CAMBRIDGE MOBILE TELEMATICS

Measuring and Pricing Phone Distraction Risk

A telematics-based analysis of U.S. driver behavior and its impact on the insurance industry

INTRODUCTION

The COVID-19 pandemic caused unprecedented disruption to driving habits around the world; within five weeks of the World Health Organization declaring a pandemic, **driving was down more than 60 percent in the United States.**

That disruption has thrown old risk pricing models into disarray; telematics data shows that as driving went down, speeding on the roads spiked. Now, nearly 14 months later, driving is returning to pre-pandemic norms, as is speeding.

However, phone **distraction has remained stubbornly high** throughout the first three months of 2021. More research is needed to uncover exactly why phone distraction isn't in lock-step with total driving and speeding, but telematics data shows the United States still significantly struggles with putting the phone away while behind the wheel.

Cambridge Mobile Telematics is the global leader in smartphone telematics. We measure more drivers around the globe, and refine our technology daily to provide the most accurate data on road safety. Smartphone telematics is the best way to measure the risk associated with phone distraction; during the pandemic, our partners had a near real-time look at how the pandemic affected their books of business.

We continue to study phone distraction closely, because not only is it predictive as a risk factor – it's causative, with **the most distracted drivers showing a loss frequency 2.2 times higher than the least distracted drivers** – but because it's a behavior that drivers can actually control and improve. We take the responsibility of identifying, understanding, and improving phone distraction very seriously, and there are several groups inside CMT dedicated to this research.

In this report, you will find four distinct looks at distracted driving from different points of view:

- An analysis of how the COVID-19 pandemic affected driving in the U.S., and what can be learned about phone **distraction from telematics data**.
- An examination of the **role of regulation** and enforcement in curbing phone distraction while driving that looks at how state laws are shifting to confront the crisis.
- A whitepaper reviewing how CMT's actuarial research reveals that **phone distraction is a causative risk factor that predicts future claims**.
- A look at the next generation of telematics, DriveScape, which uses AI-based **computer vision to identify and contextualize distraction** factors inside and outside of the vehicle.

Together with our partners, we'll strive to use this multi-faceted approach to improve our understanding of distracted driving, find better ways to measure it, and ultimately make smarter drivers and safer roads.

AUTHORS

Ian Murphy

Director of Marketing & Communications

Cambridge Mobile Telematics

Ian began his career as a newspaper journalist, covering politics, business, technology and sports, when his editors would let him. After years covering beats about business and technology, he transitioned to marketing by using his experience as a reporter to create digestible narratives for complex technological ideas – translating "Engineer to English." He began working with CMT in 2019 as a content strategist, and now leads the marketing and communications group.

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Lakshmi has over 17 years of experience in analytic product development in auto and home insurance using best in class statistical analysis and machine learning algorithms. At CMT, Lakshmi leads the strategic development of telematics scores and advanced risk factors adopted by insurers globally to accurately price drivers and build innovative coaching programs to mitigate risky behavior and make roads safer.

Ryan McMahon

VP of Insurance & Government Affairs

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Ryan's background has taken him to the heart of road safety issues, including at the scene of crashes as an Emergency Medical Technician to helping people recover as a claims adjuster in the insurance industry. Before CMT, Ryan's career spanned multiple positions within the industry including helping to introduce the first telematics-based system in the U.S. that rewarded drivers for safe behaviors. At CMT, Ryan's work is focused on advocating for road safety issues and helping partners around the globe to deliver on CMT's promise of making the world's roads safer by making drivers better.

Mike Benjamin

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Mike Benjamin, VP of IoT, joined CMT in 2019, and manages the development and production of the hardware and software associated with CMT's market leading IoT devices. Prior to joining CMT, Mike worked in the air travel information business as CTO of OAG and CEO at FlightView. As CEO at OpenRatings, Mike led a team applying AI to predict supply chain risk for manufacturers. Mike earned his BS and MS in Mechanical Engineering from MIT.

1 Phone Distraction Stubbornly Persists as Pandemic Traffic Returns To Normal

By Ian B. Murphy, *Director of Marketing & Communications, CMT*

The COVID-19 pandemic has caused an unprecedented interruption to travel. As local and national governments grappled with slowing the spread of the virus, lockdown orders changed vehicle traffic patterns. Businesses encouraged employees to work from home, altering the morning and evening commutes – all indications show those decades-old driving patterns will be permanently disrupted.

This never-before-seen phenomenon has rendered a more traditional year-over-year examination of distracted driving patterns pointless. But in looking at data for the last five quarters – all of 2020, and the first three months of 2021 – there is a specific trend that is both worrisome and worth following: gains in reducing phone distraction behind the wheel seem to have been interrupted during the pandemic, and **bad behaviors adopted while there were fewer cars on the road are persisting** as traffic returns to more familiar levels.

Driving Fell more than 60 Percent from Pre-Pandemic Peak

To measure just how significant the disruption in driving was, CMT examined the number of trips taken and the total distance driven per day by a cohort of 5,000 drivers from across the United States. Each driver in the study had at least one trip in each month from January 2020 through March 2021.

While some national and regional governments had started to react in early March, the World Health Organization declared a global pandemic on Wednesday, March 11, 2020. CMT measured the daily trips and distance compared to that of the peak driving day in the first 70 days of 2020 before the pandemic; that day happened to be **Friday, January 31**. To normalize the standard fluctuations of weekday vs. weekend driving, all daily numbers in this study reflect seven-day averages.

Total Driving Returning to Normal in Q1 2021

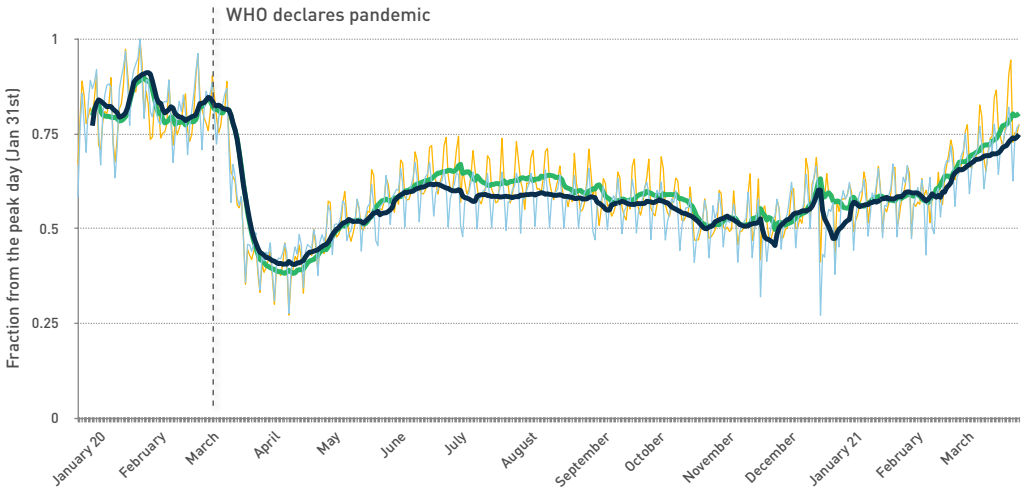
Source: CMT Research

Trips taken in the US

- 7-day average
- Fraction from the peak

Distance driven in the US

- 7-day average
- Fraction from the peak



On March 11, 2020, the day the pandemic was declared, the data showed there was already a 19.5 percent decrease in distance driven, and 18.3 percent decrease in trips from the peak day. Two weeks later, on March 25, both distance and total trips had halved – total daily distance had dropped 51.3 percent from peak, and daily trips had decreased by 50.3 percent.

The nadir of daily driving was the week of April 15: at that point distance per day had fallen 61.7 percent, and **total trips per day had dropped by 59.5 percent**.

There was a moderate recovery over the next two months – by June 17, distance driven and daily trips were below peak by 37.3 percent and 38.5 percent, respectively. Daily totals remained essentially flat through the end of summer – by September, daily distance was at 41 percent below peak, and daily trips was at 43.4 percent.

From that point driving again declined; during Q4 of 2020 there was a major spike in COVID-19 cases in the United States. According to the Washington Post, the 7-day average for reported cases on September 30 was 43,216; on October 30, it was 79, 894; By November 30, it was 161,599. Daily cases peaked on January 13, 2021 with 248,209.

During that stretch of time, the trough for daily distance and daily trips differed – the low point for distance was November 18, with **49.2 percent below the pre-pandemic peak**, while trips reached their low two weeks later, on December 2, with a 53.8 percent decrease.

Since those lows – and accepting normal seasonal interruptions for winter holidays – there has been a steady increase in driving, including a significant acceleration in March 2021. On March 3, daily distance was at 32.4 percent below peak and trips were at 34.6 percent. **By March 31, daily distance and trips had risen to just 19.6 percent and 25.2 percent below peak** – very similar to daily driving on the day the pandemic was declared.

Empty Roads Led to a Spike in Speeding

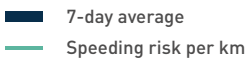
It is important to note the changes in total driving over the last five quarters because it provides context to the significant spike in risky driving behavior, especially speeding and phone distraction.

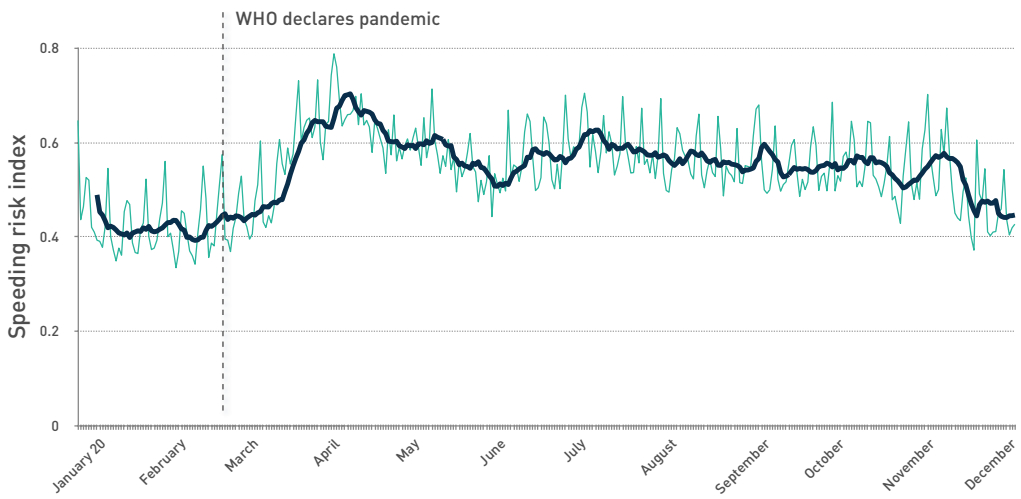
The increase in speeding was particularly drastic. This analysis used the same cohort as above, over the same time period, January 2020 through March 2021. What's measured here is the **total risk associated with speeding**, as per CMT's actuarial research based on billions of miles of telematics data. Speeding risk points are tied to the percentage of time driving where travel above the speed limit is detected, with faster speeds weighted for more risk, and then normalized per kilometer.

To measure increases/decreases in overall speeding risk, we took an **average of the first two months of 2020 to use as a baseline**. The average daily phone risk in January and February was 0.43. As above, data given for a specific date represents a 7-day average. It is important to note that CMT altered its speeding detection and classification methodology slightly in December 2020, so data after November is excluded in this analysis.

As Trips Taken Dropped by 50%, Speeding Risk Increased by 45%

Source: CMT Research





What is clear in the data is that as the roads emptied, those that still drove traveled at excessive speed much more often. In the first two weeks after the WHO declared the pandemic, increases in speeding risk more than doubled each week. On March 11, speeding risk had increased 8.4 percent from pre-pandemic averages; by March 18, the increase was 19.9 percent, and by March 25, when daily trips had dropped by 50.3 percent, speeding risk had increased by 45 percent.

Speeding risk topped out on April 8, at .70 on the speeding risk index, **a 64.1 percent increase from the pre-pandemic average**. While it remained high, speeding declined gradually through the summer; May 13 was at 42 percent above the January/February average; June 17 was still 35.7 percent above normal. Speeding remained 30 percent or more above average through the end of August, and eventually hit a low water mark of 21.4 percent above average on October 28.

When COVID-19 cases grew and U.S. drivers stayed home more during Q4 2020, speeding rose slightly – on November 11, speeding was at 33.9 percent above pre-pandemic averages – and it remained around that level until the data collection methodology changed.

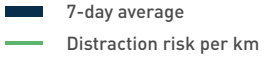
Phone Distraction Risk Rose and is still Above Normal

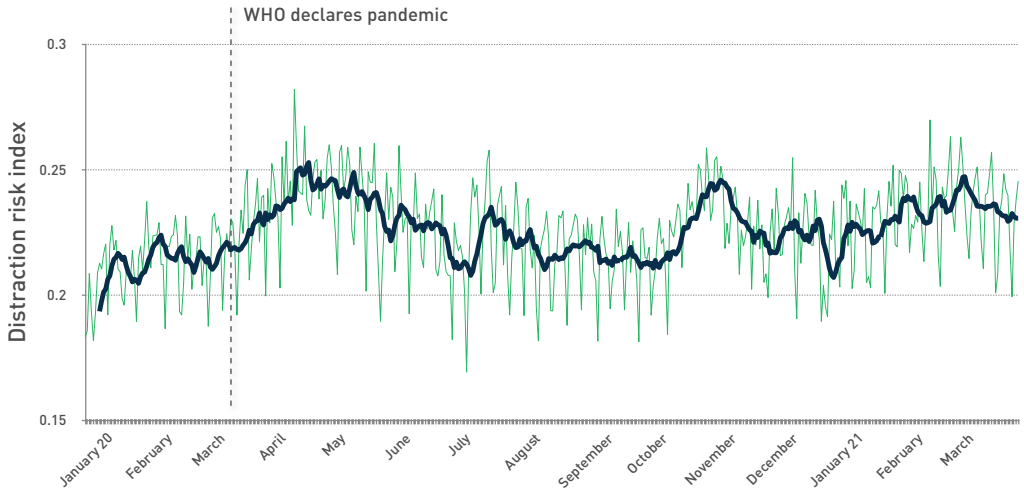
Increases in speeding risk in 2020 were clearly related to the total number of cars on the road, and speeding decreased as more drivers returned to somewhat regular travel. Phone distraction follows a similar pattern, but does not appear as directly related and **remains persistent** despite a return to more normal driving patterns.

Phone distraction risk points are tied to several factors, including the percentage of time driving where phone motion independent of the vehicle's travel is detected. To measure changes in overall phone distraction, CMT averaged the first two months of 2020 to use as a baseline. The average daily phone risk in January and February was 0.21. As above, data given for a specific date represents a seven-day average.

Distraction Remains Higher than Pre-Pandemic Averages

Source: CMT Research





At the onset of the pandemic, phone distraction risk saw similar, if less drastic, increases as drivers found fewer cars on the road. On March 11, phone distraction risk per kilometer had increased 4.1 percent from pre-pandemic averages. Two weeks later on March 25, phone distraction risk was at 8.5 percent above average; by April 15, the week with the least amount of driving, phone distraction was at a yearly high of **18.5 percent above average**.

Phone distraction risk remained elevated through May – on June 3, phone risk was still 11.5 percent above pre-pandemic averages. During the summer months phone distraction fell back towards more normal behavior – by August 12, phone distraction was 0.7 percent lower than the January/February average. It stayed low through October, but as drivers came off the road due to a surge in COVID-19 cases, phone distraction risk increased. **On November 4, phone distraction was back near its high water mark, at 15.6 percent above pre-pandemic averages**.

Phone distraction dipped during the holidays and through January 2021, but began to rise again during February, even as more cars were coming back on the road. February 3 saw phone distraction risk at 12.8 percent above average, while total daily distance and trips were both at 41 percent below peak.

By March 3, 2021, daily distance and trips had started to return to pre-pandemic normals, rising to 32.4 and 34.6 percent respectively. That week phone distraction hit its highest point in 2021, at 15.2 percent. On March 31, daily distance and trips were 19.6 and 25.2 percent below peak – nearly the same on March 11, 2020 – but phone distraction remained elevated at 9 percent above pre-pandemic averages.

Unpredictability of Phone Distraction Highlights Need for Telematics-Based Research

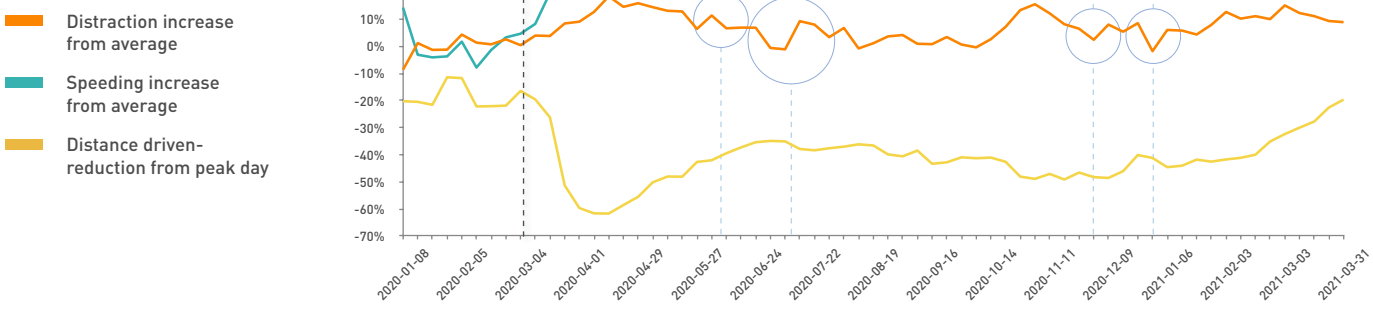
Telematics data uncovers details on the nature of driver risk that are unique and inaccessible otherwise. As the data shows, phone distraction behavior does not ebb and flow as traffic increases and decreases, like the data suggests speeding did in 2020. It is indirectly related, but in February and March 2021 phone distraction risk remained stubbornly high despite more trips and more distance traveled daily than any time since the first days of the COVID-19 pandemic. **This view of risk happening in near real time was only available to insurers with telematics-based programs**.

What happens next is uncertain: a major concern is that while enforcement priorities and the public consciousness lay elsewhere for the last year, drivers have backslid on awareness of the dangers of distracted driving, and that those bad habits could be here to stay.

The causes and solutions to distracted driving warrant further study. In eyeing the data from 2020 an interesting signal emerges: **holiday weeks have significant dips in phone distraction**.

Distraction Dropped During Holiday Weekends in 2020

Source: CMT Research



During Memorial Day, the Fourth of July, Thanksgiving, and Christmas – all weeks with holiday long weekends – a **precipitous decline of distraction** occurred. For Fourth of July, the effect stretched into two weeks; it's unclear why, though possibly people began summer vacations after a long, trying spring.

Do these dips in distraction indicate that social awareness campaigns of various road safety organizations have had a real effect in stigmatizing phone distraction while driving, so that when traveling with friends or family, phone distraction decreases? Or is there another factor at play here?

Telematics creates the best data set to further study phone distraction, but by blending other data streams, including connected car data or data from an AI-enabled dashcam (like CMT's DriveScape, discussed later in this report) can add context to continuously improve our understanding of the causes and cures of phone distraction.

2 Improving Road Safety – Revised Laws, Technology, and Communication

By Ryan McMahon, *VP of Insurance & Government Affairs, CMT*

Reducing distracted driving is going to take significantly more effort than what is being applied to the problem today. The first law to address texting and driving went into effect in the U.S. in 2007; that also was the year the iPhone was launched. Since then, smartphone adoption has skyrocketed to more than 90% of the driving adults.

This increase in smartphone usage has come at a cost to attention in many areas, and one of the most dangerous is drivers' attention to the road. Instinctively most people understand that distracted driving is not a good thing to do. Driver surveys suggest that the **number one worry for drivers on the road today is distracted drivers**, yet those same drivers admit to being distracted while behind the wheel. Telematics data analyzed by CMT confirms that concerns about smartphone distraction are not internalized effectively; smartphone distraction is now ubiquitous across speeds and road types.

CMT data provides a window into how dangerous distracted driving really is, giving a view that very few in the road safety community have seen before: an analysis of risk from millions of drivers on the road, with an in-depth understanding of how individual risk actions contribute to the likelihood that a driver will be involved in a crash. Admittedly the analysis is imperfect, limited by those who choose to opt in to the use of CMT's technology, and quite likely is based on some of the safest drivers on the road. Despite this, there is still significant risk which means that the tools society has deployed to reduce distracted driving are simply not enough.

The question is **what can be done about this?** The largest reaction thus far has been to increase tools for enforcement through stricter laws; this approach has been a critical component to improving roadway safety. It is quite likely this strategy will eventually solve distracted driving as well, and it is critically important that we continue to pass laws that help drivers understand that distraction has real consequences.

The major issue is that distracted driving is easy to hide, and hard to detect. It has become easier to evade detection as drivers have mounted smartphones to their cars or just simply placed their phone out of view of those outside the vehicle. Additionally the tools used by law enforcement to determine contributing causes for crashes are ineffective at understanding if a driver was distracted prior to a crash. Therefore **the true understanding of the actual impact of distracted driving is limited to estimates** at this time. These estimates are on the total amount of smartphone distraction occurring at any one time as well as the actual number of individuals who were distracted prior to a crash.

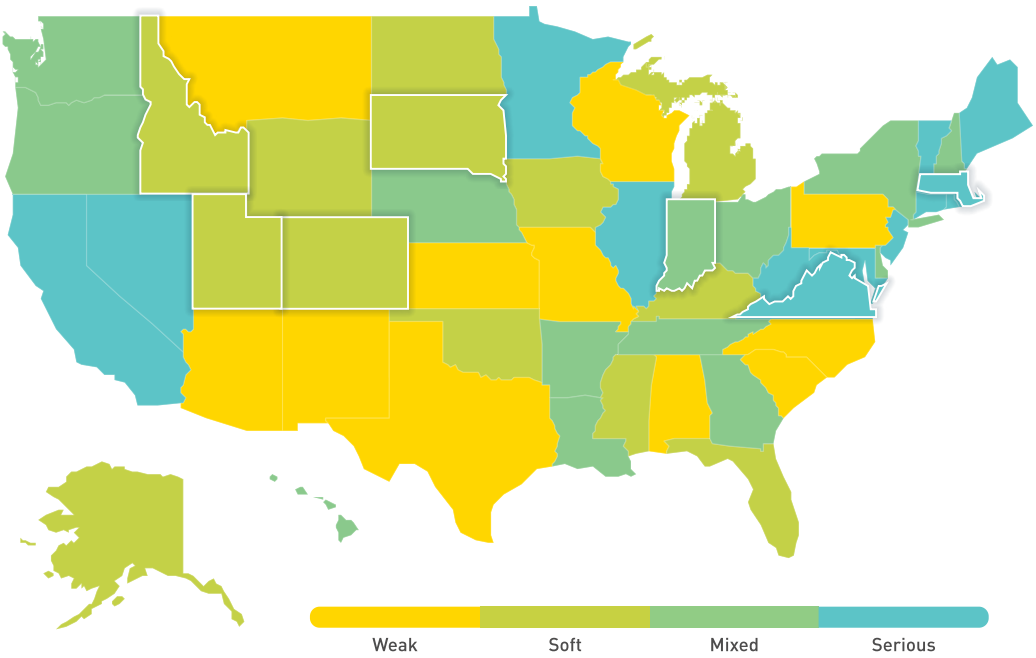
The net effect of this is that we need alternative tools to improve roadway safety, beyond just enforcement to reduce the impact that distracted driving is having on society. Those tools include education by advocacy groups such as **EndDD.org** and **Safe Roads Alliance**. They also include the "**Look Out**" program introduced by Jay Winsten at Harvard's TH Chan School of Public Health. Lastly, CMT sees the first-hand impact that technology can have on helping drivers internalize the risk they are creating for themselves and those who they share the road with.

CMT believes the way to combat distracted driving involves multiple strategies and investments that include, but are not limited, by laws alone, and through that effort we can create a much safer society where attention to a smartphone is not the last thing that someone does before claiming a life.

US Regulatory Landscape on Phone Distraction while Driving (as of May 2021)

Seven US States Strengthened Laws Against Distracted Driving

Note: the highlighted states indicate an improvement from 2020 in terms of protection against driver distraction. The methodology behind the index is from Siegfried&Jensen.



Since the beginning of 2020, at least nine states have enacted 12 distracted driving bills.

Idaho (HB 614) and **Indiana** (HB 1070) both passed a handheld ban.

Virginia (SB 160/HB 874) enacted handheld bans for all drivers. Active since January 1, 2021, handheld use of the phone while driving is now a primary offense. Drivers can now be charged with a traffic violation and fined $125 for the first offense and $250 for a second. This increases to $250 if the offense takes place in a highway work zone. Additionally, texting while driving can now lead to three points on the license.

Massachusetts has had a distracted driving law since 2010 as part of the Safe Driving Law. The new regulation is now a full handheld ban that applies to all drivers, not just drivers under 18 years old. It bans sending, typing, or reading electronic messages to or from handheld devices while operating a motor vehicle. This includes use of the internet and text messaging. The law still bans all handheld electronic devices usage by junior operators while behind the wheel.

Handheld Bans Achieved Advanced Status in Three Additional States

South Dakota's new law explicitly allows the use of a GPS or navigation system but prohibits manually entering information into those systems while driving. It allows reading, selecting, or entering a telephone number when making or receiving a call. Despite confusing press reporting, handheld use is banned by the statute. The law also specifically bans drivers from accessing, reading, or posting to a social networking site. The South Dakota senate approved the House Bill 1169 on March 4, 2020, it took effect in July of the same year.

A handheld ban in **Utah** (HB 101) passed the House and was tentatively approved by the Senate until funding could be secured for the increased court costs the bill would create. The bill makes it easier to enforce laws that ban the use of handheld cell phones while driving.

Colorado's hands-free bill (SB 65) passed the Senate but was not considered by the House.

Ohio could impose a handheld ban if enacted. The pending legislation (HB 283) considers expanding a ban on texting while driving, from secondary offense to primary. This would explicitly outlaw texting, livestreaming, taking photos, and the use of mobile apps while driving. It would make holding and using an electronic device while driving a primary offense.

Other Regulation Updates

Vermont (SB 339) significantly enhanced penalties for violating some of its distracted driving laws. The state established a civil penalty of $200 to $400 for a first violation of its hand held and texting bans in a school or work zone. The penalty is $500 to $1,000 for subsequent violations in any two-year period. Previously, violating the handheld ban carried only a one point penalty against the offender's drivers license, and the prohibition to text in a designated school or work zone did not carry enhanced penalties.

Maine (SB 653) also amended the penalty for violating its handheld ban to $50 for a first offense and $250 for a second and subsequent offense. Previously those penalties were minimums.

Texas slightly updated its regulation banning handheld phone use and texting in school zones only. Bus drivers already had an "all cell use ban" when carrying passengers under 18 years old. The update changes that age to 21.

Louisiana's handheld ban was limited to Learner or Intermediate License regardless of age, but now also includes drivers in school zones.

Maryland recently added school bus drivers to the "all cell phone" ban.

Minnesota rephrased the "all cell phone ban" to clarify that it applies to drivers younger than 18 or with Learner licenses or with Provisional driving licenses.

This update was helped greatly by the work produced by National Conference of State Legislature (NCSL), specifically their Traffic Safety Report and Review, which can be found here: https://bit.ly/33AsgAF

3 Distracted Driving in Insurance Rate Making

By Lakshmi Shalini, *VP of Risk & Insurance Analytics, CMT*

Overview

CMT's smartphone sensor data processing and AI classification algorithms provide insurance carriers with a powerful set of data points – events, advanced rating factors, and modeled scores – to consistently measure and quantify phone distraction.

Rating factors and scores are widely used by pricing actuaries to accurately compute risk-based premiums to maintain a profitable book of business. Unlike certain traditional rating factors, telematics behavior-based rating factors increase user engagement and lead to greater transparency in pricing. Many telematics factors, especially phone distraction, are not only predictive, but they are also (1) causative, not merely correlated, with crashes, and (2) controllable by the user to improve their score, unlike non-controllable factors such as age or location. By surfacing phone distraction rating factors in a usage-based insurance (UBI) program, insurers can actively coach drivers and reward safe drivers with higher discounts or lower premiums.

Evaluating the Impact of Phone Distraction on Losses

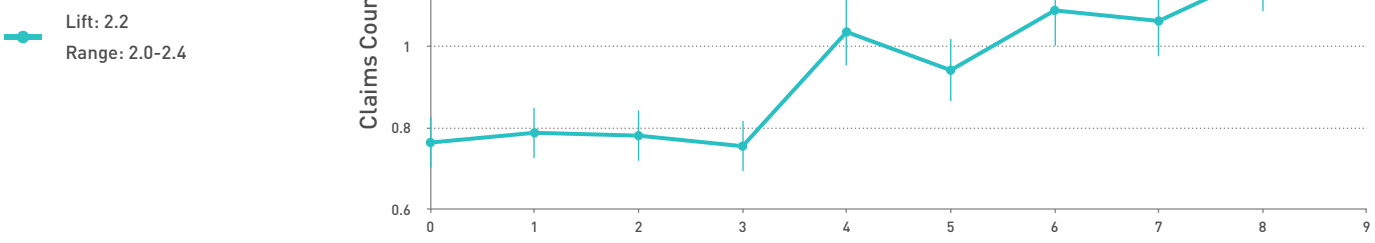
Actuaries and data scientists vet new risk factors for insurance pricing by conducting univariate and multivariate analyses on losses. The distraction risk factors are developed using machine learning algorithms and their predictive power evaluated in partnership with insurance carriers who provide external expert validation using claims data. CMT's phone distraction risk factors include detection of events, and the context in which those events occur, including if (1) a phone is being moved around in the hands of the driver, (2) the driver is interacting with the screen of the phone (such a texting), (3) phone calls are incoming, (4) phone calls are outgoing, or (5) calls are taken in handheld and hands-free modes.

Although the risk of texting, and more generally, handheld phone motion while driving is well documented, CMT's research indicates that both handheld and hands-free calls while driving a vehicle also correlate to losses, when considering intensity measures like the number or the duration of calls. External studies indicate a driver using hands-free calls or voice-controlled interface may not have full cognitive attention to safely operate a vehicle. CMT recommends insurers evaluate this further on their claims data.

Using only a subset of phone-distraction risk factors, CMT demonstrated the potential lift on a frequency model in the figure below. CMT conducted this analysis on data from several thousand insurance-partner claims on a corpus of 185 million miles and 35 million trips. The study shows that the average claims frequency increases from best to worst drivers and the 10% of most-distracted drivers have a loss frequency that is 2.2 times the 10% of least-distracted drivers.

Drivers who use their Phones the Most are More Likely to Make a Claim

Source: CMT Research



How Measuring Driver Behavior Helps Insurers Price Better

Insurers are increasingly looking to enhance their traditional pricing models with behavior-based features such as phone distraction to make insurance pricing factors more transparent and user-controllable.

CMT offers two frameworks to insurers to achieve this goal:

- Deploy an out-of-the-box telematics score that incorporates distraction features, or
- Develop a unique scoring model using a combination of distraction and other features tailored to an insurer's book of business.

CMT's Premium Score is an out-of-the-box solution that insurers can use to deploy distraction features without the time and effort to develop an in-house model. Premium Score is an actuarially-validated model and generates indications that can be adopted by carriers in a "me too" filing. The Premium Score model has been approved in 45 states (and counting), and incorporates phone motion and phone screen interaction as the two distraction rating features.

Other insurers who have gathered telematics data can utilize CMT's Advanced Risk Studio, which offers model-ready features that carriers can evaluate alongside other features to create unique custom scores. Our customers have noted that they benefit immensely from CMT's capability to accurately compute both the counts and intensity of the distraction events.

Distraction Differentiates without being Discriminatory

It is well known that traditional rating methods attribute increased risk to young drivers, resulting in drivers under 25 years of age paying significantly higher premiums. Many parents experience a sudden spike in their premiums when their teenager is first added to their existing policy. However, not all young drivers are bad drivers. Moreover, focusing on features such as age that are not controllable, makes car ownership and insurance unaffordable to younger drivers.

An approach to remedy this situation is through the addition of user-controllable telematics factors to finely segment the existing features and then over time replace the traditional features with telematics behavior-based features to develop a more equitable and fair pricing. CMT's data shows (1) many telematics factors are causative, and all are correlated, with risk; (2) most are user-controllable; and (3) all are non-discriminatory. And because they are controllable (and causative), one can induce behavioral changes to lower crashes and claims.

CMT measured its distraction feature across a population of insured users and found that younger drivers have significantly higher phone distraction, on average, than older ones. Even more interestingly, the lift is also higher – in other words, the less distracted young drivers are substantially and detectably safer than the most distracted young drivers. This insight on distraction behavior provides carriers with an opportunity to finely segment drivers as well as provide drivers with risky behaviors the opportunity to improve and get rewarded through lower premiums.

Distracted Driving is Dangerous and Insurers must Adopt this Factor in Ratings to Reduce this Behavior

Unlike traditional rating factors such as age, credit, gender, and location, distraction-based risk factors enable insurers to provide relevant coaching and incentives to reduce risky driving.

Incorporating best-in-class distraction rating factors will allow insurers to actively engage with drivers to improve driving behavior and reduce risk of future accidents.

4 The Next Step in Actuarial Science Will Use Computer Vision

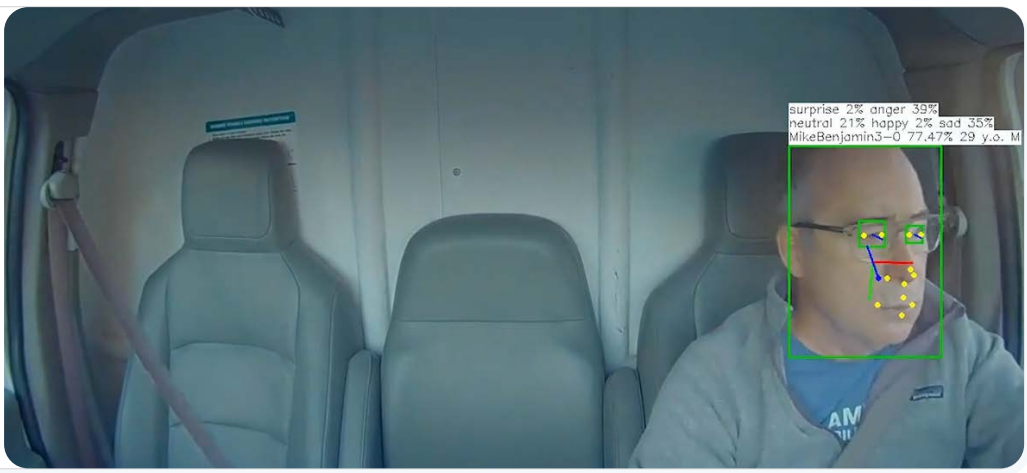
By Mike Benjamin, *VP of IoT, CMT*

Telematics has provided the insurance industry with a powerful tool to better identify and quantify risky behavior. But however precise telematics data can be, it cannot assess the full context of the risky events it measures.

For example, consider speeding: the risk profile of a driver safely going with the flow of traffic is far different than the driver weaving across several lanes. Phone distraction is widely understood to be a major source for risk, and can be measured with smartphone telematics. Yet there are several other potential sources of distraction or in-attention within the vehicle – drowsy driving, fiddling with the radio in heavy traffic, or even reading a book! To identify and quantify these behaviors a new layer of information is required.

Eye tracking technology allows a more complete picture of distraction inside the vehicle.

Source: CMT Research



This is Where Computer Vision Comes into Play

CMT has created DriveScape, a dual-facing camera that provides a 280 degree view of what's happening on both sides of the windshield.

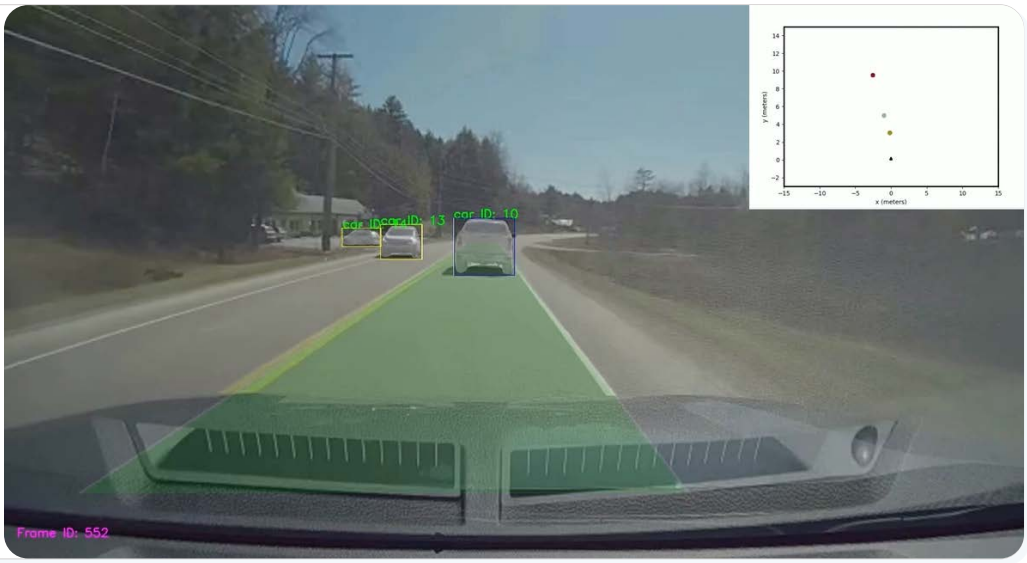
The computer vision technology powering DriveScape is able to accurately track specific patterns of movement and account for frequency and intensity. Combined with CMT's scoring platform, it can detect and score new types of risky events such as tailgating, frequent lane changes, or swerving using the outside lens.

With the inside lens, machine vision technology can identify the driver's eye movements and measure exactly what percentage of time the driver has their eyes on the road. It can also detect patterns of behavior that allows the AI to deduce that the driver is drowsy, or not focused on the roads.

DriveScape can detect if a driver is distracted with a phone that's in hands-free mode, the vehicle's onboard entertainment center, or the unruly children in the backseat.

DriveScape identifies and measures contextual risk factors on the road with computer vision AI.

Source: CMT Research



Because both directions are recorded concurrently, distraction that occurs inside the cab can also be placed into better context. There is a significant difference in risk when someone is adjusting the radio while driving on a straight, flat open road, or stuck sitting in a traffic jam, rather than driving down a busy city street, or on a curvy road in the middle of a thunderstorm. Context really matters, and that's one area where DriveScape excels: the dual video streams provide the most complete picture of what's happening when distraction in the car happens.

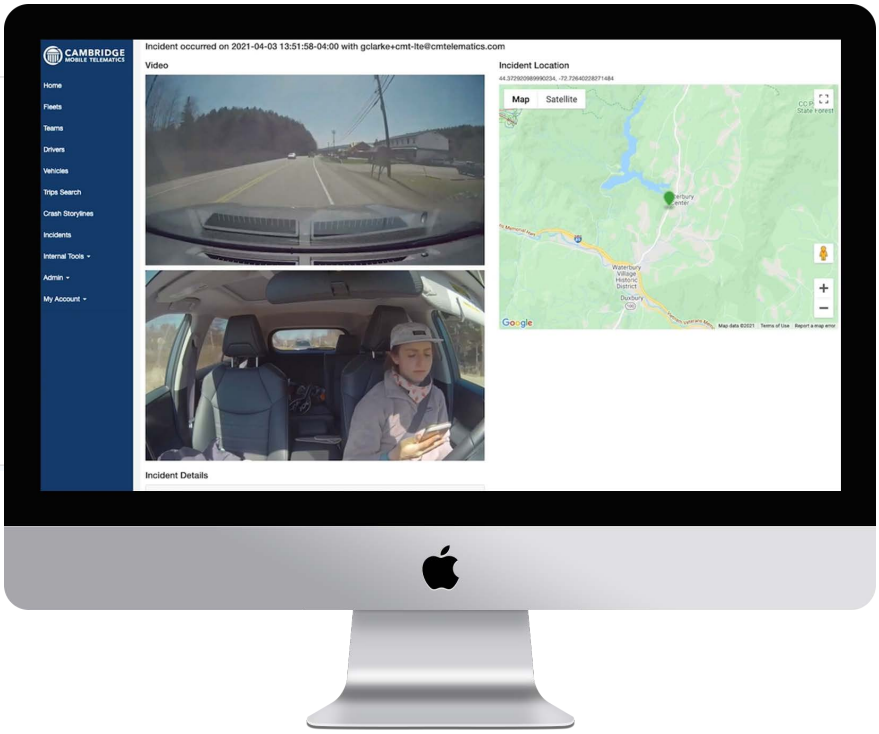
This contextual information brings enormous benefits to the calculation of risk.

Pulled together into the CMT scoring engine, computer vision helps actuaries better understand individual driver's risk and price it predictively and fairly.

The ability to generate automated and individual yet anonymized driving context information has the potential to create a new category of risk scores. In contrast with other attempts at improving risk measurement such as digital footprint monitoring, the technology aims at making risk scoring even more fair while never infringing on the driver's privacy.

DriveScape identifies and measures contextual risk factors on the road with computer vision AI.

Source: CMT Research



DriveScape was Built for Actuaries but with the Drivers in Mind

Professional drivers rely on maximizing their road time to make a living, and insights from DriveScape can reliably measure when they're most distracted, what route or climate conditions outside the car are the most dangerous, or even at what times drowsiness is the greatest concern for each individual. By using computer vision to quantify and better understand how they can improve their safety, professional drivers can stay on the job longer and get home safely.

CMT's mission is to make the world's roads & drivers safer.

Since its first product launch in 2012 that pioneered mobile usage-based insurance, CMT has become the world's leading telematics and analytics provider for insurers, rideshares, and fleets. CMT's DriveWell platform uses mobile sensing and behavioral science to measure driving risk and incentivize safer driving, while its Claims Studio reduces the claims cycle time with real-time crash detection, crash reconstruction, and damage assessment using telematics and artificial intelligence.

CMT has more than 65 active programs with insurers and other partners, improving safety for millions of drivers every day around the world. Started based on research at MIT and backed by the SoftBank Vision Fund to fuel its rapid growth, CMT is headquartered in Cambridge, MA.

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