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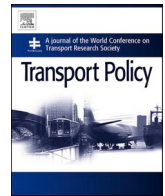
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# Factors influencing public support for more comprehensive road safety policies: The case of technology-neutral distracted driving rules

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## ABSTRACT

The rapid evolution of technology used by drivers has increased the complexity of the driving task and introduced new sources of distraction, necessitating the development of distracted driving legislation that keeps pace with these changes. As such, this study examined drivers' views of a more comprehensive, technology-neutral approach to distracted driving rules, which extends beyond mobile phone use to include portable devices, in-built and mounted systems, and wearable devices. Guided by an extended Value-Belief-Norm theory, a policy acceptance model was developed and validated in assessing public support and acceptability of more comprehensive distracted driving legislation, examining how general and normative beliefs, as well as policy-specific perceptions, influence drivers' acceptability, and identifying demographic differences in acceptability and its underlying factors. A sample of 494 drivers who reside in Queensland, Australia, participated in an online survey, which included both quantitative and open-ended questions. Findings revealed a relatively strong support for the proposed rules. Structural Equation Modelling identified personal norms, social norms, perceived fairness, and perceived effectiveness as significant predictors of acceptability, with the proposed policy acceptance model explaining 76.6% of the variance in acceptability. Group comparisons revealed that young drivers and males reported lower levels of perceived freedom, while those with greater familiarity with distracted driving reported higher levels of personal norms and problem awareness. Qualitative responses indicated that most participants viewed the proposed rules as more effective than current legislation, especially in addressing emerging technological distractions. However, concerns about enforcement, clarity, and the need for educational efforts were also raised.

## 1. Introduction

Distracted driving is a major global road safety concern, as it increases the risk of crashes by diverting drivers' attention from primary driving tasks (Regan et al., 2011). Previous research has shown that crashes involving distracted driving represent a substantial share of overall road crashes, including many associated fatalities and injuries (Beanland et al., 2013; Rejali et al., 2024; Sundfør et al., 2019). Distractions can originate from various sources, both technology-related and non-technology-related, and take different forms, including visual, cognitive, auditory, and physical (WHO, 2011). In recent years, drivers have encountered a rapid emergence of technologies while driving.

While these advancements offer certain benefits (e.g., enhanced navigation), they have increased the complexity of the driving task and introduced additional sources of distraction. The addictive nature of technological devices also makes them riskier than many other forms of distraction for drivers (Koppel et al., 2022).

Past literature has identified several technology-related tasks that can distract drivers and negatively impact driving performance in various ways, such as increasing speed deviations and reducing braking response time. These include using communication devices, such as hand-held phones (Oviedo-Trespalacios et al., 2016), in-vehicle infotainment systems, such as touchscreens (Ma et al., 2022), and wearable devices, such as smartwatches (Brodeur et al., 2021). As technologies

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advance, understanding driver interaction with these sources is important to ensure road safety, and policies should focus on mitigating the risks of these emerging technology-related distractions while driving.

Different countries adopt varied legal approaches to tackling distracted driving. For instance, distracted driving regulations in the US are largely governed at the state level, with all states apply general traffic laws such as careless or reckless driving to address distracted behaviours, though these laws often lack specificity and are inconsistently enforced (Ashford et al., 2021). To provide clearer legal frameworks, most states have enacted device-specific laws, particularly targeting mobile phone use. Some states have also expanded the scope of these laws by using broader terms like mobile electronic device to include tablets and other technologies (Oregon Government, 2017). Despite mixed evidence on the effectiveness of such laws, some studies suggest that stronger bans such as texting-while-driving bans may lead to reductions in crash-related injuries (Ferdinand et al., 2019). In Europe and Canada, as well, distracted driving is addressed through restrictive laws, with many countries imposing substantial fines and broad prohibitions on the use of phones and other devices while driving (World Health Organization, 2011).

In Australia, road rules relevant to distraction target hand-held mobile phone use while driving. Enforcement measures include police monitoring and mobile phone detection cameras in most states (Australian Road Rules, 2021). For instance, in Queensland, where this study is based, hand-held use of a mobile phone while driving is illegal. The penalty for this offence is AUD \$1209 (approximately USD \$770) and four demerit points. Additional restrictions apply to first-year provisional drivers aged under 25 years, including a limit of one passenger under 21 years of age between 11:00 p.m. and 5:00 a.m. and a prohibition on using mobile phones in loudspeaker mode by both drivers and passengers. More broadly, Queensland's road safety regulations also address careless driving, requiring drivers to maintain proper vehicle control at all times, which can be applied as a catch-all for other distracted driving related offences (Queensland Government, 2024).

Despite these legislative measures, previous evidence has shown that distracted driving rules have not kept pace with the emergence of modern in-vehicle technologies and can create confusion for road users and police about which devices are legal or illegal to use while driving (National Transport Commission, 2020). This evidence was also emphasised by recent studies, arguing that drivers perceived road rules and enforcement measures as predominantly focused on mobile phone use while containing grey areas about using other technologies. (Rejali et al., 2024a; 2024b), This lack of clarity in legislation regarding technological distractions highlighted the need for laws to cover more technological devices beyond just mobile phones (Rejali et al., 2025). However, there remains a gap in the literature, as few studies have examined the extent to which drivers support more comprehensive legislation for distracted driving and the factors that influence their level of acceptability. Understanding these factors is important, given the role of public support in shaping effective future policies and interventions.

## 2. Objectives and hypotheses

The main objective of this study was to develop and validate a policy acceptance model to understand factors influencing drivers' acceptability of a more comprehensive set of distracted driving rules proposed by the National Transport Commission (2020). The proposed distracted driving rules extend beyond mobile phone use to include technological devices such as portable, inbuilt and mounted, and wearable devices; referred to as technology-neutral rules. The rules prohibit drivers of moving or stationary (but not parked) vehicles from touching portable devices such as phones, tablets, or cameras unless they are securely mounted. These devices must not have visible displays while operating, unless controlled by voice and not visible from the normal driving position. Inbuilt and mounted devices, like infotainment systems or navigation units, may only be touched to perform limited tasks (e.g.,

accepting calls or using vehicle-related functions), but drivers must not scroll or manually input text or numbers. Similarly, wearable devices like smartwatches or smart glasses cannot be touched or have visible screens, except for audio-related functions (National Transport Commission, 2020).

The proposed policy acceptance model represents an initial step toward evaluating the factors explaining the acceptance of more comprehensive distracted driving regulations. This model is based on the Value-Belief-Norm (VBN) theory, incorporating policy-specific perceptions (Eriksson et al., 2006). This theory provides a theoretical foundation for analysing the factors that influence policy acceptability. While the extended VBN model originally was developed to explain pro-environmental behaviour, it has been widely applied in studies examining public acceptance of regulatory measures in various transport contexts (Jain et al., 2021; Li et al., 2023; Sun et al., 2016). These previous studies have demonstrated that the theory was found to be effective in explaining how drivers perceive road safety policies. In the extended VBN model, individuals' general and normative beliefs (i.e., problem awareness, social norms, and personal norms), policy-specific perceptions (i.e., perceived effectiveness, fairness, freedom, and complexity), and background information play an important role in explaining the level of acceptability. This structured approach allows for a comprehensive analysis of how values, beliefs, and norms interact with policy perceptions to determine public support for legislative measures (Eriksson et al., 2006, 2008).

Based on the VBN theory, general and normative beliefs include: problem awareness, which refers to an individual's recognition of the negative consequences of an issue and its impact on society (Steg and Vlek, 1997); social norms, which refer to the perceived expectations and behaviours of others regarding a particular issue or action (Stern et al., 1999); and personal norms, which reflect an individual's sense of moral obligation to take action or support policies addressing the issue (Stern et al., 1999). In this study, problem awareness refers to the recognition that the lack of comprehensive legislation has contributed to higher rates of distracted driving and an increased risk of crashes. Social norms reflect the extent to which other drivers and significant others support the implementation of enhanced distracted driving legislation. Personal norms represent an individual's sense of moral obligation to support more comprehensive legislation aimed at addressing distracted driving.

Previous research in the transport policy context has supported both direct and indirect positive effects of general and normative beliefs on policy acceptability. For example, Sun et al. (2016) found that personal norms directly predicted acceptability, and that both problem awareness and personal norms indirectly influenced acceptability through policy-specific beliefs. Similarly, Li et al. (2023) reported that social norms and problem awareness significantly influenced acceptability via perceived policy effectiveness. Moreover, Jain et al. (2021) identified personal norms as a significant strong positive predictor of acceptability. Building on these findings, this study hypothesises that general and normative beliefs play a role in shaping the acceptability of more comprehensive distracted driving legislation. Specifically, it is proposed that normative beliefs (social and personal norms) have a direct impact on acceptability, while problem awareness influences acceptability indirectly through its effects on perceived effectiveness and fairness (see Fig. 1 and Table 1).

In addition to general and normative beliefs, policy-specific perceptions have been found to play an important role in shaping the level of acceptability (Eriksson et al., 2006, 2008). Based on the VBN theory, the level of acceptability is explained by four policy-specific dimensions. Perceived effectiveness reflects whether individuals believe the policy successfully achieves its intended goals; i.e., in the current context, reducing distracted driving and related crashes. Perceived fairness refers to the extent to which a rule is considered as equitably applied. Perceived freedom is defined as individuals' perceptions about the restrictions of their personal autonomy by a rule. Perceived complexity indicates the level of clarity and comprehensibility of a rule. Previous

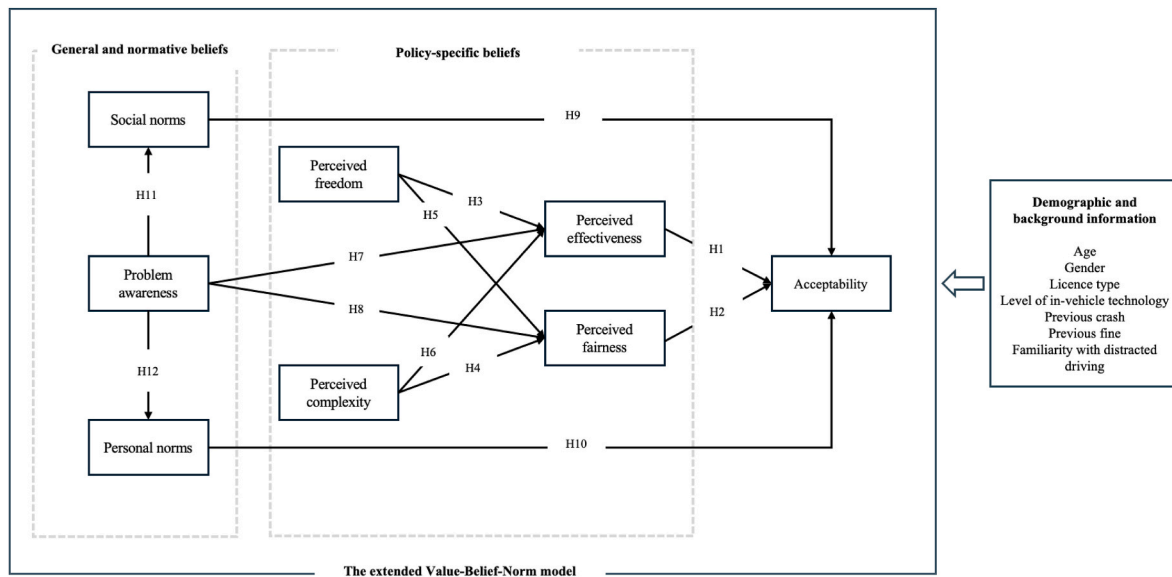


Fig. 1. The proposed extended VBN model.

Table 1  
The list of hypotheses in the proposed extended VBN model.

Hypothesis	Indicator	Description
H1	PE→ACC	Perceived effectiveness positively influences acceptability
H2	PFA→ACC	Perceived fairness positively influences acceptability
H3	PFR→PE	Perceived freedom positively influences perceived effectiveness
H4	PC→PFA	Perceived complexity negatively influences perceived fairness
H5	PFR→PFA	Perceived freedom positively influences perceived fairness
H6	PC→PE	Perceived complexity negatively influences perceived effectiveness
H7	PA→PE	Problem awareness positively influences perceived effectiveness
H8	PA→PFA	Problem awareness positively influences perceived fairness
H9	SN→ACC	Social norms positively influence acceptability
H10	PN→ACC	Personal norms positively influence acceptability
H11	PA→SN	Problem awareness positively influences social norms
H12	PA→PN	Problem awareness positively influences personal norms

**Note:** ACC: Acceptability, PE: Perceived effectiveness, PFA: Perceived fairness, PFR: Perceived freedom, PC: Perceived complexity, PA: Problem awareness, SN: Social norms, PN: Personal norms.

research has consistently found that higher levels of perceived effectiveness and fairness are significantly and positively associated with greater policy acceptability (Eriksson et al., 2006, 2008). More recent studies have also highlighted the importance of perceived freedom, confirming that greater perceived freedom positively predicts acceptability indirectly through perceived effectiveness and fairness (Li et al., 2023; Sun et al., 2016). However, evidence regarding perceived complexity is limited; some findings suggest that higher perceived complexity can hinder policy acceptance (Jain et al., 2021). Building on this evidence, the present study hypothesises that higher levels of perceived effectiveness, fairness, and freedom will positively predict the acceptability of more comprehensive distracted driving legislation, whereas higher perceived complexity will negatively predict acceptability (see Fig. 1 and Table 1).

Previous research has also highlighted that differences in demographics and social backgrounds can influence how individuals respond to policies (Li et al., 2023). For instance, Sun et al. (2016) found

that education level had a significant effect on the acceptability of road pricing policy. Studies examining distracted driving legislation have also emphasised the role of demographic factors in shaping support for mobile phone use legislation. For instance, Sanbonmatsu et al. (2016) reported that younger drivers expressed higher levels of support for mobile phone use restrictions compared to older drivers. Similarly, Pope et al. (2019) found that gender played a significant role, with females being more likely than males to support texting bans while driving. In line with these previous findings, it is reasonable to expect that the acceptability of more comprehensive distracted driving legislation may vary based on users' socio-demographic and background characteristics, such as the level of their vehicles' technology and past records of crashes and traffic fines. Therefore, this study also examined potential differences in the level of acceptability and its underlying factors across these various demographic and background characteristics (see Fig. 1).

Based on the theoretical model and the hypothesised relationships, the proposed Policy Acceptance Model provided a quantitative approach designed to address the overarching research question:

- RQ1. To what extent is the proposed policy acceptance model valid and effective in explaining factors influencing the acceptability of the proposed distracted driving legislation?

Through validating the proposed model and testing its hypothesised relationships, the study addressed three specific sub-questions including the extent to which drivers support and accept the proposed broader distracted driving legislation, how drivers' general beliefs, normative beliefs, and policy-specific perceptions influence their level of acceptability of the proposed legislation, and whether there are differences across individual groups in the level of acceptability and the underlying factors influencing it.

In addition to the quantitative model, to gain greater insights into drivers' perceptions of the proposed legislation, a qualitative approach using open-ended questions were used, aiming to compare the suggested rules with current distracted driving regulations. The open-ended questions aimed to answer the following research question:

- RQ2. How do drivers perceive the proposed distracted driving rules, in terms of effectiveness, coverage of different sources of distraction, and clarity, compared to current rules?

### 3. Method

#### 3.1. Procedure

Ethics approval for the study was granted from the QUT Human Research Ethics Committee (approval number: 8999). Data for this study were collected through an online survey. Participants had to be at least 17 years old, reside in Queensland, hold a valid Australian (learner, provisional, or open) or international driver's licence, and drive a car at least once a week. Recruitment was conducted through multiple channels, including the university's website and mailing lists, social media advertisements, and snowball sampling. The survey was administered between November 2024 and February 2025 via Qualtrics, an online platform designed for survey development. Completion of the survey took approximately 20 min. As an incentive, those who completed the survey could enter a prize draw to win one of six AUD \$50 (approximately USD \$35) e-gift cards.

This study represents the second phase of a project investigating drivers' views on and distracted driving road rules in Queensland, Australia. Given that both studies are derived from a same survey, several measures were implemented during the study design and data analysis process to minimise the risk of ethical issues. In the study design, each phase of the research addressed unique and meaningful research questions, with the survey questions were developed to align with the objectives of each phase. In the data analysis, no qualitative or quantitative data were reused across the two phases given that the survey questions were structured to address distinct research aims specific to each phase. This clear distinction ensured that responses were appropriately separated for each phase, preventing any overlap or repetition between the two studies.

#### 3.2. Materials

Participants first responded to questions regarding their demographics and background information related to distracted driving. These questions covered age, gender, driver's licence type, and vehicle

type. Additionally, participants were asked about the level of technology in their vehicles, their familiarity with distracted driving, their history of crashes (including whether distraction was a contributing factor), and any past fines (including whether they were issued for distracted driving violations).

By extending the VBN theory with policy-specific perceptions (Eriksson et al., 2006, 2008), the second section of the questionnaire focused on assessing participants' acceptability of more comprehensive road rules and the factors influencing their acceptance. To ensure participants had a clear understanding of the proposed regulations, a summary of the suggested road rules, adapted from the National Transport Commission (2020) was provided before they proceeded to answer the related questions (see Appendix). The questions comprised items measuring general and normative beliefs (i.e., problem awareness, social norms, personal norms), policy-specific beliefs (i.e., perceived effectiveness, fairness, freedom, and complexity), and the level of acceptability (see Table 2). The questionnaire items were rated on a 7-point Likert scale (1 = strongly disagree, 7 = strongly agree).

In the final section of the questionnaire, to gain greater insights into participant' perceptions of the proposed legislation, participants were asked to respond to three open-ended questions comparing the suggested rules with existing distracted driving regulations. These questions explored the perceived effectiveness of the proposed rules compared to current regulations ("In comparison with the current rules, how effective do you believe the suggested rules would be?"), the extent to which they sufficiently cover various sources of distraction ("Based on the definition of distracted driving, to what extent do the suggested rules sufficiently cover distracted driving? Why?"), and their clarity and comprehensibility ("What do you think about the clarity, understandability, and the existence of grey areas in the suggested rules?").

#### 3.3. Participants

A total of 547 participants initiated the online questionnaire. Following data cleaning, which involved the removal of 53 incomplete or invalid responses, the final sample comprised 494 participants. The

**Table 2**  
The extended Value-Belief-Norm theory items.

Construct	Item	<i>M</i>	<i>SD</i>	Question	Sources
Acceptability	ACC1	5.28	1.27	"I agree with the implementation of the suggested rules."	(Eriksson et al., 2006; Li et al., 2023)
	ACC2	5.13	1.33	"I am in complete favour of the suggested rules."	
	ACC3	5.21	1.38	"If I have the right to vote, I will vote to support the suggested rules."	
	ACC4	5.18	1.31	"I am willing to support the suggested rules."	
Perceived effectiveness	PE1	5.02	1.51	"I believe the suggested rules would be effective in reducing distracted driving."	(Eriksson et al., 2006; Li et al., 2023)
	PE2	5.04	1.53	"I believe the suggested rules would be effective in reducing distracted driving crashes."	
	PE3	5.14	1.36	"I believe the suggested rules would be effective in improving road safety."	
Perceived fairness	PFA1	5.27	1.27	"I believe the suggested rules would be a fair policy for me."	(Eriksson et al., 2006; Li et al., 2023)
	PFA2	5.36	1.27	"I believe the suggested rules would be a fair policy for other drivers."	
	PFA3	5.27	1.29	"I find the suggested rules to be an equitable policy for drivers."	
Perceived freedom	PFR1 <sup>a</sup>	4.39	1.79	"I believe the suggested rules would prevent me from driving the way I want to (reverse coded)."	Li et al. (2023)
	PFR2 <sup>a</sup>	5.05	1.75	"I believe the suggested rules would be a threat to my personal freedom (reverse coded)."	
	PFR3 <sup>a</sup>	4.94	1.75	"I believe the suggested rules would make my daily trips more difficult (reverse coded)."	
Perceived complexity	PC1	4.05	1.61	"I believe the suggested rules would be complex."	Jain et al. (2021)
	PC2	3.75	1.66	"I believe the suggested rules would be difficult to understand."	
	PC3	3.62	1.71	"I believe the suggested rules would be hard to follow."	
Problem awareness	PA1	4.86	1.42	"I believe not having a policy that covers all technological distractions has resulted in a higher risk for drivers."	(Eriksson et al., 2006, 2008)
	PA2	5.21	1.29	"I believe there is a need for a policy that covers all technological distractions."	
	PA3	4.75	1.53	"I believe current distraction-related rules are insufficient to reduce distracted driving."	
	PA4	4.55	1.40	"I believe other drivers would support the suggested rules."	
Social norms	SN1	4.55	1.40	"I believe other drivers would support the suggested rules."	Huijts et al. (2012)
	SN2	5.03	1.30	"I believe people who influence my behaviour would support the suggested rules."	
	SN3	5.04	1.28	"I believe my friends and family would support the suggested rules."	
	SN4	5.15	1.32	"I believe people who are important to me would think that I should support the suggested rules."	
Personal norms	PN1	5.36	1.31	"I feel a responsibility to follow the suggested rules."	(Eriksson et al., 2006, 2008)
	PN2	5.25	1.41	"I believe it is an obligation for drivers to support the suggested rules."	
	PN3	5.34	1.30	"I believe that following the suggested rules reflects my personal sense of responsibility."	

<sup>a</sup> Reverse-coded items.

sample had a nearly equal gender distribution, with 49.6% identifying as male ( $n = 245$ ) and 50.4% as female ( $n = 249$ ), with no one identifying as non-binary/other. Participants' ages ranged between 17 and 83 years, with a mean of 39.27 years ( $SD = 15.10$ ). Most participants held a full driver's licence (70.9%), while others had a provisional licence (8.7%), a learner's licence (5.1%), or a valid international licence (15.4%). The sample had a broad range of driving experience, with an average of 19.06 years ( $SD = 15.94$ ). The majority (73.1%) drove conventional passenger vehicles, while 6.2% owned electric vehicles and 20.2% drove hybrid vehicles. Regarding the levels of technology in participants' vehicles, 11.7% had basic technology (e.g., standard radio and manual controls such as windows and locks), 46.4% had moderate technology (e.g., Bluetooth connectivity, cruise control), 38.1% had advanced features (e.g., adaptive cruise control, lane-keeping assist, automatic/autonomous emergency braking), and 3.8% reported highly advanced features (e.g., advanced driver monitoring, artificial intelligence integration, autonomous driving capabilities). Regarding familiarity with distracted driving, 54.3% reported being definitely familiar with the concept, while 45.7% had limited or no familiarity. In the past three years, 28.3% had been involved in at least one crash, and 13.4% reported being involved in at least one crash related to distracted driving. Additionally, 36.0% had received an infringement, and 9.3% had been penalised for distracted driving. Participants demographic and background information is presented in Table 3.

### 3.4. Data analysis

A descriptive analysis was conducted using SPSS 30 to explain participants' levels of acceptability and the underlying factors, including general and normative beliefs, and policy-specific perceptions. To investigate any differences across individual groups in the level of acceptability and underlying factors, multiple independent sample t-tests and ANOVA tests were conducted. Confirmatory factor analysis (CFA) was employed to assess the measurement model. Indicators of model fit include Standardised Root Mean Square Residual (SRMR), Normed Fit Index (NFI), and Root Mean Squared Residual Covariance Matrix (RMS\_Theta) were calculated. To check the reliability and validity of the measurement scales, internal consistency was tested using Cronbach's alpha and the composite reliability (CR), with values above 0.7 indicating acceptable reliability (Fornell and Larcker, 1981). Convergent validity was established by ensuring that item factor loadings exceeded 0.7, while the average variance extracted (AVE) for each construct met the recommended threshold of 0.5 (Fornell and Larcker, 1981). Discriminant validity was assessed using the heterotrait-monotrait ratio (HTMT) of correlations, with values below 0.85 considered satisfactory (Henseler et al., 2015). To check for multicollinearity, common method variance was examined using the full collinearity test, where inner Variance Inflation Factors (VIFs) above 3.3 indicated problematic collinearity (Kock, 2015). The structural relationships within the model were analysed using Partial Least Squares Structural Equation Modelling (PLS-SEM) via SmartPLS 4. The significance of model factors was evaluated through a bootstrap procedure with 1000 subsamples.

Responses to open-ended questions were analysed using a qualitative analysis. The first author conducted an initial round of coding, guided by sentiment analysis, to classify participants' perspectives into categories (Pang and Lee, 2008). These preliminary codes were then reviewed by other authors, based on their frequency and content, until consensus on meaningful categories to represent greater understanding of drivers' views. Participants' quotes are presented by demographic identifiers, including gender and age in years (e.g., Female, 52).

**Table 3**  
Participants demographic and background information.

Variable		Frequency	Percentage
<b>Age</b>		$M = 39.27$ years, $SD = 15.10$	
	Young adults (17-30 years old)	170	34.4%
	Middle aged (31 – 55 years old)	244	49.4%
	Older drivers (over 55 years old)	80	16.2%
<b>Gender</b>	Male	245	49.6%
	Female	249	50.4%
<b>Licence type</b>	Open Licence	350	70.9%
	Provisional	43	8.7%
	Learner	25	5.1%
	International licence	76	15.4%
<b>Driving experience</b>		$M = 19.06$ years, $SD = 15.94$	
<b>Type of vehicle</b>	Conventional non-electric or non-hybrid vehicle	361	73.1%
	Electric vehicle	33	6.2%
	Hybrid car	100	20.2%
<b>Level of vehicle technology *</b>	Basic technology	58	11.7%
	Moderate technology	229	46.4%
	Advanced technology	188	38.1%
	Highly advanced technology	19	3.8%
<b>Familiarity with distracted driving</b>	Definitely familiar	268	54.3%
	Not familiar to Somewhat familiar	226	45.7%
<b>Previous crash</b>	Yes	140	28.3%
	No	354	71.7%
<b>Previous distracted driving crash</b>	Yes	66	13.4%
	No	428	86.6%
<b>Previous infringement</b>	Yes	178	36.0%
	No	316	64.0%
<b>Previous distracted driving infringement</b>	Yes	46	9.3%
	No	448	90.7%

**Note:** Basic technology: “standard radio and manual controls such as windows and lock”; Moderate technology: “Bluetooth connectivity, a basic infotainment system or touchscreen, cruise control”; Advanced technology: “adaptive cruise control, lane-keeping assist, automatic emergency braking”; Highly advanced technology: “advanced driver monitoring, artificial intelligence integration, autonomous driving capabilities”.

## 4. Results

### 4.1. Descriptive analysis

To examine the extent to which drivers support and accept the proposed technology-neutral rules, as well as their related beliefs and perceptions, descriptive analyses were conducted for all model constructs. The results of descriptive analysis for the model constructs are provided in Table 4. On average, participants reported a relatively high

**Table 4**  
Descriptives for the model constructs.

Constructs/Items	Mean	SD	95% CI	Proportion of responses							
				Strongly disagree	Disagree	Somewhat disagree	Neutral	Somewhat agree	Agree	Strongly agree	
<b>Acceptability</b>	5.20	1.18	[5.09 - 5.30]								
ACC1				1.8%	1.8%	4.5%	15.6%	23.5%	40.5%	12.3%	
ACC2				2.4%	2.2%	4.5%	20.9%	22.9%	35.4%	11.7%	
ACC3				1.6%	3.2%	4.3%	20.9%	20.6%	31.8%	17.6%	
ACC4				1.8%	2.0%	4.3%	21.7%	22.3%	34.2%	13.8%	
<b>Perceived effectiveness</b>	5.06	1.35	[4.94 - 5.18]								
PE1				3.6%	6.7%	4.5%	11.1%	29.6%	32.6%	11.9%	
PE2				3.8%	4.0%	8.9%	12.8%	21.7%	35.8%	13.0%	
PE3				2.8%	3.4%	5.5%	12.1%	26.5%	40.5%	9.1%	
<b>Perceived fairness</b>	5.30	1.15	[5.19 - 5.40]								
PFA1				3.6%	6.7%	4.5%	11.1%	29.6%	32.6%	11.9%	
PFA2				3.8%	4.0%	8.9%	12.8%	21.7%	35.8%	13.0%	
PFA3				2.8%	3.4%	5.5%	12.1%	26.5%	40.5%	9.1%	
<b>Perceived freedom</b>	4.79	1.53	[4.66 - 4.93]								
PFR1				13.8%	22.3%	10.5%	20.0%	15.0%	13.2%	5.3%	
PFR2				25.5%	27.9%	8.1%	17.6%	9.5%	8.5%	2.8%	
PFR3				20.2%	31.8%	9.1%	15.0%	11.7%	8.9%	3.2%	
<b>Perceived complexity</b>	3.80	1.49	[3.67 - 3.94]								
PC1				4.5%	17.6%	14.2%	23.7%	17.4%	17.2%	5.5%	
PC2				8.1%	21.5%	16.4%	17.2%	18.8%	14.6%	3.4%	
PC3				8.9%	24.7%	17.8%	14.8%	16.2%	12.8%	4.9%	
<b>Problem awareness</b>	4.95	1.13	[4.84 - 5.04]								
PA1				1.6%	3.4%	13.2%	21.5%	22.1%	26.3%	11.9%	
PA2				1.4%	1.2%	8.3%	13.6%	30.2%	30.0%	15.4%	
PA3				2.8%	6.7%	12.8%	15.0%	27.1%	24.1%	11.5%	
<b>Social norms</b>	4.94	1.10	[4.85 - 5.04]								
SN1				4.0%	2.8%	13.2%	28.3%	22.9%	23.3%	5.5%	
SN2				1.4%	2.6%	6.5%	23.5%	24.5%	30.4%	11.1%	
SN3				1.4%	1.8%	5.7%	25.9%	24.5%	28.9%	11.7%	
SN4				1.4%	1.2%	4.9%	29.4%	15.4%	31.8%	16.0%	
<b>Personal norms</b>	5.31	1.21	[5.20 - 5.42]								
PN1				2.2%	0.4%	4.0%	18.4%	22.3%	32.8%	19.8%	
PN2				2.6%	2.2%	4.9%	18.4%	18.8%	35.3%	17.6%	
PN3				2.4%	1.6%	2.0%	16.0%	27.5%	32.4%	18.0%	

**Note:** Mean ranges from 1 to 7. Lightest to darkest: Lowest to highest proportions.

level of acceptability for the technology-neutral rules. Based on the proportion of responses shown in Table 4, the average proportion of “Agree” responses across the four acceptability items was 35.5%, and the average proportion of “Strongly agree” responses was 13.8%; therefore, 49.3% of participants agreed or strongly agreed with the items. Regarding the policy-specific perceptions, the mean ratings for perceived effectiveness and perceived fairness were moderately high, with the most frequent responses across items were "agree" and "somewhat agree." Perceived freedom received a lower mean rating, with a higher proportion of neutral to negative responses. For instance, for items PFR2 and PFR3, more than half of the participants expressed some level of disagreement. Additionally, perceived complexity was relatively moderate, with responses more widely distributed and a notable percentage of responses indicating neutrality. Regarding the general and normative beliefs, the mean ratings for the level of problem awareness and social norms were moderately higher than the midpoint. However,

personal norms were relatively higher, with strong higher level of agreement across items.

**4.2. Differences in acceptability and underlying beliefs across driver groups**

To investigate any differences in the level of acceptability, policy-specific perceptions, and general and normative beliefs across different demographic and background groups, a series of independent sample t-tests and ANOVA tests were performed (see Table 5).

The results of ANOVA tests showed that a significant lower level of acceptability was reported by older drivers (more than 55 years old) ( $n = 80, M = 4.91, SD = 1.18$ ) compared to young adults (17 to 30 years old) ( $n = 170, M = 5.33, SD = 1.02$ )  $F(2,491) = 3.31, M_{\text{difference}} = -0.42, 95\% \text{ CI} = [-0.78, -0.03], p < 0.05, \eta^2 = 0.013$ . For policy-specific perceptions, international licence holders ( $n = 76, M = 4.29,$

**Table 5**  
Group differences for the model constructs.

	F-test			T-test			
	Age	Licence type	In-vehicle technology	Gender	Previous crash	Previous fines	Knowledge of distracted driving
Acceptability	<b>3.31</b>	1.14	0.61	1.06	0.58	1.46	1.75
Perceived effectiveness	0.39	0.89	1.66	0.15	0.14	0.63	1.89
Perceived fairness	0.67	0.65	1.65	1.49	0.48	<b>2.11</b>	1.44
Perceived freedom	<b>5.29</b>	<b>5.97</b>	1.40	<b>5.33</b>	<b>2.79</b>	<b>3.07</b>	0.57
Perceived complexity	0.03	0.49	1.45	1.18	1.28	0.74	1.21
Problem awareness	2.03	1.11	2.60	<b>2.19</b>	<b>2.12</b>	1.92	0.30
Social norms	<b>13.17</b>	1.75	0.93	0.21	1.27	0.01	1.48
Personal norms	0.24	0.67	0.89	<b>3.15</b>	0.11	0.23	<b>2.97</b>

**Note:** Bold values indicate statistical significance at the 0.05 alpha level.

$SD = 1.57$ ) reported a significantly lower level of perceived freedom compared to open licence holders ( $n = 350$ ,  $M = 4.97$ ,  $SD = 1.53$ )  $F(3,490) = 5.97$ ,  $M_{\text{difference}} = -0.68$ , 95% CI =  $[-1.16, -0.18]$ ,  $p < 0.05$ ,  $\eta^2 = 0.04$ . Additionally, young adults (17 to 30 years old) ( $n = 170$ ,  $M = 4.57$ ,  $SD = 1.52$ ) reported a significantly lower level of perceived freedom compared to older drivers (more than 55 years old) ( $n = 80$ ,  $M = 5.24$ ,  $SD = 1.58$ )  $F(2,491) = 5.29$ ,  $M_{\text{difference}} = -0.67$ , 95% CI =  $[-1.15, -0.18]$ ,  $p < 0.05$ ,  $\eta^2 = 0.021$ . Regarding the general and normative beliefs, the results showed that a significant higher level of social norms toward supporting the technology-neutral rules was reported by young adults (17 to 30 years old) ( $n = 170$ ,  $M = 5.23$ ,  $SD = 1.00$ ) compared to older drivers (more than 55 years old) ( $n = 80$ ,  $M = 4.50$ ,  $SD = 1.03$ )  $F(2,491) = 13.17$ ,  $M_{\text{difference}} = 0.73$ , 95% CI =  $[0.38, 1.07]$ ,  $p < 0.05$ ,  $\eta^2 = 0.051$ .

The results of multiple independent sample t-tests for policy-specific perceptions revealed that participants who had received fines in the past three years ( $n = 178$ ,  $M = 5.15$ ,  $SD = 1.13$ ) reported a significantly lower level of perceived fairness compared to those with no prior fines ( $n = 316$ ,  $M = 5.38$ ,  $SD = 1.15$ )  $t(492) = 2.11$ ,  $M_{\text{difference}} = -0.23$ , 95% CI =  $[-0.43, -0.01]$ ,  $p < 0.05$ ,  $d = 0.20$ . Further, males ( $n = 245$ ,  $M = 4.43$ ,  $SD = 1.54$ ) reported a significantly lower level of perceived freedom compared to females ( $n = 249$ ,  $M = 5.15$ ,  $SD = 1.43$ )  $t(488.12) = 5.33$ ,  $M_{\text{difference}} = -0.72$ , 95% CI =  $[-0.97, -0.45]$ ,  $p < 0.05$ ,  $d = 0.48$ . Regarding the general and normative beliefs, a higher level of problem awareness was reported by those who had reported a previous crash ( $n = 140$ ,  $M = 5.10$ ,  $SD = 0.99$ ) compared to those with no crashes ( $n = 354$ ,  $M = 4.87$ ,  $SD = 1.18$ )  $t(299.99) = 2.12$ ,  $M_{\text{difference}} = 0.23$ , 95% CI =  $[0.01, 0.42]$ ,  $p < 0.05$ ,  $d = 0.20$ . Further, females ( $n = 249$ ,  $M = 5.05$ ,  $SD = 1.14$ ) significantly reported a higher level of problem awareness compared to males ( $n = 245$ ,  $M = 4.82$ ,  $SD = 1.11$ )  $t(488.12) = 2.19$ ,  $M_{\text{difference}} = 0.23$ , 95% CI =  $[0.02, 0.42]$ ,  $p < 0.05$ ,  $d = 0.19$ . Additionally, drivers who were most familiar with distracted driving ( $n = 268$ ,  $M = 5.46$ ,  $SD = 1.28$ ) reported a significantly higher level of personal norms and internal obligation to support the technology-neutral rules compared to those with no or only some prior knowledge ( $n = 226$ ,  $M = 5.14$ ,  $SD = 1.10$ )  $t(491.778) = 2.97$ ,  $M_{\text{difference}} = 0.32$ , 95% CI =  $[0.10, 0.53]$ ,  $p < 0.05$ ,  $d = 0.26$ . Females ( $n = 249$ ,  $M = 5.48$ ,  $SD = 1.20$ ) also reported a significantly higher level of personal norms to support more comprehensive rules compared to males ( $n = 245$ ,  $M = 5.14$ ,  $SD = 1.20$ )  $t(492) = 3.15$ ,  $M_{\text{difference}} = 0.34$ , 95% CI =  $[0.12, 0.55]$ ,  $p < 0.05$ ,  $d = 0.28$ .

#### 4.3. Measurement model validation

To examine the measurement properties of the proposed model in relation to drivers' beliefs, perceptions, and acceptance of the technology-neutral rules, a series of reliability and validity analyses were conducted. As shown in Table 6, all factor loadings were higher than the recommended threshold of 0.70, except for two items (PA3 and SN1) that had marginally lower loadings. However, these items were retained in the model due to acceptable values of average variance extracted and composite reliability. The average variance extracted values for all constructs were above 0.50, supporting the adequate convergent validity. Furthermore, both composite reliability and Cronbach's alpha coefficients were above 0.70 for all constructs, indicating strong internal consistency in the model's factorial structure (see Table 6). Multicollinearity among factors was not present, as all inner VIFs were below the threshold of 3.3. Discriminant validity was also established, with all Heterotrait-Monotrait ratios below the threshold of 0.85 (see Table 7).

#### 4.4. Factors influencing acceptability

To examine the predictive ability of the proposed extended VBN model in explaining drivers' acceptability and its underlying factors, structural equation modelling was conducted. The model fit indices

**Table 6**  
Reliability and validity measures.

Construct	Item	Factor loading	Cronbach's alpha	Rho_a	CR	AVE
Acceptability	ACC1	.854	.918	.920	.942	.803
	ACC2	.931				
	ACC3	.898				
	ACC4	.899				
Perceived effectiveness	PE1	.931	.914	.914	.946	.854
	PE2	.946				
	PE3	.895				
Perceived fairness	PFA1	.910	.881	.883	.926	.807
	PFA2	.912				
	PFA3	.873				
Perceived freedom	PFR1	.789	.834	.864	.899	.750
	PFR2	.916				
	PFR3	.887				
Perceived complexity	PC1	.865	.882	.910	.926	.807
	PC2	.928				
	PC3	.901				
Problem awareness	PA1	.887	.722	.847	.832	.634
	PA2	.909				
	PA3	.537				
Social norms	SN1	.673	.855	.885	.902	.701
	SN2	.871				
	SN3	.905				
	SN4	.879				
Personal norms	PN1	.930	.887	.889	.930	.816
	PN2	.896				
	PN3	.883				

**Note:** ACC: Acceptability, PE: Perceived effectiveness, PFA: Perceived fairness, PFR: Perceived freedom, PC: Perceived complexity, PA: Problem awareness, SN: Social norms, PN: Personal norms.

indicated acceptable fit, with SRMR = 0.067, NFI = 0.804, Chi-Square = 2053.56, and BIC = -686.62. According to Hair et al. (2021), SRMR below 0.10 and an NFI above 0.80 suggest a good model fit. The structural equation modelling results supported the predictive ability of the proposed extended VBN model, which accounted for 76.6% of the variance in acceptability ( $R^2 = .766$ ; see Fig. 2). This indicates a strong explanatory power of the proposed model in predicting participants' acceptability to support the technology-neutral rules. Path analysis revealed that both general and normative beliefs, as well as policy-specific factors, significantly contributed to the level of acceptability, either directly or indirectly (see Table 8). Among the direct predictors, personal norms ( $\beta = .407$ ,  $p < 0.05$ ) and social norms ( $\beta = .294$ ,  $p < 0.05$ ) emerged as strong positive predictors of acceptability. In addition, perceived fairness ( $\beta = .164$ ,  $p < 0.05$ ) and perceived effectiveness ( $\beta = .148$ ,  $p < 0.05$ ) significantly predicted acceptability among the policy-specific factors.

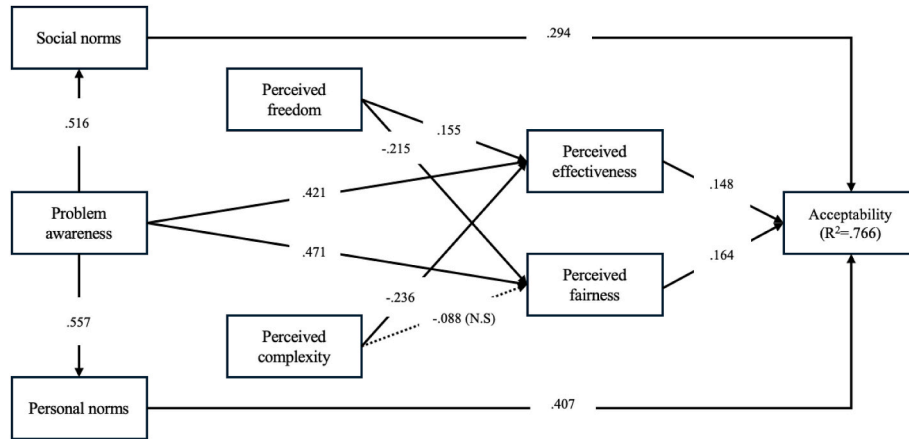
Regarding indirect effects (see Table 8), problem awareness positively influenced acceptability through its effects on perceived fairness and perceived effectiveness ( $\beta = .294$ ,  $p < 0.05$ ). Further, perceived complexity had a significant negative indirect effect on acceptability through perceived fairness and perceived effectiveness ( $\beta = -.049$ ,  $p < 0.05$ ). However, the indirect effect of perceived freedom on acceptability was not significant ( $\beta = -.012$ ,  $p = 0.08$ ).

#### 4.5. Open-ended responses

To gain deeper insights into participants' views, three open-ended questions were included to explore drivers' perceptions of the effectiveness, coverage, and clarity of the proposed rules compared to existing legislation. Responses were analysed using sentiment analysis-guided coding, which enabled the identification of key categories and subcategories (see Fig. 3).

**Table 7**  
Discriminant validity (Heterotrait-Monotrait ratio).

Scale	Acceptability	Perceived effectiveness	Perceived fairness	Perceived freedom	Perceived complexity	Problem awareness	Social norms	Personal norms
Acceptability	.658							
Perceived effectiveness	.809	.547						
Perceived fairness	.284	.133	.415					
Perceived freedom	.308	.217	.264	.565				
Perceived complexity	.641	.429	.596	.234	.165			
Problem awareness	.757	.622	.725	.170	.206	.585		
Social norms	.801	.583	.841	.355	.277	.626	.789	



**Fig. 2.** The results of path analysis for the proposed extended VBN model.

**Table 8**  
Path coefficients of the proposed extended VBN model.

Hypotheses	Direct effects		Indirect effects		Total effects	
	β	T-value	β	T-value	β	T-value
PE→ACC	.148	<b>4.178</b>	-	-	.148	<b>4.178</b>
PFA→ACC	.164	<b>2.783</b>	-	-	.164	<b>2.783</b>
PN→ACC	.407	<b>8.322</b>	-	-	.407	<b>8.322</b>
SN→ACC	.294	<b>6.564</b>	-	-	.294	<b>6.564</b>
PC→ACC	-	-	-.049	<b>3.319</b>	-.049	<b>3.319</b>
PFR→ACC	-	-	-.012	.582	-.012	.582
PA→ACC	-	-	.518	<b>13.792</b>	.518	<b>13.792</b>
PC→PE	-.236	<b>4.602</b>	-	-	-.236	<b>4.602</b>
PFR→PE	.155	<b>2.915</b>	-	-	.155	<b>2.915</b>
PA→PE	.421	<b>9.357</b>	-	-	.421	<b>9.357</b>
PC→PFA	-.088	1.733	-	-	-.088	1.733
PFR→PFA	-.215	<b>3.843</b>	-	-	-.215	<b>3.843</b>
PA→PFA	.471	<b>9.012</b>	-	-	.471	<b>9.012</b>
PA→SN	.516	<b>11.885</b>	-	-	.516	<b>11.885</b>
PA→PN	.557	<b>11.668</b>	-	-	.557	<b>11.668</b>

**Note:** Bold t-values indicate statistical significance at the 0.05 alpha level.  
ACC: Acceptability, PE: Perceived effectiveness, PFA: Perceived fairness, PFR: Perceived freedom, PC: Perceived complexity.  
PA: Problem awareness, SN: Social norms, PN: Personal norms.

**4.5.1. Effectiveness of the technology-neutral rules in comparison with the current rules**

A qualitative analysis of responses to the first open-ended question regarding the perceived effectiveness of the proposed distracted driving rules compared to existing legislation revealed that 45.95% of participants (n = 227) provided a response. The initial coding guided by sentiment analysis identified three overarching categories: (1) participants who believed the proposed rules would be more effective than current legislation in addressing distracted driving; (2) those who

viewed the proposed rules as equally effective; and (3) respondents who perceived the proposed rules as less effective than existing regulations.

For the first category, 188 participants (82.81%) who responded to the first question believed that the proposed rules would be more effective than the current legislation in addressing distracted driving. They argued that the technology-neutral rules allow for better adaptability to emerging in-vehicle technologies and provides a more comprehensive framework to address distraction by providing definitions of the actions that are illegal. However, some participants noted that while the proposed rules could be more effective, their impact depends on whether they are clearly understood and followed by the public.

*“The proposed rules better adapt to modern technology, taking into account the use of smartphones and in-car systems.” (Male, 34)*

*“I think that they are more comprehensive and clearly define what actions are acceptable and what are not, so they would be more effective than the current rules.” (Male, 44)*

*“The effectiveness of the proposed rules depends on public education and awareness, which might require more effort than with the current rules. Generally good if they were complied with by everyone.” (Male, 49)*

A few participants also mentioned that the suggested rules would address some of the ambiguities present in existing legislation. However, two respondents noted that although the proposed rules may be more effective than the current legislation in addressing distractions, they could be challenging for drivers to understand.

*“Compared to current rules, the new ones appear to close certain loopholes, particularly for hands-free devices that might still lead to distraction.” (Male, 35)*

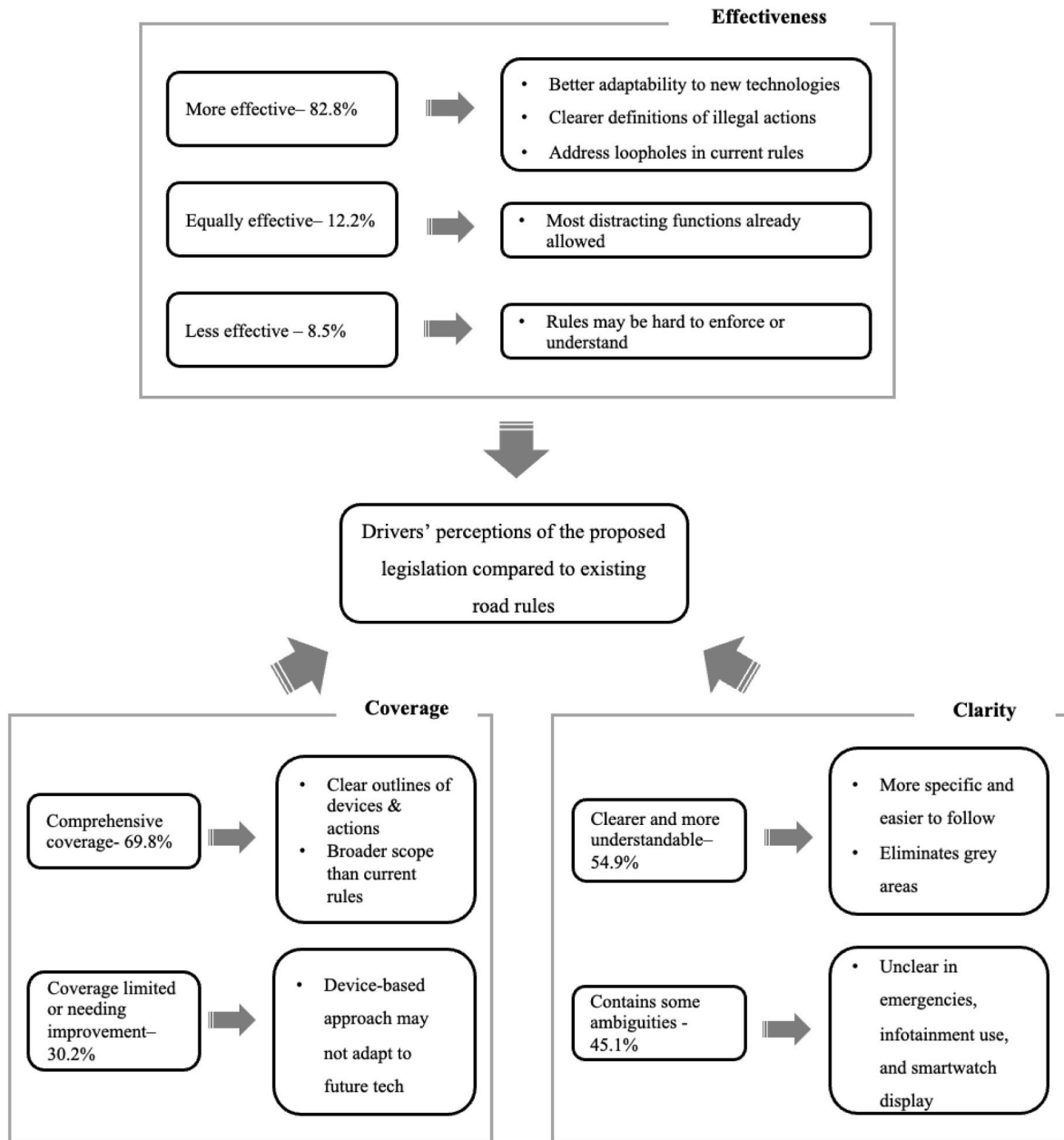


Fig. 3. Identified categories and subcategories in the open-ended responses.

*“I believe the proposed rules would be a good way to address the gaps in the current laws, particularly concerning distractions beyond mobile phones.” (Female, 20)*

*“The rules are easier to understand, which would likely impact the ability for more people to follow the rules. However, there are still some aspects of the writing that should be tested for understandability.” (Female, 46)*

In the second category, 23 participants (12.23%) who responded to this question believed that the effectiveness of the proposed rules would be similar to the current legislation, with no noticeable changes in distracted driving behaviours expected following their implementation. Several participants argued that since the most frequent distracting behaviours such as hands-free mobile phone use and navigation are already permitted under the current legislation, the additional areas covered by the proposed rules are unlikely to make a significant difference in reducing distracted driving.

*“I think most people who are using devices are only really using it for navigation and answering/rejecting calls, and since those functions would still be allowed, there are not actually that many other functions that would be limited by the rules. So, I don’t think there would be a significant difference.” (Female, 17)*

Some participants argued that, under the current enforcement measures, the effectiveness of the proposed rules would not improve unless stricter enforcement is introduced. Three participants also noted that the impact would likely remain the same, as only those who are already complying with existing rules would follow the technology-neutral legislation.

*“In my opinion, the suggested rules are likely to be similarly effective to the current ones unless there is stronger enforcement. Although the scope is broader, without consistent penalties and clear consequences, many drivers may continue their distracting habits.” (Male, 22)*

*"About as effective as the current rules are ... people will or won't follow them. You can't change people. I don't think it would make a big difference as the people who follow the current rules will continue to follow the new, and the people who don't, will continue not to."* (Female, 36)

In the third category, 16 participants (8.51%) who responded to this question believed that the proposed rules would be less effective than the existing regulations. They argued that the rules would have limited impact and that other administrative controls, such as education, should be the priority. Some participants also noted that the proposed legislation may be difficult to enforce or be entirely unenforceable. One participant further argued that distracted driving regulations should not be device-specific.

*"It will not be effective and will only result in more fines given to the public. Admin controls should not be used to make the roads safer. There are other controls that should be used before administrative controls (Rule/ laws) are implemented."* (Male, 30)

*"I don't think they would be effective as they aren't particularly nuanced, and they don't take into account the number of changes that have happened in a short time. We have drivers on the road who got their licence decades ago, they are not going to become less distracted by making rules. What is the point of any of this without showing how you are going to systemically educate all drivers on the risks of distraction and what they need to understand and do to ensure their safety and others."* (Female, 34)

*"I do not think the rules should be device specific. Also, they would be impossible to enforce."* (Female, 54)

#### 4.5.2. Coverage of the technology-neutral rules in comparison with the current rules

The results of the second open-ended question regarding the extent to which the proposed distracted driving rules cover various forms of distractions compared to existing legislation revealed that 34.81% of participants ( $n = 172$ ) provided a response. Initial coding, guided by sentiment analysis, identified two main categories: (1) participants who believed the proposed rules are comprehensive and would more thoroughly address technology-related distractions than the current legislation; and (2) participants who perceived the coverage of the proposed rules to be limited or identified areas in need of improvement to more effectively address technological distractions.

In the first category, 120 participants (69.76%) who responded to the second question believed that the proposed rules are comprehensive and would more effectively address technology-related distractions compared to the current legislation. Many participants argued that the technology-neutral rules clearly outline the legal and illegal interactions with technological devices and help prevent various forms of driver distraction.

*"Seems to cover it all - clearly outlines the different devices people use & how we can & can't use them."* (Female, 28)

*"I think it fully covers distracted driving as it eliminates more ways that drivers are currently distracted."* (Female, 54)

*"They are clearer and more comprehensive in what distracted driving is, and the different technologies that are now present in vehicles and used every day by motorists."* (Female, 36)

In the second category, 52 participants (30.24%) who responded to this question noted that the coverage of the proposed rules is somewhat limited or identified areas that need improvement to address technological distractions. Many participants argued that as technology continues to evolve, rules focused solely on specific devices may struggle to keep pace with these changes. Further, a few participants noted that while the coverage may be generally good, additional definitions of distracted driving behaviours are needed. One participant also noted

that rules may focus on the behaviour and the durations of being distracted rather than distractions sources.

*"Considering the rapid growth and change in emerging of new technology and devices, rules should be written to address general impact of interaction with and involvement of five senses of human/driver, rather than passing law for each set of devices."* (Female, 46)

*"Specific definitions of distracted behaviours reduce ambiguity, making it easier for drivers to understand and comply."* (Male, 29)

*"The new rules cover distracted driving better by including more everyday distractions like eating and talking."* (Male, 29)

Additionally, some participants suggested that the rules should extend beyond technological distractions to include common everyday distractions such as eating, smoking, and vaping.

*"Not sufficient. Only cover a few items when there are so many other not listed distractions. There should not be a list of "distractions" in the rules. Rules should be overarching, e.g., taking driver's attention from the driving task for more 3 continuous seconds."* (Female, 57)

*"I would like to see something about eating in there. Having someone turn a corner while keeping their takeaway coffee balanced in their hand or hold a burger in their lap while driving can't be safe and is so unnecessary."* (Female, 33)

#### 4.5.3. Clarity of the technology-neutral rules in comparison with the current rules

Findings from the third open-ended question regarding the clarity and understandability of the proposed distracted driving rules compared to current legislation revealed that 38.05% of participants ( $n = 184$ ) provided a response. The coding identified two main categories: (1) participants who believed the proposed rules are completely clear and understandable, with no grey areas; and (2) participants who perceived that some ambiguities exist within the technology-neutral rules, which could potentially lead to confusion for drivers.

In the first category, 101 participants (54.89%) who responded to the third question stated that the proposed rules are clear and understandable, and that they effectively address the ambiguities present in the current legislation. Participants argued that the specificity of the proposed rules makes them easier to follow and helps eliminate grey areas.

*"Since they are more specific, these rules would be easier to follow. There is less of a grey area, as they better reflect the functions available on modern devices, apps, and cars, and provide a guideline of how to safely use these (rather than 'no touching')."* (Male, 25)

*"Because the proposed standards are more explicit and take into account contemporary distractions, they are much clearer and easier to grasp than the existing restrictions."* (Female, 22)

*"The proposed rules are very clear in defining distracted behaviours, reducing the potential for misunderstandings."* (Male, 33)

In the second category, 83 participants (45.11%) who responded to this question noted that some ambiguities or areas of uncertainty exist within the technology-neutral rules, which could potentially lead to confusion for drivers. While many participants acknowledged that the proposed rules are generally clear, they pointed out that certain situations such as emergencies or the use of specific integrated vehicle infotainment systems remain unclear. A few participants also identified grey areas surrounding the use of navigation devices and smartwatches and questioned how interactions with these systems might be interpreted as illegal distracted driving.

*"Overall, the suggested rules appear clearer and easier to understand than the current ones. They explicitly outline numerous potential distractions, reducing ambiguity. However, there could still be grey areas around"*

specific, less common situations, such as handling emergencies or using vehicle-integrated devices while driving.” (Female, 23)

“They are clear and easy to understand. However, I think it is too much that a smartwatch must not have its screen visible when not parked. People use them as watches as well. It is a personal item, and people can't have such restrictions placed on them.” (Female, 37)

“I find the suggested rules somewhat clearer, but there are still potential uncertainties. For example, at what point does briefly adjusting a navigation app become a violation? More explicit examples would help clarify these borderline cases and give drivers and law enforcement alike clearer guidelines to follow.” (Male, 22)

## 5. Discussion

### 5.1. The level of public support and acceptability of the proposed rules

By proposing an extended Value-Belief-Norm model, this study evaluated the level of drivers' support and acceptability of the more comprehensive distracted driving legislation and explored how drivers' general and normative beliefs, as well as policy-specific perceptions, may influence their acceptability. The findings revealed that participants expressed relatively high levels of acceptability for technology-neutral rules, with the majority agreeing or strongly agreeing with their implementation. A recent qualitative study on drivers' perceptions of distracted driving legislation suggested that current rules could encompass a broader range of technologies beyond handheld mobile phones (Rejali et al., 2025). However, there remains a lack of quantitative research on public acceptance of more comprehensive distracted driving laws, limiting opportunities to compare the findings of this study with broader evidence in the field.

The results also revealed a significant age-related difference in the acceptability of technology-neutral rules, with older drivers (aged over 55 years) reporting significantly lower levels of acceptance compared to younger drivers (aged 17–30 years). This finding aligns with previous research on mobile phone restrictions while driving, which found that younger drivers perceived a greater threat to safety and, consequently, demonstrated higher levels of support for distracted driving legislation than their older counterparts (Sanbonmatsu et al., 2016). Furthermore, the current study found no significant gender differences in the acceptability of technology-neutral rules. In a previous study, Pope et al. (2019) examined drivers' support and any gender differences for three different distracted driving laws including bans on reading or sending text messages/emails while driving, bans on using a hand-held cell phone while driving, and bans on using non-driving-related in-vehicle technology. The findings of this study showed that gender was not a significant predictor of support for the handheld cell phone ban or the non-driving-related in-vehicle technology ban, but was significant for texting/email bans, with females having approximately twice the odds of supporting that law compared with males. Also, higher perceived threat and lower self-reported engagement in distracted driving behaviours such as mobile phone use were reported by females compared to males (Pope et al., 2021; Rudisill and Zhu, 2017). However, it is important to note that while existing studies have primarily focused on mobile phone-related restrictions such as texting while driving, there is a gap in the literature regarding any potential differences across demographic and individual profiles in supporting technology-neutral rules which may explain the difference in findings between these studies.

The findings of this study indicated that although the average perceived freedom rating was above the scale midpoint, most participants provided neutral or negative responses. Analysis of group differences revealed that younger adults and males reported significantly lower levels of perceived freedom compared to drivers aged over 30 years and females. Given that technology-neutral rules are designed to

restrict different forms of device-based activity while driving, this age and gender-related difference in perceived freedom may be explained by different levels of potential technology engagement across age and gender groups that have been noted in past literature. For example, Kreusslein et al. (2024) reported that drivers under the age of 25 were more than twice as likely to engage in technology-related secondary tasks such as mobile phone use compared to older drivers. Similar findings have also been reported in relation to gender. Past studies showed that males are significantly more likely to use devices while driving than females (AAA Foundation for Traffic Safety, 2022). Moreover, Jing et al. (2023) reported that females tend to perceive greater risk while driving, which may account for their lower engagement in non-driving-related secondary tasks. Based on this evidence and the current study's findings, it may be inferred that younger adults and males perceive lower levels of freedom under technology-neutral rules, potentially due to their higher likelihood of engaging in technology-based distractions, that may influence their perceptions of freedom with further restrictions on such activities compared to their counterparts.

The results of this study found no significant relationship between knowledge of distracted driving and the acceptability of technology-neutral rules. Although research examining the relationship between these two concepts is limited, previous studies have suggested that higher levels of distracted driving knowledge are associated with less favourable attitudes toward engaging in distractions (Rejali et al., 2026). However, it is important to recognise that distraction is a complex concept, and not all secondary tasks necessarily impose the same level of risk across driving contexts. As noted by Kircher and Ahlstrom (2017), current definitions of driver distraction are often inconsistent and may be influenced by hindsight bias. Consequently, drivers may differ in how they interpret distraction and the potential consequences of engaging in secondary tasks while driving. Some drivers may perceive occasional device use as functional or even compensatory in certain circumstances (e.g., helping maintain alertness during fatigue), despite broader evidence, such as a study by Dingus et al. (2016), that many forms of distraction can impair driving performance and increase crash risk. These perceptions may explain why knowledge of distracted driving did not significantly translate into greater acceptability of broader legislation.

### 5.2. Factors influencing public acceptability of the proposed rules

The results of the structural model indicated that both policy-specific perceptions and broader normative and general beliefs significantly predicted the acceptability of technology-neutral rules. Notably, both social and personal norms were found as strong, positive direct predictors of policy acceptability. These findings suggest that drivers not only feel personally responsible for supporting more comprehensive distracted driving legislation but also believe that other drivers and important others should support these rules. The positive influence of normative beliefs on policy acceptability aligns with findings from previous transport policy research, including studies on road and congestion pricing (Cools et al., 2011; Li et al., 2023; Nordlund et al., 2018). The results also demonstrated that policy-specific perceptions including perceived effectiveness and fairness had a direct influence on acceptability, while perceived complexity showed a significant indirect effect. However, no significant indirect relationship was found between perceived freedom and acceptability. These findings are consistent with prior research, which has consistently identified perceived effectiveness and fairness as key predictors of policy acceptability (Eriksson et al., 2006, 2008; Li et al., 2023). However, the role of perceived complexity has not been extensively explored in the literature, with only a few studies confirming its role in explaining acceptability (Jain et al., 2021). The results also revealed that problem awareness indirectly influenced the acceptability of technology-neutral rules through perceived effectiveness, perceived fairness, and normative beliefs. One possible

interpretation of this finding is that raising public awareness about the issue may enhance individuals' confidence in the fairness and effectiveness of the policy (Li et al., 2023).

### 5.3. Effectiveness, clarity, and coverage of the proposed rules

The results from the open-ended responses indicated that most participants who responded to these questions believed the proposed rules would be more effective than the current legislation in addressing distracted driving. Participants noted that the proposed rules allow for better adaptability to emerging in-vehicle technologies and provides a more comprehensive approach to addressing distractions. While these rules may have the potential to address some of the shortcomings in the current legislation such as drivers' confusion around legal versus illegal technological distractions (Rejali et al., 2024a), previous research has emphasised that the effectiveness of distracted driving policies depends on several factors including the formal and informal deterrence mechanisms (Kaviani et al., 2022; Truelove et al., 2023), self-regulation and public compliance (Watson-Brown et al., 2024), and contextual and psychological influences (Pope et al., 2019). The results also showed that while nearly half of the respondents perceived the proposed rules as clear, understandable, and without grey areas, a notable number expressed concerns about potential ambiguities that could cause confusion for drivers. Previous studies evaluating the clarity of existing distracted driving legislation have highlighted the need for rules to be more comprehensible and without ambiguity (Ferguson and Winn, 2023; Rejali et al., 2025). Considering that the technology-neutral rules aim to provide an enhanced framework for addressing distracted driving, certain aspects that have been mentioned by participants, such as interactions with technological devices that may be misinterpreted as illegal, should be further clarified to eliminate any grey areas and enhance understanding.

## 6. Policy implications

Based on the findings of this study, several insights and implications have been provided for policymakers. Overall, drivers expressed relatively high levels of support for technology-neutral rules. However, several factors should be considered in developing and promoting these policies to ensure their effectiveness and public acceptability. First, the significant positive influences of social and personal norms on acceptability highlight the need for future communication strategies that frame support for technology-neutral rules as both a personal and social responsibility. Reinforcing both personal and social norms in supporting the technology-neutral rules can also be achieved by focusing on increasing the level of problem awareness for drivers through public awareness campaigns.

Second, policy-specific perceptions, especially perceived effectiveness and fairness, were identified as significant positive predictors of acceptability. Therefore, it is important for policymakers to ensure that technology-neutral legislation is clearly presented and communicated as fair and effective. This can be achieved through messaging that emphasises the policy's adaptability to emerging technologies and its contribution to improving road safety. Additionally, given the indirect role of problem awareness, public education initiatives that highlight the risks associated with various forms of technology-related distractions could further strengthen perceptions of the effectiveness and fairness of new rules. Additionally, the study identified age- and gender-related differences in perceived freedom regarding technology-neutral rules. These individual differences in perceptions of proposed road rules should be considered by policymakers and may guide them with strategies that consider these differences.

Third, while many participants perceived the proposed rules as clear, some expressed concerns about potential ambiguities. To address this issue, the proposed legislative framework must be communicated with detailed, plain-language explanations and examples that clearly

distinguish between legal and illegal behaviours. This approach should reduce confusion and improve the legitimacy of the rules. Further, given that the participants believed the effectiveness of distracted driving legislation depends not only on the content of the rules but also on enforcement and public compliance, the development of technology-neutral rules should be supported by consistent enforcement efforts and deterrence strategies.

## 7. Limitations and future research

The limitations of the study should be considered when interpreting the findings. First, as with all studies using self-report data collection methods, data are subject to potential biases, including social desirability bias (e.g., the inclination of participants to provide responses they believe are socially acceptable or favourable (Grimm, 2010)) and recall bias (e.g., when participants do not accurately remember or report past events or experiences (Coughlin, 1990)). For instance, participants may have overreported socially acceptable attitudes, which could affect the accuracy of the reported levels of support and acceptability. However, given the ability to respond anonymously and the diversity of the open-ended responses received, this risk is considered low. Further, the sample for this research was collected from Queensland, Australia. Given that road rules vary across Australia, as well as internationally, the generalisability of the findings to other jurisdictions cannot be assumed. Future research across different states and territories would help to extend and apply these findings to other Australian contexts and could provide further insights and considerations for other countries considering distraction regulation reforms. A further limitation of this study is that, although 15.4% of participants held an international driver's licence, the questionnaire did not capture the country in which the licence was issued. Since distracted driving regulations differ between countries, the original licence country may have influenced participants' perceptions with distracted driving rules. In addition, international licence holders reported significantly lower perceived freedom regarding the technology-neutral rules compared with open licence holders. However, the specific mechanisms underlying this finding remain require further investigation in future research.

In terms of theoretical scope, this study focused on general and normative beliefs and policy-specific perceptions to explain policy acceptability. It is also important to note that high acceptability of the technology-neutral rules does not necessarily translate into behavioural compliance. While drivers expressed support for the legislation, this does not directly indicate that drivers will refrain from engaging in secondary tasks while driving. In addition, although general and normative beliefs and policy-specific factors largely explained the acceptability, other predictors identified in broader safety contexts, such as affinity for technology, ascription of responsibility, and willingness to act, were not included. Future research is encouraged to extend the proposed model by incorporating these additional constructs to better capture the underlying factors of acceptability. For instance, emerging evidence from distracted driving literature highlights that factors such as dependence on mobile phones or nomophobia (i.e., the fear of being without a mobile phone) may influence both driving behaviours and perceptions of road rules (Koppel et al., 2022). Although the present study did not include this construct in the proposed model, future studies could examine how mobile phone dependence interacts with perceived autonomy and other policy-related beliefs to shape policy acceptability. Further, although this study examined differences in acceptability across several demographic and background variables, including gender, level of in-vehicle technology use, and previous crash or fine records, no significant associations were found. Given the limited research exploring these factors in the context of distracted driving legislation, further studies are needed to clarify whether and how such characteristics may influence acceptability.

## 8. Conclusion

This study provides valuable insights into drivers' views on more comprehensive distracted driving legislation and the factors explaining the level of policy acceptability. By presenting a policy acceptance model, findings showed that the proposed rules were generally supported by drivers, with personal and social norms, perceived fairness, and perceived effectiveness emerging as key predictors of policy acceptance. The strong explanatory power of the policy acceptance model showed the importance of integrating normative and policy-specific beliefs in the model. Further the identified differences across demographic groups suggest that targeted communication strategies may be needed to promote acceptance. In addition, the qualitative findings highlighted public need for clearer definitions, practical enforcement strategies, and public education to ensure understanding and compliance.

### CRedit authorship contribution statement

**Sina Rejali:** Writing – review & editing, Writing – original draft, Validation, Software, Methodology, Investigation, Formal analysis, Data

## Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.tranpol.2026.104199>.

## Appendix

**Table A1**

The proposed technology-neutral distracted driving rules, sourced from [National Transport Commission \(2020\)](#)

### Portable devices

A driver of a vehicle that is moving, or is stationary but not parked must not:

1. touch a portable device that is not mounted or affixed to the vehicle
2. have the device's display visible to the driver while the display is operating.

**Touch** for portables includes using hand or finger to touch and operate the device, holding a portable device, or the device resting on any part of the driver's body.

This policy allows any function of portable technology to be performed by voice control as long as the display is not visible to the driver in the normal driving position while the display is operating.

#### **Examples of portable devices include:**

- mobile phones
- tablets
- laptops
- electronic games
- mp3 players
- heads-up displays
- dispatch systems
- cameras

### Inbuilt and mounted devices

A driver must not touch the device or have the screen operating while visible to the driver (from the normal driving position) while the vehicle is moving, or is stationary but not parked, unless the driver is operating the device to:

- accept, reject and initiate an audio call
- stream, play or listen to music or audio files
- use functions associated with safety and the operation of the vehicle
- use functions that monitor the driver's behaviour and/or condition
- use a dispatch system or device or an app used as part of the professional driving task
- use navigation functions

The interactions above are permitted as long as the driver:

- does not touch the device to manually enter words, sentences and numerical sequences, for example phone number, or an address for navigation.
- does not scroll, for example scroll through contact lists or playlists.

This policy allows any function of inbuilt and mounted devices to be performed by voice control as long as the display is not operating, unless it is for a function listed above.

#### **Examples of inbuilt and mounted devices include:**

- portable devices secured in a mounting affixed to the vehicle
- heads-up displays

uration, Conceptualization. **Sherrie-Anne Kaye:** Writing – review & editing, Validation, Supervision, Methodology, Investigation, Data curation, Conceptualization. **Natalie Watson-Brown:** Writing – review & editing, Validation, Supervision, Methodology, Investigation, Data curation, Conceptualization. **Teresa Senserrick:** Writing – review & editing, Validation, Supervision, Methodology, Investigation, Conceptualization. **Oscar Oviedo-Trespalacios:** Writing – review & editing, Validation, Supervision, Methodology, Investigation, Conceptualization.

### Declaration of competing interest

The authors declare that they have no conflict of interest.

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(continued on next page)

Table A1 (continued)

- Integrated infotainment system (technology that provides drivers with information such as vehicle diagnostics, road and traffic conditions, navigation information, etc.)
- integrated dispatch systems
- Inbuilt and mounted devices do not include CB radio or any other two-way radio

**Wearable devices**

A driver that is wearing a wearable device while the vehicle is moving, or is stationary but not parked must not:

1. touch the device
2. have the screen visible, unless it is being used for:
  - audio calls
  - streaming, playing or listening to music or audio files

This policy allows any function of wearable devices to be performed by voice control as long as the display is not operating, unless it is for a function listed above.

**Examples of Wearable devices:**

- smartwatches
- smart glasses
- wearable heads-up displays

Wearable devices do not include headphones, earphones, and Bluetooth earpieces.

**Data availability**

The authors do not have permission to share data.

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