THE FUTURE OF COMPULSORY THIRD PARTY
INSURANCE IN QUEENSLAND

PREPARED FOR

MOTOR ACCIDENT INSURANCE COMMISSION
QUEENSLAND GOVERNMENT
MARCH 2016

PART A - EXECUTIVE REPORT

This document is the Executive Report (Part A) for the Future of Compulsory Third Party Insurance in Queensland study.

A supplementary report (Part B) has been prepared that provides additional discussion and information.

Foreword

Not long from now, we will be able to dramatically reduce the number of road injuries. Between 2000 and 2011, approximately 220,000 people were injured in road traffic crashes in Queensland (Department of Transport and Main Roads (DTMR), 2016). A significant proportion of these injuries were due to bad driver behaviour – at least 63 per cent of hospitalisations from 2009 to 2014 were caused by drivers that disobeyed road rules (DTMR, 2015, p. 2). Human error, such as overestimating perceptual-motor skills or being mentally preoccupied, are also factors in many crashes.

Driverless vehicles, on the other hand, do not drink alcohol, fall asleep or speed. When looking to the future, it is possible that human controlled cars may be illegal on public roads. Medical advances are also allowing people to recover faster than ever. It may just be a matter of time when personalised medical treatments administered by robots will be available in Queensland.

Cities will be transformed as transportation modernises. Smart, driverless cars will enable new services and lifestyles. Road infrastructure will be more efficiently managed with real-time usage fees. Road congestion and vehicle-related greenhouse gas emissions are likely to diminish.

Medical costs may still continue to climb over the coming decade, however with less crashes and application of new technologies (e.g. 3D bio fabrication, stem cell treatments) the overall outcome for society is positive. For victims of serious crashes, where full recovery is not possible, they will benefit from new assistive technologies, such as neural interface devices, allowing them to return to society.

Between 2000 and 2011, approximately 220,000 people were injured in road traffic crashes in Queensland. Driverless vehicles, on the other hand, do not drink alcohol, fall asleep or speed.

For insurance services, there is an ever-increasing need to provide tailored insurance products, which is already evident in other forms of property insurance. Increasing vehicle-to-anything connectivity can make this happen and Queensland could lead the country in this development.

This report aims to give us all a glimpse into a potential future so that decisions that can influence the best possible outcome can be made. We believe that while there will be new risks and areas of uncertainty surrounding driverless vehicles, this is an exciting period for organisations attached to the transportation industry. And the best part of it: the time to act is now.

Marek Kowalkiewicz
Chair, PwC Chair of Digital Economy at QUT

Acknowledgements

Contents

List of acronyms

AEB	Autonomous Emergency Braking
B2T	Business-to-thing
BITRE	Bureau of Infrastructure, Transport and Regional Economics
CARRS-Q	Centre for Accident Research and Road Safety - Queensland
CTP	Compulsory Third Party Insurance
G2T	Government-to-thing
MAIC	Motor Accident Insurance Commission
QUT	Queensland University of Technology

Introduction

Driverless smart cars are not far away. In a few years, Apple and Google are expected to release electric, possibly highly automated, vehicles in the United States. They'll be joining established car manufacturers and other new entrants who are racing to develop the next generation of motor vehicles.

In the US, the Obama administration sees vehicle automation as an integral part of a modern transportation system and proposes to spend US$4 billion over a decade to accelerate the adoption of driverless vehicle technology (Spector & Ramsey, 2016). Australian state governments are also progressing trials (first one completed in November 2015 in South Australia) and regulatory changes to enable the use of driverless vehicles on public roads.

With approximately 1.2 billion cars on roads globally and an average (modest) assumption of one hour driving per day per car, a completely driverless car will unlock approximately 400,000 years of attention every year.

While it may still be more than 10 years before the average passenger vehicle on Queensland roads is truly driverless, the transformation of the transportation sector is much more expansive. We now refer to smart vehicles, cities, infrastructure and systems where objects, including cars, roads and buildings are able to communicate and automate activities that previously relied on human control. They will form distributed digital networks, collecting and processing vast amounts of data, communicating with all manner of internet enabled or virtual objects, and at the same time move passengers safely from A to B.

On top of all of this, driverless cars will allow drivers to shift their attention from focusing on traffic to other activities (entertainment, education, work). A simple calculation demonstrates the potential impact here: With approximately 1.2 billion cars on roads globally and an average (modest) assumption of one hour driving per day per car, a completely driverless car will unlock approximately 400,000 years of attention every year.

Thus, smart vehicles will become a new platform for services and products, a new digital engagement channel, mobile places of working, communication, learning and consumption of culture, propelling new economic and social activity that is similar to the step change that mobile technologies triggered during the late 2000s. Some of these applications have already been developed. For example, ParkWhiz and Visa have developed an app for digital dashboard displays that allows parking costs to be paid automatically without obtaining tickets or accessing a wallet (Newcomb, 2016).

Smart vehicles will become the new platform for services and products, a new digital engagment channel, mobile places of working, communication, learning and consumption of culture, propelling new economic and social activity that is similar to the step change that mobile technologies triggered during the late 2000s.

Insurance organisations, including the Queensland Government Motor Accident Insurance Commission (MAIC), are also sensing broader digital economy trends. Critically for MAIC, there is also a need to consider the implications that arise from a broad range of trends relating to nascent digital technologies, driver behavior, motor vehicle ownership, medical advances and costs. These factors, including car technology, will influence the frequency and severity of crashes and/or the costs associated with rehabilitating injured persons.

Further, organisations which operate in the insurance sector need to re-examine how their markets are evolving, sense demographic shifts, proactively evaluate digital affordances, assess new types of risks (e.g., hacking driverless cars) and overall increase their levels of revenue resilience.

Study Method

In late 2015, MAIC engaged the PwC Chair in Digital Economy (the Chair) based at Queensland University of Technology (QUT) to investigate how the Queensland Compulsory Third Party (CTP) scheme would be impacted by, and improved, in light of advances in the digital economy.

An extensive literature review was undertaken, as was consultation with domain expert researchers at QUT. A scenario thinking exercise enabled 10 participants from MAIC and QUT to consider the vast and disparate set of events that could influence the future of the CTP scheme.

The scenario thinking method (Wright & Cairns, 2011) aimed to help decision makers and others examine the level of certainty and impact for each of the various trends. Finally, a survey of 49 QUT students sought to identify their preferences for motor vehicle ownership, transportation modes and attitudes towards vehicle automation in order to understand emerging patterns and implications for the scheme.

Snapshot of key trends

MOTOR VEHICLE TECHNOLOGY

Smart vehicles, those that are connected and highly automated, will radically change the CTP insurance landscape. Highly automated vehicles are already common on easier to navigate highways in Germany and California, but it may be more than 10 years before driverless vehicles are able to cope with more challenging situations such as flooding, fog or city traffic. In any case, the increasing diffusion of driver assist technologies will incrementally reduce road trauma.

For example, modelling prepared for the Bureau of Infrastructure, Transport and Regional Economics (BITRE) showed that if Autonomous Emergency Braking (AEB) was installed in all new cars sold from 2018, approximately 600 lives could be saved and 24,000 hospitalisations prevented in Australia by 2033 (BITRE, 2014, p. x).

Further, the increasing rate of connectedness in motor vehicles is also expected to reduce the incidence of road trauma by introducing a range of safety applications such as auto-braking activated by infrastructure (Doecke, Grant & Anderson, 2015).

High connectivity will also provide opportunities for new processes, such as automating emergency response, which is currently available in limited makes in Australia (e.g. BMW, Ford, and Mercedes). Connectivity will lead to entirely new types of relationships in the form of business-to-thing (B2T) and government-to-thing (G2T) interactions.

Massive investment has been poured into automated vehicle research and development and investigations are continuing to increase our understanding of how driverless vehicles will integrate into our road systems.

Advanced driver assistance systems

Carmakers are facing seismic change. Suppliers which were largely kept under the hood are set to grow in influence as the industry adds more and more autonomous features to vehicles

Suppliers listed in blue*

Detects close range objects to aid parking and avoid collision by using radio waves
Autoliv, Bosch, Continental, Delphi, Denso, Hella, TRW

Enables in-car night vision systems that can detect objects further away than traditional headlights helping to avoid collisions at night
Autoliv, Bosch, Denso

Integrates driver assistance functions; algorithms for every scenario
Carmakers, Tier-One suppliers, Google, Eletrobit, Mobileye, IBM

Semiconductors underpin advanced electronic functionality
Renasas, Infineon, ST, TI, Freescale, NXP, Nvidia, Intel

Front/rear short radar

Infrared

Ultrasound

Software

Vehicle to vehicle comms

Semi-conductors

Advanced mapping

Long range radar

Stereo cameras

Used in front and rear parking sensors in modern cars. Will be adapted for assisted parking and short range pedestrian/obstacle detection
Bosch, Continental, Denso, Valeo
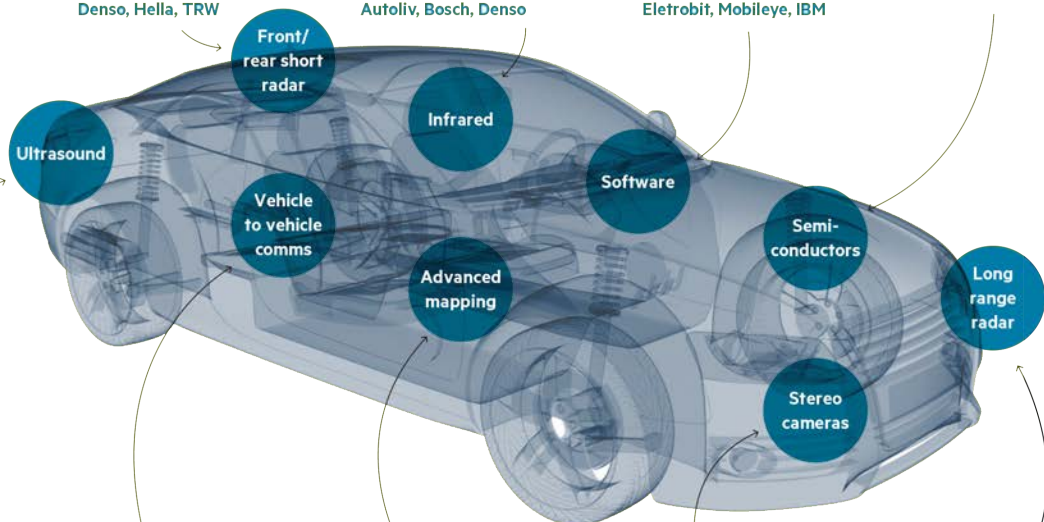
Allows vehicles to communicate with each other
Autotalks, Codha Wireless

For precise navigation
Google, TomTom, HERE (Nokia)

Identifies both directional and distance information used in lane departure systems and traffic sign recognition
Autoliv, Bosch, Continental, Takata

Seeks longer range objects for use in Adaptive Cruise Control systems
Autoliv, Bosch, TRW, Continental, Hella, Valeo

Sources: Exane BNP Paribas; Autoliv; Morgan Stanley; FT research   *Lists of suppliers are not exhaustive   Image: Cherezoff/Dreamstime   FT graphic

Motor vehicle technology continued...

One area of interest currently is identifying and developing solutions for problems arising from human-automated car interaction. For example, as we incorporate more driver assist technologies, risk assessors will need to evaluate a range of new risks. In highly automated (but not yet driverless) vehicles human drivers will still need to take over control if required and this is demonstrated to be a period of high risk.

Johns et al. (2015, p.405) discovered it takes 7 seconds for the driver to regain sufficient attention to control a vehicle after being cued to take over control from the automation system.

This is potentially a major problem if the driver is required to undertake a complex driving task in a shorter period of time. The researchers plan to perform the experiments with more complexity and using participants who are novice drivers or older drivers (Johns et al. 2015, p. 406).

"up to 90% of road trauma may be reduced by mid-century" (McKinsey, 2015)

DIGITAL TECHNOLOGIES

Other digital trends and their application relevant to the CTP scheme are listed here:

- An increasing number of new vehicle windscreens feature augmented reality and volumetric displays to alert drivers to obstacles or assist with other driving tasks. CARRS-Q researchers in collaboration with the Honda Research Institute are about to commence a multi-year research project that includes developing an in-vehicle virtual driving coach aimed at reducing risky driving behaviour.
- A growing number of connected vehicles will allow for real-time tracking and pricing of motor vehicle usage, relevant for infrastructure charges as well as behavior-based insurance pricing models.
- Smart cars could act as agents on behalf of their owners and, for example, negotiate the most attractive insurance provider for the upcoming period.
- New technologies, such as skin sensors that can detect blood alcohol, may be incorporated into new vehicles, providing unobtrusive means to reduce drunk driving (Fitzharris et al., 2015).
- Digital identities and advanced biometrics will be able to unlock features of a car to identified drivers (e.g., a driver with a suspended license would not be able to start a car).

- It could also be imagined that future smart cars carry their own 3D printer being able to print a number of required spare parts on the spot.
- The entry of customer-centric, digitally-minded corporations such as Google and Apple into the dashboard will provide drivers and passengers with previously unseen access to personal information allowing much more individualised experiences.

CONCEPTUAL SKETCH OF GAMIFICATION IN DRIVING CONCEPT
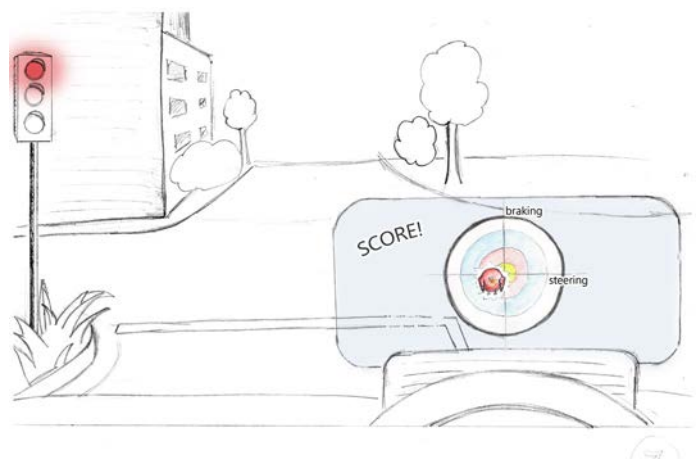
Source: R. Schroeter, personal communication, 17 February 2016

DRIVER BEHAVIOUR

Until driverless vehicles are the norm, human error and poor driving behaviour continues to be the main contributors to road trauma.

Between 2010 and 2014, 63 per cent of hospitalisations in Queensland were due to drivers disobeying road rules (DTMR, 2015, p. 2). Note, there are other human factors that contribute to crashes that are not necessarily road rule violations, some forms of distraction or fatigue cannot be determined by police when decisions regarding fault are made.

There has been improvement in some poor behaviours in recent years, for example, there has been a decrease in both fatalities and hospitalisations in Queensland linked to drink driving and speeding. However, the contribution of distraction/inattention and fatigue to hospitalisations has increased over the same time period (DTMR, 2015).

We anticipate that digital distraction could increase if digital dashboard and windscreens demand more attention from drivers. This is a real possibility given that digital businesses rely on advertising and app developer fees. Governments will need to review this trend and ensure regulations are created to ensure vehicle safety is prioritised.

DRIVER BEHAVIOUR

Sources: 1. Klauer et a. (2006) as cited in QPS, https://www.police.qld.gov.au/EventsandAlerts/campaigns/Documents/mobile_phones_and_distraction_fs.pdf; 2. BITRE (2014, p. ix); 3. Australian Transport Council (2011); 4. Contributes to 20 to 30% of deaths on the road.Australian Transport Council (2011); 5. DMR, 2013, Better Buckle Up campaign, file:///Users/sarabennett/Documents/QUT%20Digital%20Economy/CTP/Seatbelts_campaign_factsheet_2013.pdf

CAR OWNERSHIP

Motor vehicle ownership rates have been increasing in Australia over the past five years. Since 2010, the number of vehicle registrations per 1000 estimated resident population has increased by 33 registrations (Australian Bureau of Statistics, 2015).

The findings from the university student survey (n=49) conducted for this study in December 2015 suggest that car ownership is still considered important or very important for 64 per cent of students. Other research indicates that some younger people are delaying car ownership (Clay, 2014).

Other trends such as: increasing usage of car and ride sharing, increasing use of other mobility modes (including electric bicycles and public transport) are likely to marginally reduce car ownership rates.

In 10 or more years, when fully automated vehicle technology is commonplace (perhaps earlier with public transportation), the traditional model of private car ownership is likely to shift more rapidly to shared vehicle models.

CAR OWNERSHIP
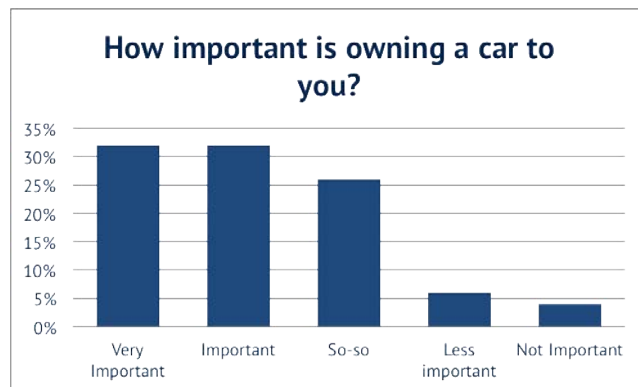
Data Source: QUT Student Survey, Future of CTP Insurance in Queensland, Dec 2015.

MEDICAL ADVANCES AND COSTS

Advances such as 3D bio fabrication, personalised pain medication, robotics and stem cell therapies promise to radically improve outcomes for injured persons. This may reduce their expected economic loss, which ultimately reduces the financial burden of road trauma.

These advances are being applied in limited circumstances now, however it may be a decade or more before measurable reduction in costs are realised. In the meantime, we note that health costs have outpaced price increase in other goods and services (Australian Bureau of Statistics, 2015).

MEDICAL EXPENDITURE (AUS)

Health expenditure has grown faster than population growth. Expenditure increased from $4,276 per person in 2001–02 to $6,230 in 2011–12.

$6230

$4276

2001-2   2011-12
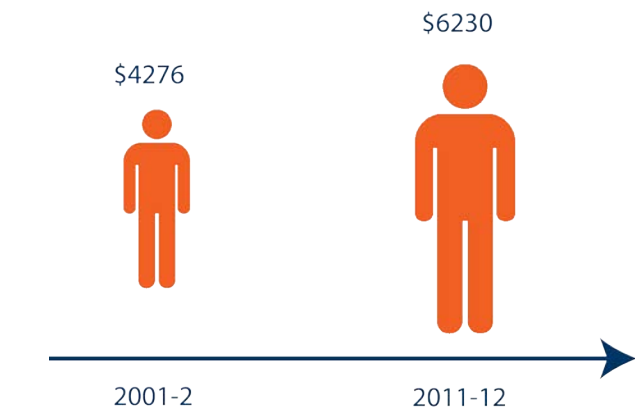
Data Source: Australian Institute of Health and Welfare (2014, p. 47)

DEMOGRAPHY AND GEOGRAPHY

Demographic modelling prepared by the Queensland Government Statistician's Office points to an ageing population, so it is anticipated that the proportion of older drivers will increase. This may see a rise in road trauma as older people experience more difficulties in driving (VicRoads, 2015) and as they are generally more frail, the medical and rehabilitation costs are generally more expensive. Road safety experts may need to increase their attention to older road users. Driverless cars, however, may offset this trend as they remove the human driver and potentially reduce crashes due to older drivers.

When assessing the future of the CTP scheme, MAIC will need to consider all members of Queensland's community including lower income and disadvantaged households as well as residents in rural, regional and remote communities. For example, in rural areas there may be additional challenges in provision of connected vehicle infrastructure. Some of the trends, such as consumer uptake of smart vehicles will also vary across different socio-economic segments and residential locations.

QLD DEMOGRAPHICS

Qld. Young and Older Persons, 2015, 2025, 2035 (Est.)

15 to 24 years   60 years +
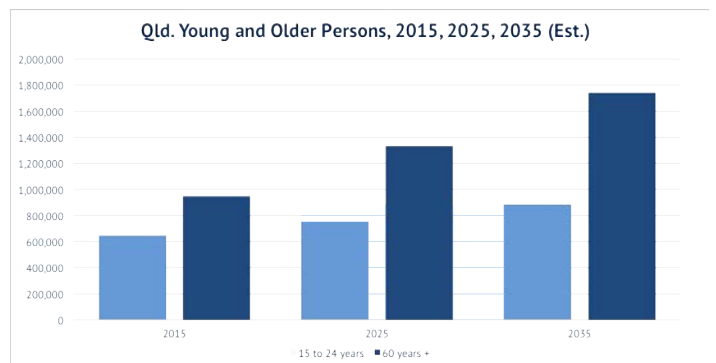
Data Source: Queensland Government population projections, medium series (2013)

Findings from the Scenario Thinking Exercise

In looking at what the future may be for the CTP scheme in Queensland, this study employed scenario thinking (Wright & Cairns, 2011). Scenario thinking is a research technique aimed at positing a range of *possible* and *plausible* futures to assist decision makers and others consider consequences and actions that are needed to address such future events. More information relating to the scenarios is presented in the supplementary report (Part B). The main findings from the scenario thinking workshop that was conducted with 10 participants from MAIC and QUT are summarised below.

Economic, social and political factors are important moderators that may slow or accelerate trends, such as the uptake of driverless vehicle technology.

- For example, if global and local economies enter recession, this will dampen new vehicle sales, thus slow the progression of driverless vehicles. Costs will initially be high and only a select few will move to driverless vehicles. Costs for infrastructure outside large population centres may impede the take up of driverless vehicles and other technologically advanced transportation infrastructure.

High uncertainty exists for many trends, including: economic outlook, climate change policy, driving behaviour, ability for driverless vehicles to navigate dirt roads or roads affected by flooding, willingness of policymakers to push through legislative changes, community acceptance and demand for driverless vehicles.

- More attention should be directed towards trends that are uncertain. Where there is

a high level of certainty, policy makers can respond early or be proactive in developing new policy. However, where high uncertainty exists, policy makers need to increase their understanding of the underlying variables that influence these uncertain trends. They also can start to formulate policy initiatives that can either mitigate negative trends or encourage positive outcomes. MAIC is encouraged to improve its preparedness or robustness for Black Swans, i.e. surprising, high impact and difficult to predict events.

Information gaps in road trauma statistics impede analysis and slow decision making.

- Greater collaboration and information sharing across government agencies, medical research institutions, insurers, hospitals, and researchers is required in order to gain a better understanding of trends and impacts.

MAIC has the ability to influence some of the desirable outcomes either through advocating changes in other government agencies and making changes to the legislation underlying the CTP scheme.

Key Findings (i) Reducing Trauma

1 **In 10 or more years, smart cars and infrastructure will be commonplace and motor vehicle crashes will be increasingly uncommon.**

- Smart systems are becoming more effective at taking over from and/or aiding drivers to assess traffic situations and react accordingly.
- These smart systems are increasingly designed to learn autonomously (with no loss of memory like in people) and from their environment (e.g. roads, other cars).
- In the short term, increasing semi-automation in new cars will reduce crashes, i.e. technologies such as Autonomous Emergency Braking (AEB).

Relevance to the CTP scheme: Currently, approximately 6,500 CTP claims are lodged each year. The frequency of claims is likely to decline at an increasing rate over the next 10 to 20 years. At the same time, personal injury liability will shift away from drivers to car manufacturers as technology takes over from humans in controlling motor vehicles. This will also require new insurance solutions focused more on technological failures (including hacking) than personal failures.

2 **Medical advances and assistive technology will be much more effective in helping injured persons get back on their feet.**

- New medical advances, such as 3D bio fabrication, stem cell therapies and robotics, are expected to improve health outcomes dramatically for injured persons, however it may be 10 to 15 years before promising technology and scientific advances are widely applied in Queensland.
- The smart vehicle might become a place for medical diagnoses if they include sensors and cameras inside vehicles as well as outside.
- Increasing effectiveness and use of assistive technologies (i.e. robots, automation and digital technology) can help injured persons overcome physical disabilities and return to productive work.

Relevance to the CTP scheme: Injured persons will be able to return to work earlier which may reduce economic loss compensation payments.

3 **Human error and poor driver behaviour remain important.**

- Until smart vehicles are widely adopted, human error and poor driving behavior will continue to be the major contributors to road trauma over the next 10 years.
- The growing digitisation of cars (e.g. larger screens, voice control) and access to digital devices while driving result in greater number of crashes due to digital distraction. Policy, technological and educational solutions will be required to address this possibly hazardous trend.

Relevance to the CTP scheme: Providing personal injury liability cover for drivers still remains relevant for the next 10 to 15 years. Research should continue to seek improvements in driver behaviour, with particular attention to an increasing proportion of older drivers as well as young drivers.

4 **Health costs are rising at a fast pace.**

- Injuries create a significant cost to the economy and hospitals capture the majority of expenditure.
- Health costs are currently rising faster than many other goods and services.
- New equipment, diagnostics, pharmaceuticals and treatments are key contributors to the rise in costs.
- However, it also can be assumed that the diagnosis, and in part therapies will become public goods that may lead to a reduction in healthcare costs.

Relevance to the CTP scheme: In the short term, costs associated with medical treatments will increase, although a corresponding decrease in crashes and better medical treatment may offset the rise in health costs.

WHAT DOES THIS MEAN?

Manufacturers of smart systems will require liability cover.

Compensation costs may reduce significanty when automation is commonplace. Ultimately the CTP scheme in current form will become redundant.

As long as pedestrians, cyclists and human drivers in conventional cars mingle together there will be road trauma.

Key Findings (ii) Modernising the CTP Scheme

5 **More detailed assessment of risk is possible.**

Increasing numbers of sensors, satellites, cameras, laser systems and the like across the globe (and in space); alongside fast, ubiquitous internet connectivity means an enormous amount of data is being collected. When the processing of this data is propelled by quantum computing, a new level of analytics will be available. Further, this increasing capacity for gathering and processing big data in real-time allows for constant tracking of:

- behaviour (of people and machines);
- car maintenance and performance;
- health symptoms; and,
- traffic and road transportation.

Real-time analysis of this big data can assist insurers, government agencies and car manufacturers in a variety of ways, such as predicting risk factors of drivers or identifying risks associated with road infrastructure or traffic conditions.

Relevance to the CTP scheme: The one-size-fits-all CTP model where vehicle class is the principal risk factor for premium calculations, could be replaced with a personalised model. Also, with increased data analysis capabilities, new patterns across the transportation and health sector may be identified, that profoundly change understanding of many issues.

6 **Administrative processes can be made more efficient.**

- Administrative processes are being automated and many soon will become redundant. For example, if motor vehicles and road infrastructure automatically records information regarding crashes, insurers would be able to verify causal factors more efficiently. This could be an important step in automating online submission of compensation claims and resolving claims quickly.
- It can also be assumed that over the next 10 years smart cars will replace some aspects of administrative tasks (i.e. pay premiums and infrastructure charges), becoming the main agents that interact with relevant corporations and public sector entities.

Relevance to the CTP scheme: The existing claims submission process could be modernised to ensure compensation and assistance to injured persons is delivered efficiently and effectively. Organisations are encouraged to plan for an increasingly B2T and G2T environment.

7 **New insurance models are emerging.**

- Peer-to-peer insurance, a sharing economy phenomenon, is gaining popularity in Europe.
- Non-traditional insurance providers have entered the general insurance market in recent years, such as supermarkets offering life insurance, home and comprehensive motor vehicle insurance.
- New real-time, usage-based insurance pricing strategies are possible particularly with the ability to use smart devices to track vehicle usage and driver behaviour more accurately and on a real-time basis. An Uber-generation will be conditioned to such a world and will increasingly question the raison-d'être for annual insurance lock-in models.

Relevance to the CTP scheme: Deregulation of the CTP scheme to allow new processes (i.e. real-time usage based insurance) and providers, including peer-to-peer insurance models, may reduce costs overall.

8 **The shift away from private vehicle ownership will accelerate.**

- The rising popularity of digital applications that enable car and ride sharing are providing people with new modes of transportation that are accessible, reliable and affordable. The advent of driverless vehicles may radically change private ownership models as these machines are more conducive to shared models or new public transportation models (i.e. operation of driverless, neighbourhood taxi transportation).

Relevance to the CTP scheme: In the first instance, the vehicle classes currently applied by MAIC may need to recognise new uses for motor vehicles. For example, ride sharing applications change how private passenger vehicles are being used and alter the risk profile of these vehicles. Second, in the longer term, the number of registered vehicles per person may decline as shared vehicle models gain popularity.

WHAT DOES THIS MEAN?

The current one-size-fits-all model can be replaced by a personalised model.

Vehicle classes may need to be revised to reflect ride sharing and multiple users.

The current CTP scheme is ripe for innovation across its administrative processes.

Our digital economy synopsis

The need for a universal, road trauma insurance scheme is confirmed for at least the next 10-15 years, particularly with the continuing use of conventional vehicles. As automation technology advances, the costs associated with road trauma are expected to decrease at a corresponding rate. Medical advances and better assistive technologies will also effectively help injured people recover quicker. Ultimately, the CTP scheme in its current form will become redundant.

In the short term, we argue that the CTP scheme will need to be adjusted and modernised. In the medium to long term, the function of the CTP scheme could be absorbed into another scheme.

With regards to adjusting and modernising the CTP scheme, the research undertaken during this study has revealed that:

- better assessment and pricing of risk is possible with real-time tracking and big data analytics;
- innovations in administrative processes can improve efficiency;
- new insurance models are emerging; and
- a shift away from private vehicle ownership in favour of more vehicle sharing will accelerate.

With regard to the current CTP scheme being absorbed into another scheme, we reached this conclusion based on three main considerations:

1. In the long term, the costs associated with road trauma are likely to be significantly lower due to vehicle automation.

2. Mandatory CTP premiums are effectively a levy paid by registered vehicle owners to ensure road trauma is adequately covered. As such, we believe governments can explore the feasibility of including all injured persons in the scheme, regardless of fault, or even injuries that may arise from other forms of mobility. The levy may need to be distributed across all households, not just registered vehicle owners.

3. The Queensland or Commonwealth governments may look to cover all citizens with transport/mobility injuries by allowing the National Disability Insurance Scheme or the National Injury Insurance Scheme to absorb all injured persons who require compensation for medical treatment, rehabilitation services and/or economic loss if they are unable to return to productive lives due to road trauma.

RECOMMENDATIONS

DATA
Harness data analytics and establish a shared data platform to better inform decisions.

OPERATIONS
Scrutinise, investigate and design proactive services to address future trends.

ADVOCACY
Advocate and promote benefits of smart vehicles. Be a driver of change.

RESEARCH
Build environmental sensing capabilities and continue research in areas of high uncertainty/high impact.

Recommendations

To adjust and modernise the CTP scheme the following actions are recommended. The actions have been grouped under four subheadings: data, operations, advocacy and research.

DATA

1. Build data analysis capabilities within MAIC to inform risk assessment and administrative processes.

2. Test the sensitivity of variables underlying the CTP scheme calculations with regards to the trends discussed in this report. For example, determine the effect of the following trends:

   - Faster growth in health costs. There are two elements that suggest this could continue – first, health costs are currently rising faster than the consumer price index and the increase in older drivers over coming decades may lead to higher medical and rehabilitation costs. While there are promising medical advances that present new, effective medical treatments for injured persons, the costs associated with developing and purchasing the technology are also very significant.
   - Reduction in the number of minor injuries due to increasing diffusion of semi-automation technologies.

3. Initiate the development of a data sharing platform that collates and presents data relating to traffic crashes, road infrastructure, injury management and medical costs. The platform should provide all decision-makers across government with real-time, relevant data. Also, discuss building big data analytic capabilities across government.

OPERATIONS

4. Scrutinise the current schedule of vehicle classes and whether they are an accurate reflection of vehicle usage and risk. For example, some passenger vehicles are now used for ride sharing which increases their exposure to road crashes.

5. Investigate how the CTP scheme may need to adjust to possible increases in product liability compensation claims (i.e. where motor vehicle automation technology fails and is 'at fault').

6. Be strategic in the allocation of new funding for research activities as well as financial support offered to other agencies. MAIC can target funding to initiatives that show highest impact (made possible with better understanding of trends) and/or where uncertainty is greatest.

7. Develop options for changing the measurement of risk and variable premium pricing mechanisms.

8. Propose changes to the MAIC legislation that enables business model innovation and new business processes, such as allowing online claims submission and processing.

9. Investigate potential for providers of CTP insurance to:

   - predict and detect significant insurance related events before vehicle owners/drivers are aware of the event, and
   - offer services with minimal or no interaction from drivers.

ADVOCACY

10. Advocate for the early introduction of connected car infrastructure and vehicle automation trials.

11. Promote the benefits of driver assist technologies, such as Autonomous Emergency Braking to consumers. This may include supporting the efforts of the Australasian New Car Assessment Program in providing transparent information about new vehicle safety ratings.

RESEARCH

12. Create an internal function within MAIC that conducts regular environmental sensing, tracks trends and identifies their relevance or meaning to the CTP scheme. It will be important to follow research that improves understanding of trends, such as increased number of older drivers and how this may moderate other trends (e.g. the adoption of car sharing or usage of mobile and connected vehicle technologies).

13. Continue to incorporate scenario thinking within MAIC and involve other related agencies, insurers and possibly car manufacturers. This will facilitate better information sharing and understanding of external trends and their level of impact and certainty.

14. Continue support of driver behaviour modification research initiatives as well as research aimed at improving outcomes for injured persons. Possible projects identified during the study include:

- Investigate the social impact of transitioning to driverless vehicles. This may include preparing strategies to overcome barriers to adoption experienced by disadvantaged and low income households. Also, the potential for new services and jobs that may arise from driverless vehicle services could be explored (i.e. services to help disabled people access driverless vehicles).
- Run trials and simulations of advanced ITS systems and driverless vehicles in regional and rural areas. In urban areas, investigate more advanced ITS technologies that are used overseas that have not been trialled in Australia.
- Research the possible increase in digital distraction experienced by drivers, particularly with increasing prevalence of new smart car interfaces.
- Conduct a research study (including a trial) of tailored, online medical and social support for people injured in road traffic crashes, including the use of 'quantified-self' wearables and digital health records.
- Prepare and analyse options for incentivising uptake of smart vehicles. This may include evaluating the economic, social and environmental impacts of different options.
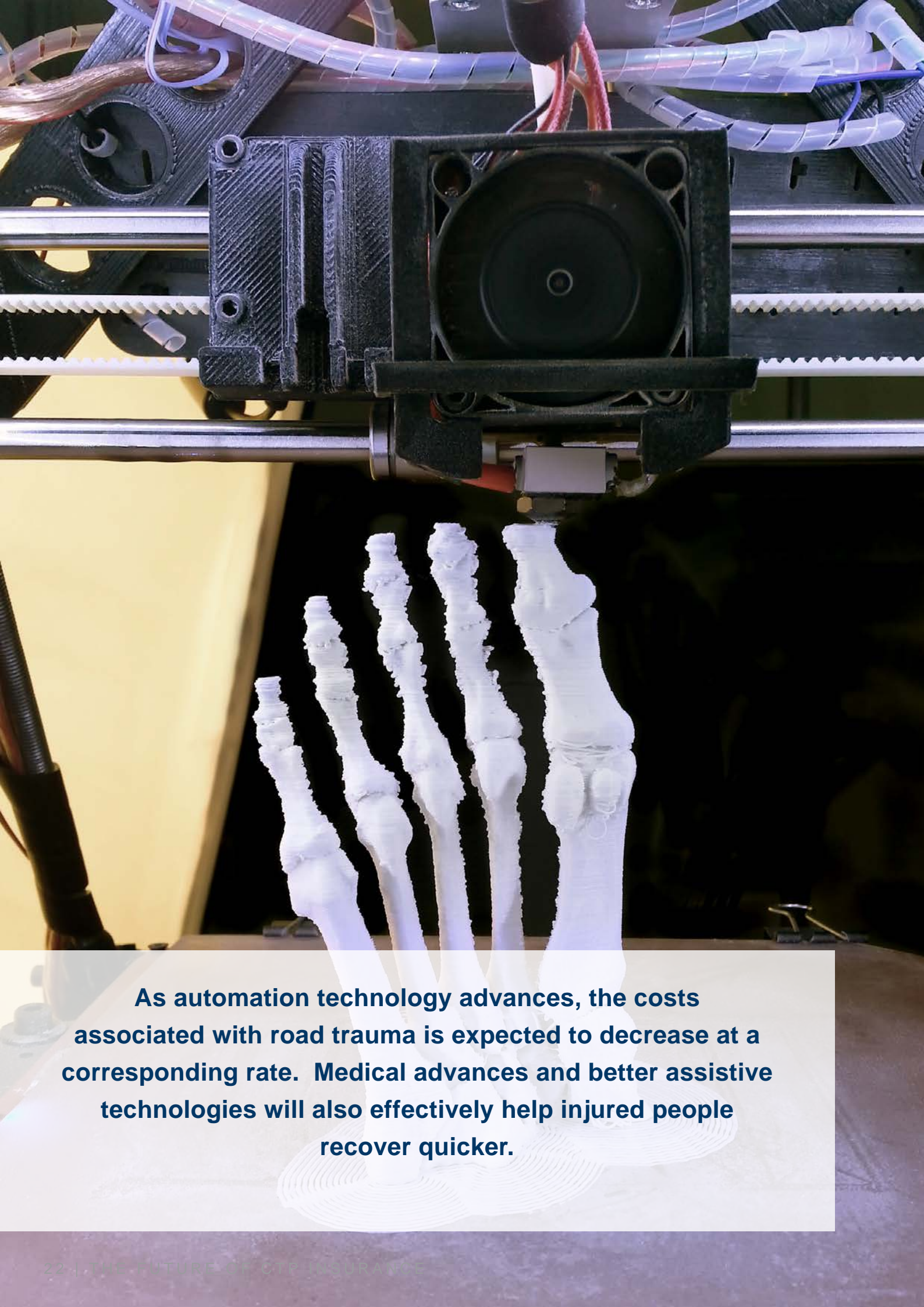
As automation technology advances, the costs associated with road trauma is expected to decrease at a corresponding rate. Medical advances and better assistive technologies will also effectively help injured people recover quicker.

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