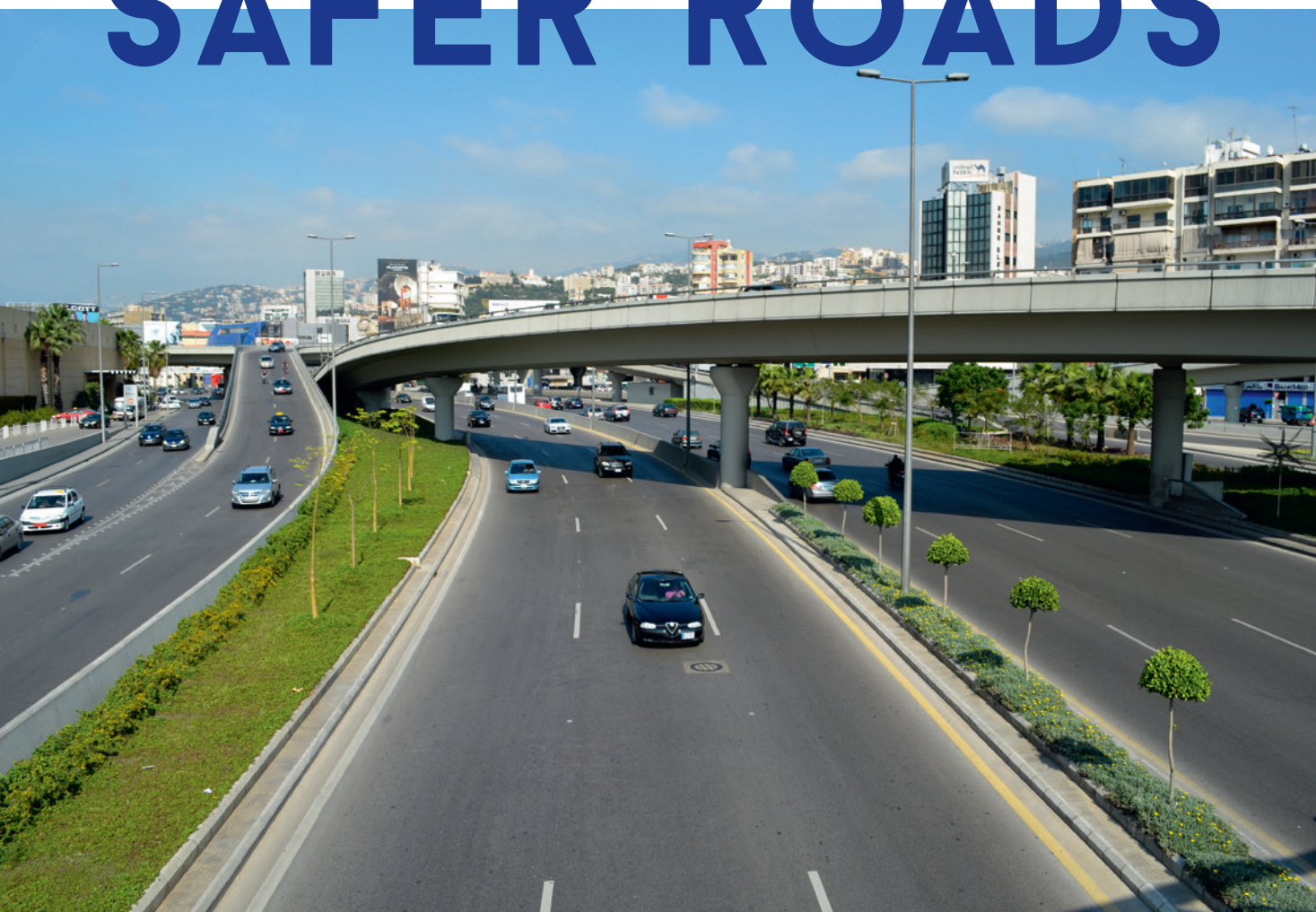

INSURING SAFER ROADS



A global guide to strengthen
the insurance industry's
contribution to road safety



The Global Road Safety Partnership is hosted by:



CONTRIBUTING ORGANIZATIONS



AXA Group

Present in 64 countries, the 166,000 employees and distributors of AXA are committed to serving 103 million customers. Our areas of expertise are reflected across three major business lines: property-casualty insurance, life & savings, and asset management, through which we provide tailored prevention and protection solutions to our customers in a fast-changing risk landscape.

For more information, visit www.axa.com/en/group



Zurich insurance group

Zurich is a leading multi-line insurer that serves its customers in global and local markets. As one of the largest global motor insurer, Zurich believes in working towards a sustainable reduction in road traffic crashes, and was the first insurer to join the Global Road Safety Partnership.

www.zurich.com/



GLOBAL ROAD SAFETY PARTNERSHIP

The global road safety partnership (GRSP)

GRSP is a non-for-profit organization hosted by the International Federation of the Red Cross and Red Crescent Societies, that works collaboratively across the public and private sector, with multi- and bi-lateral development agencies, governments, businesses and civil society organisations, to bring solutions to the road safety crisis.

www.grsproadsafety.org/



UNEP FINANCE INITIATIVE



PSI Principles for Sustainable Insurance

Un environment's principles for sustainable insurance initiative

Endorsed by the United Nations Secretary-General and insurance CEOs, the Principles for Sustainable Insurance (PSI) serve as a global framework for the insurance industry to address environmental, social and governance risks and opportunities—and a global initiative to strengthen the insurance industry's contribution to building resilient, inclusive and sustainable communities and economies. Developed by UN Environment's Finance Initiative, the PSI was launched at the 2012 UN Conference on Sustainable Development, and has led to the largest collaborative initiative between the UN and insurance industry. More than 100 organisations worldwide have adopted the four Principles for Sustainable Insurance, including insurers representing more than 20% of world premium volume and USD 14 trillion in assets under management.

www.unepfi.org/psi

KEY FIGURES & MESSAGES

Road traffic crashes are a major issue globally. In the European Union (EU), **1 million road crashes** happen each year¹, while in the United States of America (USA) some **5.7 million road crashes** occurred in 2013². Whilst these numbers are impressive, there is a far bigger problem globally, with **91% of the world's collisions** occurring in LMICs, where data about road crashes is more difficult to find.

Road collisions have a total global cost of **US\$ 1,855 billion**³ per year, which corresponds to **1 to 3% of countries' GDP**³. Costs can rise up to **5% in Low and/or Middle Income Countries (LMICs)**³ and even to **8 to 10%** in some cases such as South-Africa and Uganda where road crashes are a crucial challenge⁴.

Data show significant gaps of impact between High Income Countries (HICs) vs. LMIC, which pay the highest toll to road traffic crashes:

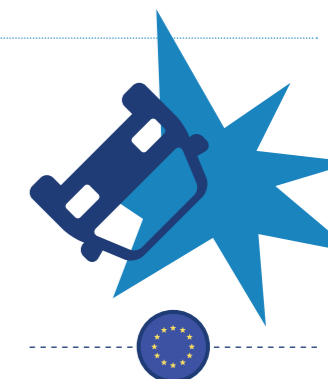
- Fatality rates are more than **two-times higher** in Africa (26,6 fatalities per 100,000 people) than in Europe (9,3 fatalities per 100,000 people)⁵.
- Insurers spend **US\$ 100bn** to compensate the victims of road collisions in Europe; the costs are **14 times smaller** in Africa (**US\$ 7bn**)⁶.

The insurance industry has a key role to play to impact road safety. With **US\$ 626 billion premiums**⁷ in 2016, Motor Insurance is a major business for insurers. It accounts for **12.8% of total insurance premiums**⁷.

Compensation for road traffic crashes amounts to more than 50% of the total Motor Insurance premium: insurers spent **US\$ 332.68 billion**⁷ in 2016 in **claims expenditure** (excluding Brazil and India).



© danielvfung / Thinkstockphotos



1 million

road traffic crashes

5.7 million



GLOBAL COST
US\$ 1,855 billion
PER YEAR



US\$ 626 billion

PREMIUMS

EXECUTIVE SUMMARY

Every year, road crashes kill 1.25 million people³ worldwide and have a global cost of US\$ 1,855 billion⁸, approximately 1 to 3% of countries' GDP³, and even 5% in low-and-middle income countries (LMICs)⁵. Besides representing a humanitarian crisis, road crashes have significant consequences for the insurance sector.

With US\$ 626 billion in premiums in 2016⁹, motor insurance is a major business for insurers, accounting for 12.8% of total global insurance premiums⁷. Compensation for road traffic crashes amounts to more than 50% of this total premium, as insurers spent US\$ 332.68 billion⁷ in 2016 in claims expenditure (excluding Brazil and India). Moreover, other lines of insurance business can be affected by road crashes, such as life, health or work injury. This makes a **strong business case for insurers to contribute to a reduction in the incidence of road crashes by reducing risks on the road, particularly given that they actually have at their disposal many levers for actions to encourage safer driving.** This report draws on this virtuous circle to highlight the key role played by the insurance industry in road safety and calls for further investments to achieve safer roads worldwide.

Motor insurance is the linchpin of the insurance industry's role in road safety. It is a protection factor for road users who rely on their insurers for coverage against financial losses and assistance with long-term care in case of a crash. Insurers work closely with public authorities to ensure all road users are

protected from the risks arising on the roads. This is key in LMICs, where some do not have compulsory motor third party liability (MTPL) and others fail to enforce and control it, so individuals have to bear the majority of the costs from road crash damages and medical care. For example, insurers spend US\$ 100 billion to compensate the victims of road crashes in Europe; the costs are 14 times smaller in Africa (US\$ 7 billion)¹⁰. **Therefore, tackling the challenge of road safety in LMICs is an absolute priority given that they account for more than 90% of global road fatalities. LMICs bear a heavier human and economic burden than high-income countries (HICs), despite them accounting for just half of the world's vehicles (54%)¹¹.**

Given the pivotal role of motor vehicle insurance, it is critical to assess the influence of the insurance industry on road safety through the lens of the motor vehicle insurance value chain, which can be divided into three phases:

- **Phase 1: Preventing and reducing road risks.** Insurers are calling public attention to the risks on the road through advocacy towards governments for stronger legislation, prevention and education programmes, as well as supporting and carrying out academic research on the risks related to road uses and driving behaviour. For example, AXA invested US\$ 5.79 million globally in road safety programmes in 2014¹² to increase knowledge and improve driving behaviour. On



© cribea / Thinkstockphotos

balance, the most impactful initiatives are those that rely on partnerships with public authorities, civil society and with other insurers. Such insurance industry initiatives are essential in LMICs where public structures are not yet sufficiently developed to carry out road safety programmes effectively on their own.

- **Phase 2: Insuring road risks.** By assessing and underwriting risks and building motor policies, insurers can integrate road safety incentives into their products and services to promote responsible driving behaviour. Financial levies that adapt the pricing to driving behaviour have been very effective in encouraging behavioural change. For example, usage-based insurance (UBI) dynamically adjusts the insurance premium based on changes in risk exposure due to driving behaviour. The rise in the use of UBI has enabled the development of in-vehicle telematics, which is a key asset for road safety. However, while telematics is being quickly adopted in HICs, there is currently a lag in LMICs that is widening the existing gap between the two groups of countries.

Moreover, insurers can further assess data they have collected over the years from customers to better understand road risks and share this knowledge with their customers. For example, AXA Mexico recently shared information with its customers about high-risk roads in Mexico's major urban areas. Data is a valuable asset of insurers: assessing this data and sharing risk expertise with stakeholders engaged in road safety can provide a more accurate and holistic view of road risks and facilitate more effective road safety measures.

- **Phase 3: Supporting customers throughout the insurance cycle.** Road safety is a good motivator for insurers to develop

strong relationships with their customers throughout the insurance's cycle. New technologies enable insurers to have a better understanding of customers' driving behaviour and practices, and to share personalised feedback to customers reduce road risks. When road crashes happen, insurers can support their customers by responding quickly, fairly, sensitively and transparently to insurance claims at all times.¹³

Finally, this report draws attention to the impact of new technologies on the automotive industry, particularly the increasing adoption of semi-autonomous and fully autonomous vehicles technologies and the development of new patterns of mobility. It is anticipated that the frequency and severity of road crashes will significantly decrease with the introduction of fully autonomous vehicles. **Analysts estimate that by 2040, autonomous vehicles could lead to a 93% reduction in crashes¹⁴.** Such predictions bode well for the future of road safety, especially in HICs where the adoption of new technologies has been quicker. Therefore, special consideration must be given to LMICs where the uptake is likely to take longer.

New technologies will heavily disrupt the traditional motor vehicle insurance business. **Analysts forecast motor premiums to decline by 80% in some mature markets by 2040¹⁵.** New technologies also create new risks. It is expected that many risks will be transferred from individuals to vehicles and in-vehicle connected devices, which will involve vehicle manufacturers, technology providers and other stakeholders. In response to these developments, insurers are developing new business strategies and models, and offering new products and services.

TABLE OF CONTENTS

2	Contributing organizations
3	Key figures & messages
4	Executive summary
6	Table of contents
8	Acronyms
9	Acknowledgements
10	Foreword
12	Introduction
14	1. WHY ROAD TRAFFIC CRASHES ARE A MAJOR ISSUE FOR THE INSURANCE INDUSTRY
14	<u>1.1. A key issue for global development</u>
14	1.1.1. Road traffic crashes, a fundamental health, societal and economic issue
16	1.1.2. The majority of road traffic crashes are preventable
19	<u>1.2. The direct impact of road traffic crashes on the insurance industry</u>
19	1.2.1. The intrinsic relationship between road traffic crashes and insurance
22	1.2.2. Motor Insurance, a key element to cover road traffic crashes
23	1.2.3. Other lines of insurance business impacted by road traffic crashes

2. HOW THE INSURANCE INDUSTRY CAN IMPROVE ROAD SAFETY	25
<u>2.1. Preventing and reducing road risks</u>	<u>26</u>
2.1.1. Education and prevention campaigns	26
2.1.2. Creating public-private partnerships to improve road safety	27
2.1.3. Funding and carrying out research on road risks	28
<u>2.2. Insuring road risks</u>	<u>28</u>
2.2.1. A road safety focus when identifying risks	28
2.2.2. Integrating road safety into the design of insurance products	31
<u>2.3. Supporting the customer throughout the insurance cycle</u>	<u>33</u>
2.3.1. Protecting customers better	33
2.3.2. Embedding road safety in the post-crash support	34
2.3.3. Improving road safety through claims management strategies	36
3. PROMOTING ROAD SAFETY IN THE MOTOR INSURANCE BUSINESS OF THE FUTURE	37
<u>3.1. The impact of automatic devices on motor insurance</u>	<u>37</u>
<u>3.2. New business models linked to disruptive mobility trends</u>	<u>40</u>
Conclusion	41
Bibliography	42
International organisation reports	
Other road safety literature	
Insurance literature	
Notes	43

ACRONYMS

AD&D

Accidental death and dismemberment insurance

ADAS

Advanced driver assistance system

AEB

Autonomous emergency braking

CasCo

Casualty & Crash

ESC

Electronic stability control

EU

European Union

FCW

Forward crash warning

GDP

Gross Domestic Product

GNP

Gross National Product

GRSP

Global Road Safety Partnership

HICs:

High income countries. Gross national income, GNI, is equivalent to US\$ 12,745 or more per capita¹⁶

IFC

International Finance Corporation

LMICs

Low-and-middle-income countries. GNI is less than US\$ 12,745 per capita¹⁵

L&S

Life & Savings business

MTPL

Motor third party liability insurance

NHTSA

National Highway Traffic Safety Administration

OECD

Organisation for Economic Cooperation and Development

P&C

Property & Casualty business

PSI

United Nations Principles for Sustainable Insurance

SDGs

United Nations Sustainable Development Goals

SMEs

Small and medium-sized enterprises

UAE

United Arab Emirates

UBI

Usage-based insurance

UK

United Kingdom

UN

United Nations

US

United States (of America)

WHO

World Health Organization

ACKNOWLEDGEMENTS

First and foremost, we cannot start this report without acknowledging the valuable work and expertise of **Dr Will Murray**, Research Director of eDriving FLEET and globally-recognized road safety specialist. He dedicated a significant amount of time and effort into the "Insurance for safer roads" initiative, and in particular, to this report. Dr Murray contributed considerably by conducting research and interviews to understand the scope of the challenge of road safety worldwide and the key contribution of the insurance industry to help make roads safer. A very sad illness caused his early departure and he was not able to complete his work with us. We deeply grieve his passing as we hope our work will honour his memory as a dedicated professional and a passionate advocate for safer roads.

We also warmly thank the professionals from the insurance and the road safety arenas and the United Nations who shared their experience and expertise with us:

- **Butch Bacani**, Programme Leader, UN Environment's Principles for Sustainable Insurance Initiative
- **Étienne Costet**, Mass Claims Transformation Manager in Motor Claims at AXA Global P&C;
- **Olivia Fabry**, Programme Manager, UN Environment's Principles for Sustainable Insurance Initiative
- **Julien Fursat**, Head of Product Design & Ecosystem and **Guillaume Lehallier**, Product Design & Ecosystem Manager at AXA Global P&C;
- **Alexander Graham**, Group Corporate Development at AXA;
- **Isabelle Jubelin**, CFO at AXA Research Fund;
- **Jean-Pierre Lerin**, Directeur International Auto / Domicile at AXA Assistance;
- **Mathilde Ray**, Executive Assistant to the Head of Operational Excellence at AXA;
- **Alice Steenland**, Head of Corporate Responsibility at AXA;
- **Guy Van Hecke**, Head of Reinsurance and **Katia Shilimanova**, Motor Reinsurance at AXA
- **Safiyah Siyanbade**, Digital Marketing Officer/Executive at AXA Mansard (Nigeria);
- **Céline Soubranne**, Head of Corporate Responsibility at AXA France and General Secretary at AXA Prévention and **Pédro Costinha Névoa**, Communications Manager at AXA Prévention (France);
- **Bettina Zahnd**, Head of Accident Research and Responsible for the Road Accident Research at AXA Winterthur (Switzerland);
- **Daniela Zepeda Mollinedo**, Public Affairs Manager at AXA Mexico;

Author: Servane Marion-Haycraft, Independent Consultant

Co-authors:

- **AXA:** **Clara Rodrigo**, Communications & Corporate Responsibility Manager for EMEA Latam region; **Alexiana Cirier**, Project Manager for EMEA Latam region; **Simon Clow**, Head of Stakeholder Engagement; **Babacar Seck**, Project Manager for Corporate Development;
- **Zurich Insurance Group:** **Andy Price**, Practice Leader for Motor Fleet for the EMEA region; **Nick List**, Fleet Intelligence European Proposition Manager;
- **Global Road Safety Partnership:** **Andrew Bradley**, Chairman and Head of Group Risk Services of Nestle; **Dr Barry Watson**, CEO; **Michael Chippendale**, Communications Manager.



FOREWORD

AXA foreword

Today, road traffic crashes are too numerous, causing considerable economic and social losses to the victims and the countries, and more critically to LMICs. We know that many concrete actions could be taken that would have positive results to save many lives worldwide. The insurance industry has long taken actions, and AXA among others is committed to promote road safety. As an insurer of 30 million vehicles, we have always felt a strong responsibility to help drivers be safer on the roads.



This publication “Insuring Safer Roads: A global guide to strengthen the insurance industry’s contribution to road safety” is strong evidence of our will to contribute to safer roads and to implement the United Nations Principles for Sustainable Insurance (PSI), and a significant step towards further collaboration between insurers and their stakeholders. We are very proud to have founded this initiative between AXA, Zurich, the Global Road Safety Partnership and Nestlé, along with the support of the PSI, with a common objective to reflect on the key role of insurers to promote road safety and achieve the Sustainable Development Goals (SDGs) target set by the United Nations to halve the global number of deaths and injuries due to road traffic crashes by 2020.

We invite all volunteers who want change, to join our coalition and contribute to stronger impact in improving road safety globally.

Gaëlle Olivier, CEO of AXA Global P&C, Member of the Management Committee and Sponsor of Road safety

Global road safety partnership (GRSP) foreword

The Global Road Safety Partnership (GRSP) is proud to be a founding member of the “Insurance for Safer Roads” initiative. We are particularly delighted to be working with three of our members, AXA, Nestlé and Zurich Insurance to identify and share strategies for enhancing the contribution of the insurance sector to global road safety.



Few other businesses have the opportunity to contribute to road safety across so many different product lines as those in the insurance sector. Insurance services and products have the

potential to reach road users in every country by collecting and using data to guide efforts, by embedding road safety within product lines, by embracing technology to incentivize safe driving and by disseminating good practice so that it becomes common practice. The contribution the sector can make is remarkable.

From a global development perspective, the United Nations’ SDGs have clearly articulated road safety as a priority area for the coming years. To achieve the ambitious road safety targets in the SDGs, however, it is essential that we scale-up road safety efforts at the country level, particularly in those LMICs experiencing rapid motorization and the consequent increase in road fatalities and injuries. At its core, the “Insurance for Safer Roads” initiative aims to engage the insurance and related sectors at a global level, in order to make a difference at the local level. It further aims to encourage other industry sectors, governments and civil society to come together and focus on innovative approaches to addressing this global public health crisis.

While the publication of this guide represents an important first step for the “Insurance for Safer Roads” initiative, we look forward to expanding the number of the organizations involved and the scope of their activities, in order to make a major contribution to global road safety.

Barry Watson, CEO of the Global Road Safety Partnership

Zurich insurance company foreword

With 1.25 million people killed in road traffic collisions every year, and at least 50 million people seriously injured, road safety is something that everybody – road users, companies, governments and society – should take seriously. At Zurich we are passionate about road safety and we’re proud to be part of the ‘Insurance for Safer Roads’ initiative.



Road safety should not be seen as competitive, so we are delighted to be involved in this important and ground breaking on-going partnership with our fellow insurer AXA, along with one of our longest standing customers Nestlé, and the GRSP. The insurance industry has a key role to play in improving road safety, and we look forward to welcoming more insurers and insurance brokers to this initiative – if we all work together then we can make a real difference to the safety of our customers and help achieve the ambitious road safety targets in the United Nations SDGs.

Karl Gray, Global Head of Casualty and Motor at Zurich Insurance Company

UN environment’s principles for sustainable insurance initiative (PSI) foreword

This global guide to strengthen the insurance industry’s contribution to road safety supports the vision of UN Environment’s Principles for Sustainable Insurance (PSI) Initiative—a risk-aware world, where the insurance industry is trusted and plays its full role in enabling a healthy, safe, resilient and sustainable society.



Through this multi-sector collaboration to reduce road risks, AXA, a founding PSI signatory, is showing leadership and its commitment to implement the PSI. Indeed, examples of actions to implement the PSI are to “develop products and services which reduce risk, have a positive impact on environmental, social and governance issues, and encourage better risk management”, and to “support prudential policy, regulatory and legal frameworks that enable risk reduction, innovation, and better management of environmental, social and governance issues”.

This global guide on road safety follows AXA’s collaboration with the PSI in delivering a pioneering global survey on how the insurance industry can work together with cities and small and medium-sized enterprises to manage climate risks, in support of the 2015 UN Climate Change Conference in Paris. This guide is also in line with the multi-year PSI Global Resilience Project led by IAG to build disaster-resilient communities and economies, which showed that collaboration is at the heart of meeting the resilience and sustainability challenge.

Moreover, reducing road risks supports the achievement of the UN Sustainable Development Goals, in particular, Goal 3—“Ensure healthy lives and promote well-being for all at all ages”—and the 2020 target of halving the number of global deaths and injuries from road traffic accidents.

With a global average of more than 3,400 deaths each day due to road crashes—the number one cause of death for 15 to 29 year-olds—reducing road risks is an urgent sustainability priority. Going forward, linking road safety, vehicle use and new technologies with solutions to pressing environmental and social challenges such as pollution, waste, climate change and health risks is another major opportunity for the insurance industry.

By insuring safer roads, insurers are practising sustainable insurance and are helping pave the road to sustainable development.

Butch Bacani, Programme Leader at UN Environment’s Principles for Sustainable Insurance Initiative

Nestlé foreword

As Chair of the Global Road Safety Partnership and from the perspective of my role in Nestlé, it is highly rewarding to be a part of the ‘Insurance for Safer Roads’ initiative. The work product thus far and the future vision for the initiative is a testament to the value of true collaborative effort.



Within the road safety community, it is regularly commented that too often actions are undertaken in ‘silos’. This is true across the spectrum of road safety actors: government departments, responsible agencies, civil society and private sector organizations. Yet, when the 64th General Assembly of the United Nations passed a resolution proclaiming 2011-2020 the Decade of Action for Road Safety, it recognized the crucial role that multi-sector partnerships must play in implementing goals on the ground. ‘Insurance for Safer Roads’ is an outstanding example of partnership from which others may learn.

I ask insurers and those in related sectors to review this guide with an eye to taking real action. I encourage you to get in contact and get involved. I also challenge you to take the road safety message beyond your office walls, share the ideas with colleagues from all industries and be the model for change that is so desperately needed to help address the road safety crisis which impacts us all.

Andrew Bradley, Chair at Global Road Safety Partnership and Head of Group Risk at Nestlé

INTRODUCTION

1.25 million people die because of road traffic crash each year

Insurers cover more than one billion vehicles worldwide

With 1.25 million people dying globally each year because of road traffic crashes and another 50 million people being injured, road crashes rank as ninth amongst the world's leading causes of death, according to the World Health Organization (WHO)¹⁷ – ranking higher than malaria, suicides and homicides¹⁸. For 15-29 year-olds youth, road crashes represent the leading cause of death¹³. In this context, road crashes, which are considered by the road safety researchers as a consequence of a breakdown in the interaction between road users, vehicles and the organisation of the traffic environment¹⁹, receive concerted attention from public but also private stakeholders. The United Nations (UN) designated 2011-2020 as the Decade of Action for Road Safety. Subsequently, it included in the Sustainable Development Goals (SDGs) the target to halve the number of global deaths and injuries from road crashes by 2020. This global agenda has been followed by various engagements from governmental organisations (e.g. the European Commission Road Safety Programme which aims to tackle road deaths in Europe between 2011 and 2020²⁰), civil society and the private sector.

Companies working in road-related businesses have engaged in this crucial topic for business, reputation and corporate responsibility purposes. Vehicle manufacturers are committed to making vehicles safer, road suppliers are committed to improving the quality of the roads, and insurers are committed to better preventing, reducing and insuring road risks. With more than a billion vehicles covered worldwide, insurers are directly involved in the issue of road traffic crashes. As revenues and profits are directly impacted by the frequency and severity of insurance claims, reducing road crashes is a significant business driver for insurers. Moreover, insurers can share with their customers the risk knowledge and expertise they have built over the years in covering them against road risks. They work to help road users be safer on the roads and to decrease the number of fatalities and serious injuries. Finally, the motor vehicle insurance business is being heavily disrupted by new technologies, which drive change in motor vehicle safety and reduce human and economic losses. These innovations pose a challenge to the traditional motor insurance business model in the near future. Investing in road safety to limit the occurrence of insurance claims, and increasing the perception of value-added service through motor insurance are key drivers for insurers.

To strengthen their commitment to road safety, insurers participated in the 2nd Global High Level Conference on Road Safety, convened by the UN in Brasilia in November 2015. At this conference, AXA, the International Finance Corporation (IFC) and the World Bank co-hosted a side-event that focused on **the role of the insurance industry in promoting road safety, especially in LMICs**. As a follow-up to the event, AXA and Zurich, supported by the GRSP and Nestle, engaged in a unique collaborative effort to further explore the role of insurance in reducing the number of road crash deaths and injuries, notably in LMICs. A two-step initiative was agreed to advance the collaboration. First, an “Insurance for Safer Roads” workshop, a public event that gathered insurers and road safety actors. Second, an “Insuring Safer Roads” guide directing insurers and other key stakeholders on strategies to improve road safety globally.

The workshop was held in October 2016 at AXA in Paris and convened insurers, public authorities, civil society organisations and academics. Approximately seventy-five people from various countries and regions (e.g. Australia, France, Great-Britain, Gulf region, Indonesia, Mexico, Morocco, Spain, Turkey, UK...) and from 50 organisations discussed the role of insurers in managing road risks. Three main areas of focus were covered:

- **Innovation in road safety and awareness:** How to run impactful prevention campaigns across society, notably by leveraging new technologies to collect data and communicate prevention messages, taking into account initiatives shared by AXA;
- **Embedding road safety in insurance products and services:** The use of insurance levies to incentivise safer driving in commercial fleets, based on the Iron Mountain good practice case study, which has significantly reduced crashes thanks to an effective risk management programme, conducted in partnership with Zurich;
- **Partnerships between insurers and public authorities:** The opportunity for insurers to build constructive dialogues around regulation, infrastructure and compulsory motor third party liability insurance. This was based on AXA Mexico's initiative, which pushed for the implementation of a nationwide road safety regulation and AXA Prévention's one, which supported the French authorities in raising awareness amongst motorcycle riders to wear appropriate protective equipment, such as helmets and gloves.

This workshop laid the foundations to harness the contribution of insurers to road safety, particularly as many opportunities remain untapped. This report aims to build the case for a stronger commitment by insurers to road safety, supported by good practices identified by the contributing organisations. It reviews the current and potential roles of insurers in promoting road safety and explores the opportunities coming from new technologies and the effective use of data to assist insurers, public authorities and civil society to collaborate for positive road safety outcomes. A key focus is to address the issue of road crashes in LMICs, that must be the main focus as they bear more than 90% of the total global fatalities¹⁵, despite them making up just half of the world's vehicles (54%)²¹.

A comprehensive methodology was used to inform the development of this report including:

- A review of the available literature regarding the role of the insurance industry in road safety;
- Interviews and inputs from key staff from AXA, Zurich, Nestle, GRSP and UN Environment's Principles for Sustainable Insurance Initiative;
- A survey of the “Insurance for Safer Roads” workshop participants;
- A review of the road safety-related data available through AXA and Zurich; and
- A review of road safety good practices conducted by insurers.

Most of the information mentioned in this report was provided by the contributing organisations, notably AXA and Zurich. Therefore, most examples are based on the experience of these two insurers. Nevertheless, the “Insurance for Safer Roads” initiative aims to encourage and enable all players from the insurance industry to promote good practices and advance initiatives that improve road safety.



© Purestock / Thinkstockphotos



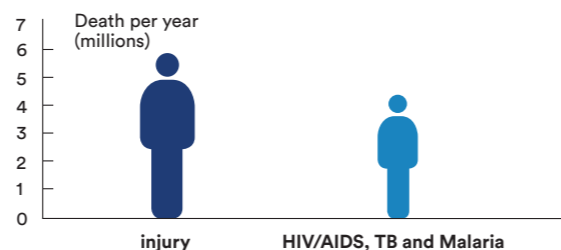
© djedzura / Thinkstockphotos

1. WHY ROAD TRAFFIC CRASHES ARE A MAJOR ISSUE FOR THE INSURANCE INDUSTRY

1.25 million people are killed on the roads each year making road crashes the 9th leading cause of death worldwide

Figure 1: Number of deaths by injury compared to HIV/AIDS, TB and Malaria
(Source: WHO, 2004)²⁶

About 5.8 million people die each year as a result of injuries, out of which one quarter are the result of road traffic crashes. This accounts for 10% of the world's deaths, 32% more than the number of fatalities that result from malaria, tuberculosis, and HIV/AIDS combined.



This major social and health issue also has a significant impact on economies. Road crashes have an estimated global cost of US\$ 1,855 billion²⁷ per year, which corresponds to around 1 to 3% of countries' Gross Domestic Product (GDP). The total costs rise to 5% of GDP in LMICs²⁶ and can even reach 8 to 10% in some LMICs, such as South Africa and Uganda²⁷, where road crashes are a crucial challenge.

These substantial costs stem from a variety of components that rank from:

- Emergency services (medical personnel, police, firefighters);
- Medical treatment and rehabilitation for injured or disabled people;
- Reduced productivity of the victim and care-giver costs;
- Administrative costs such as legal and court costs, and insurance processes;
- Damages to the vehicle;
- Costs of incident investigations;
- Cost of road maintenance.

Moreover, road crashes have long-lasting economic impact due to the loss of lives and the loss of quality of life, which are the highest costs imposed on societies.

Road crashes have an annual cost of US\$ 1,855 billion, corresponding to 3% of the countries' GDP

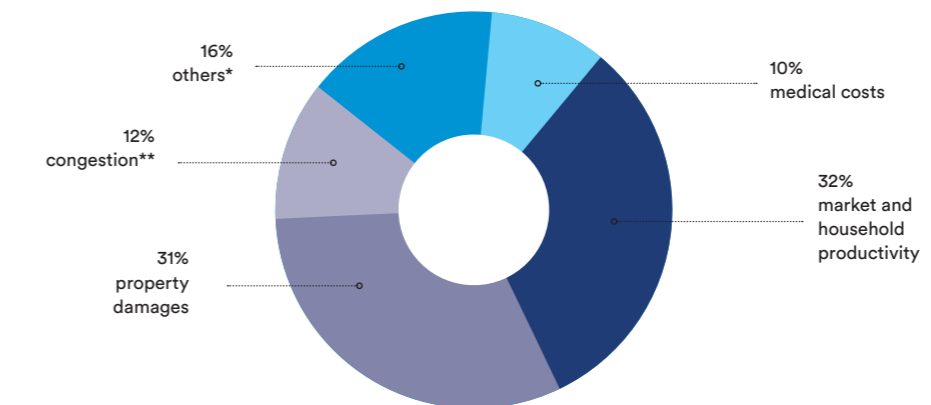
1.1. A KEY ISSUE FOR GLOBAL DEVELOPMENT

1.1.1. Road traffic crashes, a fundamental health, societal and economic issue

Road traffic crashes are one of the leading causes of death globally – 1.25 million people are estimated to be killed on the roads each year, representing more than 3,400 deaths per day – equivalent to more than 141 deaths per hour – while another 30 to 50 million people are injured every year²². Road crashes are responsible for more deaths than malaria, suicides and homicides²³ and are the only non-disease-related cause among the ten leading causes of death ranked by the WHO²⁴. Road crash deaths are estimated to rise to 1.9 million by 2020 due to increased motorisation across the world, especially in LMICs, which are highly likely to experience the greatest increases in future fatality rates. To better understand the growth trend, the number of registered motorized vehicles has risen by 16% between 2013 and 2015²⁵, and this growth should be higher if unregistered vehicles are taken into account. Hence, road crashes currently ranked by the WHO as the ninth leading cause of death across all age groups globally are predicted to become the seventh leading cause of death by 2030, unless appropriate action is taken.

A study on the impact of road traffic crashes on the US economy by the American Transportation Administration (NHTSA³⁰) valued the total economic costs of road crashes at US\$ 242 billion in 2010, corresponding to 1.6% of the national GDP. This number rose to US\$ 836 billion when quality of life valuation was considered³¹. It investigated further how the costs were split and showed that the two major sources of cost from road crashes stem from property damages (US\$ 76 billion, or about 31% of total costs) and market and household productivity losses (US\$ 77 billion, or about 32% of total costs).

The figures below highlight how LMICs bear a higher cost from road traffic crashes than HICs (Figure 4). Fatality rates are more than two times higher in Africa (26.6 fatalities per 100,000 people) than in Europe (9.3 fatalities per 100,000 people)³². **Disparities in impact are even more significant when it comes to economic costs as the burden on LMIC economies is significantly heavier than in HICs.** For example, the annual cost of fatal and serious injuries is 10.1% of annual GDP in Uganda, dropping to 1.5% of annual GDP in Australia²⁸. Furthermore, road traffic crashes impede economic development by imposing a burden on the health, insurance and legal systems of countries, and on the households that do not have sufficient financial resources, nor relevant protection (state or private insurance), to recover from a road crash injury.



The major costs of road traffic crashes in the US stem from property damages and market and household productivity losses

Figure 2: Distribution of the costs of road crashes on the US economy in 2010
(NHTSA data)²⁷

* Others: emergency medical services, workplace losses, legal and insurance costs
** Congestion caused by crashes: travel delay, added fuel usage, adverse environmental impact

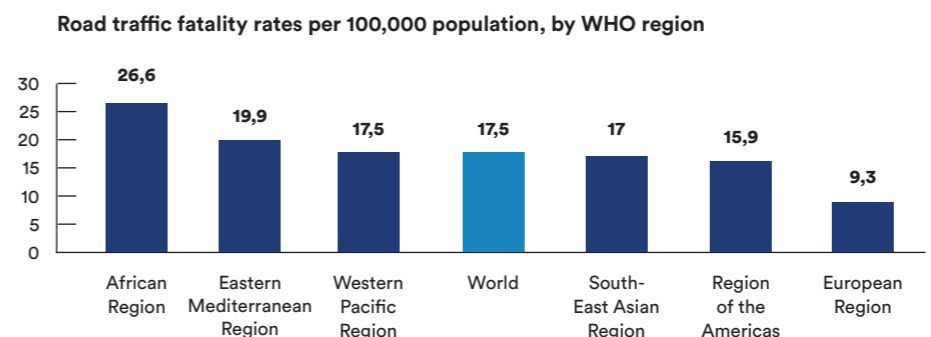


Figure 3: human impact of road traffic crashes worldwide
(Source: WHO, 2015)²⁸

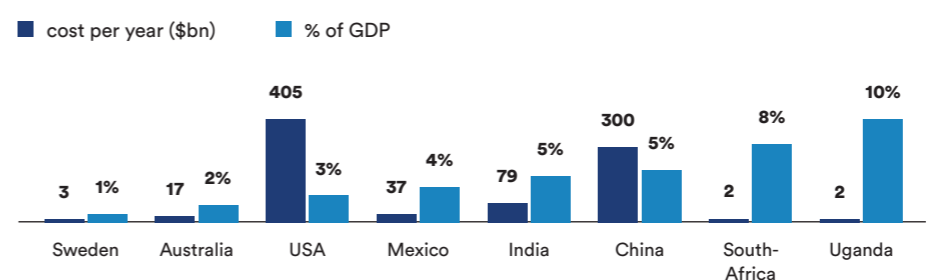


Figure 4: Economic impact of road traffic crashes worldwide (no regional data available, only data by country).
Source IRAP, 2010³³

In mature markets, private insurers cover the majority of the costs deriving from road crashes

The high cost of road crashes is dealt with differently in HICs and LMICs. In mature markets, private insurers (motor and health) cover the majority of the costs, while individuals and the State contribute about one-third of the total costs. **In the US for instance, private motor insurers cover approximately 54% of the total costs of road crashes, individual victims pay approximately 23%, while healthcare providers and charities pay 16% and public revenues cover 7%**²⁶. On the other hand, in LMICs, where financial protection from the State or from private insurers is generally insufficient, the costs are borne mostly by the individuals. Many families are driven deeper into poverty because of expenses due to road crash damages and injuries. In Egypt for instance, motor insurance (third party liability insurance for bodily injury) is compulsory for road users, but as a State-controlled product, the statutory limit for financial protection is equivalent to EGP 40,000³⁴ (about US\$ 2,520). This amount is usually insufficient to cover all expenses stemming from a road crash, so the remaining costs need to be paid by individuals.

1.1.2. The majority of road traffic crashes are preventable

While road traffic crashes are far too numerous and cause dramatic losses for society, it is important to mention that they are not inevitable because the vast majority is preventable if subject to targeted actions. According to the road safety research community, a collision is a result of a breakdown in the interaction between road users, vehicles and the organisation of the traffic environment³⁵. There are three main contributory factors to road traffic crashes – human factors, vehicle factors and road and environmental factors (often illustrated through the Haddon matrix)³⁶. The table below lists key risk factors for each of the three causes and the associated costs. It links the risk factors with the key actions and stakeholders to prevent and reduce road risks.

Table 1: Risk factors causing road traffic crashes, the actions and the actors involved for mitigation

	Risk factors	Costs	Actions to limit risks	Key stakeholders
	Speed	<ul style="list-style-type: none"> A pedestrian nearly has a 60% risk of dying if struck by a car at 80km/h A pedestrian has less than a 20% risk of dying if hit at less than 50 km/h³² Based on a 2017 survey, 82% of French drivers exceed the speed limit by up to 20km/h³⁷ 	<ul style="list-style-type: none"> US\$52bn in the US, c.22% of total cost of road crashes (2010 data)³⁶ 	<ul style="list-style-type: none"> Public authorities and police
	Drink and drug driving	<ul style="list-style-type: none"> Drivers with blood alcohol concentration (BAC) ranging from 0.02 g/dl and 0.05 g/dl have at least 3 times more chance of dying in a vehicle crash, 6 times with a BAC between 0.05 g/dl and 0.08 g/dl, and it rises exponentially above 0.08 g/dl³⁸ 	<ul style="list-style-type: none"> US\$52bn in the US, c.22% of total cost of road crashes (2010 data)³⁶ 	<ul style="list-style-type: none"> Individuals
	Non-use of seat-belt	<ul style="list-style-type: none"> Seat-belts reduce the risk of a fatality by 45% to 50%, and the risk of minor and serious injuries by 20% to 45%³² 	<ul style="list-style-type: none"> US\$10bn in the US, c.4% of total cost of road crashes (2010 data)³⁶ 	<ul style="list-style-type: none"> Public authorities and police
Human factors	Non-use of child restraints	<ul style="list-style-type: none"> Rear-facing restraints for babies and infants reduce the risk of death or injury by 90%. Forward-facing child restraints reduce the risk of serious injury by almost 80%³² 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Individuals
	Non-use of motorcycle helmets	<ul style="list-style-type: none"> Motorcycle helmets can reduce the risk of death by 40% and of severe injury by approximately 70%³² 	<ul style="list-style-type: none"> US\$8bn in the US, c.3% of total cost of road crashes (2010 data)³⁶ 	<ul style="list-style-type: none"> Civil society, infrastructure provider, car manufacturers, insurers...
	Driver fatigue	<ul style="list-style-type: none"> In a 24-hour period, crash risk for sleep-deprived drivers increases steadily when compared to drivers who slept 7h or more³⁹: <ul style="list-style-type: none"> - 6 to 7h of sleep: 1.3 times the crash risk - 5 to 6h of sleep: 1.9 times - 4 to 5h of sleep: 4.3 times - Less 4h of sleep: 11.5 times 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Encourage individual behaviour change through awareness messages or incentives
	Human error and distracted driving	<ul style="list-style-type: none"> Interpretation, observation or planning errors. Distraction or inattention to road environment Drivers talking on a mobile phone are approximately 4 times more likely to be involved in a crash than those who are not³² 59% of French drivers use their smartphone while driving³³ 	<ul style="list-style-type: none"> US\$40bn in the US, c.17% of total cost of road crashes (2010 data)³⁶ 	<ul style="list-style-type: none"> Public authorities and police
Vehicle factors	Poor vehicle maintenance	<ul style="list-style-type: none"> Almost 75% of countries around the world – notably LMICs – fail to meet even the most basic international standards on vehicle safety³² 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Create safety controls
	Lack of in-vehicle crash protection		<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Enforce coercive regulation
	Lack of crash avoidance safety systems		<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Increase level of in-vehicle safety Invest in new technologies for safety
Road and environmental factors	Growing motorization	<ul style="list-style-type: none"> A 16% increase in registered vehicles from 2010 to 2013 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Public authorities
	Poor road infrastructure	<ul style="list-style-type: none"> Poor quality of roads is a critical factor in LMICs 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Car manufacturers & car reseller
	Lack of road regulation		<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Adapt the extent and safety of road infrastructure
	Climate factors		<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Increase safety regulation

The multi-factor nature of road crash causes and the inherent complexity of the road system highlight the need to adopt a systems-based perspective to tackle road safety. In this regard, the *Safe System Approach* is increasingly being recognised as the leading strategic perspective in road safety and underpins the *Global Plan for the Decade of Action for Road Safety*⁴⁰, as well as the national road safety strategies of many strong-performing countries. Central to the Safe System Approach is the recognition of the inherent vulnerability and frailty of humans to injury and that people inevitably make mistakes⁴¹. Consequently, the road transport system needs to be transformed to better account for human limitations and to reduce the impact of human error. At a practical level, this requires a holistic and comprehensive approach involving improvements to vehicle safety for occupants and pedestrians, improvements to the road environment safety by assessing and treating poor roads, encouraging widespread compliance with road rules and other safe behaviours, and optimizing safe boundaries between vehicles and other road users, particularly by managing vehicle speeds.

FOCUS ON THE SAFE SYSTEM APPROACH TO ROAD SAFETY

Sweden and the Netherlands, which are the two best performing countries with regards to road safety, have implemented the Safe System Approach to Road Safety, an extensive and holistic programme to achieve no deaths or serious injuries on the roads. Called *Vision Zero* in Sweden, it involves distinct bodies such as policymakers, vehicle manufacturers, road safety educators and health agencies and aims to impact road infrastructure, speed management, vehicle safety, road use and driving behaviour. This Safe System is considered as an international best practice in road safety by the WHO and the OECD.

The challenge today is to leverage on this programme and adapt it to the different levels of maturity of HICs and LMICs regarding road safety in order to achieve significant reductions in road crash fatalities worldwide.

Insurers could play a key role in supporting the Safe System Approach by providing data on road user behaviour, crash types and locations, injuries and vehicle safety defects associated with road crashes, and by sharing their knowledge on good practice to reduce the frequency and severity of crashes.

However, it is important to note that there are significant differences in the way that road crash risk factors have generally been managed in HICs compared to LMICs. In many mature markets, these risks have been targeted and significantly reduced through traffic law enforcement programmes and associated awareness campaigns. These dedicated measures have contributed to a decrease in the number of road crash deaths. Based on WHO data, from 2010 to 2013, 35 HICs recorded a decrease in annual road crash deaths³². Still, significant differences also exist between mature countries, which can be partly explained by the different levels of national regulation to enforce road safety measures. For example, fatality rates are higher in the US (10.6 deaths per 100,000 population) than in the United Kingdom (UK) (2.9 per 100,000³²), which is recognised as one of the champions in fighting against road traffic crashes. In this regard, it is important to note that regulations on seatbelt, mobile phone use, motorcycle helmet use and drink-driving are stricter in the UK than in the US.

Despite years of progress in the area of road safety, a rise in road crash deaths has recently been experienced in a number of HICs. The exact reason for these increases remains unclear. However, there is a concern that it may in part be due to an increase in distracted driving due to the use of smartphones and other in-vehicle technologies. For instance, in France the number of people dying in road crashes increased in 2014 (+3.5%) and in 2015 (+2.4%) peaking at 3,464 deaths, after a decade of constant decrease⁴². According to the WHO, drivers talking on a mobile phone are approximately four times more likely to be involved in a crash than those who are not³². Currently though, data remains scarce on the direct impact of mobile phones on road crashes, because this information is not routinely collected in many countries after a crash. The rapid growth in the possession and use of mobile phones is a major concern for road safety actors.

Drivers talking on a mobile phone are 4 times more likely to be involved in a crash



Figure 5: Existing solutions for road safety

Figure 5 highlights key evidence-based solutions that have helped reduce road traffic deaths in many countries, such as seatbelt use, drink-driving laws, speed limit, and motorcycle helmet use.

On the other hand, LMICs have a high exposure to all three types of risks identified in Table 1: 1) high-risk driving behaviour, such as speeding, drink-driving, and non-use of seat-belts and helmets, 2) poor quality of vehicles, because vehicles might not be meeting standards on vehicle safety, and 3) poor environmental and road conditions. Indeed, it has been shown that the lack of strong road safety laws to manage road-user behaviour, combined with poor enforcement of road traffic laws, is common in the countries that record the highest levels of road crash deaths and injuries.

1.2. THE DIRECT IMPACT OF ROAD TRAFFIC CRASHES ON THE INSURANCE INDUSTRY

1.2.1. The intrinsic relationship between road traffic crashes and insurance

Covering almost 1 billion vehicles globally, the insurance industry is directly impacted by road crashes. **In 2016, insurers spent US\$ 332.68 billion⁴³ in claims expenditure related to road crashes** (excluding Brazil and India) to compensate the victims and help them recover from the trauma. Insurers provide emergency support when a crash occurs, pay the expenses related to vehicle damages and bodily injuries, provide access to services that deliver better medical treatment. In the longer term, insurers support crash victims with healthcare solutions to help them return to normal life and recover financial stability (case management; professional rehabilitation; loss of income compensation).

Insurers spent US\$ 332.68 billion to compensate the victims of road crashes in 2016 (excl. Brazil and India)

Table 2 compares the motor insurance market and the amount spent by insurers due to road crashes with the number of vehicles covered by motor insurance across five continents. North America is the largest market for motor insurance (US\$ 219 billion) with the highest proportion of claim expenditure (US\$ 138 billion), while the number of vehicles (250 million) covered is smaller than the one of Europe (334 million), another mature market with comparable situation. Asia is the second biggest motor insurance market (US\$ 165 billion) with the highest number of vehicles covered (645 million), but where insurers' claim expenditure (US\$ 93 billion) is lower than North America and Europe. At the other end of the spectrum, Africa lags behind with a limited motor insurance market, where premiums (US\$ 7 billion) are equivalent to the amount of claims expenditure (US\$ 7 billion) for only 41 million vehicles covered. This highlights the urgent need to support the local insurance markets in enabling African road users to get adequate financial protection against road risks.

Table 2: Impact of road traffic crashes on the insurance industry

	Europe ⁴⁴	North America (USA & Canada)	Latin America & Caribbean	Africa	Asia
MTPL compulsory	✓ Compulsory in all EU countries ⁴⁵	✓~ USA: Compulsory in all states except New Hampshire. Compulsory in Canada	✓~ Compulsory in most countries except El Salvador, Honduras, Guatemala, Paraguay	✓ Compulsory in all African countries	✓~ Compulsory in most countries except Indonesia & Cambodia (commercial vehicles only)
Number of vehicles covered with Motor Insurance (in millions, 2013)	334 m	250 m	Registered vehicles in countries where MTPL is compulsory 140 m	Registered vehicles 41 m	Registered vehicles in countries where MTPL is compulsory ⁴⁶ 645 m
Motor Insurance market (motor premium in billion dollars) ⁴⁷	(€134bn8 in 2012) \$142 Bn	(2015) \$219 Bn	(2013, c. 21,8% of total insurance premium) ⁴⁹ \$38 Bn	(€7bn in 2015) ⁴¹ \$7 Bn	(€155.6bn) \$165 Bn
Amount spent by insurers in road traffic collisions (claim expenditure) ⁴¹	(€93.9bn) \$100 Bn	\$138 Bn	(Latin America excl. Brazil) \$10 Bn	(€2.4bn) \$7 Bn	(Asia excl. India) \$93 Bn

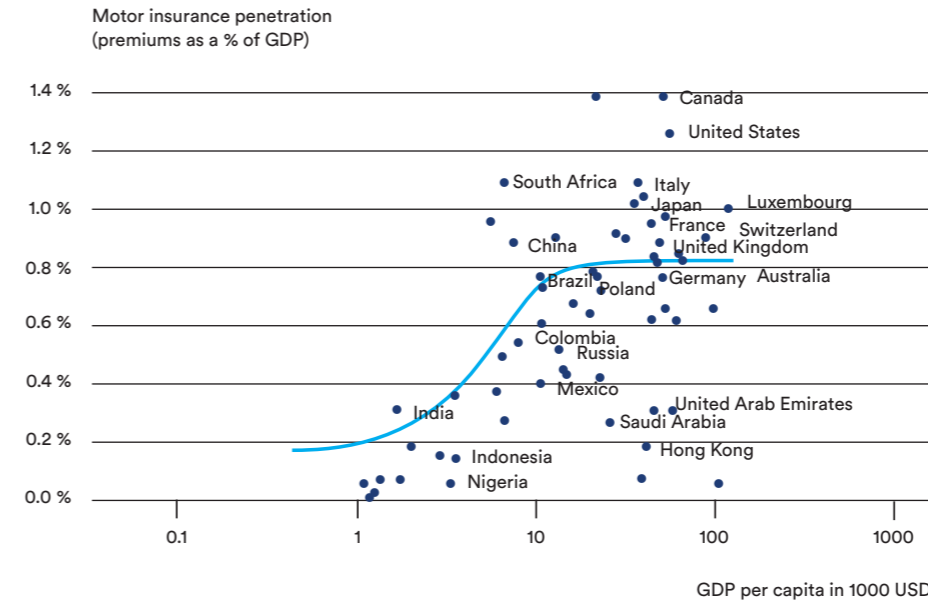


Figure 6: Motor Insurance penetration worldwide
Source: Swiss Re, 2015

Motor insurance is a source of protection for households and more broadly for societies and economies as a whole⁵⁰. Data shows that countries with the highest rates of insurance penetration are also the ones with stronger economies and fewer road deaths, whereas those with the lowest insurance penetration have weaker economies and record the highest number of road deaths (see Figure 6 on motor insurance penetration that links insurance penetration rates to the GDP per capita of the countries. LMICs tend to gather at the bottom left area while HICs cluster at the top right area). A direct causal relationship between insurance penetration and road death decrease, however, may be challenging to demonstrate because the fight against road crashes depends on many stakeholders. **Despite this constraint, one may surmise that there is a vicious cycle linking low economic development to low penetration and to high road fatality rates, from which LMICs suffer the most.** For instance, this is illustrated by the figures below comparing the situation in Latin America and the Caribbean and the situation in Europe and Central Asia. In LMICs where road users face a greater risk of being involved in a crash, higher insurance coverage help households become more resilient and help them achieve greater economic stability.

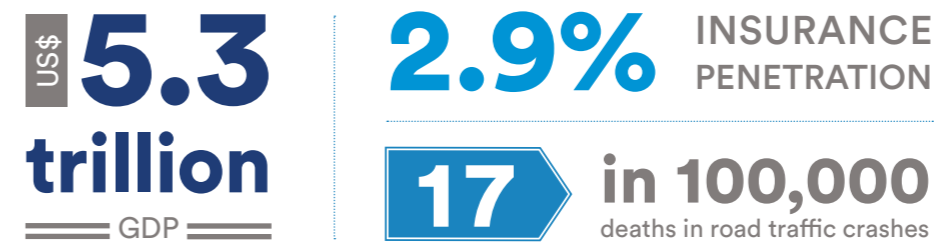


Figure 7: Latin America and the Caribbean
Source: WHO, 2015⁵¹

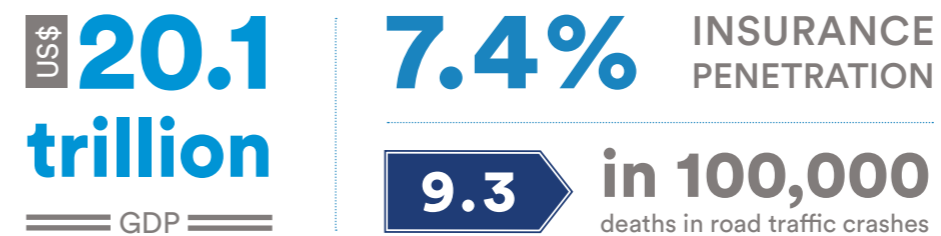


Figure 8: Europe and Central Asia,
Source: WHO, 2015⁵²

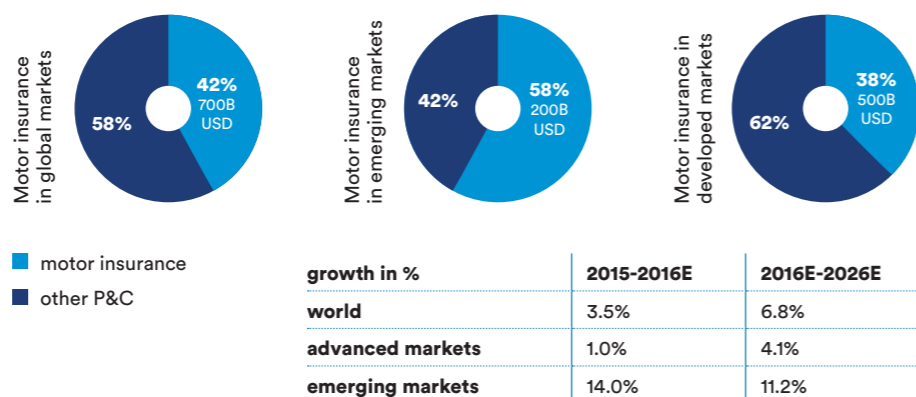
With US\$ 626 billion premiums, Motor Insurance accounts for 12.8% of the total insurance premiums

Figure 9: Motor Insurance business is the most important line of business globally for P&C⁴⁶, Source: Swiss Re, 2015

1.2.2. Motor insurance, a key element to manage road traffic crashes

Motor insurance is a major business for insurers. With total premiums of € 591 billion (around US\$ 626 billion) in 2016⁵³, motor insurance accounts for 12.8% of global insurance premiums (€ 4,630 billion, around US\$ 4,907 billion)⁴⁴ and 42% of the total property and casualty (P&C) business⁵⁴. In HICs, motor insurance corresponds to 38% of P&C activities, and rises to 58% in LMICs⁴⁶ (see Figure 9 that details the share of the motor insurance business in the P&C business across mature and emerging markets).

Motor insurance represents 42% of all non-life gross premium of total Property and Casualty insurance market



Motor third party liability insurance (MTPL), which provides financial compensation for physical damage or bodily injury resulting from crashes and liabilities that could arise to third parties, is the most basic form of motor insurance. Its aim and coverage tend to be similar across countries worldwide, but specific conditions vary depending on local regulations concerning:

- Insured limits (third party property damage, own damage, third party liability, at a per-person or per-event level);
- Country jurisdiction practices, approach (insured vehicle vs. policyholder);
- Levels of compensation, methods of compensation and types of distribution.

MTPL is an important type of financial protection for road users. Other forms of motor insurance – own-damage insurance or Casualty & Collision (CasCo) – may offer more extensive financial protection for damages not related to traffic crashes, such as fire, theft and wind-shield breakage or vandalism. These insurance products are more widely available in HICs where people have more disposable income to spend on insurance. In Europe, MTPL accounts for about 60% of the motor insurance market, and own-damage nearly 40%⁵⁵.

In HICs, motor insurance is typically compulsory for all owners of motor vehicles. As a result, insurance penetration rates are very high and insurers have reached a saturation point with growth rates now starting to decline⁵⁶. This highlights how the motor insurance business has been evolving – insurers now have to cover fewer fatal crashes, but more severe claims (expensive injuries and long-term care). In Europe, road crashes have decreased by 14% over the last decade, which was followed by a decrease in the frequency of claims, both bodily injuries and vehicle damages. Almost 1.85 million claims involved bodily injuries in 2013, which represents a drop of 15% compared to 2008, following the same trend as the number of MTPL claims⁵⁷. In the same period, the severity and the average costs of claims have increased, largely due to more expensive and sophisticated vehicles and to higher medical and third party care costs.

On the other hand, MTPL insurance regulation is not uniform across LMICs. **El Salvador, Guatemala, Honduras and Paraguay in Latin America⁵⁸, and Indonesia⁵⁹ in Asia, have not yet enforced regulation requiring compulsory third party insurance for all drivers.** Other countries have adopted compulsory MTPL but only with limited coverage (e.g. Cambodia only to commercial vehicles, Thailand and Lebanon only to bodily injuries, Afghanistan only to vehicles in Kabul, and Mexico only in federal roadways)⁴⁸, while other countries apply compulsory and

comprehensive MTPL regulation but fail to enforce it. This uncertain legal framework causes high social and financial risks for road users: LMIC populations are more likely to experience a road crash without insurance protection, making them less likely to have access to financial compensation and to long-term care. Although, the situation is rapidly evolving: lobbying is undertaken by international organizations (UN, WHO and World Bank) to encourage national governments to create a sustainable framework for road safety, including compulsory motor insurance to cover all road users. Insurers are also asking for viable financial and regulatory conditions to sell MTPL policies. **Motor insurance coverage has risen to 53% of drivers in 2012 in all emerging markets, with Asia and Latin America recording the highest growth rates⁴⁶.**

Motor insurance is a key protection element for the society as a whole. It helps individuals avoid bankruptcy by providing financial compensation and long-time care. It is key for insurers to be supported by public authorities and regulators to create sustainable MTPL insurance schemes.

1.2.3. Other lines of insurance business impacted by road traffic crashes

Road traffic crashes not only impact the motor insurance business but may also have indirect financial implications for other lines of insurance business such as life, accident, disability, and medical for individuals. For instance, a serious injury claim raises the issue of long-term care for the insurer, which is a significant part of the life insurance business. On the other hand, workers' compensation and transportation insurance, which are specific insurance policies for companies, can also be impacted to a further extent by road crashes. Table 3 below lists the different lines of insurance business that can be impacted by road traffic crashes, aside from motor insurance.

Insurance Line	Impact
Individual Insurance	Life insurance <ul style="list-style-type: none"> • Road collisions with tragic consequences increase the amount of claims paid by the insurer, and thus influence the cost of the risks of life insurance business. • The accidental death and dismemberment insurance (AD&D), a limited form of life insurance, which specifically covers deaths caused by accident, is highly impacted by road crashes.
	Health insurance <ul style="list-style-type: none"> • An individual injured in a road crash will need dedicated medical care that can have a high cost for his/her health insurance.
Corporate Insurance	Transportation insurance <ul style="list-style-type: none"> • Companies transporting goods as part of their business subscribe to a dedicated transportation insurance to cover the goods, the fleet and the driver. Road collisions can have significant costs for transportation companies.
	Workers compensation benefits <ul style="list-style-type: none"> • This policy protects companies against the costs associated with workplace injuries, illnesses and deaths. It can be completed by the Employer's liability insurance, which covers the expenses of a trial if the employee decides to sue his employer. • This business line can be impacted by road collisions for companies running a corporate fleet (i.e. a taxi company, a transportation company, a goods provider company...).
Assistance	<ul style="list-style-type: none"> • Insurers can also offer roadside assistance to Motor Insurance customers, which provides support to victims of an emergency. Road crashes are part of the emergency assistance insurers have to provide. They work simultaneously upstream to identify and minimize the risks; during the emergency, to provide efficient solutions and after it occurs, providing on-going support.
Reinsurance	<ul style="list-style-type: none"> • Insurers running a portfolio of Motor Insurance businesses rely, to varying extents, on reinsurance coverage to protect themselves against the impact of severe claims, and to be able to pay for all expenses related to the claim. Without reinsurance protection, the insurer is responsible for the entirety of any claim that arises.

Motor Insurance coverage has risen to reach 53% of drivers in LMICs

Table 3: Lines of insurance business impacted by road traffic crashes, aside from motor insurance

It is important to note that in certain cases, a customer – be it an individual or a company – can be covered by several insurance companies for different needs, such as health, motor and life insurance. For instance, a customer managing a corporate fleet may insure the vehicles with one insurer, while the health insurance of the drivers is contracted with another insurer, and assistance services provided by a third one. This makes it challenging for insurers to have a holistic view of the impact of road crashes and highlights the need for global collaboration between insurers to improve road safety.



Insurers and brokers should have a more holistic view of the impact of road crashes on all lines of insurance business in order to better understand the global impact and cost to society, both in terms of their customers' needs and their businesses' bottom line.

On balance, although there is a wide range of contributing factors, there is increasing evidence across the world of a relationship between high motor insurance penetration and low road fatality rates. Road risks are not evenly distributed worldwide, with LMICs suffering both higher fatality rates and lower motor insurance penetration than HICs. The combination of these two factors adversely impacts road crash victims and hinders economic development in emerging markets because insufficient financial and health protection exists to recover from a crash.

This chapter has explored the intrinsic relationship between road crashes and the insurance industry. This connection highlights the strong rationale for insurers to take concrete actions to promote road safety, actions that will be outlined in the next chapter.



2. HOW THE INSURANCE INDUSTRY CAN IMPROVE ROAD SAFETY

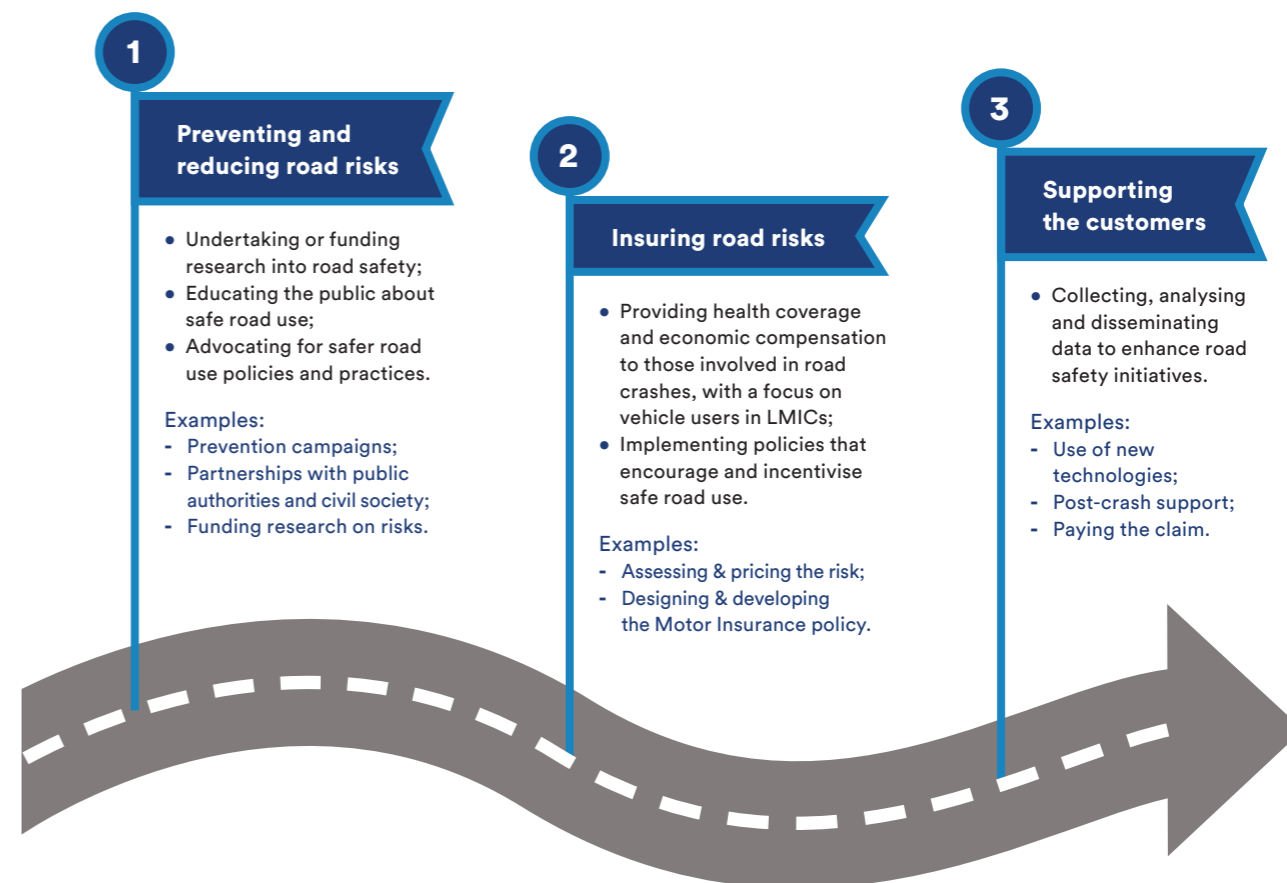
FOCUS ON THE MOTOR VEHICLE INSURANCE VALUE CHAIN

The review of the road safety literature undertaken for this report indicates that the insurance industry play an active role in enhancing road safety and reducing the negative impacts of road crashes on society.

This chapter draws on the framework of the motor vehicle insurance value chain, which highlights how the insurance industry can respond to road risks, by embedding road safety incentives in their business model, in order to provide benefits to their customers and the wider community.

The value chain is divided into three phases, reflecting what insurers can do before and after a road crash, to enhance road safety. Key initiatives are listed in each phase, which are further illustrated through successful good practices that can be brought to scale or replicated in other markets, when applicable and appropriate.

Strategies for Insurers across the motor vehicle insurance value chain



2.1. PREVENTING AND REDUCING ROAD RISKS

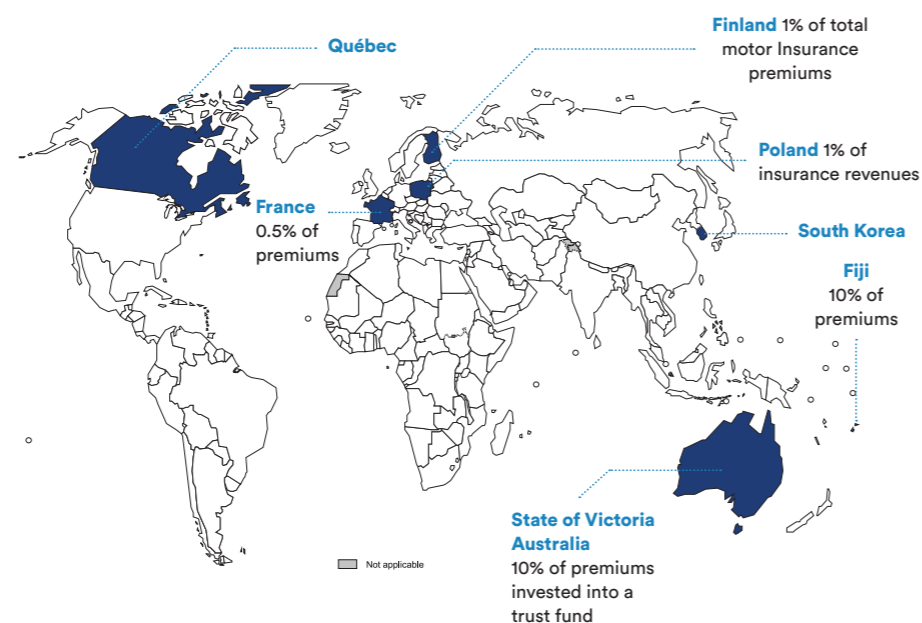
In the motor vehicle insurance value chain, insurers are active before crashes even occur, by preventing and reducing road risks. This involves investing in education and prevention campaigns to help limit the frequency and severity of crashes. Insurers usually partner with public authorities and civil society organisations to raise awareness of road traffic risks and promote road safety. They also support and carry out research to better understand and manage road risks.



2.1.1. Education and prevention campaigns

In many markets, insurers share their knowledge about road risks with their customers and broader society to draw public attention to the matter. Public authorities and civil society can expect insurers to be actively involved in the promotion of road safety given their risk assessment expertise and financial resources. In this context, in some countries, **the insurance industry is subject to a levy on its motor insurance premiums to finance road safety interventions**. Such a strategy can be an effective way to sustainably secure revenues to promote road safety. Nevertheless, there must be careful consideration when adding surcharges to insurance premiums, as this can increase the level of uninsured driving, especially in LMICs where insurance coverage evasion is a major issue⁶⁰.

Table 4: Markets with levies on motor insurance to promote road safety⁶⁰



Over the years, insurers have long conducted or sponsored road safety campaigns and other educational initiatives, with large amounts invested. For example, in 2014, AXA spent €5.48 million globally in road safety programmes (around US\$ 5.79 million⁶¹), with a focus on vulnerable road users such as children, motorcyclists and non-motorised vehicle users. Insurers also participate in government road safety committees or engage with civil society organisations: AXA Prévention in France has run the campaign “Sauve tes doigts” (“Save your fingers”) in 2012, 2013 and 2016 in partnership with Club 14, a motorcycling club of 430,000 members and the French authorities DISCR (Délégation interministérielle à la sécurité et à la circulation routière) to remind the public about the requirement for motorcyclists to wear approved gloves. Three thousand pairs of certified gloves were distributed in Paris and Marseille in 2016 as part of an awareness campaign about motorcyclists’ equipment, in light of new legal requirements making it mandatory for motorcyclists to use gloves. Another example is Zurich’s partnership with Road Safety UAE to promote prevention in the United Arab Emirates (UAE). The company launched the study “Zurich Road Safety UAE Driving Dashboard” to assess driving in the UAE and to generate data and insights that can be used to improve driving behaviour. The results informed a safe driving campaign, which was promoted through traditional, digital and social media channels to help achieve a cultural shift in driving attitudes across the country. In India, the insurer ICICI Lombard launched the “Ride to Safety” initiative in partnership with local NGOs to improve the safety of children riding on two-wheeled vehicles. One hundred educational workshops have been held in Mumbai, Pune and Delhi since September 2015. The workshops reached more than 15,000 children aged 9 to 13 years old, as well as their parents, with the aim of raising awareness of helmet use, and distributing 9,000 child helmets for free.



AXA invested US\$5.79 million globally in road safety awareness programmes in 2014

A road safety campaign for cyclists in 1980 by Zurich Insurance

Education and prevention campaigns led by insurers contribute to calling public attention to road risks. They are crucial in LMICs where public structures are often not sufficiently developed. To maximise the benefits, these campaigns and initiatives need to be evidence-based and, wherever possible, support educational and regulatory and legal enforcement efforts by government agencies.

2.1.2. Creating public-private partnerships to improve road safety

Insurers advocate better road safety regulations and legislation for compulsory insurance for all drivers. These initiatives are particularly necessary in LMICs where laws might not always be adequate or properly enforced. For instance, AXA in Mexico is working with the Mexican authorities and associations on road crash victims, through the non-profit organisation “Reacciona por la Vida”, in order to strengthen the legal framework for road traffic safety. Mexico does not have a national compulsory motor insurance scheme and only about 30% of cars are insured⁶². However, road crashes are a critical challenge with four million crashes per year, injuring one million people. Key actions have been taken through the contribution of various NGOs, including “Reacciona por la Vida”. In 2014, the Mexican government enforced compulsory third party liability insurance on federal highways. In addition, Mexico City implemented a Vanguard Regulatory Policy Framework comprising the mobility law (2014), traffic regulations (2015), and a comprehensive road safety programme (2016-2017). In October 2016, the Mexican Congress passed a new law on urban development, which included key points addressing mobility and road safety, as advocated by NGOs. These advancements in the Mexican legal and regulatory framework are key milestones for safer roads in a country where road crash deaths are a major issue.

Only around 30% of Mexican cars are covered by an insurance policy because no national compulsory Motor Insurance is required

AXA Winterthur has run 1,000 crash tests since 1982 to analyze how road traffic crashes occur

The positive results obtained by “Reacciona por la Vida” and its partners represent a good case study on the potential impact of insurers when advocating new legislation and supporting public authorities on road safety. The Federation Internationale de l’Automobile (FIA) has recently established a High Level Panel (HLP) for Road Safety, which aims to work with the Inter-American Development Bank to promote greater involvement of the insurance industry in road safety in Latin America, where road traffic fatality rates are among the highest in the world (about 17 fatalities per 100,000 people; 106,000 deaths and 700,000 severe injuries per year⁶³). The initiative is in its early days and key areas of collaboration have yet to be established, but many opportunities have been already identified. Furthermore, it has the ambition to become an example for the Asian and African regions, which also suffer from high road crash fatality rates⁶⁴.

Advocacy for insurance legislation and road safety with national and local governments is a key area where insurers can collaborate to implement well-researched and impactful initiatives.

2.1.3. Funding and carrying out research on road risks

Finally, insurers can contribute to road safety by supporting research. Many insurers fund academic research or carry out research themselves to better assess road risks. For example, AXA works with a community of experts in road safety research, through the AXA Research Fund. In 2009, it sponsored a project led by a French researcher from Inserm (Institut national de la santé et de la recherche nationale) to assess urban cyclists’ attitudes towards traffic safety and risk behaviour when wearing a helmet. Another example is Zurich sponsoring a senior professor at the University of New South Wales in Australia to develop a Safety Management System for Heavy Transport, leveraging Zurich’s technical expertise and customers’ claims data. Furthermore, AXA Winterthur in Switzerland has been funding an Accident Research & Prevention Unit since 1982, which has run over 1,000 crash tests to analyse how and why the most frequent road crashes occur. Based on the key findings, the Unit advocates public solutions.

2.2. INSURING ROAD RISKS

Aside from education and prevention campaigns and partnerships with public authorities, insurers can embed road safety in motor insurance policies to prevent and reduce road risks. Road crashes have a significant business impact on motor insurance and identifying road risks is an essential element for insurers to design sustainable insurance products.



2.2.1. A road safety focus when identifying risks

Identifying risks, a key issue for insurers

Insurers invest much of their expertise and resources to better understand the risks they cover, based on macroeconomic input and data collected from their customers. For motor insurance, the main risks are associated with human factors, vehicle factors or road and environmental factors (see Table 1). They have also identified other more specific high risk road user groups that need special attention, such as **drivers of commercial fleets** who are

30-40% more likely to be involved in a crash than a private driver⁶⁵. In the UK, work-related road crashes are the biggest cause of work-related accidental death. Insurers target this road user group, through the commercial line business, by developing tailored insurance policies that match their specific risks and needs. Another high risk group is **road users in LMICs** who are exposed to higher levels of risk than in HICs. Motor insurance policies sold in LMICs take this higher risk exposure into account to offer sustainable protection to drivers.

Moreover, pedestrians, cyclists, motorcyclists and children are more **vulnerable road users** than vehicle users, accounting for 49% of total road fatalities. As third party victims, they are usually less financially protected than policyholders, especially in some LMICs. However, insurers’ engagement with these vulnerable road users usually materialises through indirect actions, such as sponsoring education programmes in schools for children or dedicated campaigns for pedestrians and cyclists, since they do not have direct commercial relationships with them.

INCREASING FINANCIAL PROTECTION FOR LOW-INCOME ROAD USERS IN LMICS

Historically, insurers’ activities in LMICs have been constrained by factors such as slow economic development, unstable political environment and lack of financial literacy. However, over the years, strong economic growth, greater political stability, a fast-growing middle-class, and rising motorisation in many LMICs have created a significant opportunity for insurers to invest and offer financial protection to billions of road users.

Many vehicle or motorcycle users in LMICs struggle to have access to insurance because of limited financial resources, lack of financial and insurance literacy, and difficulties in accessing affordable insurance products. As some of the most vulnerable road users (due to factors such as poor vehicle quality or motorcycle safety, lack of training in driving, long working hours, lack of access to healthcare) they are in need of financial protection and represent a potential new market for insurers.

Some insurers are working to create a dedicated insurance coverage for vulnerable road users in LMICs through lower premiums and defined risks. Finding the right balance between premiums and risk coverage, affordability and practicality is key to accessing millions of new customers.

Private vehicles and small fleets exposure

Once the risks covered have been identified and assessed, insurers can set a price for the insurance policy through a premium that takes into account the risk exposure. These steps form part of the insurance underwriting process. When underwriting motor insurance policies, insurers consider a range of risk factors such as the driver’s age and experience and the type, age and use of the vehicle. The main types of risk factors are listed in Table 5, but local legislations and regulations can limit the ability of insurers to include certain risk factors. For instance, in the EU, insurers are not allowed to discriminate based on gender information.

On the other hand, underwriting a fleet of vehicles focuses on vehicles specification and commercial use (e.g. cars, taxis, trucks, buses, vans and vehicles used for agricultural and construction purposes). Premiums can be set based on the *experience rating method*, which takes into account the fleet’s claims history. Premiums can also be estimated through the *exposure rating method*, which takes into account similar risk factors to those used in personal lines (Table 5: Risk factors in personal lines). Usually, the method chosen depends on factors such as the number of vehicles covered and the claims data available.

Table 5: Risk factors in personal lines

Driver characteristics	Gender
	Licence age & licence expedition country
	Age
	Experience
Vehicle characteristics	Type of vehicle
	Age of vehicle
	Weight / horse-power
	Fuel
	Brand
Journey	Km driven
Territorial characteristics	Province
	Rural / urban
	Size of population
Policy characteristics	Type of usage
	Installment
	Coverage

Insurers could further investigate the data they have collected over the years to better understand the causes of crashes

Analysing data to increase the knowledge of the road risks

Insurers are always looking for ways to reduce the frequency and severity of road crashes in an effort to lower claims. By analysing the claims data, they can identify in their customer database groups of high-risk drivers and isolate the contributing risk factors. However, there are still various areas to be explored to better anticipate road risks. One is to further investigate the data collected by insurers over the years in insuring millions of customers. Each time a crash occurs, insurers record the details of the incident (e.g. time, weather, location, driver profile, conditions of the crash). They have aggregated and analysed this extensive data, providing an overview of risk factors such as hazardous roads, riskier environments and times, and unsafe driving behaviours. Exploiting this data to better underwrite risks and share risk knowledge with customers requires a significant amount of time and investment. However, this could provide customers valuable information and services and offer a competitive advantage to insurers. Furthermore, this risk knowledge and expertise could benefit other stakeholders such as regulatory bodies and public authorities to build impact-driven road safety programmes. AXA Mexico recently took this path by sharing information with its customers on the riskiest roads in the country's major urban areas (Mexico, Monterrey, Guadalajara, Tijuana and Chihuahua), based on claims data. The company is developing a digital platform to systematise data on road crashes, including their frequency and severity. This will provide an extensive overview of the riskiest roads and the possibility of sharing this risk knowledge with customers through alerts and prevention messages on a mobile app or via the AXA website. Data will also be shared with public authorities in order to inform the development of policies and regulations.

SHARING DATA BETWEEN INSURERS AND THE PUBLIC

When discussing the topic of better analysis and use of data owned by insurers, it is important to consider the issue of sharing data between insurers and other stakeholders, who also operate databases related to road crashes (breakdown and emergency services, maintenance of highways, public authorities...). Merging data and sharing expertise can help provide a more accurate view of road risks and determine more effective measures to promote road safety, especially in LMICs where existing data systems might not be as advanced as in HICs.

If customer data is a strong asset for insurers and part of a competitive advantage they are not willing to make public, alternative solutions could be allowing access to generic data that cannot be used for the benefit of pricing and does not put data privacy at risk; or sharing data that has already been processed and not subject to confidentiality issues. In any case, insurers need to be mindful of and respect data protection laws and privacy at all times.

2.2.2. Integrating road safety into the design of insurance products

As part of the insurance underwriting process, insurers can integrate road safety into the design of their insurance products and services. They have distinct tools to use, such as financial incentives or discounts and value-added services to increase individual's sense of personal responsibility on the roads, to encourage better driving behaviour, and even to influence vehicle manufacturers to build safer vehicles.

Risk-based pricing to promote road safety

Insurers have developed underwriting processes to match premiums with the risk profiles of customers. Risk-based pricing is a powerful tool to enhance a driver's personal responsibility, as it links the causing of a crash to the economics of paying for those consequences, and gradually leads in turn to safer driving and behaviour change. The well-known "**bonus-malus**" mechanism, where drivers who do not issue any claims are rewarded with reduced premiums, is one of the best examples of such a scheme. Similarly, the **limited mileage model** offers premium discounts to customers based on the total distances they travel with the vehicle: the less distance driven, the lower the premium to be paid. For instance, AXA in Greece launched the "Drive less – pay less" programme which offers a 20% premium discount for drivers who travel less than 5,000 kilometres a year and whose cars started to circulate as of 1 January 2000. Research and data analysis have shown that such packages effectively encourage customers to use their vehicles less and make wider use of public transport, reducing the claims probability. These mechanisms have the dual advantage of enhancing road safety and increasing customer satisfaction. They tend to demonstrate the extent to which insurers can also play an active role in supporting behavioural change and increasing road safety.

Aside from risk-based pricing, another example of a road safety lever integrated into motor insurance is the "**driving licence scheme**". Research has shown that the threat of losing one's driving licence is a highly effective deterrent, discouraging drivers from breaking road rules. Accordingly, many countries have strengthened their safety measures by adopting licence withdrawals for serious offences, graduated penalties for repeated offences, and a demerit point scheme for less serious ones. Insurers can further influence drivers' attitudes on the road by adapting their premiums to reflect the number of points held by the policyholder on his or her driving licence.

From “pay-as-you-drive” to “pay-how-you-drive” motor insurance

Usage-based insurance (UBI) or “pay-as-you-drive” insurance, is a more sophisticated mechanism where the premium depends not only upon the risk profile of the driver and the number of kilometres driven, but also the type and age of the vehicle used, the time and place of driving, and the driving behaviour. It promotes road safety by rewarding safe drivers with a lower premium if the data collected shows low-risk behaviours. This type of scheme, which is more dependent upon individual risks rather than collective risks, is relatively new but increasingly being used in HICs. Mobility is swiftly moving in those markets with alternative models, such as car-pooling and car-sharing, which impact the customer’s relationship with the vehicle. More and more people are shifting from car ownership to mobility sharing solutions. Therefore, they are more interested in insurance policies linked to driving behaviour, rather than those based on vehicle specifications. The impact of new mobility solutions is further analysed in Chapter 3 of this report.

In the near future, the UBI mechanism could become ubiquitous due to telematics tools (e.g. connectivity and geo-localization devices for all vehicles), which will allow insurers to collect data on-the-go from their customers. Various data related to the distance driven, time, weather, place of travel, typology of the roads and traffic, but also driving behaviour or even data from the vehicle’s engine can be processed and analysed. Based on these features, insurers can calculate the “driving score” of the customer that would translate to a personalised premium for his or her motor insurance. Insurance policies based on this “pay-how-you-drive” model have already been commercialised in some HICs. For example, AXA Direct Insurance launched in France the “YouDrive” offer, targeting young drivers using a free connected device installed in the vehicle to assess their driving behaviour (e.g. harsh acceleration, hard braking, sharp turns). Discounts for customers displaying safer behaviours can be up to 50% of the original premium. With this scheme, the cost of Motor Insurance adjusts dynamically to changes in risk exposure while the vehicle user is driving, incentivising drivers to adopt safer practices. As an example, for customers charged monthly for their motor insurance, the monthly premium can vary depending on how they drove in the previous month.

Developing services based on the risk knowledge to promote road safety

Leveraging on their expertise on road risks, insurers have developed value-added services to encourage safer driving behaviour. These services can vary between personal and commercial lines, and across customer segments.

For personal lines, insurers can reduce their customers’ road risks by distributing safety tools (e.g. safety jacket, warning triangle) or requiring the use of specific devices (e.g. drug and alcohol testing devices linked to engine starting for high-risk profiles, such as taxi or delivery fleets) when selling motor insurance policies. They can also offer prevention services, day-to-day support or post-crash assistance respond to customers’ needs and better protect them. For example, AXA in France and Luxembourg launched the “Garantie Joker” targeting young policyholders. If the driver feels he or she should not drive because of sleep deprivation or alcohol consumption, the customer may enjoy a free taxi ride 24 hours a day to safely go home, within a radius of 70 kilometres. It has proven to be a popular service: in 2016, in France, 3,347 taxi rides were offered to AXA’s customers as part of this service. Meanwhile, AXA in Greece launched the AXA Driving Academy, which grants motor insurance premium discounts to young drivers attending the Driving Academy where they learn safe driving techniques. Drivers aged 18 to 24 years old get a 25% reduction in their annual premiums. Such innovative services are a strong differentiator in terms of customer value and a lever to improve driving behaviour promoting road safety for all.

For commercial lines, insurers have developed specific prevention services for their business customers. Zurich has had a motor fleet risk management offer since 2003 that helps corporate customers identify where they manage risks well and where there are opportunities for improvement in order to help them create a working environment that promotes safe driving for employees. To complement this, Zurich offers a range of products, ranging from online risk

assessments to e-learning sessions, and classroom and in-vehicle coaching interventions designed to help drivers and their line managers to improve behaviour. Similarly, since 2008, AXA has complemented its fleet insurance products with prevention services, such as the “Driving at Work” programme, which includes traffic regulation and driving refresher courses. More recently, insurers have been developing telematics offers for their fleet customers. Zurich Fleet Intelligence is a driver behaviour telemetry solution that has been available since 2010, providing additional insights to the management on how vehicles are being driven 24/7, enabling them to take appropriate actions to reduce road risks.

2.3. SUPPORTING THE CUSTOMER THROUGHOUT THE INSURANCE CYCLE

Insurers seek to develop strong relationships with their customers, which enable them to increase customers’ awareness of safe driving behaviour. When road crashes occur, it helps insurers better understand how and why the crash happened, which helps reduce the probability of a reoccurrence during the insurance policy period.



2.3.1. Protecting customers better

Road safety, a unique opportunity to improve customer relationships

For personal lines, motor insurance can be seen as a singular product. In most countries, drivers are required by law to get insurance coverage. As many people think of themselves as good drivers, they assume that they will not have a crash during the policy period and do not expect to contact their insurer. For the customer, contacting insurers has negative implications (e.g. a loss that leads to a claim). Insurers have limited interactions with their customers, outside of claims management and renewal processes. These limited relationships can be a source of frustration for the customers, who may not value the service they are paying for and may feel that they are not receiving value for their money. In a highly competitive environment, insurers need to demonstrate value for money by creating positive customer interactions. This part of the value chain provides many opportunities for insurers to develop new benefits and increase the customers’ perception of strong added value.

First, insurers could engage more often with their customers to offer innovative and dynamic solutions, using their risk expertise to become key partners in the customers’ daily lives. Road safety creates a unique opportunity to enhance interactions between insurers and their customers, as the majority of them are on the roads several times a day, which can be leveraged for further communications. Insurers can work on timely messages to customers that promote road safety. For example, AXA Mansard in Nigeria launched a prevention campaign on social media, which was also promoted via e-mails to its customers, #EmberSafetyCampaign #AXAMansardcares. The campaign was run from September to December 2016 – referred to as the “Ember months” – which are the four busiest months of the year, and which are marked by a higher prevalence of road crashes. Such prevention initiatives are particularly important in countries such as Nigeria, which has the highest fatality rate in Africa with 33.7 people killed in road traffic crashes per 100,000 people. Sending prevention messages through e-mails, text messages or notifications on mobile phones is a good example of how road safety can be used by insurers to create new opportunities for interaction with their customers beyond the usual insurance processes.

Leveraging road safety to offer customers new benefits is a strong lever for insurers to increase the clients’ perception of added value

The AXA Drive Coach has been downloaded more than 700,000 times in 15 countries

Promoting new technologies to increase interactions with customers and improve road safety

Other opportunities that insurers can tap to enhance their relationships with the customers are linked with new technologies. Digitalisation fundamentally changes the way in which customers interact with their service providers. Insurers can leverage and combine digital technology with their risk expertise to create innovative road safety-related services for the customers. They can use their knowledge of the customers' claims history to share insights on a mobile app about the risks a driver may face during his or her journey. For example, by setting the destination on a navigation app, the driver would get not only a suggested itinerary but also advice on how to avoid specific hazards during the journey. This expertise could be shared with the customers and the broader public as a free service.

Insurers are using telematics to engage people more effectively and improve their driving behaviour. With these new features, insurers are able to capture driving data and send feedback with personalised advice. The AXA Drive Coach mobile app enables the user to better understand and improve his or her driving skills. It records acceleration, braking and wheel-turning level and frequency to produce an overall assessment of how the user drives and then sends useful tips on how to improve their driving practices. The AXA Drive app is available in 15 countries and has been downloaded more than 700,000 times on mobile phones and Apple Watches. Between 5,000 and 10,000 people are currently active users. **These smartphone-based initiatives with low-cost participation are key tools and can be very useful to communicate road safety good practices in both HICs and LMICs.**

In the near future, insurers are expected to go further by offering customers additional personalised services based on the data collected continuously, such as indicators concerning fuel efficiency, breakdown notification, vehicle diagnostics and maintenance, assessment of vehicle age and reliability, and even vehicle theft tracking. Insurers could also offer a free coffee at the next fuel station for a travelling customer to encourage them to take breaks during the journey. These smart features would enhance road safety, help differentiate insurers from one another and build customer loyalty.

Insurers could invest in telematics that collect driving behaviour data in order to set the motor insurance premium and develop value-added services. The data collected could also help insurers better understand and reduce road risks.

However, should insurers offer innovative value-added services, they need to be careful not to distract drivers through the use of new technologies. As previously mentioned, new technologies can help improve driving behaviour, but they can also put the driver at risk if not used properly. Insurers have an important responsibility to educate the customers on the safe use of new technologies. They should ensure that the app services they offer do not require active use or send only prevention notifications to warn about the traffic during the drive. They could also suggest to their customers to use a device to block their mobile phone connections while they are driving.

2.3.2. Embedding road safety in the post-crash support

Insurers have an essential role to play when a crash occurs to provide the customer with emergency support. It is a unique opportunity to provide support during a difficult situation and must be seen as a vital link in the motor vehicle insurance value chain to highlight the value of insurance services to the customers. Insurers are well aware of the importance of high-quality post-crash support, as it is a key lever for customer satisfaction in the long run. They usually work together with assistance providers who are specialists in managing unexpected situations, such as vehicle breakdown, health issues, and other emergencies, to ensure appropriate care is offered to customers. Vehicle-related issues make up a major part of the assistance business. For example, half of the activities of AXA Assistance is related to car breakdowns, collisions, carjacking or theft.

High-quality post-crash support is a key lever for long-term customer satisfaction

In an effort to improve the services to the customers, assistance providers are investing in road safety related actions. The scope of intervention ranges from prevention services and emergency support (e.g. breakdown service, transporting passengers to their final destination) to post-crash management. For instance, AXA Assistance offers psychological assistance to the victims of a crash-related injury to help them recover mentally and emotionally and return to normal life. Assistance providers also benefit from the new technologies to strengthen their customer services. For instance, the Ready-auto app launched by AXA Assistance in Canada, China and Spain offers an online and on-demand roadside assistance service. It may, in certain circumstances, allow the vehicle occupants to quickly leave the breakdown lane of motorways, where the risk of a fatal or serious crash involving a parked vehicle and its occupants is about three times higher than that of driving along the motorway⁶⁷.

In LMICs, customer services tend to be more focused on emergency response as assistance providers usually face high financial constraints, which limit the possibilities of developing new prevention and post-crash initiatives. Furthermore, concerns on road safety issues still remain generally low⁶⁸, so insurers offer services that are closer to the immediate needs of LMIC customers, like basic towing services, which can prevent hijacking. Meanwhile, some insurers are targeting women in LMICs, offering them post-crash management services as part of their motor insurance policy. Women can feel more vulnerable when stranded on the roadside, where they can be subject to harassment. Women seem more inclined to seek out comprehensive support with embedded care services. In that context, AXA created a motor insurance line dedicated to women in Malaysia, which includes a number of convenience services (e.g. free towing for crashes and breakdown, free tyre change and battery change) and safety services (e.g. free ride home after a crash or breakdown, free window snatch theft cover⁶⁹). Other insurers are focused on women, such as First for Women in South Africa, which provides Guardian Angels for roadside assistance, or Penélope Seguros in Spain, which offers assistance to pregnant women who encounter problems on the road.

FOCUS ON 112 E-CALL, EUROPEAN CONNECTED EMERGENCY SUPPORT

Telematics gives insurers and assistance providers real-time access to customer data when a crash happens, enabling them to respond immediately, and to offer faster assistance and better customer orientation. European regulation is pushing forward an extended use of telematics with the enforcement of the 112-eCall in all vehicles marketed across the EU starting 2018. This in-vehicle emergency button automatically activates if a crash happens and shares GPS data to an emergency centre to activate fast support for victims. The ambition is to decrease by 5,000 the number of people dying on European roads through the use of this connected emergency solution. Moreover, it will create new opportunities for assistance providers to work more closely with medical emergency services and obtain access to more data about road risks.

2.3.3. Improving road safety through claims management strategies

Following post-crash support, customers can claim financial compensation for material losses and long-term care. Claims management is another vital link in the motor insurance value chain since it determines the extent of the benefits customers get from their insurance. Managing claims with care and efficiency is a unique opportunity for insurers to deliver a positive experience, enhance customer relationships, and show the value of their work. Indeed, in the context of claims management, one of the stated possible actions to implement the UN's Principles for Sustainable Insurance is to "respond to clients quickly, fairly, sensitively and transparently at all times and make sure claims processes are clearly explained and understood." A study by Ernst & Young confirmed that "making a claim is a 'make or break' moment when it comes to customer loyalty"⁷⁰. In a competitive environment, insurers are therefore paying particular attention to the claims experience, as it can foster customer loyalty and brand advocacy if valued as a high-quality service. If not done properly, the claims experience can push existing customers away. Furthermore, the more interactions there are during the insurance policy period, the more opportunities there are for customers to trust and be familiar with their insurer. This can help the post-crash support and claim management phases become more effective and successful.

In this context, insurers can invest in improving claims management and increasing automation in order to accelerate internal processes, control associated costs, and reduce the risks of customer dissatisfaction. They benefit from new technologies to facilitate interactions with their customers. More claims can be managed directly from a mobile app, which is easier and faster than traditional processes. Insurers also rely on telematics to enhance data-driven knowledge, which helps them further transform claim processes and customers services. For instance, cameras placed on the dashboard of vehicles ("dashcam") not only facilitate better post-crash support by enabling real-time crash alerts happening, but also more efficient claims management by providing images, allowing the insurer to determine where the crash occurred and how the vehicle was being driven prior to the crash. Such information can help resolve disputes or reduce fraudulent claims for vehicle damage or personal injury. It also provides benefits to customers who can get faster, well-adapted support and peace of mind.

In the long term, the data collected through telematics can help insurers better understand real-time road risks. Capgemini found that 65% of customers are prepared to let insurers monitor their driving behaviour in exchange for lower premiums⁷¹ or value-added services. This raises the issue of who should cover the costs of the technologies. Should they be carried by insurers to get customers to use telematics, or by customers, who will, in return, benefit from discounts and services?

Another key question on the use of telematics pertains to the customers' data privacy. **The ownership and use of the driver's personal data could raise significant privacy issues and result in further regulatory and legal barriers. Guaranteeing the confidentiality of the data generated through connected devices will therefore be a crucial issue for insurers to secure the customers' trust.** According to Insurance Europe: "The key to unlocking the potential coming from data is to ensure that the access to all the risk data is only controlled by consumers and achieved through open, interoperable, standardized and secure technology to which all service providers, including insurers, can have access"⁷². Therefore, insurers need to work with governments in HICs and LMICs to develop data privacy regulations that protect customers while maintaining the opportunity for businesses to innovate and offer new products and services.

65% of customers would let insurers monitor their driving behavior in exchange for lower premiums or services

3. PROMOTING ROAD SAFETY IN THE MOTOR INSURANCE BUSINESS OF THE FUTURE

Given the strong influence of motor insurance on driving behaviour and crash prevention, the previous chapter aimed at illustrating how insurers can take further actions today to help improve road safety, both in HICs and in LMICs. In the coming years, the traditional motor insurance business is likely to be heavily disrupted by the cumulative effect of distinctive new trends: technology leading to the first autonomous vehicles, new shared mobility solutions, which question the need for car ownership, and digitalisation and availability of a multitude of data related to mobility, and more broadly, regulatory and global economic dynamics⁷³. Therefore, insurers need to continuously innovate and internalise new trends in order to remain relevant actors in road safety.

3.1. THE IMPACT OF AUTOMATIC DEVICES ON MOTOR INSURANCE

New technologies have already started to hit the automotive industry. The impending launch autonomous vehicles, which are designed to dispense with a human driver and entrust the driving to a computer-based system, are the latest example. In fully autonomous mode, the driver will hand over responsibility for driving decisions to the vehicle and its associated technology, shifting the key accountable person in the insurance policy. As most risks are related to human error, it is expected that eliminating this contributing factor would lead to a significant decrease in the probability of a crash occurring. These innovations may have a direct impact on the market and the distribution of motor insurance: analysts forecast motor insurance premiums to decline by 80% in some mature markets by 2040⁶⁵. Many studies have been published that have attempted to forecast the expected and unprecedented overhauling of the motor insurance industry by smart and connected technologies. Such interest emphasizes the uncertainty about the future and underscores the ongoing creative thinking to determine what motor insurance might look in the future tomorrow. Even though the speed and scale of the consequences of vehicle connectivity on the insurance industry remains uncertain, insurers are already anticipating significant changes and are starting to transform their traditional motor insurance business model.

By 2040, Motor Insurance premiums could decline by 80% due to the adoption of the connected vehicles

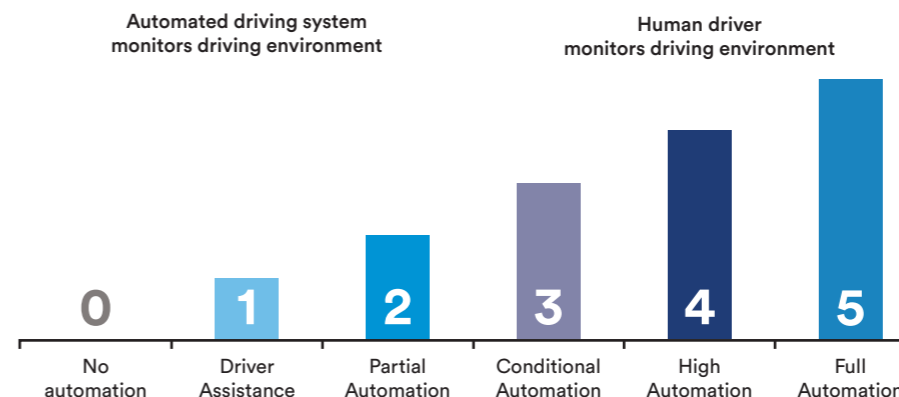


Figure 10: SAE international classification for automated driving

The adoption of autonomous vehicles can lead to a 93% reduction in road traffic crashes

Connected or semi-autonomous vehicles, corresponding to levels 1 and 2 of the internationally-accepted classification for automated system set-up by SAE International (as explained in the Figure 10)⁷⁴, are already on today's roads. They are equipped with an advanced driver assistance system (ADAS), which is focused on crash avoidance, such as forward crash warning (FCW)⁷⁵, autonomous emergency braking (AEB)⁷⁶ or blind-spot information. They also are fitted with driver aids, like cruise control, lane-keeping assistant and parking assistant that contribute to reducing road risks and decreasing fatality and serious injury rates. Swiss Re, a global reinsurer, and HERE, a location cloud company⁷⁷, analysed the potential impact of selected ADAS features on road crash frequency, differentiating between motorways and other roads. The results demonstrated a significant impact of ADAS features on fatality rates:

- Basic ADAS (FCW, blind-spot detection and lane-departure warning) would reduce crashes on motorways by 16.3% and on other roads by 11.6%;
- Sophisticated ADAS (lane keeping assistant, AEB, night vision) would reduce crashes on motorways by 25.7% and on other roads by 27.5%;
- Advanced ADAS (highway pilot) would reduce crashes on motorways by 45.4% and on other roads by 27.5%⁷⁸.

Furthermore, it is expected that road risks, including crash frequency and severity, will continue to decrease with the introduction of fully-autonomous vehicles (corresponding to level 5 of the SAE International classification). Research shows that by 2040, autonomous vehicles could lead to a 93% reduction in crashes⁷⁹, and road safety will be significantly improved: by 2030, an estimated 720,000 lives could be saved from road traffic crashes thanks to connected cars⁸⁰.

The adoption of connected vehicles is being facilitated not only by technological advancement, but also by the growth of new mobility services. The latter reduce the need for individuals to own their car, and enable mobility companies to increase their fleets of autonomous vehicles⁸¹. Moreover, consumers seem prone to adopt these autonomous vehicles, as several studies show⁸². Swiss Re and HERE expect that by 2020, more than two-thirds of cars sold worldwide will have some form of connectivity, while approximately 260 million connected cars will be on the roads⁸³. On this topic, it is important to note that **the rise of new technologies may widen the road safety gap between HICs and LMICs, as there is likely to be a lag in the adoption of new driver assistance technologies and connected services in vehicles in LMICs.** Current disparities between fatality rates may be further magnified, so special consideration needs to be given on how to fast track the adoption of effective technologies in LMICs.

Insurers can play an active role in mitigating the risks linked to vehicle factors by creating more attractive insurance policies dedicated to safer and/or more autonomous vehicles, which can prompt vehicle manufacturers to invest in connected security devices. New motor insurance business models are currently being developed, based on the exchange of data between the vehicle, connected services (e.g. onboard GPS) and road infrastructure. As we explained in Chapter 2, the analysis of the data on these factors will help individualise the risks and build a more tailored and personalised motor insurance policy. In this regard, AXA is experimenting with insurance solutions for new types of vehicles, like the InsureMyTesla policy that offers tailor made protection to owners of Tesla electric cars in Hong-Kong. It is also working on its preparedness to insure the future Google car and other autonomous vehicles. Similarly, Zurich is working with self-driving vehicle pilots, such as CityMobile2 in Europe, to better understand of the risks associated with autonomous vehicles, which would help in designing appropriate insurance policies and services. Furthermore, insurers need to take into account the new risks associated with digital systems (e.g. breakdown, hacking, data theft) that could arise from autonomous vehicles. This typology of risks conveys the need to understand, prevent and reduce new risks, and the possibility of accumulated risk exposures (e.g. hacking of an entire fleet of autonomous vehicles). This latter may need to be addressed by pooling and diversifying risks from a large number of policyholders, including buying adequate reinsurance protection to cover large losses.

FOCUS ON AUTONOMOUS VEHICLES

Autonomous vehicles create a new paradigm for the motor insurance industry. Road risks could be significantly reduced, but the responsibility for safety shifts from the driver to the vehicle, which will involve vehicle manufacturers, software providers, and service providers.

Also, automation brings new risks from large-scale threats (e.g. terrorist hacking). Insurers need to assess their current risk and insurance business models to adapt to this technological innovation and new paradigm. Furthermore, policymakers and regulators need to review current laws and regulations relating to the use of motor vehicles and amend them as necessary, or enact new ones.

Vehicle and infrastructure connectivity (vehicle-to-vehicle V2V and vehicle-to-infrastructure V2I data transmission) can facilitate road safety by helping to reduce road crashes, and consequently the number of insurance claims. Insurers and society as a whole have an interest in encouraging the use of in-vehicle connected technologies, as they will generally reduce the risks to which road users are exposed. They are now expected to invent the new business model, covering the risks associated with computer-based vehicles, dealing not just with individual customers, but also with vehicle manufacturers, original equipment manufacturers (OEM), and technology providers.

The table below links the new technology devices to the three phases of the motor insurance value chain, described in this report, highlighting how they can help prevent and reduce risk incidence (phase 1), promote safer driving through insurance (phase 2) and offer a better support to customers (phase 3) to promote road safety globally.

Table 6: Technological Developments in the value chain

	Technology	Description	Indicative players
Phase 1: Preventing and reducing road risks	Self-driving cars	Autonomous vehicles offer safer driving through machine learning technology not subject to human error	Alphabet Tesla Audi Volvo
	Driver assistance	Systems focused on collision avoidance and driver aids, contribute to less risks on the road and less fatalities	Peugeot BMW
Phase 2: Insuring road risks	Mobile applications	Smartphones and applications to educate drivers on vehicle maintenance and tools/features to prevent distracted driving	Apple CarPlay DriveScribe Endui
	Usage based premiums	Data from connected devices used for risk assessment & pricing. Safe and/or infrequent drivers are rewarded with lower premiums	Generali Zurich QBE
Phase 3: Supporting the customer	Ride sharing insurance	New insurance policies for secure ridesharing, which encourages less cars and thus less crashes on the road	AXA BlaBlaCar
	Telematics	GPS enabled technology to monitor drivers and fleets, which discourage unsafe driving, inform necessary people of whereabouts etc.	AirIQ MamaBear
	Comparison websites	Smartphones coordinated with tow-truck finders and offer price comparisons for car services	BookMyGarage MyCarNeedsA.com

**AXA has insured
20 million journeys
with Blablacar
since 2015**

3.2. NEW BUSINESS MODELS LINKED TO DISRUPTIVE MOBILITY TRENDS

The move towards shared mobility will also deeply impact the automotive and insurance industries, leading to a reduction of the size of car parcs and to a disruption of the traditional motor insurance business. Peer-to-peer car rental services, car-sharing, ride-sharing or car-pooling solutions are gaining traction in urban areas where customers forego car ownership and instead take multi-modal journeys. Moreover, they are supported by deeper macro trends across societies and economies, such as other initiatives to reduce mobility costs, and climate change impacts and solutions.

These mobility trends are driving new risks because driving can be split between several drivers for ride-sharing or a car can be owned by distinct individuals in car-sharing, which create opportunities for insurers to experiment with new insurance coverage schemes for shared fleets such as universal third party liability or coverage for limited driving time. Many insurers have partnered with key players of the sharing economy to develop new models. Since May 2015, AXA has insured 20 million journeys with Blablacar, a key player in long-distance ride sharing in Europe. This innovative policy offers specific protection for the driver and the passengers of the vehicle⁸⁴. Also, AXA is entering into the car-pooling market by insuring the fleets of GrabTaxi in Singapore and Uber customers (personal liability cover) in Egypt and in Nigeria. Car-pooling insurance policies cover drivers and passengers for contingent liability and personal injury.

These mobility trends require insurers to innovate and adapt the traditional motor insurance business into a new paradigm, which will offer insurance for various mobility schemes. According to Swiss Re and HERE: *“Vehicle data combined with other sources of data (smartphones or infrastructure) could help insurers obtain a comprehensive picture of a driver’s usage of mobility services, whatever they may be. Such analysis paves the way for insurers to develop a new scheme of policies that cover an individual using any type of mobility services (vehicle, metro, flight...), and not just for his/her driving”⁸⁵.*



CONCLUSION

The review of the current road safety initiatives led by insurers to enhance road safety undertaken in this report, combined with an overview of new areas to explore, aims at building the business case for the insurance industry strengthen its contribution to road safety. Insurers have a fundamental business interest to invest in road safety. Motor insurance revenues and profitability are directly linked to the costs, frequency and severity of road crashes, and a responsible and sustainable insurance company attracts and retains customers. Moreover, there are important human, social and economic reasons for the insurance industry to promote road safety. Road traffic crashes remain one of the leading causes of death globally, with 1.25 million people killed on the world’s roads each year, and cause a major constraint on human, social and economic development, especially in LMICs. As major players in the road safety related business, insurers are well placed to limit the consequences of this global burden. They can utilize key levers to incentivise safer driving and improve road safety including:

- Preventing and reducing road risks:** Insurers can advocate a safer driving environment (e.g. safer roads, safer vehicles, better protection for road users) to help prevent and reduce road risks and limit the occurrence of road crashes. They can also carry out or fund research to better understand road risks and inform the design of more effective prevention initiatives. It is important for insurers to collaborate with all stakeholders engaged in road safety to strengthen prevention and safety. Advocacy efforts targeting public authorities are necessary to guarantee sustainable protection for all road users, while partnerships with civil society, international organisations and governments are a strong enabler of prevention and education on road risks and protection. Finally, engaging infrastructure suppliers and vehicle manufacturers can help increase the quality of roads and vehicles.
- Insuring road risks:** Insurers design motor insurance policies to insure potential road risks. While developing an insurance product, they can utilize distinct levers to promote safer driving. The cost of the premium can reflect driving behaviour, creating a financial incentive for safe driving. Furthermore, insurers have been collecting a wealth of data over the years that can be further analysed to better understand road risks. In this regard, there is a strong need for collaboration within the insurance industry to promote road safety. In this context, building on the work of the “Insurance for Safer Roads” initiative, the GRSP is facilitating a larger coalition for reinsurers, insurers and brokers committed to road safety in order to identify further opportunities for collaborative efforts.

- Supporting the customer throughout the insurance cycle:** Insurers are developing new services for their customers. Aside from education and prevention initiatives and services, insurers provide customers with post-crash support and claims management. While new technologies and telematics open significant opportunities for new road safety services, insurers need to remain cautious about an increased risk of distracted driving due to the widespread use of smartphones and in-vehicle technologies. Moreover, they need to advocate a fast, efficient and inexpensive adoption of new technologies in vehicles sold in LMICs to prevent further widening of the road safety gap between HICs and LMICs.

Insurers have already carried out many initiatives to help improve road safety worldwide and contribute to the global target set by the United Nations within the SDGs to halve by 2020 the number of global deaths and injuries from road crashes. The potential benefits of these initiatives for society as a whole are even larger, as road safety improvements are also linked to environmental and health issues. The less vehicles are used and the more crashes avoided, the less congestion, pollution and waste, and human health and wellbeing will be better protected, as demonstrated by climate change research⁸⁶.

A range of concrete actions have been identified in this report to enable insurers to further promote road safety. A lot remains to be done before road crashes are contained worldwide and strong commitment by the insurance industry is a key step in the right direction. Nevertheless, it should be recognised that the motor vehicle insurance industry is on the verge of a major overhaul, triggered by the revolution of new technologies in the vehicle manufacturing industry, by the increasing role of data in the development of new insurance products and services and by the new mobility trends that are emerging. In this context, the insurance industry is a key player that can facilitate and leverage on these trends to build new business models that will optimise the safety and wellbeing of all those who use the roads.

BIBLIOGRAPHY

International organisation reports

- ADB. (2003). Road safety funding and the role of the insurance industry. Road safety guidelines: for the Asian and Pacific Region. Asian Development Bank. Retrieved 11 October 2016 from <http://www.adb.org>
- Fronsco, A. (2011). Road safety and insurance markets overview. Geelong, Australia. http://www.oecd-ilibrary.org/transport/road-safety-and-insurance-markets-overview_5kg29s2v5f31-en?crawler=true
- Global health Observatory data, World Health Organization (WHO) <http://www.who.int/gho/en/>
- Global Plan for the Decade of Action for Road Safety 2011-2020, World Health Organization (WHO)
- Gönülal, S. (2009). Motor third-party liability insurance. Primer Series on Insurance Issue. World Bank. Retrieved on 29 February 2013 from www.worldbank.org/nbf
- Towards Zero: Ambitious road safety targets and the safe system approach, Organization of Economic Cooperation and Development (OECD) 2008
- UNECE (2013) United Nations Economic Commission for Europe (UNECE) workshop on Insurance and Road Safety. Retrieved 10 October 2016 from http://www.unece.org/trans/roadsafe/2nd_grs_week/insurance_and_road_safety.html
- WHO (2004) World report on road traffic injury prevention. Geneva, World Health Organization. Retrieved 25 October 2016 from http://www.who.int/violence_injury_prevention/publications/road_traffic/world_report/en/

Other road safety literature

- Aeron-Thomas, (2002). The Role of the Motor Insurance Industry in preventing and compensating road casualties. TRL PROJECT REPORT PR/INT/243/02. Retrieved 10 October 2016 from http://www.transport-links.org/transport_links/filearea/documentstore/301_Insurancefinalreport.PDF or <http://r4d.dfid.gov.uk/Project/5321/>
- Bates, L., Soole, D. & Watson, B. (2012). The effectiveness of traffic policing in reducing traffic crashes. In T. Prenzler (Ed.), *Policing and Security in Practice: Challenges and Achievements*. London, UK: Macmillan Publishers
- Confidential briefing paper - Proposal for a joint initiative between the Inter-American Development Bank (IDB) and the Federation Internationale de l'Automobile (FIA) High-Level Panel (HLP) in Latin America: Approaching the insurance industry, January 2017

- Lawrence Blincoe, Lawrence, Ph.D. Ted R. Miller, Ph.D., Eduard Zaloshnja, Ph.D., Bruce A. The Economic and Societal Impact of Motor Vehicle Crashes, 2010 (Revised), May 2015 <https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812013>
- Litman, T. (2012). Distance-based vehicle insurance as a TDM strategy. Victoria Transport Policy Institute. Retrieved 21 October 2016 from www.vtpi.org/dbvi.pdf
- Pete Thomas, Andrew Morris, Rachel Talbot, Helen Fagerlind, Identifying the causes of road crashes in Europe, *Annals of Advances in Automotive Medicine*, vol 57, September 2013 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3861814/pdf/ffile043.pdf>
- Taera E G (2014) Motor Insurance Industry and Its Role in Road Safety in Ethiopia. MSc dissertation. Retrieved 10 October 2016 from <http://opendocs.ids.ac.uk/opendocs/handle/123456789/5144#V4PLV9lrKuk>
- Tooth, R., (2012). An insurance based approach to safer road use. Sapere Research Group, Australia. Retrieved 10 October 2016 from <https://trid.trb.org/view.aspx?id=1243926>
- TRL Ltd. with Ross Silcock, Babbie Group Ltd. (2001), Review of Road Safety Management Practice, Report Prepared for GRSP: Financing Road Safety Through Levies on Insurance and License Fees

Insurance literature

- Blue Paper, Morgan Stanley Research and BCG analysis, September 29, 2016
- European motor claim – Is customer satisfaction enough? Ernst & Young, 2010
- European motor insurance markets, Insurance Europe, Nov 2015
- Global Insurance Industry Insights, McKinsey&Company, 2014
- Harnessing insurance to African development as a whole, A.de Montchalin and G. Wattez-Richard, 2017
- KPMG LLP actuarial analysis
- The future of motor insurance. How car connectivity and ADAS are impacting the market, joint paper by HERE and Swiss Re

NOTES

- 1 European Commission Annual Accident Report http://ec.europa.eu/transport/road_safety/sites/roadsafety/files/pdf/statistics/dacota/aar2016_infographics.pdf
- 2 FARS 2012 (Final), 2013 (ARF), NASS GES 2012, 2013 <https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812101>
- 3 WHO data <http://www.who.int/mediacentre/factsheets/fs358/en/>
- 4 "The Global Cost of Road Crashes" WHO data (2013) and iRAP data (2013)
- 5 The Global cost of road crashes, based on the "True cost of road crashes", International Road Assessment Program (IRAP), 2008
- 6 Global status report on road safety, World Health Organization, 2015
- 7 AXCO database 2017
- 8 "The Global Cost of Road Crashes" WHO data (2013) and iRAP data (2013)
- 9 AXCO database, 2017
- 10 AXCO database 2017
- 11 Global Status Report on Road Safety, WHO, 2015
- 12 Total amount invested by AXA France, AXA Greece, AXA Ireland, AXA Spain and AXA Switzerland in 2014. Exchange rate: €1 = US\$1.05685
- 13 Principles for Sustainable Insurance, UN Environment, 2012
- 14 KPMG LLP actuarial analysis <https://www.axa.com/en/spotlight/story/the-connected-car>
- 15 Blue Paper, Morgan Stanley Research and BCG analysis, September 29, 2016
- 16 Gross National Income (GNI) per capita is the dollar value of a country's final income in a year divided by its population using Atlas methodology. Data from World Development Indicators database, World Bank, March 2015. <http://data.worldbank.org/indicator/NY.GNP.PCAP.CD/countries>.
- 17 WHO data <http://www.who.int/mediacentre/factsheets/fs358/en/>
- 18 World health statistics 2008 (www.who.int/whosis/whostat/2008/en/index.html)
- 19 Pete Thomas, Andrew Morris, Rachel Talbot, Helen Fagerlind, Identifying the causes of road crashes in Europe, *Annals of Advances in Automotive Medicine*, vol 57, September 2013 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3861814/pdf/ffile043.pdf>
- 20 https://ec.europa.eu/transport/road_safety/specialist/statistics_en
- 21 Global Status Report on Road Safety, WHO, 2015
- 22 WHO data <http://www.who.int/mediacentre/factsheets/fs358/en/>
- 23 World health statistics 2008 (www.who.int/whosis/whostat/2008/en/index.html)
- 24 Global health Observatory data, WHO
- 25 Global status report on road safety, World Health Organization, 2015
- 26 Global burden of disease, 2004, http://www.who.int/violence_injury_prevention/key_facts/VIP_key_facts.pdf
- 27 "The Global Cost of Road Crashes" WHO data (2013) and iRAP data (2013)
- 28 <http://www.who.int/mediacentre/factsheets/fs358/en/>
- 29 The Global cost of road crashes, based on the "True cost of road crashes", International Road Assessment Program (IRAP), 2008
- 30 NHTSA: National Highway Traffic Safety Administration
- 31 Lawrence Blincoe, Lawrence, Ph.D. Ted R. Miller, Ph.D., Eduard Zaloshnja, Ph.D., Bruce A. The Economic and Societal Impact of Motor Vehicle Crashes, 2010 (Revised), May 2015 <https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812013>
- 32 Global status report on road safety, World Health Organization, 2015
- 33 The Global cost of road crashes, based on the "True cost of road crashes", International Road Assessment Program (IRAP), 2008
- 34 AXA Egypt data, 2017
- 35 Pete Thomas, Andrew Morris, Rachel Talbot, Helen Fagerlind, Identifying the causes of road crashes in Europe, *Annals of Advances in Automotive Medicine*, vol 57, September 2013 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3861814/pdf/ffile043.pdf>
- 36 Risk factors for road traffic injuries, WHO
- 37 13th Survey of French driving behaviour, AXA Prévention, 2017 <https://www.axaprevention.fr/barometre-comportement-francais-volant-2017>
- 38 Global Status Report on Road Safety, World Health Organization, 2015
- 39 Acute Sleep Deprivation and Risk of Motor Vehicle Crash Involvement, AAA Foundation for Traffic Safety, December 2016 <https://www.aaafoundation.org/sites/default/files/AcuteSleepDeprivationCrashRisk.pdf>
- 40 *Global Plan for the Decade of Action for Road Safety 2011-2020*. United Nations Road Safety Collaboration. Geneva: World Health Organization (WHO)
- 41 *Zero Road Deaths and Serious Injuries: Leading a Paradigm Shift to a Safe System*. International Transport Forum of the Organisation for Economic Development. Paris: OECD Publishing
- 42 Observatoire national interministériel de sécurité routière, 2015
- 43 AXCO database 2017
- 44 European motor insurance markets, Insurance Europe, Nov 2015
- 45 EU motor insurance Directive (2009/103/EC)
- 46 The data does not include Indonesia
- 47 AXCO database, 2017
- 48 Motor insurance & Reinsurance, Current issues and future trends, Scor Global P&C, February 2015
- 49 El mercado asegurador latinoamericano en 2013-2014, Fundación Mapfre, 2015
- 50 "Harnessing insurance to African development as a whole", A.de Montchalin and G. Wattez-Richard
- 51 World Bank data on Latin America & Caribbean - <http://data.worldbank.org/region/latin-america-and-caribbean> / El mercado asegurador latinoamericano, Fundación Mapfre, 2015
- 52 World Bank data on Europe and Central Asia - <http://data.worldbank.org/region/europe-and-central-asia>
- 53 AXCO database, 2017
- 54 "The future of motor insurance. How car connectivity and ADAS are impacting the market", joint paper by HERE and Swiss Re, 2015
- 55 Motor insurance & Reinsurance, Current issues and future trends, Scor Global P&C, February 2015
- 56 Global Insurance Industry Insights, McKinsey&Company, 2014
- 57 European motor insurance markets, Insurance Europe, Nov 2015
- 58 AXCO database, 2017
- 59 MTPIL is not compulsory in Indonesia but government levies a fee for third party liability while vehicle registration
- 60 TRL Ltd. with Ross Silcock, Babbie Group Ltd. (2001), Review of Road Safety Management Practice, Report Prepared for GRSP: Financing Road Safety Through Levies on Insurance and License Fees
- 61 Total amount invested by AXA France, AXA Greece, AXA Ireland, AXA Spain and AXA Switzerland in 2014. Exchange rate: €1 = US\$1.05685
- 62 Asociación Mexicana de instituciones de Seguros (AMIS)
- 63 El mercado asegurador latinoamericano en 2013-2014, Fundación Mapfre, 2015
- 64 Proposal for a joint initiative between the Inter-American Development Bank (IDB) and the Federation Internationale de l'Automobile (FIA) High-Level Panel (HLP) in Latin America: Approaching the insurance industry, January 2017
- 65 British RoadSafe partnership <http://www.drivingbusinesssafely.org/statistics.php>
- 66 Road safety in the WHO African region. The facts 2013 http://www.who.int/violence_injury_prevention/road_safety_status/2013/report/factsheet_afro.pdf
- 67 UK public authorities – Safe use of roadside verges in vehicular emergencies (Survive)
- 68 Interview with Jean-Pierre Lerin, director of international motor / homes at AXA Assistance, conducted on 17/01/2017
- 69 Free window snatch theft cover is offered if the customer adds an additional driver-passenger personal accident cover to his comprehensive motor insurance
- 70 European motor claim – Is customer satisfaction enough? Ernst & Young, 2010, p12
- 71 World Insurance Report, Capgemini 2015
- 72 European motor insurance markets, Insurance Europe, Nov 2015, p11
- 73 Blue Paper, Morgan Stanley Research and BCG analysis, September 29, 2016
- 74 SAE International's new standard J3016: Taxonomy and Definitions for Terms Related to On-Road Motor Vehicle Automated Driving Systems https://www.sae.org/misc/pdfs/automated_driving.pdf
- 75 FCW technology alerts the driver of potential obstacles on the path
- 76 AEB technology automatically stops a vehicle before it hits an obstacle
- 77 <https://here.com/en>
- 78 "The future of motor insurance. How car connectivity and ADAS are impacting the market", p. 9, joint paper by HERE and Swiss Re
- 79 SAE International's new standard J3016: Taxonomy and Definitions for Terms Related to On-Road Motor Vehicle Automated Driving Systems https://www.sae.org/misc/pdfs/automated_driving.pdf
- 80 FCW technology alerts the driver of potential obstacles on the path
- 81 AEB technology automatically stops a vehicle before it hits an obstacle
- 82 <https://here.com/en>
- 83 "The future of motor insurance. How car connectivity and ADAS are impacting the market", p. 9, joint paper by HERE and Swiss Re
- 84 BlaBlaCar and AXA launch first-of-its-kind ridesharing insurance product, May 2015 <https://www.axa.com/en/newsroom/press-releases/blablacar-insurance-ridesharing>
- 85 "The future of motor insurance. How car connectivity and ADAS are impacting the market", p. 9, joint paper by HERE and Swiss Re
- 86 C40 Cities Benefits Research programme, <http://www.c40.org/other/benefits>

CONTACTS

Michael Chippendale, GRSP
michael.chippendale@ifrc.org

Alexiana Cirier, AXA
alexiana.cirier@axa.com

Andrew Price, Zurich
andrew.price@uk.zurich.com
