ROADS AUSTRALIA

DISTRACTION FROM TECHNOLOGIES WHILE DRIVING

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Connecting
our communities

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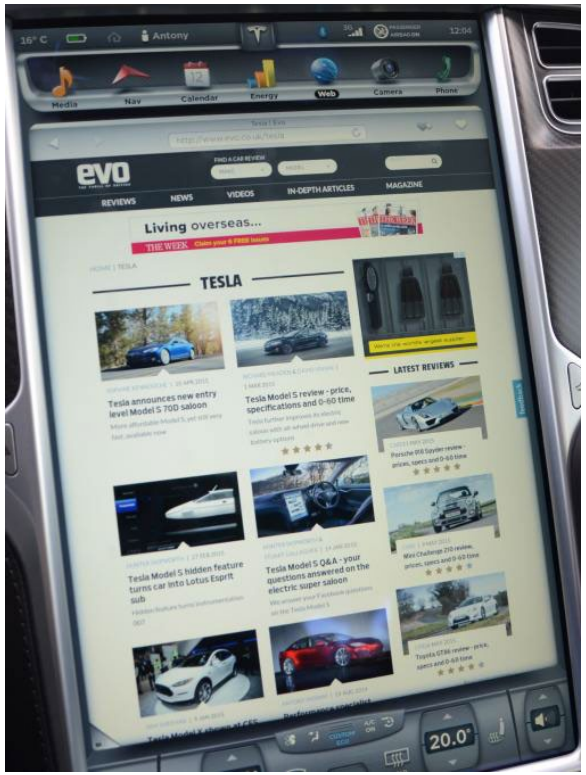
TRANSPORT FOR VICTORIA

Outline

- What is distraction?
- Performance decrements & crash risks from using phones, VDUs (visual display units) & other technologies whilst driving
- Distraction countermeasures



What is distraction?

- “Driver distraction is the diversion of attention from activities critical for safe driving to a competing activity”
- Key elements:
  - Cannot maintain safe driving – adversely affected
  - Attention diverted toward a competing activity, inside or outside the vehicle
  - Competing activity may or may not be driving-related
  - Diversion of attention may be voluntary or involuntary

PERFORMANCE DECREMENTS

Phone dialling & talking – performance decrements

- Dialling:
  - Increased RT to hazardous events*
  - Increased lane deviation*
- Hand-held talking:
  - Increased RT to hazardous events*
  - No effect on lane keeping*
  - Speed reduction*
  - No effect on headway*
  - Increased number of missed objects and driving errors*
  - Increased braking RT, headway and lane position variations***
- Hands-free talking:
  - Increased RT to road safety events* as well as no difference**
  - More abrupt and excessive braking*

*Compared with just driving
** Compared with talking/listening on a hand-held mobile
*** Compared with hands-free

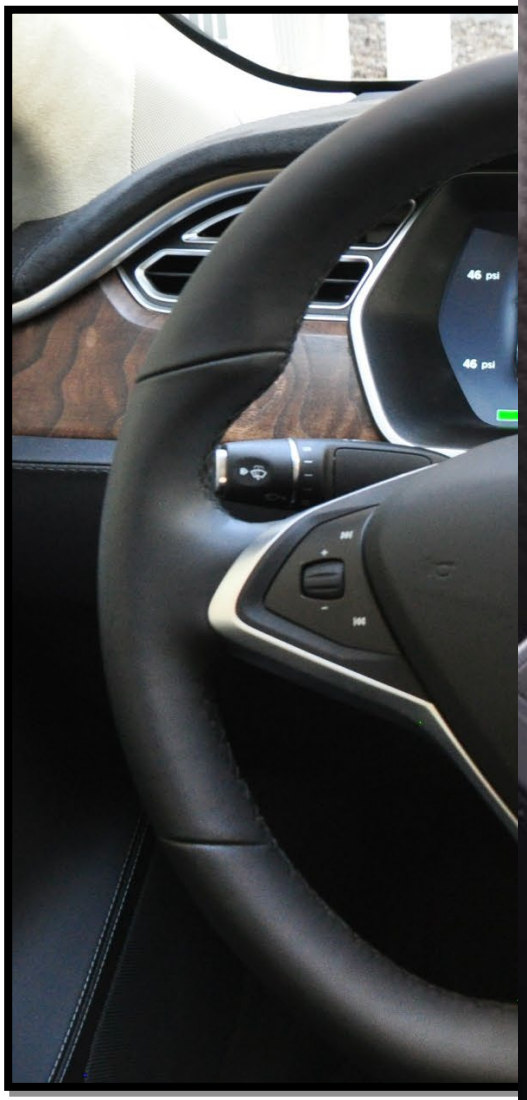
Texting – performance decrements

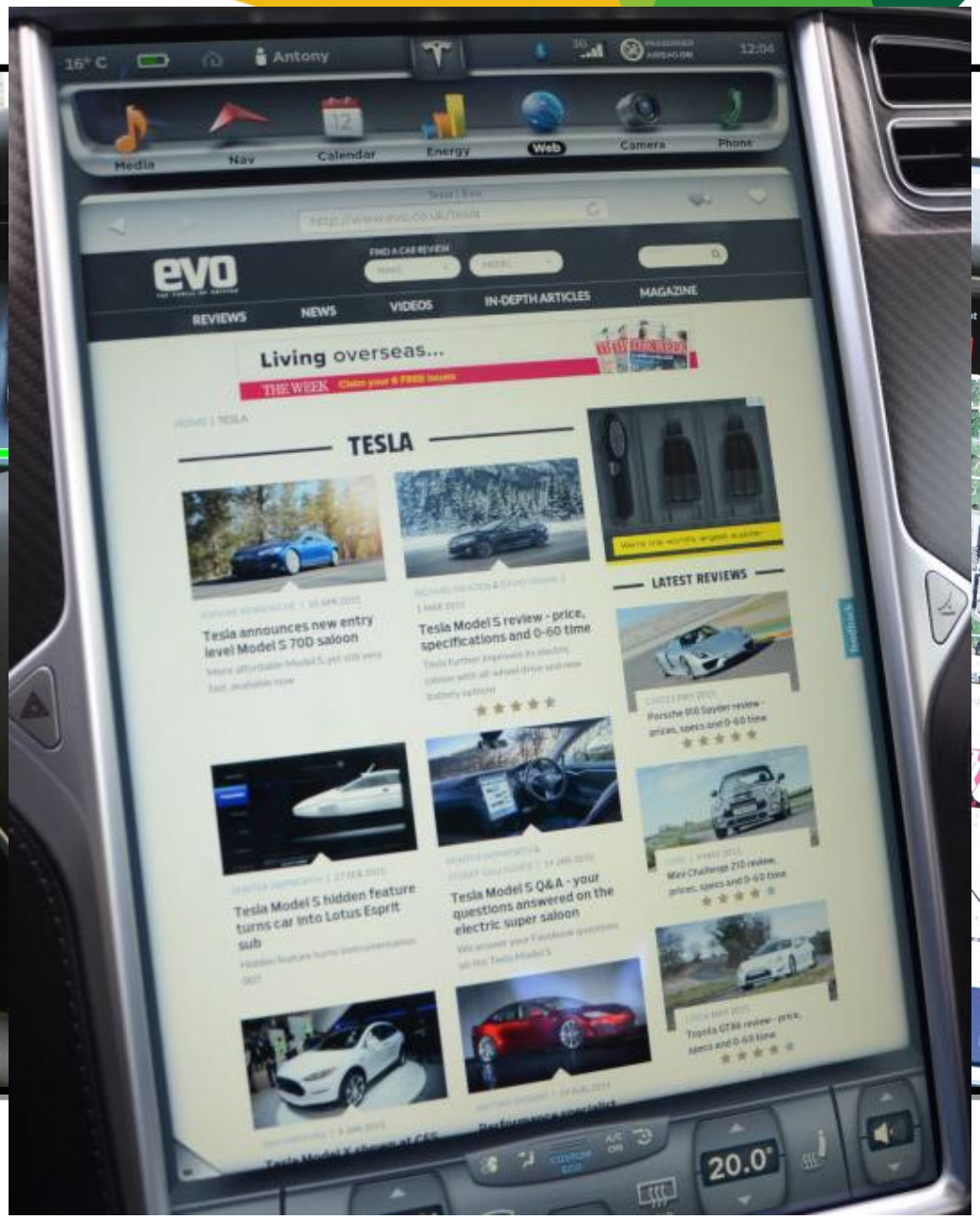
Reading	Writing
Increased reaction time (RT) to hazardous events*	Increased reaction time (RT) to hazardous events* (and for voice system on phone)
Increased lane deviation*	Increased lane deviation*
Increased headway*	Increased headway*
No effect on driving performance**	Longer glances from the roadway*
	More missed traffic signals and driver conflicts
	Increased time spent looking off forward roadway when using integrated VDU

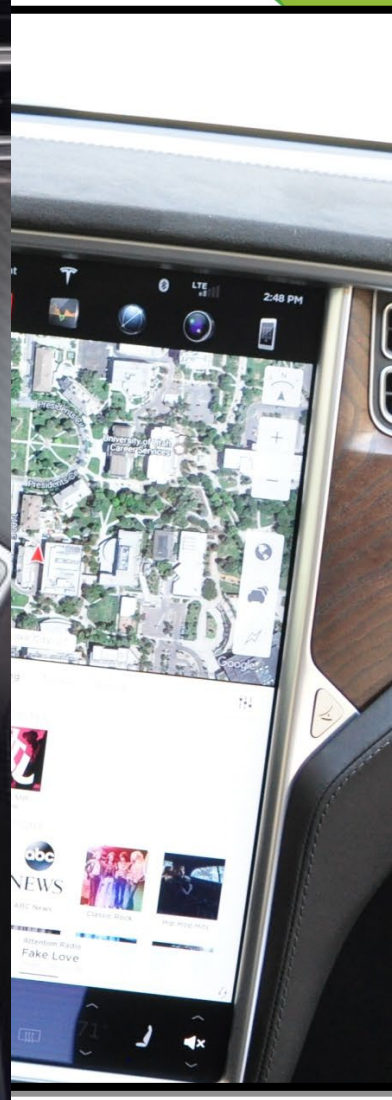
*Compared with just driving

**When message is read to driver by in-vehicle system using text-to-speech software

Distraction from HMI with today's dashboard







Distraction from HMI with today's dashboard

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Distraction from HMI with today's dashboard

Sat navs, email & music

- Sat navs (in-veh input destination) – lane deviations, braking errors, glances off the roadway, but voice input better cf manual input
  - one study - 23 s for voice vs 75 s for manual input of address
- Sat navs (following directions) – reduced lane deviations, less braking errors, less glances away from roadway (voice)
- Email (in-veh) – increased reaction time (RT) hazardous events, increased braking time, longer headways, fewer steering corrections
- Music (in-veh) – variability in lane keeping, more glances off roadway

CRASH RISKS

Phone crash risks

- Dialling:
  - 4 times more likely to crash
- Locate/answer:
  - 3.6 times more likely to crash
- Text, browse or email:
  - 10.3 times more likely to crash
- Handheld talking:
  - twice as likely to crash, but variation in studies
- Hands-free talking:
  - Some studies provide protective effect most likely due to long journeys (prevents fatigue)
  - Need more research

Visual Display Units (VDUs) – crash risks

- Second Strategic Highway Research Program Naturalistic Driving Study (Virginia Tech, USA):
  - Dingus et al. (2016) – in-vehicle device (non-radio/non-heating, ventilation & air conditioning (e.g. touchscreen menus) – **4.6 times more likely to crash**
  - Guo et al. (2016) – by age:
    - 16–20 years – 2.3 times more likely to crash
    - 21–29 years – 3.4 times more likely to crash
    - 30–64 years – 1.9 times more likely to crash
    - 65–98 years – 2.1 times more likely to crash

Voice activation performance decrements

- Compared with interacting with mobile phone or VDU:
  - Improved event detection and better lane keeping (due to increased visual attention)
  - Reduced variability in gap acceptance
  - No difference in brake response time

- Compared with just driving:
  - Driving impaired due to cognitive distraction e.g. slower RTs, reduced eye glances to forward roadway, greater speed deviations

- Lingering distraction, for up to 18 to 27 seconds, after the driver finished voice interaction task

"Hands-free voice based interactions can be very mentally demanding and ought not to be used indiscriminately while operating a motor vehicle"

WHO'S DISTRACTED? WHY?

Phone use whilst driving

- TAC Road Safety Monitor survey 2017 – phone use whilst driving:
  - 34% used a phone (either legally or illegally)
  - 26% read a text message
  - 12% wrote and sent a text message
  - 17% answered a hand-held phone call
  - 12% made a hand-held phone call
- Greater phone use – if aged under 40, especially if aged 26 to 39 years. For this age group:
  - 52% have used a phone
  - 41% read a text message
  - 21% wrote and sent a text message.
- Most believe it is easy, rather than difficult, to avoid being caught while using a hand-held mobile phone (47% versus 23%)
  - 30% thought it would be neither easy nor difficult

Reducing illegal mobile phone use is a particularly challenging road safety problem

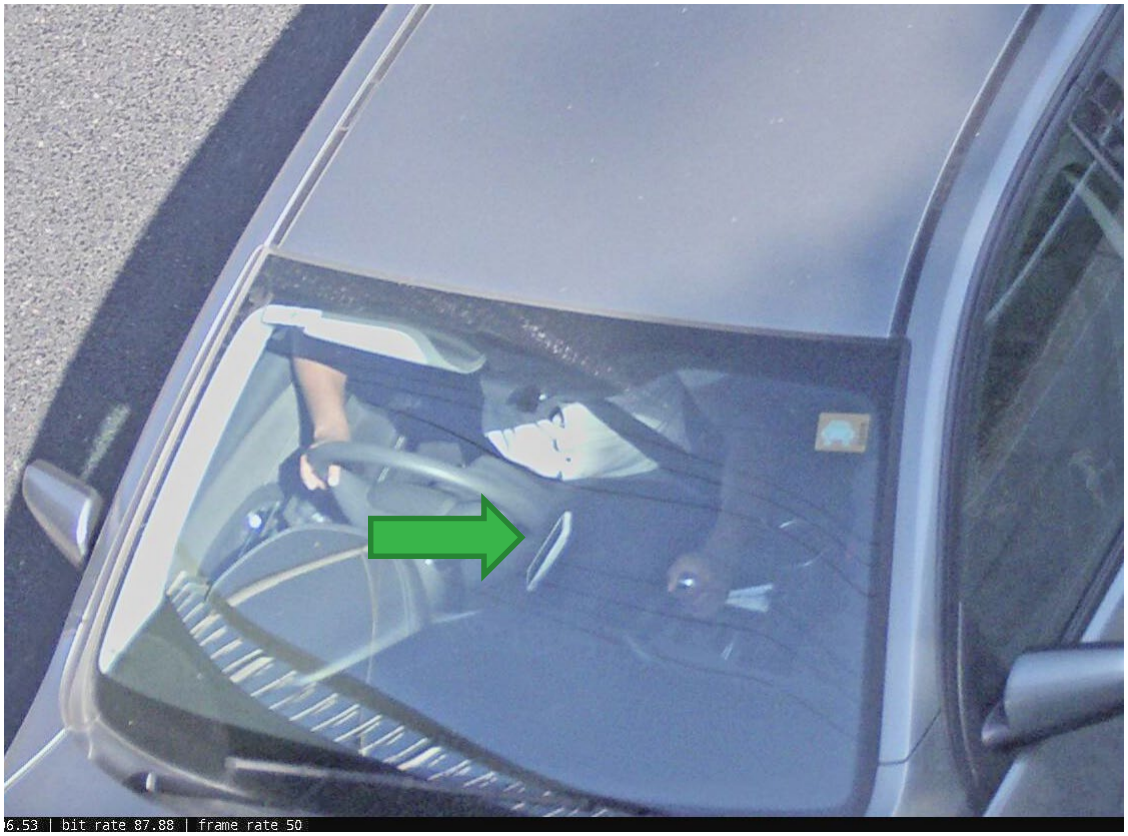
Why do drivers use their phone and drive?

- Overconfidence, optimism bias e.g. grown up with the technology, believe can use phone while driving successfully
- Peers in the vehicle, especially young drivers
- General need to be “connected” & situational e.g. ‘making plans for the evening’, ‘boredom of driving alone in a vehicle’
- Positive consequences such as ‘using time more effectively’, ‘receiving information e.g. directions, important news’
- Social approval e.g. young people expect immediate text responses
- Perceived less risk and no fear of enforcement
- Phone addiction

POTENTIAL COUNTERMEASURES TO MITIGATE DISTRACTED DRIVING

Distraction driver countermeasures

- Use improved/innovative detection technology of mobile phone / illegal distracting

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Distraction driver countermeasures (cont.)

UK trial (Norfolk)

Tech picks up phone signal in vehicle > activates warning sign (a mobile with a red line through it)

Detects only handheld phone use

Can't differentiate between driver and passengers

Distraction driver countermeasures (cont.)

- TAC PR campaigns e.g. Blind, documentary 'It's People Like Us'
- Levers to change attitudes about use of technologies whilst driving – especially young people e.g. risk to others, health
- Target fleets – workplace requirements for safety e.g. no phone policy
- Increased publicity:
  - fine and demerit point level
  - risks of phones & technologies [need drivers to think will be caught – difficult until cameras] [Link to enforcement]
- More research on crash risk for newer technologies & better data
- Text blockers – PR around existing apps
- Texting bays?! Link with fatigue bays?
- Appropriate messaging…..

Message ingredients – phone use

- Increase awareness of risk (hands-free just as risky for some groups e.g. young drivers than hand-held)
- Highlight unexpected challenges in most driving situations & risks e.g. eyes of road for 2 seconds at 50 km/h drive 27 metres blind & doubles crash risk
- Messages - disapproval from significant others, i.e. friends and family, e.g. 'Your friends don't want you to be dying to talk to them'
- Other disapproval strategies re: referring to the driver as irresponsible (e.g. 'bloody idiot')
- If adopting a positive approach, reinforce approval for the decision not to use a mobile phone while driving
- Reduce perceived advantages of texting, promote improved time management and trip preparation
- Link to improved health if not using a phone

THANK YOU

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DISTRACTION ROAD RULES

Mobile phone laws

- A fully licensed driver can make and receive calls if:
  - phone in commercial mounting/cradle OR
  - driver does not touch phone (for example, if using a car kit / Bluetooth technology)

- Can only touch your phone to make / receive a call if:
  - you are a fully licensed driver AND
  - phone in commercial mounting/cradle

- A fully licensed driver can use phone in cradle:
  - speakerphone function/button when receiving calls
  - phone for navigation or audio function like playing songs through iTunes / radio
  - at traffic lights, in accordance with the conditions described above

Mobile phone laws (cont.)

- Drivers CANNOT use phone, even if in mounting/cradle to:
  - check Facebook, the internet or apps that are not for navigation, music
  - includes using voice activation for such functions
- If phone NOT in cradle, drivers CANNOT touch the phone whilst driving (includes phone touching driver's body)

Smartwatches and the law

- Fully licensed drivers only & MUST be in cradle or via Bluetooth (handsfree) - navigation, phone or music

More information on VR website - Mobile phones, technology & driving

VDU (Visual Display Unit) laws

- Rule introduced in 1999, updated in 2013 with sanction increase
- Rule:
  - VDU cannot be visible to a driver – unless it is a driver's aid e.g. navigation, rear view screen
  - VDUs cannot be visible to drivers in other vehicles
- Police generally do not prosecute as rule was set up to prevent TVs going into vehicles

Apple Car Play / Android Auto – advice

- Learner & probationary drivers:
  - Cannot be used
- Fully licensed drivers:
  - Navigation (e.g. maps, Waze) permitted
  - Music permitted, includes Spotify, iHeartradio, TuneIn radio etc., podcasts and audio books
  - Make and receive calls permitted
- All drivers:
  - Texting, including using Whatsapp NOT permitted
  - All other apps NOT permitted

Note - advice as not covered under road rules

Mobile phone and VDU law changes 2013

- Revised 25 November 2013, with public education (mainly digital based)
- Mobile phone penalties increased:
  - Fine: $289 to $433 [from 1 July 2018 - $484]
  - Demerit points: 3 to 4 points
- VDU penalties consistent with mobile phone penalties:
  - $433 fine [from 1 July 2018 - $484]
  - Demerit points: zero to 4
- Probationary P2 licence holders now banned from phone use of any kind (so all Ls and Ps banned)
- NOTE:
  - Vehicle can now be legally parked for mobile phone & visual display unit use even if the key is in ignition and engine is running