Driver competency and knowledge over time

Project Outline

This research examined how driver knowledge changes over time and how it could be reinforced as drivers move beyond initial licensing and adapt to evolving road environments and vehicle technologies. It focused on identifying whether **knowledge gaps** emerge over time including forgetting established road rules and traffic control devices (TCDs) or failing to learn new ones and adapt to changing road environments. The research also explored evidence-based and stakeholder supported options for maintaining driver knowledge throughout the driving life-course.

Specifically, the work addressed the following research questions:

1) *Do drivers lose knowledge about existing road and traffic rules over time?*
2) *Do drivers fail to learn about new road rules and traffic control devices (TCDs) and/or fail to adapt their driving behaviours to the changing road environment?*
3) *What evidence-based knowledge development/maintenance options are available at different life-stages that would address any competence issues identified in research questions one and two?*
4) *Are any of these options a good fit in the New Zealand (NZ) context?*

Research Approach

The research was undertaken in four parts:

Literature Scan

Covering studies of:

- Knowledge retention of road rules/TCDs over time and adaption to new rules/ changing environments
- Driver knowledge initiatives

Review of Road Rules & TCDs

Focusing on notable NZ road rule changes (e.g. give way rule) and new TCDs (e.g. countdown pedestrian signals) which have been rolled out since 1988.

Driver Survey

Which included questions about:

- Knowledge of established and recent road rules and TCDs
- Driving history and demographics to assess results by these characteristics

Workshops & Options Analysis

To consider the merits of intiatives to improve driver knowledge in NZ with:

- Subject matter experts
- A representative sample of NZ drivers

Findings - Literature Scan & Review of Road Rules and TCDs

A targeted scan of relevant literature found that there is **limited** research on driver knowledge retention and uptake over time. Available studies were mostly conducted in developing countries with less established licensing systems, while research in the Western World is limited. This may indicate that core safety issues linked to knowledge deficits have already been resolved in Western contexts, or that knowledge retention is considered a relatively lower priority for improving road safety.

Few studies explored interventions to improve driver knowledge, with most combining skill, attitude, and knowledge training, making it difficult to isolate the impact of knowledge alone.

Key findings for each research question are:

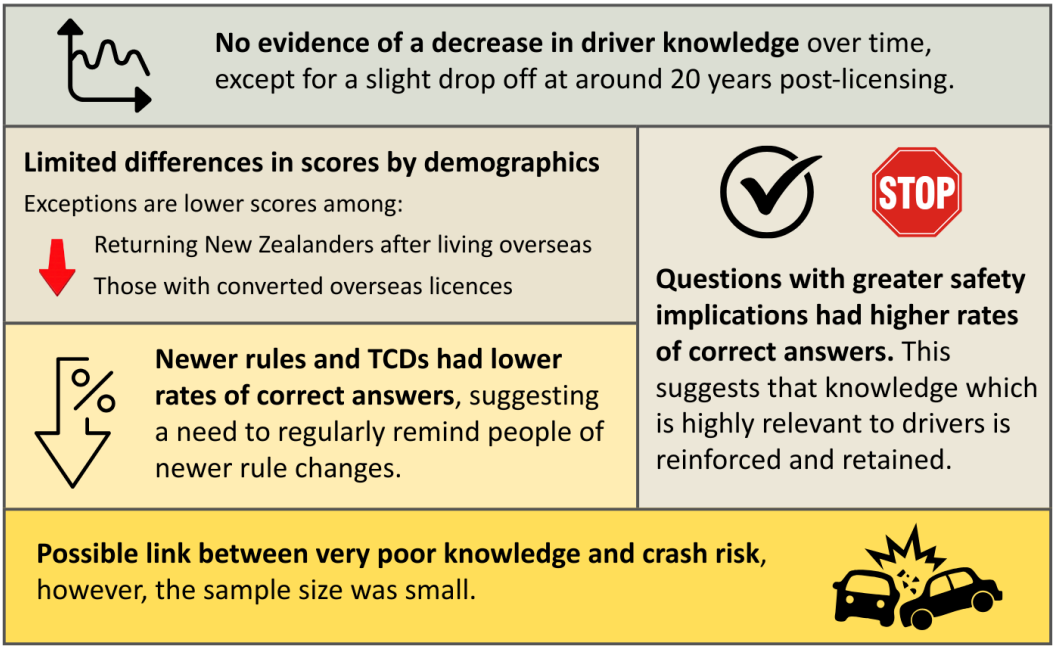
Research Question 1	Research Question 2	Research Questions 3/4
Studies of driver knowledge retention mostly indicate reduced comprehension among older drivers. There are limited studies that investigate knowledge alone.	There is very limited literature about experienced drivers not understanding new TCDs or failing to adapt driving behaviours to changing environments making it difficult to draw conclusions.	Brief and targeted knowledge interventions can be effective. Applying ergonomic principles to traffic sign design so they require less prior knowledge also has potential to enhance comprehension.

The review of historical changes to road rules and TCDs found that:

- Several key changes to NZ road rules and TCDs have occurred over recent decades, with public notification ranging from major campaigns to minimal information.
- The evolution of NZs transport system means drivers must navigate newer scenarios by applying basic knowledge to a range of dynamic conditions to ensure road user safety.

Findings - Driver Knowledge Survey

Analysis of the driver knowledge survey undertaken found:



A separate analysis of young driver licensing history found that a history of unsafe driving behaviours correlated strongly with the frequency of tickets received and crashes having occurred, suggesting that driver **attitudes, behaviours, and skills** may affect safety performance more than knowledge alone.

Findings - Workshops & Options Analysis

Workshops with industry experts and drivers found that:

- **Applied knowledge and attitudes** were perceived to have more important safety implications than knowledge alone by both Subject Matter Experts and NZ drivers.
- Post-licence driver training initiatives have been shown to have **limited safety effects**, although some initiatives such as "Ride Forever" on-road motorcycle training show promise.
- Knowledge interventions should be considered alongside the **Safe System** and need to be weighed up against other options to improve road safety.

An options assessment, tested in the workshops, supported the following driver knowledge development and maintenance initiatives:

Knowledge campaigns

Deemed useful but can take a lot of resources to be widely effective. They are however well supported by the public as an area for intervention.

Knowledge test for overseas visitors linked to permitted driving

Strongly supported by road user workshop participants. May be difficult to implement due to trade agreements.

Compulsory knowledge refresher at re-licensing

Was well supported by the public. However, the costs to administer and maintain these processes may not justify the potential benefits.

Conclusions & Recommendations

While most studies showed some evidence of reduced driver comprehension (of which knowledge is a pre-requisite) with age, this research found ***limited evidence*** to support knowledge loss over time. While there is limited available literature suggesting experienced drivers have reduced understanding of new TCDs or fail to adapt their driving behaviours to new traffic environments, the survey suggests that ***newer*** rules and TCDs are less well understood by NZ drivers.

We identified and assessed a range of driver knowledge initiatives, with evidence suggesting that **brief and targeted interventions** can be effective for retaining information, but there is not a strong established link to safety outcomes.

We propose the following recommendations to address driver knowledge development/ maintenance:

- Improve understanding of the implication of **knowledge deficits** in crash risk.
- Ensure that road environments and TCDs are **easy to understand and intuitive**, so that the impacts of any knowledge deficits are minimised.
- The implementation of knowledge-focused interventions must be weighed carefully against other investments in road safety. However, promising options for the NZ context may include:
    - Targeted knowledge **communication campaigns**
    - Compulsory **knowledge refresher** at relicensing
    - Focused refreshers, training, or tests of road rules, TCDs, and difficult driving scenarios for **overseas visitors** and **returning New Zealand residents** who have lived overseas
    - Making initial licence education and testing **broader in its focus**, beyond rules and TCDs, to focus on good driving habits, attitudes, and practices