2011 on public highways in the Commonwealth of Puerto Rico, subdivided by alcohol and controlled substances, and pedestrians.

Source: <http://www.comisionparalaseguridadeneltransito.com/index.asp>

Figure 2 shows the trend of fatalities associated with the consumption of alcohol and controlled substances involving pedestrians and drivers. Specifically, in 2000, 222 fatalities were attributed to alcohol consumption of which 54 were pedestrians, equivalent to 30% of pedestrian fatalities of that year. During 2011 this number dropped to 103 fatalities of which 32 are associated with pedestrians, representing 28.8% of all pedestrians killed in 2011. During this period, the average percent of pedestrian fatalities associated with alcohol and controlled substances consumption amounts to 27%. Note that the fatalities associated with alcohol consumption have been declining since 2007 to the present from 193 to 103, respectively. However, over the past two (2) years the fatalities related to pedestrians and alcohol consumption have almost doubled from 17 to 32.

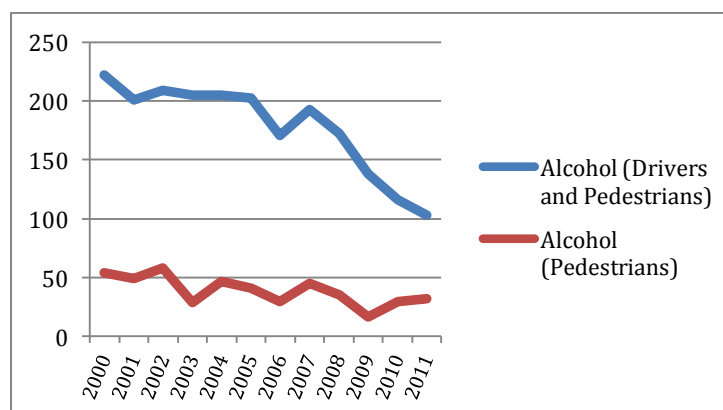


Figure 2: Distribution of total fatalities associated with alcohol and controlled substances consumption and the amount of pedestrian fatalities over the period of 200-2011 on public highways in Puerto Rico.

Source: <http://www.comisionparalaseguridadeneltransito.com/index.asp>

Figure 3 presents an analysis of the distribution of pedestrians fatalities associated with alcohol during weekdays and hourly distribution during the same period. Specifically, from Friday to Sunday more pedestrian fatalities associated with alcohol occurred corresponding to

67.5% of these fatalities. During weekdays, excluding Fridays, the remaining 32.5% of the total fatalities associated with alcohol consumption occurred. In summary, weekends are more prone to this pattern of fatalities due to the increase in social and brotherhood activities.

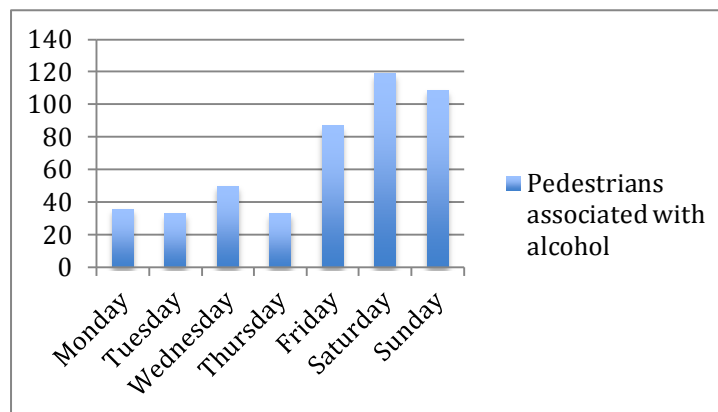


Figure 3: Distribution of pedestrian fatalities associated with alcohol consumption during weekdays, excluding Fridays, during the period of 2000-2011 in the public highways of the Commonwealth of Puerto Rico.

Figure 4 shows the distribution of pedestrian fatalities associated with alcohol consumption for a 24 hour day divided in the following four (4) periods namely, from 2:00 a.m. to 5:59 a.m., 6:00 a.m. to 5:59 p.m., 6:00 p.m. to 9:59 p.m. and 10:00 p.m. to 1:59 a.m., respectively. The analysis showed that the period from 6:00 p.m. to 9:59 p.m. is the most critical with 206 fatalities representing 44.1% of all fatalities associated with pedestrians with alcohol. During the period from 10:00 p.m. to 1:59 a.m., 121 pedestrian fatalities occurred representing 26% of the total fatalities and from 2:00 a.m. to 5:59 a.m., 95 pedestrian fatalities occurred representing 20.3% of the total. It is striking that in a period of 12 hours approximately 45 fatalities occurred versus four hours (6:00 p.m. to 9:59 p.m.) approximately 206 fatalities occurred, equivalent to a ratio that exceed 4 to 1 during the night period. In terms of sunlight, between 6:00 a.m. to 5:59 p.m. only 9% of the total fatalities associated with alcohol and controlled substances consumption occurred. No light time, is certainly a contributing element to be evaluated further in future studies.

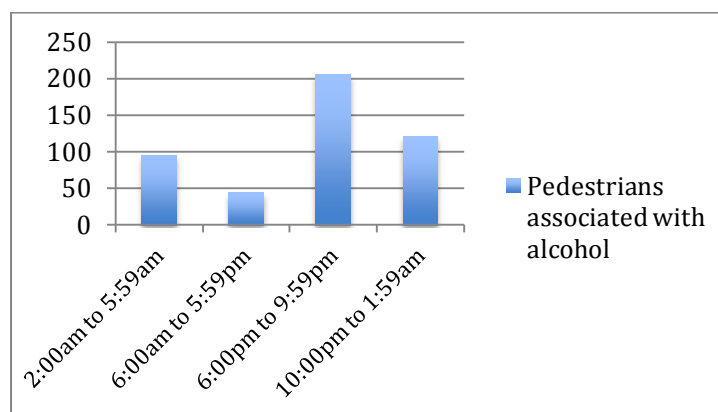


Figure 4: Distribution of pedestrian fatalities associated with alcohol consumption during the period of 2000-2011 in the public highways of Puerto Rico.

In summary, the fatalities during the last eleven (11) years have been significantly reduced in part attributed by educational and awareness campaigns conducted by administrative government agencies and other non-profit organizations. Awareness have been raised at

different levels of the population with emphasis on importance of not drinking while driving, passing the key in the event of being under the influence of controlled substances, amendments to the Vehicle and Traffic Law of the Commonwealth of Puerto Rico, Law 22, January 7, 2000, and initiatives of several administrative agencies, non-profit organizations and the academia that have supported highway safety related campaigns during this period.

Initiatives that Stimulate Road Users Awareness in Highway Safety

Several initiatives associated with highway safety and crash prevention at the local, national and international levels that stimulate road users awareness in saving lives in our public highways that are worth emulating are described in the following sections.

1. Puerto Rico Traffic Safety Commission: Educational Parks for Traffic Safety⁸

The Puerto Rico Traffic Safety Commission (TSC) established by Law No. 33 on May 25, 1972, as amended, has the primary responsibility to establish a program for the prevention of traffic crashes on highways. Its mission is to prevent and reduce deaths, injuries and property damage caused by traffic crashes, establishing campaigns and educational programs to guide on the importance of complying with the laws and regulations of traffic safety for the benefit of Puerto Rican citizenship⁹. The orientation focused on pedestrian safety is an essential part of the work plan of the agency and part of their mission of this government entity.

The Educational Parks for Traffic Safety is an innovative initiative of the government sponsored by the TSC and the Department of Transportation and Public Works (DTPW), in cooperation with the National Highway Traffic Safety Administration (NHTSA) in order to strengthen education and highway safety the island. The program is aimed to elementary school students between the ages of 7 to 10 in order to familiarize them with the fundamentals of the Vehicles and Traffic Law of the Commonwealth of Puerto Rico. In these parks, students are trained with the basic theory and practical training in their roles as drivers, cyclists and pedestrians. Currently, there are two educational parks located in the municipalities of Caguas and Arecibo. Figure 5 illustrates the facilities of these educational parks in the Commonwealth of Puerto Rico.



Figure 5: Facilities for vehicles, pedestrians and cyclists of the educational Parks for Traffic Safety. Source: Puerto Rico Traffic Safety Commission.

⁸ <http://www.comisionparalaseguridadeneltransito.com>, February 17, 2012.

⁹ <http://www.comisionparalaseguridadeneltransito.com/informacion.asp>, January 28, 2012.

2. The Safety Village: Highway Safety Rolling Park of MAPFRE FOUNDATION

The Safety Village is an innovative initiative of the private sector sponsored by MAPFRE FOUNDATION, an institution promoted by the Spanish insurance group MAPFRE, which aims to give the children a realistic experience of moving through the city while being educated in this way to help prevent and reduce crash rates on public highways. This initiative of social work consists essentially of a rolling park for the education of children between the ages of 8-12 enrolled between the third to the seventh degree of public and private schools in the country. As part of the program, children are trained in the fundamentals aspects associated with highway safety to assist in the formation of the new generation of responsible drivers and pedestrians, with greater awareness and sensitivity when use the country's highway. The rolling park is inspired by the imaginary city of Berto, a child character who fights for the welfare of The Safety Village following traffic rules promoting highway safety.

The educational process consists essentially of two (2) fundamental aspects, the first conceptual, through a session that will provide the theoretical framework of the issue, and the second phase of practice, in which children participate in the circuit through of a series of fun and interactive experiences through role play, where they become drivers, pedestrians and cyclists, using highway safety measures to transit the park supervised by trained guides on the subject.

In Table 1, the mission of the five (5) institutes that MAPFRE FOUNDATION has developed in Spain and Latin America are presented.

MAPFRE Institutes	Foundation	Mission
Institute of Highway Safety		Promote the safety of people and their heritage, with special attention to highway safety education
Institute of Prevention, Health and Environment		Promote the safety of people and their heritage, with special attention to Medicine and Health, improving the Quality of Life and Environment
Culture Institute		Promote dissemination of Culture, Arts and Letters, in addition to research and dissemination of knowledge in relation to the history of Spain, Portugal and countries linked to them by historical ties
Insurance Science Institute		Promoting education and research in areas related to Insurance
Social Action Institute		Contribute to the improvement of the economic, social and cultural conditions of people and disadvantaged sectors of our society

Table 1: MAPFRE Foundation Institutes and their mission.

The Institute of Highway Safety, in its altruistic role, assume its social responsibility recognizing they should play a leading role in highway safety education, in partnership with the Traffic Safety Commission (TSC), the Department of Education, the Private Schools Association of Puerto Rico, municipalities, private and non-profit entities related to highway safety.

The Municipality of Guaynabo became the first city in the Commonwealth of Puerto Rico to loan public space to locate the Safety Village. The parking facilities of Mario Quijote

Morales Coliseum were used to launch this innovative project in the Fall 2011. Figure 6 shows the layout of the Safety Village illustrating the geometric elements of the streets, intersections, a roundabout, pavement marking with crosswalks and parking spaces for bicycle and go-karts. The STOP regulatory sign, warning signs, traffic signals and other traffic control devices are also incorporated in a miniature scale.

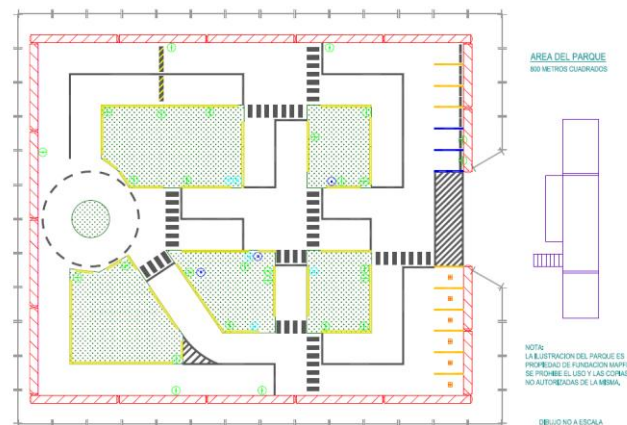


Figure 6: A Layout of the Safety Village.

The logistics associated with site selection and the surface preparation to assemble the park, the coordination with public schools and the transportation of children, safety, and other important aspects, was possible thanks to the commitment and collaboration of different departments of the Municipality of Guaynabo that participated in various stages of the project. The coordinated effort included resources of the Municipal Police, Sports and Recreation, Recycling and Ornament, Family, Environmental Control and Municipal Press Office ascribed to the Mayor's Office. The Municipalities of Dorado and Carolina follow the steps of the Municipality of Guaynabo installing the Safety Village in their respective municipalities.

Safety Village Site Selection Criteria

The main criterion for selecting the space to assemble the Safety Village rolling park is its central location with a surface area of about half acre of land suitable for the location of the trailer that carries small scale cars/go-karts, bicycles, traffic signals and other safety control devices for the operation of the Safety Village rolling park. Furthermore, a classroom to teach children in an interactive way the theoretical aspects associated with highway safety and its relationship with pedestrian, cyclists, drivers and passengers.

The three municipalities committed to provide vigilance and security during the operation of the Safety Village in days, nights and weekends as well as when the park is not in operation. In addition, officials from the Institute of Highway Safety trained the Municipal Police officers that were assigned to be part of this project and in such a way that they can collaborate in the educational development of the children with respect to highway safety. A municipal police official was engaged in the project in such a level that through his own initiative developed a "symbolic" warnings system equivalent to a traffic fine violation to those children that do not follow the signals and traffic control devices in according to the Vehicle and Traffic Law of Puerto Rico. In addition to the symbolic traffic violation ticket, the municipal police officer provided adequate orientation and explanation of the rational of the traffic violation and the corresponding fine. Incorporating a municipal police officer in

this process provided a sense of realism to the Safety Village park, adding a practical element of everyday life.

In Figure 7, the Safety Village rolling park located in the Municipality of Dorado used for highway safety education by MAPFRE FOUNDATION is shown.



Figure 7: View of the Safety Village Rolling Park in the Municipality of Dorado, Puerto Rico.

In Figure 8 children are observed in the Safety Village park riding bicycles or go-karts with the corresponding safety devices (helmets, knee pads, etc.).



Figure 8: Bicyclists and drivers enjoying the experience inside the Safety Village park.

Figure 9 shows the children inside the portable classroom that is an adapted semi trailer with air condition, LCD screen, computer and necessary software to teach a fundamental preparatory course on highway safety with the designated instructor prior to moving to the Safety Village park.



Figure 9: Children in the classroom taking the interactive class.

Figure 10 shows the first group of children that participated in the inauguration of the Safety Village Rolling Park along with supervisors, municipal police officers, representatives of MAPFRE Foundation, Puerto Rico Traffic Safety Commission (TSC), Municipality of Guaynabo and Puerto Rico Transportation Technology Transfer Center (LTAP).



Figure 10: Opening of the Safety Village.

Figure 11 shows representatives of the public, private and academia sector that participated and/or contributed to this historic initiative in highway safety education in the Municipality of Guaynabo, Puerto Rico.



Figure 11: Contributors of MAPFRE FOUNDATION Project.

First Phase of the Safety Village Rolling Park

The first phase of the Safety Village Rolling Park required an initial investment of approximately \$500,000 not including the contribution of human resources and material provided by the Municipality of Guaynabo. This initiative has been contributing to the training of future generation of drivers on the topic of crash prevention and highway safety. The rolling park has the capacity to impact 120 children per day in four (4) sessions with groups of a maximum of 30 children. Since its opening in the Municipality of Guaynabo in the Fall of 2011 and subsequent inaugurations in the Municipalities of Dorado and Carolina, the Safety Village had impacted nearly 12,000 children between the ages of 8 to 12. Furthermore, this innovating program has increase awareness among teachers, parents and relatives regarding all relevant aspects associated with highway safety.

In summary, the Safety Village is a highway education rolling park that will continue touring in the municipalities of the Commonwealth of Puerto Rico, with the primary mission to carry the highway safety message, educating and developing responsible citizens that are aware of the important of being a reasonable and prudent driver, sharing the road with cyclists and motorists, thus reducing the potential for highway crashes on public highways in the island. This caravan of highway education initiated by MAPFRE FOUNDATION has been also successfully implemented in Spain, Brazil, Mexico and Portugal.

3. Luis A. Señeriz Foundation (FLAS) / Mothers Against Drunk Driving (MADD) of Puerto Rico¹⁰

Luis A. Señeriz Foundation (FLAS) / PR MADD is a community-based organization recognized in the Island and nationwide, created in 1986 and is affiliated with the National MADD Organization since April 12, 1999. Mrs. Sonia C. Señeriz is the president of that organization and its founder, following the death of his son Luis A. Señeriz in a motor vehicle crash on October 27, 1984 with a driver under the influence (DUI) of alcohol. The foundation is dedicated in raising awareness among the community about the risk to the health of Puerto Ricans while driving under the influence of alcohol, encouraging and supporting legislation aimed at the serious problem of public health related to alcohol use and provide possible aid to victims of highway accidents. This organization seeks to amend the legislation in order to have more severe laws against violators DUI on public highways. Members of this organization include the mothers and relatives of people who have died on public highways. Another important objective of the Foundation is to strengthen the youth in decision-making through strategies to reduce alcohol consumption, since young people are the next generation of drivers and the future professionals on our country. The members of this organization maintain contact with a number of children and youths in public schools, private schools and universities in their crusade aimed toward prevention.

Luis A. Señeriz Foundation Red Promise Campaign

FLAS / PR MADD has institutionalized the Red Promise campaign to raise awareness of NOT driving while intoxicated during the holidays and throughout the year. The Red Promise carries the message of prudence and solidarity with the thousands of drivers that travel daily on our public highways during holidays, which typically starts in our island with the celebration of Thanksgiving Day, continues with Christmas and New Year festivities,

¹⁰<http://www.flas-maddpr.org/>, January 5, 2012.

culminating on January 6 with Three Kings Day. The Red Promise alerts potential drivers on the misuse of alcohol on the highways in order that this behavior does not claim another victim.

Every year, through the Department of Health and its Secretary, a proclamation is signed commemorating the event and in turn, sharing with all the 78 municipalities in the island. This proclamation serves as a catalyst in order that the mayors join our organization with innovative strategies to prevent drunk driving on their highways.

Currently, elementary schools in the Municipality of Carolina, Puerto Rico, and its directors adopted the task of motivating the student population and their faculty to celebrate the Red Promise Day with a march organized in designated streets carrying the prevention message through banners, posters and loudspeakers, influencing the children to say NO to alcohol consumption at their young age.

Protecting You/Protecting Me (PY / PM)

Protecting You/Protecting Me (PY / PM) is an educational strategy that is used in elementary schools from first through fifth grade in both Spanish and English language. The main objective of the curriculum is to educate these children about the harmful effects of alcohol consumption in their brain. Through the foundation, it has been possible to implement the educational curriculum in many elementary schools in the Commonwealth of Puerto Rico with excellent results demonstrating healthy conducts in their adolescence, thus saving lives.

Supporting of Fatal Victims' Family and Survivors

Supporting of fatal victims' family and survivors to mitigate their sufferings and needs of justice and monitoring in a court of law is very important to the FLAS / PR MADD foundation and its members. Monitor the purity of the judicial processes, both in favor of the victims and the victimizers contribute to the people to know and take as an example such catastrophic events to avoid repeating similar situations with other families.

Vigils, Masses and Acts of Remembrance for deaths on highway crashes are coordinated by the foundation to show unconditional support with family members who have had the sad experience of losing a family member because of a driver under the influence (DUI) of alcohol on the highway.

Victim Impact Panel

The Victim Impact Panel (VIP) is a program for the DUI offenders who drive under the influence of alcohol. The panel was conceived with the hope that these offenders know firsthand the trauma, physical and emotional, that may have caused their negligent conduct. FLAS / PR MADD is committed in providing the VIP Panel in the Commonwealth of Puerto Rico.

Strengthening and Amending Existing Laws

FLAS / PR MADD brings to the public forum, where necessary, the need for clear and precise legislation of people killed in highway crashes as a result of a drunk driver. Lobbying for the passage of Law No. 22 - Vehicle and Traffic Law of the Commonwealth of Puerto

Rico on January 7, 2000, as amended, provides lower alcohol levels, zero tolerance to people under 18 and 0.02% to people of 18 to 20. This amendment to the law serves as a constant echo of awareness messages to young schoolchildren and community groups to prevent deaths in public highways, alert other drivers not to drive under the influence of alcohol, passing the key and have a designated driver.

Collaboration with Government and Private Institutions

FLAS / PR MADD works closely with governmental, civic, academic and community institutions in the educating and preventing alcohol misuse in young people and highway crashes. As evidence, it maintains active involvement with coalitions created with public and private organizations, such as Agricultural Extension Service, University of Puerto Rico, Partnership for a Drug-Free Puerto Rico, Puerto Rico Youth at Risk, Mental Health and Against Addiction Administration, Puerto Rico Transportation Technology Transfer Center and others.

Another important group for FLAS are Youth in Action which are represented by college students such as the Instruction Program for Traffic Safety and Alcohol in Highways (PISTA for the Spanish acronyms) from Cupey Metropolitan University and the Instructors Facilitators in Safety, Traffic and Alcohol (FIESTA) of the University of Puerto Rico in several campuses. Keeping the Alliance with such youth allow us to multiply efforts with other young people who are not necessarily impacted on the issue of Sober Driving and Highway Safety.

"In the blink of an eye" is a short film used by the foundation, addressed to young Puerto Ricans in 7th grade and up to promulgate the message of the consequences of drinking and driving under the influence of alcohol. This short film was prepared by a young Puerto Rican named Richard Axtmayer.

4. Automobile Accident Compensation Administration (ACAA, for its acronym in Spanish) - *If you drive, do not Text*¹¹

The ACAA is a public corporation created under Act No. 138 dated June 26, 1968, as amended ¹². This organization seeks to reduce the tragic social and economic effects caused by traffic crashes on the family and other victims' dependents, providing them with medical hospital services and income that can partially heal the economic burden associated to fatal victim's dependents in such crashes.

The ACAA promoted an educational campaign with singer Tito El Bambino entitled *If you drive, don't Text*. The pertinent principal message in this campaign is: "... when you drive and text everything becomes a target; put on your bandage (in your thumb), make your commitment to drive and don't text." With this educational campaign, bandages were handed to visitors and shoppers in public places and shopping centers/malls, with the message *If you drive, don't Text*.

¹¹<http://www.acaa.gobierno.pr/ACAA/>, January 5, 2012.

¹² Morales-Millán, Felipe, History of the Automobile Accident Compensation Administration, 1968-2008.

5. ITE – Moving Toward Zero Deaths (TZD) ¹³

The U.S. Department of Transportation launched the initiative "Moving Toward Zero Deaths" (TZD) motivated on the alarming number of fatalities in the U.S. amounting to 33,308 fatalities in 2010. This alarming statistic requires an integrated plan involving public sector organizations, the private and academia to promote strategies that has the potential to achieve zero deaths on the highways. In 2011, the National Highway Traffic Safety Administration (NHTSA) published crash statistics in US highways that shows a record low of 32,367 (Reference: <http://www-nrd.nhtsa.dot.gov/Pubs/811699.pdf>). Even though, a reduction in fatal crashes was achieved, there is consensus by experts that a death is unacceptable. National experts in highway safety and members of the civil society have identified ten (10) basic strategies that have the potential to achieve the goal of zero deaths in our highway system. These are:

1. Adopt a safety culture
2. Reduce speed
3. Reduce the presence of impaired drivers
4. Increase the use of safety belts and restraint devices for passengers
5. Designing and building safer vehicles
6. Seek mechanisms to reduce driver distraction when driving motor vehicles
7. Increase safety for young drivers
8. Implement cost effective engineering improvements
9. Improve pedestrian safety
10. Develop and update comprehensive and integrated safety database systems

6. United Nations – Decade of Action for Road Safety: 2011-2020

In March 2010, the Decade of Action for Road Safety: 2011-2020 was adopted by the United Nations General Assembly. This initiative comes from a global concern documented by the World Health Organization (WHO), where showed a staggering 1.3 million fatalities per year and, 50 million people injured and become disabled for life of which 90% of the road crashes victims occurred in developing countries. This annual death rate is expected to increase to 1.9 million by 2020. Furthermore, traffic crashes are the leading cause of death among young people worldwide; by 2015 road crashes are expected to be the leading health burden for children over 5 years in developing countries. The economic cost to developing countries is estimated to exceed \$100 billion a year. Experts are convinced that traffic crashes are preventable if a Global Action Plan, that includes specific performance measurements, could save millions of lives. A key element is the creation of strategic alliances and coalitions between private, public sector and academia.

Proclamation of the Decade of Action for Road Safety: 2011-2020

In May 2011, the Governor of Puerto Rico, Luis G. Fortuño, signed a proclamation supporting the launch of the Decade of Action for Road Safety: 2011-2020 that confirms the commitment of the government and its administrative agencies to support this global initiative¹⁴. In this proclamation, the Department of Transportation and Public Works (DTPW), Traffic Safety Commission (TSC), Automobile Accident Compensation

¹³<http://safety.fhwa.dot.gov/tzd/>, January 3, 2012.

¹⁴<http://prt2.uprm.edu>, January 3, 2012.

Administration (ACAA), Puerto Rico Police, the Department of Health, MAPFRE Foundation as well as the FLAS / PR MADD, have created different alliances promoting prevention and creating emerging programs that stimulate road users awareness.

In Figure 12, the proclamation signed by the Governor is presented with the Executive Director of the Traffic Safety Commission, the President of FLAS / PR MADD and other members of this alliance representing public, private and academia.



Figure 12: Proclamation of the Decade of Action for Road Safety: 2011-2020 in the Commonwealth of Puerto Rico.

7. Puerto Rico Transportation Technology Transfer Center (PR LTAP-T2 Center)

The Puerto Rico Transportation Technology Transfer Center of the University of Puerto Rico at Mayagüez (UPRM), has collaborated in the past 27 years in the training and development of local transportation agencies in seminars and workshops related to new techniques, manuals, engineering procedures to promote highway safety aspects, changes in standards of design, construction, preservation, and rehabilitation of highway infrastructure. The T2 Center, as part of its support for the Decade of Action for Road Safety: 2011-2020, has generated a list of fourteen (14) commitments that citizens will pledge in order to help us spread the message that together we can save millions of lives on our highway system.

Figure 13: Pledge of fourteen (14) commitments to be complimented by citizens.
http://prt2.uprm.edu/formulario_ciudadano_ingles.php

Strategic Alliances to Promote Highway Safety in Puerto Rico at All Levels

The College of Engineers and Surveyors of Puerto Rico (CIAPR) and the Institute of Transportation Engineers, Puerto Rico Section has very active in all the activities associated with highway safety. Figure 14 shows representatives from CIAPR and ITE wearing Decade of Action for Road Safety pin.



Figure 14: From left to right, Dr. Benjamín Colucci, Spokesperson of DOA and Past President of ITE-PR Section; Eng. Miguel Torres-Díaz, Past President of CIAPR and current Secretary of the Department of Transportation and Public Works; Eng. Edgar Rodríguez, President of Metropolitan Bus Authority; and Dr. Alberto M. Figueroa, Past President of ITE-Puerto Rico Section.

In Figure 15 shows the recognitions in Highway Safety to representatives of WABA La Grande radio station in the West region in Puerto Rico and FLAS / PR MADD as part of the First Year Award for outstanding achievement in stimulating road users awareness through 45 seconds public service announcements (PSA) audio clips endorsed by Ms. Eridania Susaña, CEO WABA La Grande station and the Red Promise campaign by FLAS / PR MADD founder Sonia C. Señeriz.



Figure 15: Recognitions in Highway Safety to representatives of WABA La Grande radio station in the West region in Puerto Rico and FLAS / PR MADD.

The T2 Center joined the National Awareness Week in Highway Construction Zones held from April 23 – 27, 2012 by holding a press conference with the slogan *Do Not Go “Esmandao” in Highway Construction Zones! Intelligently Drive to Arrive Alive at Your Destination* in which statistical data related to crashes and fatalities in construction zones, countermeasures and other initiatives that promote road safety were presented.



Figure 16: Press Conference with representatives of the FHWA-PR Division, TSC, DTPW, Police Department of Puerto Rico, FLAS / PR MADD, MAPFRE Foundation, among others as part the National Awareness Week in Highway Construction Zones.

The T2 Center made an alliance with the WABA La Grande radio station located in the North West region of Puerto Rico. In its commitment to save lives, they produced two audio capsules that have been running continuously for the past two years as a Public Service Announcement (PSA), stimulating road users awareness.



**Figure 17: Alliance with WABA La Grande radio station executives
CEO Ms. Eridania Susaña.**

The Senate of the Commonwealth of Puerto Rico illuminated the north side of the State Capitol with the yellow color for the celebration of the First Anniversary of the Decade of Action for Road Safety: 2011-2020 in recognition of the relatives and victims of road crashes. In the illumination ceremony, the Senate reaffirmed its commitment to road safety by approving a Resolution that “recognizes the importance and value of this type of safety initiative”.



Figure 18: Yellow Illumination of the facade of Puerto Rico State Capitol and the Proclamation signed by the Governor of Puerto Rico as part of the Decade of Action for Road Safety initiatives to stimulate road user awareness.

The First Anniversary of the Decade of Action for Road Safety: 2011-2020 was dedicated by the T2 Center to Mothers and Women victims that have lost a loved one in a highway crash. In a solemn activity that had the theme *Not a Single Fatal Victim of Road Crashes*, ten (10) mothers were recognized that have been victims of fatal crashes on our road system. The past First Lady of the Government of Puerto Rico, recognized each mother on the occasion. A Resolution approved by the House of Representatives joining the commemoration of the First Anniversary of the DOA for Road Safety was also presented.



Figure 19: Recognition to ten (10) mothers that have been victims of fatal crashes during the First Anniversary of the DOA for Road Safety: 2011-2020.

In this activity, co-sponsored by the Puerto Rico Traffic Safety Commission, the participants had the opportunity to listen to the experiences of a victim and a victimizer of a fatal crash. In Figure 20, a survivor of a fatal crash is being interviewed by the University Chancellor and also a Baptist Church Minister.



**Figure 20: Interviews performed to (a) A survivor; (b) A victimizer.
A Baptist Church Minister / UPRM University Chancellor performed the interviews.**

Non-traditional Partnership to Stimulate Road User Awareness

In the fall 2012, the T2 Center started the initial steps toward a new partnership with the musical group “Atención Atención”. This group combines rock rhythm and animal characters such as Johnny the lizard, Mr. Frog and Tito the little angel, to entertain and educate children from all age groups. This unique combination of rock music and characters, that won an Emmy award for being the Best educative program in 2012, creates an amazing enthusiasm for little children as well as their parents and grandparents combined with a very profound educational message in every concert and TV show. It is our opinion that this partnership with the T2 Center will be a win-win situation in terms of reaching children of all age groups at a faster pace thus, stimulating road safety awareness that can be transferred to other children of similar age and to the parents and grandparents.

In the three-day concert held in December 2012 at the Center for Performing Arts Luis A. Ferré, over 5,500 children and parents attended the concert and a significant number visited our Exhibit on Booth with a theme “*Amigos salvando vidas*” (Friends saving lives, see Figure 21).

Our booth had in the background kids and parents riding bicycle using their helmet and protective devices. The T2 Center Staff provided literature regarding highway safety, speakers promoting seat belt usage and respect to STOP sign, retro reflective tags and car refreshers with the diamond shape and yellow color of the MUTCD Advance Warning Sign that has a QC code that can be scanned to access our Facebook account of Decade of Act on for Road Safety. The goal for Puerto Rico LTAP in 2013 with this partnership with *Atención Atención* is twofold: (1) To be partners of this educational initiative to stimulate road user awareness and (2) to continue promoting our Pledge with our road users, emphasizing the fourteen (14) commitments to save millions of lives in our highways.



Figure 21: T2 Center booth with the slogan *Amigos Salvando Vidas* as part of the DOA for Road Safety during *Atención Atención* rock musical group concert.

A Reflection on The Future of Road Safety in Puerto Rico

Several emerging programs and initiatives that stimulate road users awareness as part of the Decade of Action for Road Safety in the Commonwealth of Puerto Rico are presented in this Paper. Affirmative actions including educational and awareness campaigns carried out by the Traffic Safety Commission (TSC), the Automobile Accident Compensation Administration (ACAA), the Institute of Highway Safety (IHS) of MAPFRE FOUNDATION, "Mothers Against Drunk Driving" (MADD), Luis A. Señoriz Foundation (FLAS) / Mothers Against Drunk Driving (MADD) of Puerto Rico, Institute of Transportation Engineers (ITE), the academy, and the recent campaign of the Decade of Action for Road Safety: 2011-2020 are described.

All these initiatives have the potential to reduce the number and rate of fatal crashes on highways, thus creating a better environment for driver education for the next generation of highways users.

In summary, it is the opinion of the authors that in order to be effective and leave a permanent footprint on our society, these innovative emerging programs in driver education at all ages will require genuine commitment of volunteers from different organizations, civic and non-profits, municipalities, government agencies, the university and academia of interdisciplinary disciplines in order to achieve a safety culture that will effectively address road safety issues thus saving millions of lives on our public roads. All of us together can make a difference in adopting a safety culture to perpetuity.

Authors

Benjamín Colucci, PhD, PE, PTOE, FITE, JD, PAE, Professor, Department of Civil Engineering and Surveying, University of Puerto Rico at Mayagüez, PO Box 9000, Mayagüez, PR 00681, Telephone: 787-834-6385, Fax: 787-265-5695, e-mail: benjamin.colucci1@upr.edu. Dr. Colucci is a professor in the area of transportation engineering at UPRM, a founding member of the Puerto Rico Transportation Technology Transfer Center since 1986. Past President of the Institute of Transportation Engineers (ITE), Puerto Rico Section and is currently the spokesperson for the Puerto Rico Campaign of the Decade of Action for Road Safety 2011-2020.

Iraida Meléndez-Ortiz, Vice President of Quality, Social Responsibility and Corporate Relations, MAPFRE Puerto Rico, Urb. Tres Monjitas Industrial, 297 Ave. Carlos Chardón, San Juan, PR 00918-1410, Telephone: 787-250-5285, Fax: 939-205-5752, e-mail:

imelendez@mapfrepr.com. Mrs. Meléndez-Ortiz has a Bachelor of Science (Cum Laude) from the University of Puerto Rico, Río Piedras campus and courses related to insurance and banking operations. Started in MAPFRE, PRAICO, in 1983, working in various positions within the company. As vice president, has assumed various responsibilities within the office and is on the Executive Committee of the Company. Currently acts as the MAPFRE FOUNDATION in Puerto Rico, in addition to the Quality Department, Corporate Social Responsibility and Corporate Relations MAPFRE Puerto Rico.

Sonia C. Señeriz, President, Luis A. Señeriz Foundation, PO Box 195208, San Juan, PR 00919-5208, Telephone: 7878-765-4558, Fax: 787-754-6759, e-mail: flas7@coqui.net. Mrs. Señeriz is Founder and President of the Luis A. Señeriz Foundation/ Mothers Against Drunk Driving (MADD) of Puerto Rico, has a Master in Health Education, Graduate School of Public Health, Medical Sciences Campus of Puerto Rico. She was Director of the Continuing Education Program of the Graduate School of Public Health, UPR. She served as a consultant to the Joint Commission on Accreditation of Hospitals in the Commonwealth of Puerto Rico.

Acknowledgements

The authors acknowledge the contribution of Mr. Raúl Costilla, President and CEO MAPFRE FOUNDATION Puerto Rico for his social commitment to education and highway safety; the Municipalities of Guaynabo, Dorado and Carolina for their willingness to participate in this innovative highway safety education program, the Traffic Safety Commission (CST) for providing the database for analysis of crash fatalities involving pedestrians crashes.

Special thanks to Mrs. Lizbeth Vélez, Safety Village Rolling Park Director and all those that make up the team that works every day with the children. Furthermore, a special recognition to those that have worked to raise the ladder and stimulate road user awareness and spreading the important message of road safety throughout the years. The contributions made by officials of the Institute of Road Safety in Puerto Rico, namely Francheska Marcial, Belinda Pujols, and Rosalba Jiménez is very much appreciated. The passion and dedication that Mrs. Irmalí Franco has demonstrated since the enactment of the Proclamation of the Decade of Action of Road Safety in Puerto Rico and through the safety program of the T2 Center involving children, victims and victimizer is really appreciated and acknowledged. The authors also acknowledge Mrs. Grisel Villarrubia and Mrs. Adlin Santos for their administrative support in transcribing this technical article.