National Transport Commission

Review of the Australian Road Rules and Vehicle Standards Rules – Project 1 – Environmental Scan

1 July 2011
Executive Summary

Project Information

GHD was asked to perform an environmental scan of short, medium and longer term issues that may impact or influence the Australian Road Rules and the Australian Vehicle Standards Rules (the Rules).

Figure 1 Methodology illustrates our approach to the assignment.

Figure 1 Methodology

Context

The Australian Road Rules (the rules) contain the basic rules of the road for drivers and riders of motor vehicles, riders of bicycles, pedestrians, passengers and others. They cover issues such as speed limits; signage; turning; indicating; traffic lights; intersections; roundabouts; level crossings; overtaking; stopping; lights; pedestrians; bicycles; and seatbelts. The Vehicle Standards Rules specify in-service or roadworthiness standards for motor vehicles, and for light and heavy vehicles operating on public roads, and their operators.

The rules perform three main functions:

1. they resolve conflicts (such as who has to give way);
2. they prescribe behaviour which is necessary for the orderly operation of the system (such as keeping a vehicle in a single lane); and
3. they prohibit behaviour which is detrimental to the operation of the system (such as driving to the right of unbroken double lines).

The rules as they are presented are robust and all-encompassing and can be readily understood by a general user. However in order to retain and or improve on those attributes they need to consider new trends and changes within the wider environment.

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The national rules were first published in 1999 (and regularly updated since they were first tabled). They originally were made under a relatively static paradigm of a relationship between vehicles and other users which was slowly evolving over a period of time.

This is now changing at a faster pace primarily due to increasing patronage, technology and environmental issues. This review considers the impact of those changes.

**Key Emerging Issues**

The emerging issues as listed below relate to all aspects of road use. Their impact is often more relevant to infrastructure than the rules themselves. Additionally their effects may be managed through a number of ways, where changes to road rules is only one avenue of response. The most efficient way of responding to these trends needs to be assessed in the context of individual trends.

The key emerging issues and trends are as follows:

- Population growth in large cities;
- Ageing population;
- Shift to public transport and active transport modes;
- Increasing congestion;
- Greater transport integration; and

Impact of those factors is affected by an ever-increasing environmental awareness and community demand for a better living environment (noise, air pollution, shared spaces etc.) that is appearing as the next priority and challenge.

Finally, the rapid technology changes and improvements, internal and external to motor vehicles will be impacting on a number of issues including enforcement, safety and back-up rules in case of failure. Whilst these can be managed for a time within the existing set of rules and guidelines, they may require some attention in the medium-to long term.

**Impact on rules**

The Australian Road Rules and Vehicle Standards Rules are all-comprehensive and can be relatively easily adjusted when required.

The existing maintenance process in place is efficient in dealing with amendments and clarifications of individual rules, and most of the future changes could be accommodated through this process.

In practical terms it means that the individual ‘technical’ rules related to speed and manoeuvres, signals and signage, intersections, stopping and parking, on-vehicle signage and devices, public transport and vehicle passengers and active transport may need amendment as required to cover the new issues that are highlighted in this report as part of the overall response to a trend.

While the changing environment and new trends may result in an increasing need to manage demand and support transport modes of higher societal value and a need to protect the most vulnerable road users, this may be best achieved through a variety of responses other than changes to the rules – for example infrastructure design, enforcement, community awareness campaigns etc.
There is no doubt that strong rules need to be in place to provide appropriate sanctions for road users who demonstrate irresponsible behaviour. The question is how many rules are required to achieve this goal? There is a growing awareness amongst road safety specialists that greater emphasis needs to be placed on initiatives that improve the inherent safety of the road transport system. This provides an opportunity to reshape and simplify the structure of the Australian Road Rules to focus on the key objective of mobility and safety.

The thousand or so rules and sub rules could be separated into legal requirements i.e. ‘must do’ and enforceable and advisory rules i.e. ‘should do’.

Consideration should be also given to development of guidelines that provide an explanation of intent and principles and can be easily disseminated through new social media.

The rules with legal requirements will need to be robust and enforceable.

Impact on Australian Vehicle Standards Rules will be indirect, primarily through changes to Australian Design Rules in the areas of technology and safety. One of the new features that may be considered is the future integration between the car technology and external technology linked to the road infrastructure including ITS and enforcement.

The impact analysis confirmed that whilst there are some dynamic trends occurring, changing Australian Road Rules is only one of the means of response, and it can be accommodated through the existing maintenance system. The key challenge is to manage and improve general awareness of the rules and to keep abreast of the technological advances to manage safety, congestion and other aspects of on-road issues.

Table 1 Provides summary of impacts on individual sets of rules against identified themes and issues.
## Table 1 Impact Summary

<table>
<thead>
<tr>
<th>Theme</th>
<th>Issues</th>
<th>Application of ARR</th>
<th>Speed and manoeuvres</th>
<th>Signals and Signage</th>
<th>Intersections</th>
<th>Stopping and parking</th>
<th>On-vehicle signage</th>
<th>Public transport</th>
<th>Active transport</th>
<th>Miscellaneous Rules</th>
<th>Vehicle Standards Rules</th>
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<tbody>
<tr>
<td>Changing demographics</td>
<td>Population growth in large cities</td>
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<td>Ageing population</td>
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<td>Increasing immigration from non-English speaking nations</td>
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<td>Societal attitudes</td>
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<td>Traffic conditions</td>
<td>Increasing congestion</td>
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<td>Growing freight task</td>
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<td>Technology</td>
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<td>Enforcement</td>
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<td>Physical Environment</td>
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### Legend

<table>
<thead>
<tr>
<th>Level of Impact</th>
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<tbody>
<tr>
<td>Denotes areas of some impact where individual rules may need to be updated in the future. The changes need to be considered within the wider context of all possible means of response to the trend.</td>
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<tr>
<td>Denotes areas of no impact on the Australian Road Rules and/or vehicle Standards.</td>
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</tbody>
</table>
# Table of Contents

Executive Summary ........................................................................................................................ i

1. Introduction ................................................................................................................................... 1
   1.1 Objective and scope of the review ............................................................................... 1
   1.2 Overview of the environmental scan approach ................................................................. 1

2. Review of Rules ............................................................................................................................ 3
   2.1 Road Rules ................................................................................................................. 3
   2.2 Vehicle Standard Rules ............................................................................................... 4

3. Theme 1 – Changing demographics ...................................................................................... 5
   3.1 Context........................................................................................................................ 5
   3.2 Relevance to the rules ................................................................................................. 8

4. Theme 2 – Changing societal attitudes .................................................................................. 9
   4.1 Context........................................................................................................................ 9
   4.2 Relevance to the rules ................................................................................................. 10

5. Theme 3 – Traffic conditions.................................................................................................. 12
   5.1 Context........................................................................................................................ 12
   5.2 Relevance to the rules ................................................................................................. 14

6. Theme 4 – Changing and emerging technology ..................................................................... 15
   6.1 Context........................................................................................................................ 15
   6.2 Relevance to the rules ................................................................................................. 16

7. Theme 5 – Changing approaches to enforcement ................................................................. 17
   7.1 Context........................................................................................................................ 17
   7.2 Relevance to the rules ................................................................................................. 18

8. Theme 6 – Changes to the physical environment ................................................................. 19
   8.1 Context........................................................................................................................ 19
   8.2 Relevance to the rules ................................................................................................. 20

9. Summary of Impacts on Rules ............................................................................................... 21
   9.1 Applied methodology ................................................................................................. 23
   9.2 Outcomes .................................................................................................................... 24

10. Reference list ............................................................................................................................ 26
Table Index

Table 1 Impact Summary ................................................................................................................................... iv
Table 2 – Stakeholder interview list .................................................................................................................. 2
Table 3 Impact Summary ................................................................................................................................... 22

Figure Index

Figure 1 Methodology ........................................................................................................................................... i
Figure 2 Age of driver and fatal and serious injury crashes per distance travelled, Australia, 1996 ............... 6
Figure 3 Past trend of births, deaths and Nett Overseas Migration (NOM) .......................................................... 7
Figure 4 Methodology .......................................................................................................................................... 23
Figure 5 Impact Assessment ............................................................................................................................... 23
Figure 6 Timeframe Assessment ....................................................................................................................... 24
Figure 7 Priority Matrix ..................................................................................................................................... 24
Figure 8 Assessment Overview .......................................................................................................................... 25

Appendices

Appendix A
Prioritisation of Issues
1. Introduction

1.1 Objective and scope of the review

The Australian Road Rules contain the basic rules of the road for drivers and riders of motor vehicles, riders of bicycles, pedestrians, passengers and others. The objectives of the Australian Road Rules when introduced in December 1999 were to:

- Introduce uniform regulations throughout Australia for all road users;
- Enhance mobility and safety by updating and simplifying traffic regulations; and
- Reduce costs and achieve administrative efficiency on a national basis.

They cover issues such as speed limits; signage; turning; indicating; traffic lights; intersections; roundabouts; level crossings; overtaking; stopping; lights; pedestrians; bicycles; and seatbelts.

Many driving laws are also linked to standards that apply for vehicles and licensing requirements. The Australian Vehicle Standards Rules specify in-service or roadworthiness standards for motor vehicles, and for light and heavy vehicles operating on public roads, and their operators.

The Road Rules primarily exists to control issues of safety, traffic efficiency, and equitable transport network, enforcement and liability, but that is only one aspect of ensuring a safe, efficient and equitable transport network and should not be considered in isolation from other influences such as:

- Behaviour change strategies;
- Liability structure;
- Design standards;
- Vehicle and driver characteristics and ability;
- Emerging technology; and
- Overall demand for travel and road space.

The objective of this project is to perform an environmental scan of short, medium and longer term issues that may impact or influence the Australian Road Rules and the Australian Vehicle Standards Rules (the Rules).

1.2 Overview of the environmental scan approach

Phase 1 - Framework

To provide structure to the environmental scan we have developed a framework with six broad themes including:

- Theme 1 – Changing demographics
- Theme 2 – Changing societal attitudes
- Theme 3 – Changing traffic conditions
- Theme 4 – Changing and emerging technology
- Theme 5 – Changing approaches to enforcement
- Theme 6 – Changes to the physical environment
For each theme, we have identified a range of emerging issues and trends. It is worth noting that many of the emerging issues and trends are interrelated and cover a range of themes.

**Phase 2 – Data gathering**

We have conducted a high level strategic level scan of trends and issues that may influence the development of Australian Road Rules into the future. We have conducted a desktop review of international websites and documentation. A full list of references is outlined in Section 11.

Following the scan, we discussed our initial desktop identification of issues within a themed framework, with a range of stakeholders outlined in Table 2.

**Table 2 – Stakeholder interview list**

<table>
<thead>
<tr>
<th>Key stakeholder</th>
<th>Organisation</th>
<th>Focus of interview</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. Bruce Corben</td>
<td>Monash University Accident Research Centre</td>
<td>Road Safety, Road Design Standards</td>
</tr>
<tr>
<td>Professor Mary Lydon</td>
<td>University of Adelaide, Centre for Automotive Safety Research</td>
<td>Ageing drivers, Road Safety, Australian Design Rules, Cycling</td>
</tr>
<tr>
<td>Professor John Daley</td>
<td>CEO, Grattan Institute, University of Melbourne</td>
<td>Congestion, Rewards, Rules, Electric Vehicles, Behaviouralism</td>
</tr>
<tr>
<td>Professor Narelle Haworth</td>
<td>Centre for Accident Research and Road Safety, Queensland University of Technology</td>
<td>Safe Vehicles, Motorcycles, New Technologies, Road Rules, Research</td>
</tr>
<tr>
<td>John Gordon</td>
<td>Strategic Directions Department of Transport and Main Roads, Queensland</td>
<td>Future Vehicles, Demographics, Control of Transport Systems, Technology Controls, Virtual Cars, Youth</td>
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<tr>
<td>Cathy Currier</td>
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<td>Jack Langridge</td>
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</tbody>
</table>

Outcomes of this phase of the assignment, including stakeholder feedback, are captured in the ‘Context’ section under each of the six themes.

**Phase 3 – Data analysis**

In this phase of the assignment the theme context was analysed and possible implications for the Road Rules and Vehicle Standards Rules drawn.

**Phase 4 – Priority Assessment**

Phase 4 of the assignment prioritised the emerging issues based on the level of impact and considered timeframe.

The outcome of this approach enabled not only the identification of emerging trends and their impacts on the Road Rules and Vehicle Standards Rules, but also the identification of relative priorities for actions.
2. Review of Rules

The National Transport Commission administers Australian Road Rules (ARR) and Australian Vehicle Standard Rules (AVSR).

The Australian Design Rules (ADR), that govern the design and construction of new vehicles, are administered the Australian Government, namely the Department of Infrastructure and Transport.

2.1 Australian Road Rules

The Australian Road Rules contain the basic rules of the road for drivers and riders of motor vehicles, riders of bicycles, pedestrians, passengers and others. In very broad terms, the rules deal with the following issues:

- Application of the Australian Road Rules – (Rules 11 - 19) cover definitions of roads, road-related areas, users, drivers, riders and pedestrians and set clear framework for other rules in the document.

- Speed and manoeuvres – (Rules 20 – 43) Covers rules on speed limits, making turns, keeping left, overtaking, lanes and lines of traffic. For example road rules on speed limits stipulate that “the speed-limit applying to a driver for any length of road in a speed limited area is... [that indicated by] the area speed-limit sign” and road rules on left turns stipulate that “a driver turning left at an intersection from a road (except a multi-lane road) must approach and enter the intersection from as near as practicable to the far left side of the road.”

- Signals and signage – (Rules 44 – 66, 88 - 108) Covers rules on traffic signs and road markings, and traffic control devices. For example, “if there is a no right turn sign at an intersection.. a driver must not turn right or make a U-turn at the intersection or place”.

- Intersections – (Rules 67 – 87, 109 – 164) Covers rules on giving way, roundabouts, and level crossings. For example, at a T-intersection the driver must give way to “any vehicle travelling on a continuing road, making a U-turn on the continuing road” and “any pedestrian who is crossing the continuing road at or near the intersection” if the driver is turning left or right from a terminating road to a continuing road.

- Stopping and parking - (Rules 165 – 213) Covers rules on stopping and parking restrictions. For example, “a driver must not stop on a length of road or in an area to which a no stopping sign applies”.

- On-vehicle signage and devices – (Rules 214 – 227) Covers rules on lights and warning devices. For example, “a person must not drive a vehicle with a Gross Vehicle Mass over 12 tonnes unless the vehicle is equipped with at least 3 portable warning triangles.”

- Public transport and vehicle passengers – (Rules 263 – 286) Covers rules applying to persons travelling in or on vehicles, and additional rules for drivers of trams and public buses. For example, “the driver of a tram approaching or at T lights showing a red or yellow T light does not have to stop if a white traffic arrow is also showing and the driver is turning in the direction indicated by the arrow” and for passengers, “a person must not travel in or on a part of a motor vehicle that is not a part designed primarily for the carriage of passengers or goods.”

- Active transport – (Rules 228 – 262) Covers rules applying to pedestrians and additional rules for bicycle riders. For example, “the rider of a bicycle must not ride on a part of a separated footpath designated for the use of pedestrians.”
There are also a range of Miscellaneous Road Rules (Rules 287 – 304) which have been considered as relevant to each of the above categories as appropriate.

### 2.2 Australian Vehicle Standard Rules

The vehicle standards apply to motor vehicles, trailers and combinations on roads and road-related areas excluding motorised wheelchairs travelling at less than 10 km/hour, vehicles propelled by a motor with less than 200 W maximum power output, vehicles designed to be controlled by a person walking next to it, vehicles that are being repaired, tested or driven or towed to a location where it will be repaired and a vehicle used only on a rail or tramway. The rules cover general safety requirements pertaining to vehicle components including steering, seating, horns and alarms, additional requirements for motorbikes, vehicle markings, vehicle configurations and dimensions, lights and reflectors, braking systems, control of emissions (noise and exhaust), speed limiting and mechanical connections between vehicles. For example, “a television receiver or visual display unit must not be installed in a vehicle so any part of the image on the screen is visible to the driver from the normal driving position.”
3. Theme 1 – Changing demographics

This section discusses the four key trends identified as likely changes in demographics that could impact or influence the Rules and provides a summary of the impact of each trend on the Australian Road Rules and the Vehicle Standards Rules.

3.1 Context

We have considered the likely changes in demographics that could impact or influence the Rules and have identified four key trends;

1. Population growth in large cities;
2. Continued reliance on the private motor vehicle;
3. Ageing population; and
4. Increasing immigration from non-English speaking nations.

Population growth in large cities

Urban areas in Australia are experiencing significant growth with the current urban population rate in Australia at 89% and an annual urbanisation rate of 1.2% (CIA, 2010). In other words the a number of road users in the larger urban areas is constantly increasing.

This has implications for traffic management. Facilities to monitor and improve the current situation are necessary, such as digital monitoring for congestion, speeding and reckless behaviours, and road crashes. The Australian Road Rules should support measures to reduce congestion levels during peak hours and improving the liveability of urban centres. For example, the use of road pricing has proven its success in the UK, Singapore, Norway and Switzerland in improving the “liveability” (Paassen, 2005) and if road pricing were to be introduced in Australia changes may be required to the road rules. In the long term, the Road Rules may also need to reflect changes to signage and transport infrastructure design which aim to achieve seamless traffic flows through more efficient and flexible infrastructure, including supporting use of intelligent transport systems.

Additionally, growing population creates need to equitably manage the road system so that priority can be provided to modes of high societal value such as public transport, cycling, freight, emergency vehicles etc.

Continued reliance on the private motor vehicle

The private motor vehicle is still the dominant transport mode in Australia. In 2006, 75% of the commuters in capital cities travelled to work or study using private motor vehicles, whereas public transport only accounted for approximately 19% of commuters (ABS, 2008). The road network is therefore becoming increasingly congested during peak hours (Twiney and Rudd, 2005).

Australian Road Rules may, in the future, assist in managing the balance in reliance on the private motor vehicles and contribute towards the uptake of the transport modes with higher societal value. This will also contribute towards other issues addressed elsewhere including emissions, health, amenity, noise etc.

Ageing population

The Australian population will continue to age over the next few decades (APH, 2011). It was estimated that about 25% of the population (6.61 million) would be over 65 years of age by the year 2050 compared to 12% (2.4 million) currently. The rates of car usage by the elderly as a
proportion of total vehicles are therefore likely to experience significant growth in the next few decades.

The ageing population has both short term and long term implications for the Road Rules in terms of accessibility and mobility. There are also issues related to protection of more vulnerable users such as the increasing proportion of elderly pedestrians.

Infrastructure and vehicle design is likely to change in order to accommodate the ageing population in the long term. As a result, Vehicle Standards Rules may need to reflect the ongoing maintenance and modification requirements for emerging designs.

Stakeholder interviews also suggest the Road Rules may need to address the “over belief in [driving] abilities” which “grow with declining cognitive faculties”. Stricter rules and potential restrictions on driving and licensing may need to be considered along with other behavioural strategies.

As shown in Figure 2, older drivers are over-represented in serious injury crashes, once distance driven is taken into account (this trend has been repeatedly confirmed in Australia, New Zealand and elsewhere). Australian Road Rules may assist in reducing the risk of injury for older people, whether as drivers, passengers or pedestrians, when compared to middle-aged adults (OECD, 2001), a concern voiced by a number of stakeholders.

Figure 2 Age of driver and fatal and serious injury crashes per distance travelled, Australia, 1996

Source: (Austroads, 2002)

While the Australian Road Rules may need to respond to an ageing population of drivers, the impact of such rules on the mobility needs of the elderly must also be considered, particularly in rural areas. Recent research in South Australia concludes that older drivers who live rurally present the highest risk of serious injury and fatality from the crashes in which they are involved, when compared to all other driver groups defined in terms of age and residential locality. Given the need for the ongoing mobility of older adults, and the likely greater needs for driving in rural areas due to the lack of availability of other options, there is often a compelling need for older
drivers in rural areas to continue driving (Centre for Automotive Safety Research, 2010). Measures to minimise any confusion over the Road Rules are required in the short term and on an ongoing basis to ensure that their mobility and access needs are not restricted. As the Road Rules respond to a range of other trends, appropriate and timely communication of changes to the public may become increasingly important with an ageing population of drivers.

The mobility and access needs of an ageing population will also place continued pressure on the public transport system, particularly in terms of older Australians without access to a motor vehicle. As noted by the Moving People report by ARA et al 2010, transport systems (including buses) will need to adapt to cater for these elderly passengers by means such as low floor buses and lifts.

Baby-boomer drivers will have some markedly different travel patterns and risk factors when compared to previous generations of elderly people. Not only will their amount of travel increase due to extended years of working and increasing licensing rates, but trip length may also increase as disposable income grows and more people live in the suburbs into their later years (Austroads, 2008).

Increasing immigration from non-English speaking nations

Increasing immigration from non-English speaking nations may also be a potential issue that could impact the Road Rules and Vehicle Standards Rules (migration trends are shown in Figure 3).

Figure 3 Past trend of births, deaths and Nett Overseas Migration (NOM)

![Figure 3 Past trend of births, deaths and Nett Overseas Migration (NOM)](image)


On the basis of current policy settings, a long-term average level of NOM between 80,000 and 100,000 per annum to 2100 seems likely although that NOM can be highly volatile.

According to the 2006 General Societal Survey, 37% of the migrant population were from main English speaking countries (the United Kingdom, New Zealand, the Republic of Ireland, Canada, the United States of America and South Africa). The remainder (63%) were born in other countries. Of those born in other countries, around 2 million (82%) were proficient in spoken English. While migrants from the United Kingdom and New Zealand remained the two
largest overseas-born groups, the proportion of migrants coming to Australia who were born in China, India and South Africa increased considerably between 1996 and 2006. (ABS, 2010)

The implications for Road Rules are difficult to quantify, however Road Rules will need to be easily understood and clearly communicated to a non-English speaking audience.

### 3.2 Relevance to the rules

Using the context provided in the earlier section, this chapter outlines the type of impact according to the identified trends. The areas of impact provide a list of general groups of rules where some individual rules may need to be updated in the future. The changes need to be considered in wider context of all possible means of response to the trend.

<table>
<thead>
<tr>
<th>Key trends identified</th>
<th>Impact Description</th>
<th>Areas of Impact</th>
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<tbody>
<tr>
<td>Population growth in large cities</td>
<td>Road Rules will need to reflect changes in signage that are a result of changing transport infrastructure design. Courtesy rules or guidelines could be considered to respond to an increase in potentially aggressive road user behaviours as road congestion increases. Consider new rules to equitably manage the road system so that priority can be provided to modes of high societal values (public transport, cycling, freight, emergency vehicles etc.) – for example default speeds (Rule 25 etc.).</td>
<td>- Application of road rules – shared spaces - Signals and signage - Speed and manoeuvres - Public transport and passengers - Active transport - Miscellaneous Rule – behavioural guidelines - Intersections - Stopping and parking</td>
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<tr>
<td>Continued reliance on the private motor vehicle</td>
<td>Road Rules related to car drivers and Vehicle Standards Rules will remain dominant into the long term. Consider new rules to equitably manage the road system so that priority can be provided to modes of high societal values (public transport, cycling, freight, emergency vehicles etc.).</td>
<td>- Application of road rules – shared spaces - Public transport and passengers - Active transport - Signals and signage - Speed and manoeuvres - Intersections - Stopping and parking</td>
</tr>
<tr>
<td>Ageing population</td>
<td>Stricter licensing restrictions and Road Rules based on conditional licensing for older drivers may be considered in the future to ensure safety for all road users and to address the propensity of older drivers to self-assess their abilities beyond their capability (maybe linked to speed limits and/or other specific restrictions). Vehicle Standards Rules will need to reflect the likely requirements of motor vehicles used for public transport (i.e. buses) as these vehicles serve increasing numbers of elderly patrons. The current Vehicle Standard Rules do not incorporate requirements relating to elderly passengers such as low floor buses. New continuous educational requirements and/or training may be considered to ensure safety for all road users.</td>
<td>- Signal and signage - Speed and manoeuvres - Public transport and passengers - Active transport - Vehicle Standards - Intersections - On-vehicle signage</td>
</tr>
<tr>
<td>Increasing immigration from non-English speaking nations</td>
<td>Road Rules will need to remain clear, easy to understand and clearly communicated to a non-English speaking audience, particularly in relation to following road signs and signals. Maintain alignment of signage with international standards.</td>
<td>- Signals and signage</td>
</tr>
</tbody>
</table>
4. **Theme 2 – Changing societal attitudes**

This section discusses potential changes in societal attitudes that could impact or influence the Rules.

4.1 **Context**

*Shift to public and active transport modes*

Anecdotal evidence from interviews suggest that the Australian Road Rules will need to reflect and support the shift to cycling and walking by addressing safety and mobility needs of cyclists and pedestrians. Interviewees highlighted the need to ensure that the Road Rules address the challenges that are presented by new and changing infrastructure such as bike racks or alternative path designs. Road Rules will also need to be relevant and adequate to achieve safety and efficiency in the operation of road traffic as the number of cyclists travelling on roads increases.

Public transport patronage has also been trending upwards across Australia since in the early 90s, where the growth in Melbourne (from 9% of motorised trips to 14% in recent years) and Perth in particular has been significant (ARA et al, 2010). This demand for public transport is likely to grow into the future as a result of the continued rise in the price of transport fuel, road congestion, and environmental concerns. It is estimated that “a 20% plus mode share of motorised trips would be achieved in the medium term if a comprehensive road pricing regime was to be introduced, including congestion charging, to make road users accountable for the full costs of their travel choices” (ARA et al, undated).

Anecdotal evidence from our interviews suggests that the attitudes of Australia’s youth are changing. With the emergence of social media and new technologies, the need for physical transport may be changing. Obtaining a licence and first car may no longer be a ‘rite of passage’ for our youth. US statistics show a decline in the number of 16-19 year olds who hold their drivers licenses in 2008 compared to the same demographic in 1978 (DoT, 2009). The increased use of social media e.g. Facebook, Twitter, may provide an opportunity to influence the community attitudes through social pressure to build momentum for compliance.

*Increasing travel times and driver distraction*

Increasing congestion has resulted in substantial increases to travel time during peak hours. This may contribute to driver awareness of road conditions and their stress and fatigue levels while on the road.

There has also been an emerging trend of distracted driving behaviours during peak hours, such as eating and drinking, reading, and using cell phone while driving. In the US in 2009, 5,474 people were killed by distracted drivers, among which 995 were reported to be killed by drivers using cell phones when driving, including but not limited to voice calls and text messaging (US DOT, 2010). Case studies (Recarte and Nunes, 2003; Redelmeier and Tibshirani, 1997) have shown that using a hands-free cellular device while driving is not considered as being any safer than driving while using a hand held cell phone. In response, the US Department of Transport recently launched the ‘distracted drivers campaign’, which focuses on visual, manual and cognitive distractions including distractions from advertising, street signs, using mobile phones, eating and drinking, talking to passengers, grooming, reading, including maps, using a PDA or navigation system, watching a video, changing the radio station, CD, or Mp3 player. As in-car technologies increase the number of driving distractions, so too must the Rules evolve to maintain road safety; this was also a commonly held view amongst key stakeholders.
It is recognised, however, that much of Australia’s past road safety effort has focused on countering illegal behaviours. While the benefits of this has been clear, it is now understood that a large proportion of casualty crashes result from drivers – or other road users – making mistakes. To achieve substantially greater gains in the future, much greater emphasis needs to be placed on initiatives that improve the inherent safety of the road transport systems (SCOT, 2010).

**Alcohol and drug use**

Alcohol was involved in over 32% of road trauma deaths in Australia in 2006 (BITRE, 2009). Estimates show that, of the general Australian aged 14 years and older, 3.3% had experienced driving under the influence of drugs other than alcohol in the last 12 months (AIHW, 2005). The community support for Random Breath Tests (RBT) is extremely high with a 98% supportive rate nation wide (Petroulias, 2009). Measures such as the RBT and random stops are likely to remain effective in the future in controlling drink/drug driving.

### 4.2 Relevance to the rules

Using the context provided in the earlier section, this chapter outlines the type of impact according to the identified trends. The areas of impact provide a list of general groups of rules where some individual rules may need to be updated in the future. The changes need to be considered in wider context of all possible means of response to the trend.

<table>
<thead>
<tr>
<th>Key trends identified</th>
<th>Impact Description</th>
<th>Areas of Impact</th>
</tr>
</thead>
</table>
| Shift to public transport and active transport modes | The Road Rules may need to shift emphasis from regulating a car dominated environment to interaction rules that support the safe and efficient integration of multiple modes of transport including trams, trains, buses, bicyclists, pedestrians, personal motor vehicles and freight vehicle users. For non-motorised vehicle users, it may be appropriate to consider Australian wide road use guidelines that are not necessarily punitive (as per the intention of the majority of Rules 228 to 262) but support the safety of all road users by providing adequate guidance. While the current Vehicle Standards Rules apply primarily to motorised vehicles, rules may need to extend to include non-car modes both motorised (e.g. powered bicycles) and non-motorised. Road Rules will need to continue to be applicable as infrastructure changes occur in support of active and public transport modes. Current Road Rules already consider shared spaces (Rules 24, 80 – 83 and 188) shared paths (Rules 197, 235, 242 and 250) and bicycle paths (Rules 71, 197, 198, 239 and 243) for motorists, pedestrians and bicyclists, however, increasing use of similar spaces and potentially reduced levels of signage may require that the Road Rules be more flexible and adapt to the flexibility provided by new spaces. Present licensing requirements may not be adequate to ensure that bicyclists and pedestrians are aware of the Road Rules that are applicable to them, particularly when considered in combination with the shift in attitudes towards mobility amongst youth – if car licenses and car... | - Application of road rules – shared spaces (liability)  
- Signals and signage  
- Public transport and passengers  
- Active transport  
- Vehicle Standards  
- Miscellaneous – guidelines  
- Speed and manoeuvres  
- Intersections  
- Stopping and parking |
use begins at a later age or not at all. In the future, pedestrians and cyclists may lack awareness of the Road Rules. Road Rules are likely to require broader dissemination in future, using such media as facebook etc.

Changing attitudes to mobility may result in a lack of awareness of Road Rules due to a later start to driving; the communication of Road Rules will need to be considered appropriately.

Road Rules may assist in application of dynamic priority systems to prioritise public transport.

### Increasing travel times and driver distraction

The Road Rules will need to keep abreast of emerging and current technologies that are increasingly being used while driving. The current Road Rules focus on specific technologies such as Rule 300 relating to the use of mobile phones and Rule 299 related to television receivers and the location of visual display units in a motor vehicle and rules are treated as ‘Miscellaneous’. The Road Rules will either need to be continuously updated as technologies emerge or be altered to have the flexibility to maintain safety on the roads as the number and type of technologies and other driver distractions increase.

Given that many motor vehicle accidents are related to mistakes of the driver rather than as a result of intentional actions, it may be appropriate to consider Australia wide road use guidelines (as suggested previously) rather than adopt Rules such as Rule 299 and Rule 300 which specify that a person who breaches the rule (or sub-rule) commits an offence and can be penalised.

### Alcohol and drugs

The flexibility of the Road Rules to remain relevant as enforcement widens to deal with the use of new and previously unused substances may need to be considered as well as different types of travel modes.
5. **Theme 3 – Traffic conditions**

This theme considers likely changes in traffic conditions such as congestion, mode shifts and use of the network that could impact or influence the Rules. This section also considers issues presented by current traffic conditions.

5.1 **Context**

*Increasing congestion*

Both road and public transport networks in large cities are becoming increasingly heavy during peak hours. The “avoidable” cost of congestion for Australian capitals was estimated to be $9.4 billion for 2005 (BITRE, 2009). The social costs of congestion are expected to rise significantly and reach a total of $20.4 billion by 2020. Commercial vehicle traffic is expected to grow more substantially than private vehicle traffic (ABS, 2008). Road freight is expected to experience a significant growth and reach 2.3 times its 2008 level (BITRE, 2010). The road transport industry is pressing to extend the vehicle length and capacities, which has the potential to raise safety concerns.

Sustainable transport systems require policies to reduce the dependencies on the private vehicle in the short term and an efficient network in the long term that encourages the use of public transport (see discussion under Theme 2). More efficient measures to monitor traffic and manage road accidents are likely to be introduced in an effort to reduce congestion levels on our roads, such as variable speed limits in response to the unstable traffic flow conditions.

Anticipated road pricing reforms, from direct user charging across the road network to localised congestion charging, will impact on road-use patterns and behaviour, and on the minimum technological standard of vehicles required for them to operate on the network. The Road Rules will need to be flexible enough to adapt quickly to new road pricing policies. In the context of the stakeholder interviews, it was suggested that there may be a need to consider changes to Road Rules in the event of increased speeds as a result of reduced congestion following initiatives such as road pricing reforms. New Integrated Transport Systems (ITS), such as variable messaging, may also be implemented to support such changes.

*Growing freight task*

Higher Productivity Freight Vehicles (HPFV) are currently being trialled in Melbourne to meet the growing freight task and there has been significant growth in freight movements across Australia. ITS solutions in relation to signal operations, driver information systems and truck tracking and innovation in vehicle design (ARA et al, undated) will play a large part in reducing undesirable interaction between freight vehicles and other traffic on metropolitan networks. Interviews with key stakeholders also suggest that the impact of increasing freight vehicle size presents challenges to the Australian Road Rules mainly in the area of vehicle standards.

*Greater transport integration and a changing vehicle mix*

The development of an integrated transport system, which incorporates land use planning, traffic management, road safety, parking, pedestrians and cyclists and public transport, has been highly promoted (Spenser, 2002).

Both short and long term measures to encourage the use of public and active transport modes by delivering an efficient and competitive public transport system to reduce travel time and road congestion are likely to be implemented. The flexibility and convenience of public transport may be addressed through measures such as priority traffic signals, dynamic road markings and demand responsive bus corridors. Infrastructure design is likely to incorporate the various
transport modes and will increasingly consider the level of flexibility in adapting new transport technologies. Safe and accessible bicycle networks will continue to be integrated into the current transport system. Changes to bicycle training requirements and registration may be considered accordingly and new technologies and facilities that guide and monitor pedestrian flows may be implemented. Future Road Rules and Vehicle Standards Rules should assist in accommodating the changing vehicle mix and various travel behaviours expected.

It is also anticipated that a ‘third mode’ of vehicles, powered bicycles and smaller, slower ‘cars’, will emerge in the near future. The Road Rules will need to establish a system for shared corridors to enable these vehicles to safely enter the road network.

Reflecting new understandings of safety, the term "naked streets" refers to streetscapes devoid of lights and signs. “Naked streets” indicate to the driver that the city is a shared space, where drivers must exercise caution. The growing use of shared spaces, particularly in urban areas, will require either new Road Rules for these spaces, or flexibility in the application of the existing Road Rules.

Vehicle Safety

The cost of road traffic crashes in Australia has totalled up to $15 billion per year (BITRE, 2009). Cars account for the biggest share in fatal crashes than any other vehicle type. The rates of vehicle involvement in fatal crashes based on per billion kilometres travelled are considerably higher for motorcycles and trucks than other types of vehicles. Approximately 59.2% of crashes occurred in capital cities, and the number of fatalities in 2006 ranged from 496 in NSW to 13 in ACT.

The Australian New Car Assessment Program (ANCAP) provides star ratings for vehicles (up to five stars) based on crash testing and inclusion of safety features. It has been estimated that if everyone drove the safest car in its category, road trauma involving light passenger vehicles could be reduced by 26%. If each vehicle incorporated the safest design elements for its class, such trauma could be reduced by 40% (SCOT, 2010). Concerns were raised during consultation that the allowable imports of Star 1 and Star 2 rated vehicles were running counter to the positive progress through ANCAP.

Older vehicles also raise safety, environmental and operational issues that may impact on the Vehicle Standard Rules. Older vehicles are often used by higher-risk motorists such as novice drivers (SCOT, 2010). In amending and updating the Vehicle Standards Rules, NTC may need to consider whether the safety, environmental and efficiency gains made through new vehicle standards warrant removing older vehicles from the network.

Road Rules and Vehicle Standards Rules should be regularly updated in response to the increasing commercial vehicle traffic and road freight, with a focus on managing traffic and ensuring safety. For example, Road Rules and facilities to enhance the safety of night time travel is crucial; and measures to monitor heavy and/or commercial vehicles effectively should be considered, such as vehicle separation.
### 5.2 Relevance to the rules

Using the context provided in the earlier section, this chapter outlines the type of impact according to the identified trends. The areas of impact provide a list of general groups of rules where some individual rules may need to be updated in the future. The changes need to be considered in wider context of all possible means of response to the trend.

<table>
<thead>
<tr>
<th>Key trends identified</th>
<th>Impact Description</th>
<th>Areas of Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increasing congestion</td>
<td>*Note that some impacts of increasing road congestion by both motorised and non-motorised traffic has been discussed in previous sections in relation to population growth. Road Rules may need to be amended to incorporate the requirements of new signage and signalling (Rules 44 – 108) designs as new ITS solutions respond to the traffic management needs of increasing congestion. Road Rules relating to stopping, parking and intersections (Rules 109 – 213) are also likely to be impacted by signalling and signage changes. As per the previous point, Road Rules relating to the operation of public transport may also need to be updated to reflect new ITS solutions (Rules 273 – 204). The Road Rules will also need to be flexible enough to adapt quickly to new road pricing policies. The Road Rules may assist in application of dynamic priority systems to prioritise public transport.</td>
<td>- Application of road rules (shared spaces) - Speed and manoeuvres - Signals and signage - Intersections - Stopping and parking - Public transport and passengers - Active transport - Miscellaneous Rule – behavioural guidelines</td>
</tr>
<tr>
<td>Growing freight task</td>
<td>As HPFVs are introduced into the road network, additional Vehicle Standards Rules may be required to ensure that the safety of road users is maintained. While current Rules such as Rule 96 are adequately flexible to ensure that longer vehicles ‘show a light visible 200 m from the vehicle’, implications of HPFV should be assessed to ensure that this flexibility remains appropriate for all vehicle components. Similarly, ITS solutions relating to the vehicles and their operation on the roads will need to be regulated through consistent Road Rules and Vehicle Standards Rules.</td>
<td>- Speed and manoeuvres - Signals and signage - Vehicle standards - On-vehicle signage</td>
</tr>
<tr>
<td>Greater transport integration</td>
<td>*Note that the impacts of a shift to active travel and public transport modes as a result of greater transport integration have been discussed in previous sections. This includes the impact of changing environments and road environments (such as the naked streets movement). *The implications of a changing vehicle mix (e.g. slower and quieter cars) is discussed as part of Theme 4 – Changing and emerging technologies. The Road Rules may assist in application of dynamic priority systems to prioritise public transport.</td>
<td>- Application of the Road Rules - Signals and signage - Public transport and passengers - Active transport</td>
</tr>
<tr>
<td>Vehicle safety</td>
<td>Similar implications to larger freight vehicles are likely to be relevant to safety issues related to a</td>
<td>- Application of the Road Rules</td>
</tr>
</tbody>
</table>
6. Theme 4 – Changing and emerging technology

This section discusses the impact of changing and emerging technologies on the Road Rules and Vehicle Standards Rules.

6.1 Context

Emerging vehicle and fuel technologies

Potentially, Electric Vehicles (EV’s) could provide a dramatic change to our fleet mix in the future. The debate is divided about the likely take up of EV’s ranging from Evan Thornley, Better Place predicting 25% of new car sales by 2020 to IBIS World predicting that by 2020, the share will rise to 1% worldwide, and only 0.8% in Australia (Hannan, 2011).

As discussed in earlier sections and highlighted by stakeholders interviewed as part of this project, Road Rules and Vehicle Standards Rules will be impacted by both the changing mix of vehicles and related changes to noise levels, vehicle sizes, collision impacts, and the changing streetscapes that may appear as a result of emerging vehicles.

In addition, a number of stakeholders noted that Vehicle Standards Rules and Road Rules may need to change in response to vehicles that could take control away from the driver and vehicle technologies to assist ageing drivers.

ITS solutions

Various traffic management technologies are emerging, aiming to reduce congestion, speeding and accidents (Road Traffic Technology). Digital monitoring has been playing an increasing role in helping the traffic police with traffic management such as the wide adoption of the speed camera and CCTV cameras and the recent introduction of the motorway incident detection devices and the automatic signalling sensors.
GPS technologies are also taking an increasingly important role in monitoring parking and vehicle tracking. Road sensors are introduced to measure as well as store a range of traffic data, including volume, individual vehicle speed, average speed, lane occupancy, and vehicle classification. The information of individual vehicles is thus collected by these devices involuntarily.

Reliance on the car has implications for road agencies as they invest in computer-based transport systems to reduce emissions and improve traffic flows on key roads and motorways by installing new technologies to co-ordinate traffic signals and on-ramps, variable speed limits, control lanes and monitor traffic.

6.2 Relevance to the rules

Using the context provided in the earlier section, this chapter outlines the type of impact according to the identified trends. The areas of impact provide a list of general groups of rules where some individual rules may need to be updated in the future. The changes need to be considered in wider context of all possible means of response to the trend.

<table>
<thead>
<tr>
<th>Key trends identified</th>
<th>Impact Description</th>
<th>Areas of Impact</th>
</tr>
</thead>
</table>
| Emerging vehicles and technologies    | *Note that the impact of changing streetscapes and a changing vehicle mix (including lighter, quieter vehicles) on the Road Rules and Vehicle Standards Rules have been discussed in earlier sections. The potential introduction of smarter vehicles that could take control away from the driver may indirectly impact both the Road Rules and the Vehicle Standards Rules. While the punitive measure for breach of a Road Rule (offence) is outside the scope of the Rules (i.e. depends on the jurisdiction that the offense was committed), the Road Rules may need to consider the impact of the Rules on offences resulting from a self-controlling vehicle. This is a long term impact that is likely to have little influence on the Road Rules but the approaches of different jurisdictions in relation to this matter and potential changes to the Rules will need to be monitored and assessed into the future. Vehicle Standards Rules may also need to be altered to ensure that modifications to such vehicles are in line with the Australian Design Rules and the safety of all road users is maintained. | - Application of the Road Rules  
- Vehicle standards  
- Speed and manoeuvres  
- On-vehicle signage  
- Public transport and passengers |
| ITS solutions                          | Road Rules relating to signals and signage may need to be extended to include the requirements of new ITS solutions. As discussed previously, the process of amending the Road Rules should also be considered (i.e. either incrementally or altered to be more flexible and therefore requiring little or no changes as a result of new ITS solutions). | - Signals and signage  
- Vehicle standards  
- Stopping and parking  
- Intersections |
7. **Theme 5 – Changing approaches to enforcement**

This section contains a discussion of the key trends in changing approaches to enforcement and their potential impact on the Road Rules and Vehicle Standards Rules.

7.1 **Context**

From our interviews, key road safety areas for Police are viewed as:

- Speed offences
- Alcohol offences
- Drug offences
- License offences
- Registration offences
- Distraction offences
- Seat belt offences

With the emergence of technologies, enforcement models are evolving from on road enforcement to back office enforcement. A variety of enforcement technologies have been adopted to help traffic police in many countries for a number of years, as discussed in Theme 4. Given the current congestion level, manual payments of road freight fees are considered highly inefficient. The scale of the network is expanding, and the transport systems are likely to become more integrated in the near future where manual monitoring is no longer feasible and efficient. Active traffic management with digital monitoring is likely to help to achieve an efficient and integrated transport system.

GPS based parking and toll systems can be utilised to replace traditional manual systems. The employment of electronic licensing and permits are being considered to accommodate the digital enforcement system. Other enforcement strategies, such as in-vehicle permanent speed-detection equipment and in-vehicle devices that enable the communication between the driver and traffic police, can be considered over the long term.

As traffic management relies more and more heavily on digital resources, the potential costs of manual mistakes or break down of the system at the back office can be vital. It is essential to set up the rules and back-up facilities/resources to minimise the risk and/or cost associated with these issues.

Through the stakeholder interviews it was suggested that the possible alternative way forward would be to reward positive behaviour and create immense social pressure rather than punishing negative behaviour.
# 7.2 Relevance to the rules

Using the context provided in the earlier section, this chapter outlines the type of impact according to the identified trends. The areas of impact provide a list of general groups of rules where some individual rules may need to be updated in the future. The changes need to be considered in wider context of all possible means of response to the trend.

<table>
<thead>
<tr>
<th>Key trends identified</th>
<th>Impact Description</th>
<th>Areas of Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Onus of proof</td>
<td>Review of vehicle standards - new enforcement technologies (GPS based parking and toll system) In-vehicle and permanent speed detection equipment that allow communication between driver and police. Review of rules and guidelines - possible alternative to reward positive behaviour and increased social awareness rather than punishing negative behaviour. Rules regarding the control of the vehicle (what if technology failure leads to breach of rules).</td>
<td>- Application of the Road Rules - Vehicle standards</td>
</tr>
<tr>
<td>Improved technology</td>
<td>Reliance on technology for enforcement and mistakes/breakdowns could be critical – need for rules to back up facilities/resources to minimise risk and/or cost – rules for default positions.</td>
<td>- Application of the Road Rules - Speed and manoeuvres - Intersections - Vehicle standards</td>
</tr>
</tbody>
</table>
8. Theme 6 – Changes to the physical environment

8.1 Context

**Climate change impact and mitigation**

Climate change impacts directly and indirectly on road infrastructure. The direct impacts are due to the effects of the environment where more extreme weather events contribute to faster deterioration of infrastructure and more dangerous conditions on roads, particularly during the extreme events.

It is anticipated that the cost of infrastructure maintenance will increase with the increased rate of deterioration. This effect will be compounded by higher use levels due to population increase.

In 2005, the transport sector was responsible for about 14% of Australia’s greenhouse gas emissions. The carbon dioxide equivalent emissions from this sector had grown by 30% or 18.5 million tons from 1990 (Department of Climate Change and Energy Efficiency, 2011). Substantial growth in road freight raises potential issues such as increased road noise, air pollution, and greenhouse gas emissions (BITRE, 2010).

Australian Design Rules can be shaped to effectively control greenhouse gas emissions in the near future. This can be further supported through some changes to Road Rules (for example default speed limits). With regard to the increasing road freight task (discussed in previous themes), rules can be designed in a way that lowers the competitiveness of road freight relatively to other modes such as rail freight, for example, increasing the heavy Vehicle Standards Rules, introducing restrictions, or raising the costs of road freight. The competitiveness of cleaner fuels and more efficient energy can also be promoted by introducing rules or tailoring the Australian Design Rules.

**Urban form and structure**

The “liveability” of a city relates closely to the resulting physical environment that Road Rules and Vehicle Standards Rules have impacts on. The prospect of an integrated transport system over the long term requires Road Rules and Vehicle Standards Rules to be accommodated from the design of the system to the vehicle mix. For example, street layouts that promote active transport need to be complimented with effective rules and safety standards; an introduction of a pedestrian path which allows no access of motor vehicles requires a viable alternative route for vehicles that completes the system; and the optimal design of variable signals can potentially achieve seamless flows of traffic.
### 8.2 Relevance to the rules

Using the context provided in the earlier section, this chapter outlines the type of impact according to the identified trends. The areas of impact provide a list of general groups of rules where some individual rules may need to be updated in the future. The changes need to be considered in wider context of all possible means of response to the trend.

<table>
<thead>
<tr>
<th>Key trends identified</th>
<th>Impact Description</th>
<th>Areas of Impact</th>
</tr>
</thead>
</table>
| Climate change – mitigation and impact | Review of Vehicle Standards Rules in relation to climate change and vehicles ability to cope with extreme weather events  
The competitiveness of cleaner fuels and more efficient energy can also be promoted by introducing rules or tailoring the Australian Design Rules | - Application of the Road Rules  
- Signals and signage  
- Speed and manoeuvres                                                                                                                             |
| Urban form and Structure | Consider changes to Road and Vehicle Standards Rules to control increased noise, air and GHG pollution as a result of increasing freight & personal vehicle use – (for example, introducing restrictions, or raising the costs of road freight)  
Changing streetscapes due to improving liveability of a city – need for review of rules re shared spaces | - Application of the Road Rules  
- Speed and manoeuvres  
- Signals and signage  
- Vehicle standards  
- Stopping and parking                                                                                                                         |
9. Summary of Impacts on Rules

This section of the document provides a summary of outcomes of Sections 3 to Section 8 analysis on impacts on rules.

What has become apparent throughout the analysis is that the rules as they stand are all-comprehensive and can be relatively easily adjusted when required.

The existing maintenance process in place is efficient in dealing with amendments and clarifications of individual rules, and most of the future changes could be accommodated through this process.

In practical terms it means that the individual ‘technical’ rules related to speed and manoeuvres, signals and signage, intersections, stopping and parking, on-vehicle signage and devices, public transport and vehicle passengers and active transport may need amendment as required to cover the new issues that are highlighted in this report as part of the overall response to a trend.

While the intent of the Rules and their general application (Rules 11-19) remains valid, it may, in the future, be align with the changing context to further support increasing need to manage demand and support transport modes of higher societal value as well as protect the most vulnerable road users.

There is no doubt that strong rules need to be in place to provide appropriate sanctions for road users who demonstrate irresponsible behaviour. The question is how many rules are required to achieve this goal? There is a growing awareness amongst road safety specialists that greater emphasis needs to be placed on initiatives that improve the inherent safety of the road transport system. This provides an opportunity to reshape and simplify the structure of the Australian Road Rules to focus on the key objective of mobility and safety.

The thousand or so rules and sub rules could be separated into legal requirements i.e. ‘must do’ and enforceable and advisory rules i.e. ‘should do’.

Consideration should be also given to development of guidelines that provide an explanation of intent and principles and can be easily disseminated through new social media.

The rules with legal requirements will need to be robust and enforceable.

Impact on Australian Vehicle Standards Rules will be indirect, primarily through changes to Australian Design Rules in the areas of technology and safety. One of the new features that may be considered is the future integration between the car technology and external technology linked to the road infrastructure including ITS and enforcement.

The impact analysis confirmed that whilst there are some dynamic trends occurring, changes to Australian Road Rules, as only one of the means of response, can be accommodated through the existing maintenance system. The key challenge is to manage and improve general awareness of the rules and to keep abreast of the technological advances to manage safety, congestion and other aspects of the on-road issues.

Table 3 provides a summary of impacts by themes/issues.

The impact analysis confirms the above-mentioned need to focus on the intent of the Rules and their general application to manage the arising issues as well as need for the Vehicle Standards to keep abreast of the technological advances to manage safety, congestion and other aspects of the on-road issues.
### Table 3 Impact Summary

<table>
<thead>
<tr>
<th>Theme</th>
<th>Issues</th>
</tr>
</thead>
<tbody>
<tr>
<td>Changing demographics</td>
<td>Population growth in large cities</td>
</tr>
<tr>
<td></td>
<td>Continued reliance on the private motor vehicle</td>
</tr>
<tr>
<td></td>
<td>Ageing population</td>
</tr>
<tr>
<td></td>
<td>Increasing immigration from non-English speaking nations</td>
</tr>
<tr>
<td>Societal attitudes</td>
<td>Shift to public transport and active transport modes</td>
</tr>
<tr>
<td></td>
<td>Increasing travel times and driver distraction</td>
</tr>
<tr>
<td></td>
<td>Alcohol and drugs use</td>
</tr>
<tr>
<td>Traffic conditions</td>
<td>Increasing congestion</td>
</tr>
<tr>
<td></td>
<td>Growing freight task</td>
</tr>
<tr>
<td></td>
<td>Greater transport integration</td>
</tr>
<tr>
<td></td>
<td>Vehicle safety</td>
</tr>
<tr>
<td>Technology</td>
<td>Emerging vehicles and technologies</td>
</tr>
<tr>
<td></td>
<td>ITS</td>
</tr>
<tr>
<td>Enforcement</td>
<td>Onus of proof</td>
</tr>
<tr>
<td>Physical Environ.</td>
<td>Climate change impacts and mitigation</td>
</tr>
<tr>
<td></td>
<td>Urban form and structure</td>
</tr>
</tbody>
</table>

#### Legend

<table>
<thead>
<tr>
<th>Level of Impact</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Denotes areas of some impact where individual rules may need to be updated</td>
</tr>
<tr>
<td></td>
<td>in the future. The changes need to be considered within the wider context</td>
</tr>
<tr>
<td></td>
<td>of all possible means of response to the trend.</td>
</tr>
<tr>
<td></td>
<td>Denotes areas of no impact on the Australian Road Rules and/or vehicle</td>
</tr>
<tr>
<td></td>
<td>Standards.</td>
</tr>
</tbody>
</table>
10. Prioritisation of Issues

This section of the document prioritises the emerging issues based on the level of impact and considered timeframe.

10.1 Applied methodology

Figure 4 outlines our methodology for the assessment of priorities:

**Figure 4 Methodology**

Detailed assessment of each issue under relevant themes is provided in Appendix A.

**Impact Assessment**

The level of impact is assessed for each individual issue under given themes and based on the key outcomes identified under each theme (refer to Sections 3.2 to 8.2).

It is important to note that the impact assessment is relative within the context of this assignment. The impacts levels are as follows:

**Figure 5 Impact Assessment**

<table>
<thead>
<tr>
<th>Impact</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impact</td>
<td>Selected rule(s) may require amendment to road/vehicle rule and regulation. This can be achieved through the existing maintenance process.</td>
</tr>
<tr>
<td>Some Impact</td>
<td>Impact that, with proper attention and awareness improvement may be managed within the existing road/vehicle rule and regulation through awareness raising.</td>
</tr>
<tr>
<td>Indirect Impact</td>
<td>Impacts with consequences which can be readily absorbed within the existing roads and regulations but requires management effort to minimise the impact.</td>
</tr>
<tr>
<td>No Impact</td>
<td>Existing rules and regulations will suffice to manage impacts.</td>
</tr>
</tbody>
</table>

**Timeframe Assessment**

The timeframe assessment is also based on the context outlined under each theme issue. It is important to note that in some instances the changing timeframe may influence the level of impact (eg. issues that have only a indirect impact within the immediate timeframe may become a ‘strong impact’ issue in long-term). In those instances we have adopted a rating that delivers higher priority.
### Figure 6 Timeframe Assessment

<table>
<thead>
<tr>
<th>Timeframe</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immediate</td>
<td>Issues currently occurring or expected to occur within the next year. Some of the impacts can already be observed on the roads.</td>
</tr>
<tr>
<td>Medium-term</td>
<td>Medium term denotes impacts expected within the timeframe of 1 to 5 years.</td>
</tr>
<tr>
<td>Long-term</td>
<td>Long-term denotes clear trends that will be impacting on roads in future beyond a 5-year timeframe.</td>
</tr>
</tbody>
</table>

### Priority Assessment

Priority is determined as a combination of level of impact and timing as shown in Figure 7:  

**Figure 7 Priority Matrix**

10.2 Outcomes

Applying the prioritisation methodology as described above, it becomes apparent that 1st priority trends all relate to closely connected issues of population growth and demographic changes, underlying increase in traffic congestion and related shift to public transport and active transport modes. As noted before, the priority levels are only relative to each other, as majority of the future impacts will be addressed through response means other than changes to the rules.

Figure 8 provides a general assessment outcomes overview. The detailed assessment of themes and related issues is provided in Appendix A.

The key emerging issues and trends are as follows:

- Population growth in large cities;
- Ageing population;
- Shift to public transport and active transport modes;
- Increasing congestion;
- Greater transport integration; and

This is further accelerated by an ever-increasing environmental awareness and a community demand for a better living environment (noise, air pollution, shared spaces etc.) that is appearing as the next priority and challenge.

Finally, the rapid technology changes and improvements internal and external to motor vehicles will impact on a number of issues including enforcement, safety and back-up rules in case of technology failure. Whilst these can be managed for a time within the existing set of rules and guidelines, they will require some attention in medium-to long term.

**Figure 8 Assessment Overview**
11. Reference list


Austroads (2002), J. Langford, Monash University Accident Research Centre

Austroads (2008), M. Bohensky & J. Langford, Monash University, Accident Research Centre

ABS – 1301.0 – Year Book Australia, 2009 – 10

Australasian Railway Association (ARA), the Bus Industry Confederation (BIC) and the International Association of Public Transport – UITP 2010, Moving People, Solutions for a growing Australia


Centre for Automotive Safety Research (2010), Older Drivers in rural and urban areas: Comparisons of crash, serious injury and fatality rates.


Appendix A
Prioritisation of Issues
### Priority:

<table>
<thead>
<tr>
<th>Timeframe</th>
<th>Impact</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immediate</td>
<td>Strong Impact</td>
<td>Issues currently occurring or expected to occur within the next year. Some of the impacts can already be observed on the roads.</td>
</tr>
<tr>
<td>Medium-term</td>
<td>Some Impact</td>
<td>Medium term denotes impacts expected within the timeframe of 1 to 5 years.</td>
</tr>
<tr>
<td>Long-term</td>
<td>Indirect Impact</td>
<td>Long-term denotes clear trends that will be impacting on roads in future beyond 5 year timeframe.</td>
</tr>
<tr>
<td></td>
<td>No Impact</td>
<td>Not worth worrying about. Existing rules and regulations will suffice to manage impacts.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Timeframe</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immediate</td>
<td>Impact that will require amendment to road/vehicle rule and regulation</td>
</tr>
<tr>
<td>Medium-term</td>
<td>Impact that, with proper attention and awareness improvement may be managed within the existing road/vehicle rule and regulation</td>
</tr>
<tr>
<td>Long-term</td>
<td>Impacts with consequences which can be readily absorbed within the existing roads and regulations but requires management effort to minimise the impact.</td>
</tr>
</tbody>
</table>

### Environmental Scan

- **Project:** Review of the Road and Vehicle Standard Rules
- **Topic:** Environmental Scan
- **Client:** National Transport Commission
- **Created:** 05-May-11
- **By:** Tomas Nohel
- **Last Updated:** 11-May-11
- **BY:** Tomas Nohel
### Issues Assessment: Theme 1 Changing demographics

<table>
<thead>
<tr>
<th>Issues Description</th>
<th>Analysis</th>
<th>Rank</th>
<th>Impact</th>
<th>Rank</th>
<th>Timeframe</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population growth in large cities</td>
<td>Road Rules will need to reflect changes in signage that are a result of changing in transport infrastructure design. Courtesy rules or guidelines could be considered to respond to an increase in potentially aggressive road user behaviours as road congestion increases.</td>
<td>3</td>
<td>Strong Impact</td>
<td>B</td>
<td>Medium-term</td>
<td>HIGH</td>
</tr>
<tr>
<td>Continued reliance on the private motor vehicle</td>
<td>Consider new rules to equitably manage the road system so that priority can be provided to modes of high societal values (public transport, cycling, freight, emergency vehicles etc.). Road Rules related to car drivers and Vehicle Standards Rules will remain dominant into the long term.</td>
<td>2</td>
<td>Some Impact</td>
<td>C</td>
<td>Long-term</td>
<td>MEDIUM</td>
</tr>
<tr>
<td>Ageing population</td>
<td>Stricter licensing restrictions and Road Rules based on conditional licensing for older drivers may be considered in the future to ensure safety for all road users and to address the propensity of older drivers to self-assess their abilities beyond their capability (maybe linked to speed limits and/or other specific restrictions). Vehicle Standards Rules will need to reflect the likely requirements of motor vehicles used for public transport (i.e. buses) as these vehicles serve increasing numbers of elderly patrons.</td>
<td>3</td>
<td>Strong Impact</td>
<td>B</td>
<td>Medium-term</td>
<td>HIGH</td>
</tr>
<tr>
<td>Increasing immigration from non-English speaking nations</td>
<td>Road Rules will need to remain clear, easy to understand and clearly communicated to a non-English speaking audience, particularly in relation to following road signs and signals. Maintain alignment of signage with international standards.</td>
<td>1</td>
<td>Indirect Impact</td>
<td>B</td>
<td>Medium-term</td>
<td>LOW</td>
</tr>
</tbody>
</table>
### Issues Assessment: Changing societal attitudes

<table>
<thead>
<tr>
<th>Issues Description</th>
<th>Analysis</th>
<th>Rank</th>
<th>Impact</th>
<th>Rank</th>
<th>Timeframe</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shift to public transport and active transport modes</td>
<td>The Road Rules may need to shift emphasis from regulating a car dominated environment to interaction rules that support the safe and efficient integration of multiple modes of transport including trams, trains, buses, bicyclists, pedestrians, personal motor vehicles and freight vehicle users. For non-motorised vehicle users, it may be appropriate to consider Australian wide road use guidelines that are not necessarily punitive (as per the intention of the majority of Rules 228 to 262) but support the safety of all road users by providing adequate guidance. While the current Vehicle Standards Rules apply primarily to motorised vehicles, rules may need to extend to include non-car modes both motorised (e.g. powered bicycles) and non-motorised. Road Rules will need to continue to be applicable as infrastructure changes occur in support of active and public transport modes. Current Road Rules already consider shared spaces (Rules 24, 80 – 83 and 188) shared paths (Rules 197, 235, 242 and 250) and bicycle paths (Rules 71, 197, 198 239 and 243) for motorists, pedestrian and bicyclists, however, increasing use of similar spaces and potentially reduced levels of signage may require that the Road Rules be more flexible and adapt to the flexiblity provided by new spaces. Present licensing requirements may not be adequate to ensure that bicyclists and pedestrians are aware of the Road Rules that are applicable Changing attitudes to mobility may result in a lack of awareness of Road Rules due to a later start to driving; the communication of Road Rules Road Rules may assist in application of dynamic priority systems to prioritise public transport.</td>
<td>3</td>
<td>Strong</td>
<td>A</td>
<td>Immediate</td>
<td>HIGH</td>
</tr>
<tr>
<td>Increasing travel times and driver distraction</td>
<td>The Road Rules will need to keep abreast of emerging and current technologies that are increasingly being used while driving. The current Road Rules focus on specific technologies such as Rule 300 relating to the use of mobile phones and Rule 299 related to television receivers and the location of visual display units in a motor vehicle and rules are treated as ‘Miscellaneous’. The Road Rules will either need to be continuously updated as technologies emerge or be altered to have the flexiblity to maintain safety on the roads as the number and type of technologies and other driver distractions increase. Given that many motor vehicle accidents are related to mistakes of the driver rather than as a result of intentional actions, it may be appropriate to consider Australian wide road use guidelines (as suggested previously) rather than adopt Rules such as Rule 299 and Rule 300 which specify that a person who breaches the rule (or sub-ule) commits an offence and can be penalised.</td>
<td>3</td>
<td>Strong</td>
<td>B</td>
<td>Medium-term</td>
<td>HIGH</td>
</tr>
<tr>
<td>Alcohol and drugs use</td>
<td>The flexibility of the Road Rules to remain relevant as enforcement widens to deal with the use of new and previously unused substances may need to be considered as well as different types of travel modes.</td>
<td>2</td>
<td>Some</td>
<td>B</td>
<td>Medium-term</td>
<td>MEDIUM</td>
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<tr>
<td>Issues Description</td>
<td>Analysis</td>
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<tr>
<td>Increasing congestion</td>
<td>Road Rules may need to be amended to incorporate the requirements of new signage and signalling (Rules 44 – 108) designs as new ITS solutions respond to the traffic management needs of increasing congestion. Road Rules relating to stopping, parking and intersections (Rules 109 – 213) are also likely to be impacted by signalling and signage changes. The Road Rules will also need to be flexible enough to adapt quickly to new road pricing policies. The Road Rules may assist in application of dynamic priority systems to prioritise public transport.</td>
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</tr>
<tr>
<td>Growing freight task</td>
<td>As HPFVs are introduced into the road network, additional Vehicle Standards Rules may be required to ensure that the safety of road users is maintained. While current Rules such as Rule 96 are adequately flexible to ensure that longer vehicles ‘show a light visible 200 m from the vehicle’, implications of HPVF should be assessed to ensure that this flexibility remains appropriate for all vehicle components. Similarly, ITS solutions relating to the vehicles and their operation on the roads need to be regulated through consistent Road Rules and Vehicle Standards Rules.</td>
<td></td>
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</tr>
<tr>
<td>Greater transport integration</td>
<td>This includes the impact of changing environments and road environments (such as the naked streets movement). The implications of a changing vehicle mix (e.g. slower and quieter cars) is discussed as part of Theme 4 – Changing and emerging technologies. The Road Rules may assist in application of dynamic priority systems to prioritise public transport.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Vehicle safety</td>
<td>Similar implications to larger freight vehicles are likely to be relevant to safety issues related to a changed vehicle mix inclusive of varied size vehicles (e.g. from bicycles and scooters to compact four wheel drives). Vehicle Standards Rules may need to incorporate restrictions to ensure that the safety of all road users is maintained in the event of vehicle collisions. This may include changed restrictions to speed limiters and Road Rules relating to vehicle separation. As discussed previously, changing attitudes to mobility may result in a lack of awareness of Road Rules due to a later start to driving; the communication of Road Rules will need to be considered appropriately. The communication of Australian Road Rules and Vehicle Standards Rules by alternative mediums such as social media, web based applications and mobile applications should be considered in aiming to achieve wider awareness. In amending and updating the Vehicle Standards Rules, NTC may need to consider whether the safety, environmental and efficiency gains made through new vehicle standards warrant removing older vehicles from the network.</td>
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</table>
Issues Assessment: Theme 4 Traffic conditions

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<tr>
<th>Issues Description</th>
<th>Analysis</th>
<th>Rank</th>
<th>Impact</th>
<th>Rank</th>
<th>Timeframe</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emerging vehicles and technologies</td>
<td>The potential introduction of smarter vehicles that could take control away from the driver may impact both the Road Rules and the Vehicle Standards Rules. While the punitive measure for breach of a Road Rule (offence) is outside the scope of the Rules (i.e. depends on the jurisdiction that the offense was committed), the Road Rules may need to consider the impact of the Rules on offences resulting from a self-controlling vehicle. This is a long term impact that is likely to have little influence on the Road Rules but the approaches of different jurisdictions in relation to this matter and potential changes to the Rules will need to be monitored and assessed into the future. Vehicle Standards Rules may also need to be altered to ensure that modifications to such vehicles are in line with the Australian Design Rules and the safety of all road users is maintained.</td>
<td>2</td>
<td>Some Impact</td>
<td>B</td>
<td>Medium-term</td>
<td>MEDIUM</td>
</tr>
<tr>
<td>ITS</td>
<td>Road Rules relating to signals and signage may need to be extended to include the requirements of new ITS solutions. As discussed previously, the process of amending the Road Rules should also be considered (i.e. either incrementally or altered to be more flexible and therefore requiring little or no changes as a result of new ITS solutions).</td>
<td>2</td>
<td>Some Impact</td>
<td>A</td>
<td>Immediate</td>
<td>HIGH</td>
</tr>
<tr>
<td>Issues Description</td>
<td>Analysis</td>
<td>Rank</td>
<td>Impact</td>
<td>Rank</td>
<td>Timeframe</td>
<td>Priority</td>
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<tr>
<td>Onus of proof</td>
<td>Review of vehicle standards - new enforcement technologies (GPS based parking and toll system) In-vehicle and permanent speed detection equipment that allow communication between driver and police. Review of rules and guidelines - possible alternative to reward positive behaviour and create immense social pressure rather than punishing negative behaviour. Rules regarding control of vehicle (what if technology failure leads to breach of rules).</td>
<td>1</td>
<td>Indirect</td>
<td>B</td>
<td>Medium-term</td>
<td>LOW</td>
</tr>
<tr>
<td>Improved technologies</td>
<td>Reliance on technology for enforcement and mistakes/break downs could be critical – need for rules to back up facilities/resources to minimise risk and/or cost – rules for default positions.</td>
<td>2</td>
<td>Some Impact</td>
<td>B</td>
<td>Medium-term</td>
<td>MEDIUM</td>
</tr>
</tbody>
</table>
### Issues Assessment: Theme 6 Changes to Physical Environment

<table>
<thead>
<tr>
<th>Issues Description</th>
<th>Analysis</th>
<th>Rank</th>
<th>Impact</th>
<th>Rank</th>
<th>Timeframe</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Climate change impacts and mitigation</td>
<td>Review of Vehicle Standards Rules in relation to climate change and vehicles ability to cope with extreme weather events</td>
<td>2</td>
<td>Some</td>
<td>B</td>
<td>Medium-term</td>
<td>MEDIUM</td>
</tr>
<tr>
<td></td>
<td>The competitiveness of cleaner fuels and more efficient energy can also be promoted by introducing rules or tailoring the Vehicle Standards Rules.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban form and structure</td>
<td>Consider changes to Road and Vehicle Standards Rules to control increased noise, air and GHG pollution as a result of increasing freight &amp; personal vehicle use – (for example, increasing the heavy Vehicle Standards Rules, introducing restrictions, or raising the costs of road freight)</td>
<td>2</td>
<td>Some</td>
<td>B</td>
<td>Medium-term</td>
<td>MEDIUM</td>
</tr>
<tr>
<td></td>
<td>Changing streetscapes due to improving liveability of a city – need for review of rules re shared spaces</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Theme No.</td>
<td>Theme 1</td>
<td>Theme 2</td>
<td>Theme 3</td>
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<tr>
<td></td>
<td>Changing demographics</td>
<td>Changing societal attitudes</td>
<td>Traffic conditions</td>
<td>Changing and Emerging Technology</td>
<td>Changing Approaches to Enforcement</td>
<td>Changes to Physical Environment</td>
</tr>
<tr>
<td></td>
<td>Population growth in large cities</td>
<td>Shift to public transport and active transport modes</td>
<td>Increasing congestion</td>
<td>Emerging vehicles and technologies</td>
<td>Onus of proof</td>
<td>Climate change impacts and mitigation</td>
</tr>
<tr>
<td></td>
<td>Continued reliance on the private motor vehicle</td>
<td>Increasing travel times and driver distraction</td>
<td>Growing freight task</td>
<td>ITS</td>
<td>Improved technologies</td>
<td>Urban form and structure</td>
</tr>
<tr>
<td></td>
<td>Ageing population</td>
<td>Alcohol and drugs use</td>
<td>Greater transport integration</td>
<td>Vehicle safety</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Increasing immigration from non-English speaking nations</td>
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</tr>
</tbody>
</table>

**ISSUES**
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Document Status

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<th>Reviewer</th>
<th>Approved for Issue</th>
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<td>D. Rolland</td>
<td>D. Rolland</td>
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