

Texting while Driving – Reading or Writing, the Data Doesn't Look Good





The epidemic of driver texting while driving has been well profiled in the media.

The exact effect of this driver behaviour on driver performance needs to be discussed.

*By Alan Morris, PhD, P.Eng.,
Accident Reconstruction and
Biomechanical Engineering Group,
Roar Engineering*

Tasks During Driving

Canadian Drivers are being distracted with a number of tasks they are attempting while driving their cars including use of entertainment systems, eating, in-car discussions, reaching back for an item, interacting with GPS device, talking on the phone hands-free, talking on the phone in-hand, adjusting clothing, adjusting making, and texting. The frequency of these tasks are shown in Figure 1:

Texting Behaviour

Texting (reading or writing), like many of the other tasks distract a driver by requiring him/her to adjust eye focus onto a small screen and away from the roadway.

While those ticketed only represent a fraction of those using their phones while behind the wheel, most people caught texting while driving don't believe they are breaking the law. Some drivers will provide the excuse that they are an experienced driver or that they are good at multi-tasking!

Canadian Snapshot

- A report from SGI, Saskatchewan's Driver Licensing and Registration, indicated that approximately 400-600 drivers are fined each month for being on their phones or being distracted other ways.
- Since 2015, Edmonton police say they have issued more than 21,000 distracted driving violations, commonly texting - an average of about 20 tickets a day.
- Across Alberta, in 2017, there were over 24,000 distracted driving convictions – men were twice as likely as women to be found guilty.
- Between January and September 2017, Montreal handed out 10,000 citations to drivers for

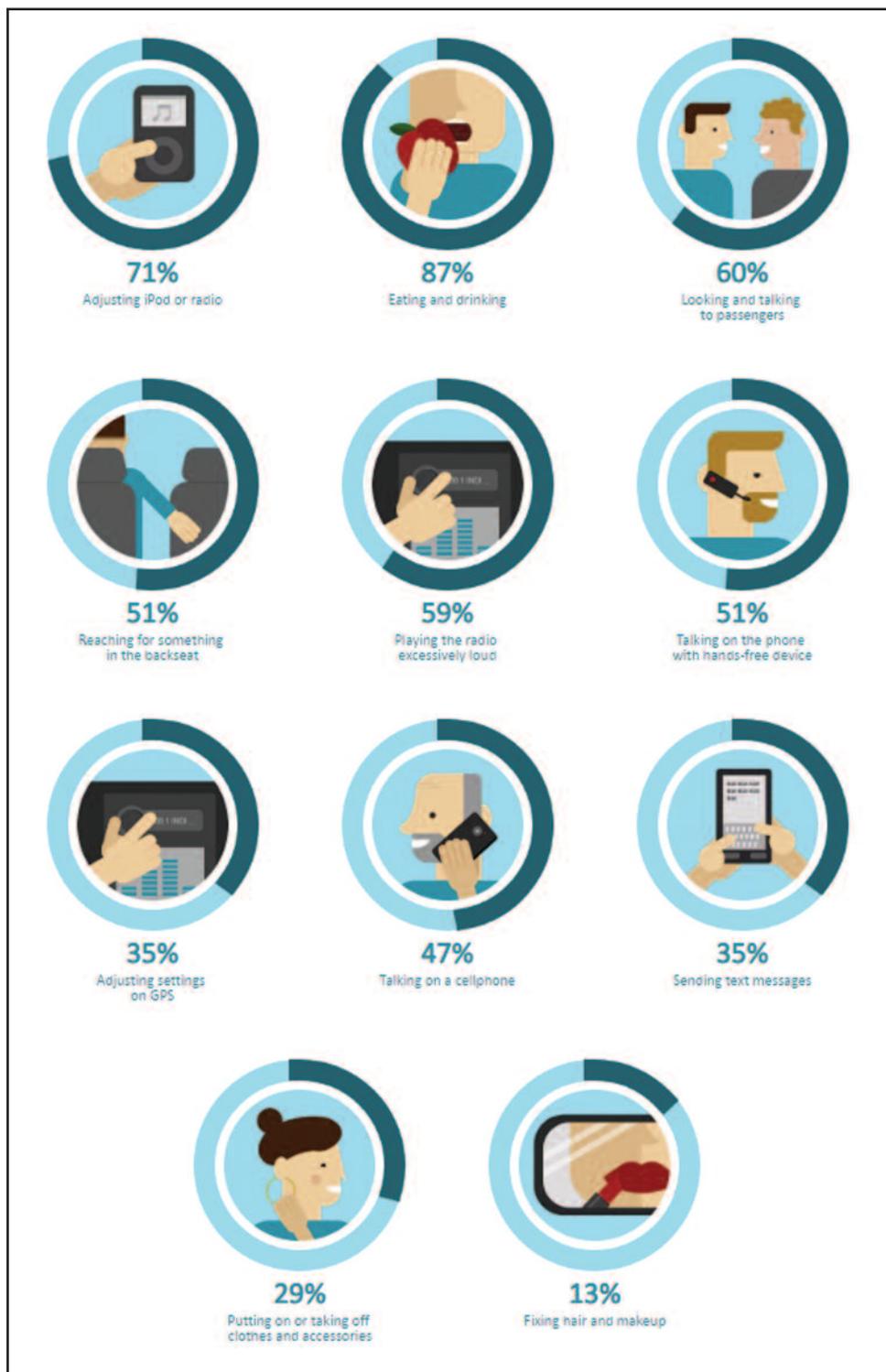
using their cell phone while behind the wheel, and an additional 1,950 citations related to distracted driving.

- Between 2012 and 2016, 33% of

fatal crashes and 42% of serious collisions in Quebec were linked to distracted driving.

- According to the Canadian Auto Association (CAA), a recent 2017

Figure 1: Distracted driving behaviours (<http://www.rates.ca>)



survey of 2,003 drivers indicated that they considered texting while driving and drunk driving equally as their most serious road safety concern.

See Figure 2 on page 13.

U.S. Snapshot

- The U.S. National Safety Council estimates that 1 out of every 4 accidents in the U.S. is caused by texting and driving. In a 2018 survey of 1400 U.S. drivers, 41% admitted to reading texts while in moving traffic, 11% admitted to have texted while in moving traffic, 8% admitted to watching Youtube/Netflix videos while behind the wheel, and 18% admitted to checking social media while behind the wheel.
- According to the U.S. National Highway Transportation Safety Administration, in 2015 approximately 3,500 people were killed in distracted driving crashes, about 10% of total traffic fatalities.
- U.S. telematics provider, Cambridge Mobile Telematics (CMT), collected data collected from more than 65 million trips across the U.S. over a 6 month period ending in April of each year.
- The Cambridge Mobile Telematics data indicated:
 - Distracted driving occurred during 36.1% of trips nationwide.
 - Evening commutes had the greatest amount of distraction with 38% of trips between 4pm and 6pm exhibited distracted driving.
 - Distracted driving most typically occurred at speeds of 30-40 mph (48-64 km/h).
 - Distracted driving occurred more on local roads (57%) versus highways (43%).



- More than 1 minute of distraction on more than 40% of distracted drives and more than 2 minutes of distraction on 20% of distracted drives.
- Drivers using their phones the

most are 6x more likely to crash than the least distracted drivers, and more than 2.3x more likely to crash than the average driver.

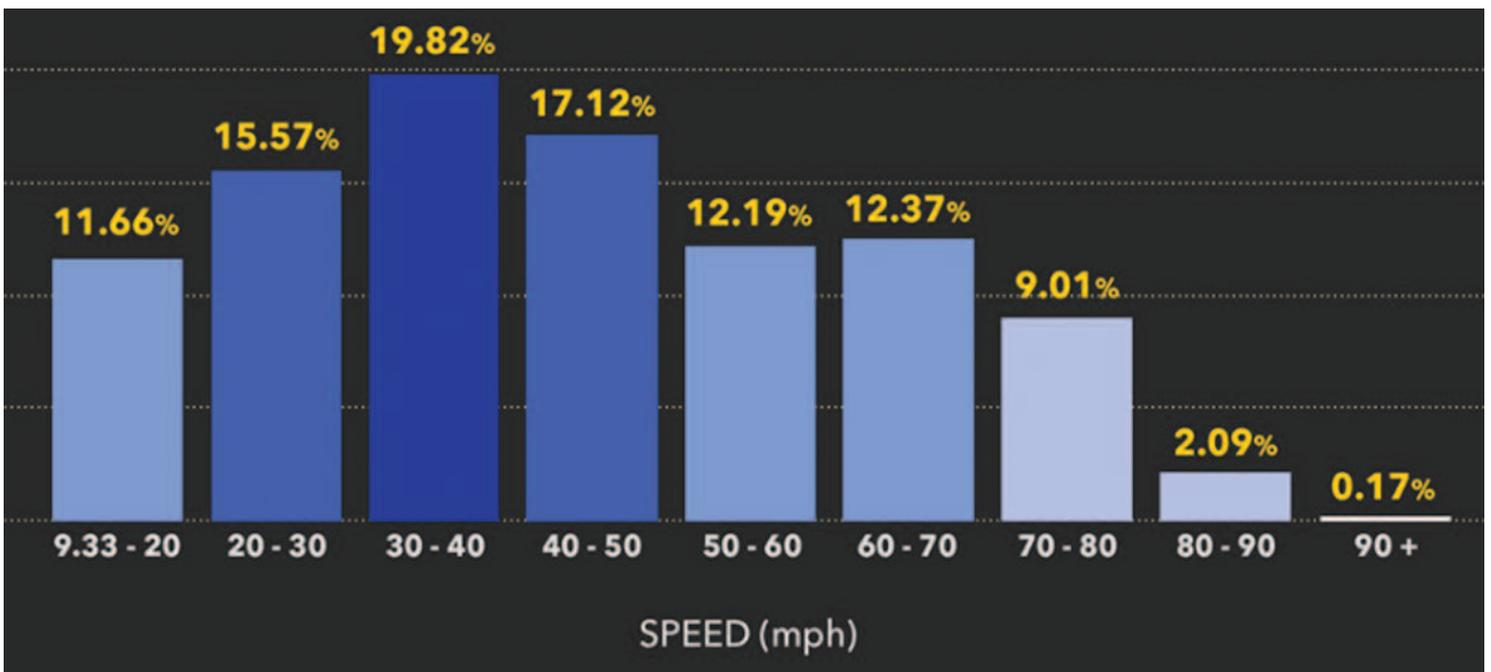
Figure 2: Distracted Driving Laws in Canada (<http://www.rates.ca>)

Distracted driving laws in Canada

Province	Fine	Demerits
British Columbia	\$167	3
Alberta	\$172	none
Saskatchewan	\$280	4
Manitoba	\$200	2
Ontario	\$1000 - \$3000	6
Quebec	\$115 - \$154	3
Newfoundland	\$100 - \$400	4
Prince Edward Island	\$250 - \$400	3
Nova Scotia	\$176 - \$350	none
New Brunswick	\$172.50	3
Yukon	\$250	3
Northwest Territories	\$322	3
Nunavut	n/a	n/a

- Across eight U.S. cities (Boston, Chicago, New York, Los Angeles, Washington D.C., Houston, Philadelphia and San Francisco), distracted driving averaged 11% greater than the national average.
- Distracted driving in the U.S. increased from 31% in 2017 to 36% in 2018.
- The nationwide average length of time distracted was 1.66 seconds per kilometre with a maximum average of 2.34 seconds per kilometric occurring in Philadelphia – at 60 km/h (1 km/min) that is equivalent to looking away from the road for 2.34 seconds of every minute.

Figure 3: U.S. Incidence of Distraction Events for Given Speed Ranges (Cambridge Mobile Telematics, 2018)



Perception-response time of a normally attentive driver detecting a pedestrian hazard is affected by factors including the setting (intersection or mid-block), available lighting and the pedestrian's clothing colour, and whether the pedestrian was seen to be stationary beforehand.

How Texting Affects Driver Performance

Those that study human factors quantify the response of a driver to a hazard as perception-response time - the time required for a driver to detect, identify, decide upon a response, and physically initiate a response (i.e. steering or braking) to the hazard.

Perception-response time of a normally attentive driver detecting a pedestrian hazard is affected by factors including the setting (intersection or mid-block), available lighting and the pedestrian's clothing colour, and whether the pedestrian was seen to be stationary beforehand.

What Driver Behaviour Response Studies Say

A review study of many studies (a meta-analysis!) indicates the following effects of texting on driving:

- Typing and Reading or Typing alone had a larger effect on a driver's eye movement, response time, and the lateral control of the vehicle (keeping in the lane) than reading alone.

- The time taken for a driver to respond and keeping in the lane were strongly correlated to the length of a text message being read. A long text answering task had a high correlation with a vehicle's speed.
- Texting with one or both hands caused the frequency of steering wheel (course) corrections to be reduced or delayed, resulting in large corrections and erratic vehicle movement that required other drivers to anticipate or accommodate.
- Drivers who read and typed texts tended to decrease their speed and increase their following distance behind vehicles in front of them - trying to compensate for looking away from the roadway. Prolonged and repeated glances, however, will negate the added time/distance available to respond from the increased following distance. The variation in following distance also increases while texting - drivers intermittently follow lead vehicles, fall back and catch up after texting is completed. It is

not known whether the increased following distance is an intentional safety strategy or is just a new default due to distraction.

- Drivers looked at their phones an average of 17.5 times and the longest duration away from the roadway was 2.7s.
- Glances from the roadway exceeding 1.6 - 2.0 seconds increased crash risk.
- Drivers trailing a texting driver must also anticipate and accommodate fluctuating speeds of the lead vehicle and variations in within-lane position.
- Texting results in prolonged and frequent glances away from the road, missed detection opportunities, had slower responses to hazards, had poorer lateral control of the vehicle, and was involved in a higher number of crashes.
- The accumulated evidence of visual, physical and cognitive driver distraction due to texting is negative, unequivocal and converges.
- The perception-response time of a driver during reading or writing a text double from 1-2 seconds to between 3 and 4 seconds and drivers were 11+ times more likely to detect a flashing light while they were texting.
- **Amongst novice drivers, the risk of a crash or near-crash increases 8x when dialing a cellphone, 7x when reaching for a cellphone, and 4x when sending or receiving a text message.**
- **Texting and driving is a greater safety threat than dialing a cellphone while driving, driving drunk, smoking cannabis while driving, or talking on the cellphone while driving.**

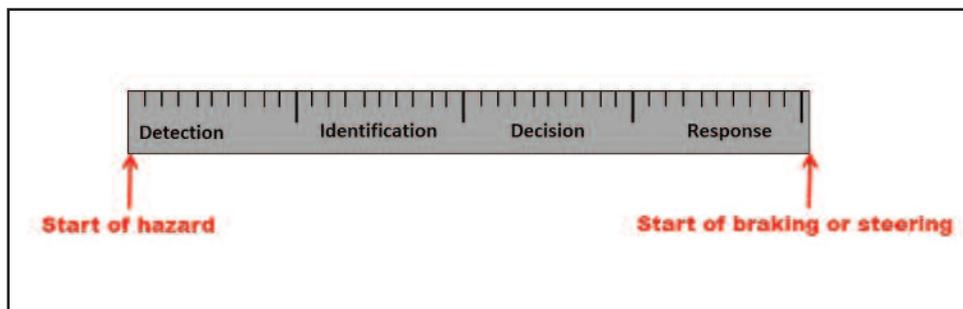


Figure 4: Concept of perception-response time



A Final Note

Texting while driving is extremely risky behaviour. Many drivers will recognize when a driver ahead of them is texting, indicated by seeing a driver’s bobbing head, vehicle weaving within the lane, vehicle speeding up and slowing down, and the vehicle responding late to a change in the traffic condition. Drivers are weary of another driver texting, and rightly believe it is the most serious safety risk on today’s roads. The data shows that a texting driver will take twice as long to respond to a hazard – potentially taking away most opportunities for that driver to respond to and avoid a hazard on the road ahead. The risks of a texting driver crashing are 6x greater and the potential cost to life is significant.

The overwhelming evidence indicates:

Don’t pick up your phone while driving!

References

Allstate (2013) Survey: Gen X worst distracted driving culprits – Most

Canadians perceive behaviour negatively even as this behaviour increases. <https://www.allstate.ca/web-pages/about/newsroom.aspx?article=gen-x#.VCW0OvldWcl>

Bartko, K. (2018) 21K Distracted driving tickets issued in 3 years in Edmonton. Global News (Feb 14, 2018). <https://globalnews.ca/news/4024916/edmonton-21k-distracted-driving-tickets-3-years/>

Caird, J.K., Johnston, K.A., Willness, C.R., Asbridge, M., and Steel, P. (2014) A meta-analysis of the effects of texting on driving. *Accident Analysis and Prevention* 71: 311-318.

Cambridge Mobile Telematics (2018) Distraction 2018 [Infographic] <https://www.cmt telematics.com/distracted-driving-awareness/distraction-2018-infographic/>

Klauer, S.G., Guo, F., Simons-Morton, B.G., Ouimet, M.C., Lee, S.E., and Dingus, T.A. (2014) Distracted driving and risk of road crashes among novice and experi-

enced drivers. *New England Journal of Medicine* 370: 54-59.

Persaud, C. (2018) Distracted driving on the rise in top U.S. cities. *WiFi HiFi* (April 4, 2018). <https://www.wifihifi.ca/content/index/page?pid=6270>

Rates.ca (2018) Distracted Driving Infographic. <https://rates.ca/distracted-driving-infographic>



Alan Morris, PhD, P.Eng., manages the

Accident Reconstruction and Biomechanical Engineering group at Roar Engineering in Mississauga. Over the past 10 years consulting to the insurance and legal industries, Dr. Morris has investigated numerous motor vehicle collisions involving cars, heavy trucks, motorcycles, cyclists and pedestrians.

To investigate and reconstruct collisions, Dr. Morris applies the latest software and techniques and applying evidence from various sources including: “black box” data, site measurement, vehicle damage, police investigation, witness statements and medical records. Dr. Morris specializes in the statistical analyses of collision-injury databases to estimate hypothetical driver/occupant injury profiles when to investigate hypothetical collision scenarios.