# Solutions To Reduce Distracted Driving And Technology-Induced Inattention

By
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## I. Background of the problem

How many times have you heard that you should not text and drive, talk on the phone, or grab that bag of potato chips in the seat next to you while driving? There are many awareness programs that provide powerful statistics about the dangers and risks or show bloody asphalt scenes associated with distracted driving. Awareness initiatives are important, and some have had limited success in reducing distracted driving through education. Yet after a decade of increasing awareness, the data shows that 1.6 million crashes, more than 3,100 deaths and 400,000 injuries were caused by some form of distracted driving in 2019.[1] Over 1 in 4 of all accidents[1] and 87% of rear-end collisions are the result of some form of distracted driving.[2] Rear-end collisions are most often associated with serious spinal injuries. Clearly, we need to do more than simply make folks aware of the problem.

We all know on some level that distracted driving is unsafe, so why do we choose to do it so often? One cause is cognitive dissonance - the driver's denial that distracted driving is unsafe for themself. Survey research indicates that 92% of drivers say texting and driving should be illegal, with mandatory fines accompanying citations, yet 60% of the 18 to 34 year olds believe they could text and drive safely.[3]

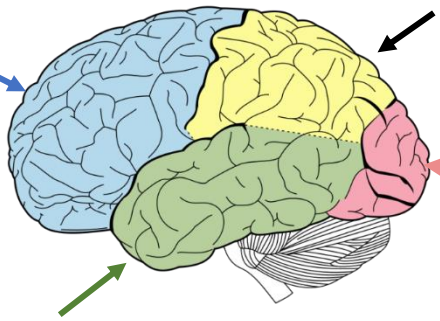
Enter the new world of technology-induced inattention. These days cognitive distraction is not caused solely by mobile devices. A wide range of new in-car gadgets can cause you to take your eyes of the road, your hands off the wheel, and your mind off driving.

These in-car technologies, such as driver-assist technologies, often have non-intuitive operations and larger display screens (some are touch screens) that can be confusing. These can take a long time to figure out which can decrease adoption. Auto manufacturers spend little time explaining how to use new self-driving technologies, and often fail to point out their limitations. We explored these issues in the following video: Semi-Autonomous Vehicles | ADEPT Driver

## II. Brain Science

When talking on the phone your brain directs about 37% of its energy away from parts of brain that deal with driving.[4] The result is what researchers call **inattention blindness**. You look, but do not truly recognize everything you are looking at. As a result, you can miss 50% of what is going on around you.[5] Cognitive distractions that take your mind off the road are a leading cause of distracted driving and technology-induced inattention injuries and death.

**Frontal lobe**
Emotions, reasoning, planning, movement, parts of speech judgment, problem solving, and planning.

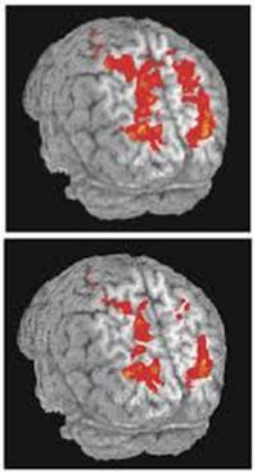


**Parietal lobes**
Driving activities

**Occipital lobe**
Vision

**Temporal lobes**
Hearing, memory, meaning, and language. They also play a role in emotion and learning. The temporal lobes are concerned with interpreting and processing auditory stimuli.

**Neurocognitive activity in red**



Driving alone and not on phone

Listening to a question on cell phone while driving

**Inattention Blindness**

The parts of the brain associated with recognizing moving objects and vision reduces neuropathway energy by 37%. You miss things like a traffic light turning red, a pedestrian stepping off the curb, or cars slamming on their brakes 10 seconds ahead.

## III. A new approach to significantly reducing distracted driving and technology-induced inattention injuries and death.

**Neurocognitive training:** New in-car technologies require the driver to adapt and learn how to maximize their safety benefit. In short, using driver skills of the past are not going to be the best practices going forward. Psychometric-based driving simulations allow drivers to improve neurocognitive activity associated with driving. The science behind neurocognitive training has dramatically grown in the last ten years, and there is compelling evidence that this approach can significantly reduce crash frequency and severity, including distracted driving and technology-induced caused crashes. Developing neurocognitive pathways to improve the driver's visual awareness and crash avoidance skills has great potential. Most drivers feel they are great drivers, but few understand how intense the distracted driving and technology-induced impairment is until they have a crash.

It is easy to understand that taking your eyes off the road is not a good idea, but cognitive dissonance seems to undermine this logic for many drivers. Drivers do not understand how weak their visual awareness is until they experience neurocognitive driving simulations that requires them to visually search and remember what they just saw. As drivers get better at these skills, they realize how much they have been missing all these years. On average, research indicates a 56% or greater improvement in recognizing objects in blind spots, rear view mirrors and directly ahead.[6] When a driver becomes more visually aware of their driving environment, it is harder to give in to technology-induced inattention, or to rationalize denial of risk. Please see the following still shot of a visual search and memory driving simulation. The simulation plays and then freezes. The user is then required to remember objects in six different visual zones.


Drivers know that taking your hands off the wheel can be a problem. But the risk of doing so is not always recognized or appreciated. After completing neurocognitive driving simulations targeting risk assessment and visual awareness of the driving environment, the driver gets better at determining real-time driving risk assessment. Hands off the wheel is often accompanied by eyes off the road and mind off driving.

The following still shot is from a Distracted Driving simulation exercise that demonstrates how much can happen in 3 seconds when you choose to glance down at a text message.

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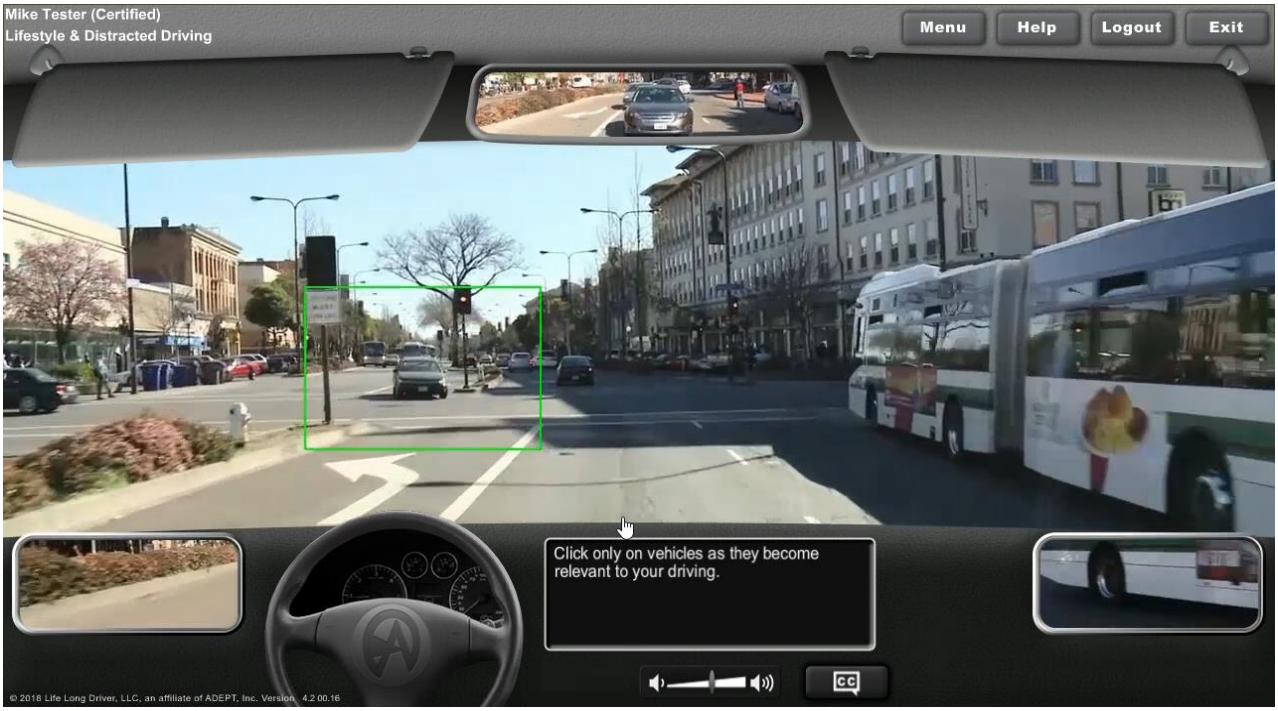


**Telematics:** Using connected car technology and data science to predict crash risk has been around for many years and is getting better. Many insurance companies use "telematics devices" to measure how the car is driven. There are also phone-based apps that can identify when a driver is using the mobile device, speeding or hard braking. Data is collected about how the car is being driven, not why the car is being driven that way. In effect, they are observing the symptoms of distracted driving and technology-induced inattention but miss the underlying causes.

Pairing telematics data with the driver's crash avoidance skill data is a very promising approach to significantly reducing injury and death caused by distracted driving and technology-induced inattention. It sounds like the future, but we are doing it today. There is opportunity to develop a diagnostic/prescriptive model to improve driver safety right now. This pairing will revolutionize the driver safety and insurance industry.

## IV. Promising Indicators that injuries and death caused by distracted driving and technology-induced inattention can be significantly reduced.

Research studies indicate significant improvement in skills associated with distracted driving and technology induced inattention.[6] In large scale before/after skills assessments, drivers significantly improved their visual awareness, hazard detection, risk assessment (including anticipating and reacting to emergencies), and gap analysis such as judging safe gaps in traffic and following distance.

When drivers improve these skills, they are not only safer drivers in general, but they are less likely to give in to technology-induced inattention or rationalize their distracted driving behaviors. Decades-long research studies and insurance company actuarial evaluations of the effectiveness of neurocognitive training observed one year after training clearly indicate significant driver behavior changes resulting in decreased crash frequency, bodily injuries, property damage and moving traffic violations.[7] Another indicator of behavior change after neuro-cognitive training is evidenced by a 67% reduction and traffic violations after training.[8] In addition, survey research indicates that over 80% of teen drivers are less likely to text while driving after neuro-cognitive training.[9]

One in four crashes, and 87% of rear end crashes, are caused by some form of distracted driving or technology-induced inattention.[1] Skill improvement through neurocognitive training directly related to reducing distracted driving and technology-induced inattention offers great hope for the future.

## V. Summary and Conclusions

Awareness initiatives are effective at educating our population of the risks and dangers of distracted driving and technology induced inattention. There is a clear need for solutions and treatments before we can expect to move the needle on reducing crashes and injuries. Understanding brain science and developing neuro-cognitive training that targets the causes of distracted driving crashes is an effective solution and treatment. These programs exist today and need to be more widely adopted to see dramatic reductions deaths and injuries associated with driver error.

**We have created a fun and engaging video that explains how we can significantly reduce distracted driving crashes. Please check out the following link:**
**https://www.adeptdriver.com/distracted-driving-headed-towards-a-happy-ending/**

**Sources**

[1] National Highway Traffic Safety Administration. (April 2020). Traffic Safety Facts Research Note: Distracted Driving 2018external icon.
[2] https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/analyses20of20rear-end20crashes20and20near-crashes20dot20hs2081020846.pdf
[3] https://www.claimsjournal.com/news/national/2017/09/12/280460.htm
[4] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2713933/
[5] https://www.sciencedirect.com/topics/neuroscience/inattentional-blindness
[6] ADEPT Driver 2018 developmental evaluation
[7] California DOI Rate Filling 2006
[8] Dunlap & Associates Safety Benefits of teenSMART Driver Training April 2020
[9] ADEPT Customer Survey 2019